ENGINEERING
TOMORROW

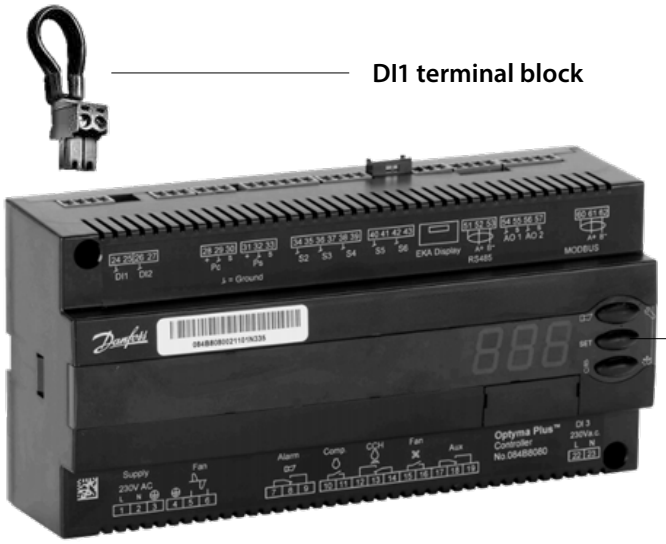
Quick starting procedure

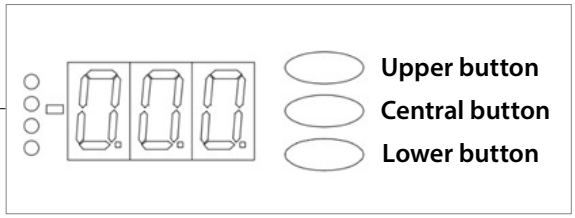
# Optyma™ **Plus**
# Control unit (mounted code 084B8080)




Caution:
The information contained herein is a summary of the instructions available in the Danfoss documentation. For further information, please consult the user guide or other documents provided with the condensing unit.

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AN330833960600en-000101

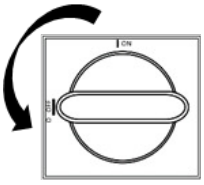



The upper and lower buttons are used to navigate the menu and change the values, while the central button lets you access the parameters and confirm the value

## Step 1 - Removing the DI1 terminal block

**1.1**



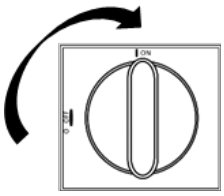
If the condensing unit is powered up, cut off the power supply using the switch.

**1.2**



Remove the DI1 terminal block.
This is the external stop start hard wired link for the controller & will stop the compressor from running. You can access the controller by opening the hinged door of the unit & then removing two screws on the cover plate that covers the controller terminals.

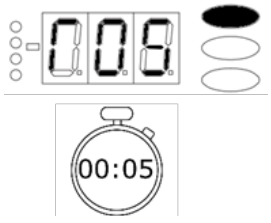
**1.3**



Power the unit back on by turning the switch.

## Step 2 - Settings mode

**2.1**




Press the upper button for 5 seconds: r05 will appear.

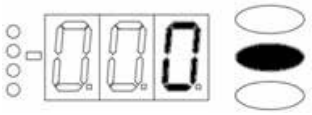
## Step 3 - Deactivating the control unit functionalities

**3.1**



Use the upper and lower buttons to scroll through the parameters. Select the parameter r12 and press the central button to confirm.

**3.2**



Set the value to 0: the control unit is then deactivated. Confirm your selection using the central button.

## Step 4 - Selecting the refrigerant

**4.1**



Scroll through parameters and select parameter o30, press the central button to confirm.

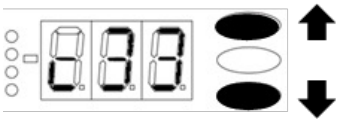
**4.2**

| Fluid | Parameter | Fluid | Parameter |
|---|---|---|---|
| R134a | 3 | R513A | 36 |
| R507A | 17 | R448A | 40 |
| R404A | 19 | R449A | 41 |
| R407A | 21 | R452A | 42 |
| R407F | 37 | | |

Enter the value corresponding to your refrigerant and confirm your selection using the central button.

## Step 5 - Set condensing unit type

**5.1**



Scroll through parameters and select parameter c33.

**5.2**



Set the Pump Down cut-out value. The Average for R513A is 0.9 bar for scroll compressors. This value depends on the type of application and refrigerant. Confirm your selection with the central button.

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## If you have an Optyma™ Plus INVERTER

**5.1**



If you have an Optyma™ **Plus INVERTER**, set the evaporating pressure setting with parameter r23.

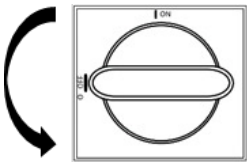
**5.2**



This parameter is based on the evaporation temperature (dew point). For example, if the evaporation temperature is -10°C, set this value to -10.

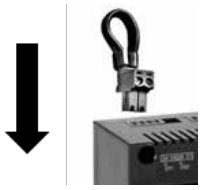
## Step 6 - Activating the control unit functionalities

**6.1**



Cut off the power supply using the switch.

**6.2**



Connect the terminal block DI1.

**6.3**



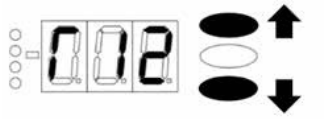
Power the unit back on via the switch.

**6.4**



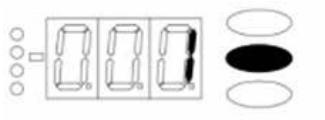

Press the upper button for 5 seconds: r05 will appear.

**6.5**



Use the upper and lower buttons to scroll through the parameters. Select the parameter r12 and press the central button to confirm.

**6.6**



Set the value to 1: the control unit is then activated. Confirm your selection using the central button. The condensing unit is ready to start.

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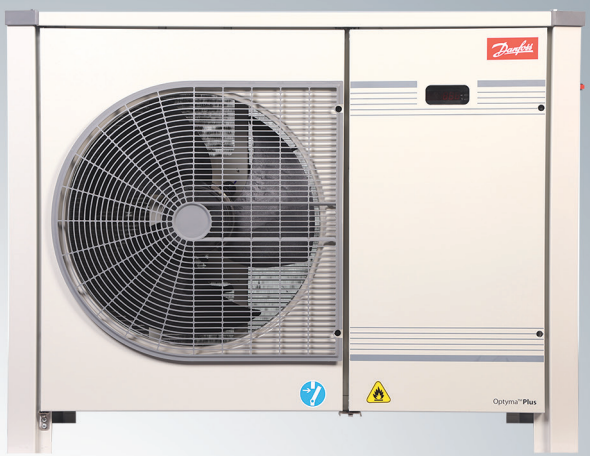
ENGINEERING
TOMORROW

European Catalogue

# Optyma™
# Packaged condensing units

R452A, R134a, R513A, R448A, R449A, R407A, R407F, R404A/R507, R744, R454C, R455A, R1234yf - 50 Hz









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# Danfoss Optyma™
# packaged condensing units

**Highly efficient and reliable plug and play condensing units designed with the contractor and end-user in mind, and providing unique benefits.**

## Benefits for the contractor

- Simple and fast selection and installation, reduced maintenance time
- Models compatible with multiple lower GWP refrigerants
- Reduced refrigerant costs thanks to microchannel condenser inside

## Benefits for the end-user

- Higher food safety and longer products shelf life
- Units suitable for residential areas thanks to low sound level operation
- Reduced life cycle costs of refrigeration equipment thanks to highly efficient units

### Optyma™ **Slim Pack (W05)**



Compact and cost effective.
**With microchannel condenser**



### Optyma™ **Slim Pack (W09)**



Cost effective and efficient.
**W05 base + fan speed controller and main switch**



A2L Multi-refrigerants A1+A2L

### Optyma™ **Plus (P00)**



Reliability & connectivity to the cloud.
**With electronic controller**



### Optyma™ **with Liquid Injection (P02)**

P00 base + Liquid injection feature with electronic expansion valve and dedicated electronic controller.



A2L Multi-refrigerants A1+A2L

### Optyma™ **Plus INVERTER (P01)**



Unmatched efficiency for high energy savings.
**With variable speed drive**



## MBP and LBP **applications**



- Cold rooms, display cabinets in convenience stores, mini-markets, restaurants, fisheries, butcheries, bakeries, florists, laboratories
- Wine cellars
- Milk cooling
- Industrial processes
- Dairy and general food storage

## Designation

**OP - MSXM034 ML W05 G**

1 2 3 4 5 6 7 8

| | |
|---|---|
| | **OP** = Optyma™ |
| 1 | Application: **M** = MBP ; **L** = LBP |
| 2 | Condensing unit family: **S** = Slim Pack / **P** = OP Plus and OP Plus INVERTER |
| 3 | Refrigerant: **A** = R744; **B** = R404A/R507, R448A, R449A, R452A; **G** = R134a, R513A; **H** = R404A/R507; **I** = R404A/R507, R134a, R407A, R407F, R448A, R513A, R449A, R452A, R454C, R455A; **K** = R404A, R448A, R449A, R452A, R454C, R455A; **O** = R452A, R404A/R507, R448A, R449A; **P** = R448A/R449A, R407A/F, R404A/R507; **Q** = R452A, R404A/R507; **S** = R134a, R513A, R1234yf ; **T** = R404A/R507,R455A,R454C,R448A/R449A,R452A; **V** =R454C, R455A, R452A, R404A/R507; **X** = R404A/R507, R134a, R407A, R407F, R448A, R513A, R449A, R452A ; **Y** = R404A/R507, R449A; |
| 4 | **M** = Microchannel heat condenser |
| 5 | Displacement in $cm^3$: Example 034 = 34 $cm^3$ |
| 6 | Compressor platform VVL = variable speed scroll VLZ<br>DX/DP/DS/DY/SC/CS/NTZ = Fixed Speed Recip Compressor<br>MLZ and LLZ = Fixed speed Scroll Compressor |
| 7 | Version:<br>**W05/W09:** Optyma™ **Slim Pack**<br>**P00**: Optyma™ **Plus**<br>**P01**: Optyma™ **Plus INVERTER**<br>**P02**: Optyma™ **Plus** with Liquid Injection |
| 8 | Electrical code: **G** = 230V/1-phase compressor & fan<br>**E** = 400V/3-phase compressor & 230V/1-phase fan |

## Feature overview:

| | Optyma™ Slim Pack | | Optyma™ Plus | | Optyma™ Plus INVERTER | Optyma™ iCO₂ |
|---|---|---|---|---|---|---|
| | (W05) | (W09) | (P00) | (P02) | (P01) | (P04) |
| **IP level** | IP54 | | IP54 | | IP54 | IP54 |
| **Compressor technology** | Scroll/Reciprocating | | Scroll/Reciprocating | Scroll | Variable speed scroll | Variable speed scroll |
| **Control box (pre-wired E-panel)** | yes | | yes | | yes | yes |
| **Microchannel condenser** | yes | | yes | | yes | yes |
| **Fan speed controller** | - | yes | yes | | yes | yes |
| **Main switch (circuit breaker)** | - | yes | yes | | yes | yes |
| **Filter drier (flare connections)** | yes | | yes | | yes | yes (brazed) |
| **Sight glass** | yes | | yes | | yes | yes |
| **Crankcase heater** | yes | | yes | | yes | yes |
| **HP/LP adjustable pressostat** | Auto/Manual reset mode | | Electronic | | Electronic | Electronic |
| **Fail safe mini-pressostat** | - | | Mechanical | | Mechanical | Mechanical |
| **Access door(s)** | - | | yes | | yes | yes |
| **Acoustic insulation** | - | | yes | | yes | yes |
| **Condensing unit electronic controller** | - | | yes | | yes | yes |
| **Network connectivity** | - | | yes | | yes | yes |
| **Stack mounting** | - | | yes | | - | yes |
| **Oil separator** | - | | - | | yes | yes |
| **Discharge gas thermostat** | yes* | | yes | | yes | yes |
| **HP/LP Alarm** | yes* | | yes | | yes | yes |
| **Liquid injection kit** | - | | - | yes | - | - |
| **Net weight in kg** | B1 housing: from 50.4 to 53<br>B2 housing: from 61.5 to 77<br>B3 housing: from 76 to 79 | | H1 housing: from 49 to 53<br>H2 housing: from 80 to 94<br>H3 housing: from 101 to 107<br>H4 housing: 169 | H3 housing: from 135 and 136<br>H4 housing: 161 and 166 | H3 housing:<br>124 and 125<br>H3+: | H3 housing: 116 |
| **Dimensions in mm (height x width x depth)** | B1 housing: 530 x 910 x 364<br>B2 housing: 690 x 1079 X464<br>B3 housing: 825 x 1105 x 464 | | H1 housing: 605 X 941 X 406<br>H2 housing: 813 X 1090 X 480<br>H3 housing: 965 X 1441 X 531<br>H4 housing: 966 X 1835 X 650 | H3 housing: 965 X 1441 X 531<br>H4 housing: 966 X 1835 X 650 | H3 housing:<br>965 x 1406 x 481<br>H3+: | H3 housing:<br>835 x 1340 x 500 |

* Not premounted, provision available

## Overview by range and refrigerant:

| Min / Max Cooling capacity range [kW] | Optyma™ Slim Pack | Optyma™ Plus | Optyma™ with Liquid injection | Optyma™ Plus INVERTER | Optyma™ iCO₂ |
|---|---|---|---|---|---|
| **Medium temperature (MBP)** | | | | | |
| **R744** | - | - | - | - | 4.6 |
| **R448A/R449A** | 0.8 - 11.0 | 0.8 - 16.2 | - | 5.9 - 11.3 | - |
| **R134a** | 0.6 - 6.6 | 1.3 - 10.2 | - | - | - |
| **R513A** | 0.6 - 7.0 | 1.3 - 10.3 | - | - | - |
| **R452A** | 0.8 - 10.8 | 0.8 - 16.1 | - | - | - |
| **R404A/507** | 0.8 - 10.3 | 0.8 - 16.1 | - | 6.0 - 11.5 | - |
| **R455A** | 0.8 - 5.7 | 0.8 - 5.7 | - | - | - |
| **R454C** | 0.7 - 5.2 | 0.7 - 5.2 | - | - | - |
| **R1234yf** | 0.6 - 1.4 | 1.2 - 1.4 | - | - | - |
| **Low temperature (LBP)** | | | | | |
| **R448A/R449A** | - | - | 2.5 - 6.6 | - | - |
| **R452A** | 0.3 - 3.4 | 0.4 - 1.7 | 2.4 - 6.3 | - | - |
| **R404A/507** | 0.4 - 3.6 | 0.4 - 1.7 | 2.6 - 5.8 | - | - |
| **R455A** | 0.3 - 1.5 | 0.3 - 5.9 | - | - | - |
| **R454C** | 0.3 - 1.2 | 0.3 - 5.0 | - | - | - |

**Rating conditions EN 13215 (Mid point):**
**MBP:** Ambient temp = 32°C, Evap temp = -10°C, Superheat = 10K, Subcooling = 0K / **LBP:** Ambient temp = 32°C, Evap temp = -35°C, Superheat = 10K, Subcooling = 0K

# Optyma™ Slim Pack
## Light on **refrigerant, heavy on efficiency**

Get it all with Optyma™ **Slim Pack**. It combines quiet operation and more value for money with an energy-efficient and compact solution.

### Quick and safe installation and service
Same serviceable units, upgraded for A2L refrigerants. Ignition proof tested in TÜV laboratory.

### High SEPR*
All models in the range are highly efficient and well above EcoDesign 2018 thresholds, contributing to a reduction in energy costs.
**SEPR: Seasonal Energy Performance Ratio.*

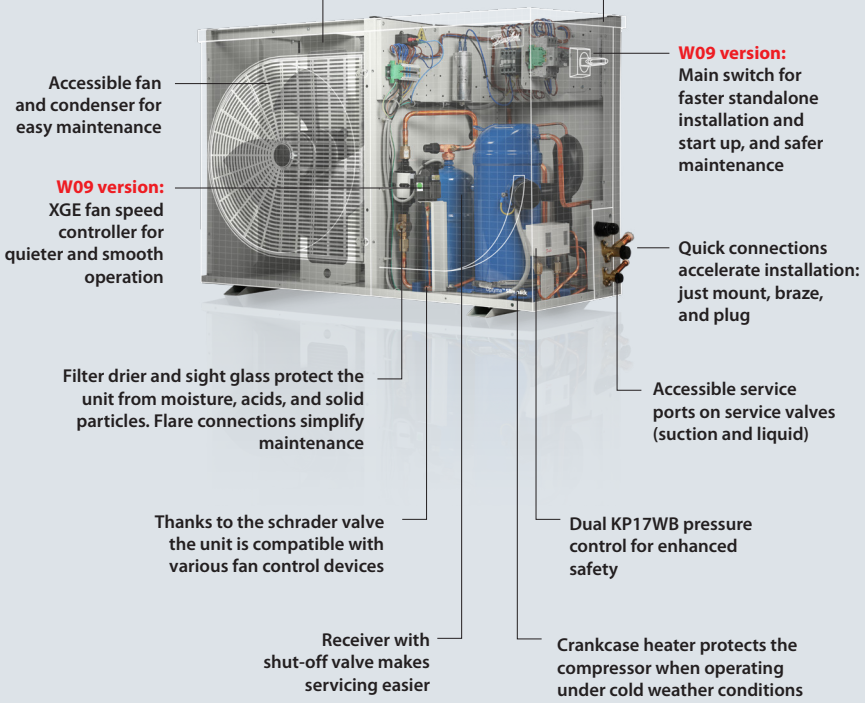
### A2L
Multi-refrigerants units for complexity reduction, available with new code numbers. Go A2L for a sustainable compliant choice.

### Suitable for residential areas
It operates up to 7 dB(A) lower than other packaged units of the same capacity and the fan-speed controller further reduces the sound level by up to 4 dB(A).

### Optimized footprint for floor and wall mounting
Thanks to its slim design and low weight, it is easy to transport and handle during installation – particularly for wall mounting.

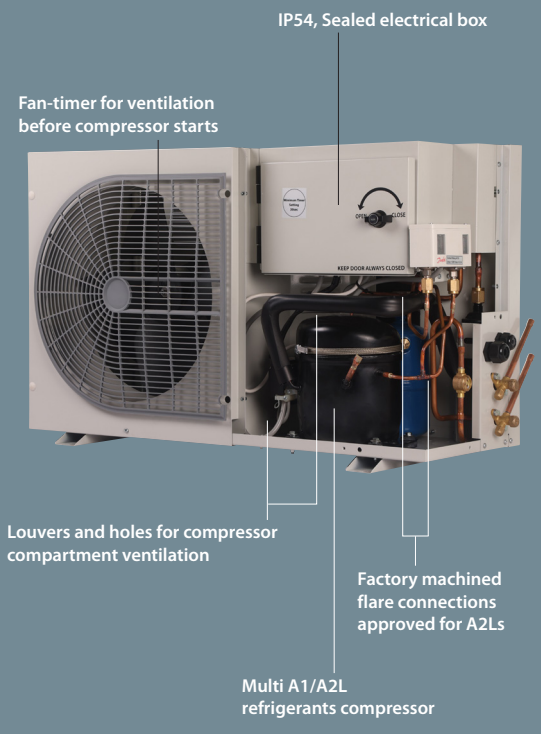


## Standard range **(W05 and W09)**




## Multi refrigerant range **(W05 and W09)**

A2L




Electrical components approved for A2Ls

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LSQM014DP | 114X7106 114X7129 | W05 W09 | A1 | G | 27 | 0.34 | 0.44 | 0.56 | 0.68 | 0.81 | 0.94 | - | 0.98 | - | 6 | 31 |
| | | | | | 32 | 0.30 | 0.40 | 0.50 | 0.61 | 0.73 | 0.85 | - | | | | |
| | | | | | 38 | - | 0.34 | 0.43 | 0.53 | 0.63 | 0.74 | - | | | | |
| | | | | | 43 | - | 0.29 | 0.37 | 0.46 | 0.55 | 0.66 | - | | | | |
| OP-LSVM014DP | 114X7263 114X7295 | W05 W09 | A1 + A2L | G | 27 | 0.34 | 0.44 | 0.56 | 0.68 | 0.81 | 0.94 | - | 0.98 | - | 6 | 31 |
| | | | | | 32 | 0.30 | 0.40 | 0.50 | 0.61 | 0.73 | 0.85 | - | | | | |
| | | | | | 38 | - | 0.34 | 0.43 | 0.53 | 0.63 | 0.74 | - | | | | |
| | | | | | 43 | - | 0.29 | 0.37 | 0.46 | 0.55 | 0.66 | - | | | | |
| OP-LSQM018DP | 114X7107 114X7130 | W05 W09 | A1 | G | 27 | 0.35 | 0.48 | 0.63 | 0.79 | 0.96 | 1.15 | - | 1.00 | - | 6 | 32 |
| | | | | | 32 | 0.31 | 0.43 | 0.56 | 0.71 | 0.87 | 1.04 | - | | | | |
| | | | | | 38 | - | 0.37 | 0.48 | 0.61 | 0.75 | 0.91 | - | | | | |
| | | | | | 43 | - | 0.31 | 0.42 | 0.53 | 0.66 | 0.80 | - | | | | |
| OP-LSVM016DP | 114X7242 114X7296 | W05 W09 | A1 + A2L | G | 27 | 0.35 | 0.48 | 0.63 | 0.79 | 0.96 | 1.15 | - | 1.00 | - | 6 | 32 |
| | | | | | 32 | 0.31 | 0.43 | 0.56 | 0.71 | 0.87 | 1.04 | - | | | | |
| | | | | | 38 | - | 0.37 | 0.48 | 0.61 | 0.75 | 0.91 | - | | | | |
| | | | | | 43 | - | 0.31 | 0.42 | 0.53 | 0.66 | 0.80 | - | | | | |
| OP-LSVM026DS | 114X7227 114X7297 | W05 W09 | A1 + A2L | G | 27 | 0.49 | 0.70 | 0.95 | 1.23 | 1.55 | 1.90 | - | 0.98 | - | 10 | 39 |
| | | | | | 32 | 0.44 | 0.63 | 0.86 | 1.13 | 1.42 | 1.75 | - | | | | |
| | | | | | 38 | - | 0.56 | 0.76 | 1.00 | 1.27 | 1.58 | - | | | | |
| | | | | | 43 | - | 0.49 | 0.68 | 0.90 | 1.15 | 1.44 | - | | | | |
| OP-LSVM034DS | 114X7228 114X7298 | W05 W09 | A1 + A2L | G | 27 | 0.67 | 0.95 | 1.27 | 1.63 | 2.04 | 2.48 | - | 1.02 | - | 10 | 39 |
| | | | | | 32 | 0.60 | 0.86 | 1.16 | 1.49 | 1.87 | 2.28 | - | | | | |
| | | | | | 38 | - | 0.75 | 1.02 | 1.33 | 1.67 | 2.05 | - | | | | |
| | | | | | 43 | - | 0.67 | 0.91 | 1.19 | 1.50 | 1.86 | - | | | | |
| OP-LSQM048NT | 114X7087 114X7181 | W05 W09 | A1 | G | 27 | 0.84 | 1.17 | 1.57 | 2.02 | 2.54 | 3.11 | - | 1.15 | - | 12 | 42 |
| | | | | | 32 | 0.71 | 1.02 | 1.38 | 1.80 | 2.27 | 2.79 | - | | | | |
| | | | | | 38 | 0.57 | 0.84 | 1.17 | 1.54 | 1.96 | 2.42 | - | | | | |
| | | | | | 43 | 0.47 | 0.71 | 1.00 | 1.33 | 1.71 | 2.11 | - | | | | |
| OP-LSVM048NT | 114X7244 114X7282 | W05 W09 | A1 + A2L | G | 27 | 0.84 | 1.17 | 1.57 | 2.02 | 2.54 | 3.11 | - | 1.15 | - | 12 | 42 |
| | | | | | 32 | 0.71 | 1.02 | 1.38 | 1.80 | 2.27 | 2.79 | - | | | | |
| | | | | | 38 | 0.57 | 0.84 | 1.17 | 1.54 | 1.96 | 2.42 | - | | | | |
| | | | | | 43 | 0.47 | 0.71 | 1.00 | 1.33 | 1.71 | 2.11 | - | | | | |
| OP-LSQM048NT | 114X7088 114X7182 | W05 W09 | A1 | E | 27 | 0.80 | 1.13 | 1.52 | 1.94 | 2.42 | 2.94 | - | 1.10 | - | 6 | 42 |
| | | | | | 32 | 0.69 | 0.99 | 1.35 | 1.74 | 2.17 | 2.63 | - | | | | |
| | | | | | 38 | 0.54 | 0.82 | 1.14 | 1.49 | 1.86 | 2.27 | - | | | | |
| | | | | | 43 | 0.41 | 0.68 | 0.97 | 1.28 | 1.62 | 1.97 | - | | | | |
| OP-LSVM048NT | 114X7245 114X7283 | W05 W09 | A1+A2L | E | 27 | 0.80 | 1.13 | 1.52 | 1.94 | 2.42 | 2.94 | - | 1.10 | - | 6 | 42 |
| | | | | | 32 | 0.69 | 0.99 | 1.35 | 1.74 | 2.17 | 2.63 | - | | | | |
| | | | | | 38 | 0.54 | 0.82 | 1.14 | 1.49 | 1.86 | 2.27 | - | | | | |
| | | | | | 43 | 0.41 | 0.68 | 0.97 | 1.28 | 1.62 | 1.97 | - | | | | |
| OP-LSQM068NT | 114X7090 114X7184 | W05 W09 | A1 | E | 27 | 1.29 | 1.73 | 2.23 | 2.77 | 3.33 | 3.91 | - | 1.17 | - | 10 | 43 |
| | | | | | 32 | 1.12 | 1.52 | 1.97 | 2.46 | 2.96 | 3.49 | - | | | | |
| | | | | | 38 | 0.92 | 1.27 | 1.66 | 2.08 | 2.54 | 3.00 | - | | | | |
| | | | | | 43 | 0.75 | 1.07 | 1.42 | 1.79 | 2.19 | 2.57 | - | | | | |
| OP-LSVM068NT | 114X7247 114X7285 | W05 W09 | A1+A2L | E | 27 | 1.29 | 1.73 | 2.23 | 2.77 | 3.33 | 3.91 | - | 1.17 | - | 10 | 43 |
| | | | | | 32 | 1.12 | 1.52 | 1.97 | 2.46 | 2.96 | 3.49 | - | | | | |
| | | | | | 38 | 0.92 | 1.27 | 1.66 | 2.08 | 2.54 | 3.00 | - | | | | |
| | | | | | 43 | 0.75 | 1.07 | 1.42 | 1.79 | 2.19 | 2.57 | - | | | | |

**This table continues on the next page**

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

## Catalogue Optyma™ Slim Pack - Performance data R452A LBP

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LSQM068NT | 114X7089<br>114X7183 | W05<br>W09 | A1 | G | 27 | 1.32 | 1.75 | 2.22 | 2.75 | 3.32 | 3.92 | - | 1.02 | - | 20 | 43 |
| | | | | | 32 | 1.11 | 1.52 | 1.96 | 2.44 | 2.96 | 3.51 | - | | | | |
| | | | | | 38 | 0.88 | 1.25 | 1.65 | 2.08 | 2.54 | 3.02 | - | | | | |
| | | | | | 43 | 0.70 | 1.03 | 1.40 | 1.79 | 2.21 | 2.63 | - | | | | |
| OP-LSQM067LL | 114X7091<br>114X7187 | W05<br>W09 | A1 | E | 27 | 2.05 | 2.64 | 3.36 | 4.21 | 5.20 | 6.34 | - | - | 1.69 | 16 | 45 |
| | | | | | 32 | 1.90 | 2.44 | 3.10 | 3.88 | 4.80 | 5.86 | - | | | | |
| | | | | | 38 | 1.73 | 2.20 | 2.79 | 3.49 | 4.31 | 5.27 | - | | | | |
| | | | | | 43 | 1.59 | 2.01 | 2.53 | 3.15 | 3.90 | 4.77 | - | | | | |
| OP-LSQM084LL | 114X7092<br>114X7188 | W05<br>W09 | A1 | E | 27 | 2.55 | 3.23 | 4.03 | 4.96 | 6.03 | 7.25 | - | - | 1.66 | 20 | 44 |
| | | | | | 32 | 2.35 | 2.97 | 3.71 | 4.57 | 5.56 | 6.69 | - | | | | |
| | | | | | 38 | 2.10 | 2.66 | 3.32 | 4.09 | 4.98 | 6.00 | - | | | | |
| | | | | | 43 | 1.88 | 2.38 | 2.98 | 3.67 | 4.48 | 5.41 | - | | | | |
| OP-LSQM098LL | 114X7075<br>114X7189 | W05<br>W09 | A1 | E | 27 | 2.98 | 3.76 | 4.68 | 5.74 | 6.95 | 8.31 | - | - | 1.67 | 20 | 45 |
| | | | | | 32 | 2.74 | 3.46 | 4.30 | 5.28 | 6.40 | 7.66 | - | | | | |
| | | | | | 38 | 2.43 | 3.08 | 3.84 | 4.71 | 5.71 | 6.85 | - | | | | |
| | | | | | 43 | 2.18 | 2.76 | 3.43 | 4.22 | 5.12 | 6.15 | - | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LSQM014DP | 114X7106 114X7129 | W05 W09 | A1 | G | 27 | 0.37 | 0.50 | 0.65 | 0.81 | 0.99 | 1.18 | - | 1.04 | - | 6 | 31 |
| | | | | | 32 | 0.33 | 0.45 | 0.58 | 0.73 | 0.90 | 1.08 | - | | | | |
| | | | | | 38 | 0.29 | 0.39 | 0.51 | 0.64 | 0.79 | 0.95 | - | | | | |
| | | | | | 43 | - | 0.34 | 0.44 | 0.56 | 0.70 | 0.85 | - | | | | |
| OP-LSVM014DP | 114X7263 114X7295 | W05 W09 | A1 + A2L | G | 27 | 0.37 | 0.50 | 0.65 | 0.81 | 0.99 | 1.18 | - | 1.04 | - | 6 | 31 |
| | | | | | 32 | 0.33 | 0.45 | 0.58 | 0.73 | 0.90 | 1.08 | - | | | | |
| | | | | | 38 | 0.29 | 0.39 | 0.51 | 0.64 | 0.79 | 0.95 | - | | | | |
| | | | | | 43 | - | 0.34 | 0.44 | 0.56 | 0.70 | 0.85 | - | | | | |
| OP-LSVM016DP | 114X7242 114X7296 | W05 W09 | A1 + A2L | G | 27 | 0.39 | 0.54 | 0.72 | 0.91 | 1.12 | 1.36 | - | 1.08 | - | 6 | 32 |
| | | | | | 32 | 0.35 | 0.49 | 0.64 | 0.82 | 1.02 | 1.24 | - | | | | |
| | | | | | 38 | 0.30 | 0.42 | 0.56 | 0.72 | 0.90 | 1.09 | - | | | | |
| | | | | | 43 | - | 0.36 | 0.49 | 0.63 | 0.79 | 0.98 | - | | | | |
| OP-LSQM018DP | 114X7107 114X7130 | W05 W09 | A1 | G | 27 | 0.39 | 0.54 | 0.72 | 0.91 | 1.12 | 1.36 | - | 1.08 | - | 6 | 32 |
| | | | | | 32 | 0.35 | 0.49 | 0.64 | 0.82 | 1.02 | 1.24 | - | | | | |
| | | | | | 38 | 0.30 | 0.42 | 0.56 | 0.72 | 0.90 | 1.09 | - | | | | |
| | | | | | 43 | - | 0.36 | 0.49 | 0.63 | 0.79 | 0.98 | - | | | | |
| OP-LSVM026DS | 114X7227 114X7297 | W05 W09 | A1 + A2L | G | 27 | 0.48 | 0.70 | 0.95 | 1.22 | 1.53 | 1.86 | - | 0.97 | - | 10 | 39 |
| | | | | | 32 | 0.44 | 0.64 | 0.87 | 1.12 | 1.41 | 1.72 | - | | | | |
| | | | | | 38 | 0.39 | 0.56 | 0.77 | 1.00 | 1.26 | 1.56 | - | | | | |
| | | | | | 43 | - | 0.50 | 0.69 | 0.90 | 1.14 | 1.42 | - | | | | |
| OP-LSVM034DS | 114X7228 114X7298 | W05 W09 | A1 + A2L | G | 27 | 0.67 | 0.97 | 1.30 | 1.68 | 2.10 | 2.55 | - | 1.03 | - | 10 | 39 |
| | | | | | 32 | 0.61 | 0.88 | 1.19 | 1.54 | 1.93 | 2.35 | - | | | | |
| | | | | | 38 | 0.54 | 0.77 | 1.05 | 1.37 | 1.73 | 2.12 | - | | | | |
| | | | | | 43 | - | 0.69 | 0.94 | 1.23 | 1.56 | 1.93 | - | | | | |
| OP-LSQM048NT | 114X7087 114X7181 | W05 W09 | A1 | G | 27 | 0.79 | 1.15 | 1.59 | 2.11 | 2.71 | 3.39 | - | 1.02 | - | 12 | 42 |
| | | | | | 32 | 0.67 | 1.00 | 1.40 | 1.88 | 2.43 | 3.05 | - | | | | |
| | | | | | 38 | 0.51 | 0.81 | 1.18 | 1.60 | 2.09 | 2.65 | - | | | | |
| | | | | | 43 | 0.39 | 0.66 | 0.99 | 1.37 | 1.81 | - | - | | | | |
| OP-LSVM048NT | 114X7244 114X7282 | W05 W09 | A1+A2L | G | 27 | 0.79 | 1.15 | 1.59 | 2.11 | 2.71 | 3.39 | - | 1.02 | - | 12 | 42 |
| | | | | | 32 | 0.67 | 1.00 | 1.40 | 1.88 | 2.43 | 3.05 | - | | | | |
| | | | | | 38 | 0.51 | 0.81 | 1.18 | 1.60 | 2.09 | 2.65 | - | | | | |
| | | | | | 43 | 0.39 | 0.66 | 0.99 | 1.37 | 1.81 | - | - | | | | |
| OP-LSQM048NT | 114X7088 114X7182 | W05 W09 | A1 | E | 27 | 0.80 | 1.16 | 1.60 | 2.10 | 2.68 | 3.32 | - | 1.14 | - | 6 | 42 |
| | | | | | 32 | 0.68 | 1.02 | 1.41 | 1.88 | 2.40 | 2.99 | - | | | | |
| | | | | | 38 | 0.55 | 0.85 | 1.20 | 1.61 | 2.07 | 2.60 | - | | | | |
| | | | | | 43 | 0.44 | 0.71 | 1.02 | 1.38 | 1.80 | - | - | | | | |
| OP-LSVM048NT | 114X7245 114X7283 | W05 W09 | A1+A2L | E | 27 | 0.80 | 1.16 | 1.60 | 2.10 | 2.68 | 3.32 | - | 1.14 | - | 6 | 42 |
| | | | | | 32 | 0.68 | 1.02 | 1.41 | 1.88 | 2.40 | 2.99 | - | | | | |
| | | | | | 38 | 0.55 | 0.85 | 1.20 | 1.61 | 2.07 | 2.60 | - | | | | |
| | | | | | 43 | 0.44 | 0.71 | 1.02 | 1.38 | 1.80 | - | - | | | | |
| OP-LSQM068NT | 114X7089 114X7183 | W05 W09 | A1 | G | 27 | 1.36 | 1.82 | 2.37 | 3.02 | 3.76 | 4.59 | - | 1.07 | - | 20 | 43 |
| | | | | | 32 | 1.21 | 1.63 | 2.13 | 2.72 | 3.39 | 4.13 | - | | | | |
| | | | | | 38 | 1.04 | 1.41 | 1.85 | 2.36 | 2.94 | 3.59 | - | | | | |
| | | | | | 43 | 0.89 | 1.23 | 1.62 | 2.07 | 2.58 | - | - | | | | |
| OP-LSQM068NT | 114X7090 114X7184 | W05 W09 | A1 | E | 27 | 1.38 | 1.88 | 2.47 | 3.13 | 3.88 | 4.70 | - | 1.16 | - | 10 | 43 |
| | | | | | 32 | 1.19 | 1.65 | 2.18 | 2.79 | 3.48 | 4.23 | - | | | | |
| | | | | | 38 | 0.99 | 1.39 | 1.87 | 2.40 | 3.01 | 3.68 | - | | | | |
| | | | | | 43 | 0.83 | 1.20 | 1.62 | 2.10 | 2.64 | - | - | | | | |

**This table continues on the next page**

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] | | | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | COP | SEPR | | |
| OP-LSVM068NT | 114X7247<br>114X7285 | W05<br>W09 | A1+A2L | E | 27 | 1.38 | 1.88 | 2.47 | 3.13 | 3.88 | 4.70 | - | 1.16 | - | 20 | 43 |
| | | | | | 32 | 1.19 | 1.65 | 2.18 | 2.79 | 3.48 | 4.23 | - | | | | |
| | | | | | 38 | 0.99 | 1.39 | 1.87 | 2.40 | 3.01 | 3.68 | - | | | | |
| | | | | | 43 | 0.83 | 1.20 | 1.62 | 2.10 | 2.64 | - | - | | | | |
| OP-LSQM067LL | 114X7091<br>114X7187 | W05<br>W09 | A1 | E | 27 | 2.23 | 2.85 | 3.58 | 4.43 | 5.40 | 6.52 | - | - | 1.66 | 16 | 45 |
| | | | | | 32 | 2.04 | 2.62 | 3.30 | 4.09 | 5.00 | 6.03 | - | | | | |
| | | | | | 38 | 1.81 | 2.34 | 2.96 | 3.67 | 4.49 | 5.43 | - | | | | |
| | | | | | 43 | 1.60 | 2.09 | 2.65 | 3.30 | 4.04 | 4.89 | - | | | | |
| OP-LSQM084LL | 114X7092<br>114X7188 | W05<br>W09 | A1 | E | 27 | 2.68 | 3.40 | 4.28 | 5.30 | 6.49 | 7.85 | - | - | 1.69 | 20 | 44 |
| | | | | | 32 | 2.46 | 3.14 | 3.94 | 4.88 | 5.98 | 7.22 | - | | | | |
| | | | | | 38 | 2.19 | 2.80 | 3.52 | 4.36 | 5.33 | 6.45 | - | | | | |
| | | | | | 43 | 1.95 | 2.50 | 3.15 | 3.91 | 4.78 | 5.78 | - | | | | |
| OP-LSQM098LL | 114X7075<br>114X7189 | W05<br>W09 | A1 | E | 27 | 3.12 | 3.95 | 4.95 | 6.12 | 7.47 | 9.00 | - | - | 1.73 | 20 | 45 |
| | | | | | 32 | 2.86 | 3.64 | 4.56 | 5.63 | 6.87 | 8.27 | - | | | | |
| | | | | | 38 | 2.54 | 3.24 | 4.06 | 5.02 | 6.12 | 7.36 | - | | | | |
| | | | | | 43 | 2.26 | 2.89 | 3.63 | 4.48 | 5.47 | 6.58 | - | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling Capacity (2) in Watts | | | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Evaporating Temperature (Mid point) [°C] | | | | | | | | | | |
| | | | | | | -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | COP | SEPR | | |
| OP-LSVM014DP | 114X7263<br>114X7295 | W05<br>W09 | A1 + A2L | G | 27 | - | 0.43 | 0.54 | 0.67 | 0.81 | 0.96 | - | 0.89 | - | 6 | 31 |
| | | | | | 32 | - | 0.38 | 0.48 | 0.60 | 0.73 | 0.87 | - | | | | |
| | | | | | 38 | - | 0.32 | 0.41 | 0.52 | 0.64 | 0.77 | - | | | | |
| | | | | | 43 | - | - | 0.36 | 0.45 | 0.56 | 0.69 | - | | | | |
| OP-LSVM016DP | 114X7242<br>114X7296 | W05<br>W09 | A1 + A2L | G | 27 | - | 0.48 | 0.62 | 0.78 | 0.95 | 1.14 | - | 0.90 | - | 6 | 32 |
| | | | | | 32 | - | 0.43 | 0.56 | 0.70 | 0.86 | 1.04 | - | | | | |
| | | | | | 38 | - | 0.36 | 0.47 | 0.61 | 0.75 | 0.92 | - | | | | |
| | | | | | 43 | - | - | 0.41 | 0.53 | 0.67 | 0.82 | - | | | | |
| OP-LSVM026DS | 114X7227<br>114X7297 | W05<br>W09 | A1 + A2L | G | 27 | - | 0.64 | 0.87 | 1.13 | 1.42 | 1.74 | - | 0.93 | - | 10 | 39 |
| | | | | | 32 | - | 0.58 | 0.79 | 1.04 | 1.31 | 1.61 | - | | | | |
| | | | | | 38 | - | 0.51 | 0.70 | 0.92 | 1.17 | 1.46 | - | | | | |
| | | | | | 43 | - | - | 0.62 | 0.83 | 1.06 | 1.33 | - | | | | |
| OP-LSVM048NT | 114X7244<br>114X7282 | W05<br>W09 | A1 + A2L | G | 27 | - | 1.06 | 1.47 | 1.96 | 2.52 | 3.14 | - | 0.98 | - | 12 | 42 |
| | | | | | 32 | - | 0.94 | 1.31 | 1.75 | 2.26 | 2.83 | - | | | | |
| | | | | | 38 | - | 0.78 | 1.11 | 1.50 | 1.95 | 2.46 | - | | | | |
| | | | | | 43 | - | - | 0.95 | 1.30 | 1.70 | 2.16 | - | | | | |
| OP-LSVM034DS | 114X7228<br>114X7298 | W05<br>W09 | A1 + A2L | G | 27 | - | 0.99 | 1.34 | 1.73 | 2.16 | 2.62 | - | 0.98 | - | 10 | 39 |
| | | | | | 32 | - | 0.90 | 1.22 | 1.58 | 1.98 | 2.43 | - | | | | |
| | | | | | 38 | - | 0.79 | 1.07 | 1.41 | 1.78 | 2.19 | - | | | | |
| | | | | | 43 | - | - | 0.96 | 1.26 | 1.61 | 2.00 | - | | | | |
| OP-LSVM048NT | 114X7245<br>114X7283 | W05<br>W09 | A1 + A2L | E | 27 | - | 1.05 | 1.45 | 1.92 | 2.47 | 3.09 | - | 0.99 | - | 6 | 42 |
| | | | | | 32 | - | 0.93 | 1.29 | 1.72 | 2.22 | 2.79 | - | | | | |
| | | | | | 38 | - | 0.79 | 1.10 | 1.48 | 1.92 | 2.42 | - | | | | |
| | | | | | 43 | - | - | 0.95 | 1.29 | 1.68 | 2.13 | - | | | | |
| OP-LSVM068NT | 114X7247<br>114X7285 | W05<br>W09 | A1 + A2L | E | 27 | - | 1.61 | 2.09 | 2.63 | 3.21 | 3.81 | - | 0.98 | - | 10 | 43 |
| | | | | | 32 | - | 1.45 | 1.90 | 2.39 | 2.92 | 3.46 | - | | | | |
| | | | | | 38 | - | - | 1.66 | 2.10 | 2.56 | 3.03 | - | | | | |
| | | | | | 43 | - | - | - | 1.85 | 2.26 | 2.67 | - | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LSVM014DP | 114X7263 114X7295 | W05 W09 | A1 + A2L | G | 27 | 0.26 | 0.38 | 0.52 | 0.67 | 0.83 | 1.01 | 0.88 | - | 6 | 31 |
| | | | | | 32 | 0.23 | 0.34 | 0.46 | 0.6 | 0.75 | 0.92 | | | | |
| | | | | | 38 | 0.19 | 0.29 | 0.4 | 0.52 | 0.66 | 0.82 | | | | |
| | | | | | 43 | - | 0.24 | 0.34 | 0.46 | 0.59 | 0.73 | | | | |
| OP-LSVM016DP | 114X7242 114X7296 | W05 W09 | A1 + A2L | G | 27 | 0.27 | 0.4 | 0.54 | 0.69 | 0.86 | 1.05 | 0.87 | - | 6 | 32 |
| | | | | | 32 | 0.24 | 0.35 | 0.48 | 0.62 | 0.78 | 0.96 | | | | |
| | | | | | 38 | 0.2 | 0.3 | 0.41 | 0.54 | 0.68 | 0.85 | | | | |
| | | | | | 43 | - | 0.25 | 0.35 | 0.47 | 0.6 | 0.75 | | | | |
| OP-LSVM026DS | 114X7227 114X7297 | W05 W09 | A1 + A2L | G | 27 | 0.39 | 0.57 | 0.78 | 1.02 | 1.28 | 1.58 | 0.87 | - | 10 | 39 |
| | | | | | 32 | 0.35 | 0.52 | 0.71 | 0.93 | 1.18 | 1.47 | | | | |
| | | | | | 38 | 0.31 | 0.45 | 0.63 | 0.83 | 1.06 | 1.33 | | | | |
| | | | | | 43 | - | 0.4 | 0.56 | 0.75 | 0.96 | 1.21 | | | | |
| OP-LSVM034DS | 114X7228 114X7298 | W05 W09 | A1 + A2L | G | 27 | 0.63 | 0.91 | 1.24 | 1.61 | 2.03 | 2.48 | 0.96 | - | 10 | 39 |
| | | | | | 32 | 0.57 | 0.82 | 1.13 | 1.47 | 1.86 | 2.3 | | | | |
| | | | | | 38 | 0.5 | 0.72 | 1 | 1.31 | 1.67 | 2.08 | | | | |
| | | | | | 43 | - | 0.64 | 0.89 | 1.18 | 1.51 | 1.89 | | | | |
| OP-LSVM048NT | 114X7245 114X7283 | W05 W09 | A1+A2L | E | 27 | - | 0.85 | 1.17 | 1.56 | 2 | 2.51 | 0.89 | - | 6 | 39 |
| | | | | | 32 | - | 0.76 | 1.05 | 1.39 | 1.79 | 2.26 | | | | |
| | | | | | 38 | - | 0.64 | 0.9 | 1.2 | 1.56 | 1.97 | | | | |
| | | | | | 43 | - | - | 0.78 | 1.05 | 1.37 | 1.73 | | | | |
| OP-LSVM048NT | 114X7244 114X7282 | W05 W09 | A1+A2L | G | 27 | - | 0.91 | 1.25 | 1.65 | 2.11 | 2.63 | 0.91 | - | 12 | 42 |
| | | | | | 32 | - | 0.8 | 1.11 | 1.47 | 1.9 | 2.37 | | | | |
| | | | | | 38 | - | - | 0.95 | 1.27 | 1.65 | 2.08 | | | | |
| | | | | | 43 | - | - | 0.82 | 1.11 | 1.45 | 1.84 | | | | |
| OP-LSVM068NT | 114X7247 114X7285 | W05 W09 | A1+A2L | E | 27 | - | 1.35 | 1.81 | 2.35 | 2.96 | 3.63 | 0.88 | - | 10 | 43 |
| | | | | | 32 | - | 1.21 | 1.63 | 2.12 | 2.67 | 3.28 | | | | |
| | | | | | 38 | - | 1.03 | 1.41 | 1.85 | 2.34 | 2.87 | | | | |
| | | | | | 43 | - | - | 1.23 | 1.62 | 2.05 | 2.53 | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSGM012SC | 114X7099 114X7207 | W05 W09 | A1 | G | 27 | 0.55 | 0.69 | 0.86 | 1.06 | 1.28 | 1.53 | 1.71 | - | 4 | 31 |
| | | | | | 32 | 0.50 | 0.64 | 0.80 | 0.99 | 1.20 | 1.44 | | | | |
| | | | | | 38 | 0.45 | 0.58 | 0.73 | 0.90 | 1.11 | 1.34 | | | | |
| | | | | | 43 | 0.40 | 0.52 | 0.66 | 0.83 | 1.03 | 1.25 | | | | |
| OP-MSSM012SC | 114X7238 114X7291 | W05 W09 | A1 + A2L | G | 27 | 0.55 | 0.69 | 0.86 | 1.06 | 1.28 | 1.53 | 1.71 | - | 4 | 31 |
| | | | | | 32 | 0.50 | 0.64 | 0.80 | 0.99 | 1.20 | 1.44 | | | | |
| | | | | | 38 | 0.45 | 0.58 | 0.73 | 0.90 | 1.11 | 1.34 | | | | |
| | | | | | 43 | 0.40 | 0.52 | 0.66 | 0.83 | 1.03 | 1.25 | | | | |
| OP-MSGM015SC | 114X7100 114X7208 | W05 W09 | A1 | G | 27 | 0.59 | 0.76 | 0.95 | 1.18 | 1.44 | 1.73 | 1.64 | - | 6 | 31 |
| | | | | | 32 | 0.56 | 0.72 | 0.90 | 1.12 | 1.36 | 1.63 | | | | |
| | | | | | 38 | 0.52 | 0.67 | 0.84 | 1.03 | 1.26 | 1.51 | | | | |
| | | | | | 43 | 0.47 | 0.62 | 0.78 | 0.96 | 1.17 | 1.40 | | | | |
| OP-MSSM015SC | 114X7239 114X7292 | W05 W09 | A1 + A2L | G | 27 | 0.59 | 0.76 | 0.95 | 1.18 | 1.44 | 1.73 | 1.64 | - | 6 | 31 |
| | | | | | 32 | 0.56 | 0.72 | 0.90 | 1.12 | 1.36 | 1.63 | | | | |
| | | | | | 38 | 0.52 | 0.67 | 0.84 | 1.03 | 1.26 | 1.51 | | | | |
| | | | | | 43 | 0.47 | 0.62 | 0.78 | 0.96 | 1.17 | 1.40 | | | | |
| OP-MSGM018SC | 114X7101 114X7131 | W05 W09 | A1 | G | 27 | 0.76 | 0.94 | 1.14 | 1.38 | 1.65 | 1.95 | 1.61 | - | 6 | 32 |
| | | | | | 32 | 0.68 | 0.86 | 1.06 | 1.29 | 1.55 | 1.85 | | | | |
| | | | | | 38 | 0.61 | 0.77 | 0.97 | 1.19 | 1.44 | 1.73 | | | | |
| | | | | | 43 | 0.56 | 0.72 | 0.90 | 1.11 | 1.36 | 1.63 | | | | |
| OP-MSSM018SC | 114X7240 114X7293 | W05 W09 | A1 + A2L | G | 27 | 0.76 | 0.94 | 1.14 | 1.38 | 1.65 | 1.95 | 1.61 | - | 6 | 32 |
| | | | | | 32 | 0.68 | 0.86 | 1.06 | 1.29 | 1.55 | 1.85 | | | | |
| | | | | | 38 | 0.61 | 0.77 | 0.97 | 1.19 | 1.44 | 1.73 | | | | |
| | | | | | 43 | 0.56 | 0.72 | 0.90 | 1.11 | 1.36 | 1.63 | | | | |
| OP-MSGM021SC | 114X7102 114X7132 | W05 W09 | A1 | G | 27 | 0.89 | 1.11 | 1.36 | 1.64 | 1.95 | 2.29 | 1.74 | - | 6 | 32 |
| | | | | | 32 | 0.81 | 1.03 | 1.27 | 1.54 | 1.84 | 2.17 | | | | |
| | | | | | 38 | 0.73 | 0.93 | 1.16 | 1.42 | 1.70 | 2.02 | | | | |
| | | | | | 43 | 0.67 | 0.85 | 1.07 | 1.31 | 1.58 | 1.88 | | | | |
| OP-MSSM021SC | 114X7241 114X7294 | W05 W09 | A1 + A2L | G | 27 | 0.89 | 1.11 | 1.36 | 1.64 | 1.95 | 2.29 | 1.74 | - | 6 | 32 |
| | | | | | 32 | 0.81 | 1.03 | 1.27 | 1.54 | 1.84 | 2.17 | | | | |
| | | | | | 38 | 0.73 | 0.93 | 1.16 | 1.42 | 1.70 | 2.02 | | | | |
| | | | | | 43 | 0.67 | 0.85 | 1.07 | 1.31 | 1.58 | 1.88 | | | | |
| OP-MSSM026CS | 114X7248 114X7304 | W05 W09 | A1 + A2L | G | 27 | 1.22 | 1.58 | 1.97 | 2.39 | 2.85 | 3.33 | 1.98 | - | 10 | 38 |
| | | | | | 32 | 1.11 | 1.44 | 1.81 | 2.21 | 2.65 | 3.11 | | | | |
| | | | | | 38 | 0.97 | 1.28 | 1.62 | 2.00 | 2.41 | 2.85 | | | | |
| | | | | | 43 | 0.85 | 1.14 | 1.46 | 1.82 | 2.21 | 2.63 | | | | |
| OP-MSSM030CS | 114X7249 114X7305 | W05 W09 | A1 + A2L | G | 27 | 1.34 | 1.75 | 2.20 | 2.69 | 3.23 | 3.82 | 1.86 | - | 10 | 38 |
| | | | | | 32 | 1.22 | 1.60 | 2.03 | 2.50 | 3.02 | 3.59 | | | | |
| | | | | | 38 | 1.06 | 1.42 | 1.82 | 2.27 | 2.77 | 3.32 | | | | |
| | | | | | 43 | 0.94 | 1.27 | 1.65 | 2.08 | 2.56 | 3.09 | | | | |
| OP-MSXM034ML | 114X7062 114X7196 | W05 W09 | A1 | E | 27 | 1.82 | 2.29 | 2.83 | 3.47 | 4.19 | 5.00 | 2.25 | - | 8 | 40 |
| | | | | | 32 | 1.72 | 2.16 | 2.69 | 3.29 | 3.98 | 4.76 | | | | |
| | | | | | 38 | 1.60 | 2.01 | 2.50 | 3.07 | 3.72 | 4.46 | | | | |
| | | | | | 43 | 1.50 | 1.89 | 2.35 | 2.88 | 3.50 | 4.21 | | | | |
| OP-MSIM034ML | 114X7266 114X7274 | W05 W09 | A1+A2L | E | 27 | 1.82 | 2.29 | 2.83 | 3.47 | 4.19 | 5.00 | 2.25 | - | 8 | 40 |
| | | | | | 32 | 1.72 | 2.16 | 2.69 | 3.29 | 3.98 | 4.76 | | | | |
| | | | | | 38 | 1.60 | 2.01 | 2.50 | 3.07 | 3.72 | 4.46 | | | | |
| | | | | | 43 | 1.50 | 1.89 | 2.35 | 2.88 | 3.50 | 4.21 | | | | |

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSXM034ML | 114X7061 114X7195 | W05 W09 | A1 | G | 27 | 1.82 | 2.32 | 2.88 | 3.51 | 4.22 | 5.00 | 2.17 | - | 20 | 40 |
| | | | | | 32 | 1.71 | 2.19 | 2.73 | 3.34 | 4.02 | 4.79 | | | | |
| | | | | | 38 | 1.58 | 2.03 | 2.54 | 3.12 | 3.77 | 4.50 | | | | |
| | | | | | 43 | 1.48 | 1.89 | 2.37 | 2.92 | 3.54 | 4.25 | | | | |
| OP-MSIM034ML | 114X7267 114X7275 | W05 W09 | A1+A2L | G | 27 | 1.82 | 2.32 | 2.88 | 3.51 | 4.22 | 5.00 | 2.17 | - | 20 | 40 |
| | | | | | 32 | 1.71 | 2.19 | 2.73 | 3.34 | 4.02 | 4.79 | | | | |
| | | | | | 38 | 1.58 | 2.03 | 2.54 | 3.12 | 3.77 | 4.50 | | | | |
| | | | | | 43 | 1.48 | 1.89 | 2.37 | 2.92 | 3.54 | 4.25 | | | | |
| OP-MSXM044ML | 114X7162 114X7212 | W05 W09 | A1 | E | 27 | 2.32 | 2.90 | 3.58 | 4.37 | 5.26 | 6.26 | 2.23 | - | 12 | 41 |
| | | | | | 32 | 2.19 | 2.74 | 3.39 | 4.14 | 4.99 | 5.94 | | | | |
| | | | | | 38 | 2.03 | 2.54 | 3.15 | 3.85 | 4.66 | 5.55 | | | | |
| | | | | | 43 | 1.90 | 2.38 | 2.95 | 3.61 | 4.37 | 5.22 | | | | |
| OP-MSIM044ML | 114X7268 114X7276 | W05 W09 | A1+A2L | E | 27 | 2.32 | 2.90 | 3.58 | 4.37 | 5.26 | 6.26 | 2.23 | - | 12 | 41 |
| | | | | | 32 | 2.19 | 2.74 | 3.39 | 4.14 | 4.99 | 5.94 | | | | |
| | | | | | 38 | 2.03 | 2.54 | 3.15 | 3.85 | 4.66 | 5.55 | | | | |
| | | | | | 43 | 1.90 | 2.38 | 2.95 | 3.61 | 4.37 | 5.22 | | | | |
| OP-MSXM044ML | 114X7161 114X7211 | W05 W09 | A1 | G | 27 | 2.31 | 2.92 | 3.61 | 4.39 | 5.27 | 6.24 | 2.01 | - | 25 | 41 |
| | | | | | 32 | 2.17 | 2.75 | 3.41 | 4.16 | 5.01 | 5.95 | | | | |
| | | | | | 38 | 2.01 | 2.54 | 3.16 | 3.87 | 4.67 | 5.57 | | | | |
| | | | | | 43 | 1.88 | 2.36 | 2.94 | 3.61 | 4.37 | 5.23 | | | | |
| OP-MSIM044ML | 114X7269 114X7277 | W05 W09 | A1+A2L | G | 27 | 2.31 | 2.92 | 3.61 | 4.39 | 5.27 | 6.24 | 2.01 | - | 25 | 41 |
| | | | | | 32 | 2.17 | 2.75 | 3.41 | 4.16 | 5.01 | 5.95 | | | | |
| | | | | | 38 | 2.01 | 2.54 | 3.16 | 3.87 | 4.67 | 5.57 | | | | |
| | | | | | 43 | 1.88 | 2.36 | 2.94 | 3.61 | 4.37 | 5.23 | | | | |
| OP-MSXM046ML | 114X7064 114X7198 | W05 W09 | A1 | E | 27 | 2.48 | 3.09 | 3.82 | 4.66 | 5.62 | 6.69 | 2.33 | - | 12 | 41 |
| | | | | | 32 | 2.34 | 2.92 | 3.61 | 4.42 | 5.33 | 6.36 | | | | |
| | | | | | 38 | 2.17 | 2.71 | 3.36 | 4.12 | 4.98 | 5.95 | | | | |
| | | | | | 43 | 2.02 | 2.54 | 3.15 | 3.86 | 4.67 | 5.59 | | | | |
| OP-MSIM046ML | 114X7270 114X7278 | W05 W09 | A1+A2L | E | 27 | 2.48 | 3.09 | 3.82 | 4.66 | 5.62 | 6.69 | 2.33 | - | 12 | 41 |
| | | | | | 32 | 2.34 | 2.92 | 3.61 | 4.42 | 5.33 | 6.36 | | | | |
| | | | | | 38 | 2.17 | 2.71 | 3.36 | 4.12 | 4.98 | 5.95 | | | | |
| | | | | | 43 | 2.02 | 2.54 | 3.15 | 3.86 | 4.67 | 5.59 | | | | |
| OP-MSXM046ML | 114X7063 114X7197 | W05 W09 | A1 | G | 27 | 2.47 | 3.11 | 3.85 | 4.69 | 5.63 | 6.67 | 2.07 | - | 32 | 41 |
| | | | | | 32 | 2.32 | 2.93 | 3.64 | 4.45 | 5.35 | 6.36 | | | | |
| | | | | | 38 | 2.14 | 2.71 | 3.37 | 4.13 | 4.99 | 5.96 | | | | |
| | | | | | 43 | 2.01 | 2.52 | 3.14 | 3.86 | 4.68 | 5.60 | | | | |
| OP-MSIM046ML | 114X7271 114X7279 | W05 W09 | A1+A2L | G | 27 | 2.47 | 3.11 | 3.85 | 4.69 | 5.63 | 6.67 | 2.07 | - | 32 | 41 |
| | | | | | 32 | 2.32 | 2.93 | 3.64 | 4.45 | 5.35 | 6.36 | | | | |
| | | | | | 38 | 2.14 | 2.71 | 3.37 | 4.13 | 4.99 | 5.96 | | | | |
| | | | | | 43 | 2.01 | 2.52 | 3.14 | 3.86 | 4.68 | 5.60 | | | | |
| OP-MSXM057ML | 114X7066 114X7200 | W05 W09 | A1 | E | 27 | 2.99 | 3.75 | 4.63 | 5.63 | 6.76 | 8.02 | 2.28 | - | 12 | 42 |
| | | | | | 32 | 2.81 | 3.54 | 4.38 | 5.33 | 6.41 | 7.61 | | | | |
| | | | | | 38 | 2.60 | 3.28 | 4.06 | 4.96 | 5.97 | 7.10 | | | | |
| | | | | | 43 | 2.42 | 3.06 | 3.80 | 4.64 | 5.60 | 6.66 | | | | |
| OP-MSIM057ML | 114X7272 114X7280 | W05 W09 | A1+A2L | E | 27 | 2.99 | 3.75 | 4.63 | 5.63 | 6.76 | 8.02 | 2.28 | - | 12 | 42 |
| | | | | | 32 | 2.81 | 3.54 | 4.38 | 5.33 | 6.41 | 7.61 | | | | |
| | | | | | 38 | 2.60 | 3.28 | 4.06 | 4.96 | 5.97 | 7.10 | | | | |
| | | | | | 43 | 2.42 | 3.06 | 3.80 | 4.64 | 5.60 | 6.66 | | | | |

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSXM057ML | 114X7065 114X7199 | W05 W09 | A1 | G | 27 | 2.98 | 3.76 | 4.65 | 5.65 | 6.76 | 7.99 | 1.90 | - | 32 | 42 |
| | | | | | 32 | 2.81 | 3.54 | 4.38 | 5.34 | 6.41 | 7.60 | | | | |
| | | | | | 38 | 2.60 | 3.27 | 4.05 | 4.95 | 5.96 | 7.09 | | | | |
| | | | | | 43 | 2.44 | 3.05 | 3.77 | 4.61 | 5.56 | 6.64 | | | | |
| OP-MSIM057ML | 114X7273 114X7281 | W05 W09 | A1+A2L | G | 27 | 2.98 | 3.76 | 4.65 | 5.65 | 6.76 | 7.99 | 1.90 | - | 32 | 42 |
| | | | | | 32 | 2.81 | 3.54 | 4.38 | 5.34 | 6.41 | 7.60 | | | | |
| | | | | | 38 | 2.60 | 3.27 | 4.05 | 4.95 | 5.96 | 7.09 | | | | |
| | | | | | 43 | 2.44 | 3.05 | 3.77 | 4.61 | 5.56 | 6.64 | | | | |
| OP-MSXM068ML | 114X7068 114X7202 | W05 W09 | A1 | E | 27 | 3.69 | 4.63 | 5.74 | 7.02 | 8.47 | 10.10 | 2.41 | - | 16 | 43 |
| | | | | | 32 | 3.48 | 4.38 | 5.44 | 6.66 | 8.05 | 9.61 | | | | |
| | | | | | 38 | 3.24 | 4.08 | 5.07 | 6.21 | 7.52 | 9.01 | | | | |
| | | | | | 43 | 3.04 | 3.82 | 4.75 | 5.83 | 7.07 | 8.48 | | | | |
| OP-MSIM068ML | 114X7311 114X7317 | W05 W09 | A1+A2L | E | 27 | 3.69 | 4.63 | 5.74 | 7.02 | 8.47 | 10.10 | 2.47 | - | 16 | 43 |
| | | | | | 32 | 3.48 | 4.38 | 5.44 | 6.66 | 8.05 | 9.61 | | | | |
| | | | | | 38 | 3.24 | 4.08 | 5.07 | 6.21 | 7.52 | 9.01 | | | | |
| | | | | | 43 | 3.04 | 3.82 | 4.75 | 5.83 | 7.07 | 8.48 | | | | |
| OP-MSXM068ML | 114X7067 114X7201 | W05 W09 | A1 | G | 27 | 3.79 | 4.66 | 5.75 | 7.04 | 8.47 | 10.03 | 2.11 | - | 40 | 43 |
| | | | | | 32 | 3.64 | 4.43 | 5.45 | 6.67 | 8.06 | 9.58 | | | | |
| | | | | | 38 | 3.48 | 4.15 | 5.07 | 6.21 | 7.53 | 9.00 | | | | |
| | | | | | 43 | 3.36 | 3.92 | 4.75 | 5.82 | 7.07 | 8.49 | | | | |
| OP-MSIM068ML | 114X7312 114X7318 | W05 W09 | A1+A2L | G | 27 | 3.79 | 4.66 | 5.75 | 7.04 | 8.47 | 10.03 | 2.16 | - | 40 | 43 |
| | | | | | 32 | 3.64 | 4.43 | 5.45 | 6.67 | 8.06 | 9.58 | | | | |
| | | | | | 38 | 3.48 | 4.15 | 5.07 | 6.21 | 7.53 | 9.00 | | | | |
| | | | | | 43 | 3.36 | 3.92 | 4.75 | 5.82 | 7.07 | 8.49 | | | | |
| OP-MSXM080ML | 114X7070 114X7204 | W05 W09 | A1 | E | 27 | 4.28 | 5.39 | 6.67 | 8.13 | 9.78 | 11.63 | - | 3.43 | 20 | 44 |
| | | | | | 32 | 4.03 | 5.09 | 6.31 | 7.70 | 9.28 | 11.05 | | | | |
| | | | | | 38 | 3.72 | 4.71 | 5.86 | 7.18 | 8.66 | 10.33 | | | | |
| | | | | | 43 | 3.45 | 4.40 | 5.48 | 6.72 | 8.13 | 9.71 | | | | |
| OP-MSIM080ML | 114X7313 114X7319 | W05 W09 | A1+A2L | E | 27 | 4.28 | 5.39 | 6.67 | 8.13 | 9.78 | 11.63 | - | 3.61 | 20 | 44 |
| | | | | | 32 | 4.03 | 5.09 | 6.31 | 7.70 | 9.28 | 11.05 | | | | |
| | | | | | 38 | 3.72 | 4.71 | 5.86 | 7.18 | 8.66 | 10.33 | | | | |
| | | | | | 43 | 3.45 | 4.40 | 5.48 | 6.72 | 8.13 | 9.71 | | | | |
| OP-MSXM080ML | 114X7069 114X7203 | W05 W09 | A1 | G | 27 | 4.25 | 5.47 | 6.79 | 8.23 | 9.82 | 11.58 | - | 3.08 | 45 | 44 |
| | | | | | 32 | 3.95 | 5.14 | 6.41 | 7.80 | 9.33 | 11.03 | | | | |
| | | | | | 38 | 3.57 | 4.71 | 5.93 | 7.26 | 8.72 | 10.33 | | | | |
| | | | | | 43 | 3.23 | 4.33 | 5.50 | 6.78 | 8.18 | 9.72 | | | | |
| OP-MSIM080ML | 114X7314 114X7320 | W05 W09 | A1+A2L | G | 27 | 4.25 | 5.47 | 6.79 | 8.23 | 9.82 | 11.58 | - | 3.17 | 45 | 44 |
| | | | | | 32 | 3.95 | 5.14 | 6.41 | 7.80 | 9.33 | 11.03 | | | | |
| | | | | | 38 | 3.57 | 4.71 | 5.93 | 7.26 | 8.72 | 10.33 | | | | |
| | | | | | 43 | 3.23 | 4.33 | 5.50 | 6.78 | 8.18 | 9.72 | | | | |
| OP-MSXM099ML | 114X7071 114X7205 | W05 W09 | A1 | E | 27 | 5.33 | 6.67 | 8.26 | 10.09 | 12.14 | 14.39 | - | 3.89 | 20 | 44 |
| | | | | | 32 | 5.02 | 6.29 | 7.81 | 9.55 | 11.51 | 13.67 | | | | |
| | | | | | 38 | 4.65 | 5.82 | 7.24 | 8.88 | 10.73 | 12.78 | | | | |
| | | | | | 43 | 4.34 | 5.43 | 6.75 | 8.30 | 10.05 | 11.99 | | | | |
| OP-MSIM099ML | 114X7315 114X7321 | W05 W09 | A1+A2L | E | 27 | 5.33 | 6.67 | 8.26 | 10.09 | 12.14 | 14.39 | - | 4.01 | 20 | 44 |
| | | | | | 32 | 5.02 | 6.29 | 7.81 | 9.55 | 11.51 | 13.67 | | | | |
| | | | | | 38 | 4.65 | 5.82 | 7.24 | 8.88 | 10.73 | 12.78 | | | | |
| | | | | | 43 | 4.34 | 5.43 | 6.75 | 8.30 | 10.05 | 11.99 | | | | |

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

## Catalogue Optyma™ Slim Pack - Performance data R134a MBP

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSXM108ML | 114X7072<br>114X7206 | W05<br>W09 | A1 | E | 27 | 5.64 | 7.05 | 8.71 | 10.60 | 12.72 | 15.06 | - | 3.80 | 20 | 46 |
| | | | | | 32 | 5.30 | 6.64 | 8.22 | 10.03 | 12.06 | 14.30 | | | | |
| | | | | | 38 | 4.89 | 6.14 | 7.62 | 9.32 | 11.24 | 13.35 | | | | |
| | | | | | 43 | 4.55 | 5.71 | 7.10 | 8.71 | 10.52 | 12.53 | | | | |
| OP-MSIM108ML | 114X7316<br>114X7322 | W05<br>W09 | A1+A2L | E | 27 | 5.64 | 7.05 | 8.71 | 10.60 | 12.72 | 15.06 | - | 3.90 | 20 | 46 |
| | | | | | 32 | 5.30 | 6.64 | 8.22 | 10.03 | 12.06 | 14.30 | | | | |
| | | | | | 38 | 4.89 | 6.14 | 7.62 | 9.32 | 11.24 | 13.35 | | | | |
| | | | | | 43 | 4.55 | 5.71 | 7.10 | 8.71 | 10.52 | 12.53 | | | | |

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSSM012SC | 114X7238 114X7291 | W05 W09 | A1 + A2L | G | 27 | 0.57 | 0.72 | 0.89 | 1.09 | 1.31 | 1.56 | 1.68 | - | 4 | 31 |
| | | | | | 32 | 0.52 | 0.66 | 0.83 | 1.01 | 1.23 | 1.47 | | | | |
| | | | | | 38 | 0.46 | 0.59 | 0.74 | 0.92 | 1.13 | 1.36 | | | | |
| | | | | | 43 | 0.41 | 0.53 | 0.68 | 0.85 | 1.04 | 1.26 | | | | |
| OP-MSGM012SC | 114X7099 114X7207 | W05 W09 | A1 | G | 27 | 0.57 | 0.72 | 0.89 | 1.09 | 1.31 | 1.56 | 1.68 | - | 4 | 31 |
| | | | | | 32 | 0.52 | 0.66 | 0.83 | 1.01 | 1.23 | 1.47 | | | | |
| | | | | | 38 | 0.46 | 0.59 | 0.74 | 0.92 | 1.13 | 1.36 | | | | |
| | | | | | 43 | 0.41 | 0.53 | 0.68 | 0.85 | 1.04 | 1.26 | | | | |
| OP-MSGM015SC | 114X7100 114X7208 | W05 W09 | A1 | G | 27 | 0.62 | 0.79 | 0.98 | 1.21 | 1.47 | 1.76 | 1.61 | - | 6 | 31 |
| | | | | | 32 | 0.58 | 0.74 | 0.93 | 1.15 | 1.39 | 1.66 | | | | |
| | | | | | 38 | 0.53 | 0.68 | 0.86 | 1.06 | 1.28 | 1.53 | | | | |
| | | | | | 43 | 0.49 | 0.63 | 0.79 | 0.98 | 1.18 | 1.42 | | | | |
| OP-MSSM015SC | 114X7239 114X7292 | W05 W09 | A1 + A2L | G | 27 | 0.62 | 0.79 | 0.98 | 1.21 | 1.47 | 1.76 | 1.61 | - | 6 | 31 |
| | | | | | 32 | 0.58 | 0.74 | 0.93 | 1.15 | 1.39 | 1.66 | | | | |
| | | | | | 38 | 0.53 | 0.68 | 0.86 | 1.06 | 1.28 | 1.53 | | | | |
| | | | | | 43 | 0.49 | 0.63 | 0.79 | 0.98 | 1.18 | 1.42 | | | | |
| OP-MSGM018SC | 114X7101 114X7131 | W05 W09 | A1 | G | 27 | 0.79 | 0.97 | 1.18 | 1.42 | 1.69 | 2.00 | 1.57 | - | 6 | 32 |
| | | | | | 32 | 0.70 | 0.88 | 1.09 | 1.32 | 1.59 | 1.88 | | | | |
| | | | | | 38 | 0.62 | 0.79 | 0.99 | 1.21 | 1.47 | 1.76 | | | | |
| | | | | | 43 | 0.57 | 0.73 | 0.92 | 1.13 | 1.37 | 1.65 | | | | |
| OP-MSSM018SC | 114X7240 114X7293 | W05 W09 | A1 + A2L | G | 27 | 0.79 | 0.97 | 1.18 | 1.42 | 1.69 | 2.00 | 1.57 | - | 6 | 32 |
| | | | | | 32 | 0.70 | 0.88 | 1.09 | 1.32 | 1.59 | 1.88 | | | | |
| | | | | | 38 | 0.62 | 0.79 | 0.99 | 1.21 | 1.47 | 1.76 | | | | |
| | | | | | 43 | 0.57 | 0.73 | 0.92 | 1.13 | 1.37 | 1.65 | | | | |
| OP-MSGM021SC | 114X7102 114X7132 | W05 W09 | A1 | G | 27 | 0.92 | 1.14 | 1.40 | 1.68 | 1.99 | 2.34 | 1.69 | - | 6 | 32 |
| | | | | | 32 | 0.84 | 1.06 | 1.30 | 1.57 | 1.88 | 2.21 | | | | |
| | | | | | 38 | 0.75 | 0.95 | 1.18 | 1.44 | 1.73 | 2.04 | | | | |
| | | | | | 43 | 0.68 | 0.87 | 1.08 | 1.32 | 1.60 | 1.90 | | | | |
| OP-MSSM021SC | 114X7241 114X7294 | W05 W09 | A1 + A2L | G | 27 | 0.92 | 1.14 | 1.40 | 1.68 | 1.99 | 2.34 | 1.69 | - | 6 | 32 |
| | | | | | 32 | 0.84 | 1.06 | 1.30 | 1.57 | 1.88 | 2.21 | | | | |
| | | | | | 38 | 0.75 | 0.95 | 1.18 | 1.44 | 1.73 | 2.04 | | | | |
| | | | | | 43 | 0.68 | 0.87 | 1.08 | 1.32 | 1.60 | 1.90 | | | | |
| OP-MSSM026CS | 114X7248 114X7304 | W05 W09 | A1 + A2L | G | 27 | 1.10 | 1.41 | 1.77 | 2.16 | 2.58 | 3.04 | 1.99 | - | 10 | 38 |
| | | | | | 32 | 0.99 | 1.29 | 1.63 | 2.00 | 2.41 | 2.86 | | | | |
| | | | | | 38 | 0.86 | 1.14 | 1.46 | 1.81 | 2.20 | 2.64 | | | | |
| | | | | | 43 | 0.76 | 1.02 | 1.32 | 1.66 | 2.03 | 2.45 | | | | |
| OP-MSSM030CS | 114X7249 114X7305 | W05 W09 | A1 + A2L | G | 27 | 1.33 | 1.74 | 2.19 | 2.70 | 3.25 | 3.86 | 1.86 | - | 10 | 38 |
| | | | | | 32 | 1.20 | 1.59 | 2.02 | 2.50 | 3.04 | 3.62 | | | | |
| | | | | | 38 | 1.05 | 1.41 | 1.81 | 2.27 | 2.78 | 3.35 | | | | |
| | | | | | 43 | 0.92 | 1.26 | 1.64 | 2.08 | 2.57 | 3.11 | | | | |
| OP-MSXM034ML | 114X7061 114X7195 | W05 W09 | A1 | G | 27 | 1.92 | 2.38 | 2.93 | 3.57 | 4.32 | 5.18 | 2.20 | - | 20 | 40 |
| | | | | | 32 | 1.80 | 2.24 | 2.76 | 3.37 | 4.07 | 4.88 | | | | |
| | | | | | 38 | 1.66 | 2.07 | 2.55 | 3.11 | 3.77 | 4.53 | | | | |
| | | | | | 43 | 1.53 | 1.92 | 2.37 | 2.90 | 3.51 | 4.22 | | | | |
| OP-MSIM034ML | 114X7267 114X7275 | W05 W09 | A1+A2L | G | 27 | 1.92 | 2.38 | 2.93 | 3.57 | 4.32 | 5.18 | 2.20 | - | 20 | 40 |
| | | | | | 32 | 1.80 | 2.24 | 2.76 | 3.37 | 4.07 | 4.88 | | | | |
| | | | | | 38 | 1.66 | 2.07 | 2.55 | 3.11 | 3.77 | 4.53 | | | | |
| | | | | | 43 | 1.53 | 1.92 | 2.37 | 2.90 | 3.51 | 4.22 | | | | |

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**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSXM034ML | 114X7062 114X7196 | W05 W09 | A1 | E | 27 | 1.94 | 2.40 | 2.95 | 3.60 | 4.34 | 5.19 | 2.26 | - | 8 | 40 |
| | | | | | 32 | 1.82 | 2.26 | 2.78 | 3.39 | 4.09 | 4.90 | | | | |
| | | | | | 38 | 1.67 | 2.08 | 2.56 | 3.13 | 3.79 | 4.54 | | | | |
| | | | | | 43 | 1.54 | 1.92 | 2.38 | 2.91 | 3.53 | 4.24 | | | | |
| OP-MSIM034ML | 114X7266 114X7274 | W05 W09 | A1+A2L | E | 27 | 1.94 | 2.40 | 2.95 | 3.60 | 4.34 | 5.19 | 2.26 | - | 8 | 40 |
| | | | | | 32 | 1.82 | 2.26 | 2.78 | 3.39 | 4.09 | 4.90 | | | | |
| | | | | | 38 | 1.67 | 2.08 | 2.56 | 3.13 | 3.79 | 4.54 | | | | |
| | | | | | 43 | 1.54 | 1.92 | 2.38 | 2.91 | 3.53 | 4.24 | | | | |
| OP-MSXM044ML | 114X7161 114X7211 | W05 W09 | A1 | G | 27 | 2.41 | 2.99 | 3.67 | 4.46 | 5.37 | 6.40 | 1.96 | - | 25 | 41 |
| | | | | | 32 | 2.26 | 2.81 | 3.46 | 4.22 | 5.08 | 6.06 | | | | |
| | | | | | 38 | 2.07 | 2.59 | 3.20 | 3.91 | 4.72 | 5.64 | | | | |
| | | | | | 43 | 1.91 | 2.40 | 2.97 | 3.64 | 4.40 | 5.27 | | | | |
| OP-MSIM044ML | 114X7269 114X7277 | W05 W09 | A1+A2L | G | 27 | 2.41 | 2.99 | 3.67 | 4.46 | 5.37 | 6.40 | 1.96 | - | 25 | 41 |
| | | | | | 32 | 2.26 | 2.81 | 3.46 | 4.22 | 5.08 | 6.06 | | | | |
| | | | | | 38 | 2.07 | 2.59 | 3.20 | 3.91 | 4.72 | 5.64 | | | | |
| | | | | | 43 | 1.91 | 2.40 | 2.97 | 3.64 | 4.40 | 5.27 | | | | |
| OP-MSXM044ML | 114X7162 114X7212 | W05 W09 | A1 | E | 27 | 2.48 | 3.07 | 3.76 | 4.56 | 5.47 | 6.49 | 2.32 | - | 12 | 41 |
| | | | | | 32 | 2.31 | 2.88 | 3.53 | 4.29 | 5.16 | 6.13 | | | | |
| | | | | | 38 | 2.11 | 2.64 | 3.25 | 3.96 | 4.77 | 5.69 | | | | |
| | | | | | 43 | 1.93 | 2.43 | 3.01 | 3.68 | 4.44 | 5.30 | | | | |
| OP-MSIM044ML | 114X7268 114X7276 | W05 W09 | A1+A2L | E | 27 | 2.48 | 3.07 | 3.76 | 4.56 | 5.47 | 6.49 | 2.32 | - | 12 | 41 |
| | | | | | 32 | 2.31 | 2.88 | 3.53 | 4.29 | 5.16 | 6.13 | | | | |
| | | | | | 38 | 2.11 | 2.64 | 3.25 | 3.96 | 4.77 | 5.69 | | | | |
| | | | | | 43 | 1.93 | 2.43 | 3.01 | 3.68 | 4.44 | 5.30 | | | | |
| OP-MSXM046ML | 114X7063 114X7197 | W05 W09 | A1 | E | 27 | 2.56 | 3.17 | 3.89 | 4.72 | 5.68 | 6.75 | 1.99 | - | 12 | 41 |
| | | | | | 32 | 2.39 | 2.98 | 3.67 | 4.46 | 5.36 | 6.39 | | | | |
| | | | | | 38 | 2.19 | 2.75 | 3.39 | 4.13 | 4.98 | 5.94 | | | | |
| | | | | | 43 | 2.02 | 2.54 | 3.15 | 3.84 | 4.64 | 5.54 | | | | |
| OP-MSIM046ML | 114X7270 114X7278 | W05 W09 | A1+A2L | E | 27 | 2.63 | 3.25 | 3.97 | 4.81 | 5.77 | 6.84 | 2.32 | - | 12 | 41 |
| | | | | | 32 | 2.45 | 3.04 | 3.73 | 4.53 | 5.44 | 6.46 | | | | |
| | | | | | 38 | 2.23 | 2.79 | 3.44 | 4.18 | 5.03 | 5.99 | | | | |
| | | | | | 43 | 2.04 | 2.57 | 3.18 | 3.88 | 4.68 | 5.59 | | | | |
| OP-MSXM046ML | 114X7064 114X7198 | W05 W09 | A1 | G | 27 | 2.63 | 3.25 | 3.97 | 4.81 | 5.77 | 6.84 | 2.32 | - | 32 | 41 |
| | | | | | 32 | 2.45 | 3.04 | 3.73 | 4.53 | 5.44 | 6.46 | | | | |
| | | | | | 38 | 2.23 | 2.79 | 3.44 | 4.18 | 5.03 | 5.99 | | | | |
| | | | | | 43 | 2.04 | 2.57 | 3.18 | 3.88 | 4.68 | 5.59 | | | | |
| OP-MSIM046ML | 114X7271 114X7279 | W05 W09 | A1+A2L | G | 27 | 2.56 | 3.17 | 3.89 | 4.72 | 5.68 | 6.75 | 1.99 | - | 32 | 41 |
| | | | | | 32 | 2.39 | 2.98 | 3.67 | 4.46 | 5.36 | 6.39 | | | | |
| | | | | | 38 | 2.19 | 2.75 | 3.39 | 4.13 | 4.98 | 5.94 | | | | |
| | | | | | 43 | 2.02 | 2.54 | 3.15 | 3.84 | 4.64 | 5.54 | | | | |
| OP-MSXM057ML | 114X7065 114X7199 | W05 W09 | A1 | G | 27 | 3.14 | 3.89 | 4.75 | 5.74 | 6.86 | 8.10 | 2.06 | - | 32 | 42 |
| | | | | | 32 | 2.94 | 3.65 | 4.47 | 5.41 | 6.47 | 7.65 | | | | |
| | | | | | 38 | 2.69 | 3.36 | 4.12 | 5.00 | 5.98 | 7.08 | | | | |
| | | | | | 43 | 2.47 | 3.10 | 3.82 | 4.64 | 5.56 | 6.60 | | | | |
| OP-MSIM057ML | 114X7273 114X7281 | W05 W09 | A1+A2L | G | 27 | 3.14 | 3.89 | 4.75 | 5.74 | 6.86 | 8.10 | 2.06 | - | 32 | 42 |
| | | | | | 32 | 2.94 | 3.65 | 4.47 | 5.41 | 6.47 | 7.65 | | | | |
| | | | | | 38 | 2.69 | 3.36 | 4.12 | 5.00 | 5.98 | 7.08 | | | | |
| | | | | | 43 | 2.47 | 3.10 | 3.82 | 4.64 | 5.56 | 6.60 | | | | |

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**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSXM057ML | 114X7066 114X7200 | W05 W09 | A1 | E | 27 | 3.20 | 3.96 | 4.83 | 5.83 | 6.95 | 8.20 | 2.30 | - | 12 | 42 |
| | | | | | 32 | 2.97 | 3.70 | 4.53 | 5.48 | 6.55 | 7.74 | | | | |
| | | | | | 38 | 2.69 | 3.37 | 4.16 | 5.05 | 6.05 | 7.17 | | | | |
| | | | | | 43 | 2.44 | 3.09 | 3.83 | 4.67 | 5.62 | 6.67 | | | | |
| OP-MSIM057ML | 114X7272 114X7280 | W05 W09 | A1+A2L | E | 27 | 3.20 | 3.96 | 4.83 | 5.83 | 6.95 | 8.20 | 2.30 | - | 12 | 42 |
| | | | | | 32 | 2.97 | 3.70 | 4.53 | 5.48 | 6.55 | 7.74 | | | | |
| | | | | | 38 | 2.69 | 3.37 | 4.16 | 5.05 | 6.05 | 7.17 | | | | |
| | | | | | 43 | 2.44 | 3.09 | 3.83 | 4.67 | 5.62 | 6.67 | | | | |
| OP-MSXM068ML | 114X7067 114X7201 | W05 W09 | A1 | G | 27 | 3.94 | 4.85 | 5.92 | 7.17 | 8.61 | 10.24 | 2.30 | - | 40 | 43 |
| | | | | | 32 | 3.68 | 4.55 | 5.58 | 6.77 | 8.14 | 9.69 | | | | |
| | | | | | 38 | 3.37 | 4.19 | 5.14 | 6.26 | 7.54 | 9.01 | | | | |
| | | | | | 43 | 3.10 | 3.87 | 4.77 | 5.82 | 7.03 | 8.41 | | | | |
| OP-MSIM068ML | 114X7312 114X7318 | W05 W09 | A1+A2L | G | 27 | 3.94 | 4.85 | 5.92 | 7.17 | 8.61 | 10.24 | 2.36 | - | 40 | 43 |
| | | | | | 32 | 3.68 | 4.55 | 5.58 | 6.77 | 8.14 | 9.69 | | | | |
| | | | | | 38 | 3.37 | 4.19 | 5.14 | 6.26 | 7.54 | 9.01 | | | | |
| | | | | | 43 | 3.10 | 3.87 | 4.77 | 5.82 | 7.03 | 8.41 | | | | |
| OP-MSXM068ML | 114X7068 114X7202 | W05 W09 | A1 | E | 27 | 3.99 | 4.93 | 6.03 | 7.32 | 8.80 | 10.48 | 2.52 | - | 16 | 43 |
| | | | | | 32 | 3.75 | 4.64 | 5.69 | 6.92 | 8.32 | 9.92 | | | | |
| | | | | | 38 | 3.44 | 4.28 | 5.26 | 6.41 | 7.73 | 9.22 | | | | |
| | | | | | 43 | 3.18 | 3.97 | 4.89 | 5.97 | 7.21 | 8.62 | | | | |
| OP-MSIM068ML | 114X7311 114X7317 | W05 W09 | A1+A2L | E | 27 | 3.99 | 4.93 | 6.03 | 7.32 | 8.80 | 10.48 | 2.59 | - | 16 | 43 |
| | | | | | 32 | 3.75 | 4.64 | 5.69 | 6.92 | 8.32 | 9.92 | | | | |
| | | | | | 38 | 3.44 | 4.28 | 5.26 | 6.41 | 7.73 | 9.22 | | | | |
| | | | | | 43 | 3.18 | 3.97 | 4.89 | 5.97 | 7.21 | 8.62 | | | | |
| OP-MSXM080ML | 114X7069 114X7203 | W05 W09 | A1 | G | 27 | 4.59 | 5.68 | 6.95 | 8.43 | 10.13 | 12.04 | - | 3.24 | 45 | 44 |
| | | | | | 32 | 4.31 | 5.34 | 6.56 | 7.96 | 9.57 | 11.38 | | | | |
| | | | | | 38 | 3.95 | 4.93 | 6.06 | 7.37 | 8.87 | 10.57 | | | | |
| | | | | | 43 | 3.65 | 4.56 | 5.63 | 6.86 | 8.27 | 9.87 | | | | |
| OP-MSIM080ML | 114X7314 114X7320 | W05 W09 | A1+A2L | G | 27 | 4.59 | 5.68 | 6.95 | 8.43 | 10.13 | 12.04 | - | 3.33 | 45 | 44 |
| | | | | | 32 | 4.31 | 5.34 | 6.56 | 7.96 | 9.57 | 11.38 | | | | |
| | | | | | 38 | 3.95 | 4.93 | 6.06 | 7.37 | 8.87 | 10.57 | | | | |
| | | | | | 43 | 3.65 | 4.56 | 5.63 | 6.86 | 8.27 | 9.87 | | | | |
| OP-MSXM080ML | 114X7070 114X7204 | W05 W09 | A1 | E | 27 | 4.67 | 5.75 | 7.02 | 8.49 | 10.17 | 12.07 | - | 3.82 | 20 | 44 |
| | | | | | 32 | 4.37 | 5.40 | 6.61 | 8.00 | 9.60 | 11.40 | | | | |
| | | | | | 38 | 4.00 | 4.97 | 6.09 | 7.39 | 8.88 | 10.57 | | | | |
| | | | | | 43 | 3.69 | 4.59 | 5.65 | 6.87 | 8.27 | 9.86 | | | | |
| OP-MSIM080ML | 114X7313 114X7319 | W05 W09 | A1+A2L | E | 27 | 4.67 | 5.75 | 7.02 | 8.49 | 10.17 | 12.07 | - | 4.02 | 20 | 44 |
| | | | | | 32 | 4.37 | 5.40 | 6.61 | 8.00 | 9.60 | 11.40 | | | | |
| | | | | | 38 | 4.00 | 4.97 | 6.09 | 7.39 | 8.88 | 10.57 | | | | |
| | | | | | 43 | 3.69 | 4.59 | 5.65 | 6.87 | 8.27 | 9.86 | | | | |
| OP-MSXM099ML | 114X7071 114X7205 | W05 W09 | A1 | E | 27 | 5.71 | 7.03 | 8.57 | 10.35 | 12.36 | 14.62 | - | 3.78 | 20 | 44 |
| | | | | | 32 | 5.34 | 6.60 | 8.06 | 9.74 | 11.64 | 13.78 | | | | |
| | | | | | 38 | 4.88 | 6.06 | 7.42 | 8.98 | 10.75 | 12.75 | | | | |
| | | | | | 43 | 4.49 | 5.60 | 6.87 | 8.33 | 9.99 | 11.86 | | | | |
| OP-MSIM099ML | 114X7315 114X7321 | W05 W09 | A1+A2L | E | 27 | 5.71 | 7.03 | 8.57 | 10.35 | 12.36 | 14.62 | - | 3.88 | 20 | 44 |
| | | | | | 32 | 5.34 | 6.60 | 8.06 | 9.74 | 11.64 | 13.78 | | | | |
| | | | | | 38 | 4.88 | 6.06 | 7.42 | 8.98 | 10.75 | 12.75 | | | | |
| | | | | | 43 | 4.49 | 5.60 | 6.87 | 8.33 | 9.99 | 11.86 | | | | |

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**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] | | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | COP | SEPR | | |
| OP-MSXM108ML | 114X7072<br>114X7206 | W05<br>W09 | A1 | E | 27 | 6.08 | 7.49 | 9.14 | 11.02 | 13.16 | 15.56 | - | 3.79 | 20 | 46 |
| | | | | | 32 | 5.65 | 7.00 | 8.57 | 10.36 | 12.39 | 14.67 | | | | |
| | | | | | 38 | 5.13 | 6.40 | 7.86 | 9.54 | 11.44 | 13.57 | | | | |
| | | | | | 43 | 4.68 | 5.88 | 7.25 | 8.83 | 10.61 | 12.63 | | | | |
| OP-MSIM108ML | 114X7316<br>114X7322 | W05<br>W09 | A1+A2L | E | 27 | 6.08 | 7.49 | 9.14 | 11.02 | 13.16 | 15.56 | - | 3.88 | 20 | 46 |
| | | | | | 32 | 5.65 | 7.00 | 8.57 | 10.36 | 12.39 | 14.67 | | | | |
| | | | | | 38 | 5.13 | 6.40 | 7.86 | 9.54 | 11.44 | 13.57 | | | | |
| | | | | | 43 | 4.68 | 5.88 | 7.25 | 8.83 | 10.61 | 12.63 | | | | |

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] | | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | COP | SEPR | | |
| OP-MSSM012SC | 114X7238<br>114X7291 | W05<br>W09 | A1 + A2L | G | 27 | 0.57 | 0.72 | 0.89 | 1.09 | 1.32 | 1.58 | 1.76 | - | 4 | 31 |
| | | | | | 32 | 0.52 | 0.66 | 0.82 | 1.02 | 1.24 | 1.49 | | | | |
| | | | | | 38 | 0.46 | 0.59 | 0.74 | 0.93 | 1.13 | 1.37 | | | | |
| | | | | | 43 | 0.41 | 0.53 | 0.68 | 0.85 | 1.05 | 1.28 | | | | |
| OP-MSSM015SC | 114X7239<br>114X7292 | W05<br>W09 | A1 + A2L | G | 27 | 0.61 | 0.78 | 0.98 | 1.22 | 1.48 | 1.78 | 1.68 | - | 6 | 31 |
| | | | | | 32 | 0.58 | 0.74 | 0.93 | 1.15 | 1.40 | 1.68 | | | | |
| | | | | | 38 | 0.53 | 0.68 | 0.86 | 1.06 | 1.29 | 1.55 | | | | |
| | | | | | 43 | 0.48 | 0.62 | 0.79 | 0.98 | 1.19 | 1.43 | | | | |
| OP-MSSM018SC | 114X7240<br>114X7293 | W05<br>W09 | A1 + A2L | G | 27 | 0.78 | 0.97 | 1.18 | 1.43 | 1.70 | 2.02 | 1.65 | - | 6 | 32 |
| | | | | | 32 | 0.70 | 0.88 | 1.09 | 1.33 | 1.60 | 1.90 | | | | |
| | | | | | 38 | 0.62 | 0.79 | 0.99 | 1.22 | 1.48 | 1.77 | | | | |
| | | | | | 43 | 0.56 | 0.72 | 0.91 | 1.13 | 1.38 | 1.67 | | | | |
| OP-MSSM021SC | 114X7241<br>114X7294 | W05<br>W09 | A1 + A2L | G | 27 | 0.91 | 1.14 | 1.40 | 1.69 | 2.01 | 2.36 | 1.77 | - | 6 | 32 |
| | | | | | 32 | 0.83 | 1.05 | 1.30 | 1.58 | 1.89 | 2.23 | | | | |
| | | | | | 38 | 0.74 | 0.95 | 1.18 | 1.44 | 1.74 | 2.07 | | | | |
| | | | | | 43 | 0.67 | 0.86 | 1.08 | 1.33 | 1.61 | 1.92 | | | | |
| OP-MSSM026CS | 114X7248<br>114X7304 | W05<br>W09 | A1 + A2L | G | 27 | 1.12 | 1.44 | 1.81 | 2.21 | 2.64 | 3.12 | 1.95 | - | 10 | 38 |
| | | | | | 32 | 1.01 | 1.31 | 1.66 | 2.04 | 2.46 | 2.92 | | | | |
| | | | | | 38 | 0.87 | 1.16 | 1.48 | 1.85 | 2.25 | 2.69 | | | | |
| | | | | | 43 | 0.76 | 1.03 | 1.34 | 1.68 | 2.07 | 2.50 | | | | |
| OP-MSSM030CS | 114X7249<br>114X7305 | W05<br>W09 | A1 + A2L | G | 27 | 1.19 | 1.55 | 1.97 | 2.43 | 2.94 | 3.49 | 1.83 | - | 10 | 38 |
| | | | | | 32 | 1.07 | 1.42 | 1.81 | 2.25 | 2.74 | 3.28 | | | | |
| | | | | | 38 | 0.93 | 1.25 | 1.62 | 2.04 | 2.51 | 3.03 | | | | |
| | | | | | 43 | 0.82 | 1.12 | 1.47 | 1.87 | 2.32 | 2.82 | | | | |

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM008DY | 114X7226 114X7286 | W05 W09 | A1 + A2L | G | 27 | - | 0.78 | 0.97 | 1.18 | 1.40 | 1.63 | - | 2.26 | - | 6 | 31 |
| | | | | | 32 | - | 0.70 | 0.87 | 1.06 | 1.26 | 1.48 | - | | | | |
| | | | | | 38 | - | 0.59 | 0.74 | 0.91 | 1.10 | 1.29 | - | | | | |
| | | | | | 43 | - | - | 0.64 | 0.79 | 0.96 | 1.14 | - | | | | |
| OP-MSTM009DY | 114X7229 114X7287 | W05 W09 | A1 + A2L | G | 27 | - | 0.89 | 1.09 | 1.30 | 1.53 | 1.77 | - | 2.05 | - | 8 | 32 |
| | | | | | 32 | - | 0.79 | 0.98 | 1.17 | 1.38 | 1.60 | - | | | | |
| | | | | | 38 | - | 0.68 | 0.84 | 1.02 | 1.20 | 1.40 | - | | | | |
| | | | | | 43 | - | - | 0.73 | 0.89 | 1.06 | 1.24 | - | | | | |
| OP-MSBM009DY | 114X7108 114X7133 | W05 W09 | A1 | G | 27 | - | 0.89 | 1.09 | 1.30 | 1.53 | 1.77 | - | 2.05 | - | | |
| | | | | | 32 | - | 0.79 | 0.98 | 1.17 | 1.38 | 1.60 | - | | | | |
| | | | | | 38 | - | 0.68 | 0.84 | 1.02 | 1.20 | 1.40 | - | | | | |
| | | | | | 43 | - | - | 0.73 | 0.89 | 1.06 | 1.24 | - | | | | |
| OP-MSTM012DP | 114X7230 114X7288 | W05 W09 | A1 + A2L | G | 27 | - | 1.14 | 1.39 | 1.66 | 1.93 | 2.22 | - | 1.86 | - | 8 | 32 |
| | | | | | 32 | - | 1.01 | 1.24 | 1.48 | 1.74 | 2.01 | - | | | | |
| | | | | | 38 | - | 0.86 | 1.06 | 1.28 | 1.51 | 1.75 | - | | | | |
| | | | | | 43 | - | - | 0.92 | 1.11 | 1.32 | 1.54 | - | | | | |
| OP-MSBM012DP | 114X7109 114X7134 | W05 W09 | A1 | G | 27 | - | 1.14 | 1.39 | 1.66 | 1.93 | 2.22 | - | 1.86 | - | | |
| | | | | | 32 | - | 1.01 | 1.24 | 1.48 | 1.74 | 2.01 | - | | | | |
| | | | | | 38 | - | 0.86 | 1.06 | 1.28 | 1.51 | 1.75 | - | | | | |
| | | | | | 43 | - | - | 0.92 | 1.11 | 1.32 | 1.54 | - | | | | |
| OP-MSTM014DP | 114X7231 114X7289 | W05 W09 | A1 + A2L | G | 27 | - | 1.20 | 1.45 | 1.71 | 2.00 | 2.29 | - | 1.79 | - | 8 | 33 |
| | | | | | 32 | - | 1.09 | 1.32 | 1.57 | 1.83 | 2.11 | - | | | | |
| | | | | | 38 | - | 0.96 | 1.16 | 1.39 | 1.63 | 1.89 | - | | | | |
| | | | | | 43 | - | - | 1.03 | 1.24 | 1.47 | 1.71 | - | | | | |
| OP-MSBM014DP | 114X7110 114X7135 | W05 W09 | A1 | G | 27 | - | 1.20 | 1.45 | 1.71 | 2.00 | 2.29 | - | 1.79 | - | | |
| | | | | | 32 | - | 1.09 | 1.32 | 1.57 | 1.83 | 2.11 | - | | | | |
| | | | | | 38 | - | 0.96 | 1.16 | 1.39 | 1.63 | 1.89 | - | | | | |
| | | | | | 43 | - | - | 1.03 | 1.24 | 1.47 | 1.71 | - | | | | |
| OP-MSTM018DX | 114X7232 114X7290 | W05 W09 | A1 + A2L | G | 27 | - | 1.26 | 1.51 | 1.77 | 2.05 | 2.34 | - | 1.66 | - | 10 | 39 |
| | | | | | 32 | - | 1.15 | 1.38 | 1.62 | 1.88 | 2.16 | - | | | | |
| | | | | | 38 | - | 1.02 | 1.22 | 1.44 | 1.68 | 1.94 | - | | | | |
| | | | | | 43 | - | - | 1.09 | 1.30 | 1.52 | 1.76 | - | | | | |
| OP-MSTM021DX* | 114X7325 114X7327 | W05 W09 | A1 + A2L | G | 27 | 1.159 | 1.403 | 1.666 | 1.946 | 2.241 | 2.550 | - | 1.61 | - | 10 | 39 |
| | | | | | 32 | 1.057 | 1.280 | 1.522 | 1.781 | 2.057 | 2.347 | - | | | | |
| | | | | | 38 | 0.937 | 1.133 | 1.349 | 1.584 | 1.836 | 2.104 | - | | | | |
| | | | | | 43 | 0.839 | 1.012 | 1.207 | 1.421 | 1.653 | 1.902 | - | | | | |
| OP-MSTM022DS | 114X7233 114X7299 | W05 W09 | A1 + A2L | G | 27 | - | 1.84 | 2.24 | 2.69 | 3.18 | 3.73 | - | 1.93 | - | 10 | 39 |
| | | | | | 32 | - | 1.66 | 2.03 | 2.44 | 2.90 | 3.39 | - | | | | |
| | | | | | 38 | - | 1.45 | 1.78 | 2.15 | 2.56 | 3.00 | - | | | | |
| | | | | | 43 | - | - | 1.58 | 1.91 | 2.27 | 2.67 | - | | | | |
| OP-MSTM026DS | 114X7234 114X7300 | W05 W09 | A1 + A2L | G | 27 | - | 2.24 | 2.74 | 3.26 | 3.80 | 4.36 | - | 2.02 | - | 16 | 39 |
| | | | | | 32 | - | 1.98 | 2.43 | 2.91 | 3.41 | 3.93 | - | | | | |
| | | | | | 38 | - | 1.67 | 2.06 | 2.49 | 2.94 | 3.41 | - | | | | |
| | | | | | 43 | - | - | 1.76 | 2.14 | 2.55 | 2.98 | - | | | | |
| OP-MSTM026DS | 114X7235 114X7301 | W05 W09 | A1 + A2L | E | 27 | - | 2.25 | 2.75 | 3.27 | 3.82 | 4.39 | - | 2.07 | - | 6 | 39 |
| | | | | | 32 | - | 1.99 | 2.44 | 2.92 | 3.43 | 3.95 | - | | | | |
| | | | | | 38 | - | 1.68 | 2.07 | 2.50 | 2.95 | 3.43 | - | | | | |
| | | | | | 43 | - | - | 1.77 | 2.15 | 2.56 | 3.00 | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM034DS | 114X7237 114X7302 | W05 W09 | A1 + A2L | G | 27 | - | 2.29 | 2.96 | 3.71 | 4.55 | 5.47 | - | 1.81 | - | 20 | 40 |
| | | | | | 32 | - | 2.05 | 2.68 | 3.39 | 4.18 | 5.05 | - | | | | |
| | | | | | 38 | - | 1.76 | 2.33 | 2.99 | 3.72 | 4.53 | - | | | | |
| | | | | | 43 | - | - | 2.04 | 2.65 | 3.33 | 4.09 | - | | | | |
| OP-MSTM034DS | 114X7236 114X7303 | W05 W09 | A1 + A2L | E | 27 | - | 2.33 | 3.01 | 3.78 | 4.63 | 5.57 | - | 1.86 | - | 8 | 40 |
| | | | | | 32 | - | 2.09 | 2.73 | 3.45 | 4.25 | 5.13 | - | | | | |
| | | | | | 38 | - | 1.79 | 2.38 | 3.04 | 3.78 | 4.60 | - | | | | |
| | | | | | 43 | - | - | 2.08 | 2.70 | 3.39 | 4.15 | - | | | | |
| OP-MSXM034ML | 114X7062 114X7196 | W05 W09 | A1 | E | 27 | 2.63 | 3.24 | 3.93 | 4.72 | 5.60 | 6.58 | - | 2.24 | - | 8 | 40 |
| | | | | | 32 | 2.43 | 3.00 | 3.65 | 4.40 | 5.23 | 6.16 | - | | | | |
| | | | | | 38 | 2.17 | 2.70 | 3.30 | 3.99 | 4.77 | 5.63 | - | | | | |
| | | | | | 43 | - | 2.44 | 3.00 | 3.64 | 4.36 | 5.17 | - | | | | |
| OP-MSIM034ML | 114X7266 114X7274 | W05 W09 | A1+A2L | E | 27 | 2.63 | 3.24 | 3.93 | 4.72 | 5.60 | 6.58 | - | 2.24 | - | 8 | 40 |
| | | | | | 32 | 2.43 | 3.00 | 3.65 | 4.40 | 5.23 | 6.16 | - | | | | |
| | | | | | 38 | 2.17 | 2.70 | 3.30 | 3.99 | 4.77 | 5.63 | - | | | | |
| | | | | | 43 | - | 2.44 | 3.00 | 3.64 | 4.36 | 5.17 | - | | | | |
| OP-MSXM034ML | 114X7061 114X7195 | W05 W09 | A1 | G | 27 | 2.62 | 3.23 | 3.94 | 4.73 | 5.61 | 6.59 | - | 2.30 | - | 20 | 40 |
| | | | | | 32 | 2.43 | 3.01 | 3.67 | 4.41 | 5.25 | 6.17 | - | | | | |
| | | | | | 38 | 2.20 | 2.73 | 3.33 | 4.02 | 4.80 | 5.66 | - | | | | |
| | | | | | 43 | - | 2.49 | 3.05 | 3.69 | 4.41 | 5.21 | - | | | | |
| OP-MSIM034ML | 114X7267 114X7275 | W05 W09 | A1+A2L | G | 27 | 2.62 | 3.23 | 3.94 | 4.73 | 5.61 | 6.59 | - | 2.30 | - | 20 | 40 |
| | | | | | 32 | 2.43 | 3.01 | 3.67 | 4.41 | 5.25 | 6.17 | - | | | | |
| | | | | | 38 | 2.20 | 2.73 | 3.33 | 4.02 | 4.80 | 5.66 | - | | | | |
| | | | | | 43 | - | 2.49 | 3.05 | 3.69 | 4.41 | 5.21 | - | | | | |
| OP-MSTM038DS* | 114X7326 114X7328 | W05 W09 | A1+A2L | G | 27 | 1.851 | 2.479 | 3.197 | 4.003 | 4.904 | 5.886 | - | 1.78 | - | 20 | 40 |
| | | | | | 32 | 1.630 | 2.218 | 2.890 | 3.647 | 4.495 | 5.421 | - | | | | |
| | | | | | 38 | 1.357 | 1.896 | 2.514 | 3.210 | 3.994 | 4.853 | - | | | | |
| | | | | | 43 | 1.127 | 1.624 | 2.195 | 2.841 | 3.571 | 4.374 | - | | | | |
| OP-MSXM044ML | 114X7161 114X7211 | W05 W09 | A1 | G | 27 | 3.21 | 3.97 | 4.82 | 5.78 | 6.85 | 8.02 | - | 2.00 | - | 25 | 41 |
| | | | | | 32 | 2.98 | 3.69 | 4.50 | 5.40 | 6.41 | 7.53 | - | | | | |
| | | | | | 38 | 2.70 | 3.36 | 4.10 | 4.93 | 5.87 | 6.91 | - | | | | |
| | | | | | 43 | - | 3.07 | 3.75 | 4.53 | 5.40 | 6.37 | - | | | | |
| OP-MSIM044ML | 114X7269 114X7277 | W05 W09 | A1+A2L | G | 27 | 3.21 | 3.97 | 4.82 | 5.78 | 6.85 | 8.02 | - | 2.00 | - | 25 | 41 |
| | | | | | 32 | 2.98 | 3.69 | 4.50 | 5.40 | 6.41 | 7.53 | - | | | | |
| | | | | | 38 | 2.70 | 3.36 | 4.10 | 4.93 | 5.87 | 6.91 | - | | | | |
| | | | | | 43 | - | 3.07 | 3.75 | 4.53 | 5.40 | 6.37 | - | | | | |
| OP-MSXM044ML | 114X7162 114X7212 | W05 W09 | A1 | E | 27 | 3.31 | 4.06 | 4.90 | 5.85 | 6.90 | 8.05 | - | 2.11 | - | 12 | 41 |
| | | | | | 32 | 3.07 | 3.77 | 4.56 | 5.44 | 6.42 | 7.50 | - | | | | |
| | | | | | 38 | 2.77 | 3.41 | 4.14 | 4.94 | 5.84 | 6.84 | - | | | | |
| | | | | | 43 | - | 3.11 | 3.78 | 4.53 | 5.36 | 6.28 | - | | | | |
| OP-MSIM044ML | 114X7268 114X7276 | W05 W09 | A1+A2L | E | 27 | 3.31 | 4.06 | 4.90 | 5.85 | 6.90 | 8.05 | - | 2.11 | - | 12 | 41 |
| | | | | | 32 | 3.07 | 3.77 | 4.56 | 5.44 | 6.42 | 7.50 | - | | | | |
| | | | | | 38 | 2.77 | 3.41 | 4.14 | 4.94 | 5.84 | 6.84 | - | | | | |
| | | | | | 43 | - | 3.11 | 3.78 | 4.53 | 5.36 | 6.28 | - | | | | |
| OP-MSXM046ML | 114X7064 114X7198 | W05 W09 | A1 | E | 27 | 3.50 | 4.29 | 5.19 | 6.20 | 7.31 | 8.53 | - | 2.14 | - | 12 | 41 |
| | | | | | 32 | 3.22 | 3.96 | 4.80 | 5.74 | 6.79 | 7.95 | - | | | | |
| | | | | | 38 | 2.87 | 3.55 | 4.32 | 5.18 | 6.15 | 7.22 | - | | | | |
| | | | | | 43 | - | 3.20 | 3.91 | 4.70 | 5.60 | 6.59 | - | | | | |

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*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSIM046ML | 114X7270 114X7278 | W05 W09 | A1+A2L | E | 27 | 3.50 | 4.29 | 5.19 | 6.20 | 7.31 | 8.53 | - | 2.14 | - | 12 | 41 |
| | | | | | 32 | 3.22 | 3.96 | 4.80 | 5.74 | 6.79 | 7.95 | - | | | | |
| | | | | | 38 | 2.87 | 3.55 | 4.32 | 5.18 | 6.15 | 7.22 | - | | | | |
| | | | | | 43 | - | 3.20 | 3.91 | 4.70 | 5.60 | 6.59 | - | | | | |
| OP-MSXM046ML | 114X7063 114X7197 | W05 W09 | A1 | G | 27 | 3.51 | 4.31 | 5.21 | 6.23 | 7.37 | 8.61 | - | 2.06 | - | 32 | 41 |
| | | | | | 32 | 3.24 | 3.99 | 4.84 | 5.79 | 6.86 | 8.04 | - | | | | |
| | | | | | 38 | 2.91 | 3.60 | 4.38 | 5.25 | 6.24 | 7.33 | - | | | | |
| | | | | | 43 | - | 3.27 | 3.98 | 4.79 | 5.70 | 6.72 | - | | | | |
| OP-MSIM046ML | 114X7271 114X7279 | W05 W09 | A1+A2L | G | 27 | 3.51 | 4.31 | 5.21 | 6.23 | 7.37 | 8.61 | - | 2.06 | - | 32 | 41 |
| | | | | | 32 | 3.24 | 3.99 | 4.84 | 5.79 | 6.86 | 8.04 | - | | | | |
| | | | | | 38 | 2.91 | 3.60 | 4.38 | 5.25 | 6.24 | 7.33 | - | | | | |
| | | | | | 43 | - | 3.27 | 3.98 | 4.79 | 5.70 | 6.72 | - | | | | |
| OP-MSXM057ML | 114X7066 114X7200 | W05 W09 | A1 | E | 27 | 4.21 | 5.17 | 6.24 | 7.41 | 8.70 | 10.09 | - | - | 3.36 | 12 | 42 |
| | | | | | 32 | 3.84 | 4.73 | 5.73 | 6.83 | 8.04 | 9.35 | - | | | | |
| | | | | | 38 | 3.37 | 4.19 | 5.10 | 6.11 | 7.22 | 8.42 | - | | | | |
| | | | | | 43 | - | 3.73 | 4.57 | 5.49 | 6.50 | 7.61 | - | | | | |
| OP-MSIM057ML | 114X7272 114X7280 | W05 W09 | A1+A2L | E | 27 | 4.21 | 5.17 | 6.24 | 7.41 | 8.70 | 10.09 | - | - | 3.36 | 12 | 42 |
| | | | | | 32 | 3.84 | 4.73 | 5.73 | 6.83 | 8.04 | 9.35 | - | | | | |
| | | | | | 38 | 3.37 | 4.19 | 5.10 | 6.11 | 7.22 | 8.42 | - | | | | |
| | | | | | 43 | - | 3.73 | 4.57 | 5.49 | 6.50 | 7.61 | - | | | | |
| OP-MSXM057ML | 114X7065 114X7199 | W05 W09 | A1 | G | 27 | 4.26 | 5.22 | 6.29 | 7.49 | 8.80 | 10.23 | - | - | 3.15 | 32 | 42 |
| | | | | | 32 | 3.92 | 4.80 | 5.80 | 6.92 | 8.14 | 9.48 | - | | | | |
| | | | | | 38 | 3.49 | 4.29 | 5.19 | 6.20 | 7.31 | 8.54 | - | | | | |
| | | | | | 43 | - | 3.84 | 4.65 | 5.57 | 6.59 | 7.72 | - | | | | |
| OP-MSIM057ML | 114X7273 114X7281 | W05 W09 | A1+A2L | G | 27 | 4.26 | 5.22 | 6.29 | 7.49 | 8.80 | 10.23 | - | - | 3.15 | 32 | 42 |
| | | | | | 32 | 3.92 | 4.80 | 5.80 | 6.92 | 8.14 | 9.48 | - | | | | |
| | | | | | 38 | 3.49 | 4.29 | 5.19 | 6.20 | 7.31 | 8.54 | - | | | | |
| | | | | | 43 | - | 3.84 | 4.65 | 5.57 | 6.59 | 7.72 | - | | | | |
| OP-MSXM068ML | 114X7067 114X7201 | W05 W09 | A1 | G | 27 | 5.33 | 6.54 | 7.93 | 9.49 | 11.23 | 13.17 | - | - | 3.59 | 40 | 43 |
| | | | | | 32 | 4.91 | 6.06 | 7.36 | 8.83 | 10.47 | 12.31 | - | | | | |
| | | | | | 38 | 4.40 | 5.46 | 6.65 | 8.01 | 9.53 | 11.24 | - | | | | |
| | | | | | 43 | - | 4.95 | 6.05 | 7.31 | 8.73 | 10.33 | - | | | | |
| OP-MSIM068ML | 114X7311 114X7317 | W05 W09 | A1+A2L | E | 27 | 5.36 | 6.57 | 7.95 | 9.51 | 11.25 | 13.17 | - | - | 3.87 | 16 | 43 |
| | | | | | 32 | 4.94 | 6.08 | 7.37 | 8.84 | 10.48 | 12.31 | - | | | | |
| | | | | | 38 | 4.42 | 5.46 | 6.65 | 8.00 | 9.52 | 11.22 | - | | | | |
| | | | | | 43 | - | 4.92 | 6.02 | 7.27 | 8.68 | 10.27 | - | | | | |
| OP-MSXM068ML | 114X7068 114X7202 | W05 W09 | A1 | E | 27 | 5.36 | 6.57 | 7.95 | 9.51 | 11.25 | 13.17 | - | - | 3.78 | 16 | 43 |
| | | | | | 32 | 4.94 | 6.08 | 7.37 | 8.84 | 10.48 | 12.31 | - | | | | |
| | | | | | 38 | 4.42 | 5.46 | 6.65 | 8.00 | 9.52 | 11.22 | - | | | | |
| | | | | | 43 | - | 4.92 | 6.02 | 7.27 | 8.68 | 10.27 | - | | | | |
| OP-MSIM068ML | 114X7312 114X7318 | W05 W09 | A1+A2L | G | 27 | 5.33 | 6.54 | 7.93 | 9.49 | 11.23 | 13.17 | - | - | 3.67 | 40 | 43 |
| | | | | | 32 | 4.91 | 6.06 | 7.36 | 8.83 | 10.47 | 12.31 | - | | | | |
| | | | | | 38 | 4.40 | 5.46 | 6.65 | 8.01 | 9.53 | 11.24 | - | | | | |
| | | | | | 43 | - | 4.95 | 6.05 | 7.31 | 8.73 | 10.33 | - | | | | |
| OP-MSXM080ML | 114X7069 114X7203 | W05 W09 | A1 | G | 27 | 6.13 | 7.50 | 9.04 | 10.76 | 12.66 | 14.73 | - | - | 3.32 | 45 | 44 |
| | | | | | 32 | 5.69 | 6.97 | 8.42 | 10.03 | 11.81 | 13.76 | - | | | | |
| | | | | | 38 | 5.14 | 6.32 | 7.64 | 9.11 | 10.75 | 12.55 | - | | | | |
| | | | | | 43 | - | 5.75 | 6.97 | 8.33 | 9.83 | 11.50 | - | | | | |

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSIM080ML | 114X7313 114X7319 | W05 W09 | A1+A2L | E | 27 | 6.22 | 7.59 | 9.15 | 10.89 | 12.81 | 14.91 | - | - | 3.82 | 20 | 44 |
| | | | | | 32 | 5.72 | 7.01 | 8.47 | 10.10 | 11.91 | 13.89 | - | | | | |
| | | | | | 38 | 5.11 | 6.29 | 7.62 | 9.12 | 10.79 | 12.63 | - | | | | |
| | | | | | 43 | - | 5.67 | 6.90 | 8.28 | 9.83 | 11.54 | - | | | | |
| OP-MSXM080ML | 114X7070 114X7204 | W05 W09 | A1 | E | 27 | 6.22 | 7.59 | 9.15 | 10.89 | 12.81 | 14.91 | - | - | 3.70 | 20 | 44 |
| | | | | | 32 | 5.72 | 7.01 | 8.47 | 10.10 | 11.91 | 13.89 | - | | | | |
| | | | | | 38 | 5.11 | 6.29 | 7.62 | 9.12 | 10.79 | 12.63 | - | | | | |
| | | | | | 43 | - | 5.67 | 6.90 | 8.28 | 9.83 | 11.54 | - | | | | |
| OP-MSIM080ML | 114X7314 114X7320 | W05 W09 | A1+A2L | G | 27 | 6.13 | 7.50 | 9.04 | 10.76 | 12.66 | 14.73 | - | - | 3.38 | 45 | 44 |
| | | | | | 32 | 5.69 | 6.97 | 8.42 | 10.03 | 11.81 | 13.76 | - | | | | |
| | | | | | 38 | 5.14 | 6.32 | 7.64 | 9.11 | 10.75 | 12.55 | - | | | | |
| | | | | | 43 | - | 5.75 | 6.97 | 8.33 | 9.83 | 11.50 | - | | | | |
| OP-MSXM099ML | 114X7071 114X7205 | W05 W09 | A1 | E | 27 | 7.56 | 9.29 | 11.23 | 13.39 | 15.75 | 18.33 | - | - | 3.71 | 20 | 44 |
| | | | | | 32 | 6.96 | 8.58 | 10.39 | 12.39 | 14.61 | 17.03 | - | | | | |
| | | | | | 38 | 6.22 | 7.69 | 9.33 | 11.16 | 13.18 | 15.41 | - | | | | |
| | | | | | 43 | - | 6.92 | 8.42 | 10.09 | 11.95 | 14.00 | - | | | | |
| OP-MSIM099ML | 114X7315 114X7321 | W05 W09 | A1+A2L | E | 27 | 7.56 | 9.29 | 11.23 | 13.39 | 15.75 | 18.33 | - | - | 3.77 | 20 | 44 |
| | | | | | 32 | 6.96 | 8.58 | 10.39 | 12.39 | 14.61 | 17.03 | - | | | | |
| | | | | | 38 | 6.22 | 7.69 | 9.33 | 11.16 | 13.18 | 15.41 | - | | | | |
| | | | | | 43 | - | 6.92 | 8.42 | 10.09 | 11.95 | 14.00 | - | | | | |
| OP-MSXM108ML | 114X7072 114X7206 | W05 W09 | A1 | E | 27 | 8.09 | 9.90 | 11.93 | 14.18 | 16.67 | 19.40 | - | - | 3.55 | 20 | 46 |
| | | | | | 32 | 7.43 | 9.11 | 11.01 | 13.12 | 15.45 | 18.02 | - | | | | |
| | | | | | 38 | 6.62 | 8.14 | 9.86 | 11.79 | 13.93 | 16.29 | - | | | | |
| | | | | | 43 | - | 7.32 | 8.88 | 10.64 | 12.61 | 14.79 | - | | | | |
| OP-MSIM108ML | 114X7316 114X7322 | W05 W09 | A1+A2L | E | 27 | 8.09 | 9.90 | 11.93 | 14.18 | 16.67 | 19.40 | - | - | 3.60 | 20 | 46 |
| | | | | | 32 | 7.43 | 9.11 | 11.01 | 13.12 | 15.45 | 18.02 | - | | | | |
| | | | | | 38 | 6.62 | 8.14 | 9.86 | 11.79 | 13.93 | 16.29 | - | | | | |
| | | | | | 43 | - | 7.32 | 8.88 | 10.64 | 12.61 | 14.79 | - | | | | |

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM008DY | 114X7226 114X7286 | W05 W09 | A1+A2L | G | 27 | - | 0.77 | 0.96 | 1.17 | 1.38 | 1.62 | - | 2.25 | - | 8 | 32 |
| | | | | | 32 | - | 0.69 | 0.86 | 1.05 | 1.25 | 1.46 | - | | | | |
| | | | | | 38 | - | 0.58 | 0.74 | 0.90 | 1.09 | 1.28 | - | | | | |
| | | | | | 43 | - | - | 0.63 | 0.78 | 0.95 | 1.13 | - | | | | |
| OP-MSBM009DY | 114X7108 114X7133 | W05 W09 | A1 | G | 27 | - | 0.87 | 1.08 | 1.29 | 1.52 | 1.75 | - | 2.04 | - | 8 | 32 |
| | | | | | 32 | - | 0.78 | 0.97 | 1.16 | 1.37 | 1.59 | - | | | | |
| | | | | | 38 | - | 0.67 | 0.83 | 1.01 | 1.19 | 1.39 | - | | | | |
| | | | | | 43 | - | - | 0.72 | 0.88 | 1.05 | 1.23 | - | | | | |
| OP-MSTM009DY | 114X7229 114X7287 | W05 W09 | A1 + A2L | G | 27 | - | 0.87 | 1.08 | 1.29 | 1.52 | 1.75 | - | 2.04 | - | 8 | 32 |
| | | | | | 32 | - | 0.78 | 0.97 | 1.16 | 1.37 | 1.59 | - | | | | |
| | | | | | 38 | - | 0.67 | 0.83 | 1.01 | 1.19 | 1.39 | - | | | | |
| | | | | | 43 | - | - | 0.72 | 0.88 | 1.05 | 1.23 | - | | | | |
| OP-MSBM012DP | 114X7109 114X7134 | W05 W09 | A1 | G | 27 | - | 1.12 | 1.37 | 1.64 | 1.92 | 2.21 | - | 1.85 | - | 8 | 32 |
| | | | | | 32 | - | 1.00 | 1.23 | 1.47 | 1.73 | 1.99 | - | | | | |
| | | | | | 38 | - | 0.85 | 1.05 | 1.27 | 1.50 | 1.74 | - | | | | |
| | | | | | 43 | - | - | 0.91 | 1.10 | 1.31 | 1.53 | - | | | | |
| OP-MSTM012DP | 114X7230 114X7288 | W05 W09 | A1 + A2L | G | 27 | - | 1.12 | 1.37 | 1.64 | 1.92 | 2.21 | - | 1.85 | - | 8 | 32 |
| | | | | | 32 | - | 1.00 | 1.23 | 1.47 | 1.73 | 1.99 | - | | | | |
| | | | | | 38 | - | 0.85 | 1.05 | 1.27 | 1.50 | 1.74 | - | | | | |
| | | | | | 43 | - | - | 0.91 | 1.10 | 1.31 | 1.53 | - | | | | |
| OP-MSBM014DP | 114X7110 114X7135 | W05 W09 | A1 | G | 27 | - | 1.19 | 1.43 | 1.70 | 1.98 | 2.28 | - | 1.78 | - | 8 | 33 |
| | | | | | 32 | - | 1.08 | 1.30 | 1.55 | 1.81 | 2.10 | - | | | | |
| | | | | | 38 | - | 0.95 | 1.15 | 1.37 | 1.62 | 1.88 | - | | | | |
| | | | | | 43 | - | - | 1.02 | 1.23 | 1.45 | 1.70 | - | | | | |
| OP-MSTM014DP | 114X7231 114X7289 | W05 W09 | A1 + A2L | G | 27 | - | 1.19 | 1.43 | 1.70 | 1.98 | 2.28 | - | 1.78 | - | 8 | 33 |
| | | | | | 32 | - | 1.08 | 1.30 | 1.55 | 1.81 | 2.10 | - | | | | |
| | | | | | 38 | - | 0.95 | 1.15 | 1.37 | 1.62 | 1.88 | - | | | | |
| | | | | | 43 | - | - | 1.02 | 1.23 | 1.45 | 1.70 | - | | | | |
| OP-MSTM018DX | 114X7232 114X7290 | W05 W09 | A1 + A2L | G | 27 | - | 1.25 | 1.49 | 1.75 | 2.03 | 2.32 | - | 1.65 | - | 10 | 39 |
| | | | | | 32 | - | 1.14 | 1.36 | 1.61 | 1.87 | 2.14 | - | | | | |
| | | | | | 38 | - | 1.01 | 1.21 | 1.43 | 1.67 | 1.93 | - | | | | |
| | | | | | 43 | - | - | 1.08 | 1.28 | 1.51 | 1.75 | - | | | | |
| OP-MSTM021DX* | 114X7325 114X7327 | W05 W09 | A1 + A2L | G | 27 | 1.159 | 1.403 | 1.666 | 1.946 | 2.241 | 2.550 | - | 1.61 | - | 10 | 39 |
| | | | | | 32 | 1.057 | 1.280 | 1.522 | 1.781 | 2.057 | 2.347 | - | | | | |
| | | | | | 38 | 0.937 | 1.133 | 1.349 | 1.584 | 1.836 | 2.104 | - | | | | |
| | | | | | 43 | 0.839 | 1.012 | 1.207 | 1.421 | 1.653 | 1.902 | - | | | | |
| OP-MSTM022DS | 114X7233 114X7299 | W05 W09 | A1 + A2L | G | 27 | - | 1.81 | 2.21 | 2.66 | 3.15 | 3.70 | - | 1.91 | - | 10 | 41 |
| | | | | | 32 | - | 1.64 | 2.01 | 2.42 | 2.87 | 3.37 | - | | | | |
| | | | | | 38 | - | 1.43 | 1.76 | 2.13 | 2.53 | 2.98 | - | | | | |
| | | | | | 43 | - | - | 1.56 | 1.89 | 2.25 | 2.65 | - | | | | |
| OP-MSTM026DS | 114X7234 114X7300 | W05 W09 | A1 + A2L | G | 27 | - | 2.21 | 2.71 | 3.23 | 3.77 | 4.33 | - | 2.01 | - | 16 | 39 |
| | | | | | 32 | - | 1.95 | 2.40 | 2.88 | 3.38 | 3.90 | - | | | | |
| | | | | | 38 | - | 1.64 | 2.04 | 2.46 | 2.91 | 3.39 | - | | | | |
| | | | | | 43 | - | - | 1.74 | 2.12 | 2.53 | 2.96 | - | | | | |
| OP-MSTM026DS | 114X7235 114X7301 | W05 W09 | A1 + A2L | E | 27 | - | 2.22 | 2.72 | 3.24 | 3.79 | 4.36 | - | 2.06 | - | 6 | 39 |
| | | | | | 32 | - | 1.96 | 2.41 | 2.89 | 3.40 | 3.92 | - | | | | |
| | | | | | 38 | - | 1.65 | 2.05 | 2.48 | 2.93 | 3.41 | - | | | | |
| | | | | | 43 | - | - | 1.75 | 2.13 | 2.54 | 2.98 | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM034DS | 114X7237 114X7302 | W05 W09 | A1 + A2L | G | 27 | - | 2.25 | 2.91 | 3.67 | 4.50 | 5.43 | - | 1.79 | - | 20 | 40 |
| | | | | | 32 | - | 2.02 | 2.64 | 3.34 | 4.13 | 5.00 | - | | | | |
| | | | | | 38 | - | 1.73 | 2.30 | 2.95 | 3.68 | 4.49 | - | | | | |
| | | | | | 43 | - | - | 2.01 | 2.61 | 3.29 | 4.05 | - | | | | |
| OP-MSTM034DS | 114X7236 114X7303 | W05 W09 | A1 + A2L | E | 27 | - | 2.29 | 2.97 | 3.73 | 4.58 | 5.52 | - | 1.84 | - | 8 | 40 |
| | | | | | 32 | - | 2.05 | 2.69 | 3.40 | 4.20 | 5.09 | - | | | | |
| | | | | | 38 | - | 1.76 | 2.34 | 3.00 | 3.74 | 4.56 | - | | | | |
| | | | | | 43 | - | - | 2.05 | 2.66 | 3.35 | 4.12 | - | | | | |
| OP-MSXM034ML | 114X7062 114X7196 | W05 W09 | A1 | E | 27 | 2.59 | 3.20 | 3.89 | 4.67 | 5.55 | 6.52 | - | 2.22 | - | 8 | 40 |
| | | | | | 32 | 2.39 | 2.96 | 3.61 | 4.35 | 5.18 | 6.10 | - | | | | |
| | | | | | 38 | 2.14 | 2.66 | 3.26 | 3.95 | 4.72 | 5.58 | - | | | | |
| | | | | | 43 | - | 2.41 | 2.96 | 3.60 | 4.32 | 5.12 | - | | | | |
| OP-MSIM034ML | 114X7266 114X7274 | W05 W09 | A1+A2L | E | 27 | 2.59 | 3.20 | 3.89 | 4.67 | 5.55 | 6.52 | - | 2.22 | - | 8 | 40 |
| | | | | | 32 | 2.39 | 2.96 | 3.61 | 4.35 | 5.18 | 6.10 | - | | | | |
| | | | | | 38 | 2.14 | 2.66 | 3.26 | 3.95 | 4.72 | 5.58 | - | | | | |
| | | | | | 43 | - | 2.41 | 2.96 | 3.60 | 4.32 | 5.12 | - | | | | |
| OP-MSXM034ML | 114X7061 114X7195 | W05 W09 | A1 | G | 27 | 2.58 | 3.19 | 3.89 | 4.68 | 5.56 | 6.53 | - | 2.28 | - | 20 | 40 |
| | | | | | 32 | 2.39 | 2.97 | 3.62 | 4.36 | 5.20 | 6.12 | - | | | | |
| | | | | | 38 | 2.17 | 2.69 | 3.29 | 3.98 | 4.75 | 5.61 | - | | | | |
| | | | | | 43 | - | 2.46 | 3.01 | 3.65 | 4.36 | 5.17 | - | | | | |
| OP-MSIM034ML | 114X7267 114X7275 | W05 W09 | A1+A2L | G | 27 | 2.58 | 3.19 | 3.89 | 4.68 | 5.56 | 6.53 | - | 2.28 | - | 20 | 40 |
| | | | | | 32 | 2.39 | 2.97 | 3.62 | 4.36 | 5.20 | 6.12 | - | | | | |
| | | | | | 38 | 2.17 | 2.69 | 3.29 | 3.98 | 4.75 | 5.61 | - | | | | |
| | | | | | 43 | - | 2.46 | 3.01 | 3.65 | 4.36 | 5.17 | - | | | | |
| OP-MSTM038DS* | 114X7326 114X7328 | W05 W09 | A1+A2L | G | 27 | 1.851 | 2.479 | 3.197 | 4.003 | 4.904 | 5.886 | - | 1.78 | - | 20 | 39 |
| | | | | | 32 | 1.630 | 2.218 | 2.890 | 3.647 | 4.495 | 5.421 | - | | | | |
| | | | | | 38 | 1.357 | 1.896 | 2.514 | 3.210 | 3.994 | 4.853 | - | | | | |
| | | | | | 43 | 1.127 | 1.624 | 2.195 | 2.841 | 3.571 | 4.374 | - | | | | |
| OP-MSXM044ML | 114X7161 114X7211 | W05 W09 | A1 | G | 27 | 3.17 | 3.92 | 4.77 | 5.72 | 6.78 | 7.95 | - | 1.98 | - | 25 | 41 |
| | | | | | 32 | 2.94 | 3.65 | 4.45 | 5.35 | 6.35 | 7.46 | - | | | | |
| | | | | | 38 | 2.67 | 3.31 | 4.05 | 4.88 | 5.81 | 6.84 | - | | | | |
| | | | | | 43 | - | 3.03 | 3.71 | 4.48 | 5.35 | 6.31 | - | | | | |
| OP-MSIM044ML | 114X7269 114X7277 | W05 W09 | A1+A2L | G | 27 | 3.17 | 3.92 | 4.77 | 5.72 | 6.78 | 7.95 | - | 1.98 | - | 25 | 41 |
| | | | | | 32 | 2.94 | 3.65 | 4.45 | 5.35 | 6.35 | 7.46 | - | | | | |
| | | | | | 38 | 2.67 | 3.31 | 4.05 | 4.88 | 5.81 | 6.84 | - | | | | |
| | | | | | 43 | - | 3.03 | 3.71 | 4.48 | 5.35 | 6.31 | - | | | | |
| OP-MSXM044ML | 114X7162 114X7212 | W05 W09 | A1 | E | 27 | 3.26 | 4.01 | 4.85 | 5.79 | 6.83 | 7.98 | - | 2.10 | - | 12 | 41 |
| | | | | | 32 | 3.02 | 3.72 | 4.50 | 5.38 | 6.36 | 7.44 | - | | | | |
| | | | | | 38 | 2.73 | 3.37 | 4.09 | 4.89 | 5.78 | 6.78 | - | | | | |
| | | | | | 43 | - | 3.08 | 3.74 | 4.48 | 5.30 | 6.22 | - | | | | |
| OP-MSIM044ML | 114X7268 114X7276 | W05 W09 | A1+A2L | E | 27 | 3.26 | 4.01 | 4.85 | 5.79 | 6.83 | 7.98 | - | 2.10 | - | 12 | 41 |
| | | | | | 32 | 3.02 | 3.72 | 4.50 | 5.38 | 6.36 | 7.44 | - | | | | |
| | | | | | 38 | 2.73 | 3.37 | 4.09 | 4.89 | 5.78 | 6.78 | - | | | | |
| | | | | | 43 | - | 3.08 | 3.74 | 4.48 | 5.30 | 6.22 | - | | | | |
| OP-MSXM046ML | 114X7064 114X7198 | W05 W09 | A1 | E | 27 | 3.45 | 4.23 | 5.13 | 6.13 | 7.24 | 8.46 | - | 2.12 | - | 12 | 41 |
| | | | | | 32 | 3.17 | 3.91 | 4.74 | 5.68 | 6.73 | 7.88 | - | | | | |
| | | | | | 38 | 2.83 | 3.50 | 4.27 | 5.13 | 6.09 | 7.15 | - | | | | |
| | | | | | 43 | - | 3.16 | 3.86 | 4.65 | 5.54 | 6.52 | - | | | | |

*Preliminary data

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

## Catalogue Optyma™ Slim Pack - Performance data R449A MBP

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSIM046ML | 114X7270 114X7278 | W05 W09 | A1+A2L | E | 27 | 3.45 | 4.23 | 5.13 | 6.13 | 7.24 | 8.46 | - | 2.12 | - | 12 | 41 |
| | | | | | 32 | 3.17 | 3.91 | 4.74 | 5.68 | 6.73 | 7.88 | - | | | | |
| | | | | | 38 | 2.83 | 3.50 | 4.27 | 5.13 | 6.09 | 7.15 | - | | | | |
| | | | | | 43 | - | 3.16 | 3.86 | 4.65 | 5.54 | 6.52 | - | | | | |
| OP-MSXM046ML | 114X7063 114X7197 | W05 W09 | A1 | G | 27 | 3.46 | 4.25 | 5.15 | 6.17 | 7.30 | 8.54 | - | 2.04 | - | 32 | 41 |
| | | | | | 32 | 3.19 | 3.94 | 4.78 | 5.73 | 6.79 | 7.97 | - | | | | |
| | | | | | 38 | 2.87 | 3.55 | 4.32 | 5.19 | 6.17 | 7.26 | - | | | | |
| | | | | | 43 | - | 3.22 | 3.93 | 4.74 | 5.64 | 6.66 | - | | | | |
| OP-MSIM046ML | 114X7271 114X7279 | W05 W09 | A1+A2L | G | 27 | 3.46 | 4.25 | 5.15 | 6.17 | 7.30 | 8.54 | - | 2.04 | - | 32 | 41 |
| | | | | | 32 | 3.19 | 3.94 | 4.78 | 5.73 | 6.79 | 7.97 | - | | | | |
| | | | | | 38 | 2.87 | 3.55 | 4.32 | 5.19 | 6.17 | 7.26 | - | | | | |
| | | | | | 43 | - | 3.22 | 3.93 | 4.74 | 5.64 | 6.66 | - | | | | |
| OP-MSXM057ML | 114X7066 114X7200 | W05 W09 | A1 | E | 27 | 4.15 | 5.10 | 6.16 | 7.33 | 8.62 | 10.00 | - | - | 3.33 | 12 | 42 |
| | | | | | 32 | 3.78 | 4.67 | 5.66 | 6.76 | 7.96 | 9.26 | - | | | | |
| | | | | | 38 | 3.32 | 4.13 | 5.04 | 6.04 | 7.14 | 8.33 | - | | | | |
| | | | | | 43 | - | 3.67 | 4.50 | 5.42 | 6.43 | 7.53 | - | | | | |
| OP-MSIM057ML | 114X7272 114X7280 | W05 W09 | A1+A2L | E | 27 | 4.15 | 5.10 | 6.16 | 7.33 | 8.62 | 10.00 | - | - | 3.33 | 12 | 42 |
| | | | | | 32 | 3.78 | 4.67 | 5.66 | 6.76 | 7.96 | 9.26 | - | | | | |
| | | | | | 38 | 3.32 | 4.13 | 5.04 | 6.04 | 7.14 | 8.33 | - | | | | |
| | | | | | 43 | - | 3.67 | 4.50 | 5.42 | 6.43 | 7.53 | - | | | | |
| OP-MSXM057ML | 114X7065 114X7199 | W05 W09 | A1 | G | 27 | 4.20 | 5.15 | 6.22 | 7.41 | 8.72 | 10.14 | - | - | 3.12 | 32 | 42 |
| | | | | | 32 | 3.86 | 4.74 | 5.73 | 6.84 | 8.06 | 9.40 | - | | | | |
| | | | | | 38 | 3.44 | 4.23 | 5.12 | 6.12 | 7.24 | 8.46 | - | | | | |
| | | | | | 43 | - | 3.79 | 4.59 | 5.50 | 6.52 | 7.64 | - | | | | |
| OP-MSIM057ML | 114X7273 114X7281 | W05 W09 | A1+A2L | G | 27 | 4.20 | 5.15 | 6.22 | 7.41 | 8.72 | 10.14 | - | - | 3.12 | 32 | 42 |
| | | | | | 32 | 3.86 | 4.74 | 5.73 | 6.84 | 8.06 | 9.40 | - | | | | |
| | | | | | 38 | 3.44 | 4.23 | 5.12 | 6.12 | 7.24 | 8.46 | - | | | | |
| | | | | | 43 | - | 3.79 | 4.59 | 5.50 | 6.52 | 7.64 | - | | | | |
| OP-MSXM068ML | 114X7067 114X7201 | W05 W09 | A1 | G | 27 | 5.25 | 6.46 | 7.83 | 9.39 | 11.12 | 13.05 | - | - | 3.56 | 40 | 43 |
| | | | | | 32 | 4.84 | 5.98 | 7.27 | 8.73 | 10.37 | 12.20 | - | | | | |
| | | | | | 38 | 4.34 | 5.38 | 6.57 | 7.92 | 9.44 | 11.14 | - | | | | |
| | | | | | 43 | - | 4.88 | 5.97 | 7.22 | 8.63 | 10.23 | - | | | | |
| OP-MSIM068ML | 114X7312 114X7318 | W05 W09 | A1+A2L | G | 27 | 5.25 | 6.46 | 7.83 | 9.39 | 11.12 | 13.05 | - | - | 3.64 | 40 | 43 |
| | | | | | 32 | 4.84 | 5.98 | 7.27 | 8.73 | 10.37 | 12.20 | - | | | | |
| | | | | | 38 | 4.34 | 5.38 | 6.57 | 7.92 | 9.44 | 11.14 | - | | | | |
| | | | | | 43 | - | 4.88 | 5.97 | 7.22 | 8.63 | 10.23 | - | | | | |
| OP-MSXM068ML | 114X7068 114X7202 | W05 W09 | A1 | E | 27 | 5.29 | 6.49 | 7.86 | 9.41 | 11.14 | 13.06 | - | - | 3.75 | 16 | 43 |
| | | | | | 32 | 4.87 | 6.00 | 7.29 | 8.74 | 10.38 | 12.20 | - | | | | |
| | | | | | 38 | 4.35 | 5.38 | 6.57 | 7.91 | 9.42 | 11.11 | - | | | | |
| | | | | | 43 | - | 4.85 | 5.94 | 7.18 | 8.59 | 10.17 | - | | | | |
| OP-MSIM068ML | 114X7311 114X7317 | W05 W09 | A1+A2L | E | 27 | 5.29 | 6.49 | 7.86 | 9.41 | 11.14 | 13.06 | - | - | 3.84 | 16 | 43 |
| | | | | | 32 | 4.87 | 6.00 | 7.29 | 8.74 | 10.38 | 12.20 | - | | | | |
| | | | | | 38 | 4.35 | 5.38 | 6.57 | 7.91 | 9.42 | 11.11 | - | | | | |
| | | | | | 43 | - | 4.85 | 5.94 | 7.18 | 8.59 | 10.17 | - | | | | |
| OP-MSXM080ML | 114X7069 114X7203 | W05 W09 | A1 | G | 27 | 6.04 | 7.40 | 8.94 | 10.65 | 12.54 | 14.61 | - | - | 3.30 | 45 | 44 |
| | | | | | 32 | 5.61 | 6.88 | 8.32 | 9.92 | 11.69 | 13.64 | - | | | | |
| | | | | | 38 | 5.07 | 6.23 | 7.55 | 9.01 | 10.64 | 12.43 | - | | | | |
| | | | | | 43 | - | 5.68 | 6.88 | 8.23 | 9.73 | 11.40 | - | | | | |

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSIM080ML | 114X7314 114X7320 | W05 W09 | A1+A2L | G | 27 | 6.04 | 7.40 | 8.94 | 10.65 | 12.54 | 14.61 | - | - | 3.35 | 45 | 44 |
| | | | | | 32 | 5.61 | 6.88 | 8.32 | 9.92 | 11.69 | 13.64 | - | | | | |
| | | | | | 38 | 5.07 | 6.23 | 7.55 | 9.01 | 10.64 | 12.43 | - | | | | |
| | | | | | 43 | - | 5.68 | 6.88 | 8.23 | 9.73 | 11.40 | - | | | | |
| OP-MSXM080ML | 114X7070 114X7204 | W05 W09 | A1 | E | 27 | 6.13 | 7.50 | 9.04 | 10.77 | 12.69 | 14.78 | - | - | 3.67 | 20 | 44 |
| | | | | | 32 | 5.64 | 6.92 | 8.37 | 9.99 | 11.79 | 13.77 | - | | | | |
| | | | | | 38 | 5.04 | 6.20 | 7.53 | 9.02 | 10.68 | 12.51 | - | | | | |
| | | | | | 43 | - | 5.59 | 6.81 | 8.18 | 9.73 | 11.43 | - | | | | |
| OP-MSIM080ML | 114X7313 114X7319 | W05 W09 | A1+A2L | E | 27 | 6.13 | 7.50 | 9.04 | 10.77 | 12.69 | 14.78 | - | - | 3.79 | 20 | 44 |
| | | | | | 32 | 5.64 | 6.92 | 8.37 | 9.99 | 11.79 | 13.77 | - | | | | |
| | | | | | 38 | 5.04 | 6.20 | 7.53 | 9.02 | 10.68 | 12.51 | - | | | | |
| | | | | | 43 | - | 5.59 | 6.81 | 8.18 | 9.73 | 11.43 | - | | | | |
| OP-MSXM099ML | 114X7071 114X7205 | W05 W09 | A1 | E | 27 | 7.46 | 9.18 | 11.11 | 13.26 | 15.62 | 18.19 | - | - | 3.68 | 20 | 44 |
| | | | | | 32 | 6.87 | 8.47 | 10.27 | 12.28 | 14.48 | 16.90 | - | | | | |
| | | | | | 38 | 6.13 | 7.59 | 9.23 | 11.05 | 13.07 | 15.28 | - | | | | |
| | | | | | 43 | - | 6.83 | 8.33 | 9.99 | 11.85 | 13.89 | - | | | | |
| OP-MSIM099ML | 114X7315 114X7321 | W05 W09 | A1+A2L | E | 27 | 7.46 | 9.18 | 11.11 | 13.26 | 15.62 | 18.19 | - | - | 3.74 | 20 | 44 |
| | | | | | 32 | 6.87 | 8.47 | 10.27 | 12.28 | 14.48 | 16.90 | - | | | | |
| | | | | | 38 | 6.13 | 7.59 | 9.23 | 11.05 | 13.07 | 15.28 | - | | | | |
| | | | | | 43 | - | 6.83 | 8.33 | 9.99 | 11.85 | 13.89 | - | | | | |
| OP-MSXM108ML | 114X7072 114X7206 | W05 W09 | A1 | E | 27 | 7.98 | 9.77 | 11.79 | 14.03 | 16.51 | 19.23 | - | - | 3.52 | 20 | 46 |
| | | | | | 32 | 7.32 | 8.99 | 10.88 | 12.98 | 15.30 | 17.86 | - | | | | |
| | | | | | 38 | 6.52 | 8.03 | 9.75 | 11.66 | 13.79 | 16.14 | - | | | | |
| | | | | | 43 | - | 7.21 | 8.77 | 10.53 | 12.49 | 14.65 | - | | | | |
| OP-MSIM108ML | 114X7316 114X7322 | W05 W09 | A1+A2L | E | 27 | 7.98 | 9.77 | 11.79 | 14.03 | 16.51 | 19.23 | - | - | 3.57 | 20 | 46 |
| | | | | | 32 | 7.32 | 8.99 | 10.88 | 12.98 | 15.30 | 17.86 | - | | | | |
| | | | | | 38 | 6.52 | 8.03 | 9.75 | 11.66 | 13.79 | 16.14 | - | | | | |
| | | | | | 43 | - | 7.21 | 8.77 | 10.53 | 12.49 | 14.65 | - | | | | |

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

## Catalogue — Optyma™ Slim Pack - Performance data R452A MBP

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM008DY | 114X7226 114X7286 | W05 W09 | A1 + A2L | G | 27 | 0.58 | 0.74 | 0.92 | 1.10 | 1.30 | 1.51 | - | 2.26 | - | 6 | 31 |
| | | | | | 32 | 0.52 | 0.66 | 0.82 | 0.99 | 1.17 | 1.37 | - | | | | |
| | | | | | 38 | 0.44 | 0.57 | 0.71 | 0.86 | 1.02 | 1.20 | - | | | | |
| | | | | | 43 | 0.38 | 0.49 | 0.61 | 0.75 | 0.90 | 1.06 | - | | | | |
| OP-MSTM009DY | 114X7229 114X7287 | W05 W09 | A1 + A2L | G | 27 | 0.64 | 0.83 | 1.03 | 1.25 | 1.48 | 1.72 | - | 2.01 | - | 8 | 32 |
| | | | | | 32 | 0.57 | 0.74 | 0.92 | 1.12 | 1.33 | 1.56 | - | | | | |
| | | | | | 38 | 0.49 | 0.63 | 0.79 | 0.97 | 1.16 | 1.36 | - | | | | |
| | | | | | 43 | 0.43 | 0.55 | 0.69 | 0.84 | 1.02 | 1.20 | - | | | | |
| OP-MSBM009DY | 114X7108 114X7133 | W05 W09 | A1 | G | 27 | 0.64 | 0.83 | 1.03 | 1.25 | 1.48 | 1.72 | | 2.01 | - | 10 | 32 |
| | | | | | 32 | 0.57 | 0.74 | 0.92 | 1.12 | 1.33 | 1.56 | | | | | |
| | | | | | 38 | 0.49 | 0.63 | 0.79 | 0.97 | 1.16 | 1.36 | | | | | |
| | | | | | 43 | 0.43 | 0.55 | 0.69 | 0.84 | 1.02 | 1.20 | | | | | |
| OP-MSBM012DP | 114X7109 114X7134 | W05 W09 | A1 | G | 27 | 0.91 | 1.15 | 1.40 | 1.66 | 1.93 | 2.21 | | 1.98 | - | 10 | 32 |
| | | | | | 32 | 0.81 | 1.02 | 1.25 | 1.49 | 1.74 | 2.00 | | | | | |
| | | | | | 38 | 0.69 | 0.88 | 1.08 | 1.29 | 1.51 | 1.74 | | | | | |
| | | | | | 43 | 0.60 | 0.76 | 0.93 | 1.12 | 1.32 | 1.53 | | | | | |
| OP-MSTM012DP | 114X7230 114X7288 | W05 W09 | A1 + A2L | G | 27 | 0.91 | 1.15 | 1.40 | 1.66 | 1.93 | 2.21 | - | 1.98 | - | 8 | 32 |
| | | | | | 32 | 0.81 | 1.02 | 1.25 | 1.49 | 1.74 | 2.00 | - | | | | |
| | | | | | 38 | 0.69 | 0.88 | 1.08 | 1.29 | 1.51 | 1.74 | - | | | | |
| | | | | | 43 | 0.60 | 0.76 | 0.93 | 1.12 | 1.32 | 1.53 | - | | | | |
| OP-MSBM014DP | 114X7110 114X7135 | W05 W09 | A1 | G | 27 | - | 1.17 | 1.43 | 1.70 | 2.00 | 2.32 | | 1.88 | - | 10 | 33 |
| | | | | | 32 | - | 1.06 | 1.30 | 1.55 | 1.83 | 2.13 | - | | | | |
| | | | | | 38 | - | 0.93 | 1.14 | 1.37 | 1.63 | 1.91 | | | | | |
| | | | | | 43 | - | - | 1.01 | 1.22 | 1.46 | 1.72 | | | | | |
| OP-MSTM014DP | 114X7231 114X7289 | W05 W09 | A1 + A2L | G | 27 | 0.94 | 1.17 | 1.43 | 1.70 | 2.00 | 2.32 | - | 1.88 | - | 8 | 33 |
| | | | | | 32 | 0.85 | 1.06 | 1.30 | 1.55 | 1.83 | 2.13 | - | | | | |
| | | | | | 38 | 0.74 | 0.93 | 1.14 | 1.37 | 1.63 | 1.91 | - | | | | |
| | | | | | 43 | 0.65 | 0.82 | 1.01 | 1.22 | 1.46 | 1.72 | - | | | | |
| OP-MSTM018DX | 114X7232 114X7290 | W05 W09 | A1 + A2L | G | 27 | 1.01 | 1.27 | 1.55 | 1.85 | 2.15 | 2.47 | - | 1.71 | - | 10 | 39 |
| | | | | | 32 | 0.90 | 1.13 | 1.39 | 1.65 | 1.94 | 2.24 | - | | | | |
| | | | | | 38 | 0.76 | 0.97 | 1.19 | 1.43 | 1.68 | 1.95 | - | | | | |
| | | | | | 43 | 0.65 | 0.83 | 1.02 | 1.24 | 1.47 | 1.72 | - | | | | |
| OP-MSTM021DX* | 114X7325 114X7327 | W05 W09 | A1 + A2L | G | 27 | 1.16 | 1.46 | 1.78 | 2.10 | 2.44 | 2.80 | - | 1.66 | - | 10 | 39 |
| | | | | | 32 | 1.03 | 1.30 | 1.59 | 1.89 | 2.20 | 2.53 | - | | | | |
| | | | | | 38 | 0.88 | 1.11 | 1.36 | 1.63 | 1.91 | 2.21 | - | | | | |
| | | | | | 43 | 0.75 | 0.95 | 1.17 | 1.41 | 1.67 | 1.94 | - | | | | |
| OP-MSTM022DS | 114X7233 114X7299 | W05 W09 | A1 + A2L | G | 27 | - | 1.84 | 2.26 | 2.73 | 3.25 | 3.82 | - | 1.99 | - | 10 | 41 |
| | | | | | 32 | - | 1.66 | 2.04 | 2.47 | 2.95 | 3.48 | - | | | | |
| | | | | | 38 | - | 1.44 | 1.78 | 2.17 | 2.60 | 3.07 | - | | | | |
| | | | | | 43 | - | - | 1.57 | 1.92 | 2.30 | 2.73 | - | | | | |
| OP-MSTM026DS | 114X7234 114X7300 | W05 W09 | A1 + A2L | G | 27 | 1.72 | 2.17 | 2.65 | 3.14 | 3.65 | 4.17 | - | 1.89 | - | 16 | 39 |
| | | | | | 32 | 1.51 | 1.92 | 2.34 | 2.79 | 3.26 | 3.75 | - | | | | |
| | | | | | 38 | 1.26 | 1.61 | 1.99 | 2.38 | 2.80 | 3.24 | - | | | | |
| | | | | | 43 | 1.05 | 1.36 | 1.69 | 2.04 | 2.42 | 2.82 | - | | | | |
| OP-MSTM026DS | 114X7235 114X7301 | W05 W09 | A1 + A2L | E | 27 | 1.74 | 2.19 | 2.67 | 3.17 | 3.68 | 4.21 | - | 1.94 | - | 6 | 39 |
| | | | | | 32 | 1.52 | 1.93 | 2.37 | 2.82 | 3.29 | 3.78 | - | | | | |
| | | | | | 38 | 1.27 | 1.63 | 2.01 | 2.41 | 2.83 | 3.27 | - | | | | |
| | | | | | 43 | 1.06 | 1.37 | 1.71 | 2.07 | 2.45 | 2.85 | - | | | | |

**This table continues on the next page**

*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L


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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM034DS | 114X7237 114X7302 | W05 W09 | A1 + A2L | G | 27 | 1.69 | 2.29 | 2.98 | 3.77 | 4.65 | 5.62 | - | 1.88 | - | 20 | 40 |
| | | | | | 32 | 1.48 | 2.04 | 2.69 | 3.43 | 4.25 | 5.17 | - | | | | |
| | | | | | 38 | 1.22 | 1.73 | 2.33 | 3.01 | 3.77 | 4.62 | - | | | | |
| | | | | | 43 | 1.00 | 1.47 | 2.02 | 2.65 | 3.36 | 4.15 | - | | | | |
| OP-MSTM034DS | 114X7236 114X7303 | W05 W09 | A1 + A2L | E | 27 | 1.72 | 2.33 | 3.04 | 3.84 | 4.73 | 5.71 | - | 1.93 | - | 8 | 40 |
| | | | | | 32 | 1.50 | 2.08 | 2.74 | 3.49 | 4.32 | 5.25 | - | | | | |
| | | | | | 38 | 1.24 | 1.76 | 2.37 | 3.06 | 3.83 | 4.69 | - | | | | |
| | | | | | 43 | 1.02 | 1.50 | 2.06 | 2.69 | 3.41 | 4.22 | - | | | | |
| OP-MSXM034ML | 114X7062 114X7196 | W05 W09 | A1 | E | 27 | 2.57 | 3.15 | 3.81 | 4.55 | 5.37 | 6.29 | - | 2.11 | - | 8 | 40 |
| | | | | | 32 | 2.37 | 2.90 | 3.51 | 4.20 | 4.97 | 5.82 | - | | | | |
| | | | | | 38 | 2.13 | 2.60 | 3.15 | 3.77 | 4.46 | 5.24 | - | | | | |
| | | | | | 43 | 1.92 | 2.35 | 2.84 | 3.40 | - | - | - | | | | |
| OP-MSIM034ML | 114X7266 114X7274 | W05 W09 | A1+A2L | E | 27 | 2.57 | 3.15 | 3.81 | 4.55 | 5.37 | 6.29 | - | 2.11 | - | 8 | 40 |
| | | | | | 32 | 2.37 | 2.90 | 3.51 | 4.20 | 4.97 | 5.82 | - | | | | |
| | | | | | 38 | 2.13 | 2.60 | 3.15 | 3.77 | 4.46 | 5.24 | - | | | | |
| | | | | | 43 | 1.92 | 2.35 | 2.84 | 3.40 | - | - | - | | | | |
| OP-MSXM034ML | 114X7061 114X7195 | W05 W09 | A1 | G | 27 | 2.59 | 3.17 | 3.83 | 4.58 | 5.41 | 6.32 | - | 2.11 | - | 20 | 40 |
| | | | | | 32 | 2.39 | 2.92 | 3.54 | 4.23 | 5.00 | 5.86 | - | | | | |
| | | | | | 38 | 2.14 | 2.62 | 3.17 | 3.79 | 4.50 | 5.28 | - | | | | |
| | | | | | 43 | 1.92 | 2.36 | 2.85 | 3.42 | - | - | - | | | | |
| OP-MSIM034ML | 114X7267 114X7275 | W05 W09 | A1+A2L | G | 27 | 2.59 | 3.17 | 3.83 | 4.58 | 5.41 | 6.32 | - | 2.11 | - | 20 | 40 |
| | | | | | 32 | 2.39 | 2.92 | 3.54 | 4.23 | 5.00 | 5.86 | - | | | | |
| | | | | | 38 | 2.14 | 2.62 | 3.17 | 3.79 | 4.50 | 5.28 | - | | | | |
| | | | | | 43 | 1.92 | 2.36 | 2.85 | 3.42 | - | - | - | | | | |
| OP-MSTM038DS* | 114X7326 114X7328 | W05 W09 | A1+A2L | G | 27 | 1.83 | 2.47 | 3.21 | 4.06 | 4.99 | 6.02 | - | 1.84 | - | 20 | 39 |
| | | | | | 32 | 1.60 | 2.20 | 2.89 | 3.68 | 4.56 | 5.53 | - | | | | |
| | | | | | 38 | 1.31 | 1.86 | 2.50 | 3.22 | 4.03 | 4.93 | - | | | | |
| | | | | | 43 | 1.08 | 1.58 | 2.16 | 2.84 | 3.59 | 4.43 | - | | | | |
| OP-MSXM044ML | 114X7162 114X7212 | W05 W09 | A1 | E | 27 | 3.28 | 4.02 | 4.85 | 5.78 | 6.80 | 7.93 | - | 2.12 | - | 12 | 41 |
| | | | | | 32 | 3.02 | 3.70 | 4.47 | 5.33 | 6.28 | 7.34 | - | | | | |
| | | | | | 38 | 2.69 | 3.30 | 3.99 | 4.77 | 5.64 | 6.60 | - | | | | |
| | | | | | 43 | 2.42 | 2.97 | 3.59 | 4.30 | - | - | - | | | | |
| OP-MSIM044ML | 114X7268 114X7276 | W05 W09 | A1+A2L | E | 27 | 3.28 | 4.02 | 4.85 | 5.78 | 6.80 | 7.93 | - | 2.12 | - | 12 | 41 |
| | | | | | 32 | 3.02 | 3.70 | 4.47 | 5.33 | 6.28 | 7.34 | - | | | | |
| | | | | | 38 | 2.69 | 3.30 | 3.99 | 4.77 | 5.64 | 6.60 | - | | | | |
| | | | | | 43 | 2.42 | 2.97 | 3.59 | 4.30 | - | - | - | | | | |
| OP-MSXM044ML | 114X7161 114X7211 | W05 W09 | A1 | G | 27 | 3.28 | 4.02 | 4.87 | 5.81 | 6.86 | 8.00 | - | 2.04 | - | 25 | 41 |
| | | | | | 32 | 3.02 | 3.71 | 4.50 | 5.38 | 6.35 | 7.42 | - | | | | |
| | | | | | 38 | 2.69 | 3.32 | 4.03 | 4.83 | 5.72 | 6.70 | - | | | | |
| | | | | | 43 | 2.41 | 2.99 | 3.63 | 4.36 | - | - | - | | | | |
| OP-MSIM044ML | 114X7269 114X7277 | W05 W09 | A1+A2L | G | 27 | 3.28 | 4.02 | 4.87 | 5.81 | 6.86 | 8.00 | - | 2.04 | - | 25 | 41 |
| | | | | | 32 | 3.02 | 3.71 | 4.50 | 5.38 | 6.35 | 7.42 | - | | | | |
| | | | | | 38 | 2.69 | 3.32 | 4.03 | 4.83 | 5.72 | 6.70 | - | | | | |
| | | | | | 43 | 2.41 | 2.99 | 3.63 | 4.36 | - | - | - | | | | |
| OP-MSXM046ML | 114X7064 114X7198 | W05 W09 | A1 | E | 27 | 3.46 | 4.24 | 5.12 | 6.12 | 7.22 | 8.42 | - | 2.12 | - | 12 | 41 |
| | | | | | 32 | 3.17 | 3.89 | 4.71 | 5.63 | 6.66 | 7.78 | - | | | | |
| | | | | | 38 | 2.81 | 3.46 | 4.20 | 5.04 | 5.97 | 6.99 | - | | | | |
| | | | | | 43 | 2.51 | 3.10 | 3.76 | 4.52 | - | - | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

## Catalogue — Optyma™ Slim Pack - Performance data R452A MBP

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSIM046ML | 114X7270 114X7278 | W05 W09 | A1+A2L | E | 27 | 3.46 | 4.24 | 5.12 | 6.12 | 7.22 | 8.42 | - | 2.12 | - | 12 | 41 |
| | | | | | 32 | 3.17 | 3.89 | 4.71 | 5.63 | 6.66 | 7.78 | - | | | | |
| | | | | | 38 | 2.81 | 3.46 | 4.20 | 5.04 | 5.97 | 6.99 | - | | | | |
| | | | | | 43 | 2.51 | 3.10 | 3.76 | 4.52 | - | - | - | | | | |
| OP-MSXM046ML | 114X7063 114X7197 | W05 W09 | A1 | G | 27 | 3.48 | 4.26 | 5.14 | 6.12 | 7.20 | 8.38 | - | 2.04 | - | 32 | 41 |
| | | | | | 32 | 3.21 | 3.93 | 4.73 | 5.64 | 6.64 | 7.74 | - | | | | |
| | | | | | 38 | 2.87 | 3.51 | 4.23 | 5.04 | 5.95 | 6.94 | - | | | | |
| | | | | | 43 | 2.58 | 3.15 | 3.80 | 4.53 | - | - | - | | | | |
| OP-MSIM046ML | 114X7271 114X7279 | W05 W09 | A1+A2L | G | 27 | 3.48 | 4.26 | 5.14 | 6.12 | 7.20 | 8.38 | - | 2.04 | - | 32 | 41 |
| | | | | | 32 | 3.21 | 3.93 | 4.73 | 5.64 | 6.64 | 7.74 | - | | | | |
| | | | | | 38 | 2.87 | 3.51 | 4.23 | 5.04 | 5.95 | 6.94 | - | | | | |
| | | | | | 43 | 2.58 | 3.15 | 3.80 | 4.53 | - | - | - | | | | |
| OP-MSXM057ML | 114X7065 114X7199 | W05 W09 | A1 | G | 27 | 4.32 | 5.28 | 6.36 | 7.57 | 8.89 | 10.33 | - | - | 3.31 | 32 | 42 |
| | | | | | 32 | 3.97 | 4.86 | 5.85 | 6.96 | 8.19 | 9.53 | - | | | | |
| | | | | | 38 | 3.54 | 4.33 | 5.22 | 6.21 | 7.31 | 8.52 | - | | | | |
| | | | | | 43 | 3.18 | 3.88 | 4.67 | 5.56 | - | - | - | | | | |
| OP-MSIM057ML | 114X7273 114X7281 | W05 W09 | A1+A2L | G | 27 | 4.32 | 5.28 | 6.36 | 7.57 | 8.89 | 10.33 | - | - | 3.31 | 32 | 42 |
| | | | | | 32 | 3.97 | 4.86 | 5.85 | 6.96 | 8.19 | 9.53 | - | | | | |
| | | | | | 38 | 3.54 | 4.33 | 5.22 | 6.21 | 7.31 | 8.52 | - | | | | |
| | | | | | 43 | 3.18 | 3.88 | 4.67 | 5.56 | - | - | - | | | | |
| OP-MSXM057ML | 114X7066 114X7200 | W05 W09 | A1 | E | 27 | 4.28 | 5.23 | 6.30 | 7.49 | 8.81 | 10.24 | - | - | 3.51 | 12 | 42 |
| | | | | | 32 | 3.91 | 4.78 | 5.77 | 6.87 | 8.09 | 9.43 | - | | | | |
| | | | | | 38 | 3.45 | 4.23 | 5.11 | 6.09 | 7.19 | 8.40 | - | | | | |
| | | | | | 43 | 3.05 | 3.75 | 4.53 | 5.42 | - | - | - | | | | |
| OP-MSIM057ML | 114X7272 114X7280 | W05 W09 | A1+A2L | E | 27 | 4.28 | 5.23 | 6.30 | 7.49 | 8.81 | 10.24 | - | - | 3.51 | 12 | 42 |
| | | | | | 32 | 3.91 | 4.78 | 5.77 | 6.87 | 8.09 | 9.43 | - | | | | |
| | | | | | 38 | 3.45 | 4.23 | 5.11 | 6.09 | 7.19 | 8.40 | - | | | | |
| | | | | | 43 | 3.05 | 3.75 | 4.53 | 5.42 | - | - | - | | | | |
| OP-MSXM068ML | 114X7067 114X7201 | W05 W09 | A1 | G | 27 | 5.23 | 6.38 | 7.69 | 9.17 | 10.80 | 12.61 | - | - | 3.40 | 40 | 43 |
| | | | | | 32 | 4.82 | 5.88 | 7.09 | 8.45 | 9.97 | 11.65 | - | | | | |
| | | | | | 38 | 4.31 | 5.26 | 6.34 | 7.56 | 8.94 | 10.47 | - | | | | |
| | | | | | 43 | 3.88 | 4.73 | 5.70 | 6.80 | - | - | - | | | | |
| OP-MSIM068ML | 114X7312 114X7318 | W05 W09 | A1+A2L | G | 27 | 5.23 | 6.38 | 7.69 | 9.17 | 10.80 | 12.61 | - | - | 3.47 | 40 | 43 |
| | | | | | 32 | 4.82 | 5.88 | 7.09 | 8.45 | 9.97 | 11.65 | - | | | | |
| | | | | | 38 | 4.31 | 5.26 | 6.34 | 7.56 | 8.94 | 10.47 | - | | | | |
| | | | | | 43 | 3.88 | 4.73 | 5.70 | 6.80 | - | - | - | | | | |
| OP-MSXM068ML | 114X7068 114X7202 | W05 W09 | A1 | E | 27 | 5.21 | 6.37 | 7.70 | 9.20 | 10.87 | 12.70 | - | - | 3.59 | 16 | 43 |
| | | | | | 32 | 4.80 | 5.87 | 7.09 | 8.48 | 10.03 | 11.74 | - | | | | |
| | | | | | 38 | 4.29 | 5.24 | 6.34 | 7.59 | 9.00 | 10.56 | - | | | | |
| | | | | | 43 | 3.86 | 4.71 | 5.70 | 6.83 | - | - | - | | | | |
| OP-MSIM068ML | 114X7311 114X7317 | W05 W09 | A1+A2L | E | 27 | 5.21 | 6.37 | 7.70 | 9.20 | 10.87 | 12.70 | - | - | 3.67 | 16 | 43 |
| | | | | | 32 | 4.80 | 5.87 | 7.09 | 8.48 | 10.03 | 11.74 | - | | | | |
| | | | | | 38 | 4.29 | 5.24 | 6.34 | 7.59 | 9.00 | 10.56 | - | | | | |
| | | | | | 43 | 3.86 | 4.71 | 5.70 | 6.83 | - | - | - | | | | |
| OP-MSXM080ML | 114X7070 114X7204 | W05 W09 | A1 | E | 27 | 6.07 | 7.41 | 8.93 | 10.63 | 12.51 | 14.57 | - | - | 3.58 | 20 | 44 |
| | | | | | 32 | 5.54 | 6.79 | 8.20 | 9.78 | 11.53 | 13.46 | - | | | | |
| | | | | | 38 | 4.89 | 6.01 | 7.28 | 8.72 | 10.31 | 12.07 | - | | | | |
| | | | | | 43 | 4.33 | 5.34 | 6.49 | 7.80 | - | - | - | | | | |

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L


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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] | | | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | COP | SEPR | | |
| OP-MSIM080ML | 114X7313<br>114X7319 | W05<br>W09 | A1+A2L | E | 27 | 5.96 | 7.26 | 8.73 | 10.36 | 12.15 | 14.11 | - | - | 3.51 | 20 | 44 |
| | | | | | 32 | 5.43 | 6.63 | 7.99 | 9.51 | 11.18 | 13.00 | - | | | | |
| | | | | | 38 | 4.78 | 5.86 | 7.08 | 8.44 | 9.96 | 11.62 | - | | | | |
| | | | | | 43 | 4.22 | 5.19 | 6.29 | 7.52 | - | - | - | | | | |
| OP-MSXM080ML | 114X7069<br>114X7203 | W05<br>W09 | A1 | G | 27 | 6.06 | 7.42 | 8.96 | 10.69 | 12.59 | 14.68 | - | - | 3.32 | 45 | 44 |
| | | | | | 32 | 5.55 | 6.81 | 8.23 | 9.84 | 11.61 | 13.57 | - | | | | |
| | | | | | 38 | 4.92 | 6.05 | 7.33 | 8.78 | 10.39 | 12.17 | - | | | | |
| | | | | | 43 | 4.39 | 5.40 | 6.55 | 7.86 | - | - | - | | | | |
| OP-MSIM080ML | 114X7314<br>114X7320 | W05<br>W09 | A1+A2L | G | 27 | 6.06 | 7.42 | 8.96 | 10.69 | 12.59 | 14.68 | - | - | 3.38 | 45 | 44 |
| | | | | | 32 | 5.55 | 6.81 | 8.23 | 9.84 | 11.61 | 13.57 | - | | | | |
| | | | | | 38 | 4.92 | 6.05 | 7.33 | 8.78 | 10.39 | 12.17 | - | | | | |
| | | | | | 43 | 4.39 | 5.40 | 6.55 | 7.86 | - | - | - | | | | |
| OP-MSXM099ML | 114X7071<br>114X7205 | W05<br>W09 | A1 | E | 27 | 7.51 | 9.15 | 11.00 | 13.07 | 15.34 | 17.81 | - | - | 3.49 | 20 | 44 |
| | | | | | 32 | 6.88 | 8.39 | 10.09 | 12.00 | 14.10 | 16.39 | - | | | | |
| | | | | | 38 | 6.10 | 7.43 | 8.95 | 10.65 | 12.54 | 14.61 | - | | | | |
| | | | | | 43 | 5.43 | 6.61 | 7.96 | 9.48 | - | - | - | | | | |
| OP-MSIM099ML | 114X7315<br>114X7321 | W05<br>W09 | A1+A2L | E | 27 | 7.51 | 9.15 | 11.00 | 13.07 | 15.34 | 17.81 | - | - | 3.54 | 20 | 44 |
| | | | | | 32 | 6.88 | 8.39 | 10.09 | 12.00 | 14.10 | 16.39 | - | | | | |
| | | | | | 38 | 6.10 | 7.43 | 8.95 | 10.65 | 12.54 | 14.61 | - | | | | |
| | | | | | 43 | 5.43 | 6.61 | 7.96 | 9.48 | - | - | - | | | | |
| OP-MSXM108ML | 114X7072<br>114X7206 | W05<br>W09 | A1 | E | 27 | 8.11 | 9.90 | 11.92 | 14.16 | 16.63 | 19.31 | - | - | 3.55 | 20 | 46 |
| | | | | | 32 | 7.38 | 9.02 | 10.88 | 12.96 | 15.25 | 17.75 | - | | | | |
| | | | | | 38 | 6.48 | 7.94 | 9.60 | 11.46 | 13.52 | 15.79 | - | | | | |
| | | | | | 43 | 5.71 | 7.01 | 8.49 | 10.16 | - | - | - | | | | |
| OP-MSIM108ML | 114X7316<br>114X7322 | W05<br>W09 | A1+A2L | E | 27 | 8.11 | 9.90 | 11.92 | 14.16 | 16.63 | 19.31 | - | - | 3.60 | 20 | 46 |
| | | | | | 32 | 7.38 | 9.02 | 10.88 | 12.96 | 15.25 | 17.75 | - | | | | |
| | | | | | 38 | 6.48 | 7.94 | 9.60 | 11.46 | 13.52 | 15.79 | - | | | | |
| | | | | | 43 | 5.71 | 7.01 | 8.49 | 10.16 | - | - | - | | | | |

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM008DY | 114X7226 114X7286 | W05 W09 | A1 + A2L | G | 27 | 0.59 | 0.75 | 0.93 | 1.12 | 1.32 | 1.54 | - | 2.06 | - | 6 | 31 |
| | | | | | 32 | 0.53 | 0.68 | 0.84 | 1.01 | 1.21 | 1.41 | - | | | | |
| | | | | | 38 | 0.46 | 0.59 | 0.73 | 0.89 | 1.07 | 1.26 | - | | | | |
| | | | | | 43 | 0.40 | 0.52 | 0.65 | 0.79 | 0.96 | 1.14 | - | | | | |
| OP-MSBM009DY | 114X7108 114X7133 | W05 W09 | A1 | G | 27 | 0.66 | 0.83 | 1.01 | 1.22 | 1.43 | 1.67 | - | 2.01 | - | 8 | 32 |
| | | | | | 32 | 0.59 | 0.75 | 0.92 | 1.11 | 1.31 | 1.53 | - | | | | |
| | | | | | 38 | 0.52 | 0.66 | 0.81 | 0.98 | 1.16 | 1.37 | - | | | | |
| | | | | | 43 | 0.46 | 0.58 | 0.72 | 0.87 | 1.04 | 1.23 | - | | | | |
| OP-MSTM009DY | 114X7229 114X7287 | W05 W09 | A1 + A2L | G | 27 | 0.66 | 0.83 | 1.01 | 1.22 | 1.43 | 1.67 | - | 2.01 | - | 8 | 32 |
| | | | | | 32 | 0.59 | 0.75 | 0.92 | 1.11 | 1.31 | 1.53 | - | | | | |
| | | | | | 38 | 0.52 | 0.66 | 0.81 | 0.98 | 1.16 | 1.37 | - | | | | |
| | | | | | 43 | 0.46 | 0.58 | 0.72 | 0.87 | 1.04 | 1.23 | - | | | | |
| OP-MSTM012DP | 114X7230 114X7288 | W05 W09 | A1 + A2L | G | 27 | 0.89 | 1.11 | 1.35 | 1.60 | 1.87 | 2.15 | - | 1.83 | - | 8 | 32 |
| | | | | | 32 | 0.80 | 1.00 | 1.22 | 1.46 | 1.71 | 1.97 | - | | | | |
| | | | | | 38 | 0.70 | 0.88 | 1.07 | 1.29 | 1.51 | 1.76 | - | | | | |
| | | | | | 43 | 0.62 | 0.77 | 0.95 | 1.14 | 1.35 | 1.58 | - | | | | |
| OP-MSBM012DP | 114X7109 114X7134 | W05 W09 | A1 | G | 27 | 0.89 | 1.11 | 1.35 | 1.60 | 1.87 | 2.15 | - | 1.83 | - | 8 | 32 |
| | | | | | 32 | 0.80 | 1.00 | 1.22 | 1.46 | 1.71 | 1.97 | - | | | | |
| | | | | | 38 | 0.70 | 0.88 | 1.07 | 1.29 | 1.51 | 1.76 | - | | | | |
| | | | | | 43 | 0.62 | 0.77 | 0.95 | 1.14 | 1.35 | 1.58 | - | | | | |
| OP-MSTM014DP | 114X7231 114X7289 | W05 W09 | A1 + A2L | G | 27 | 0.92 | 1.15 | 1.40 | 1.68 | 1.98 | 2.29 | - | 1.73 | - | 8 | 33 |
| | | | | | 32 | 0.84 | 1.05 | 1.28 | 1.54 | 1.82 | 2.12 | - | | | | |
| | | | | | 38 | 0.74 | 0.93 | 1.14 | 1.37 | 1.63 | 1.91 | - | | | | |
| | | | | | 43 | 0.66 | 0.83 | 1.02 | 1.24 | 1.48 | 1.74 | - | | | | |
| OP-MSBM014DP | 114X7110 114X7135 | W05 W09 | A1 | G | 27 | 0.92 | 1.15 | 1.40 | 1.68 | 1.98 | 2.29 | - | 1.73 | - | 8 | 33 |
| | | | | | 32 | 0.84 | 1.05 | 1.28 | 1.54 | 1.82 | 2.12 | - | | | | |
| | | | | | 38 | 0.74 | 0.93 | 1.14 | 1.37 | 1.63 | 1.91 | - | | | | |
| | | | | | 43 | 0.66 | 0.83 | 1.02 | 1.24 | 1.48 | 1.74 | - | | | | |
| OP-MSTM018DX | 114X7232 114X7290 | W05 W09 | A1 + A2L | G | 27 | 0.96 | 1.21 | 1.47 | 1.76 | 2.07 | 2.40 | - | 1.64 | - | 10 | 39 |
| | | | | | 32 | 0.88 | 1.10 | 1.35 | 1.61 | 1.90 | 2.22 | - | | | | |
| | | | | | 38 | 0.78 | 0.97 | 1.19 | 1.44 | 1.71 | 2.00 | - | | | | |
| | | | | | 43 | 0.70 | 0.87 | 1.07 | 1.29 | 1.54 | 1.82 | - | | | | |
| OP-MSTM021DX* | 114X7325 114X7327 | W05 W09 | A1 + A2L | G | 27 | 1.12 | 1.40 | 1.70 | 2.02 | 2.37 | 2.73 | - | 1.64 | - | 10 | 39 |
| | | | | | 32 | 1.02 | 1.27 | 1.55 | 1.85 | 2.18 | 2.52 | - | | | | |
| | | | | | 38 | 0.90 | 1.13 | 1.37 | 1.65 | 1.94 | 2.27 | - | | | | |
| | | | | | 43 | 0.81 | 1.00 | 1.23 | 1.48 | 1.75 | 2.05 | - | | | | |
| OP-MSTM022DS | 114X7233 114X7299 | W05 W09 | A1 + A2L | G | 27 | 1.44 | 1.81 | 2.23 | 2.71 | 3.24 | 3.83 | - | 1.87 | - | 10 | 41 |
| | | | | | 32 | 1.29 | 1.63 | 2.02 | 2.46 | 2.95 | 3.49 | - | | | | |
| | | | | | 38 | 1.10 | 1.41 | 1.76 | 2.16 | 2.60 | 3.09 | - | | | | |
| | | | | | 43 | 0.95 | 1.24 | 1.56 | 1.91 | 2.31 | 2.75 | - | | | | |
| OP-MSTM026DS | 114X7234 114X7300 | W05 W09 | A1 + A2L | G | 27 | 1.73 | 2.18 | 2.67 | 3.18 | 3.74 | 4.32 | - | 1.75 | - | 16 | 39 |
| | | | | | 32 | 1.53 | 1.94 | 2.39 | 2.87 | 3.39 | 3.94 | - | | | | |
| | | | | | 38 | 1.29 | 1.66 | 2.06 | 2.50 | 2.97 | 3.48 | - | | | | |
| | | | | | 43 | 1.10 | 1.42 | 1.78 | 2.18 | 2.62 | 3.10 | - | | | | |
| OP-MSTM026DS | 114X7235 114X7301 | W05 W09 | A1 + A2L | E | 27 | 1.75 | 2.20 | 2.69 | 3.22 | 3.77 | 4.36 | - | 1.80 | - | 6 | 39 |
| | | | | | 32 | 1.54 | 1.96 | 2.41 | 2.90 | 3.42 | 3.97 | - | | | | |
| | | | | | 38 | 1.31 | 1.67 | 2.08 | 2.52 | 3.00 | 3.51 | - | | | | |
| | | | | | 43 | 1.11 | 1.44 | 1.80 | 2.21 | 2.65 | 3.13 | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM034DS | 114X7237 114X7302 | W05 W09 | A1 + A2L | G | 27 | 1.68 | 2.31 | 3.04 | 3.87 | 4.81 | 5.84 | - | 1.71 | - | 20 | 40 |
| | | | | | 32 | 1.47 | 2.06 | 2.74 | 3.52 | 4.40 | 5.38 | - | | | | |
| | | | | | 38 | 1.21 | 1.74 | 2.37 | 3.08 | 3.90 | 4.81 | - | | | | |
| | | | | | 43 | 0.98 | 1.48 | 2.05 | 2.71 | 3.47 | 4.32 | - | | | | |
| OP-MSTM034DS | 114X7236 114X7303 | W05 W09 | A1 + A2L | E | 27 | 1.72 | 2.35 | 3.09 | 3.94 | 4.89 | 5.94 | - | 1.76 | - | 8 | 39 |
| | | | | | 32 | 1.50 | 2.09 | 2.79 | 3.58 | 4.47 | 5.47 | - | | | | |
| | | | | | 38 | 1.23 | 1.77 | 2.41 | 3.14 | 3.96 | 4.89 | - | | | | |
| | | | | | 43 | 1.00 | 1.50 | 2.09 | 2.76 | 3.53 | 4.40 | - | | | | |
| OP-MSXM034ML | 114X7062 114X7196 | W05 W09 | A1 | E | 27 | 2.52 | 3.10 | 3.76 | 4.49 | 5.30 | 6.19 | - | 2.13 | - | 8 | 40 |
| | | | | | 32 | 2.27 | 2.81 | 3.42 | 4.10 | 4.85 | 5.67 | - | | | | |
| | | | | | 38 | 1.94 | 2.44 | 2.99 | 3.60 | 4.28 | 5.02 | - | | | | |
| | | | | | 43 | 1.65 | 2.11 | 2.62 | 3.17 | 3.79 | 4.47 | - | | | | |
| OP-MSIM034ML | 114X7266 114X7274 | W05 W09 | A1+A2L | E | 27 | 2.52 | 3.10 | 3.76 | 4.49 | 5.30 | 6.19 | - | 2.13 | - | 8 | 40 |
| | | | | | 32 | 2.27 | 2.81 | 3.42 | 4.10 | 4.85 | 5.67 | - | | | | |
| | | | | | 38 | 1.94 | 2.44 | 2.99 | 3.60 | 4.28 | 5.02 | - | | | | |
| | | | | | 43 | 1.65 | 2.11 | 2.62 | 3.17 | 3.79 | 4.47 | - | | | | |
| OP-MSXM034ML | 114X7061 114X7195 | W05 W09 | A1 | G | 27 | 2.61 | 3.17 | 3.81 | 4.52 | 5.32 | 6.20 | - | 2.09 | - | 20 | 40 |
| | | | | | 32 | 2.39 | 2.91 | 3.50 | 4.17 | 4.91 | 5.73 | - | | | | |
| | | | | | 38 | 2.11 | 2.58 | 3.12 | 3.72 | 4.40 | 5.16 | - | | | | |
| | | | | | 43 | 1.88 | 2.31 | 2.79 | 3.35 | 3.98 | 4.68 | - | | | | |
| OP-MSIM034ML | 114X7267 114X7275 | W05 W09 | A1+A2L | G | 27 | 2.61 | 3.17 | 3.81 | 4.52 | 5.32 | 6.20 | - | 2.09 | - | 20 | 40 |
| | | | | | 32 | 2.39 | 2.91 | 3.50 | 4.17 | 4.91 | 5.73 | - | | | | |
| | | | | | 38 | 2.11 | 2.58 | 3.12 | 3.72 | 4.40 | 5.16 | - | | | | |
| | | | | | 43 | 1.88 | 2.31 | 2.79 | 3.35 | 3.98 | 4.68 | - | | | | |
| OP-MSTM038DS* | 114X7326 114X7328 | W05 W09 | A1 + A2L | G | 27 | 1.81 | 2.49 | 3.27 | 4.17 | 5.18 | 6.30 | - | 1.67 | - | 20 | 39 |
| | | | | | 32 | 1.58 | 2.21 | 2.94 | 3.78 | 4.73 | 5.79 | - | | | | |
| | | | | | 38 | 1.29 | 1.86 | 2.53 | 3.30 | 4.18 | 5.17 | - | | | | |
| | | | | | 43 | 1.04 | 1.57 | 2.19 | 2.90 | 3.72 | 4.64 | - | | | | |
| OP-MSXM044ML | 114X7162 114X7212 | W05 W09 | A1 | E | 27 | 3.26 | 3.95 | 4.72 | 5.59 | 6.54 | 7.60 | - | 2.08 | - | 12 | 41 |
| | | | | | 32 | 2.98 | 3.62 | 4.33 | 5.13 | 6.01 | 7.00 | - | | | | |
| | | | | | 38 | 2.62 | 3.20 | 3.84 | 4.55 | 5.35 | 6.25 | - | | | | |
| | | | | | 43 | 2.30 | 2.82 | 3.40 | 4.05 | 4.78 | 5.60 | - | | | | |
| OP-MSIM044ML | 114X7268 114X7276 | W05 W09 | A1+A2L | E | 27 | 3.26 | 3.95 | 4.72 | 5.59 | 6.54 | 7.60 | - | 2.08 | - | 12 | 41 |
| | | | | | 32 | 2.98 | 3.62 | 4.33 | 5.13 | 6.01 | 7.00 | - | | | | |
| | | | | | 38 | 2.62 | 3.20 | 3.84 | 4.55 | 5.35 | 6.25 | - | | | | |
| | | | | | 43 | 2.30 | 2.82 | 3.40 | 4.05 | 4.78 | 5.60 | - | | | | |
| OP-MSXM044ML | 114X7161 114X7211 | W05 W09 | A1 | G | 27 | 3.30 | 4.01 | 4.80 | 5.68 | 6.65 | 7.71 | - | 2.05 | - | 25 | 41 |
| | | | | | 32 | 3.02 | 3.66 | 4.39 | 5.21 | 6.11 | 7.10 | - | | | | |
| | | | | | 38 | 2.65 | 3.23 | 3.89 | 4.62 | 5.43 | 6.33 | - | | | | |
| | | | | | 43 | 2.33 | 2.85 | 3.44 | 4.10 | 4.84 | 5.67 | - | | | | |
| OP-MSIM044ML | 114X7269 114X7277 | W05 W09 | A1+A2L | G | 27 | 3.30 | 4.01 | 4.80 | 5.68 | 6.65 | 7.71 | - | 2.05 | - | 25 | 41 |
| | | | | | 32 | 3.02 | 3.66 | 4.39 | 5.21 | 6.11 | 7.10 | - | | | | |
| | | | | | 38 | 2.65 | 3.23 | 3.89 | 4.62 | 5.43 | 6.33 | - | | | | |
| | | | | | 43 | 2.33 | 2.85 | 3.44 | 4.10 | 4.84 | 5.67 | - | | | | |
| OP-MSXM046ML | 114X7064 114X7198 | W05 W09 | A1 | E | 27 | 3.43 | 4.15 | 4.96 | 5.86 | 6.85 | 7.94 | - | 2.04 | - | 12 | 41 |
| | | | | | 32 | 3.13 | 3.80 | 4.54 | 5.37 | 6.29 | 7.30 | - | | | | |
| | | | | | 38 | 2.75 | 3.34 | 4.01 | 4.75 | 5.58 | 6.51 | - | | | | |
| | | | | | 43 | 2.41 | 2.95 | 3.55 | 4.22 | 4.97 | 5.82 | - | | | | |

*Preliminary data

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSIM046ML | 114X7270 114X7278 | W05 W09 | A1+A2L | E | 27 | 3.43 | 4.15 | 4.96 | 5.86 | 6.85 | 7.94 | - | 2.04 | - | 12 | 41 |
| | | | | | 32 | 3.13 | 3.80 | 4.54 | 5.37 | 6.29 | 7.30 | - | | | | |
| | | | | | 38 | 2.75 | 3.34 | 4.01 | 4.75 | 5.58 | 6.51 | - | | | | |
| | | | | | 43 | 2.41 | 2.95 | 3.55 | 4.22 | 4.97 | 5.82 | - | | | | |
| OP-MSXM046ML | 114X7063 114X7197 | W05 W09 | A1 | G | 27 | 3.47 | 4.21 | 5.03 | 5.95 | 6.96 | 8.05 | - | 2.00 | - | 32 | 41 |
| | | | | | 32 | 3.17 | 3.84 | 4.60 | 5.45 | 6.38 | 7.40 | - | | | | |
| | | | | | 38 | 2.78 | 3.38 | 4.06 | 4.82 | 5.66 | 6.59 | - | | | | |
| | | | | | 43 | 2.44 | 2.98 | 3.59 | 4.28 | 5.04 | 5.89 | - | | | | |
| OP-MSIM046ML | 114X7271 114X7279 | W05 W09 | A1+A2L | G | 27 | 3.47 | 4.21 | 5.03 | 5.95 | 6.96 | 8.05 | - | 2.00 | - | 32 | 41 |
| | | | | | 32 | 3.17 | 3.84 | 4.60 | 5.45 | 6.38 | 7.40 | - | | | | |
| | | | | | 38 | 2.78 | 3.38 | 4.06 | 4.82 | 5.66 | 6.59 | - | | | | |
| | | | | | 43 | 2.44 | 2.98 | 3.59 | 4.28 | 5.04 | 5.89 | - | | | | |
| OP-MSXM057ML | 114X7066 114X7200 | W05 W09 | A1 | E | 27 | 4.02 | 4.86 | 5.81 | 6.86 | 8.01 | 9.25 | - | - | 3.05 | 12 | 42 |
| | | | | | 32 | 3.66 | 4.43 | 5.30 | 6.26 | 7.32 | 8.47 | - | | | | |
| | | | | | 38 | 3.23 | 3.90 | 4.67 | 5.52 | 6.46 | 7.49 | - | | | | |
| | | | | | 43 | 2.85 | 3.45 | 4.12 | 4.87 | 5.72 | 6.67 | - | | | | |
| OP-MSIM057ML | 114X7272 114X7280 | W05 W09 | A1+A2L | E | 27 | 4.02 | 4.86 | 5.81 | 6.86 | 8.01 | 9.25 | - | - | 3.05 | 12 | 42 |
| | | | | | 32 | 3.66 | 4.43 | 5.30 | 6.26 | 7.32 | 8.47 | - | | | | |
| | | | | | 38 | 3.23 | 3.90 | 4.67 | 5.52 | 6.46 | 7.49 | - | | | | |
| | | | | | 43 | 2.85 | 3.45 | 4.12 | 4.87 | 5.72 | 6.67 | - | | | | |
| OP-MSXM057ML | 114X7065 114X7199 | W05 W09 | A1 | G | 27 | 4.02 | 4.87 | 5.81 | 6.87 | 8.02 | 9.26 | - | - | 2.95 | 32 | 42 |
| | | | | | 32 | 3.67 | 4.44 | 5.31 | 6.27 | 7.33 | 8.48 | - | | | | |
| | | | | | 38 | 3.23 | 3.91 | 4.67 | 5.53 | 6.47 | 7.49 | - | | | | |
| | | | | | 43 | 2.85 | 3.45 | 4.12 | 4.88 | 5.71 | 6.63 | - | | | | |
| OP-MSIM057ML | 114X7273 114X7281 | W05 W09 | A1+A2L | G | 27 | 4.02 | 4.87 | 5.81 | 6.87 | 8.02 | 9.26 | - | - | 2.95 | 32 | 42 |
| | | | | | 32 | 3.67 | 4.44 | 5.31 | 6.27 | 7.33 | 8.48 | - | | | | |
| | | | | | 38 | 3.23 | 3.91 | 4.67 | 5.53 | 6.47 | 7.49 | - | | | | |
| | | | | | 43 | 2.85 | 3.45 | 4.12 | 4.88 | 5.71 | 6.63 | - | | | | |
| OP-MSXM068ML | 114X7068 114X7202 | W05 W09 | A1 | E | 27 | 5.32 | 6.50 | 7.85 | 9.38 | 11.08 | 12.95 | - | - | 3.81 | 16 | 43 |
| | | | | | 32 | 4.88 | 5.98 | 7.24 | 8.67 | 10.27 | 12.04 | - | | | | |
| | | | | | 38 | 4.33 | 5.32 | 6.47 | 7.78 | 9.25 | 10.89 | - | | | | |
| | | | | | 43 | 3.85 | 4.76 | 5.80 | 7.00 | 8.36 | 9.89 | - | | | | |
| OP-MSIM068ML | 114X7311 114X7317 | W05 W09 | A1+A2L | E | 27 | 5.32 | 6.50 | 7.85 | 9.38 | 11.08 | 12.95 | - | - | 3.89 | 16 | 43 |
| | | | | | 32 | 4.88 | 5.98 | 7.24 | 8.67 | 10.27 | 12.04 | - | | | | |
| | | | | | 38 | 4.33 | 5.32 | 6.47 | 7.78 | 9.25 | 10.89 | - | | | | |
| | | | | | 43 | 3.85 | 4.76 | 5.80 | 7.00 | 8.36 | 9.89 | - | | | | |
| OP-MSXM068ML | 114X7067 114X7201 | W05 W09 | A1 | G | 27 | 5.33 | 6.51 | 7.86 | 9.38 | 11.08 | 12.96 | - | - | 3.73 | 40 | 43 |
| | | | | | 32 | 4.88 | 5.99 | 7.25 | 8.68 | 10.28 | 12.05 | - | | | | |
| | | | | | 38 | 4.33 | 5.33 | 6.48 | 7.78 | 9.26 | 10.90 | - | | | | |
| | | | | | 43 | 3.85 | 4.76 | 5.81 | 7.00 | 8.36 | 9.89 | - | | | | |
| OP-MSIM068ML | 114X7312 114X7318 | W05 W09 | A1+A2L | G | 27 | 5.33 | 6.51 | 7.86 | 9.38 | 11.08 | 12.96 | - | - | 3.81 | 40 | 43 |
| | | | | | 32 | 4.88 | 5.99 | 7.25 | 8.68 | 10.28 | 12.05 | - | | | | |
| | | | | | 38 | 4.33 | 5.33 | 6.48 | 7.78 | 9.26 | 10.90 | - | | | | |
| | | | | | 43 | 3.85 | 4.76 | 5.81 | 7.00 | 8.36 | 9.89 | - | | | | |
| OP-MSXM080ML | 114X7069 114X7203 | W05 W09 | A1 | G | 27 | 6.11 | 7.52 | 9.10 | 10.83 | 12.70 | 14.69 | - | - | 3.38 | 45 | 44 |
| | | | | | 32 | 5.55 | 6.85 | 8.32 | 9.95 | 11.71 | 13.60 | - | | | | |
| | | | | | 38 | 4.86 | 6.03 | 7.36 | 8.84 | 10.46 | 12.21 | - | | | | |
| | | | | | 43 | 4.29 | 5.34 | 6.54 | 7.89 | 9.39 | 11.02 | - | | | | |

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSIM080ML | 114X7314 114X7320 | W05 W09 | A1+A2L | G | 27 | 6.11 | 7.52 | 9.10 | 10.83 | 12.70 | 14.69 | - | - | 3.43 | 45 | 44 |
| | | | | | 32 | 5.55 | 6.85 | 8.32 | 9.95 | 11.71 | 13.60 | - | | | | |
| | | | | | 38 | 4.86 | 6.03 | 7.36 | 8.84 | 10.46 | 12.21 | - | | | | |
| | | | | | 43 | 4.29 | 5.34 | 6.54 | 7.89 | 9.39 | 11.02 | - | | | | |
| OP-MSXM080ML | 114X7070 114X7204 | W05 W09 | A1 | E | 27 | 6.28 | 7.62 | 9.14 | 10.85 | 12.76 | 14.84 | - | - | 3.73 | 20 | 44 |
| | | | | | 32 | 5.75 | 6.99 | 8.40 | 9.99 | 11.76 | 13.72 | - | | | | |
| | | | | | 38 | 5.06 | 6.18 | 7.45 | 8.89 | 10.50 | 12.29 | - | | | | |
| | | | | | 43 | 4.46 | 5.46 | 6.62 | 7.92 | 9.38 | 11.03 | - | | | | |
| OP-MSIM080ML | 114X7313 114X7319 | W05 W09 | A1+A2L | E | 27 | 6.28 | 7.62 | 9.14 | 10.85 | 12.76 | 14.84 | - | - | 3.85 | 20 | 44 |
| | | | | | 32 | 5.75 | 6.99 | 8.40 | 9.99 | 11.76 | 13.72 | - | | | | |
| | | | | | 38 | 5.06 | 6.18 | 7.45 | 8.89 | 10.50 | 12.29 | - | | | | |
| | | | | | 43 | 4.46 | 5.46 | 6.62 | 7.92 | 9.38 | 11.03 | - | | | | |
| OP-MSXM099ML | 114X7071 114X7205 | W05 W09 | A1 | E | 27 | 7.34 | 8.88 | 10.62 | 12.54 | 14.65 | 16.95 | - | - | 3.41 | 20 | 44 |
| | | | | | 32 | 6.69 | 8.10 | 9.70 | 11.48 | 13.44 | 15.59 | - | | | | |
| | | | | | 38 | 5.86 | 7.12 | 8.55 | 10.15 | 11.93 | 13.89 | - | | | | |
| | | | | | 43 | 5.13 | 6.26 | 7.55 | 9.00 | 10.62 | 12.43 | - | | | | |
| OP-MSIM099ML | 114X7315 114X7321 | W05 W09 | A1+A2L | E | 27 | 7.34 | 8.88 | 10.62 | 12.54 | 14.65 | 16.95 | - | - | 3.46 | 20 | 44 |
| | | | | | 32 | 6.69 | 8.10 | 9.70 | 11.48 | 13.44 | 15.59 | - | | | | |
| | | | | | 38 | 5.86 | 7.12 | 8.55 | 10.15 | 11.93 | 13.89 | - | | | | |
| | | | | | 43 | 5.13 | 6.26 | 7.55 | 9.00 | 10.62 | 12.43 | - | | | | |
| OP-MSXM108ML | 114X7072 114X7206 | W05 W09 | A1 | E | 27 | 7.91 | 9.55 | 11.37 | 13.38 | 15.59 | 18.02 | - | - | 3.35 | 20 | 46 |
| | | | | | 32 | 7.19 | 8.70 | 10.37 | 12.23 | 14.27 | 16.53 | - | | | | |
| | | | | | 38 | 6.28 | 7.64 | 9.13 | 10.79 | 12.63 | 14.68 | - | | | | |
| | | | | | 43 | 5.49 | 6.70 | 8.05 | 9.54 | 11.21 | 13.09 | - | | | | |
| OP-MSIM108ML | 114X7316 114X7322 | W05 W09 | A1+A2L | E | 27 | 7.91 | 9.55 | 11.37 | 13.38 | 15.59 | 18.02 | - | - | 3.40 | 20 | 46 |
| | | | | | 32 | 7.19 | 8.70 | 10.37 | 12.23 | 14.27 | 16.53 | - | | | | |
| | | | | | 38 | 6.28 | 7.64 | 9.13 | 10.79 | 12.63 | 14.68 | - | | | | |
| | | | | | 43 | 5.49 | 6.70 | 8.05 | 9.54 | 11.21 | 13.09 | - | | | | |

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM008DY | 114X7226 114X7286 | W05 W09 | A1 + A2L | G | 27 | - | 0.61 | 0.77 | 0.93 | 1.10 | 1.27 | - | 1.88 | - | 10 | 32 |
| | | | | | 32 | - | 0.54 | 0.68 | 0.83 | 0.98 | 1.15 | - | | | | |
| | | | | | 38 | - | 0.45 | 0.57 | 0.71 | 0.85 | 1.00 | - | | | | |
| | | | | | 43 | - | - | 0.49 | 0.61 | 0.74 | 0.88 | - | | | | |
| OP-MSTM009DY | 114X7229 114X7287 | W05 W09 | A1 + A2L | G | 27 | - | 0.73 | 0.89 | 1.06 | 1.25 | 1.44 | - | 1.89 | - | 10 | 32 |
| | | | | | 32 | - | 0.67 | 0.82 | 0.98 | 1.16 | 1.34 | - | | | | |
| | | | | | 38 | - | 0.60 | 0.73 | 0.88 | 1.03 | 1.20 | - | | | | |
| | | | | | 43 | - | - | 0.66 | 0.78 | 0.92 | 1.07 | - | | | | |
| OP-MSTM012DP | 114X7230 114X7288 | W05 W09 | A1 + A2L | G | 27 | - | 1.14 | 1.38 | 1.63 | 1.90 | 2.18 | - | 1.88 | - | 10 | 32 |
| | | | | | 32 | - | 1.02 | 1.24 | 1.48 | 1.72 | 1.99 | - | | | | |
| | | | | | 38 | - | 0.89 | 1.08 | 1.29 | 1.52 | 1.76 | - | | | | |
| | | | | | 43 | - | - | 0.95 | 1.14 | 1.35 | 1.57 | - | | | | |
| OP-MSTM014DP | 114X7231 114X7289 | W05 W09 | A1 + A2L | G | 27 | - | 1.20 | 1.45 | 1.72 | 2.00 | 2.30 | - | 1.80 | - | 10 | 33 |
| | | | | | 32 | - | 1.08 | 1.31 | 1.56 | 1.83 | 2.11 | - | | | | |
| | | | | | 38 | - | 0.94 | 1.15 | 1.37 | 1.62 | 1.88 | - | | | | |
| | | | | | 43 | - | - | 1.01 | 1.22 | 1.45 | 1.70 | - | | | | |
| OP-MSTM018DX | 114X7232 114X7290 | W05 W09 | A1 + A2L | G | 27 | - | 1.34 | 1.62 | 1.92 | 2.24 | 2.56 | - | 1.70 | - | 10 | 39 |
| | | | | | 32 | - | 1.21 | 1.46 | 1.74 | 2.03 | 2.34 | - | | | | |
| | | | | | 38 | - | 1.04 | 1.28 | 1.53 | 1.80 | 2.08 | - | | | | |
| | | | | | 43 | - | - | 1.12 | 1.35 | 1.60 | 1.87 | - | | | | |
| OP-MSTM021DX* | 114X7325 114X7327 | W05 W09 | A1 + A2L | G | 27 | 1.100 | 1.435 | 1.778 | 2.129 | 2.486 | 2.848 | - | 1.61 | - | 10 | 39 |
| | | | | | 32 | 0.985 | 1.291 | 1.607 | 1.932 | 2.264 | 2.603 | - | | | | |
| | | | | | 38 | 0.850 | 1.122 | 1.405 | 1.698 | 2.001 | 2.312 | - | | | | |
| | | | | | 43 | 0.740 | 0.983 | 1.239 | 1.506 | 1.783 | 2.071 | - | | | | |
| OP-MSTM022DS | 114X7233 114X7299 | W05 W09 | A1 + A2L | G | 27 | - | 1.81 | 2.21 | 2.65 | 3.14 | 3.67 | - | 1.89 | - | 10 | 41 |
| | | | | | 32 | - | 1.63 | 1.99 | 2.40 | 2.85 | 3.33 | - | | | | |
| | | | | | 38 | - | 1.42 | 1.74 | 2.10 | 2.50 | 2.93 | - | | | | |
| | | | | | 43 | - | - | 1.53 | 1.86 | 2.21 | 2.60 | - | | | | |
| OP-MSTM026DS | 114X7234 114X7300 | W05 W09 | A1 + A2L | G | 27 | - | 2.20 | 2.66 | 3.18 | 3.74 | 4.34 | - | 1.90 | - | 10 | 39 |
| | | | | | 32 | - | 1.98 | 2.41 | 2.88 | 3.39 | 3.93 | - | | | | |
| | | | | | 38 | - | 1.73 | 2.10 | 2.52 | 2.97 | 3.46 | - | | | | |
| | | | | | 43 | - | - | 1.85 | 2.22 | 2.63 | 3.06 | - | | | | |
| OP-MSTM026DS | 114X7235 114X7301 | W05 W09 | A1 + A2L | E | 27 | - | 2.22 | 2.69 | 3.21 | 3.77 | 4.38 | - | 1.95 | - | 10 | 39 |
| | | | | | 32 | - | 2.00 | 2.43 | 2.90 | 3.42 | 3.97 | - | | | | |
| | | | | | 38 | - | 1.74 | 2.12 | 2.54 | 3.00 | 3.49 | - | | | | |
| | | | | | 43 | - | - | 1.87 | 2.25 | 2.66 | 3.09 | - | | | | |
| OP-MSTM034DS | 114X7237 114X7302 | W05 W09 | A1 + A2L | G | 27 | - | 2.52 | 3.15 | 3.80 | 4.46 | 5.14 | - | 1.77 | - | 10 | 40 |
| | | | | | 32 | - | 2.27 | 2.84 | 3.43 | 4.04 | 4.67 | - | | | | |
| | | | | | 38 | - | 1.97 | 2.47 | 3.00 | 3.54 | 4.12 | - | | | | |
| | | | | | 43 | - | - | 2.17 | 2.64 | 3.13 | 3.66 | - | | | | |
| OP-MSTM034DS | 114X7236 114X7303 | W05 W09 | A1 + A2L | E | 27 | - | 2.54 | 3.17 | 3.82 | 4.49 | 5.17 | - | 1.82 | - | 10 | 40 |
| | | | | | 32 | - | 2.28 | 2.86 | 3.45 | 4.07 | 4.70 | - | | | | |
| | | | | | 38 | - | 1.98 | 2.48 | 3.01 | 3.57 | 4.14 | - | | | | |
| | | | | | 43 | - | - | 2.18 | 2.65 | 3.15 | 3.68 | - | | | | |
| OP-MSIM034ML | 114X7267 114X7275 | W05 W09 | A1+A2L | G | 27 | 2.67 | 3.29 | 4.00 | 4.81 | 5.71 | 6.70 | - | 2.46 | - | 25 | 38 |
| | | | | | 32 | 2.46 | 3.05 | 3.72 | 4.47 | 5.32 | 6.25 | - | | | | |
| | | | | | 38 | 2.22 | 2.75 | 3.37 | 4.06 | 4.84 | 5.71 | - | | | | |
| | | | | | 43 | - | - | 3.07 | 3.72 | 4.44 | 5.25 | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid Point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSIM034ML | 114X7266 114X7274 | W05 W09 | A1+A2L | E | 27 | 2.69 | 3.31 | 4.02 | 4.83 | 5.74 | 6.75 | - | 2.54 | - | 10 | 38 |
| | | | | | 32 | 2.48 | 3.06 | 3.72 | 4.48 | 5.34 | 6.30 | - | | | | |
| | | | | | 38 | 2.23 | 2.75 | 3.36 | 4.06 | 4.85 | 5.74 | - | | | | |
| | | | | | 43 | - | - | 3.06 | 3.70 | 4.44 | 5.27 | - | | | | |
| OP-MSTM038DS* | 114X7326 114X7328 | W05 W09 | A1+A2L | G | 27 | 2.338 | 2.825 | 3.356 | 3.930 | 4.545 | 5.199 | - | 1.72 | - | 20 | 39 |
| | | | | | 32 | 2.122 | 2.583 | 3.090 | 3.640 | 4.232 | 4.866 | - | | | | |
| | | | | | 38 | 1.867 | 2.296 | 2.772 | 3.293 | 3.859 | 4.467 | - | | | | |
| | | | | | 43 | 1.656 | 2.060 | 2.510 | 3.006 | 3.548 | 4.136 | - | | | | |
| OP-MSIM044ML | 114X7269 114X7277 | W05 W09 | A1+A2L | G | 27 | 3.29 | 4.06 | 4.93 | 5.91 | 6.99 | 8.18 | - | 2.23 | - | 32 | 38 |
| | | | | | 32 | 3.05 | 3.77 | 4.59 | 5.51 | 6.53 | 7.66 | - | | | | |
| | | | | | 38 | 2.76 | 3.42 | 4.17 | 5.02 | 5.97 | 7.01 | - | | | | |
| | | | | | 43 | - | - | 3.81 | 4.60 | 5.48 | 6.46 | - | | | | |
| OP-MSIM044ML | 114X7268 114X7276 | W05 W09 | A1+A2L | E | 27 | 3.41 | 4.18 | 5.04 | 6.01 | 7.09 | 8.26 | - | 2.39 | - | 32 | 38 |
| | | | | | 32 | 3.15 | 3.86 | 4.67 | 5.58 | 6.58 | 7.69 | - | | | | |
| | | | | | 38 | 2.83 | 3.48 | 4.22 | 5.04 | 5.97 | 6.99 | - | | | | |
| | | | | | 43 | - | - | 3.85 | 4.60 | 5.45 | 6.39 | - | | | | |
| OP-MSIM046ML | 114X7271 114X7279 | W05 W09 | A1+A2L | G | 27 | 3.48 | 4.26 | 5.16 | 6.16 | 7.27 | 8.48 | - | 2.22 | - | 32 | 38 |
| | | | | | 32 | 3.20 | 3.94 | 4.77 | 5.71 | 6.75 | 7.90 | - | | | | |
| | | | | | 38 | 2.87 | 3.54 | 4.30 | 5.16 | 6.12 | 7.18 | - | | | | |
| | | | | | 43 | - | - | 3.90 | 4.69 | 5.58 | 6.57 | - | | | | |
| OP-MSIM046ML | 114X7270 114X7278 | W05 W09 | A1+A2L | E | 27 | 3.54 | 4.33 | 5.23 | 6.23 | 7.34 | 8.55 | - | 2.37 | - | 16 | 38 |
| | | | | | 32 | 3.24 | 3.98 | 4.82 | 5.76 | 6.80 | 7.93 | - | | | | |
| | | | | | 38 | 2.89 | 3.56 | 4.32 | 5.18 | 6.13 | 7.18 | - | | | | |
| | | | | | 43 | - | - | 3.90 | 4.69 | 5.57 | 6.54 | - | | | | |
| OP-MSIM057ML | 114X7272 114X7280 | W05 W09 | A1+A2L | E | 27 | 4.23 | 5.16 | 6.20 | 7.36 | 8.61 | 9.96 | - | - | 3.61 | 16 | 38 |
| | | | | | 32 | 3.85 | 4.72 | 5.69 | 6.76 | 7.93 | 9.20 | - | | | | |
| | | | | | 38 | 3.40 | 4.18 | 5.06 | 6.03 | 7.11 | 8.27 | - | | | | |
| | | | | | 43 | - | - | 4.53 | 5.42 | 6.40 | 7.48 | - | | | | |
| OP-MSIM057ML | 114X7273 114X7281 | W05 W09 | A1+A2L | G | 27 | 4.20 | 5.12 | 6.16 | 7.30 | 8.56 | 9.92 | - | - | 3.47 | 32 | 38 |
| | | | | | 32 | 3.85 | 4.70 | 5.66 | 6.73 | 7.90 | 9.18 | - | | | | |
| | | | | | 38 | 3.43 | 4.19 | 5.06 | 6.02 | 7.09 | 8.25 | - | | | | |
| | | | | | 43 | - | - | 4.54 | 5.42 | 6.39 | 7.46 | - | | | | |
| OP-MSIM068ML | 114X7311 114X7317 | W05 W09 | A1+A2L | E | 27 | 5.43 | 6.64 | 8.04 | 9.62 | 11.39 | 13.35 | - | - | 4.21 | 16 | 40 |
| | | | | | 32 | 4.99 | 6.13 | 7.43 | 8.92 | 10.59 | 12.44 | - | | | | |
| | | | | | 38 | 4.47 | 5.50 | 6.70 | 8.06 | 9.60 | 11.33 | - | | | | |
| | | | | | 43 | - | - | 6.07 | 7.33 | 8.76 | 10.37 | - | | | | |
| OP-MSIM068ML | 114X7312 114X7318 | W05 W09 | A1+A2L | G | 27 | 5.47 | 6.72 | 8.14 | 9.74 | 11.53 | 13.52 | - | - | 4.04 | 40 | 40 |
| | | | | | 32 | 5.04 | 6.20 | 7.53 | 9.04 | 10.72 | 12.60 | - | | | | |
| | | | | | 38 | 4.51 | 5.58 | 6.80 | 8.18 | 9.75 | 11.50 | - | | | | |
| | | | | | 43 | - | - | 6.18 | 7.46 | 8.92 | 10.56 | - | | | | |
| OP-MSIM080ML | 114X7313 114X7319 | W05 W09 | A1+A2L | E | 27 | 6.31 | 7.70 | 9.27 | 11.04 | 12.99 | 15.11 | - | - | 4.11 | 20 | 40 |
| | | | | | 32 | 5.80 | 7.09 | 8.56 | 10.21 | 12.05 | 14.05 | - | | | | |
| | | | | | 38 | 5.18 | 6.35 | 7.69 | 9.21 | 10.90 | 12.76 | - | | | | |
| | | | | | 43 | - | - | 6.96 | 8.36 | 9.93 | 11.66 | - | | | | |
| OP-MSIM080ML | 114X7314 114X7320 | W05 W09 | A1+A2L | G | 27 | 6.15 | 7.51 | 9.06 | 10.78 | 12.69 | 14.78 | - | - | 3.67 | 40 | 40 |
| | | | | | 32 | 5.70 | 6.97 | 8.41 | 10.02 | 11.81 | 13.77 | - | | | | |
| | | | | | 38 | 5.15 | 6.31 | 7.62 | 9.10 | 10.74 | 12.54 | - | | | | |
| | | | | | 43 | - | - | 6.96 | 8.31 | 9.83 | 11.50 | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid Point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

## Catalogue Optyma™ Slim Pack - Performance data R455A MBP

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSIM099ML | 114X7315<br>114X7321 | W05<br>W09 | A1+A2L | E | 27 | 7.49 | 9.15 | 11.01 | 13.06 | 15.30 | 17.71 | - | - | 3.81 | 20 | 40 |
| | | | | | 32 | 6.88 | 8.41 | 10.13 | 12.04 | 14.12 | 16.38 | - | | | | |
| | | | | | 38 | 6.14 | 7.52 | 9.07 | 10.79 | 12.69 | 14.75 | - | | | | |
| | | | | | 43 | - | - | 8.17 | 9.74 | 11.47 | 13.36 | - | | | | |
| OP-MSIM108ML | 114X7316<br>114X7322 | W05<br>W09 | A1+A2L | E | 27 | 8.11 | 9.85 | 11.79 | 13.93 | 16.26 | 18.76 | - | - | 3.70 | 20 | 40 |
| | | | | | 32 | 7.41 | 9.02 | 10.83 | 12.82 | 14.99 | 17.33 | - | | | | |
| | | | | | 38 | 6.56 | 8.02 | 9.65 | 11.45 | 13.43 | 15.58 | - | | | | |
| | | | | | 43 | - | - | 8.65 | 10.30 | 12.11 | 14.09 | - | | | | |

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid Point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM008DY | 114X7226 114X7286 | W05 W09 | A1 + A2L | G | 27 | - | 0.57 | 0.72 | 0.87 | 1.04 | 1.21 | - | 1.84 | - | 6 | 31 |
| | | | | | 32 | - | 0.50 | 0.63 | 0.78 | 0.93 | 1.09 | - | | | | |
| | | | | | 38 | - | 0.42 | 0.54 | 0.67 | 0.80 | 0.95 | - | | | | |
| | | | | | 43 | - | - | 0.46 | 0.57 | 0.70 | 0.84 | - | | | | |
| OP-MSTM009DY | 114X7229 114X7287 | W05 W09 | A1 + A2L | G | 27 | - | 0.63 | 0.78 | 0.95 | 1.11 | 1.29 | - | 1.82 | - | 8 | 32 |
| | | | | | 32 | - | 0.56 | 0.70 | 0.85 | 1.00 | 1.17 | - | | | | |
| | | | | | 38 | - | 0.47 | 0.59 | 0.73 | 0.87 | 1.02 | - | | | | |
| | | | | | 43 | - | - | 0.51 | 0.63 | 0.76 | 0.90 | - | | | | |
| OP-MSTM012DP | 114X7230 114X7288 | W05 W09 | A1 + A2L | G | 27 | - | 1.06 | 1.28 | 1.52 | 1.78 | 2.04 | - | 1.81 | - | 8 | 32 |
| | | | | | 32 | - | 0.95 | 1.16 | 1.38 | 1.61 | 1.86 | - | | | | |
| | | | | | 38 | - | 0.83 | 1.01 | 1.21 | 1.42 | 1.65 | - | | | | |
| | | | | | 43 | - | - | 0.89 | 1.07 | 1.26 | 1.47 | - | | | | |
| OP-MSTM014DP | 114X7231 114X7289 | W05 W09 | A1 + A2L | G | 27 | - | 1.09 | 1.33 | 1.58 | 1.85 | 2.13 | - | 1.71 | - | 8 | 33 |
| | | | | | 32 | - | 0.98 | 1.20 | 1.44 | 1.69 | 1.96 | - | | | | |
| | | | | | 38 | - | 0.86 | 1.05 | 1.27 | 1.50 | 1.75 | - | | | | |
| | | | | | 43 | - | - | 0.93 | 1.13 | 1.34 | 1.57 | - | | | | |
| OP-MSTM018DX | 114X7232 114X7290 | W05 W09 | A1 + A2L | G | 27 | - | 1.20 | 1.48 | 1.77 | 2.08 | 2.41 | - | 1.65 | - | 10 | 39 |
| | | | | | 32 | - | 1.07 | 1.32 | 1.59 | 1.88 | 2.19 | - | | | | |
| | | | | | 38 | - | 0.92 | 1.14 | 1.38 | 1.64 | 1.92 | - | | | | |
| | | | | | 43 | - | - | 0.99 | 1.20 | 1.44 | 1.70 | - | | | | |
| OP-MSTM021DX* | 114X7325 114X7327 | W05 W09 | A1 + A2L | G | 27 | 0.961 | 1.270 | 1.589 | 1.916 | 2.252 | 2.594 | - | 1.62 | - | 10 | 39 |
| | | | | | 32 | 0.862 | 1.145 | 1.438 | 1.742 | 2.054 | 2.375 | - | | | | |
| | | | | | 38 | 0.746 | 0.997 | 1.260 | 1.534 | 1.819 | 2.114 | - | | | | |
| | | | | | 43 | 0.652 | 0.877 | 1.113 | 1.363 | 1.624 | 1.897 | - | | | | |
| OP-MSTM022DS | 114X7233 114X7299 | W05 W09 | A1 + A2L | G | 27 | - | 1.61 | 2.05 | 2.56 | 3.14 | 3.77 | - | 1.97 | - | 10 | 41 |
| | | | | | 32 | - | 1.45 | 1.86 | 2.33 | 2.86 | 3.46 | - | | | | |
| | | | | | 38 | - | 1.26 | 1.63 | 2.05 | 2.53 | 3.07 | - | | | | |
| | | | | | 43 | - | - | 1.44 | 1.82 | 2.26 | 2.76 | - | | | | |
| OP-MSTM026DS | 114X7234 114X7300 | W05 W09 | A1 + A2L | G | 27 | - | 2.03 | 2.49 | 2.98 | 3.50 | 4.04 | - | 2.15 | - | 16 | 39 |
| | | | | | 32 | - | 1.80 | 2.22 | 2.68 | 3.16 | 3.67 | - | | | | |
| | | | | | 38 | - | 1.53 | 1.91 | 2.32 | 2.76 | 3.23 | - | | | | |
| | | | | | 43 | - | - | 1.65 | 2.02 | 2.42 | 2.86 | - | | | | |
| OP-MSTM026DS | 114X7235 114X7301 | W05 W09 | A1 + A2L | E | 27 | - | 2.04 | 2.50 | 2.99 | 3.51 | 4.06 | - | 2.20 | - | 6 | 39 |
| | | | | | 32 | - | 1.81 | 2.23 | 2.69 | 3.18 | 3.69 | - | | | | |
| | | | | | 38 | - | 1.54 | 1.92 | 2.33 | 2.77 | 3.25 | - | | | | |
| | | | | | 43 | - | - | 1.66 | 2.03 | 2.44 | 2.88 | - | | | | |
| OP-MSTM034DS | 114X7237 114X7302 | W05 W09 | A1 + A2L | G | 27 | - | 2.16 | 2.72 | 3.29 | 3.87 | 4.46 | - | 1.67 | - | 20 | 40 |
| | | | | | 32 | - | 1.95 | 2.45 | 2.97 | 3.51 | 4.06 | - | | | | |
| | | | | | 38 | - | 1.69 | 2.13 | 2.59 | 3.07 | 3.57 | - | | | | |
| | | | | | 43 | - | - | 1.87 | 2.28 | 2.71 | 3.17 | - | | | | |
| OP-MSTM034DS | 114X7236 114X7303 | W05 W09 | A1 + A2L | E | 27 | - | 2.18 | 2.73 | 3.31 | 3.89 | 4.49 | - | 1.71 | - | 8 | 39 |
| | | | | | 32 | - | 1.96 | 2.46 | 2.99 | 3.53 | 4.08 | - | | | | |
| | | | | | 38 | - | 1.70 | 2.14 | 2.61 | 3.09 | 3.59 | - | | | | |
| | | | | | 43 | - | - | 1.88 | 2.30 | 2.73 | 3.19 | - | | | | |
| OP-MSIM034ML | 114X7266 114X7274 | W05 W09 | A1+A2L | E | 27 | 2.44 | 3.01 | 3.67 | 4.42 | 5.27 | 6.21 | - | 2.50 | - | 8 | 40 |
| | | | | | 32 | 2.25 | 2.78 | 3.40 | 4.11 | 4.91 | 5.80 | - | | | | |
| | | | | | 38 | 2.02 | 2.51 | 3.07 | 3.72 | 4.46 | 5.29 | - | | | | |
| | | | | | 43 | - | - | 2.80 | 3.40 | 4.09 | 4.86 | - | | | | |
| OP-MSIM034ML | 114X7267 114X7275 | W05 W09 | A1+A2L | G | 27 | 2.48 | 3.07 | 3.74 | 4.50 | 5.36 | 6.31 | - | 2.42 | - | 20 | 40 |
| | | | | | 32 | 2.29 | 2.84 | 3.47 | 4.19 | 5.00 | 5.89 | - | | | | |
| | | | | | 38 | 2.06 | 2.57 | 3.15 | 3.81 | 4.56 | 5.39 | - | | | | |
| | | | | | 43 | - | - | 2.87 | 3.49 | 4.18 | 4.96 | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid Point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MSTM038DS* | 114X7326 114X7328 | W05 W09 | A1+A2L | G | 27 | 2.054 | 2.493 | 2.975 | 3.498 | 4.061 | 4.662 | - | 1.7 | - | 20 | 39 |
| | | | | | 32 | 1.866 | 2.282 | 2.741 | 3.243 | 3.786 | 4.369 | - | | | | |
| | | | | | 38 | 1.644 | 2.031 | 2.463 | 2.938 | 3.457 | 4.018 | - | | | | |
| | | | | | 43 | 1.460 | 1.823 | 2.232 | 2.685 | 3.183 | 3.725 | - | | | | |
| OP-MSIM044ML | 114X7269 114X7277 | W05 W09 | A1+A2L | G | 27 | 3.00 | 3.71 | 4.52 | 5.44 | 6.46 | 7.59 | - | 2.29 | - | 25 | 41 |
| | | | | | 32 | 2.78 | 3.45 | 4.21 | 5.07 | 6.04 | 7.11 | - | | | | |
| | | | | | 38 | 2.52 | 3.13 | 3.83 | 4.63 | 5.52 | 6.52 | - | | | | |
| | | | | | 43 | - | - | 3.51 | 4.25 | 5.08 | 6.02 | - | | | | |
| OP-MSIM044ML | 114X7268 114X7276 | W05 W09 | A1+A2L | E | 27 | 3.12 | 3.83 | 4.65 | 5.56 | 6.58 | 7.69 | - | 2.41 | - | 12 | 41 |
| | | | | | 32 | 2.88 | 3.55 | 4.31 | 5.16 | 6.12 | 7.17 | - | | | | |
| | | | | | 38 | 2.60 | 3.20 | 3.89 | 4.68 | 5.55 | 6.52 | - | | | | |
| | | | | | 43 | - | - | 3.55 | 4.26 | 5.07 | 5.98 | - | | | | |
| OP-MSIM046ML | 114X7271 114X7279 | W05 W09 | A1+A2L | G | 27 | 3.19 | 3.92 | 4.76 | 5.70 | 6.75 | 7.91 | - | 2.28 | - | 32 | 41 |
| | | | | | 32 | 2.94 | 3.62 | 4.40 | 5.29 | 6.27 | 7.37 | - | | | | |
| | | | | | 38 | 2.64 | 3.26 | 3.97 | 4.78 | 5.69 | 6.71 | - | | | | |
| | | | | | 43 | - | - | 3.61 | 4.36 | 5.20 | 6.15 | - | | | | |
| OP-MSIM046ML | 114X7270 114X7278 | W05 W09 | A1+A2L | E | 27 | 3.25 | 4.00 | 4.84 | 5.79 | 6.84 | 8.00 | - | 2.40 | - | 12 | 41 |
| | | | | | 32 | 2.99 | 3.68 | 4.47 | 5.35 | 6.34 | 7.43 | - | | | | |
| | | | | | 38 | 2.67 | 3.29 | 4.01 | 4.82 | 5.73 | 6.74 | - | | | | |
| | | | | | 43 | - | - | 3.62 | 4.37 | 5.21 | 6.15 | - | | | | |
| OP-MSIM057ML | 114X7272 114X7280 | W05 W09 | A1+A2L | E | 27 | 3.83 | 4.70 | 5.68 | 6.76 | 7.95 | 9.24 | - | - | 3.73 | 12 | 42 |
| | | | | | 32 | 3.49 | 4.30 | 5.21 | 6.23 | 7.34 | 8.55 | - | | | | |
| | | | | | 38 | 3.08 | 3.82 | 4.65 | 5.57 | 6.59 | 7.71 | - | | | | |
| | | | | | 43 | - | - | 4.17 | 5.02 | 5.96 | 6.99 | - | | | | |
| OP-MSIM057ML | 114X7273 114X7281 | W05 W09 | A1+A2L | G | 27 | 3.83 | 4.69 | 5.66 | 6.75 | 7.94 | 9.24 | - | - | 3.47 | 32 | 42 |
| | | | | | 32 | 3.52 | 4.32 | 5.22 | 6.23 | 7.34 | 8.56 | - | | | | |
| | | | | | 38 | 3.15 | 3.86 | 4.67 | 5.59 | 6.60 | 7.71 | - | | | | |
| | | | | | 43 | - | - | 4.21 | 5.04 | 5.97 | 6.99 | - | | | | |
| OP-MSIM068ML | 114X7312 114X7318 | W05 W09 | A1+A2L | G | 27 | 4.88 | 6.02 | 7.31 | 8.79 | 10.45 | 12.29 | - | - | 3.83 | 40 | 43 |
| | | | | | 32 | 4.50 | 5.56 | 6.78 | 8.16 | 9.73 | 11.47 | - | | | | |
| | | | | | 38 | 4.03 | 5.00 | 6.12 | 7.40 | 8.84 | 10.47 | - | | | | |
| | | | | | 43 | - | - | 5.57 | 6.75 | 8.10 | 9.62 | - | | | | |
| OP-MSIM068ML | 114X7311 114X7317 | W05 W09 | A1+A2L | E | 27 | 4.96 | 6.09 | 7.40 | 8.89 | 10.56 | 12.42 | - | - | 4.27 | 16 | 43 |
| | | | | | 32 | 4.57 | 5.63 | 6.85 | 8.25 | 9.82 | 11.58 | - | | | | |
| | | | | | 38 | 4.10 | 5.06 | 6.18 | 7.46 | 8.92 | 10.56 | - | | | | |
| | | | | | 43 | - | - | 5.61 | 6.79 | 8.15 | 9.69 | - | | | | |
| OP-MSIM080ML | 114X7314 114X7320 | W05 W09 | A1+A2L | G | 27 | 5.55 | 6.80 | 8.24 | 9.85 | 11.63 | 13.60 | - | - | 3.51 | 45 | 44 |
| | | | | | 32 | 5.14 | 6.32 | 7.66 | 9.17 | 10.85 | 12.70 | - | | | | |
| | | | | | 38 | 4.65 | 5.73 | 6.95 | 8.34 | 9.88 | 11.59 | - | | | | |
| | | | | | 43 | - | - | 6.35 | 7.63 | 9.05 | 10.64 | - | | | | |
| OP-MSIM080ML | 114X7313 114X7319 | W05 W09 | A1+A2L | E | 27 | 5.79 | 7.08 | 8.56 | 10.23 | 12.08 | 14.12 | - | - | 4.24 | 20 | 44 |
| | | | | | 32 | 5.32 | 6.53 | 7.91 | 9.48 | 11.22 | 13.14 | - | | | | |
| | | | | | 38 | 4.76 | 5.86 | 7.12 | 8.56 | 10.17 | 11.95 | - | | | | |
| | | | | | 43 | - | - | 6.45 | 7.77 | 9.27 | 10.93 | - | | | | |
| OP-MSIM099ML | 114X7315 114X7321 | W05 W09 | A1+A2L | E | 27 | 6.84 | 8.40 | 10.15 | 12.09 | 14.23 | 16.55 | - | - | 3.86 | 20 | 44 |
| | | | | | 32 | 6.30 | 7.74 | 9.36 | 11.17 | 13.16 | 15.33 | - | | | | |
| | | | | | 38 | 5.64 | 6.93 | 8.40 | 10.03 | 11.85 | 13.83 | - | | | | |
| | | | | | 43 | - | - | 7.59 | 9.08 | 10.73 | 12.56 | - | | | | |
| OP-MSIM108ML | 114X7316 114X7322 | W05 W09 | A1+A2L | E | 27 | 7.39 | 9.02 | 10.86 | 12.89 | 15.12 | 17.53 | - | - | 3.79 | 20 | 46 |
| | | | | | 32 | 6.77 | 8.29 | 9.99 | 11.88 | 13.96 | 16.23 | - | | | | |
| | | | | | 38 | 6.02 | 7.38 | 8.93 | 10.65 | 12.55 | 14.63 | - | | | | |
| | | | | | 43 | - | - | 8.03 | 9.60 | 11.35 | 13.27 | - | | | | |

*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid Point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Application | Code | | Model | Compressor Model | Electrical Code (1) | Refrigerant (2) | Condenser Coil | | | Fan | | Receiver | Dimensions | | | | Connection | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Type | Airflow | Internal Volume | Number | Blade ø | Volume | Housing | Height | Width | Length | Suction valve | Liquid valve | Gross | Net |
| | W05 | W09 | | | | | | ($m^3/h$) | ($dm^3$) | | (mm) | (L) | | mm | mm | mm | inch | inch | Kg | Kg |
| LBP | 114X7106 | 114X7129 | OP-LSQM014DP | DPT14LA | G | Q | A7 | 2,200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 64 | 51 |
| LBP | 114X7107 | 114X7130 | OP-LSQM016DP | DPT16LA | G | Q | A7 | 2,200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 65 | 51 |
| LBP | 114X7087 | 114X7181 | OP-LSQM048NT | NTZ048-5 | G | Q | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 540 | 1079 | 464 | 5/8" | 1/2" | 77 | 62 |
| LBP | 114X7088 | 114X7182 | OP-LSQM048NT | NTZ048-4 | E | Q | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 540 | 1079 | 464 | 5/8" | 1/2" | 77 | 62 |
| LBP | 114X7090 | 114X7184 | OP-LSQM068NT | NTZ068-4 | E | Q | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 540 | 1079 | 464 | 5/8" | 1/2" | 80 | 65 |
| LBP | 114X7089 | 114X7183 | OP-LSQM068NT | NTZ068-5 | G | Q | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 540 | 1079 | 464 | 5/8" | 1/2" | 79 | 64 |
| LBP | 114X7091 | 114X7187 | OP-LSQM067LL | LLZ013T4A | E | Q | G7 | 5,200 | 1.62 | 1 | 500 | 6.2 | B3 | 540 | 1105 | 464 | 3/4" | 1/2" | 97 | 78 |
| LBP | 114X7092 | 114X7188 | OP-LSQM084LL | LLZ015T4A | E | Q | G7 | 5,200 | 1.62 | 1 | 500 | 6.2 | B3 | 540 | 1105 | 464 | 3/4" | 1/2" | 97 | 78 |
| LBP | 114X7075 | 114X7189 | OP-LSQM098LL | LLZ018T4A | E | Q | G7 | 5,200 | 1.62 | 1 | 500 | 6.2 | B3 | 540 | 1105 | 464 | 3/4" | 1/2" | 97 | 78 |
| MBP | 114X7099 | 114X7207 | OP-MSGM012SC | SC12G | G | G | A7 | 2,200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 66 | 52 |
| MBP | 114X7100 | 114X7208 | OP-MSGM015SC | SC15G | G | G | A7 | 2,200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 66 | 52 |
| MBP | 114X7101 | 114X7131 | OP-MSGM018SC | SC18G | G | G | A7 | 2,200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 53 |
| MBP | 114X7108 | 114X7133 | OP-MSBM009DY | DLY90RAb | G | B | A7 | 2,200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 64 | 50 |
| MBP | 114X7102 | 114X7132 | OP-MSGM021SC | SC21G | G | G | A7 | 2,200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 53 |
| MBP | 114X7109 | 114X7134 | OP-MSBM012DP | DPT12RA | G | B | A7 | 2,200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 64 | 51 |
| MBP | 114X7110 | 114X7135 | OP-MSBM014DP | DPT14RA | G | B | A7 | 2,200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 65 | 52 |
| MBP | 114X7062 | 114X7196 | OP-MSXM034ML | MLZ015T4A | E | X | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7061 | 114X7195 | OP-MSXM034ML | MLZ015T5A | G | X | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7162 | 114X7212 | OP-MSXM044ML | MLZ019T4A | E | X | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7161 | 114X7211 | OP-MSXM044ML | MLZ019T5A | G | X | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7064 | 114X7198 | OP-MSXM046ML | MLZ021T4A | E | X | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7063 | 114X7197 | OP-MSXM046ML | MLZ021T5A | G | X | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7065 | 114X7199 | OP-MSXM057ML | MLZ026T5A | G | X | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7066 | 114X7200 | OP-MSXM057ML | MLZ026T4A | E | X | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7068 | 114X7202 | OP-MSXM068ML | MLZ030T4A | E | X | G7 | 5,200 | 1.62 | 1 | 500 | 6.2 | B3 | 825 | 1105 | 464 | 7/8" | 1/2" | 95 | 76 |
| MBP | 114X7067 | 114X7201 | OP-MSXM068ML | MLZ030T5A | G | X | G7 | 5,200 | 1.62 | 1 | 500 | 6.2 | B3 | 825 | 1105 | 464 | 7/8" | 1/2" | 95 | 76 |
| MBP | 114X7069 | 114X7203 | OP-MSXM080ML | MLZ038T5A | G | X | G7 | 5,200 | 1.62 | 1 | 500 | 6.2 | B3 | 825 | 1105 | 464 | 7/8" | 1/2" | 96 | 77 |
| MBP | 114X7070 | 114X7204 | OP-MSXM080ML | MLZ038T4A | E | X | G7 | 5,200 | 1.62 | 1 | 500 | 6.2 | B3 | 825 | 1105 | 464 | 7/8" | 1/2" | 96 | 77 |
| MBP | 114X7071 | 114X7205 | OP-MSXM099ML | MLZ045T4A | E | X | G7 | 5,200 | 1.62 | 1 | 500 | 6.2 | B3 | 825 | 1105 | 464 | 7/8" | 1/2" | 98 | 79 |
| MBP | 114X7072 | 114X7206 | OP-MSXM108ML | MLZ048T4A | E | X | G7 | 5,200 | 1.62 | 1 | 500 | 6.2 | B3 | 825 | 1105 | 464 | 7/8" | 1/2" | 98 | 79 |

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2) G** - R134a & R513A
**X** - R134a, R404A/R507, R407A, R407F, R449A, R448A, R513A & R452A
**B** - R404A/R507, R448A, R449A, R452A
**Q** - R404A/R507 & R452A

| Application | Code | | Model | Compressor Model | Electrical Code (1) | Refrigerant (2) | Condenser Coil | | | Fan | | Receiver | Dimensions | | | | Connection | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Type | Airflow | Internal Volume | Number | Blade ø | Volume | Housing | Height | Width | Length | Suction valve | Liquid valve | Gross | Net |
| | W05 | W09 | | | | | | ($m^2$/h) | ($dm^3$) | | (mm) | (L) | | mm | mm | mm | inch | inch | Kg | Kg |
| LBP | 114X7263 | 114X7295 | OP-LSVM014DP | DPT14LA | G | V | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 52 |
| LBP | 114X7242 | 114X7296 | OP-LSVM016DP | DPT16LA | G | V | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 52 |
| LBP | 114X7227 | 114X7297 | OP-LSVM026DS | DST26NA | G | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 68 | 53 |
| LBP | 114X7228 | 114X7298 | OP-LSVM034DS | DST34LA | G | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 69 | 54 |
| LBP | 114X7244 | 114X7282 | OP-LSVM048NT | NTZ048-5 | G | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 5/8" | 1/2" | 77 | 62 |
| LBP | 114X7245 | 114X7283 | OP-LSVM048NT | NTZ048-4 | E | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 5/8" | 1/2" | 77 | 62 |
| LBP | 114X7247 | 114X7285 | OP-LSVM068NT | NTZ068-4 | G | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 5/8" | 1/2" | 80 | 65 |
| MBP | 114X7226 | 114X7286 | OP-MSTM008DY | DLY80RAb | G | T | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 66 | 51 |
| MBP | 114X7229 | 114X7287 | OP-MSTM009DY | DLY90RAb | G | T | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 66 | 51 |
| MBP | 114X7230 | 114X7288 | OP-MSTM012DP | DPT12RA | G | T | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 52 |
| MBP | 114X7238 | 114X7291 | OP-MSSM012SC | SC12G | G | S | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 52 |
| MBP | 114X7231 | 114X7289 | OP-MSTM014DP | DPT14RA | G | T | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 52 |
| MBP | 114X7239 | 114X7292 | OP-MSSM015SC | SC15G | G | S | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 52 |
| MBP | 114X7232 | 114X7290 | OP-MSTM018DX | DX18Tba | G | T | A7 | 3300 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 52 |
| MBP | 114X7240 | 114X7293 | OP-MSSM018SC | SC18G | G | S | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 67 | 52 |
| MBP | 114X7241 | 114X7294 | OP-MSSM021SC | SC21G | G | S | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | B1 | 530 | 910 | 364 | 3/8" | 3/8" | 68 | 53 |
| MBP | 114X7325 | 114X7327 | OP-MSTM021DX | DX21Tba | G | T | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 77 | 62 |
| MBP | 114X7233 | 114X7299 | OP-MSTM022DS | DS22TB | G | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 68 | 53 |
| MBP | 114X7248 | 114X7304 | OP-MSSM026CS | CS26TB | G | S | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 68 | 53 |
| MBP | 114X7234 | 114X7300 | OP-MSTM026DS | DS26TB | G | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 68 | 53 |
| MBP | 114X7235 | 114X7301 | OP-MSTM026DS | DS26T3 | E | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 68 | 53 |
| MBP | 114X7249 | 114X7305 | OP-MSSM030CS | CS30TB | G | S | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 69 | 54 |
| MBP | 114X7237 | 114X7302 | OP-MSTM034DS | DS34TB | G | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 69 | 54 |
| MBP | 114X7236 | 114X7303 | OP-MSTM034DS | DS34T3 | E | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 69 | 54 |
| MBP | 114X7326 | 114X7328 | OP-MSTM038DS | DST38NA | G | T | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 1/2" | 1/2" | 76 | 61 |
| MBP | 114X7266 | 114X7274 | OP-MSIM034ML | MLZ015T4B | E | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7267 | 114X7275 | OP-MSIM034ML | MLZ015T5B | G | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7268 | 114X7276 | OP-MSIM044ML | MLZ019T4B | E | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7269 | 114X7277 | OP-MSIM044ML | MLZ019T5B | G | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7270 | 114X7278 | OP-MSIM046ML | MLZ021T4B | E | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7271 | 114X7279 | OP-MSIM046ML | MLZ021T5B | G | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7272 | 114X7280 | OP-MSIM057ML | MLZ026T4B | E | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7273 | 114X7281 | OP-MSIM057ML | MLZ026T5B | G | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | B2 | 690 | 1079 | 464 | 3/4" | 1/2" | 85 | 70 |
| MBP | 114X7311 | 114X7317 | OP-MSIM068ML | MLZ030T4B | E | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | B3 | 825 | 1105 | 464 | 3/8" | 1/2" | 98 | 80 |
| MBP | 114X7312 | 114X7318 | OP-MSIM068ML | MLZ030T5B | G | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | B3 | 825 | 1105 | 464 | 3/8" | 1/2" | 98 | 80 |
| MBP | 114X7313 | 114X7319 | OP-MSIM080ML | MLZ038T4B | E | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | B3 | 825 | 1105 | 464 | 3/8" | 1/2" | 98 | 80 |
| MBP | 114X7314 | 114X7320 | OP-MSIM080ML | MLZ038T5B | G | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | B3 | 825 | 1105 | 464 | 3/8" | 1/2" | 98 | 80 |
| MBP | 114X7315 | 114X7321 | OP-MSIM099ML | MLZ045T4B | E | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | B3 | 825 | 1105 | 464 | 1/2" | 1/2" | 100 | 82 |
| MBP | 114X7316 | 114X7322 | OP-MSIM108ML | MLZ048T4B | E | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | B3 | 825 | 1105 | 464 | 1/2" | 1/2" | 100 | 82 |

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2) S** - R134a, R513A & R1234yf
**T** - R404A/R507,R455A,R454C,R448A/R449A,R452A ;
**V** - R454C, R455A, R452A, R404A/R507


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| Designation | | LSQM026AJ | LSQM034AJ | LSQM048NT | LSQM048NT | LSQM068NT | LSQM068NT | LSQM067LL |
|---|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7085 | 114X7086 | 114X7087 | 114X7088 | 114X7089 | 114X7090 | 114X7091 |
| | W09 | 114X7179 | 114X7180 | 114X7181 | 114X7182 | 114X7183 | 114X7184 | 114X7187 |
| Compressor Description | | CAJ2446Z | CAJ2464Z | NTZ048-5 | NTZ048-4 | NTZ068-5 | NTZ068-4 | LLZ013T4 |
| Oil (reference) | | RL32HA/HT | RL32HA/HT | 175PZ-POE | 175PZ-POE | 175PZ-POE | 175PZ-POE | 215PZ-POE46 |
| Housing | | B2 | B2 | B2 | B2 | B2 | B2 | B3 |
| **Spare Parts** | | | | | | | | |
| Compressor single pack | | 118U3992 | 118U3990 | 120F0228 | 120F0226 | 120F0232 | 120F0230 | 121L9535 |
| Condenser | | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5219 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | - | - | - | - | - | - | 118U3829 |
| Fan blade | | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | - |
| Fan capacitor | | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | - |
| Fan cowl/grill | | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3485 |
| Fan motor | | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3829 |
| Filter drier | | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5044 |
| Liquid valve | | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 |
| Receiver | | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4014 |
| Sight glass | | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 |
| Suction valve | | 118U3761 | 118U3761 | 118U3764 | 118U3764 | 118U3764 | 118U3764 | 118U3762 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | |
| Crankcase heater | | 120Z0057 | 120Z0057 | 120Z0459 | 120Z0459 | 120Z0459 | 120Z0459 | 120Z5040 |
| Contactor kit | | 118U3893 | 118U3894 | 118U3894 | 118U3893 | 118U3896 | 118U3893 | 118U3896 |
| Main switch kit | W05 | 118U3872 | 118U3976 | 118U3976 | 118U3872 | 118U3869 | 118U3873 | 118U3873 |
| | W09 | 118U3851 | 118U3852 | 118U3852 | 118U3853 | 118U3854 | 118U3851 | 118U3852 |
| Isolator switch assembly | W09 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5120 |
| Overload relay | | 118U3876 | 118U3877 | 118U3877 | 118U3978 | 118U3879 | 118U3876 | 118U3877 |
| Run capacitor | | 118U5191* | 118U5192* | 8173041 | - | 8173041 | - | - |
| Starting capacitor | | | | 120Z0400 | - | 120Z0400 | - | - |
| Starting relay | | | | 8173022 | - | 8173022 | - | - |
| Sequence phase relay | | - | - | - | - | - | - | 118U3882 |
| FSC - XGE Female connection | | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 |
| **Accessories (Not Premounted)** | | | | | | | | |
| Acoustic hood | | - | - | 120Z0575 | 120Z0575 | 120Z0575 | 120Z0575 | 120Z5052 |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Fusible plug (1/4") | | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | | |
| Top panel | | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5151 |
| Fan panel | | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5152 |
| Back panel | | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5153 |
| Left side panel | | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5169 |
| Service panel | W05 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5154 |
| | W09 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5158 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit

| Designation | | LSQM084LL | LSQM098LL | LSQM068FH | LSQM068FH | LSQM014DP | LSQM018P |
|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7092 | 114X7075 | 114X7095 | 114X7096 | 114X7106 | 114X7107 |
| | W09 | 114X7188 | 114X7189 | 114X7185 | 114X7186 | 114X7129 | 114X7130 |
| Compressor Description | | LLZ015T4 | LLZ018T4 | FH2511Z-XC | FH2511Z-XG | DPT14LA | DPT16LA |
| Oil (reference) | | 215PZ-POE46 | 215PZ-POE46 | RL32HA/HT | RL32HA/HT | POE32 | POE32 |
| Housing | | B3 | B3 | B2 | B2 | B1 | B1 |
| **Spare Parts** | | | | | | | |
| Compressor single pack | | 121L9537 | 121L9539 | 118U5333 | 118U5334 | 123B6013 | 123B6014 |
| Condenser | | 118U5219 | 118U5219 | 118U5218 | 118U5218 | 118U5217 | 118U5217 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | 118U3829 | 118U3829 | - | - | - | - |
| Fan blade | | - | - | 118U3481 | 118U3481 | 118U3480 | 118U3480 |
| Fan capacitor | | - | - | 118U3297 | 118U3297 | 118U3296 | 118U3296 |
| Fan cowl/grill | | 118U3485 | 118U3485 | 118U3484 | 118U3484 | 118U3483 | 118U3483 |
| Fan motor | | 118U3829 | 118U3829 | 118U3823 | 118U3823 | 118U3477 | 118U3477 |
| Filter drier | | 023Z5044 | 023Z5044 | 023Z5041 | 023Z5041 | 023Z5040 | 023Z5040 |
| Liquid valve | | 118U5253 | 118U3761 | 118U3761 | 118U3761 | 118U3414 | 118U3414 |
| Receiver | | 118U4014 | 118U4014 | 118U4012 | 118U4012 | 118U4020 | 118U4020 |
| Sight glass | | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0182 | 014L0182 |
| Suction valve | | 118U3762 | 118U3762 | 118U5288 | 118U3764 | 118U5254 | 118U3414 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | |
| Crankcase heater | | 120Z5040 | 120Z5040 | 120Z0459 | 120Z0459 | 118U0051 | 118U0051 |
| Contactor kit | | 118U3896 | 118U3896 | 118U3867 | 118U3893 | 118U3893 | 118U3893 |
| Main switch kit | W05 | 118U3874 | 118U3874 | 118U3870 | 118U3872 | 118U3975 | 118U3975 |
| | W09 | 118U3852 | 118U3852 | 118U3855 | 118U3851 | 118U3853 | 118U3853 |
| Isolator switch assembly | W09 | 118U5120 | 118U5120 | 118U5117 | 118U5117 | 118U5117 | 118U5117 |
| Overload relay | | 118U3878 | 118U3878 | 118U3880 | 118U3876 | 118U3978 | 118U3978 |
| Run capacitor | | - | - | 118U5199* | - | 123B9222 | 123B9219 |
| Starting capacitor | | - | - | | - | 123B9312 | 123B9316 |
| Starting relay | | - | - | | - | 123B9151 | 123B9151 |
| Sequence phase relay | | 118U3882 | 118U3882 | - | - | - | - |
| FSC - XGE Female connection | | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 |
| **Accessories (Not Premounted)** | | | | | | | |
| Acoustic hood | | 120Z5052 | 120Z5052 | - | - | - | - |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Fusible plug (1/4") | | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | |
| Top panel | | 118U5151 | 118U5151 | 118U5146 | 118U5146 | 118U5141 | 118U5141 |
| Fan panel | | 118U5152 | 118U5152 | 118U5147 | 118U5147 | 118U5142 | 118U5142 |
| Back panel | | 118U5153 | 118U5153 | 118U5148 | 118U5148 | 118U5143 | 118U5143 |
| Left side panel | | 118U5169 | 118U5169 | 118U5168 | 118U5168 | 118U5167 | 118U5167 |
| Service panel | W05 | 118U5154 | 118U5154 | 118U5149 | 118U5149 | 118U5144 | 118U5144 |
| | W09 | 118U5158 | 118U5158 | 118U5157 | 118U5157 | 118U5156 | 118U5156 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit


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| Designation | | LSVM014DP | LSVM016DP | LSVM026DS | LSVM034DS | LSVM048NT | LSVM048NT | LSVM068NT |
|---|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7263 | 114X7242 | 114X7227 | 114X7228 | 114X7244 | 114X7245 | 114X7247 |
| | W09 | 114X7295 | 114X7296 | 114X7297 | 114X7298 | 114X7282 | 114X7283 | 114X7285 |
| Compressor Description | | DPT14LA | DPT16LA | DST26NA | DST34LA | NTZ048-5 | NTZ048-4 | NTZ068-4 |
| Oil (reference) | | POE32 | POE32 | POE 46 | POE 46 | 175PZ-POE | 175PZ-POE | 175PZ-POE |
| Housing | | B1 | B1 | B2 | B2 | B2 | B2 | B2 |
| **Spare Parts** | | | | | | | | |
| Compressor single pack | | 123B6013 | 123B6014 | 123B6015 | 123B6016 | 120F0228 | 120F0226 | 120F0230 |
| Condenser | | 118U5217 | 118U5217 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | - | - | - | - | - | - | - |
| Fan blade | | 118U3480 | 118U3480 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 |
| Fan capacitor | | 118U3296 | 118U3296 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 |
| Fan cowl/grill | | 118U3483 | 118U3483 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 |
| Fan motor | | 118U3477 | 118U3477 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 |
| Filter drier | | 023Z5040 | 023Z5040 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 |
| Liquid valve | | 118U5254 | 118U5254 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 |
| Receiver | | 118U5297 | 118U5297 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 |
| E-box Cable gland | | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Sight glass | | 014L0182 | 014L0182 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 |
| Suction valve | | 118U5254 | 118U5254 | 118U5253 | 118U5253 | 118U5288 | 118U5288 | 118U5288 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | |
| Crankcase heater | | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0459 | 120Z0459 | 120Z0459 |
| Contactor kit | | 118U3893 | 118U3893 | 118U3894 | 118U3894 | 118U3896 | 118U3893 | 118U3894 |
| Timer | | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 |
| Main switch kit | W05 | 118U3975 | 118U3975 | 118U3976 | 118U3976 | 118U3976 | 118U5088 | 118U5084 |
| | W09 | 118U3853 | 118U3853 | 118U3851 | 118U3851 | 118U3852 | 118U3853 | 118U3851 |
| Overload relay | W05 | 118U3978 | 118U3978 | 118U3876 | 118U3876 | 118U3877 | 118U3978 | 118U3876 |
| Isolator switch assembly | W09 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Run capacitor | | 123B9222 | 123B9219 | 123B9215 | 123B9226 | 8173041 | - | - |
| Starting capacitor | | 123B9312 | 123B9316 | 123B9304 | 123B9304 | 120Z0400 | - | - |
| Starting relay | | 123B9151 | 123B9151 | 123B9154 | 123B9154 | 8173022 | - | - |
| Sequence phase relay | | - | - | - | - | - | - | - |
| **Accessories (Not Premounted)** | | | | | | | | |
| Acoustic hood | | - | - | - | - | - | - | - |
| FSC Female connection | | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Unit stand | | 118U5281 | 118U5281 | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | | |
| Top panel | | 118U5141 | 118U5141 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 |
| Fan panel | | 118U5142 | 118U5142 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 |
| Back panel | | 118U5143 | 118U5143 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 |
| Left side panel | | 118U5167 | 118U5167 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 |
| Service panel | W05 | 118U5144 | 118U5144 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 |
| | W09 | 118U5156 | 118U5156 | 118U5293 | 118U5293 | 118U5293 | 118U5293 | 118U5156 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit

| Designation | | MSGM012SC | MSGM015SC | MSGM018SC | MSGM021SC | MSBM009DY | MSBM012DP | MSBM014DP | MSBM026AJ | MSBM034AJ |
|---|---|---|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7099 | 114X7100 | 114X7101 | 114X7102 | 114X7108 | 114X7109 | 114X7110 | 114X7083 | 114X7084 |
| | W09 | 114X7207 | 114X7208 | 114X7131 | 114X7132 | 114X7133 | 114X7134 | 114X7135 | 114X7190 | 114X7191 |
| Compressor Description | | SC12G | SC15G | SC18G | SC21G | DLY90RAb | DPT12RA | DPT14RA | CAJ4517Z | CAJ4519Z |
| Oil (reference) | | POE22 | POE22 | POE22 | POE22 | POE32 | POE32 | POE32 | RL32HA/HT | RL32HA/HT |
| Housing | | B1 | B1 | B1 | B1 | B1 | B1 | B1 | B2 | B2 |
| **Spare Parts** | | | | | | | | | | |
| Compressor single pack | | 118U5367 | 118U5368 | 118U5354 | 118U5356 | 123B6004 | 123B6005 | 123B6006 | 118U3993 | 118U3994 |
| Condenser | | 118U5217 | 118U5217 | 118U5217 | 118U5217 | 118U5217 | 118U5217 | 118U5217 | 118U5218 | 118U5218 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | - | - | - | - | - | - | - | - | - |
| Fan blade | | 118U3480 | 118U3480 | 118U3480 | 118U3480 | 118U3480 | 118U3480 | 118U3480 | 118U3481 | 118U3481 |
| Fan capacitor | | 118U3296 | 118U3296 | 118U3296 | 118U3296 | 118U3296 | 118U3296 | 118U3296 | 118U3297 | 118U3297 |
| Fan cowl/grill | | 118U3483 | 118U3483 | 118U3483 | 118U3483 | 118U3483 | 118U3483 | 118U3483 | 118U3484 | 118U3484 |
| Fan motor | | 118U3477 | 118U3477 | 118U3477 | 118U3477 | 118U3477 | 118U3477 | 118U3477 | 118U3823 | 118U3823 |
| Filter drier | | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5041 | 023Z5041 |
| Liquid valve | | 118U5254 | 118U5254 | 118U5254 | 118U5254 | 118U5254 | 118U5254 | 118U5254 | 118U3761 | 118U3761 |
| Receiver | | 118U4020 | 118U4020 | 118U4020 | 118U4020 | 118U4020 | 118U4020 | 118U4020 | 118U4012 | 118U4012 |
| Sight glass | | 014L0182 | 014L0182 | 014L0182 | 014L0182 | 014L0182 | 014L0182 | 014L0182 | 014L0173 | 014L0173 |
| Suction valve | | 118U3414 | 118U3414 | 118U3414 | 118U3414 | 118U3414 | 118U3414 | 118U3414 | 118U5253 | 118U3761 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | | |
| Crankcase heater | | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 |
| Contactor kit | | 118U3893 | 118U3893 | 118U3893 | 118U3893 | 118U3893 | 118U3893 | 118U3893 | 118U3896 | 118U3896 |
| Main switch kit | W05 | 118U3980 | 118U3980 | 118U3980 | 118U3980 | 118U3975 | 118U3975 | 118U3975 | 118U3976 | 118U3976 |
| | W09 | 118U5162 | 118U3853 | 118U3853 | 118U3853 | 118U3853 | 118U3853 | 118U3851 | 118U3852 | 118U3852 |
| Isolator switch assembly | W09 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 |
| Overload relay | | 118U3979 | 118U3979 | 118U3978 | 118U3978 | 118U3978 | 118U3876 | 118U3876 | 118U3877 | 118U3878 |
| Run capacitor | | - | - | - | 117-7029* | 123B9222 | 123B9215 | 123B9226 | 118U5195* | 118U5196* |
| Starting capacitor | | 117U5017 | 117U5017 | 117U5017 | - | 123B9315 | 123B9315 | 123B9315 | - | - |
| Starting relay | | 117U6003 | 117U6005 | 117U6019 | - | 123B9133 | 123B9151 | 123B9139 | - | - |
| Sequence phase relay | | - | - | - | - | - | - | - | - | - |
| FSC - XGE Female connection | | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 |
| **Accessories (Not Premounted)** | | | | | | | | | | |
| Acoustic hood | | - | - | - | - | - | - | - | - | - |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Fusible plug (1/4") | | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | | | | |
| Top panel | | 118U5141 | 118U5141 | 118U5141 | 118U5141 | 118U5141 | 118U5141 | 118U5141 | 118U5146 | 118U5146 |
| Fan panel | | 118U5142 | 118U5142 | 118U5142 | 118U5142 | 118U5142 | 118U5142 | 118U5142 | 118U5147 | 118U5147 |
| Back panel | | 118U5143 | 118U5143 | 118U5143 | 118U5143 | 118U5143 | 118U5143 | 118U5143 | 118U5148 | 118U5148 |
| Left side panel | | 118U5167 | 118U5167 | 118U5167 | 118U5167 | 118U5167 | 118U5167 | 118U5167 | 118U5168 | 118U5168 |
| Service panel | W05 | 118U5144 | 118U5144 | 118U5144 | 118U5144 | 118U5144 | 118U5144 | 118U5144 | 118U5149 | 118U5149 |
| | W09 | 118U5156 | 118U5156 | 118U5156 | 118U5156 | 118U5156 | 118U5156 | 118U5156 | 118U5157 | 118U5157 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit


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| Designation | | MSBM026AJ | MSBM034AJ | MSBM024AJ | MSGM026AJ | MSGM033AJ | MSBM018AJ | MSXM034ML | MSXM034ML | MSXM044ML | MSXM044ML |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7093 | 114X7094 | 114X7097 | 114X7103 | 114X7104 | 114X7111 | 114X7061 | 114X7062 | 114X7161 | 114X7162 |
| | W09 | 114X7192 | 114X7193 | 114X7194 | 114X7209 | 114X7210 | 114X7136 | 114X7195 | 114X7196 | 114X7211 | 114X7212 |
| Compressor Description | | TAJ4517Z | TAJ4519Z | CAJ9513Z | CAJ4492Y | CAJ4511Y | CAJ9510Z | MLZ015T5 | MLZ015T4 | MLZ019T5 | MLZ019T4 |
| Oil (reference) | | RL32HA/HT | RL32HA/HT | RL32HA/HT | RL32HA/HT | RL32HA/HT | RL32HA/HT | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 |
| Housing | | B2 | B2 | B2 | B2 | B2 | B2 | B2 | B2 | B2 | B2 |
| **Spare Parts** | | | | | | | | | | | |
| Compressor single pack | | 118U3991 | 118U3989 | 118U3995 | 118U3997 | 118U3996 | 118U3988 | 121L8631 | 120U8725 | 121U8731 | 120U8725 |
| Condenser | | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | - | - | - | - | - | - | - | - | - | - |
| Fan blade | | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 |
| Fan capacitor | | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 |
| Fan cowl/grill | | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 |
| Fan motor | | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 |
| Filter drier | | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 |
| Liquid valve | | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 |
| Receiver | | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 |
| Sight glass | | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 |
| Suction valve | | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3761 | 118U3762 | 118U3762 | 118U3762 | 118U3762 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | | | |
| Crankcase heater | | 118U0051 | 118U0051 | 120Z0057 | 120Z0459 | 120Z0459 | 118U3761 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 |
| Contactor kit | | 118U3893 | 118U3893 | 118U3894 | 118U3894 | 118U3894 | 118U3894 | 118U3867 | 118U3893 | 118U3867 | 118U3894 |
| Main switch kit | W05 | 118U3872 | 118U3872 | 118U3976 | 118U3872 | 118U3872 | 118U3975 | 118U3873 | 118U3872 | 118U3870 | 118U3873 |
| | W09 | 118U3853 | 118U3853 | 118U3852 | 118U3851 | 118U3851 | 118U3851 | 118U3854 | 118U3851 | 118U3855 | 118U3851 |
| Isolator switch assembly | W09 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5117 |
| Overload relay | | 118U3978 | 118U3978 | 118U3877 | 118U3876 | 118U3876 | 118U3876 | 118U3879 | 118U3875 | 118U3880 | 118U3876 |
| Run capacitor | | - | - | 118U5198* | 118U5193* | 118U5194* | 118U5197* | 8173231 | - | 120Z0051 | - |
| Starting capacitor | | - | - | | | | | 120Z0399 | - | 120Z0399 | - |
| Starting relay | | - | - | | | | | 120Z0394 | - | 120Z0394 | - |
| Sequence phase relay | | - | - | - | - | - | - | 118U3882 | 118U3882 | 118U3882 | 118U3882 |
| FSC - XGE Female connection | | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 |
| **Accessories (Not Premounted)** | | | | | | | | | | | |
| Acoustic hood | | - | - | - | - | - | - | 120Z5083 | 120Z5083 | 120Z5083 | 120Z5083 |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Fusible plug (1/4") | | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | | | | | |
| Top panel | | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 |
| Fan panel | | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 |
| Back panel | | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 |
| Left side panel | | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 |
| Service panel | W05 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 |
| | W09 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5157 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit

| Designation | | MSXM046ML | MSXM046ML | MSXM057ML | MSXM057ML | MSXM068ML | MSXM068ML | MSXM080ML | MSXM080ML | MSXM099ML | MSXM108ML |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7063 | 114X7064 | 114X7065 | 114X7066 | 114X7067 | 114X7068 | 114X7069 | 114X7070 | 114X7071 | 114X7072 |
| | W09 | 114X7197 | 114X7198 | 114X7199 | 114X7200 | 114X7201 | 114X7202 | 114X7203 | 114X7204 | 114X7205 | 114X7206 |
| Compressor Description | | MLZ021T5 | MLZ021T4 | MLZ026T5 | MLZ026T4 | MLZ030T5 | MLZ030T4 | MLZ038T5 | MLZ038T4 | MLZ045T4 | MLZ048T4 |
| Oil (reference) | | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 |
| Housing | | B2 | B2 | B2 | B2 | B3 | B3 | B3 | B3 | B3 | B3 |
| **Spare Parts** | | | | | | | | | | | |
| Compressor single pack | | 121L8635 | 121L8633 | 121L8639 | 121L8637 | 121L8643 | 121L8641 | 121L8647 | 121L8645 | 121L8649 | 121L8651 |
| Condenser | | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5219 | 118U5219 | 118U5219 | 118U5219 | 118U5219 | 118U5219 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | - | - | - | - | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 |
| Fan blade | | 118U3481 | 118U3481 | 118U3481 | 118U3481 | - | - | - | - | - | - |
| Fan capacitor | | 118U3297 | 118U3297 | 118U3297 | 118U3297 | - | - | - | - | - | - |
| Fan cowl/grill | | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 |
| Fan motor | | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 |
| Filter drier | | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5044 | 023Z5044 | 023Z5044 | 023Z5044 | 023Z5044 | 023Z5044 |
| Liquid valve | | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 |
| Receiver | | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4014 | 118U4014 | 118U4014 | 118U4014 | 118U4014 | 118U4014 |
| Sight glass | | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 |
| Suction valve | | 118U3762 | 118U3762 | 118U3762 | 118U3762 | 118U5290 | 118U3763 | 118U3763 | 118U3763 | 118U3763 | 118U3763 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | | | |
| Crankcase heater | | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 |
| Contactor kit | | 118U3867 | 118U3894 | 118U3895 | 118U3894 | 118U3895 | 118U3896 | 118U3868 | 118U3896 | 118U3896 | 118U3896 |
| Main switch kit | W05 | 118U3870 | 118U3873 | 118U3870 | 118U3873 | 118U3874 | 118U3873 | 118U3871 | 118U3874 | 118U3874 | 118U3874 |
| | W09 | 118U3856 | 118U3851 | 118U3856 | 118U3852 | 118U3857 | 118U3852 | 118U3857 | 118U3852 | 118U3852 | 118U3854 |
| Isolator switch assembly | W09 | 118U5117 | 118U5117 | 118U5117 | 118U5117 | 118U5119 | 118U5120 | 118U5119 | 118U5120 | 118U5120 | 118U5120 |
| Overload relay | | 118U3880 | 118U3876 | 118U3880 | 118U3877 | 118U3880 | 118U3877 | 118U3881 | 118U3878 | 118U3878 | 118U3878 |
| Run capacitor | | 120Z0051 | - | 120Z0051 | - | 8173233 | - | 8173234 | - | - | - |
| Starting capacitor | | 120Z0399 | - | 120Z0399 | - | 120Z0400 | - | 8173001 | - | - | - |
| Starting relay | | 120Z0394 | - | 120Z0394 | - | 120Z0394 | - | 120Z0395 | - | - | - |
| Sequence phase relay | | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 |
| FSC - XGE Female connection | | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 | 061H3248 |
| **Accessories (Not Premounted)** | | | | | | | | | | | |
| Acoustic hood | | - | 120Z5043 | 120Z5043 | 120Z5043 | 120Z5044 | 120Z5044 | 120Z5044 | 120Z5044 | 120Z5044 | 120Z5044 |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Fusible plug (1/4") | | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | | | | | |
| Top panel | | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5151 | 118U5151 | 118U5151 | 118U5151 | 118U5151 | 118U5151 |
| Fan panel | | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5152 | 118U5152 | 118U5152 | 118U5152 | 118U5152 | 118U5152 |
| Back panel | | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5153 | 118U5153 | 118U5153 | 118U5153 | 118U5153 | 118U5153 |
| Left side panel | | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5169 | 118U5169 | 118U5169 | 118U5169 | 118U5169 | 118U5169 |
| Service panel | W05 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5154 | 118U5154 | 118U5154 | 118U5154 | 118U5154 | 118U5154 |
| | W09 | 118U5157 | 118U5157 | 118U5157 | 118U5157 | 118U5158 | 118U5158 | 118U5158 | 118U5158 | 118U5158 | 118U5158 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit


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| Designation | | MSIM034ML | MSIM034ML | MSIM044ML | MSIM044ML | MSIM046ML | MSIM046ML | MSIM057ML | MSIM057ML |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7266 | 114X7267 | 114X7268 | 114X7269 | 114X7270 | 114X7271 | 114X7272 | 114X7273 |
| | W09 | 114X7274 | 114X7275 | 114X7276 | 114X7277 | 114X7278 | 114X7279 | 114X7280 | 114X7281 |
| Compressor Description | | MLZ015T4 | MLZ015T5 | MLZ019T4 | MLZ019T5 | MLZ021T4 | MLZ021T5 | MLZ026T4 | MLZ026T5 |
| Oil (reference) | | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 |
| Housing | | B2 | B2 | B2 | B2 | B2 | B2 | B2 | B2 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | | 121L8421 | 121L8423 | 121L8425 | 121L8427 | 121L8429 | 121L8431 | 121L8433 | 121L8435 |
| Condenser | | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | - | - | - | - | - | - | - | - |
| Fan blade | | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 |
| Fan capacitor | | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 |
| Fan cowl/grill | | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 |
| Fan motor | | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 |
| Filter drier | | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 |
| Liquid valve | | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 |
| Receiver | | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 |
| E-box Cable gland | | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Sight glass | | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 |
| Suction valve | | 118U5289 | 118U5289 | 118U5289 | 118U5289 | 118U5289 | 118U5289 | 118U5289 | 118U5289 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 |
| Contactor kit | | 118U3893 | 118U3867 | 118U3894 | 118U3867 | 118U3894 | 118U3867 | 118U3894 | 118U3895 |
| Timer | | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 |
| Main switch kit | W05 | 118U3872 | 118U3873 | 118U3873 | 118U3870 | 118U3873 | 118U3870 | 118U3873 | 118U3870 |
| | W09 | 118U3851 | 118U3854 | 118U3851 | 118U3855 | 118U3851 | 118U3855 | 118U3852 | 118U3855 |
| Overload relay | | 118U3875 | 118U3879 | 118U3876 | 118U3879 | 118U3876 | 118U3880 | 118U3877 | 118U3880 |
| Potentiometer | | - | - | - | - | - | - | - | - |
| Run capacitor | | - | 8173231 | - | 120Z0051 | - | 120Z0051 | - | 120Z0051 |
| Starting capacitor | | - | 120Z0399 | - | 120Z0399 | - | 120Z0399 | - | 120Z0399 |
| Starting relay | | - | 120Z0394 | - | 120Z0394 | - | 120Z0394 | - | 120Z0394 |
| Sequence phase relay | | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | | 120Z5083 | 120Z5083 | 120Z5083 | 120Z5083 | 120Z5083 | 120Z5083 | 120Z5083 | 120Z5083 |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Unit stand | | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | | | |
| Top panel | | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 |
| Fan panel | | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 |
| Back panel | | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 |
| Left side panel | | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 |
| Service panel | W05 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 |
| | W09 | 118U5293 | 118U5293 | 118U5293 | 118U5293 | 118U5293 | 118U5293 | 118U5293 | 118U5293 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit

| Designation | | MSIM068ML | MSIM068ML | MSIM080ML | MSIM080ML | MSIM099ML | MSIM108ML | MSSM012SC | MSSM015SC |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7311 | 114X7312 | 114X7313 | 114X7314 | 114X7315 | 114X7316 | 114X7238 | 114X7239 |
| | W09 | 114X7317 | 114X7318 | 114X7319 | 114X7320 | 114X7321 | 114X7322 | 114X7291 | 114X7292 |
| Compressor Description | | MLZ030T4 | MLZ030T5 | MLZ038T4 | MLZ038T5 | MLZ045T4 | MLZ048T4 | SC12G | SC15G |
| Oil (reference) | | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | POE 22 | POE 22 |
| Housing | | B3 | B3 | B3 | B3 | B3 | B3 | B1 | B1 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | | 121L8437 | 121L8439 | 121L8441 | 121L8443 | 121L8445 | 121L8447 | 118U5367 | 118U5368 |
| Condenser | | 118U5219 | 118U5219 | 118U5219 | 118U5219 | 118U5219 | 118U5219 | 118U5217 | 118U5217 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | 118U5296 | 118U5296 | 118U5296 | 118U5296 | 118U5296 | 118U5296 | - | - |
| Fan blade | | - | - | - | - | - | - | 118U3480 | 118U3480 |
| Fan capacitor | | - | - | - | - | - | - | 118U3296 | 118U3296 |
| Fan cowl/grill | | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3483 | 118U3483 |
| Fan motor | | - | -- | - | - | - | - | 118U3477 | 118U3477 |
| Filter drier | | 023Z5044 | 023Z5044 | 023Z5044 | 023Z5044 | 023Z5044 | 023Z5044 | 023Z5040 | 023Z5040 |
| Liquid valve | | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5254 | 118U5254 |
| Receiver | | 118U5299 | 118U5299 | 118U5299 | 118U5299 | 118U5299 | 118U5299 | 118U5297 | 118U5297 |
| E-box Cable gland | | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Sight glass | | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0182 | 014L0182 |
| Suction valve | | 118U5290 | 118U5290 | 118U5290 | 118U5290 | 118U5290 | 118U5290 | 118U5254 | 118U5254 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z0057 | 120Z0057 |
| Contactor kit | | 118U3896 | 118U3895 | 118U3896 | 118U3868 | 118U3896 | 118U3896 | 118U3893 | 118U3893 |
| Timer | | 118U5247 | 118U5247 | 118U5247 | 118U5247 | 118U5247 | 118U5247 | 118U5257 | 118U5257 |
| Main switch kit | W05 | 118U3874 | 118U3871 | 118U3874 | 118U3871 | 118U3874 | 118U3874 | 118U3980 | 118U3980 |
| | W09 | 118U3852 | 118U3857 | 118U3854 | 118U3857 | 118U3854 | 118U3854 | 118U5162 | 118U5234 |
| Overload relay | | 118U3878 | 118U3880 | 118U3880 | 118U3881 | 118U3878 | 118U3878 | 118U3979 | 118U3979 |
| Potentiometer | | 118U5511 | 118U5511 | 118U5511 | 118U5511 | 118U5511 | 118U5511 | - | - |
| Run capacitor | | - | 8173233 | - | 8173234 | - | - | - | - |
| Starting capacitor | | - | 120Z0400 | - | 120Z0400 | - | - | 117U5017 | 117U5017 |
| Starting relay | | - | 120Z0394 | - | 120Z0395 | - | - | 117U6003 | 117U6005 |
| Sequence phase relay | | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | 118U3882 | - | - |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | | 120Z5084 | 120Z5084 | 120Z5084 | 120Z5084 | 120Z5084 | 120Z5084 | - | - |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Unit stand | | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5281 | 118U5281 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | | | |
| Top panel | | 118U5151 | 118U5151 | 118U5151 | 118U5151 | 118U5151 | 118U5151 | 118U5141 | 118U5141 |
| Fan panel | | 118U5330 | 118U5330 | 118U5330 | 118U5330 | 118U5330 | 118U5330 | 118U5142 | 118U5142 |
| Back panel | | 118U5153 | 118U5153 | 118U5153 | 118U5153 | 118U5153 | 118U5153 | 118U5143 | 118U5143 |
| Left side panel | | 118U5169 | 118U5169 | 118U5169 | 118U5169 | 118U5169 | 118U5169 | 118U5167 | 118U5167 |
| Service panel | W05 | 118U5154 | 118U5154 | 118U5154 | 118U5154 | 118U5154 | 118U5154 | 118U5144 | 118U5144 |
| | W09 | 118U5331 | 118U5331 | 118U5331 | 118U5331 | 118U5331 | 118U5331 | 118U5156 | 118U5156 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit


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| Designation | | MSSM018SC | MSSM021SC | MSSM026CS | MSSM030CS | MSTM008DY | MSTM009DY | MSTM012DP | MSTM014DP |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7240 | 114X7241 | 114X7248 | 114X7249 | 114X7226 | 114X7229 | 114X7230 | 114X7231 |
| | W09 | 114X7293 | 114X7294 | 114X7304 | 114X7305 | 114X7286 | 114X7287 | 114X7288 | 114X7289 |
| Compressor Description | | SC18G | SC21G | CS26TB | CS30TB | DLY80RAb | DLY90RAb | DPT12RA | DPT14RA |
| Oil (reference) | | POE 22 | POE 22 | POE 32 | POE 46 | POE 32 | POE 32 | POE 32 | POE 32 |
| Housing | | B1 | B1 | B2 | B2 | B1 | B1 | B1 | B1 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | | 118U5354 | 118U5356 | 123B6001 | 123B6002 | 123B6003 | 123B6004 | 123B6005 | 123B6006 |
| Condenser | | 118U5217 | 118U5217 | 118U5218 | 118U5218 | 118U5217 | 118U5217 | 118U5217 | 118U5217 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | - | - | - | - | - | - | - | - |
| Fan blade | | 118U3480 | 118U3480 | 118U3481 | 118U3481 | 118U3480 | 118U3480 | 118U3480 | 118U3480 |
| Fan capacitor | | 118U3296 | 118U3296 | 118U3297 | 118U3297 | 118U3296 | 118U3296 | 118U3296 | 118U3296 |
| Fan cowl/grill | | 118U3483 | 118U3483 | 118U3484 | 118U3484 | 118U3483 | 118U3483 | 118U3483 | 118U3483 |
| Fan motor | | 118U3477 | 118U3477 | 118U3823 | 118U3823 | 118U3477 | 118U3477 | 118U3477 | 118U3477 |
| Filter drier | | 023Z5040 | 023Z5040 | 023Z5041 | 023Z5041 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 |
| Liquid valve | | 118U5254 | 118U5254 | 118U5253 | 118U5253 | 118U5254 | 118U5254 | 118U5254 | 118U5254 |
| Receiver | | 118U5297 | 118U5297 | 118U5298 | 118U5298 | 118U5297 | 118U5297 | 118U5297 | 118U5297 |
| E-box Cable gland | | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Sight glass | | 014L0182 | 014L0182 | 014L0173 | 014L0173 | 014L0182 | 014L0182 | 014L0182 | 014L0182 |
| Suction valve | | 118U5254 | 118U5254 | 118U5253 | 118U5253 | 118U5254 | 118U5254 | 118U5254 | 118U5254 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 |
| Contactor kit | | 118U3893 | 118U3893 | 118U3894 | 118U3894 | 118U3893 | 118U3893 | 118U3893 | 118U3893 |
| Timer | | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 |
| Main switch kit | W05 | 118U3980 | 118U3980 | 118U3976 | 118U3976 | 118U3980 | 118U3975 | 118U3975 | 118U3975 |
| | W09 | 118U3853 | 118U3853 | 118U3852 | 118U3851 | 118U3853 | 118U3853 | 118U3853 | 118U3851 |
| Overload relay | | 118U3978 | 118U3978 | 118U3876 | 118U3876 | 118U3978 | 118U3978 | 118U3978 | 118U3875 |
| Potentiometer | | - | - | - | - | - | - | - | - |
| Run capacitor | | - | 117-7029 | - | 123B9146 | 123B9222 | 123B9222 | 123B9315 | 123B9315 |
| Starting capacitor | | 117U5017 | 117U5373 | 123B9304 | 123B9219 | 123B9315 | 123B9315 | 123B9215 | 123B9215 |
| Starting relay | | 117U6009 | - | 123B9146 | 123B9302 | 123B9133 | 123B9133 | 123B9151 | 123B9151 |
| Sequence phase relay | | - | - | - | - | - | - | - | - |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | | - | - | - | - | - | - | - | - |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Unit stand | | 118U5281 | 118U5281 | 118U5282 | 118U5282 | 118U5281 | 118U5281 | 118U5281 | 118U5281 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | | | |
| Top panel | | 118U5141 | 118U5141 | 118U5146 | 118U5146 | 118U5141 | 118U5141 | 118U5141 | 118U5141 |
| Fan panel | | 118U5142 | 118U5142 | 118U5147 | 118U5147 | 118U5142 | 118U5142 | 118U5142 | 118U5142 |
| Back panel | | 118U5143 | 118U5143 | 118U5148 | 118U5148 | 118U5143 | 118U5143 | 118U5143 | 118U5143 |
| Left side panel | | 118U5167 | 118U5167 | 118U5168 | 118U5168 | 118U5167 | 118U5167 | 118U5167 | 118U5167 |
| Service panel | W05 | 118U5144 | 118U5144 | 118U5149 | 118U5149 | 118U5144 | 118U5144 | 118U5144 | 118U5144 |
| | W09 | 118U5156 | 118U5156 | 118U5293 | 118U5293 | 118U5156 | 118U5156 | 118U5156 | 118U5156 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit

| Designation | | MSTM018DX | MSTM021DX | MSTM022DS | MSTM026DS | MSTM026DS | MSTM034DS | MSTM034DS | MSTM034DS |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | W05 | 114X7232 | 114X7325 | 114X7233 | 114X7234 | 114X7235 | 114X7237 | 114X7236 | 114X7326 |
| | W09 | 114X7290 | 114X7327 | 114X7299 | 114X7300 | 114X7301 | 114X7302 | 114X7303 | 114X7328 |
| Compressor Description | | DX18Tba | DX21Tba | DS22TB | DS26TB | DS26T3 | DS34TB | DS34T3 | DST38NA |
| Oil (reference) | | POE 32 | POE 46 | POE 46 | POE 46 | POE 46 | POE 46 | POE 46 | POE 46 |
| Housing | | B1 | B2 | B2 | B2 | B2 | B2 | B2 | B2 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | | 123B6007 | 123B6019 | 123B6008 | 123B6009 | 123B6011 | 123B6010 | 123B6012 | 123B6017 |
| Condenser | | 118U5217 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 |
| Dual pressure switch | | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 | 060-539766 |
| Fan assembly | | - | - | - | - | - | - | - | - |
| Fan blade | | 118U3480 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 |
| Fan capacitor | | 118U3296 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 |
| Fan cowl/grill | | 118U3483 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 |
| Fan motor | | 118U3477 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 |
| Filter drier | | 023Z5040 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 |
| Liquid valve | | 118U5254 | 118U5298 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5298 |
| Receiver | | 118U5297 | 118U5251 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5251 |
| E-box Cable gland | | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Sight glass | | 014L0182 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 |
| Suction valve | | 118U5254 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 | 118U5253 |
| Brass plug (3/8" NPT) | | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 |
| Contactor kit | | 118U3894 | 118U3894 | 118U3894 | 118U3896 | 118U3893 | 118U3867 | 118U3893 | 118U3893 |
| Timer | | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 | 118U5257 |
| Main switch kit | W05 | 118U3980 | 118U3976 | 118U3976 | 118U3976 | 118U5088 | 118U5102 | 118U5088 | 118U5088 |
| | W09 | 118U3853 | 118U3851 | 118U3851 | 118U3853 | 118U3854 | 118U3851 | 118U3851 | 118U3851 |
| Overload relay | | 118U3876 | 118U3876 | 118U3876 | 118U3877 | 118U3978 | 118U3879 | 118U3875 | 118U3875 |
| Potentiometer | | - | - | - | - | - | - | - | - |
| Run capacitor | | 123B9219 | 123B9215 | 123B9215 | 123B9215 | - | 123B9226 | - | 123B9226 |
| Starting capacitor | | 123B9321 | 123B9302 | 123B9302 | 123B9304 | | 123B9304 | - | 123B9304 |
| Starting relay | | 123B9159 | 123B9154 | 123B9154 | 123B9154 | - | 123B9154 | - | 123B9154 |
| Sequence phase relay | | - | - | - | - | - | - | - | - |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | | - | - | - | - | - | - | - | - |
| Discharge Gas thermostat | | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 | 7750009 |
| Unit stand | | 118U5281 | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 | 118U5282 |
| Pressure Relief Valve | | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Sheet Metal** | | | | | | | | | |
| Top panel | | 118U5141 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 | 118U5146 |
| Fan panel | | 118U5142 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 | 118U5147 |
| Back panel | | 118U5143 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 | 118U5148 |
| Left side panel | | 118U5167 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 | 118U5168 |
| Service panel | W05 | 118U5144 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 | 118U5149 |
| | W09 | 118U5156 | 118U5293 | 118U5293 | 118U5293 | 118U5293 | 118U5293 | 118U5293 | 118U5293 |

XGE - FSC, Fan Speed Controller
* - Spare part, Starting Kit


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| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Acoustic Hood | 120Z0575 | ACOUSTIC HOOD COMP 1CYL | |
| Acoustic Hood | 120Z5043 | ACCOUSTIC HOOD - SMALL FRAME | |
| Acoustic Hood | 120Z5044 | Acoustic hood for Scroll MLZ compressor | |
| Acoustic Hood | 120Z5045 | ACCOUSTIC HOOD, LARGE FRAME | |
| Acoustic Hood | 120Z5052 | Sound Cover, LLZ013-018 | |
| Back Panel B1 | 118U5143 | SPARE PART, SHEET METAL BACK B1 | |
| Back Panel B2 | 118U5148 | SPARE PART, SHEET METAL BACK B2 | |
| Back Panel B3 | 118U5153 | SPARE PART, SHEET METAL BACK B3 | |
| Brass plug (3/8" NPT) | 118U4037 | SPARE PART, 3/8" BRASS PLUG | 3/8" NPT connection |
| Capacitor | 8173001 | CAPACITOR 100µF 330V+R | |
| Capacitor | 8173041 | CAPACITOR 30µF 450V | |
| Capacitor | 117U5017 | START CAPACITOR 80 mfd | |
| Capacitor | 117U5012 | Start Capacitor 125 mF, 220V/50Hz | |
| Capacitor | 120Z0400 | CAPACITOR 161-193µF 330V | |
| Compressor Single Pack | 118U5333 | SPARE PART COM FH2511 1P FH2 PLUS | |
| Compressor Single Pack | 118U5334 | SPARE PART COM FH2511 3P FH2 PLUS | |
| Compressor Single Pack | 118U3988 | CAJ9510Z - AJ2 range | |
| Compressor Single Pack | 118U3989 | TAJ4519Z - AJ2 range | |
| Compressor Single Pack | 118U3990 | CAJ2464Z - AJ2 range | |
| Compressor Single Pack | 118U3991 | TAJ4517Z - AJ2 range | |
| Compressor Single Pack | 118U3992 | CAJ2446Z - AJ2 range | |
| Compressor Single Pack | 118U3993 | CAJ4517Z - AJ2 range | |
| Compressor Single Pack | 118U3994 | CAJ4519Z - AJ2 range | |
| Compressor Single Pack | 118U3995 | CAJ9513Z - AJ2 range | |
| Compressor Single Pack | 118U3996 | CAJ4511Y - AJ2 range | |
| Compressor Single Pack | 118U3997 | CAJ4492Y - AJ2 range | |
| Compressor Single Pack | 120F0226 | NTZ048-4LR1B | |
| Compressor Single Pack | 120F0228 | NTZ048-5LR1B | |
| Compressor Single Pack | 120F0230 | NTZ068-4LR1B | |
| Compressor Single Pack | 120F0232 | NTZ068-5LR1B | |
| Compressor Single Pack | 121L8629 | MLZ015T4LP9A | |
| Compressor Single Pack | 121L8631 | MLZ015T5LP9A | |
| Compressor Single Pack | 121U8731 | MLZ019T5LT9A COMPRESSOR | |
| Compressor Single Pack | 120U8725 | MLZ019T4LP9A COMPRESSOR | |
| Compressor Single Pack | 121L8633 | MLZ021T4LP9A | |
| Compressor Single Pack | 121L8635 | MLZ021T5LP9A | |
| Compressor Single Pack | 121L8637 | MLZ026T4LP9A | |
| Compressor Single Pack | 121L8639 | MLZ026T5LP9A | |
| Compressor Single Pack | 121L8641 | MLZ030T4LC9A | |
| Compressor Single Pack | 121L8643 | MLZ030T5LC9A | |
| Compressor Single Pack | 121L8645 | MLZ038T4LC9A | |
| Compressor Single Pack | 121L8647 | MLZ038T5LC9A | |
| Compressor Single Pack | 121L8649 | MLZ045T4LC9A | |
| Compressor Single Pack | 121L8651 | MLZ048T4LC9A | |
| Compressor Single Pack | 121L9535 | LLZ013T4LQ9A | |
| Compressor Single Pack | 121L9537 | LLZ015T4LQ9A | |
| Compressor Single Pack | 121L9539 | LLZ018T4LQ9A | |
| Compressor Single Pack | 123B2126 | MPT14LA | |
| Compressor Single Pack | 123B2127 | MPT16LA | |
| Compressor Single Pack | 123B2514 | MLY90RAb | |
| Compressor Single Pack | 123B2518 | MPT12RA | |
| Compressor Single Pack | 123B2704 | MPT14RA | |
| Compressor Single Pack | 195B0050 | SC12G | |
| Compressor Single Pack | 195B0053 | SC15G | |
| Compressor Single Pack | 195B0059 | SC18G | |
| Compressor Single Pack | 195B0636 | SC21G | |
| Compressor Single Pack | 123B6001 | CS26TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6002 | CS30TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6003 | DLY80RAb; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6004 | DLY90RAb; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6005 | DPT12RA; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6006 | DPT14RA; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6007 | DX18TBa; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6008 | DS22TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6009 | DS26TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6010 | DS34TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6011 | DS26T3; 400/440V 50/60Hz ~3; I Pack | |
| Compressor Single Pack | 123B6012 | DS34T3; 400/440V 50/60Hz ~3; I Pack | |
| Compressor Single Pack | 123B6013 | DPT14LA; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6014 | DPT16LA; 220-240V 50Hz ~1; I Pack | |

| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Compressor Single Pack | 123B6015 | DST26NA; 220-240V 50Hz; I Pack | |
| Compressor Single Pack | 123B6016 | DST34LA; 220-240V 50Hz ~1; I Pac | |
| Compressor Single Pack | 121L8421 | MLZ015T4; A2L compressor, Single pack | |
| Compressor Single Pack | 121L8423 | MLZ015T5; A2L compressor, Single pack | |
| Compressor Single Pack | 121L8425 | MLZ019T4; A2L compressor, Single pack | |
| Compressor Single Pack | 121L8427 | MLZ019T5; A2L compressor, Single pack | |
| Compressor Single Pack | 121L8429 | MLZ021T4; A2L compressor, Single pack | |
| Compressor Single Pack | 121L8431 | MLZ021T5; A2L compressor, Single pack | |
| Compressor Single Pack | 121L8433 | MLZ026T4; A2L compressor, Single pack | |
| Compressor Single Pack | 121L8435 | MLZ026T5; A2L compressor, Single pack | |
| Condenser | 118U3492 | Spare part, A7 MCHX | Phased out & replaced by 118U5217 from SN: -096147CG0419 |
| Condenser | 118U3493 | Spare part, D7 MCHX | Phased out & replaced by 118U5218 from SN: -096147CG0419 |
| Condenser | 118U3494 | Spare part, G7 MCHX | Phased out & replaced by 118U5219 from SN: -096147CG0419 |
| Contactor kit | 118U3867 | KIT CONT,LC1E2501M6 | |
| Contactor kit | 118U3868 | KIT CONT,LC1E3801M6 | |
| Contactor kit | 118U3893 | KIT CONT,LC1E0901M5 | |
| Contactor kit | 118U3894 | KIT CONT,LC1E1201M5 | |
| Contactor kit | 118U3895 | KIT CONT,LC1E3201M5 | |
| Contactor kit | 118U3896 | KIT CONT,LC1E1801M5 | |
| Crankcase heater | 120Z0057 | Belt type, 50 W, 230 V, CE mark, UL | |
| Crankcase heater | 120Z0459 | PTC heater 27 W, CE mark, UL | |
| Crankcase heater | 120Z5040 | Belt type, 70 W, 240 V, CE mark, UL | |
| Crankcase heater | 118U0051 | CRANKCASE HEATER 55W | |
| Door Handle | 118U3858 | HANDLE, ABB-OHB2AJM,MSMN,OXS5X131 | |
| Dual pressure switch | 060-539766 | KP17WB Pressure Switch M/24 | |
| E-box Cable gland | 118U5258 | SPARE PART, CABLE GLAND | |
| Fan assembly | 118U3829 | FAN ASSEMBLIES, EBM, ERP2015 | |
| Fan blade | 118U3480 | FAN BLADE 14" | |
| Fan blade | 118U3481 | FAN BLADE 18" | |
| Fan capacitor | 118U3296 | CAPACITOR 1,8 µF | |
| Fan capacitor | 118U3297 | 25PACITOR 3,5 µF | |
| Fan cowl/grill | 118U3483 | FAN GRILL HOUSING Ø356 mm | |
| Fan cowl/grill | 118U3484 | FAN GRILL HOUSING Ø457 mm | |
| Fan cowl/grill | 118U3485 | FAN GRILL HOUSING Ø609 mm | |
| Fan motor (Capacitor not included) | 118U3477 | FAN MOTOR 25W | |
| Fan motor (Capacitor not included) | 118U3823 | FAN MOTOR 68W | |
| Fan panel B1 | 118U5142 | SPARE PART, SHEET METAL FAN B1 | |
| Fan panel B2 | 118U5147 | SPARE PART, SHEET METAL FAN B2 | |
| Fan panel B3 | 118U5152 | SPARE PART, SHEET METAL FAN B3 | |
| Fan speed control Female connection | 061H3248 | XGE-2C | |
| Filter drier | 023Z5040 | DML083 | |
| Filter drier | 023Z5041 | DML084 | |
| Filter drier | 023Z5044 | DML164 | |
| Fusible plug (1/4") | 118U5170 | SPARE PART, FUSIBLE PLUG | |
| Isolator switch | 118U5117 | SPARE PART, ISOLATOR SWITCH SHAFT ASSLY B1/B2 | |
| Isolator switch | 118U5120 | SPARE PART, ISOLATOR SWITCH SHAFT ASSLY B3 3PH | |
| Isolator switch | 118U5119 | SPARE PART, ISOLATOR SWITCH SHAFT ASSLY B3 1PH | |
| Left Side Panel B1 | 118U5167 | SPARE PART, SHEET METAL LEFT SIDE B1 | |
| Left Side Panel B2 | 118U5168 | SPARE PART, SHEET METAL LEFT SIDE B2 | |
| Left Side Panel B3 | 118U5169 | SPARE PART, SHEET METAL LEFT SIDE B3 | |
| Main switch kit | 118U3869 | C60H2P25AC | |
| Main switch kit | 118U3870 | C60H2P32AC | |
| Main switch kit | 118U3871 | C60H2P40AC | |
| Main switch kit | 118U3872 | C60H4P10AC | |
| Main switch kit | 118U3873 | C60H4P16AC | |
| Main switch kit | 118U3874 | C60H4P20AC | |
| Main switch kit | 118U3975 | KIT CIRCUITBREAKER,C60H2P10A | |
| Main switch kit | 118U3976 | KIT CIRCUITBREAKER,C60H2P16A | |
| Main switch kit | 118U3980 | KIT CIRCUITBREAKER, -A9N2P06C | |
| Main switch kit | 118U3851 | KIT MPCB, ABB-MS116-10+HK1-20 | |
| Main switch kit | 118U3852 | KIT MPCB, ABB-MS116-16+HK1-20 | |
| Main switch kit | 118U3853 | KIT MPCB, ABB-MS116-6.3+HK1-20 | |
| Main switch kit | 118U3854 | KIT MPCB, ABB-MS132-20+HK1-20 | |
| Main switch kit | 118U3855 | KIT MPCB, ABB-MS132-25+HK1-20 | |
| Main switch kit | 118U3856 | KIT MPCB, ABB-MS132-32+HK1-20 | |
| Main switch kit | 118U3857 | KIT MPCB, ABB-MS450-40+HKS4-20 | |
| Main switch kit | 118U5162 | SPARE PART, KIT MPCB MS116-4.0 2.5-4A | |
| Main switch kit | 118U5234 | KIT MPCB, MS116-4.0 | |

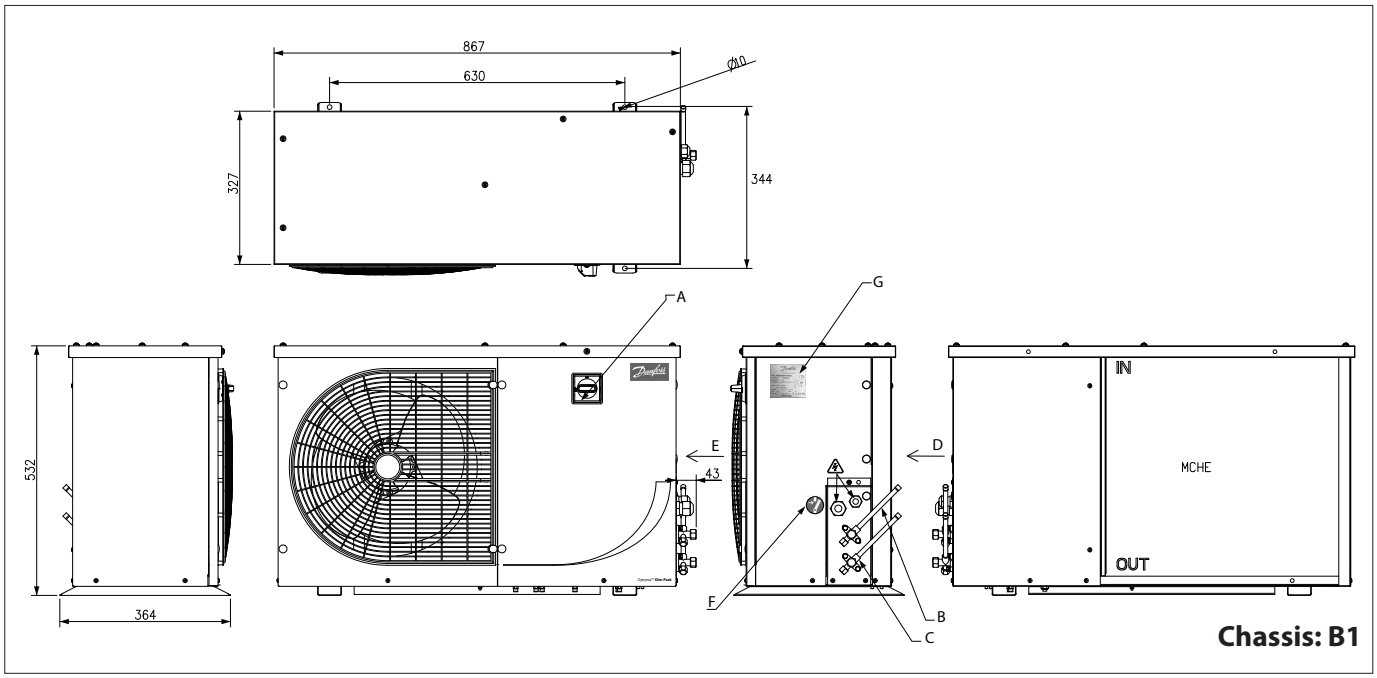

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| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Main switch kit | 118U5237 | KIT MPCB, MS116-12 | |
| Main switch kit | 118U5088 | KIT MPCB, A9N4P10C | |
| Main switch kit | 118U5102 | KIT MPCB, A9N2P25C | |
| Main switch kit | 118U5084 | KIT MPCB, A9N4P16C | |
| Main switch kit | 118U5098 | KIT MPCB, A9N2P32C | |
| Oil | - | POE32 for Light Commercial (MLY / MPT) | |
| Oil | - | RL32HA/HT for light Commercial (CAJ/FH/TAJ/TFH) | |
| Oil | 120Z0638 | 1 litre can of 175PZ - POE (NTZ Platform) | CU with a SN above 051220CG3016 |
| Oil | 120Z0648 | 1 litre can of 215PZ - POE46 (MLZ & LLZ Platform) | CU with a SN above 051220CG3016 |
| Overload relay | 118U3875 | KIT OL-RELAY, -LRE12+LAEB2 | |
| Overload relay | 118U3876 | KIT OL-RELAY, -LRE14+LAEB2 | |
| Overload relay | 118U3877 | KIT OL-RELAY, -LRE16+LAEB2 | |
| Overload relay | 118U3878 | KIT OL-RELAY, -LRE21+LAEB2 | |
| Overload relay | 118U3879 | KIT OL-RELAY, -LRE22+LAEB2 | |
| Overload relay | 118U3880 | KIT OL-RELAY, -LRE32+LAEB2 | |
| Overload relay | 118U3881 | KIT OL-RELAY, -LRE35+LAEB2 | |
| Overload relay | 118U3978 | KIT OL-RELAY, -LRE1 | |
| Overload relay | 118U3979 | KIT OL-RELAY, -LRE08 | |
| Receiver | 118U4020 | LIQUID RECEIVER 1,3 L | |
| Receiver | 118U4012 | LIQUID RECEIVER 3,4 L | |
| Receiver | 118U4014 | LIQUID RECEIVER 6,2 L | |
| Receiver | 118U4069 | SPARE PART, RCVR 1.3L, 1/4x3/8 | |
| Receiver | 118U5298 | SPARE PART, RCVR 3.4L, 1/2x1/2 | |
| Relay | 8173022 | STARTING RELAY TYPE RVA6AMKL | |
| Relay | 117U6013 | STARTING RELAY | |
| Relay | 117U6019 | Starting Relay SC 50/60 Hz | |
| Relay | 117U6011 | STARTING RELAY SC 220V/60Hz | |
| Relay | 117-7027 | SC-RELAY | |
| Relay | 117U6003 | STARTING RELAY TL/SC 115V/50/60Hz | |
| Relay | 117U6005 | STARTING RELAY SC 220V/50Hz | |
| Relay | 117-7029 | SC-RELAY | |
| Relay | 123B9133 | RELAY + CON. BOARD 1149-8 BDG 149S+ NTC | |
| Relay | 123B9139 | RELAY + CON. BOARD 1166-8 BDG 166S+ NTC | |
| Relay | 123B9151 | RELAY + CON. BOARD 1158-8 BDG 158S+ NTC | |
| Run capacitor | 8173231 | Run capacitor 440V, 40 µF | |
| Run capacitor | 8173233 | Run capacitor 440V,50 µF | |
| Run capacitor | 8173234 | Run capacitor 440V,55 µF | |
| Run capacitor | 120Z0051 | Run capacitor 70 µF | |
| Run capacitor | 123B9222 | RUN CAPACITOR 10µF/420V, REF. 326 | |
| Run capacitor | 123B9219 | RUN CAPACITOR 16µF/420V, REF. 321 | |
| Run capacitor | 123B9226 | RUN CAPACITOR 25µF/420V, REF. 310 MET. | |
| Run capacitor | 123B9215 | Run capacitor 420V, 20 µF | |
| Sequence phase relay | 118U3882 | SM500-MG73BF | |
| Service panel W05 B1 | 118U5144 | SPARE PART, SHEET METAL SERVICE PANEL B1 | |
| Service panel W05 B2 | 118U5149 | SPARE PART, SHEET METAL SERVICE PANEL B2 | |
| Service panel W05 B3 | 118U5154 | SPARE PART, SHEET METAL SERVICE PANEL B3 | |
| Service panel W09 B1 | 118U5156 | SPARE PART, SHEET METAL SERVICE PANEL B1- W09 | |
| Service panel W09 B1 | 118U5156 | SPARE PART, SHEET METAL SERVICE PANEL B1 -W09 A2L | |
| Service panel W09 B2 | 118U5157 | SPARE PART, SHEET METAL SERVICE PANEL B2 -W09 | |
| Service panel W09 B2 | 118U5293 | SPARE PART, SHEET METAL SERVICE PANEL B2 -W09 A2L | |
| Service panel W09 B3 | 118U5158 | SPARE PART, SHEET METAL SERVICE PANEL B3 -W09 | |
| Service valve | 118U3761 | SPARE PART - BRAZED SERVICE VALVE 1/2" | |
| Service valve | 118U3414 | SPARE PART - BRAZED SERVICE VALVE 3/8" | |
| Service valve | 118U3762 | SPARE PART VALVE- BRAZE SERVICE VALVE 3/4" | |
| Service valve | 118U3763 | SPARE PART-BRAZE SERVICE VALVE 7/8" | |
| Service valve | 118U3764 | SPARE PART-BRAZE SERVICE VALVE 5/8" | |
| Service valve | 118U5253 | SPARE PART, ECOSOFT SERVICE VLV 1/2" | |
| Service valve | 118U5254 | SPARE PART, ECOSOFT SERVICE VLV 3/8" | |
| Sight glass | 014L0173 | SGP 12 N | |
| Sight glass | 014L0182 | SGP 10s N | |
| Start capacitor | 123B9302 | Start capacitor 72-88 µF, 330 V | |
| Start capacitor | 123B9316 | STARTING CAPACITOR+CC 72-88µF/330V R216 | |
| Start capacitor | 123B9315 | STARTING CAPACITOR+CC 64-77µF/330V R205 | |
| Start capacitor | 117U5373 | START CAPACITOR 80 mfd | |
| Start capacitor | 120Z0399 | Start capacitor 145-175 F | |
| Start capacitor | 123B9321 | Start capacitor 88-108 µF, 330V+Cover+Cable | |

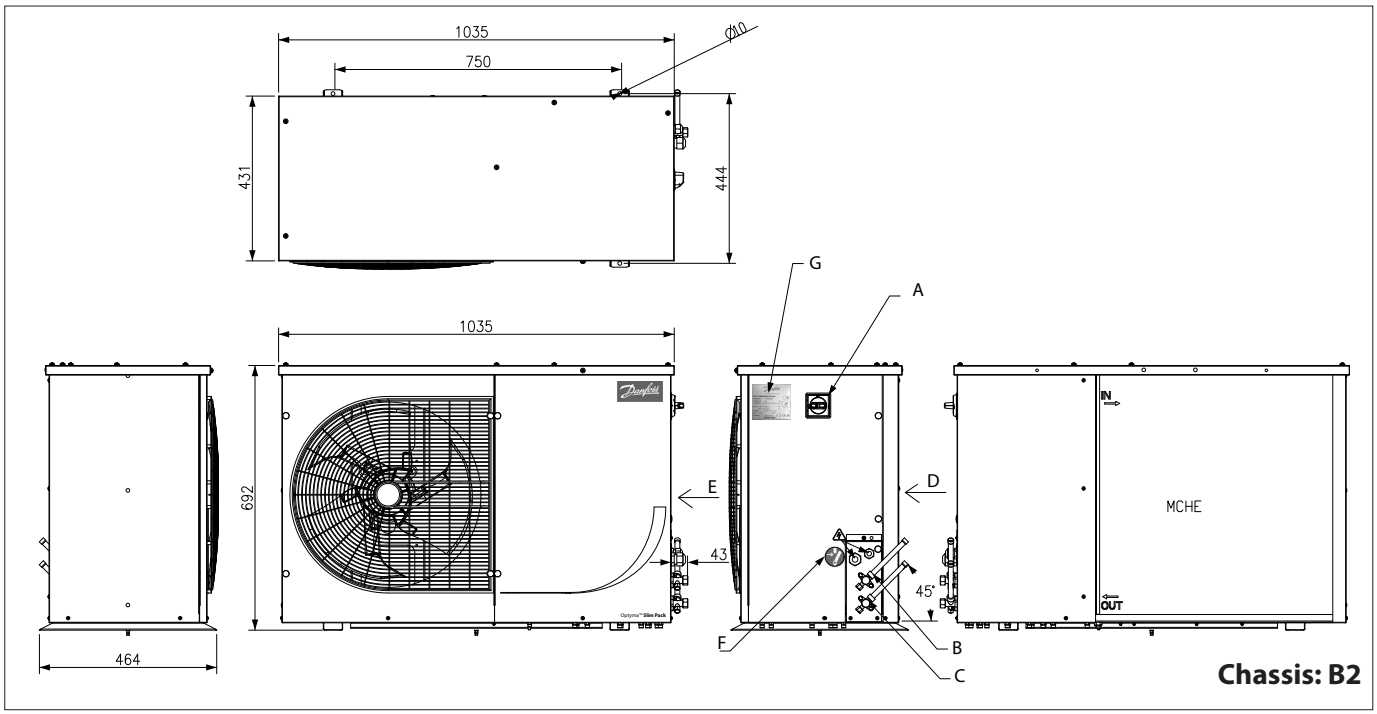
**Catalogue** **Optyma™ Slim Pack - Spare parts & accessories list**

| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Start capacitor | 117U5017 | Start capacitor 80 µF, 220V - SC | |
| Start capacitor | 123B9304 | Start capacitor 88-108 µF, 330V | |
| Start relay | 120Z0393 | Starting relay RVA9CKL | |
| Start relay | 120Z0394 | Starting relay RVA3EKL | |
| Start relay | 120Z0395 | Starting relay RVA4GKL | |
| Start relay | 123B9133 | RELAY + CON. BOARD 1149-8 BDG 149S+ NTC | |
| Start relay | 123B9151 | RELAY + CON. BOARD 1158-8 BDG 158S+ NTC | |
| Start relay | 117U6003 | STARTING RELAY TL/SC 115V/50/60Hz | |
| Start relay | 117U6005 | STARTING RELAY SC 220V/50Hz | |
| Start relay | 123B9159 | Relay + Con. Board R.1180 | |
| Start relay | 117U6009 | Relay Assembly - SC18G | |
| Start relay | 123B9154 | Tension Relay 9002 | |
| Start relay | 123B9146 | Tension Relay 9004 | |
| Start relay | 123B9219 | RUN CAPACITOR 16µF/420V, REF. 321 | |
| Starting KIT | 118U5191 | CAJ2446Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5192 | CAJ2464Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5193 | CAJ4492Y _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5194 | CAJ4511Y _ F1KIT Capacitor and relay | |
| Starting KIT | 118U5195 | CAJ4517Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5196 | CAJ4519Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5197 | CAJ9510Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5198 | CAJ9513Z _ F1KIT Capacitor and relay | |
| Starting KIT | 118U5199 | FH2511Z _ F1KIT Capacitor and relay | |
| Starting relay | 123B9146 | Tension Relay 9004 | |
| Timer | 118U5257 | SPARE PART, GIC TIMER | |
| Timer | 118A2165 | SPARE PART, GIC TIMER (A2L) | |
| Top Panel B1 | 118U5141 | SPARE PART, SHEET METAL TOP B1 | |
| Top Panel B2 | 118U5146 | SPARE PART, SHEET METAL TOP B2 | |
| Top Panel B3 | 118U5151 | SPARE PART, SHEET METAL TOP B3 | |
| Unit stand | 118U5281 | SPARE PART, B1 UNIT STAND (A2L) | |
| Unit stand | 118U5282 | SPARE PART, B2 UNIT STAND (A2L) | |


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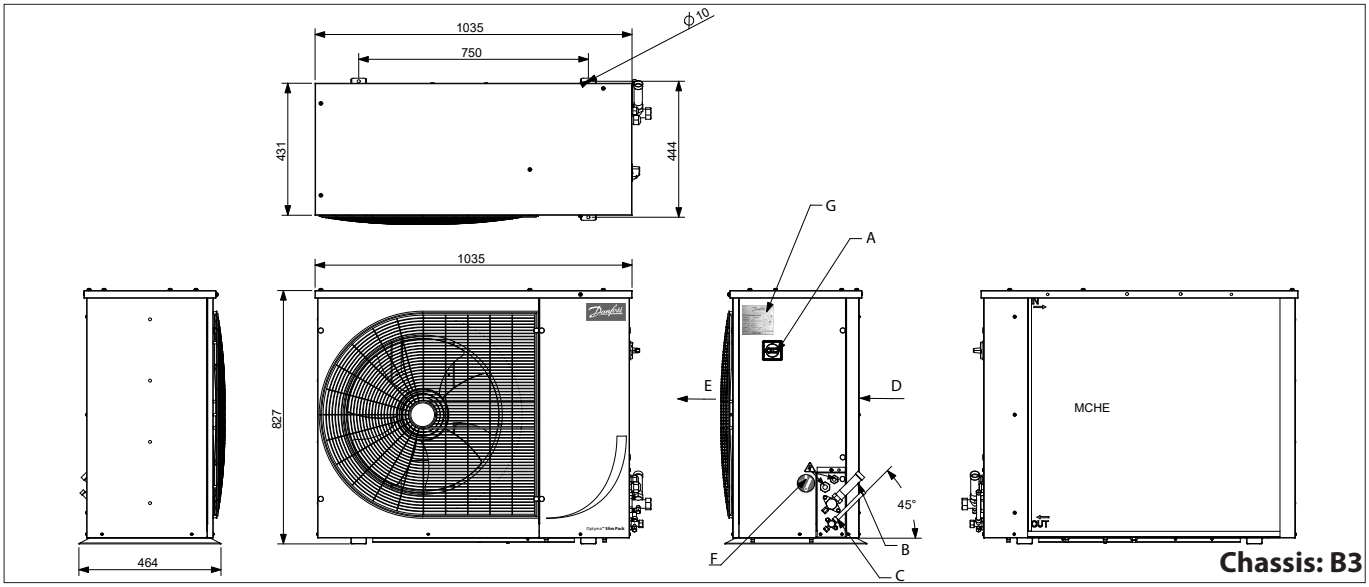



**Chassis: B1**



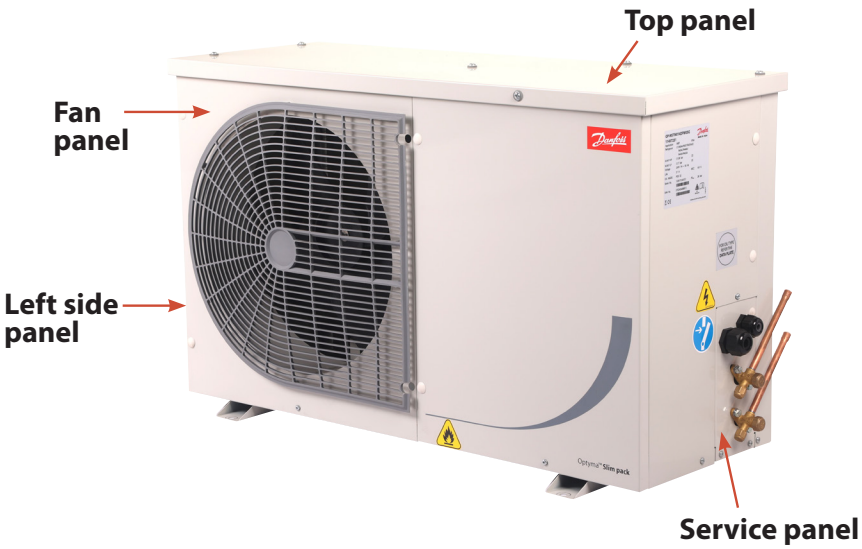

**Chassis: B2**

A Isolator Switch (W09 only)
B Suction Valve
C Liquid Valve
D Air in
E Air out
F Door safety Lable
G Name Plate
⚠ Electrical Cables
*Note: all dimension are in mm*




A Isolator Switch (W09 only)
B Suction Valve
C Liquid Valve
D Air in
E Air out
F Door safety Lable
G Name Plate
⚠ Electrical Cables
*Note: all dimension are in mm*


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*For electrical wiring diagrams refer to installation guide AN233086440134O5-xxxxxx*

# Optyma™ Plus
## Equipped for **quietness** and **top performance**

The same robust quality with added technology and smarter design.
That's a seriously cool combination.

### Quick and safe installation and service
Same serviceable units, upgraded for A2L refrigerants. Ignition proof tested in TÜV laboratory.

### High SEPR*
All models in the range are highly efficient and well above EcoDesign 2018 thresholds, contributing to a reduction in energy costs.
**SEPR: Seasonal Energy Performance Ratio.*

### A2L
Multi-refrigerants units for complexity reduction, available with new code numbers. Go A2L for a sustainable compliant choice.

### The best sound performance in the market
Due to its long-life compressor, acoustic insulation, component design as well as intelligent fan speed reduction during low capacity operation.

### Connectivity
Contributes to considerable energy savings, making the Optyma™ **Plus** up to 20% more economical than an equivalent product.



## Standard range (P00 and P02)

**In-field stacking cuts costs**
With its unique load-bearing design, it's possible to stack units in the field. This cuts installation time, and saves on carpentry and brackets to reduce cost.

**Compact cabinet speeds installation**
New compact design makes it easier to maneuver when fitting in tight spaces, saving installation time.

**New MCHE alloy coils**
New upgraded alloy with 1000 hours salt spray test



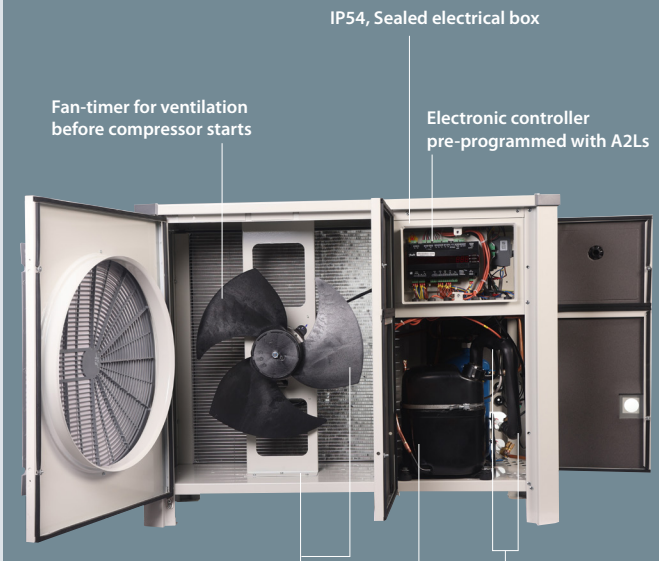
**Accessibility to speed up service**
Easier and quicker accessibility to all components with new double door design – saves time during servicing, maintenance and repair.

**Intelligent technology speeds start-up and enhances reliability**
Preset parameters make it easier to get it right from the start. Fewer mistakes reduce the risk of damage and save time and money on repairs.

**P02:** Scroll compressor with Liquid injection management for safety and reliability of installation using high glide refrigerants

## Multi refrigerant range (P00)
A2L

additional feature




Electrical components approved for A2Ls

Stacking up to 2 units

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LPVM016DP | 114X3110 | P00 | A1 + A2L | G | 27 | 0.35 | 0.48 | 0.63 | 0.79 | 0.96 | 1.15 | - | 1.00 | - | 6 | 31 |
| | | | | | 32 | 0.31 | 0.43 | 0.56 | 0.71 | 0.87 | 1.04 | - | | | | |
| | | | | | 38 | - | 0.37 | 0.48 | 0.61 | 0.75 | 0.91 | - | | | | |
| | | | | | 43 | - | 0.31 | 0.42 | 0.53 | 0.66 | 0.80 | - | | | | |
| OP-LPQM017DP | 114X3118 | P00 | A1 | G | 27 | 0.35 | 0.48 | 0.63 | 0.79 | 0.96 | 1.15 | - | 1.00 | - | 6 | 31 |
| | | | | | 32 | 0.31 | 0.43 | 0.56 | 0.71 | 0.87 | 1.04 | - | | | | |
| | | | | | 38 | - | 0.37 | 0.48 | 0.61 | 0.75 | 0.91 | - | | | | |
| | | | | | 43 | - | 0.31 | 0.42 | 0.53 | 0.66 | 0.80 | - | | | | |
| OP-LPVM026DS | 114X3201 | P00 | A1 + A2L | G | 27 | 0.49 | 0.70 | 0.95 | 1.23 | 1.55 | 1.90 | - | 0.98 | - | 10 | 38 |
| | | | | | 32 | 0.44 | 0.63 | 0.86 | 1.13 | 1.42 | 1.75 | - | | | | |
| | | | | | 38 | - | 0.56 | 0.76 | 1.00 | 1.27 | 1.58 | - | | | | |
| | | | | | 43 | - | 0.49 | 0.68 | 0.90 | 1.15 | 1.44 | - | | | | |
| OP-LPVM034DS | 114X3202 | P00 | A1 + A2L | G | 27 | 0.67 | 0.95 | 1.27 | 1.63 | 2.04 | 2.48 | - | 1.02 | - | 10 | 39 |
| | | | | | 32 | 0.60 | 0.86 | 1.16 | 1.49 | 1.87 | 2.28 | - | | | | |
| | | | | | 38 | - | 0.75 | 1.02 | 1.33 | 1.67 | 2.05 | - | | | | |
| | | | | | 43 | - | 0.67 | 0.91 | 1.19 | 1.50 | 1.86 | - | | | | |
| OP-LPQM048NT | 114X3233 | P00 | A1 | E | 27 | 0.80 | 1.13 | 1.52 | 1.94 | 2.42 | 2.94 | - | 1.10 | - | 6 | 39 |
| | | | | | 32 | 0.69 | 0.99 | 1.35 | 1.74 | 2.17 | 2.63 | - | | | | |
| | | | | | 38 | 0.54 | 0.82 | 1.14 | 1.49 | 1.86 | 2.27 | - | | | | |
| | | | | | 43 | 0.41 | 0.68 | 0.97 | 1.28 | 1.62 | 1.97 | - | | | | |
| OP-LPVM048NT | 114X3205 | P00 | A1+A2L | E | 27 | 0.80 | 1.13 | 1.52 | 1.94 | 2.42 | 2.94 | - | 1.10 | - | 6 | 39 |
| | | | | | 32 | 0.69 | 0.99 | 1.35 | 1.74 | 2.17 | 2.63 | - | | | | |
| | | | | | 38 | 0.54 | 0.82 | 1.14 | 1.49 | 1.86 | 2.27 | - | | | | |
| | | | | | 43 | 0.41 | 0.68 | 0.97 | 1.28 | 1.62 | 1.97 | - | | | | |
| OP-LPQM048NT | 114X3225 | P00 | A1 | G | 27 | 0.84 | 1.17 | 1.57 | 2.02 | 2.54 | 3.11 | - | 1.15 | - | 12 | 39 |
| | | | | | 32 | 0.71 | 1.02 | 1.38 | 1.80 | 2.27 | 2.79 | - | | | | |
| | | | | | 38 | 0.57 | 0.84 | 1.17 | 1.54 | 1.96 | 2.42 | - | | | | |
| | | | | | 43 | 0.47 | 0.71 | 1.00 | 1.33 | 1.71 | 2.11 | - | | | | |
| OP-LPVM048NT | 114X3204 | P00 | A1+A2L | G | 27 | 0.84 | 1.17 | 1.57 | 2.02 | 2.54 | 3.11 | - | 1.15 | - | 12 | 39 |
| | | | | | 32 | 0.71 | 1.02 | 1.38 | 1.80 | 2.27 | 2.79 | - | | | | |
| | | | | | 38 | 0.57 | 0.84 | 1.17 | 1.54 | 1.96 | 2.42 | - | | | | |
| | | | | | 43 | 0.47 | 0.71 | 1.00 | 1.33 | 1.71 | 2.11 | - | | | | |
| OP-LPQM068NT | 114X3249 | P00 | A1 | E | 27 | 1.29 | 1.73 | 2.23 | 2.77 | 3.33 | 3.91 | - | 1.17 | - | 10 | 40 |
| | | | | | 32 | 1.12 | 1.52 | 1.97 | 2.46 | 2.96 | 3.49 | - | | | | |
| | | | | | 38 | 0.92 | 1.27 | 1.66 | 2.08 | 2.54 | 3.00 | - | | | | |
| | | | | | 43 | 0.75 | 1.07 | 1.42 | 1.79 | 2.19 | 2.57 | - | | | | |
| OP-LPVM068NT | 114X3207 | P00 | A1+A2L | E | 27 | 1.29 | 1.73 | 2.23 | 2.77 | 3.33 | 3.91 | - | 1.17 | - | 10 | 40 |
| | | | | | 32 | 1.12 | 1.52 | 1.97 | 2.46 | 2.96 | 3.49 | - | | | | |
| | | | | | 38 | 0.92 | 1.27 | 1.66 | 2.08 | 2.54 | 3.00 | - | | | | |
| | | | | | 43 | 0.75 | 1.07 | 1.42 | 1.79 | 2.19 | 2.57 | - | | | | |
| OP-LPQM068NT | 114X3241 | P00 | A1 | G | 27 | 1.32 | 1.75 | 2.22 | 2.75 | 3.32 | 3.92 | - | 1.02 | - | 20 | 40 |
| | | | | | 32 | 1.11 | 1.52 | 1.96 | 2.44 | 2.96 | 3.51 | - | | | | |
| | | | | | 38 | 0.88 | 1.25 | 1.65 | 2.08 | 2.54 | 3.02 | - | | | | |
| | | | | | 43 | 0.70 | 1.03 | 1.40 | 1.79 | 2.21 | 2.63 | - | | | | |
| OP-LPOM067LL | 114X3371 | P02 | A1 | E | 27 | 2.05 | 2.64 | 3.36 | 4.21 | 5.20 | 6.34 | - | - | 1.72 | 16 | 43 |
| | | | | | 32 | 1.90 | 2.44 | 3.10 | 3.88 | 4.80 | 5.86 | - | | | | |
| | | | | | 38 | 1.73 | 2.20 | 2.79 | 3.49 | 4.31 | 5.27 | - | | | | |
| | | | | | 43 | 1.59 | 2.01 | 2.53 | 3.15 | 3.90 | 4.77 | - | | | | |
| OP-LPKM067LL | 114X3304 | P02 | A1+A2L | E | 27 | 2.05 | 2.64 | 3.36 | 4.21 | 5.20 | 6.34 | - | - | 1.77 | 16 | 43 |
| | | | | | 32 | 1.90 | 2.44 | 3.10 | 3.88 | 4.80 | 5.86 | - | | | | |
| | | | | | 38 | 1.73 | 2.20 | 2.79 | 3.49 | 4.31 | 5.27 | - | | | | |
| | | | | | 43 | 1.59 | 2.01 | 2.53 | 3.15 | 3.90 | 4.77 | - | | | | |

LBP

This table continues on the next page

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LPOM084LL | 114X3372 | P02 | A1 | E | 27 | 2.55 | 3.23 | 4.03 | 4.96 | 6.03 | 7.25 | - | - | 1.69 | 20 | 43 |
| | | | | | 32 | 2.35 | 2.97 | 3.71 | 4.57 | 5.56 | 6.69 | - | | | | |
| | | | | | 38 | 2.10 | 2.66 | 3.32 | 4.09 | 4.98 | 6.00 | - | | | | |
| | | | | | 43 | 1.88 | 2.38 | 2.98 | 3.67 | 4.48 | 5.41 | - | | | | |
| OP-LPKM084LL | 114X3305 | P02 | A1+A2L | E | 27 | 2.55 | 3.23 | 4.03 | 4.96 | 6.03 | 7.25 | - | - | 1.72 | 20 | 43 |
| | | | | | 32 | 2.35 | 2.97 | 3.71 | 4.57 | 5.56 | 6.69 | - | | | | |
| | | | | | 38 | 2.10 | 2.66 | 3.32 | 4.09 | 4.98 | 6.00 | - | | | | |
| | | | | | 43 | 1.88 | 2.38 | 2.98 | 3.67 | 4.48 | 5.41 | - | | | | |
| OP-LPOM098LL | 114X3373 | P02 | A1 | E | 27 | 2.98 | 3.76 | 4.68 | 5.74 | 6.95 | 8.31 | - | - | 1.69 | 20 | 43 |
| | | | | | 32 | 2.74 | 3.46 | 4.30 | 5.28 | 6.40 | 7.66 | - | | | | |
| | | | | | 38 | 2.43 | 3.08 | 3.84 | 4.71 | 5.71 | 6.85 | - | | | | |
| | | | | | 43 | 2.18 | 2.76 | 3.43 | 4.22 | 5.12 | 6.15 | - | | | | |
| OP-LPKM098LL | 114X3306 | P02 | A1+A2L | E | 27 | 2.98 | 3.76 | 4.68 | 5.74 | 6.95 | 8.31 | - | - | 1.72 | 20 | 43 |
| | | | | | 32 | 2.74 | 3.46 | 4.30 | 5.28 | 6.40 | 7.66 | - | | | | |
| | | | | | 38 | 2.43 | 3.08 | 3.84 | 4.71 | 5.71 | 6.85 | - | | | | |
| | | | | | 43 | 2.18 | 2.76 | 3.43 | 4.22 | 5.12 | 6.15 | - | | | | |
| OP-LPOM120LL | 114X3485 | P02 | A1 | E | 27 | 3.85 | 4.89 | 6.12 | 7.57 | 9.26 | 11.19 | - | - | 1.77 | 25 | 50 |
| | | | | | 32 | 3.54 | 4.51 | 5.66 | 7.01 | 8.58 | 10.39 | - | | | | |
| | | | | | 38 | 3.17 | 4.04 | 5.08 | 6.30 | 7.73 | 9.38 | - | | | | |
| | | | | | 43 | 2.84 | 3.63 | 4.57 | 5.69 | 6.99 | 8.50 | - | | | | |
| OP-LPKM120LL | 114X3405 | P02 | A1+A2L | E | 27 | 3.85 | 4.89 | 6.12 | 7.57 | 9.26 | 11.19 | | - | 1.83 | 25 | 47 |
| | | | | | 32 | 3.54 | 4.51 | 5.66 | 7.01 | 8.58 | 10.39 | | | | | |
| | | | | | 38 | 3.17 | 4.04 | 5.08 | 6.30 | 7.73 | 9.38 | | | | | |
| | | | | | 43 | 2.84 | 3.63 | 4.57 | 5.69 | 6.99 | 8.50 | | | | | |
| OP-LPOM168LL | 114X3486 | P02 | A1 | E | 27 | 5.50 | 6.95 | 8.66 | 10.64 | 12.91 | 15.49 | - | - | 1.83 | 32 | 48 |
| | | | | | 32 | 5.05 | 6.39 | 7.97 | 9.81 | 11.91 | 14.30 | - | | | | |
| | | | | | 38 | 4.49 | 5.70 | 7.11 | 8.76 | 10.66 | 12.82 | - | | | | |
| | | | | | 43 | 4.02 | 5.11 | 6.38 | 7.86 | 9.58 | 11.54 | - | | | | |
| OP-LPKM168LL | 114X3406 | P02 | A1+A2L | E | 27 | 5.50 | 6.95 | 8.66 | 10.64 | 12.91 | 15.49 | | - | 1.87 | 32 | 47 |
| | | | | | 32 | 5.05 | 6.39 | 7.97 | 9.81 | 11.91 | 14.30 | | | | | |
| | | | | | 38 | 4.49 | 5.70 | 7.11 | 8.76 | 10.66 | 12.82 | | | | | |
| | | | | | 43 | 4.02 | 5.11 | 6.38 | 7.86 | 9.58 | 11.54 | | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)



For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LPVM016DP | 114X3110 | P00 | A1 + A2L | G | 27 | 0.39 | 0.54 | 0.72 | 0.91 | 1.12 | 1.36 | - | 1.08 | - | 6 | 31 |
| | | | | | 32 | 0.35 | 0.49 | 0.64 | 0.82 | 1.02 | 1.24 | - | | | | |
| | | | | | 38 | 0.30 | 0.42 | 0.56 | 0.72 | 0.90 | 1.09 | - | | | | |
| | | | | | 43 | - | 0.36 | 0.49 | 0.63 | 0.79 | 0.98 | - | | | | |
| OP-LPQM017DP | 114X3118 | P00 | A1 | G | 27 | 0.39 | 0.54 | 0.72 | 0.91 | 1.12 | 1.36 | - | 1.08 | - | 6 | 31 |
| | | | | | 32 | 0.35 | 0.49 | 0.64 | 0.82 | 1.02 | 1.24 | - | | | | |
| | | | | | 38 | 0.30 | 0.42 | 0.56 | 0.72 | 0.90 | 1.09 | - | | | | |
| | | | | | 43 | - | 0.36 | 0.49 | 0.63 | 0.79 | 0.98 | - | | | | |
| OP-LPVM026DS | 114X3201 | P00 | A1 + A2L | G | 27 | 0.48 | 0.70 | 0.95 | 1.22 | 1.53 | 1.86 | - | 0.97 | - | 10 | 38 |
| | | | | | 32 | 0.44 | 0.64 | 0.87 | 1.12 | 1.41 | 1.72 | - | | | | |
| | | | | | 38 | 0.39 | 0.56 | 0.77 | 1.00 | 1.26 | 1.56 | - | | | | |
| | | | | | 43 | - | 0.50 | 0.69 | 0.90 | 1.14 | 1.42 | - | | | | |
| OP-LPVM034DS | 114X3202 | P00 | A1 + A2L | G | 27 | 0.67 | 0.97 | 1.30 | 1.68 | 2.10 | 2.55 | - | 1.03 | - | 10 | 39 |
| | | | | | 32 | 0.61 | 0.88 | 1.19 | 1.54 | 1.93 | 2.35 | - | | | | |
| | | | | | 38 | 0.54 | 0.77 | 1.05 | 1.37 | 1.73 | 2.12 | - | | | | |
| | | | | | 43 | - | 0.69 | 0.94 | 1.23 | 1.56 | 1.93 | - | | | | |
| OP-LPQM048NT | 114X3225 | P00 | A1 | G | 27 | 0.79 | 1.15 | 1.59 | 2.11 | 2.71 | 3.39 | - | 1.02 | - | 12 | 39 |
| | | | | | 32 | 0.67 | 1.00 | 1.40 | 1.88 | 2.43 | 3.05 | - | | | | |
| | | | | | 38 | 0.51 | 0.81 | 1.18 | 1.60 | 2.09 | 2.65 | - | | | | |
| | | | | | 43 | 0.39 | 0.66 | 0.99 | 1.37 | 1.81 | - | - | | | | |
| OP-LPVM048NT | 114X3204 | P00 | A1+A2L | G | 27 | 0.79 | 1.15 | 1.59 | 2.11 | 2.71 | 3.39 | - | 1.02 | - | 12 | 39 |
| | | | | | 32 | 0.67 | 1.00 | 1.40 | 1.88 | 2.43 | 3.05 | - | | | | |
| | | | | | 38 | 0.51 | 0.81 | 1.18 | 1.60 | 2.09 | 2.65 | - | | | | |
| | | | | | 43 | 0.39 | 0.66 | 0.99 | 1.37 | 1.81 | - | - | | | | |
| OP-LPQM048NT | 114X3233 | P00 | A1 | E | 27 | 0.80 | 1.16 | 1.60 | 2.10 | 2.68 | 3.32 | - | 1.14 | - | 6 | 39 |
| | | | | | 32 | 0.68 | 1.02 | 1.41 | 1.88 | 2.40 | 2.99 | - | | | | |
| | | | | | 38 | 0.55 | 0.85 | 1.20 | 1.61 | 2.07 | 2.60 | - | | | | |
| | | | | | 43 | 0.44 | 0.71 | 1.02 | 1.38 | 1.80 | - | - | | | | |
| OP-LPVM048NT | 114X3205 | P00 | A1+A2L | E | 27 | 0.80 | 1.16 | 1.60 | 2.10 | 2.68 | 3.32 | - | 1.14 | - | 6 | 39 |
| | | | | | 32 | 0.68 | 1.02 | 1.41 | 1.88 | 2.40 | 2.99 | - | | | | |
| | | | | | 38 | 0.55 | 0.85 | 1.20 | 1.61 | 2.07 | 2.60 | - | | | | |
| | | | | | 43 | 0.44 | 0.71 | 1.02 | 1.38 | 1.80 | - | - | | | | |
| OP-LPQM068NT | 114X3241 | P00 | A1 | G | 27 | 1.36 | 1.82 | 2.37 | 3.02 | 3.76 | 4.59 | - | 1.07 | - | 20 | 40 |
| | | | | | 32 | 1.21 | 1.63 | 2.13 | 2.72 | 3.39 | 4.13 | - | | | | |
| | | | | | 38 | 1.04 | 1.41 | 1.85 | 2.36 | 2.94 | 3.59 | - | | | | |
| | | | | | 43 | 0.89 | 1.23 | 1.62 | 2.07 | 2.58 | - | - | | | | |
| OP-LPVM068NT | 114X3206 | P00 | A1 | G | 27 | 1.36 | 1.82 | 2.37 | 3.02 | 3.76 | 4.59 | - | - | - | 25 | 39 |
| | | | | | 32 | 1.21 | 1.63 | 2.13 | 2.72 | 3.39 | 4.13 | - | | | | |
| | | | | | 38 | 1.04 | 1.41 | 1.85 | 2.36 | 2.94 | 3.59 | - | | | | |
| | | | | | 43 | 0.89 | 1.23 | 1.62 | 2.07 | 2.58 | - | - | | | | |
| OP-LPQM068NT | 114X3249 | P00 | A1 | E | 27 | 1.38 | 1.88 | 2.47 | 3.13 | 3.88 | 4.70 | - | 1.16 | - | 10 | 40 |
| | | | | | 32 | 1.19 | 1.65 | 2.18 | 2.79 | 3.48 | 4.23 | - | | | | |
| | | | | | 38 | 0.99 | 1.39 | 1.87 | 2.40 | 3.01 | 3.68 | - | | | | |
| | | | | | 43 | 0.83 | 1.20 | 1.62 | 2.10 | 2.64 | - | - | | | | |
| OP-LPVM068NT | 114X3207 | P00 | A1+A2L | E | 27 | 1.38 | 1.88 | 2.47 | 3.13 | 3.88 | 4.70 | - | 1.16 | - | 10 | 40 |
| | | | | | 32 | 1.19 | 1.65 | 2.18 | 2.79 | 3.48 | 4.23 | - | | | | |
| | | | | | 38 | 0.99 | 1.39 | 1.87 | 2.40 | 3.01 | 3.68 | - | | | | |
| | | | | | 43 | 0.83 | 1.20 | 1.62 | 2.10 | 2.64 | - | - | | | | |

This table continues on the next page

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LPQM096NT | 114X3357 | P00 | A1 | E | 27 | 1.48 | 2.02 | 2.65 | 3.37 | 4.17 | 5.04 | - | 1.02 | - | 20 | 44 |
| | | | | | 32 | 1.26 | 1.75 | 2.33 | 2.98 | 3.70 | 4.48 | - | | | | |
| | | | | | 38 | 1.00 | 1.42 | 1.93 | 2.51 | 3.14 | 3.81 | - | | | | |
| | | | | | 43 | 0.79 | 1.16 | 1.61 | 2.12 | 2.68 | - | - | | | | |
| OP-LPOM067LL | 114X3371 | P02 | A1 | E | 27 | 2.23 | 2.85 | 3.58 | 4.43 | 5.40 | 6.52 | - | - | 1.69 | 16 | 41 |
| | | | | | 32 | 2.04 | 2.62 | 3.30 | 4.09 | 5.00 | 6.03 | - | | | | |
| | | | | | 38 | 1.81 | 2.34 | 2.96 | 3.67 | 4.49 | 5.43 | - | | | | |
| | | | | | 43 | 1.60 | 2.09 | 2.65 | 3.30 | 4.04 | 4.89 | - | | | | |
| OP-LPKM067LL | 114X3304 | P02 | A1+A2L | E | 27 | 2.23 | 2.85 | 3.58 | 4.43 | 5.40 | 6.52 | - | - | 1.73 | 16 | 43 |
| | | | | | 32 | 2.04 | 2.62 | 3.30 | 4.09 | 5.00 | 6.03 | - | | | | |
| | | | | | 38 | 1.81 | 2.34 | 2.96 | 3.67 | 4.49 | 5.43 | - | | | | |
| | | | | | 43 | 1.60 | 2.09 | 2.65 | 3.30 | 4.04 | 4.89 | - | | | | |
| OP-LPOM084LL | 114X3372 | P02 | A1 | E | 27 | 2.68 | 3.40 | 4.28 | 5.30 | 6.49 | 7.85 | - | - | 1.71 | 20 | 43 |
| | | | | | 32 | 2.46 | 3.14 | 3.94 | 4.88 | 5.98 | 7.22 | - | | | | |
| | | | | | 38 | 2.19 | 2.80 | 3.52 | 4.36 | 5.33 | 6.45 | - | | | | |
| | | | | | 43 | 1.95 | 2.50 | 3.15 | 3.91 | 4.78 | 5.78 | - | | | | |
| OP-LPKM084LL | 114X3305 | P02 | A1+A2L | E | 27 | 2.68 | 3.40 | 4.28 | 5.30 | 6.49 | 7.85 | - | - | 1.74 | 20 | 43 |
| | | | | | 32 | 2.46 | 3.14 | 3.94 | 4.88 | 5.98 | 7.22 | - | | | | |
| | | | | | 38 | 2.19 | 2.80 | 3.52 | 4.36 | 5.33 | 6.45 | - | | | | |
| | | | | | 43 | 1.95 | 2.50 | 3.15 | 3.91 | 4.78 | 5.78 | - | | | | |
| OP-LPOM098LL | 114X3373 | P02 | A1 | E | 27 | 3.12 | 3.95 | 4.95 | 6.12 | 7.47 | 9.00 | - | - | 1.75 | 20 | 43 |
| | | | | | 32 | 2.86 | 3.64 | 4.56 | 5.63 | 6.87 | 8.27 | - | | | | |
| | | | | | 38 | 2.54 | 3.24 | 4.06 | 5.02 | 6.12 | 7.36 | - | | | | |
| | | | | | 43 | 2.26 | 2.89 | 3.63 | 4.48 | 5.47 | 6.58 | - | | | | |
| OP-LPKM098LL | 114X3306 | P02 | A1+A2L | E | 27 | 3.12 | 3.95 | 4.95 | 6.12 | 7.47 | 9.00 | - | - | 1.79 | 20 | 43 |
| | | | | | 32 | 2.86 | 3.64 | 4.56 | 5.63 | 6.87 | 8.27 | - | | | | |
| | | | | | 38 | 2.54 | 3.24 | 4.06 | 5.02 | 6.12 | 7.36 | - | | | | |
| | | | | | 43 | 2.26 | 2.89 | 3.63 | 4.48 | 5.47 | 6.58 | - | | | | |
| OP-LPOM120LL | 114X3485 | P02 | A1 | E | 27 | 3.90 | 4.93 | 6.14 | 7.55 | 9.16 | 10.95 | - | - | 1.65 | 25 | 50 |
| | | | | | 32 | 3.57 | 4.52 | 5.64 | 6.92 | 8.39 | 10.02 | - | | | | |
| | | | | | 38 | 3.15 | 4.01 | 5.00 | 6.14 | 7.43 | 8.87 | - | | | | |
| | | | | | 43 | 2.79 | 3.56 | 4.44 | 5.46 | 6.60 | 7.88 | - | | | | |
| OP-LPKM120LL | 114X3405 | P02 | A1+A2L | E | 27 | 3.90 | 4.93 | 6.14 | 7.55 | 9.16 | 10.95 | - | - | 1.70 | 25 | 47 |
| | | | | | 32 | 3.57 | 4.52 | 5.64 | 6.92 | 8.39 | 10.02 | - | | | | |
| | | | | | 38 | 3.15 | 4.01 | 5.00 | 6.14 | 7.43 | 8.87 | - | | | | |
| | | | | | 43 | 2.79 | 3.56 | 4.44 | 5.46 | 6.60 | 7.88 | - | | | | |
| OP-LPOM168LL | 114X3486 | P02 | A1 | E | 27 | 5.20 | 6.48 | 7.96 | 9.62 | 11.47 | 13.50 | - | - | 1.68 | 32 | 48 |
| | | | | | 32 | 4.70 | 5.88 | 7.22 | 8.72 | 10.37 | 12.19 | - | | | | |
| | | | | | 38 | 4.04 | 5.09 | 6.26 | 7.56 | 8.99 | 10.55 | - | | | | |
| | | | | | 43 | 3.44 | 4.38 | 5.40 | 6.53 | 7.77 | 9.11 | - | | | | |
| OP-LPKM168LL | 114X3406 | P02 | A1+A2L | E | 27 | 5.20 | 6.48 | 7.96 | 9.62 | 11.47 | 13.50 | - | - | 1.72 | 32 | 47 |
| | | | | | 32 | 4.70 | 5.88 | 7.22 | 8.72 | 10.37 | 12.19 | - | | | | |
| | | | | | 38 | 4.04 | 5.09 | 6.26 | 7.56 | 8.99 | 10.55 | - | | | | |
| | | | | | 43 | 3.44 | 4.38 | 5.40 | 6.53 | 7.77 | 9.11 | - | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) | | | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Evaporating Temperature (Mid point) [°C] | | | | | | | | | | |
| | | | | | | -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | COP | SEPR | | |
| OP-LPOM067LL | 114X3371 | P02 | A1 | E | 27 | 2.13 | 2.79 | 3.57 | 4.48 | 5.52 | 6.68 | - | - | 1.62 | 16 | 43 |
| | | | | | 32 | 2.01 | 2.61 | 3.33 | 4.18 | 5.14 | 6.22 | - | | | | |
| | | | | | 38 | 1.86 | 2.40 | 3.05 | 3.81 | 4.68 | 5.67 | - | | | | |
| | | | | | 43 | 1.76 | 2.23 | 2.81 | 3.50 | 4.29 | 5.19 | - | | | | |
| OP-LPKM067LL | 114X3304 | P02 | A1+A2L | E | 27 | 2.13 | 2.79 | 3.57 | 4.48 | 5.52 | 6.68 | - | - | 1.66 | 16 | 43 |
| | | | | | 32 | 2.01 | 2.61 | 3.33 | 4.18 | 5.14 | 6.22 | - | | | | |
| | | | | | 38 | 1.86 | 2.40 | 3.05 | 3.81 | 4.68 | 5.67 | - | | | | |
| | | | | | 43 | 1.76 | 2.23 | 2.81 | 3.50 | 4.29 | 5.19 | - | | | | |
| OP-LPOM084LL | 114X3372 | P02 | A1 | E | 27 | 2.67 | 3.51 | 4.49 | 5.63 | 6.91 | 8.33 | - | - | 1.66 | 20 | 43 |
| | | | | | 32 | 2.50 | 3.29 | 4.21 | 5.26 | 6.45 | 7.78 | - | | | | |
| | | | | | 38 | 2.30 | 3.02 | 3.86 | 4.82 | 5.90 | 7.12 | - | | | | |
| | | | | | 43 | 2.14 | 2.80 | 3.57 | 4.44 | 5.44 | 6.55 | - | | | | |
| OP-LPKM084LL | 114X3305 | P02 | A1+A2L | E | 27 | 2.67 | 3.51 | 4.49 | 5.63 | 6.91 | 8.33 | - | - | 1.70 | 20 | 43 |
| | | | | | 32 | 2.50 | 3.29 | 4.21 | 5.26 | 6.45 | 7.78 | - | | | | |
| | | | | | 38 | 2.30 | 3.02 | 3.86 | 4.82 | 5.90 | 7.12 | - | | | | |
| | | | | | 43 | 2.14 | 2.80 | 3.57 | 4.44 | 5.44 | 6.55 | - | | | | |
| OP-LPOM098LL | 114X3373 | P02 | A1 | E | 27 | 3.09 | 3.86 | 4.78 | 5.84 | 7.07 | 8.45 | - | - | 1.64 | 20 | 43 |
| | | | | | 32 | 2.92 | 3.63 | 4.48 | 5.47 | 6.60 | 7.88 | - | | | | |
| | | | | | 38 | 2.71 | 3.35 | 4.11 | 5.00 | 6.02 | 7.17 | - | | | | |
| | | | | | 43 | 2.52 | 3.10 | 3.79 | 4.59 | 5.51 | 6.56 | - | | | | |
| OP-LPKM098LL | 114X3306 | P02 | A1+A2L | E | 27 | 3.09 | 3.86 | 4.78 | 5.84 | 7.07 | 8.45 | - | - | 1.68 | 20 | 43 |
| | | | | | 32 | 2.92 | 3.63 | 4.48 | 5.47 | 6.60 | 7.88 | - | | | | |
| | | | | | 38 | 2.71 | 3.35 | 4.11 | 5.00 | 6.02 | 7.17 | - | | | | |
| | | | | | 43 | 2.52 | 3.10 | 3.79 | 4.59 | 5.51 | 6.56 | - | | | | |
| OP-LPOM120LL | 114X3485 | P02 | A1 | E | 27 | 3.96 | 5.06 | 6.36 | 7.89 | 9.65 | 11.65 | - | - | 1.67 | 25 | 50 |
| | | | | | 32 | 3.72 | 4.74 | 5.95 | 7.37 | 9.00 | 10.85 | - | | | | |
| | | | | | 38 | 3.40 | 4.34 | 5.44 | 6.72 | 8.20 | 9.87 | - | | | | |
| | | | | | 43 | 3.13 | 3.99 | 5.00 | 6.17 | 7.51 | 9.03 | - | | | | |
| OP-LPKM120LL | 114X3405 | P02 | A1+A2L | E | 27 | 3.96 | 5.06 | 6.36 | 7.89 | 9.65 | 11.65 | - | - | 1.73 | 25 | 47 |
| | | | | | 32 | 3.72 | 4.74 | 5.95 | 7.37 | 9.00 | 10.85 | - | | | | |
| | | | | | 38 | 3.40 | 4.34 | 5.44 | 6.72 | 8.20 | 9.87 | - | | | | |
| | | | | | 43 | 3.13 | 3.99 | 5.00 | 6.17 | 7.51 | 9.03 | - | | | | |
| OP-LPOM168LL | 114X3486 | P02 | A1 | E | 27 | 5.27 | 6.69 | 8.38 | 10.35 | 12.59 | 15.11 | - | - | 1.65 | 32 | 48 |
| | | | | | 32 | 4.95 | 6.27 | 7.83 | 9.65 | 11.73 | 14.07 | - | | | | |
| | | | | | 38 | 4.55 | 5.75 | 7.15 | 8.79 | 10.67 | 12.78 | - | | | | |
| | | | | | 43 | 4.22 | 5.30 | 6.57 | 8.05 | 9.76 | 11.68 | - | | | | |
| OP-LPKM168LL | 114X3406 | P02 | A1+A2L | E | 27 | 5.27 | 6.69 | 8.38 | 10.35 | 12.59 | 15.11 | - | - | 1.68 | 32 | 47 |
| | | | | | 32 | 4.95 | 6.27 | 7.83 | 9.65 | 11.73 | 14.07 | - | | | | |
| | | | | | 38 | 4.55 | 5.75 | 7.15 | 8.79 | 10.67 | 12.78 | - | | | | |
| | | | | | 43 | 4.22 | 5.30 | 6.57 | 8.05 | 9.76 | 11.68 | - | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LPOM067LL | 114X3371 | P02 | A1 | E | 27 | 2.09 | 2.74 | 3.52 | 4.42 | 5.45 | 6.60 | - | - | 1.60 | 16 | 43 |
| | | | | | 32 | 1.97 | 2.57 | 3.28 | 4.12 | 5.08 | 6.16 | - | | | | |
| | | | | | 38 | 1.83 | 2.36 | 3.00 | 3.76 | 4.62 | 5.61 | - | | | | |
| | | | | | 43 | 1.73 | 2.20 | 2.77 | 3.45 | 4.24 | 5.14 | - | | | | |
| OP-LPKM067LL | 114X3304 | P02 | A1+A2L | E | 27 | 2.09 | 2.74 | 3.52 | 4.42 | 5.45 | 6.60 | - | - | 1.65 | 16 | 43 |
| | | | | | 32 | 1.97 | 2.57 | 3.28 | 4.12 | 5.08 | 6.16 | - | | | | |
| | | | | | 38 | 1.83 | 2.36 | 3.00 | 3.76 | 4.62 | 5.61 | - | | | | |
| | | | | | 43 | 1.73 | 2.20 | 2.77 | 3.45 | 4.24 | 5.14 | - | | | | |
| OP-LPOM084LL | 114X3372 | P02 | A1 | E | 27 | 2.62 | 3.45 | 4.43 | 5.55 | 6.82 | 8.24 | - | - | 1.64 | 20 | 43 |
| | | | | | 32 | 2.45 | 3.23 | 4.14 | 5.19 | 6.38 | 7.70 | - | | | | |
| | | | | | 38 | 2.25 | 2.97 | 3.80 | 4.75 | 5.83 | 7.04 | - | | | | |
| | | | | | 43 | 2.10 | 2.75 | 3.51 | 4.39 | 5.37 | 6.48 | - | | | | |
| OP-LPKM084LL | 114X3305 | P02 | A1+A2L | E | 27 | 2.62 | 3.45 | 4.43 | 5.55 | 6.82 | 8.24 | - | - | 1.68 | 20 | 43 |
| | | | | | 32 | 2.45 | 3.23 | 4.14 | 5.19 | 6.38 | 7.70 | - | | | | |
| | | | | | 38 | 2.25 | 2.97 | 3.80 | 4.75 | 5.83 | 7.04 | - | | | | |
| | | | | | 43 | 2.10 | 2.75 | 3.51 | 4.39 | 5.37 | 6.48 | - | | | | |
| OP-LPOM098LL | 114X3373 | P02 | A1 | E | 27 | 3.05 | 3.80 | 4.71 | 5.77 | 6.99 | 8.36 | - | - | 1.63 | 20 | 43 |
| | | | | | 32 | 2.88 | 3.58 | 4.42 | 5.40 | 6.53 | 7.80 | - | | | | |
| | | | | | 38 | 2.67 | 3.30 | 4.05 | 4.93 | 5.95 | 7.10 | - | | | | |
| | | | | | 43 | 2.48 | 3.06 | 3.74 | 4.53 | 5.45 | 6.49 | - | | | | |
| OP-LPKM098LL | 114X3306 | P02 | A1+A2L | E | 27 | 3.05 | 3.80 | 4.71 | 5.77 | 6.99 | 8.36 | - | - | 1.66 | 20 | 43 |
| | | | | | 32 | 2.88 | 3.58 | 4.42 | 5.40 | 6.53 | 7.80 | - | | | | |
| | | | | | 38 | 2.67 | 3.30 | 4.05 | 4.93 | 5.95 | 7.10 | - | | | | |
| | | | | | 43 | 2.48 | 3.06 | 3.74 | 4.53 | 5.45 | 6.49 | - | | | | |
| OP-LPOM120LL | 114X3485 | P02 | A1 | E | 27 | 3.90 | 4.98 | 6.27 | 7.79 | 9.53 | 11.52 | - | - | 1.66 | 25 | 50 |
| | | | | | 32 | 3.65 | 4.67 | 5.87 | 7.27 | 8.89 | 10.73 | - | | | | |
| | | | | | 38 | 3.35 | 4.27 | 5.36 | 6.64 | 8.10 | 9.76 | - | | | | |
| | | | | | 43 | 3.07 | 3.93 | 4.93 | 6.09 | 7.42 | 8.94 | - | | | | |
| OP-LPKM120LL | 114X3405 | P02 | A1+A2L | E | 27 | 3.90 | 4.98 | 6.27 | 7.79 | 9.53 | 11.52 | - | - | 1.71 | 25 | 47 |
| | | | | | 32 | 3.65 | 4.67 | 5.87 | 7.27 | 8.89 | 10.73 | - | | | | |
| | | | | | 38 | 3.35 | 4.27 | 5.36 | 6.64 | 8.10 | 9.76 | - | | | | |
| | | | | | 43 | 3.07 | 3.93 | 4.93 | 6.09 | 7.42 | 8.94 | - | | | | |
| OP-LPOM168LL | 114X3486 | P02 | A1 | E | 27 | 5.18 | 6.59 | 8.26 | 10.21 | 12.44 | 14.95 | - | - | 1.63 | 32 | 48 |
| | | | | | 32 | 4.86 | 6.17 | 7.72 | 9.53 | 11.59 | 13.92 | - | | | | |
| | | | | | 38 | 4.48 | 5.66 | 7.06 | 8.68 | 10.55 | 12.65 | - | | | | |
| | | | | | 43 | 4.15 | 5.22 | 6.48 | 7.95 | 9.65 | 11.56 | - | | | | |
| OP-LPKM168LL | 114X3406 | P02 | A1+A2L | E | 27 | 5.18 | 6.59 | 8.26 | 10.21 | 12.44 | 14.95 | - | - | 1.67 | 32 | 47 |
| | | | | | 32 | 4.86 | 6.17 | 7.72 | 9.53 | 11.59 | 13.92 | - | | | | |
| | | | | | 38 | 4.48 | 5.66 | 7.06 | 8.68 | 10.55 | 12.65 | - | | | | |
| | | | | | 43 | 4.15 | 5.22 | 6.48 | 7.95 | 9.65 | 11.56 | - | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)



For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LPVM016DP | 114X3110 | P00 | A1 + A2L | G | 27 | - | 0.48 | 0.62 | 0.78 | 0.95 | 1.14 | - | 0.90 | - | 6 | 31 |
| | | | | | 32 | - | 0.36 | 0.56 | 0.70 | 0.86 | 1.04 | - | | | | |
| | | | | | 38 | - | 0.36 | 0.47 | 0.61 | 0.75 | 0.92 | - | | | | |
| | | | | | 43 | - | - | 0.41 | 0.53 | 0.67 | 0.82 | - | | | | |
| OP-LPVM026DS | 114X3201 | P00 | A1 + A2L | G | 27 | - | 0.64 | 0.87 | 1.13 | 1.42 | 1.74 | - | 0.93 | - | 10 | 38 |
| | | | | | 32 | - | 0.51 | 0.79 | 1.04 | 1.31 | 1.61 | - | | | | |
| | | | | | 38 | - | 0.51 | 0.70 | 0.92 | 1.17 | 1.46 | - | | | | |
| | | | | | 43 | - | - | 0.62 | 0.83 | 1.06 | 1.33 | - | | | | |
| OP-LPVM048NT | 114X3204 | P00 | A1 + A2L | G | 27 | - | 1.06 | 1.47 | 1.96 | 2.52 | 3.14 | - | 0.98 | - | 12 | 39 |
| | | | | | 32 | - | 0.78 | 1.31 | 1.75 | 2.26 | 2.83 | - | | | | |
| | | | | | 38 | - | 0.78 | 1.11 | 1.50 | 1.95 | 2.46 | - | | | | |
| | | | | | 43 | - | - | 0.95 | 1.30 | 1.70 | 2.16 | - | | | | |
| OP-LPVM034DS | 114X3202 | P00 | A1 + A2L | G | 27 | - | 0.99 | 1.34 | 1.73 | 2.16 | 2.62 | - | 0.98 | - | 10 | 39 |
| | | | | | 32 | - | 0.79 | 1.22 | 1.58 | 1.98 | 2.43 | - | | | | |
| | | | | | 38 | - | 0.79 | 1.07 | 1.41 | 1.78 | 2.19 | - | | | | |
| | | | | | 43 | - | - | 0.96 | 1.26 | 1.61 | 2.00 | - | | | | |
| OP-LPVM048NT | 114X3205 | P00 | A1 + A2L | E | 27 | - | 1.05 | 1.45 | 1.92 | 2.47 | 3.09 | - | 0.99 | - | 6 | 39 |
| | | | | | 32 | - | 0.79 | 1.29 | 1.72 | 2.22 | 2.79 | - | | | | |
| | | | | | 38 | - | 0.79 | 1.10 | 1.48 | 1.92 | 2.42 | - | | | | |
| | | | | | 43 | - | - | 0.95 | 1.29 | 1.68 | 2.13 | - | | | | |
| OP-LPVM068NT | 114X3207 | P00 | A1 + A2L | E | 27 | - | 1.61 | 2.09 | 2.63 | 3.21 | 3.81 | - | 0.98 | - | 10 | 40 |
| | | | | | 32 | - | 1.45 | 1.90 | 2.39 | 2.92 | 3.46 | - | | | | |
| | | | | | 38 | - | - | 1.66 | 2.10 | 2.56 | 3.03 | - | | | | |
| | | | | | 43 | - | - | - | 1.85 | 2.26 | 2.67 | - | | | | |
| OP-LPKM067LL | 114X3304 | P02 | A1+A2L | E | 27 | - | 2.74 | 3.43 | 4.22 | 5.12 | 6.12 | - | - | 1.74 | 16 | 43 |
| | | | | | 32 | - | 2.31 | 3.18 | 3.92 | 4.75 | 5.67 | - | | | | |
| | | | | | 38 | - | 2.31 | 2.89 | 3.55 | 4.30 | 5.14 | - | | | | |
| | | | | | 43 | - | 2.11 | 2.64 | 3.24 | 3.92 | 4.68 | - | | | | |
| OP-LPKM084LL | 114X3305 | P02 | A1+A2L | E | 27 | - | 3.29 | 4.09 | 5.00 | 6.02 | 7.14 | - | - | 1.70 | 20 | 43 |
| | | | | | 32 | - | 2.76 | 3.79 | 4.63 | 5.56 | 6.60 | - | | | | |
| | | | | | 38 | - | 2.76 | 3.42 | 4.17 | 5.01 | 5.94 | - | | | | |
| | | | | | 43 | - | 2.52 | 3.11 | 3.78 | 4.54 | 5.38 | - | | | | |
| OP-LPKM098LL | 114X3306 | P02 | A1+A2L | E | 27 | - | 3.89 | 4.84 | 5.92 | 7.11 | 8.41 | - | - | 1.58 | 20 | 43 |
| | | | | | 32 | - | 3.21 | 4.49 | 5.49 | 6.59 | 7.79 | - | | | | |
| | | | | | 38 | - | 3.21 | 4.03 | 4.94 | 5.93 | 7.01 | - | | | | |
| | | | | | 43 | - | 2.86 | 3.61 | 4.44 | 5.35 | 6.32 | - | | | | |
| OP-LPKM120LL | 114X3405 | P02 | A1+A2L | E | 27 | - | 4.74 | 5.88 | 7.18 | 8.62 | 10.20 | - | - | 1.70 | 25 | 47 |
| | | | | | 32 | - | 4.40 | 5.45 | 6.64 | 7.96 | 9.40 | - | | | | |
| | | | | | 38 | - | 3.97 | 4.91 | 5.96 | 7.13 | 8.41 | - | | | | |
| | | | | | 43 | - | 3.59 | 4.43 | 5.37 | 6.42 | 7.55 | - | | | | |
| OP-LPKM168LL | 114X3406 | P02 | A1+A2L | E | 27 | - | 6.41 | 7.86 | 9.53 | 11.40 | 13.46 | - | - | 1.73 | 32 | 47 |
| | | | | | 32 | - | 5.90 | 7.21 | 8.72 | 10.41 | 12.28 | - | | | | |
| | | | | | 38 | - | 5.29 | 6.41 | 7.73 | 9.21 | 10.85 | - | | | | |
| | | | | | 43 | - | 4.79 | 5.76 | 6.90 | 8.20 | 9.63 | - | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -40°C | -35°C | -30°C | -25°C | -20°C | -15°C | -10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-LPVM016DP | 114X3110 | P00 | A1 + A2L | G | 27 | - | 0.40 | 0.54 | 0.70 | 0.87 | 1.05 | - | 0.87 | - | 6 | 31 |
| | | | | | 32 | - | 0.35 | 0.48 | 0.62 | 0.78 | 0.96 | - | | | | |
| | | | | | 38 | - | 0.30 | 0.41 | 0.54 | 0.69 | 0.85 | - | | | | |
| | | | | | 43 | - | - | 0.35 | 0.47 | 0.61 | 0.76 | - | | | | |
| OP-LPVM026DS | 114X3201 | P00 | A1 + A2L | G | 27 | - | 0.57 | 0.78 | 1.02 | 1.29 | 1.59 | - | 0.87 | - | 10 | 38 |
| | | | | | 32 | - | 0.52 | 0.71 | 0.93 | 1.19 | 1.47 | - | | | | |
| | | | | | 38 | - | 0.45 | 0.63 | 0.83 | 1.07 | 1.33 | - | | | | |
| | | | | | 43 | - | - | 0.56 | 0.75 | 0.97 | 1.22 | - | | | | |
| OP-LPVM034DS | 114X3202 | P00 | A1 + A2L | G | 27 | - | 0.91 | 1.24 | 1.62 | 2.03 | 2.49 | - | 0.96 | - | 10 | 39 |
| | | | | | 32 | - | 0.83 | 1.13 | 1.48 | 1.87 | 2.31 | - | | | | |
| | | | | | 38 | - | 0.73 | 1.00 | 1.32 | 1.68 | 2.08 | - | | | | |
| | | | | | 43 | - | - | 0.89 | 1.18 | 1.52 | 1.90 | - | | | | |
| OP-LPVM048NT | 114X3205 | P00 | A1 + A2L | E | 27 | - | 0.86 | 1.19 | 1.58 | 2.03 | 2.54 | - | 0.90 | - | 6 | 39 |
| | | | | | 32 | - | 0.76 | 1.06 | 1.41 | 1.82 | 2.29 | - | | | | |
| | | | | | 38 | - | 0.65 | 0.91 | 1.22 | 1.58 | 2.00 | - | | | | |
| | | | | | 43 | - | - | 0.79 | 1.07 | 1.39 | 1.76 | - | | | | |
| OP-LPVM048NT | 114X3204 | P00 | A1 + A2L | G | 27 | - | 1.00 | 1.39 | 1.87 | 2.45 | 3.14 | - | 1.00 | - | 12 | 39 |
| | | | | | 32 | - | 0.88 | 1.24 | 1.67 | 2.20 | 2.83 | - | | | | |
| | | | | | 38 | - | 0.74 | 1.06 | 1.45 | 1.92 | 2.48 | - | | | | |
| | | | | | 43 | - | - | 0.92 | 1.27 | 1.70 | 2.20 | - | | | | |
| OP-LPVM068NT | 114X3207 | P00 | A1 + A2L | E | 27 | - | 1.37 | 1.84 | 2.38 | 3.00 | 3.68 | - | 0.89 | - | 10 | 40 |
| | | | | | 32 | - | 1.22 | 1.66 | 2.15 | 2.71 | 3.34 | - | | | | |
| | | | | | 38 | - | - | 1.43 | 1.88 | 2.37 | 2.92 | - | | | | |
| | | | | | 43 | - | - | 1.24 | 1.64 | 2.09 | 2.58 | - | | | | |
| OP-LPKM067LL | 114X3304 | P02 | A1+A2L | E | 27 | - | 2.39 | 3.03 | 3.76 | 4.61 | 5.55 | - | - | 1.71 | 16 | 43 |
| | | | | | 32 | - | 2.23 | 2.82 | 3.50 | 4.28 | 5.16 | - | | | | |
| | | | | | 38 | - | 2.03 | 2.57 | 3.18 | 3.89 | 4.69 | - | | | | |
| | | | | | 43 | - | 1.87 | 2.35 | 2.92 | 3.56 | 4.30 | - | | | | |
| OP-LPKM084LL | 114X3305 | P02 | A1+A2L | E | 27 | - | 2.97 | 3.71 | 4.56 | 5.53 | 6.60 | - | - | 1.67 | 20 | 43 |
| | | | | | 32 | - | 2.76 | 3.45 | 4.23 | 5.12 | 6.12 | - | | | | |
| | | | | | 38 | - | 2.51 | 3.12 | 3.83 | 4.63 | 5.52 | - | | | | |
| | | | | | 43 | - | 2.29 | 2.84 | 3.48 | 4.20 | 5.02 | - | | | | |
| OP-LPKM098LL | 114X3306 | P02 | A1+A2L | E | 27 | - | 3.39 | 4.25 | 5.23 | 6.34 | 7.57 | - | - | 1.63 | 20 | 43 |
| | | | | | 32 | - | 3.16 | 3.96 | 4.88 | 5.91 | 7.05 | - | | | | |
| | | | | | 38 | - | 2.87 | 3.60 | 4.43 | 5.37 | 6.41 | - | | | | |
| | | | | | 43 | - | 2.61 | 3.28 | 4.04 | 4.90 | 5.85 | - | | | | |
| OP-LPKM120LL | 114X3405 | P02 | A1+A2L | E | 27 | - | 3.99 | 4.81 | 5.79 | 7.01 | 8.51 | - | - | 1.66 | 25 | 47 |
| | | | | | 32 | - | 3.89 | 4.66 | 5.54 | 6.61 | 7.93 | - | | | | |
| | | | | | 38 | - | 3.72 | 4.44 | 5.20 | 6.09 | 7.19 | - | | | | |
| | | | | | 43 | - | 3.52 | 4.20 | 4.86 | 5.62 | 6.55 | - | | | | |
| OP-LPKM168LL | 114X3406 | P02 | A1+A2L | E | 27 | - | 5.41 | 6.68 | 8.15 | 9.83 | 11.71 | - | - | 1.68 | 32 | 47 |
| | | | | | 32 | - | 5.01 | 6.18 | 7.54 | 9.08 | 10.82 | - | | | | |
| | | | | | 38 | - | 4.50 | 5.56 | 6.77 | 8.15 | 9.69 | - | | | | |
| | | | | | 43 | - | 4.05 | 5.00 | 6.09 | 7.32 | 8.70 | - | | | | |

**LBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -35°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K (NTZ comp models with 10K superheat)

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPSM026CS | 114X4243 | P00 | A1 + A2L | G | 27 | 1.22 | 1.58 | 1.97 | 2.39 | 2.85 | 3.33 | 1.98 | - | 10 | 37 |
| | | | | | 32 | 1.11 | 1.44 | 1.81 | 2.21 | 2.65 | 3.11 | | | | |
| | | | | | 38 | 0.97 | 1.28 | 1.62 | 2.00 | 2.41 | 2.85 | | | | |
| | | | | | 43 | 0.85 | 1.14 | 1.46 | 1.82 | 2.21 | 2.63 | | | | |
| OP-MPSM030CS | 114X4244 | P00 | A1 + A2L | G | 27 | 1.34 | 1.75 | 2.20 | 2.69 | 3.23 | 3.82 | 1.86 | - | 10 | 37 |
| | | | | | 32 | 1.22 | 1.60 | 2.03 | 2.50 | 3.02 | 3.59 | | | | |
| | | | | | 38 | 1.06 | 1.42 | 1.82 | 2.27 | 2.77 | 3.32 | | | | |
| | | | | | 43 | 0.94 | 1.27 | 1.65 | 2.08 | 2.56 | 3.09 | | | | |
| OP-MPXM034ML | 114X4264 | P00 | A1 | E | 27 | 1.82 | 2.29 | 2.83 | 3.47 | 4.19 | 5.00 | 2.25 | - | 10 | 38 |
| | | | | | 32 | 1.72 | 2.16 | 2.69 | 3.29 | 3.98 | 4.76 | | | | |
| | | | | | 38 | 1.60 | 2.01 | 2.50 | 3.07 | 3.72 | 4.46 | | | | |
| | | | | | 43 | 1.50 | 1.89 | 2.35 | 2.88 | 3.50 | 4.21 | | | | |
| OP-MPIM034ML | 114X4204 | P00 | A1+A2L | E | 27 | 1.82 | 2.29 | 2.83 | 3.47 | 4.19 | 5.00 | 2.25 | - | 10 | 38 |
| | | | | | 32 | 1.72 | 2.16 | 2.69 | 3.29 | 3.98 | 4.76 | | | | |
| | | | | | 38 | 1.60 | 2.01 | 2.50 | 3.07 | 3.72 | 4.46 | | | | |
| | | | | | 43 | 1.50 | 1.89 | 2.35 | 2.88 | 3.50 | 4.21 | | | | |
| OP-MPXM034ML | 114X4261 | P00 | A1 | G | 27 | 1.82 | 2.32 | 2.88 | 3.51 | 4.22 | 5.00 | 2.17 | - | 20 | 38 |
| | | | | | 32 | 1.71 | 2.19 | 2.73 | 3.34 | 4.02 | 4.79 | | | | |
| | | | | | 38 | 1.58 | 2.03 | 2.54 | 3.12 | 3.77 | 4.50 | | | | |
| | | | | | 43 | 1.48 | 1.89 | 2.37 | 2.92 | 3.54 | 4.25 | | | | |
| OP-MPIM034ML | 114X4205 | P00 | A1+A2L | G | 27 | 1.82 | 2.32 | 2.88 | 3.51 | 4.22 | 5.00 | 2.17 | - | 20 | 38 |
| | | | | | 32 | 1.71 | 2.19 | 2.73 | 3.34 | 4.02 | 4.79 | | | | |
| | | | | | 38 | 1.58 | 2.03 | 2.54 | 3.12 | 3.77 | 4.50 | | | | |
| | | | | | 43 | 1.48 | 1.89 | 2.37 | 2.92 | 3.54 | 4.25 | | | | |
| OP-MPXM046ML | 114X4284 | P00 | A1 | E | 27 | 2.48 | 3.09 | 3.82 | 4.66 | 5.62 | 6.69 | 2.33 | - | 12 | 38 |
| | | | | | 32 | 2.34 | 2.92 | 3.61 | 4.42 | 5.33 | 6.36 | | | | |
| | | | | | 38 | 2.17 | 2.71 | 3.36 | 4.12 | 4.98 | 5.95 | | | | |
| | | | | | 43 | 2.02 | 2.54 | 3.15 | 3.86 | 4.67 | 5.59 | | | | |
| OP-MPIM046ML | 114X4206 | P00 | A1+A2L | E | 27 | 2.48 | 3.09 | 3.82 | 4.66 | 5.62 | 6.69 | 2.33 | - | 12 | 38 |
| | | | | | 32 | 2.34 | 2.92 | 3.61 | 4.42 | 5.33 | 6.36 | | | | |
| | | | | | 38 | 2.17 | 2.71 | 3.36 | 4.12 | 4.98 | 5.95 | | | | |
| | | | | | 43 | 2.02 | 2.54 | 3.15 | 3.86 | 4.67 | 5.59 | | | | |
| OP-MPXM046ML | 114X4281 | P00 | A1 | G | 27 | 2.47 | 3.11 | 3.85 | 4.69 | 5.63 | 6.67 | 2.07 | - | 32 | 38 |
| | | | | | 32 | 2.32 | 2.93 | 3.64 | 4.45 | 5.35 | 6.36 | | | | |
| | | | | | 38 | 2.14 | 2.71 | 3.37 | 4.13 | 4.99 | 5.96 | | | | |
| | | | | | 43 | 2.01 | 2.52 | 3.14 | 3.86 | 4.68 | 5.60 | | | | |
| OP-MPIM046ML | 114X4207 | P00 | A1+A2L | G | 27 | 2.47 | 3.11 | 3.85 | 4.69 | 5.63 | 6.67 | 2.07 | - | 32 | 38 |
| | | | | | 32 | 2.32 | 2.93 | 3.64 | 4.45 | 5.35 | 6.36 | | | | |
| | | | | | 38 | 2.14 | 2.71 | 3.37 | 4.13 | 4.99 | 5.96 | | | | |
| | | | | | 43 | 2.01 | 2.52 | 3.14 | 3.86 | 4.68 | 5.60 | | | | |
| OP-MPXM057ML | 114X4293 | P00 | A1 | E | 27 | 2.99 | 3.75 | 4.63 | 5.63 | 6.76 | 8.02 | 2.28 | - | 12 | 39 |
| | | | | | 32 | 2.81 | 3.54 | 4.38 | 5.33 | 6.41 | 7.61 | | | | |
| | | | | | 38 | 2.60 | 3.28 | 4.06 | 4.96 | 5.97 | 7.10 | | | | |
| | | | | | 43 | 2.42 | 3.06 | 3.80 | 4.64 | 5.60 | 6.66 | | | | |
| OP-MPIM057ML | 114X4208 | P00 | A1+A2L | E | 27 | 2.99 | 3.75 | 4.63 | 5.63 | 6.76 | 8.02 | 2.28 | - | 12 | 39 |
| | | | | | 32 | 2.81 | 3.54 | 4.38 | 5.33 | 6.41 | 7.61 | | | | |
| | | | | | 38 | 2.60 | 3.28 | 4.06 | 4.96 | 5.97 | 7.10 | | | | |
| | | | | | 43 | 2.42 | 3.06 | 3.80 | 4.64 | 5.60 | 6.66 | | | | |

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPXM057ML | 114X4290 | P00 | A1 | G | 27 | 2.98 | 3.76 | 4.65 | 5.65 | 6.76 | 7.99 | 1.90 | - | 32 | 39 |
| | | | | | 32 | 2.81 | 3.54 | 4.38 | 5.34 | 6.41 | 7.60 | | | | |
| | | | | | 38 | 2.60 | 3.27 | 4.05 | 4.95 | 5.96 | 7.09 | | | | |
| | | | | | 43 | 2.44 | 3.05 | 3.77 | 4.61 | 5.56 | 6.64 | | | | |
| OP-MPIM057ML | 114X4209 | P00 | A1+A2L | G | 27 | 2.98 | 3.76 | 4.65 | 5.65 | 6.76 | 7.99 | 1.90 | - | 32 | 39 |
| | | | | | 32 | 2.81 | 3.54 | 4.38 | 5.34 | 6.41 | 7.60 | | | | |
| | | | | | 38 | 2.60 | 3.27 | 4.05 | 4.95 | 5.96 | 7.09 | | | | |
| | | | | | 43 | 2.44 | 3.05 | 3.77 | 4.61 | 5.56 | 6.64 | | | | |
| OP-MPXM068ML | 114X4311 | P00 | A1 | E | 27 | 3.69 | 4.63 | 5.74 | 7.02 | 8.47 | 10.10 | 2.41 | - | 16 | 42 |
| | | | | | 32 | 3.48 | 4.38 | 5.44 | 6.66 | 8.05 | 9.61 | | | | |
| | | | | | 38 | 3.24 | 4.08 | 5.07 | 6.21 | 7.52 | 9.01 | | | | |
| | | | | | 43 | 3.04 | 3.82 | 4.75 | 5.83 | 7.07 | 8.48 | | | | |
| OP-MPIM068ML | 114X4306 | P00 | A1+A2L | E | 27 | 3.69 | 4.63 | 5.74 | 7.02 | 8.47 | 10.10 | 2.47 | - | 16 | 42 |
| | | | | | 32 | 3.48 | 4.38 | 5.44 | 6.66 | 8.05 | 9.61 | | | | |
| | | | | | 38 | 3.24 | 4.08 | 5.07 | 6.21 | 7.52 | 9.01 | | | | |
| | | | | | 43 | 3.04 | 3.82 | 4.75 | 5.83 | 7.07 | 8.48 | | | | |
| OP-MPXM068ML | 114X4308 | P00 | A1 | G | 27 | 3.79 | 4.66 | 5.75 | 7.04 | 8.47 | 10.03 | 2.11 | - | 40 | 42 |
| | | | | | 32 | 3.64 | 4.43 | 5.45 | 6.67 | 8.06 | 9.58 | | | | |
| | | | | | 38 | 3.48 | 4.15 | 5.07 | 6.21 | 7.53 | 9.00 | | | | |
| | | | | | 43 | 3.36 | 3.92 | 4.75 | 5.82 | 7.07 | 8.49 | | | | |
| OP-MPIM068ML | 114X4307 | P00 | A1+A2L | G | 27 | 3.79 | 4.66 | 5.75 | 7.04 | 8.47 | 10.03 | 2.16 | - | 40 | 42 |
| | | | | | 32 | 3.64 | 4.43 | 5.45 | 6.67 | 8.06 | 9.58 | | | | |
| | | | | | 38 | 3.48 | 4.15 | 5.07 | 6.21 | 7.53 | 9.00 | | | | |
| | | | | | 43 | 3.36 | 3.92 | 4.75 | 5.82 | 7.07 | 8.49 | | | | |
| OP-MPXM080ML | 114X4324 | P00 | A1 | E | 27 | 4.28 | 5.39 | 6.67 | 8.13 | 9.78 | 11.63 | - | 3.50 | 20 | 42 |
| | | | | | 32 | 4.03 | 5.09 | 6.31 | 7.70 | 9.28 | 11.05 | | | | |
| | | | | | 38 | 3.72 | 4.71 | 5.86 | 7.18 | 8.66 | 10.33 | | | | |
| | | | | | 43 | 3.45 | 4.40 | 5.48 | 6.72 | 8.13 | 9.71 | | | | |
| OP-MPIM080ML | 114X4309 | P00 | A1+A2L | E | 27 | 4.28 | 5.39 | 6.67 | 8.13 | 9.78 | 11.63 | - | 3.61 | 20 | 42 |
| | | | | | 32 | 4.03 | 5.09 | 6.31 | 7.70 | 9.28 | 11.05 | | | | |
| | | | | | 38 | 3.72 | 4.71 | 5.86 | 7.18 | 8.66 | 10.33 | | | | |
| | | | | | 43 | 3.45 | 4.40 | 5.48 | 6.72 | 8.13 | 9.71 | | | | |
| OP-MPXM080ML | 114X4321 | P00 | A1 | G | 27 | 4.25 | 5.47 | 6.79 | 8.23 | 9.82 | 11.58 | - | 3.08 | 45 | 42 |
| | | | | | 32 | 3.95 | 5.14 | 6.41 | 7.80 | 9.33 | 11.03 | | | | |
| | | | | | 38 | 3.57 | 4.71 | 5.93 | 7.26 | 8.72 | 10.33 | | | | |
| | | | | | 43 | 3.23 | 4.33 | 5.50 | 6.78 | 8.18 | 9.72 | | | | |
| OP-MPIM080ML | 114X4312 | P00 | A1+A2L | G | 27 | 4.25 | 5.47 | 6.79 | 8.23 | 9.82 | 11.58 | - | 3.17 | 45 | 42 |
| | | | | | 32 | 3.95 | 5.14 | 6.41 | 7.80 | 9.33 | 11.03 | | | | |
| | | | | | 38 | 3.57 | 4.71 | 5.93 | 7.26 | 8.72 | 10.33 | | | | |
| | | | | | 43 | 3.23 | 4.33 | 5.50 | 6.78 | 8.18 | 9.72 | | | | |
| OP-MPXM108ML | 114X4344 | P00 | A1 | E | 27 | 5.64 | 7.05 | 8.71 | 10.60 | 12.72 | 15.06 | - | 3.80 | 20 | 43 |
| | | | | | 32 | 5.30 | 6.64 | 8.22 | 10.03 | 12.06 | 14.30 | | | | |
| | | | | | 38 | 4.89 | 6.14 | 7.62 | 9.32 | 11.24 | 13.35 | | | | |
| | | | | | 43 | 4.55 | 5.71 | 7.10 | 8.71 | 10.52 | 12.53 | | | | |
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 5.64 | 7.05 | 8.71 | 10.60 | 12.72 | 15.06 | - | 3.90 | 20 | 43 |
| | | | | | 32 | 5.30 | 6.64 | 8.22 | 10.03 | 12.06 | 14.30 | | | | |
| | | | | | 38 | 4.89 | 6.14 | 7.62 | 9.32 | 11.24 | 13.35 | | | | |
| | | | | | 43 | 4.55 | 5.71 | 7.10 | 8.71 | 10.52 | 12.53 | | | | |

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**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] | | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | COP | SEPR | | |
| OP-MPXM125ML | 114X4414 | P00 | A1 | E | 27 | 6.78 | 8.48 | 10.42 | 12.63 | 15.11 | 17.86 | - | 3.40 | 32 | 46 |
| | | | | | 32 | 6.35 | 7.98 | 9.84 | 11.96 | 14.33 | 16.96 | | | | |
| | | | | | 38 | 5.82 | 7.36 | 9.13 | 11.13 | 13.36 | 15.85 | | | | |
| | | | | | 43 | 5.36 | 6.84 | 8.52 | 10.41 | 12.54 | 14.90 | | | | |
| OP-MPXM162ML | 114X4434 | P00 | A1 | E | 27 | 8.70 | 10.88 | 13.39 | 16.23 | 19.42 | 22.94 | - | 3.46 | 32 | 46 |
| | | | | | 32 | 8.17 | 10.25 | 12.64 | 15.35 | 18.40 | 21.78 | | | | |
| | | | | | 38 | 7.54 | 9.48 | 11.71 | 14.27 | 17.14 | 20.34 | | | | |
| | | | | | 43 | 7.04 | 8.83 | 10.93 | 13.33 | 16.05 | 19.09 | | | | |
| OP-MPIM125ML | 114X4409 | P00 | A1 + A2L | E | 27 | 6.78 | 8.48 | 10.42 | 12.63 | 15.11 | 17.86 | - | 3.40 | 32 | 46 |
| | | | | | 32 | 6.35 | 7.98 | 9.84 | 11.96 | 14.33 | 16.96 | | | | |
| | | | | | 38 | 5.82 | 7.36 | 9.13 | 11.13 | 13.36 | 15.85 | | | | |
| | | | | | 43 | 5.36 | 6.84 | 8.52 | 10.41 | 12.54 | 14.90 | | | | |
| OP-MPIM162ML | 114X4410 | P00 | A1 + A2L | E | 27 | 8.70 | 10.88 | 13.39 | 16.23 | 19.42 | 22.94 | - | 3.46 | 40 | 46 |
| | | | | | 32 | 8.17 | 10.25 | 12.64 | 15.35 | 18.40 | 21.78 | | | | |
| | | | | | 38 | 7.54 | 9.48 | 11.71 | 14.27 | 17.14 | 20.34 | | | | |
| | | | | | 43 | 7.04 | 8.83 | 10.93 | 13.33 | 16.05 | 19.09 | | | | |

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K



For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPSM026CS | 114X4243 | P00 | A1 + A2L | G | 27 | 1.10 | 1.41 | 1.77 | 2.16 | 2.58 | 3.04 | 1.99 | - | 10 | 37 |
| | | | | | 32 | 0.99 | 1.29 | 1.63 | 2.00 | 2.41 | 2.86 | | | | |
| | | | | | 38 | 0.86 | 1.14 | 1.46 | 1.81 | 2.20 | 2.64 | | | | |
| | | | | | 43 | 0.76 | 1.02 | 1.32 | 1.66 | 2.03 | 2.45 | | | | |
| OP-MPSM030CS | 114X4244 | P00 | A1 + A2L | G | 27 | 1.33 | 1.74 | 2.19 | 2.70 | 3.25 | 3.86 | 1.86 | - | 10 | 37 |
| | | | | | 32 | 1.20 | 1.59 | 2.02 | 2.50 | 3.04 | 3.62 | | | | |
| | | | | | 38 | 1.05 | 1.41 | 1.81 | 2.27 | 2.78 | 3.35 | | | | |
| | | | | | 43 | 0.92 | 1.26 | 1.64 | 2.08 | 2.57 | 3.11 | | | | |
| OP-MPXM034ML | 114X4261 | P00 | A1 | G | 27 | 1.92 | 2.38 | 2.93 | 3.57 | 4.32 | 5.18 | 2.20 | - | 20 | 38 |
| | | | | | 32 | 1.80 | 2.24 | 2.76 | 3.37 | 4.07 | 4.88 | | | | |
| | | | | | 38 | 1.66 | 2.07 | 2.55 | 3.11 | 3.77 | 4.53 | | | | |
| | | | | | 43 | 1.53 | 1.92 | 2.37 | 2.90 | 3.51 | 4.22 | | | | |
| OP-MPIM034ML | 114X4205 | P00 | A1+A2L | G | 27 | 1.92 | 2.38 | 2.93 | 3.57 | 4.32 | 5.18 | 2.20 | - | 20 | 38 |
| | | | | | 32 | 1.80 | 2.24 | 2.76 | 3.37 | 4.07 | 4.88 | | | | |
| | | | | | 38 | 1.66 | 2.07 | 2.55 | 3.11 | 3.77 | 4.53 | | | | |
| | | | | | 43 | 1.53 | 1.92 | 2.37 | 2.90 | 3.51 | 4.22 | | | | |
| OP-MPXM034ML | 114X4264 | P00 | A1 | E | 27 | 1.94 | 2.40 | 2.95 | 3.60 | 4.34 | 5.19 | 2.26 | - | 10 | 38 |
| | | | | | 32 | 1.82 | 2.26 | 2.78 | 3.39 | 4.09 | 4.90 | | | | |
| | | | | | 38 | 1.67 | 2.08 | 2.56 | 3.13 | 3.79 | 4.54 | | | | |
| | | | | | 43 | 1.54 | 1.92 | 2.38 | 2.91 | 3.53 | 4.24 | | | | |
| OP-MPIM034ML | 114X4204 | P00 | A1+A2L | E | 27 | 1.94 | 2.40 | 2.95 | 3.60 | 4.34 | 5.19 | 2.26 | - | 10 | 38 |
| | | | | | 32 | 1.82 | 2.26 | 2.78 | 3.39 | 4.09 | 4.90 | | | | |
| | | | | | 38 | 1.67 | 2.08 | 2.56 | 3.13 | 3.79 | 4.54 | | | | |
| | | | | | 43 | 1.54 | 1.92 | 2.38 | 2.91 | 3.53 | 4.24 | | | | |
| OP-MPXM046ML | 114X4281 | P00 | A1 | G | 27 | 2.56 | 3.17 | 3.89 | 4.72 | 5.68 | 6.75 | 1.99 | - | 32 | 38 |
| | | | | | 32 | 2.39 | 2.98 | 3.67 | 4.46 | 5.36 | 6.39 | | | | |
| | | | | | 38 | 2.19 | 2.75 | 3.39 | 4.13 | 4.98 | 5.94 | | | | |
| | | | | | 43 | 2.02 | 2.54 | 3.15 | 3.84 | 4.64 | 5.54 | | | | |
| OP-MPIM046ML | 114X4207 | P00 | A1+A2L | G | 27 | 2.56 | 3.17 | 3.89 | 4.72 | 5.68 | 6.75 | 1.99 | - | 32 | 38 |
| | | | | | 32 | 2.39 | 2.98 | 3.67 | 4.46 | 5.36 | 6.39 | | | | |
| | | | | | 38 | 2.19 | 2.75 | 3.39 | 4.13 | 4.98 | 5.94 | | | | |
| | | | | | 43 | 2.02 | 2.54 | 3.15 | 3.84 | 4.64 | 5.54 | | | | |
| OP-MPXM046ML | 114X4284 | P00 | A1 | E | 27 | 2.63 | 3.25 | 3.97 | 4.81 | 5.77 | 6.84 | 2.32 | - | 12 | 38 |
| | | | | | 32 | 2.45 | 3.04 | 3.73 | 4.53 | 5.44 | 6.46 | | | | |
| | | | | | 38 | 2.23 | 2.79 | 3.44 | 4.18 | 5.03 | 5.99 | | | | |
| | | | | | 43 | 2.04 | 2.57 | 3.18 | 3.88 | 4.68 | 5.59 | | | | |
| OP-MPIM046ML | 114X4206 | P00 | A1+A2L | E | 27 | 2.63 | 3.25 | 3.97 | 4.81 | 5.77 | 6.84 | 2.32 | - | 12 | 38 |
| | | | | | 32 | 2.45 | 3.04 | 3.73 | 4.53 | 5.44 | 6.46 | | | | |
| | | | | | 38 | 2.23 | 2.79 | 3.44 | 4.18 | 5.03 | 5.99 | | | | |
| | | | | | 43 | 2.04 | 2.57 | 3.18 | 3.88 | 4.68 | 5.59 | | | | |
| OP-MPXM057ML | 114X4290 | P00 | A1 | G | 27 | 3.14 | 3.89 | 4.75 | 5.74 | 6.86 | 8.10 | 2.06 | - | 32 | 39 |
| | | | | | 32 | 2.94 | 3.65 | 4.47 | 5.41 | 6.47 | 7.65 | | | | |
| | | | | | 38 | 2.69 | 3.36 | 4.12 | 5.00 | 5.98 | 7.08 | | | | |
| | | | | | 43 | 2.47 | 3.10 | 3.82 | 4.64 | 5.56 | 6.60 | | | | |
| OP-MPIM057ML | 114X4209 | P00 | A1+A2L | G | 27 | 3.14 | 3.89 | 4.75 | 5.74 | 6.86 | 8.10 | 2.06 | - | 32 | 39 |
| | | | | | 32 | 2.94 | 3.65 | 4.47 | 5.41 | 6.47 | 7.65 | | | | |
| | | | | | 38 | 2.69 | 3.36 | 4.12 | 5.00 | 5.98 | 7.08 | | | | |
| | | | | | 43 | 2.47 | 3.10 | 3.82 | 4.64 | 5.56 | 6.60 | | | | |

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPXM057ML | 114X4293 | P00 | A1 | E | 27 | 3.20 | 3.96 | 4.83 | 5.83 | 6.95 | 8.20 | 2.30 | - | 12 | 39 |
| | | | | | 32 | 2.97 | 3.70 | 4.53 | 5.48 | 6.55 | 7.74 | | | | |
| | | | | | 38 | 2.69 | 3.37 | 4.16 | 5.05 | 6.05 | 7.17 | | | | |
| | | | | | 43 | 2.44 | 3.09 | 3.83 | 4.67 | 5.62 | 6.67 | | | | |
| OP-MPIM057ML | 114X4208 | P00 | A1+A2L | E | 27 | 3.20 | 3.96 | 4.83 | 5.83 | 6.95 | 8.20 | 2.30 | - | 12 | 39 |
| | | | | | 32 | 2.97 | 3.70 | 4.53 | 5.48 | 6.55 | 7.74 | | | | |
| | | | | | 38 | 2.69 | 3.37 | 4.16 | 5.05 | 6.05 | 7.17 | | | | |
| | | | | | 43 | 2.44 | 3.09 | 3.83 | 4.67 | 5.62 | 6.67 | | | | |
| OP-MPXM068ML | 114X4308 | P00 | A1 | G | 27 | 3.94 | 4.85 | 5.92 | 7.17 | 8.61 | 10.24 | 2.30 | - | 40 | 42 |
| | | | | | 32 | 3.68 | 4.55 | 5.58 | 6.77 | 8.14 | 9.69 | | | | |
| | | | | | 38 | 3.37 | 4.19 | 5.14 | 6.26 | 7.54 | 9.01 | | | | |
| | | | | | 43 | 3.10 | 3.87 | 4.77 | 5.82 | 7.03 | 8.41 | | | | |
| OP-MPIM068ML | 114X4307 | P00 | A1+A2L | G | 27 | 3.94 | 4.85 | 5.92 | 7.17 | 8.61 | 10.24 | 2.36 | - | 40 | 42 |
| | | | | | 32 | 3.68 | 4.55 | 5.58 | 6.77 | 8.14 | 9.69 | | | | |
| | | | | | 38 | 3.37 | 4.19 | 5.14 | 6.26 | 7.54 | 9.01 | | | | |
| | | | | | 43 | 3.10 | 3.87 | 4.77 | 5.82 | 7.03 | 8.41 | | | | |
| OP-MPXM068ML | 114X4311 | P00 | A1 | E | 27 | 3.99 | 4.93 | 6.03 | 7.32 | 8.80 | 10.48 | 2.52 | - | 16 | 42 |
| | | | | | 32 | 3.75 | 4.64 | 5.69 | 6.92 | 8.32 | 9.92 | | | | |
| | | | | | 38 | 3.44 | 4.28 | 5.26 | 6.41 | 7.73 | 9.22 | | | | |
| | | | | | 43 | 3.18 | 3.97 | 4.89 | 5.97 | 7.21 | 8.62 | | | | |
| OP-MPIM068ML | 114X4306 | P00 | A1+A2L | E | 27 | 3.99 | 4.93 | 6.03 | 7.32 | 8.80 | 10.48 | 2.59 | - | 16 | 42 |
| | | | | | 32 | 3.75 | 4.64 | 5.69 | 6.92 | 8.32 | 9.92 | | | | |
| | | | | | 38 | 3.44 | 4.28 | 5.26 | 6.41 | 7.73 | 9.22 | | | | |
| | | | | | 43 | 3.18 | 3.97 | 4.89 | 5.97 | 7.21 | 8.62 | | | | |
| OP-MPXM080ML | 114X4321 | P00 | A1 | G | 27 | 4.59 | 5.68 | 6.95 | 8.43 | 10.13 | 12.04 | - | 3.24 | 45 | 42 |
| | | | | | 32 | 4.31 | 5.34 | 6.56 | 7.96 | 9.57 | 11.38 | | | | |
| | | | | | 38 | 3.95 | 4.93 | 6.06 | 7.37 | 8.87 | 10.57 | | | | |
| | | | | | 43 | 3.65 | 4.56 | 5.63 | 6.86 | 8.27 | 9.87 | | | | |
| OP-MPIM080ML | 114X4312 | P00 | A1+A2L | G | 27 | 4.59 | 5.68 | 6.95 | 8.43 | 10.13 | 12.04 | - | 3.33 | 45 | 42 |
| | | | | | 32 | 4.31 | 5.34 | 6.56 | 7.96 | 9.57 | 11.38 | | | | |
| | | | | | 38 | 3.95 | 4.93 | 6.06 | 7.37 | 8.87 | 10.57 | | | | |
| | | | | | 43 | 3.65 | 4.56 | 5.63 | 6.86 | 8.27 | 9.87 | | | | |
| OP-MPXM080ML | 114X4324 | P00 | A1 | E | 27 | 4.67 | 5.75 | 7.02 | 8.49 | 10.17 | 12.07 | - | 3.89 | 20 | 42 |
| | | | | | 32 | 4.37 | 5.40 | 6.61 | 8.00 | 9.60 | 11.40 | | | | |
| | | | | | 38 | 4.00 | 4.97 | 6.09 | 7.39 | 8.88 | 10.57 | | | | |
| | | | | | 43 | 3.69 | 4.59 | 5.65 | 6.87 | 8.27 | 9.86 | | | | |
| OP-MPIM080ML | 114X4309 | P00 | A1+A2L | E | 27 | 4.67 | 5.75 | 7.02 | 8.49 | 10.17 | 12.07 | - | 4.02 | 20 | 42 |
| | | | | | 32 | 4.37 | 5.40 | 6.61 | 8.00 | 9.60 | 11.40 | | | | |
| | | | | | 38 | 4.00 | 4.97 | 6.09 | 7.39 | 8.88 | 10.57 | | | | |
| | | | | | 43 | 3.69 | 4.59 | 5.65 | 6.87 | 8.27 | 9.86 | | | | |
| OP-MPXM108ML | 114X4344 | P00 | A1 | E | 27 | 6.08 | 7.49 | 9.14 | 11.02 | 13.16 | 15.56 | - | 3.79 | 20 | 43 |
| | | | | | 32 | 5.65 | 7.00 | 8.57 | 10.36 | 12.39 | 14.67 | | | | |
| | | | | | 38 | 5.13 | 6.40 | 7.86 | 9.54 | 11.44 | 13.57 | | | | |
| | | | | | 43 | 4.68 | 5.88 | 7.25 | 8.83 | 10.61 | 12.63 | | | | |
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 6.08 | 7.49 | 9.14 | 11.02 | 13.16 | 15.56 | - | 3.88 | 20 | 43 |
| | | | | | 32 | 5.65 | 7.00 | 8.57 | 10.36 | 12.39 | 14.67 | | | | |
| | | | | | 38 | 5.13 | 6.40 | 7.86 | 9.54 | 11.44 | 13.57 | | | | |
| | | | | | 43 | 4.68 | 5.88 | 7.25 | 8.83 | 10.61 | 12.63 | | | | |

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) | | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Evaporating Temperature (Mid point) [°C] | | | | | | | | | |
| | | | | | | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | COP | SEPR | | |
| OP-MPXM125ML | 114X4414 | P00 | A1 | E | 27 | 7.29 | 9.01 | 11.02 | 13.34 | 15.98 | 18.96 | - | 3.66 | 32 | 46 |
| | | | | | 32 | 6.81 | 8.45 | 10.37 | 12.57 | 15.09 | 17.92 | | | | |
| | | | | | 38 | 6.21 | 7.76 | 9.55 | 11.61 | 13.97 | 16.63 | | | | |
| | | | | | 43 | 5.70 | 7.16 | 8.84 | 10.78 | 13.00 | 15.51 | | | | |
| OP-MPXM162ML | 114X4434 | P00 | A1 | E | 27 | 8.91 | 11.06 | 13.55 | 16.40 | 19.61 | 23.19 | - | 3.16 | 32 | 46 |
| | | | | | 32 | 8.28 | 10.32 | 12.68 | 15.38 | 18.42 | 21.82 | | | | |
| | | | | | 38 | 7.50 | 9.42 | 11.62 | 14.13 | 16.96 | 20.13 | | | | |
| | | | | | 43 | 6.85 | 8.65 | 10.71 | 13.06 | 15.71 | 18.69 | | | | |
| OP-MPIM125ML | 114X4409 | P00 | A1 + A2L | E | 27 | 7.29 | 9.01 | 11.02 | 13.34 | 15.98 | 18.96 | - | 3.66 | 32 | 46 |
| | | | | | 32 | 6.81 | 8.45 | 10.37 | 12.57 | 15.09 | 17.92 | | | | |
| | | | | | 38 | 6.21 | 7.76 | 9.55 | 11.61 | 13.97 | 16.63 | | | | |
| | | | | | 43 | 5.70 | 7.16 | 8.84 | 10.78 | 13.00 | 15.51 | | | | |
| OP-MPIM162ML | 114X4410 | P00 | A1 + A2L | E | 27 | 8.91 | 11.06 | 13.55 | 16.40 | 19.61 | 23.19 | - | 3.16 | 40 | 46 |
| | | | | | 32 | 8.28 | 10.32 | 12.68 | 15.38 | 18.42 | 21.82 | | | | |
| | | | | | 38 | 7.50 | 9.42 | 11.62 | 14.13 | 16.96 | 20.13 | | | | |
| | | | | | 43 | 6.85 | 8.65 | 10.71 | 13.06 | 15.71 | 18.69 | | | | |

**MBP**
**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K



For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L


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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPSM026CS | 114X4243 | P00 | A1 + A2L | G | 27 | 1.12 | 1.44 | 1.81 | 2.21 | 2.64 | 3.12 | 1.95 | - | 10 | 37 |
| | | | | | 32 | 1.01 | 1.31 | 1.66 | 2.04 | 2.46 | 2.92 | | | | |
| | | | | | 38 | 0.87 | 1.16 | 1.48 | 1.85 | 2.25 | 2.69 | | | | |
| | | | | | 43 | 0.76 | 1.03 | 1.34 | 1.68 | 2.07 | 2.50 | | | | |
| OP-MPSM030CS | 114X4244 | P00 | A1 + A2L | G | 27 | 1.19 | 1.55 | 1.97 | 2.43 | 2.94 | 3.49 | 1.83 | - | 10 | 37 |
| | | | | | 32 | 1.07 | 1.42 | 1.81 | 2.25 | 2.74 | 3.28 | | | | |
| | | | | | 38 | 0.93 | 1.25 | 1.62 | 2.04 | 2.51 | 3.03 | | | | |
| | | | | | 43 | 0.82 | 1.12 | 1.47 | 1.87 | 2.32 | 2.82 | | | | |

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K



For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPBM008DY | 114X4119 | P00 | A1 | G | 27 | - | 0.78 | 0.97 | 1.18 | 1.40 | 1.63 | - | 2.26 | - | 6 | 31 |
| | | | | | 32 | - | 0.70 | 0.87 | 1.06 | 1.26 | 1.48 | - | | | | |
| | | | | | 38 | - | 0.59 | 0.74 | 0.91 | 1.10 | 1.29 | - | | | | |
| | | | | | 43 | - | - | 0.64 | 0.79 | 0.96 | 1.14 | - | | | | |
| OP-MPBM009DY | 114X4120 | P00 | A1 | G | 27 | - | 0.89 | 1.09 | 1.30 | 1.53 | 1.77 | - | 2.05 | - | 8 | 31 |
| | | | | | 32 | - | 0.79 | 0.98 | 1.17 | 1.38 | 1.60 | - | | | | |
| | | | | | 38 | - | 0.68 | 0.84 | 1.02 | 1.20 | 1.40 | - | | | | |
| | | | | | 43 | - | - | 0.73 | 0.89 | 1.06 | 1.24 | - | | | | |
| OP-MPTM008DY | 114X4107 | P00 | A1 + A2L | G | 27 | - | 0.78 | 0.97 | 1.18 | 1.40 | 1.63 | - | 2.26 | - | 6 | 31 |
| | | | | | 32 | - | 0.70 | 0.87 | 1.06 | 1.26 | 1.48 | - | | | | |
| | | | | | 38 | - | 0.59 | 0.74 | 0.91 | 1.10 | 1.29 | - | | | | |
| | | | | | 43 | - | - | 0.64 | 0.79 | 0.96 | 1.14 | - | | | | |
| OP-MPTM009DY | 114X4111 | P00 | A1 + A2L | G | 27 | - | 0.89 | 1.09 | 1.30 | 1.53 | 1.77 | - | 2.05 | - | 8 | 31 |
| | | | | | 32 | - | 0.79 | 0.98 | 1.17 | 1.38 | 1.60 | - | | | | |
| | | | | | 38 | - | 0.68 | 0.84 | 1.02 | 1.20 | 1.40 | - | | | | |
| | | | | | 43 | - | - | 0.73 | 0.89 | 1.06 | 1.24 | - | | | | |
| OP-MPBM012DP | 114X4121 | P00 | A1 | G | 27 | - | 1.14 | 1.39 | 1.66 | 1.93 | 2.22 | - | 1.86 | - | 8 | 31 |
| | | | | | 32 | - | 1.01 | 1.24 | 1.48 | 1.74 | 2.01 | - | | | | |
| | | | | | 38 | - | 0.86 | 1.06 | 1.28 | 1.51 | 1.75 | - | | | | |
| | | | | | 43 | - | - | 0.92 | 1.11 | 1.32 | 1.54 | - | | | | |
| OP-MPBM014DP | 114X4122 | P00 | A1 | G | 27 | - | 1.20 | 1.45 | 1.71 | 2.00 | 2.29 | - | 1.79 | - | 8 | 31 |
| | | | | | 32 | - | 1.09 | 1.32 | 1.57 | 1.83 | 2.11 | - | | | | |
| | | | | | 38 | - | 0.96 | 1.16 | 1.39 | 1.63 | 1.89 | - | | | | |
| | | | | | 43 | - | - | 1.03 | 1.24 | 1.47 | 1.71 | - | | | | |
| OP-MPTM012DP | 114X4113 | P00 | A1 + A2L | G | 27 | - | 1.14 | 1.39 | 1.66 | 1.93 | 2.22 | - | 1.86 | - | 8 | 31 |
| | | | | | 32 | - | 1.01 | 1.24 | 1.48 | 1.74 | 2.01 | - | | | | |
| | | | | | 38 | - | 0.86 | 1.06 | 1.28 | 1.51 | 1.75 | - | | | | |
| | | | | | 43 | - | - | 0.92 | 1.11 | 1.32 | 1.54 | - | | | | |
| OP-MPTM014DP | 114X4114 | P00 | A1 + A2L | G | 27 | - | 1.20 | 1.45 | 1.71 | 2.00 | 2.29 | - | 1.79 | - | 8 | 31 |
| | | | | | 32 | - | 1.09 | 1.32 | 1.57 | 1.83 | 2.11 | - | | | | |
| | | | | | 38 | - | 0.96 | 1.16 | 1.39 | 1.63 | 1.89 | - | | | | |
| | | | | | 43 | - | - | 1.03 | 1.24 | 1.47 | 1.71 | - | | | | |
| OP-MPTM018DX | 114X4115 | P00 | A1 + A2L | G | 27 | - | 1.26 | 1.51 | 1.77 | 2.05 | 2.34 | - | 1.66 | - | 10 | 39 |
| | | | | | 32 | - | 1.15 | 1.38 | 1.62 | 1.88 | 2.16 | - | | | | |
| | | | | | 38 | - | 1.02 | 1.22 | 1.44 | 1.68 | 1.94 | - | | | | |
| | | | | | 43 | - | - | 1.09 | 1.30 | 1.52 | 1.76 | - | | | | |
| OP-MPTM021DX* | 114X4217 | P00 | A1 + A2L | G | 27 | 1.16 | 1.40 | 1.67 | 1.95 | 2.24 | 2.55 | - | 1.61 | - | 10 | 39 |
| | | | | | 32 | 1.06 | 1.28 | 1.52 | 1.78 | 2.06 | 2.35 | - | | | | |
| | | | | | 38 | 0.94 | 1.13 | 1.35 | 1.58 | 1.84 | 2.10 | - | | | | |
| | | | | | 43 | 0.84 | 1.01 | 1.21 | 1.42 | 1.65 | 1.90 | - | | | | |
| OP-MPTM022DS | 114X4237 | P00 | A1 + A2L | G | 27 | - | 1.84 | 2.24 | 2.69 | 3.18 | 3.73 | - | 1.93 | - | 10 | 40 |
| | | | | | 32 | - | 1.66 | 2.03 | 2.44 | 2.90 | 3.39 | - | | | | |
| | | | | | 38 | - | 1.45 | 1.78 | 2.15 | 2.56 | 3.00 | - | | | | |
| | | | | | 43 | - | - | 1.58 | 1.91 | 2.27 | 2.67 | - | | | | |
| OP-MPTM026DS | 114X4238 | P00 | A1 + A2L | G | 27 | - | 2.24 | 2.74 | 3.26 | 3.80 | 4.36 | - | 2.02 | - | 16 | 38 |
| | | | | | 32 | - | 1.98 | 2.43 | 2.91 | 3.41 | 3.93 | - | | | | |
| | | | | | 38 | - | 1.67 | 2.06 | 2.49 | 2.94 | 3.41 | - | | | | |
| | | | | | 43 | - | - | 1.76 | 2.14 | 2.55 | 2.98 | - | | | | |

**This table continues on the next page**

*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPTM026DS | 114X4239 | P00 | A1 + A2L | E | 27 | - | 2.25 | 2.75 | 3.27 | 3.82 | 4.39 | - | 2.07 | - | 6 | 38 |
| | | | | | 32 | - | 1.99 | 2.44 | 2.92 | 3.43 | 3.95 | - | | | | |
| | | | | | 38 | - | 1.68 | 2.07 | 2.50 | 2.95 | 3.43 | - | | | | |
| | | | | | 43 | - | - | 1.77 | 2.15 | 2.56 | 3.00 | - | | | | |
| OP-MPTM034DS | 114X4241 | P00 | A1 + A2L | G | 27 | - | 2.29 | 2.96 | 3.71 | 4.55 | 5.47 | - | 1.81 | - | 20 | 39 |
| | | | | | 32 | - | 2.05 | 2.68 | 3.39 | 4.18 | 5.05 | - | | | | |
| | | | | | 38 | - | 1.76 | 2.33 | 2.99 | 3.72 | 4.53 | - | | | | |
| | | | | | 43 | - | - | 2.04 | 2.65 | 3.33 | 4.09 | - | | | | |
| OP-MPTM034DS | 114X4242 | P00 | A1 + A2L | E | 27 | - | 2.33 | 3.01 | 3.78 | 4.63 | 5.57 | - | 1.86 | - | 8 | 39 |
| | | | | | 32 | - | 2.09 | 2.73 | 3.45 | 4.25 | 5.13 | - | | | | |
| | | | | | 38 | - | 1.79 | 2.38 | 3.04 | 3.78 | 4.60 | - | | | | |
| | | | | | 43 | 1.06 | - | 2.08 | 2.70 | 3.39 | 4.15 | - | | | | |
| OP-MPXM034ML | 114X4264 | P00 | A1 | E | 27 | 2.63 | 3.24 | 3.93 | 4.72 | 5.60 | 6.58 | - | 2.24 | - | 10 | 38 |
| | | | | | 32 | 2.43 | 3.00 | 3.65 | 4.40 | 5.23 | 6.16 | - | | | | |
| | | | | | 38 | 2.17 | 2.70 | 3.30 | 3.99 | 4.77 | 5.63 | - | | | | |
| | | | | | 43 | - | 2.44 | 3.00 | 3.64 | 4.36 | 5.17 | - | | | | |
| OP-MPIM034ML | 114X4204 | P00 | A1+A2L | E | 27 | 2.63 | 3.24 | 3.93 | 4.72 | 5.60 | 6.58 | - | 2.24 | - | 10 | 38 |
| | | | | | 32 | 2.43 | 3.00 | 3.65 | 4.40 | 5.23 | 6.16 | - | | | | |
| | | | | | 38 | 2.17 | 2.70 | 3.30 | 3.99 | 4.77 | 5.63 | - | | | | |
| | | | | | 43 | - | 2.44 | 3.00 | 3.64 | 4.36 | 5.17 | - | | | | |
| OP-MPXM034ML | 114X4261 | P00 | A1 | G | 27 | 2.62 | 3.23 | 3.94 | 4.73 | 5.61 | 6.59 | - | 2.30 | - | 20 | 38 |
| | | | | | 32 | 2.43 | 3.01 | 3.67 | 4.41 | 5.25 | 6.17 | - | | | | |
| | | | | | 38 | 2.20 | 2.73 | 3.33 | 4.02 | 4.80 | 5.66 | - | | | | |
| | | | | | 43 | - | 2.49 | 3.05 | 3.69 | 4.41 | 5.21 | - | | | | |
| OP-MPIM034ML | 114X4205 | P00 | A1+A2L | G | 27 | 2.62 | 3.23 | 3.94 | 4.73 | 5.61 | 6.59 | - | 2.30 | - | 20 | 38 |
| | | | | | 32 | 2.43 | 3.01 | 3.67 | 4.41 | 5.25 | 6.17 | - | | | | |
| | | | | | 38 | 2.20 | 2.73 | 3.33 | 4.02 | 4.80 | 5.66 | - | | | | |
| | | | | | 43 | - | 2.49 | 3.05 | 3.69 | 4.41 | 5.21 | - | | | | |
| OP-MPTM038DS* | 114X4218 | P00 | A1 + A2L | G | 27 | 1.85 | 2.48 | 3.20 | 4.00 | 4.90 | 5.89 | - | 1.78 | - | 20 | 39 |
| | | | | | 32 | 1.63 | 2.22 | 2.89 | 3.65 | 4.50 | 5.42 | - | | | | |
| | | | | | 38 | 1.36 | 1.90 | 2.51 | 3.21 | 3.99 | 4.85 | - | | | | |
| | | | | | 43 | 1.13 | 1.62 | 2.20 | 2.84 | 3.57 | 4.37 | - | | | | |
| OP-MPXM046ML | 114X4284 | P00 | A1 | E | 27 | 3.50 | 4.29 | 5.19 | 6.20 | 7.31 | 8.53 | - | 2.14 | - | 12 | 38 |
| | | | | | 32 | 3.22 | 3.96 | 4.80 | 5.74 | 6.79 | 7.95 | - | | | | |
| | | | | | 38 | 2.87 | 3.55 | 4.32 | 5.18 | 6.15 | 7.22 | - | | | | |
| | | | | | 43 | - | 3.20 | 3.91 | 4.70 | 5.60 | 6.59 | - | | | | |
| OP-MPIM046ML | 114X4206 | P00 | A1+A2L | E | 27 | 3.50 | 4.29 | 5.19 | 6.20 | 7.31 | 8.53 | - | 2.14 | - | 12 | 38 |
| | | | | | 32 | 3.22 | 3.96 | 4.80 | 5.74 | 6.79 | 7.95 | - | | | | |
| | | | | | 38 | 2.87 | 3.55 | 4.32 | 5.18 | 6.15 | 7.22 | - | | | | |
| | | | | | 43 | - | 3.20 | 3.91 | 4.70 | 5.60 | 6.59 | - | | | | |
| OP-MPXM046ML | 114X4281 | P00 | A1 | G | 27 | 3.51 | 4.31 | 5.21 | 6.23 | 7.37 | 8.61 | - | 2.06 | - | 32 | 38 |
| | | | | | 32 | 3.24 | 3.99 | 4.84 | 5.79 | 6.86 | 8.04 | - | | | | |
| | | | | | 38 | 2.91 | 3.60 | 4.38 | 5.25 | 6.24 | 7.33 | - | | | | |
| | | | | | 43 | - | 3.27 | 3.98 | 4.79 | 5.70 | 6.72 | - | | | | |
| OP-MPIM046ML | 114X4207 | P00 | A1+A2L | G | 27 | 3.51 | 4.31 | 5.21 | 6.23 | 7.37 | 8.61 | - | 2.06 | - | 32 | 38 |
| | | | | | 32 | 3.24 | 3.99 | 4.84 | 5.79 | 6.86 | 8.04 | - | | | | |
| | | | | | 38 | 2.91 | 3.60 | 4.38 | 5.25 | 6.24 | 7.33 | - | | | | |
| | | | | | 43 | - | 3.27 | 3.98 | 4.79 | 5.70 | 6.72 | - | | | | |

This table continues on the next page

*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPXM057ML | 114X4293 | P00 | A1 | E | 27 | 4.21 | 5.17 | 6.24 | 7.41 | 8.70 | 10.09 | - | - | 3.36 | 12 | 39 |
| | | | | | 32 | 3.84 | 4.73 | 5.73 | 6.83 | 8.04 | 9.35 | - | | | | |
| | | | | | 38 | 3.37 | 4.19 | 5.10 | 6.11 | 7.22 | 8.42 | - | | | | |
| | | | | | 43 | - | 3.73 | 4.57 | 5.49 | 6.50 | 7.61 | - | | | | |
| OP-MPIM057ML | 114X4208 | P00 | A1+A2L | E | 27 | 4.21 | 5.17 | 6.24 | 7.41 | 8.70 | 10.09 | - | - | 3.36 | 12 | 39 |
| | | | | | 32 | 3.84 | 4.73 | 5.73 | 6.83 | 8.04 | 9.35 | - | | | | |
| | | | | | 38 | 3.37 | 4.19 | 5.10 | 6.11 | 7.22 | 8.42 | - | | | | |
| | | | | | 43 | - | 3.73 | 4.57 | 5.49 | 6.50 | 7.61 | - | | | | |
| OP-MPXM057ML | 114X4290 | P00 | A1 | G | 27 | 4.26 | 5.22 | 6.29 | 7.49 | 8.80 | 10.23 | - | - | 3.15 | 32 | 39 |
| | | | | | 32 | 3.92 | 4.80 | 5.80 | 6.92 | 8.14 | 9.48 | - | | | | |
| | | | | | 38 | 3.49 | 4.29 | 5.19 | 6.20 | 7.31 | 8.54 | - | | | | |
| | | | | | 43 | - | 3.84 | 4.65 | 5.57 | 6.59 | 7.72 | - | | | | |
| OP-MPIM057ML | 114X4209 | P00 | A1+A2L | G | 27 | 4.26 | 5.22 | 6.29 | 7.49 | 8.80 | 10.23 | - | - | 3.15 | 32 | 39 |
| | | | | | 32 | 3.92 | 4.80 | 5.80 | 6.92 | 8.14 | 9.48 | - | | | | |
| | | | | | 38 | 3.49 | 4.29 | 5.19 | 6.20 | 7.31 | 8.54 | - | | | | |
| | | | | | 43 | - | 3.84 | 4.65 | 5.57 | 6.59 | 7.72 | - | | | | |
| OP-MPXM068ML | 114X4308 | P00 | A1 | G | 27 | 5.33 | 6.54 | 7.93 | 9.49 | 11.23 | 13.17 | - | - | 3.59 | 40 | 42 |
| | | | | | 32 | 4.91 | 6.06 | 7.36 | 8.83 | 10.47 | 12.31 | - | | | | |
| | | | | | 38 | 4.40 | 5.46 | 6.65 | 8.01 | 9.53 | 11.24 | - | | | | |
| | | | | | 43 | - | 4.95 | 6.05 | 7.31 | 8.73 | 10.33 | - | | | | |
| OP-MPIM068ML | 114X4307 | P00 | A1+A2L | G | 27 | 5.33 | 6.54 | 7.93 | 9.49 | 11.23 | 13.17 | - | - | 3.67 | 40 | 42 |
| | | | | | 32 | 4.91 | 6.06 | 7.36 | 8.83 | 10.47 | 12.31 | - | | | | |
| | | | | | 38 | 4.40 | 5.46 | 6.65 | 8.01 | 9.53 | 11.24 | - | | | | |
| | | | | | 43 | - | 4.95 | 6.05 | 7.31 | 8.73 | 10.33 | - | | | | |
| OP-MPXM068ML | 114X4311 | P00 | A1 | E | 27 | 5.36 | 6.57 | 7.95 | 9.51 | 11.25 | 13.17 | - | - | 3.78 | 16 | 42 |
| | | | | | 32 | 4.94 | 6.08 | 7.37 | 8.84 | 10.48 | 12.31 | - | | | | |
| | | | | | 38 | 4.42 | 5.46 | 6.65 | 8.00 | 9.52 | 11.22 | - | | | | |
| | | | | | 43 | - | 4.92 | 6.02 | 7.27 | 8.68 | 10.27 | - | | | | |
| OP-MPIM068ML | 114X4306 | P00 | A1+A2L | E | 27 | 5.36 | 6.57 | 7.95 | 9.51 | 11.25 | 13.17 | - | - | 3.87 | 16 | 42 |
| | | | | | 32 | 4.94 | 6.08 | 7.37 | 8.84 | 10.48 | 12.31 | - | | | | |
| | | | | | 38 | 4.42 | 5.46 | 6.65 | 8.00 | 9.52 | 11.22 | - | | | | |
| | | | | | 43 | - | 4.92 | 6.02 | 7.27 | 8.68 | 10.27 | - | | | | |
| OP-MPXM080ML | 114X4321 | P00 | A1 | G | 27 | 6.13 | 7.50 | 9.04 | 10.76 | 12.66 | 14.73 | - | - | 3.32 | 45 | 42 |
| | | | | | 32 | 5.69 | 6.97 | 8.42 | 10.03 | 11.81 | 13.76 | - | | | | |
| | | | | | 38 | 5.14 | 6.32 | 7.64 | 9.11 | 10.75 | 12.55 | - | | | | |
| | | | | | 43 | - | 5.75 | 6.97 | 8.33 | 9.83 | 11.50 | - | | | | |
| OP-MPIM080ML | 114X4312 | P00 | A1+A2L | G | 27 | 6.13 | 7.50 | 9.04 | 10.76 | 12.66 | 14.73 | - | - | 3.38 | 45 | 42 |
| | | | | | 32 | 5.69 | 6.97 | 8.42 | 10.03 | 11.81 | 13.76 | - | | | | |
| | | | | | 38 | 5.14 | 6.32 | 7.64 | 9.11 | 10.75 | 12.55 | - | | | | |
| | | | | | 43 | - | 5.75 | 6.97 | 8.33 | 9.83 | 11.50 | - | | | | |
| OP-MPXM080ML | 114X4324 | P00 | A1 | E | 27 | 6.22 | 7.59 | 9.15 | 10.89 | 12.81 | 14.91 | - | - | 3.74 | 20 | 42 |
| | | | | | 32 | 5.72 | 7.01 | 8.47 | 10.10 | 11.91 | 13.89 | - | | | | |
| | | | | | 38 | 5.11 | 6.29 | 7.62 | 9.12 | 10.79 | 12.63 | - | | | | |
| | | | | | 43 | - | 5.67 | 6.90 | 8.28 | 9.83 | 11.54 | - | | | | |
| OP-MPIM080ML | 114X4309 | P00 | A1+A2L | E | 27 | 6.22 | 7.59 | 9.15 | 10.89 | 12.81 | 14.91 | - | - | 3.82 | 20 | 42 |
| | | | | | 32 | 5.72 | 7.01 | 8.47 | 10.10 | 11.91 | 13.89 | - | | | | |
| | | | | | 38 | 5.11 | 6.29 | 7.62 | 9.12 | 10.79 | 12.63 | - | | | | |
| | | | | | 43 | - | 5.67 | 6.90 | 8.28 | 9.83 | 11.54 | - | | | | |
| OP-MPXM108ML | 114X4344 | P00 | A1 | E | 27 | 8.09 | 9.90 | 11.93 | 14.18 | 16.67 | 19.40 | - | - | 3.55 | 20 | 43 |
| | | | | | 32 | 7.43 | 9.11 | 11.01 | 13.12 | 15.45 | 18.02 | - | | | | |
| | | | | | 38 | 6.62 | 8.14 | 9.86 | 11.79 | 13.93 | 16.29 | - | | | | |
| | | | | | 43 | - | 7.32 | 8.88 | 10.64 | 12.61 | 14.79 | - | | | | |

**MBP**

**This table continues on the next page**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L




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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 8.09 | 9.90 | 11.93 | 14.18 | 16.67 | 19.40 | - | - | 3.60 | 20 | 43 |
| | | | | | 32 | 7.43 | 9.11 | 11.01 | 13.12 | 15.45 | 18.02 | - | | | | |
| | | | | | 38 | 6.62 | 8.14 | 9.86 | 11.79 | 13.93 | 16.29 | - | | | | |
| | | | | | 43 | - | 7.32 | 8.88 | 10.64 | 12.61 | 14.79 | - | | | | |
| OP-MPXM125ML | 114X4414 | P00 | A1 | E | 27 | 9.63 | 11.78 | 14.21 | 16.93 | 19.94 | 23.23 | - | - | 3.63 | 32 | 46 |
| | | | | | 32 | 8.87 | 10.89 | 13.16 | 15.71 | 18.53 | 21.63 | - | | | | |
| | | | | | 38 | 7.94 | 9.78 | 11.85 | 14.19 | 16.78 | 19.65 | - | | | | |
| | | | | | 43 | - | 8.83 | 10.73 | 12.87 | 15.27 | 17.93 | - | | | | |
| OP-MPXM162ML | 114X4434 | P00 | A1 | E | 27 | 11.70 | 14.50 | 17.67 | 21.22 | 25.15 | 29.44 | - | - | 3.35 | 32 | 46 |
| | | | | | 32 | 10.65 | 13.27 | 16.24 | 19.59 | 23.30 | 27.37 | - | | | | |
| | | | | | 38 | 9.35 | 11.74 | 14.46 | 17.54 | 20.98 | 24.77 | - | | | | |
| | | | | | 43 | - | 10.43 | 12.93 | 15.77 | 18.96 | 22.49 | - | | | | |
| OP-MPIM125ML | 114X4409 | P00 | A1 + A2L | E | 27 | 9.63 | 11.78 | 14.21 | 16.93 | 19.94 | 23.23 | - | - | 3.63 | 32 | 46 |
| | | | | | 32 | 8.87 | 10.89 | 13.16 | 15.71 | 18.53 | 21.63 | - | | | | |
| | | | | | 38 | 7.94 | 9.78 | 11.85 | 14.19 | 16.78 | 19.65 | - | | | | |
| | | | | | 43 | - | 8.83 | 10.73 | 12.87 | 15.27 | 17.93 | - | | | | |
| OP-MPIM162ML | 114X4410 | P00 | A1 + A2L | E | 27 | 11.70 | 14.50 | 17.67 | 21.22 | 25.15 | 29.44 | - | - | 3.35 | 40 | 46 |
| | | | | | 32 | 10.65 | 13.27 | 16.24 | 19.59 | 23.30 | 27.37 | - | | | | |
| | | | | | 38 | 9.35 | 11.74 | 14.46 | 17.54 | 20.98 | 24.77 | - | | | | |
| | | | | | 43 | - | 10.43 | 12.93 | 15.77 | 18.96 | 22.49 | - | | | | |

**MBP**
**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K



For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) | | | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Evaporating Temperature (Mid point) [°C] | | | | | | | | | | |
| | | | | | | -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | COP | SEPR | | |
| OP-MPBM008DY | 114X4119 | P00 | A1 | G | 27 | - | 0.77 | 0.96 | 1.17 | 1.38 | 1.62 | - | 2.25 | - | 6 | 31 |
| | | | | | 32 | - | 0.69 | 0.86 | 1.05 | 1.25 | 1.46 | - | | | | |
| | | | | | 38 | - | 0.58 | 0.74 | 0.90 | 1.09 | 1.28 | - | | | | |
| | | | | | 43 | - | - | 0.63 | 0.78 | 0.95 | 1.13 | - | | | | |
| OP-MPBM009DY | 114X4120 | P00 | A1 | G | 27 | - | 0.87 | 1.08 | 1.29 | 1.52 | 1.75 | - | 2.04 | - | 8 | 31 |
| | | | | | 32 | - | 0.78 | 0.97 | 1.16 | 1.37 | 1.59 | - | | | | |
| | | | | | 38 | - | 0.67 | 0.83 | 1.01 | 1.19 | 1.39 | - | | | | |
| | | | | | 43 | - | - | 0.72 | 0.88 | 1.05 | 1.23 | - | | | | |
| OP-MPTM008DY | 114X4107 | P00 | A1 + A2L | G | 27 | - | 0.77 | 0.96 | 1.17 | 1.38 | 1.62 | - | 2.25 | - | 6 | 31 |
| | | | | | 32 | - | 0.69 | 0.86 | 1.05 | 1.25 | 1.46 | - | | | | |
| | | | | | 38 | - | 0.58 | 0.74 | 0.90 | 1.09 | 1.28 | - | | | | |
| | | | | | 43 | - | - | 0.63 | 0.78 | 0.95 | 1.13 | - | | | | |
| OP-MPTM009DY | 114X4111 | P00 | A1 + A2L | G | 27 | - | 0.87 | 1.08 | 1.29 | 1.52 | 1.75 | - | 2.04 | - | 8 | 31 |
| | | | | | 32 | - | 0.78 | 0.97 | 1.16 | 1.37 | 1.59 | - | | | | |
| | | | | | 38 | - | 0.67 | 0.83 | 1.01 | 1.19 | 1.39 | - | | | | |
| | | | | | 43 | - | - | 0.72 | 0.88 | 1.05 | 1.23 | - | | | | |
| OP-MPBM012DP | 114X4121 | P00 | A1 | G | 27 | - | 1.12 | 1.37 | 1.64 | 1.92 | 2.21 | - | 1.85 | - | 8 | 31 |
| | | | | | 32 | - | 1.00 | 1.23 | 1.47 | 1.73 | 1.99 | - | | | | |
| | | | | | 38 | - | 0.85 | 1.05 | 1.27 | 1.50 | 1.74 | - | | | | |
| | | | | | 43 | - | - | 0.91 | 1.10 | 1.31 | 1.53 | - | | | | |
| OP-MPBM014DP | 114X4122 | P00 | A1 | G | 27 | - | 1.19 | 1.43 | 1.70 | 1.98 | 2.28 | - | 1.78 | - | 8 | 31 |
| | | | | | 32 | - | 1.08 | 1.30 | 1.55 | 1.81 | 2.10 | - | | | | |
| | | | | | 38 | - | 0.95 | 1.15 | 1.37 | 1.62 | 1.88 | - | | | | |
| | | | | | 43 | - | - | 1.02 | 1.23 | 1.45 | 1.70 | - | | | | |
| OP-MPTM012DP | 114X4113 | P00 | A1 + A2L | G | 27 | - | 1.12 | 1.37 | 1.64 | 1.92 | 2.21 | - | 1.85 | - | 8 | 31 |
| | | | | | 32 | - | 1.00 | 1.23 | 1.47 | 1.73 | 1.99 | - | | | | |
| | | | | | 38 | - | 0.85 | 1.05 | 1.27 | 1.50 | 1.74 | - | | | | |
| | | | | | 43 | - | - | 0.91 | 1.10 | 1.31 | 1.53 | - | | | | |
| OP-MPTM014DP | 114X4114 | P00 | A1 + A2L | G | 27 | - | 1.19 | 1.43 | 1.70 | 1.98 | 2.28 | - | 1.78 | - | 8 | 31 |
| | | | | | 32 | - | 1.08 | 1.30 | 1.55 | 1.81 | 2.10 | - | | | | |
| | | | | | 38 | - | 0.95 | 1.15 | 1.37 | 1.62 | 1.88 | - | | | | |
| | | | | | 43 | - | - | 1.02 | 1.23 | 1.45 | 1.70 | - | | | | |
| OP-MPTM018DX | 114X4115 | P00 | A1 + A2L | G | 27 | - | 1.25 | 1.49 | 1.75 | 2.03 | 2.32 | - | 1.65 | - | 10 | 39 |
| | | | | | 32 | - | 1.14 | 1.36 | 1.61 | 1.87 | 2.14 | - | | | | |
| | | | | | 38 | - | 1.01 | 1.21 | 1.43 | 1.67 | 1.93 | - | | | | |
| | | | | | 43 | - | - | 1.08 | 1.28 | 1.51 | 1.75 | - | | | | |
| OP-MPTM021DX* | 114X4217 | P00 | A1 + A2L | G | 27 | 1.16 | 1.40 | 1.67 | 1.95 | 2.24 | 2.55 | - | 1.61 | - | 10 | 39 |
| | | | | | 32 | 1.06 | 1.28 | 1.52 | 1.78 | 2.06 | 2.35 | - | | | | |
| | | | | | 38 | 0.94 | 1.13 | 1.35 | 1.58 | 1.84 | 2.10 | - | | | | |
| | | | | | 43 | 0.84 | 1.01 | 1.21 | 1.42 | 1.65 | 1.90 | - | | | | |
| OP-MPTM022DS | 114X4237 | P00 | A1 + A2L | G | 27 | - | 1.81 | 2.21 | 2.66 | 3.15 | 3.70 | - | 1.91 | - | 10 | 40 |
| | | | | | 32 | - | 1.64 | 2.01 | 2.42 | 2.87 | 3.37 | - | | | | |
| | | | | | 38 | - | 1.43 | 1.76 | 2.13 | 2.53 | 2.98 | - | | | | |
| | | | | | 43 | - | - | 1.56 | 1.89 | 2.25 | 2.65 | - | | | | |
| OP-MPTM026DS | 114X4238 | P00 | A1 + A2L | G | 27 | - | 2.21 | 2.71 | 3.23 | 3.77 | 4.33 | - | 2.01 | - | 16 | 38 |
| | | | | | 32 | - | 1.95 | 2.40 | 2.88 | 3.38 | 3.90 | - | | | | |
| | | | | | 38 | - | 1.64 | 2.04 | 2.46 | 2.91 | 3.39 | - | | | | |
| | | | | | 43 | - | - | 1.74 | 2.12 | 2.53 | 2.96 | - | | | | |

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*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L




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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPTM026DS | 114X4239 | P00 | A1 + A2L | E | 27 | - | 2.22 | 2.72 | 3.24 | 3.79 | 4.36 | - | 2.06 | - | 6 | 38 |
| | | | | | 32 | - | 1.96 | 2.41 | 2.89 | 3.40 | 3.92 | - | | | | |
| | | | | | 38 | - | 1.65 | 2.05 | 2.48 | 2.93 | 3.41 | - | | | | |
| | | | | | 43 | - | - | 1.75 | 2.13 | 2.54 | 2.98 | - | | | | |
| OP-MPTM034DS | 114X4241 | P00 | A1 + A2L | G | 27 | - | 2.25 | 2.91 | 3.67 | 4.50 | 5.43 | - | 1.79 | - | 20 | 39 |
| | | | | | 32 | - | 2.02 | 2.64 | 3.34 | 4.13 | 5.00 | - | | | | |
| | | | | | 38 | - | 1.73 | 2.30 | 2.95 | 3.68 | 4.49 | - | | | | |
| | | | | | 43 | - | - | 2.01 | 2.61 | 3.29 | 4.05 | - | | | | |
| OP-MPTM034DS | 114X4242 | P00 | A1 + A2L | E | 27 | - | 2.29 | 2.97 | 3.73 | 4.58 | 5.52 | - | 1.84 | - | 8 | 39 |
| | | | | | 32 | - | 2.05 | 2.69 | 3.40 | 4.20 | 5.09 | - | | | | |
| | | | | | 38 | - | 1.76 | 2.34 | 3.00 | 3.74 | 4.56 | - | | | | |
| | | | | | 43 | 1.04 | - | 2.05 | 2.66 | 3.35 | 4.12 | - | | | | |
| OP-MPXM034ML | 114X4264 | P00 | A1 | E | 27 | 2.59 | 3.20 | 3.89 | 4.67 | 5.55 | 6.52 | - | 2.22 | - | 10 | 38 |
| | | | | | 32 | 2.39 | 2.96 | 3.61 | 4.35 | 5.18 | 6.10 | - | | | | |
| | | | | | 38 | 2.14 | 2.66 | 3.26 | 3.95 | 4.72 | 5.58 | - | | | | |
| | | | | | 43 | - | 2.41 | 2.96 | 3.60 | 4.32 | 5.12 | - | | | | |
| OP-MPIM034ML | 114X4204 | P00 | A1+A2L | E | 27 | 2.59 | 3.20 | 3.89 | 4.67 | 5.55 | 6.52 | - | 2.22 | - | 10 | 38 |
| | | | | | 32 | 2.39 | 2.96 | 3.61 | 4.35 | 5.18 | 6.10 | - | | | | |
| | | | | | 38 | 2.14 | 2.66 | 3.26 | 3.95 | 4.72 | 5.58 | - | | | | |
| | | | | | 43 | - | 2.41 | 2.96 | 3.60 | 4.32 | 5.12 | - | | | | |
| OP-MPXM034ML | 114X4261 | P00 | A1 | G | 27 | 2.58 | 3.19 | 3.89 | 4.68 | 5.56 | 6.53 | - | 2.28 | - | 20 | 38 |
| | | | | | 32 | 2.39 | 2.97 | 3.62 | 4.36 | 5.20 | 6.12 | - | | | | |
| | | | | | 38 | 2.17 | 2.69 | 3.29 | 3.98 | 4.75 | 5.61 | - | | | | |
| | | | | | 43 | - | 2.46 | 3.01 | 3.65 | 4.36 | 5.17 | - | | | | |
| OP-MPIM034ML | 114X4205 | P00 | A1+A2L | G | 27 | 2.58 | 3.19 | 3.89 | 4.68 | 5.56 | 6.53 | - | 2.28 | - | 20 | 38 |
| | | | | | 32 | 2.39 | 2.97 | 3.62 | 4.36 | 5.20 | 6.12 | - | | | | |
| | | | | | 38 | 2.17 | 2.69 | 3.29 | 3.98 | 4.75 | 5.61 | - | | | | |
| | | | | | 43 | - | 2.46 | 3.01 | 3.65 | 4.36 | 5.17 | - | | | | |
| OP-MPTM038DS* | 114X4218 | P00 | A1 + A2L | G | 27 | 1.85 | 2.48 | 3.20 | 4.00 | 4.90 | 5.89 | - | 1.78 | - | 20 | 39 |
| | | | | | 32 | 1.63 | 2.22 | 2.89 | 3.65 | 4.50 | 5.42 | - | | | | |
| | | | | | 38 | 1.36 | 1.90 | 2.51 | 3.21 | 3.99 | 4.85 | - | | | | |
| | | | | | 43 | 1.13 | 1.62 | 2.20 | 2.84 | 3.57 | 4.37 | - | | | | |
| OP-MPXM046ML | 114X4284 | P00 | A1 | E | 27 | 3.45 | 4.23 | 5.13 | 6.13 | 7.24 | 8.46 | - | 2.12 | - | 12 | 38 |
| | | | | | 32 | 3.17 | 3.91 | 4.74 | 5.68 | 6.73 | 7.88 | - | | | | |
| | | | | | 38 | 2.83 | 3.50 | 4.27 | 5.13 | 6.09 | 7.15 | - | | | | |
| | | | | | 43 | - | 3.16 | 3.86 | 4.65 | 5.54 | 6.52 | - | | | | |
| OP-MPIM046ML | 114X4206 | P00 | A1+A2L | E | 27 | 3.45 | 4.23 | 5.13 | 6.13 | 7.24 | 8.46 | - | 2.12 | - | 12 | 38 |
| | | | | | 32 | 3.17 | 3.91 | 4.74 | 5.68 | 6.73 | 7.88 | - | | | | |
| | | | | | 38 | 2.83 | 3.50 | 4.27 | 5.13 | 6.09 | 7.15 | - | | | | |
| | | | | | 43 | - | 3.16 | 3.86 | 4.65 | 5.54 | 6.52 | - | | | | |
| OP-MPXM046ML | 114X4281 | P00 | A1 | G | 27 | 3.46 | 4.25 | 5.15 | 6.17 | 7.30 | 8.54 | - | 2.04 | - | 32 | 38 |
| | | | | | 32 | 3.19 | 3.94 | 4.78 | 5.73 | 6.79 | 7.97 | - | | | | |
| | | | | | 38 | 2.87 | 3.55 | 4.32 | 5.19 | 6.17 | 7.26 | - | | | | |
| | | | | | 43 | - | 3.22 | 3.93 | 4.74 | 5.64 | 6.66 | - | | | | |
| OP-MPIM046ML | 114X4207 | P00 | A1+A2L | G | 27 | 3.46 | 4.25 | 5.15 | 6.17 | 7.30 | 8.54 | - | 2.04 | - | 32 | 38 |
| | | | | | 32 | 3.19 | 3.94 | 4.78 | 5.73 | 6.79 | 7.97 | - | | | | |
| | | | | | 38 | 2.87 | 3.55 | 4.32 | 5.19 | 6.17 | 7.26 | - | | | | |
| | | | | | 43 | - | 3.22 | 3.93 | 4.74 | 5.64 | 6.66 | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPXM057ML | 114X4293 | P00 | A1 | E | 27 | 4.15 | 5.10 | 6.16 | 7.33 | 8.62 | 10.00 | - | - | 3.33 | 12 | 39 |
| | | | | | 32 | 3.78 | 4.67 | 5.66 | 6.76 | 7.96 | 9.26 | - | | | | |
| | | | | | 38 | 3.32 | 4.13 | 5.04 | 6.04 | 7.14 | 8.33 | - | | | | |
| | | | | | 43 | - | 3.67 | 4.50 | 5.42 | 6.43 | 7.53 | - | | | | |
| OP-MPIM057ML | 114X4208 | P00 | A1+A2L | E | 27 | 4.15 | 5.10 | 6.16 | 7.33 | 8.62 | 10.00 | - | - | 3.33 | 12 | 39 |
| | | | | | 32 | 3.78 | 4.67 | 5.66 | 6.76 | 7.96 | 9.26 | - | | | | |
| | | | | | 38 | 3.32 | 4.13 | 5.04 | 6.04 | 7.14 | 8.33 | - | | | | |
| | | | | | 43 | - | 3.67 | 4.50 | 5.42 | 6.43 | 7.53 | - | | | | |
| OP-MPXM057ML | 114X4290 | P00 | A1 | G | 27 | 4.20 | 5.15 | 6.22 | 7.41 | 8.72 | 10.14 | - | - | 3.12 | 32 | 39 |
| | | | | | 32 | 3.86 | 4.74 | 5.73 | 6.84 | 8.06 | 9.40 | - | | | | |
| | | | | | 38 | 3.44 | 4.23 | 5.12 | 6.12 | 7.24 | 8.46 | - | | | | |
| | | | | | 43 | - | 3.79 | 4.59 | 5.50 | 6.52 | 7.64 | - | | | | |
| OP-MPIM057ML | 114X4209 | P00 | A1+A2L | G | 27 | 4.20 | 5.15 | 6.22 | 7.41 | 8.72 | 10.14 | - | - | 3.12 | 32 | 39 |
| | | | | | 32 | 3.86 | 4.74 | 5.73 | 6.84 | 8.06 | 9.40 | - | | | | |
| | | | | | 38 | 3.44 | 4.23 | 5.12 | 6.12 | 7.24 | 8.46 | - | | | | |
| | | | | | 43 | - | 3.79 | 4.59 | 5.50 | 6.52 | 7.64 | - | | | | |
| OP-MPXM068ML | 114X4308 | P00 | A1 | G | 27 | 5.25 | 6.46 | 7.83 | 9.39 | 11.12 | 13.05 | - | - | 3.56 | 40 | 42 |
| | | | | | 32 | 4.84 | 5.98 | 7.27 | 8.73 | 10.37 | 12.20 | - | | | | |
| | | | | | 38 | 4.34 | 5.38 | 6.57 | 7.92 | 9.44 | 11.14 | - | | | | |
| | | | | | 43 | - | 4.88 | 5.97 | 7.22 | 8.63 | 10.23 | - | | | | |
| OP-MPIM068ML | 114X4307 | P00 | A1+A2L | G | 27 | 5.25 | 6.46 | 7.83 | 9.39 | 11.12 | 13.05 | - | - | 3.64 | 40 | 42 |
| | | | | | 32 | 4.84 | 5.98 | 7.27 | 8.73 | 10.37 | 12.20 | - | | | | |
| | | | | | 38 | 4.34 | 5.38 | 6.57 | 7.92 | 9.44 | 11.14 | - | | | | |
| | | | | | 43 | - | 4.88 | 5.97 | 7.22 | 8.63 | 10.23 | - | | | | |
| OP-MPXM068ML | 114X4311 | P00 | A1 | E | 27 | 5.29 | 6.49 | 7.86 | 9.41 | 11.14 | 13.06 | - | - | 3.75 | 16 | 42 |
| | | | | | 32 | 4.87 | 6.00 | 7.29 | 8.74 | 10.38 | 12.20 | - | | | | |
| | | | | | 38 | 4.35 | 5.38 | 6.57 | 7.91 | 9.42 | 11.11 | - | | | | |
| | | | | | 43 | - | 4.85 | 5.94 | 7.18 | 8.59 | 10.17 | - | | | | |
| OP-MPIM068ML | 114X4306 | P00 | A1+A2L | E | 27 | 5.29 | 6.49 | 7.86 | 9.41 | 11.14 | 13.06 | - | - | 3.84 | 16 | 42 |
| | | | | | 32 | 4.87 | 6.00 | 7.29 | 8.74 | 10.38 | 12.20 | - | | | | |
| | | | | | 38 | 4.35 | 5.38 | 6.57 | 7.91 | 9.42 | 11.11 | - | | | | |
| | | | | | 43 | - | 4.85 | 5.94 | 7.18 | 8.59 | 10.17 | - | | | | |
| OP-MPXM080ML | 114X4321 | P00 | A1 | G | 27 | 6.04 | 7.40 | 8.94 | 10.65 | 12.54 | 14.61 | - | - | 3.30 | 45 | 42 |
| | | | | | 32 | 5.61 | 6.88 | 8.32 | 9.92 | 11.69 | 13.64 | - | | | | |
| | | | | | 38 | 5.07 | 6.23 | 7.55 | 9.01 | 10.64 | 12.43 | - | | | | |
| | | | | | 43 | - | 5.68 | 6.88 | 8.23 | 9.73 | 11.40 | - | | | | |
| OP-MPIM080ML | 114X4312 | P00 | A1+A2L | G | 27 | 6.04 | 7.40 | 8.94 | 10.65 | 12.54 | 14.61 | - | - | 3.35 | 45 | 42 |
| | | | | | 32 | 5.61 | 6.88 | 8.32 | 9.92 | 11.69 | 13.64 | - | | | | |
| | | | | | 38 | 5.07 | 6.23 | 7.55 | 9.01 | 10.64 | 12.43 | - | | | | |
| | | | | | 43 | - | 5.68 | 6.88 | 8.23 | 9.73 | 11.40 | - | | | | |
| OP-MPXM080ML | 114X4324 | P00 | A1 | E | 27 | 6.13 | 7.50 | 9.04 | 10.77 | 12.69 | 14.78 | - | - | 3.72 | 20 | 42 |
| | | | | | 32 | 5.64 | 6.92 | 8.37 | 9.99 | 11.79 | 13.77 | - | | | | |
| | | | | | 38 | 5.04 | 6.20 | 7.53 | 9.02 | 10.68 | 12.51 | - | | | | |
| | | | | | 43 | - | 5.59 | 6.81 | 8.18 | 9.73 | 11.43 | - | | | | |
| OP-MPIM080ML | 114X4309 | P00 | A1+A2L | E | 27 | 6.13 | 7.50 | 9.04 | 10.77 | 12.69 | 14.78 | - | - | 3.79 | 20 | 42 |
| | | | | | 32 | 5.64 | 6.92 | 8.37 | 9.99 | 11.79 | 13.77 | - | | | | |
| | | | | | 38 | 5.04 | 6.20 | 7.53 | 9.02 | 10.68 | 12.51 | - | | | | |
| | | | | | 43 | - | 5.59 | 6.81 | 8.18 | 9.73 | 11.43 | - | | | | |

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

SEPR, Seasonal Energy Performance Ratio

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPXM108ML | 114X4344 | P00 | A1 | E | 27 | 7.98 | 9.77 | 11.79 | 14.03 | 16.51 | 19.23 | - | - | 3.52 | 20 | 43 |
| | | | | | 32 | 7.32 | 8.99 | 10.88 | 12.98 | 15.30 | 17.86 | - | | | | |
| | | | | | 38 | 6.52 | 8.03 | 9.75 | 11.66 | 13.79 | 16.14 | - | | | | |
| | | | | | 43 | - | 7.21 | 8.77 | 10.53 | 12.49 | 14.65 | - | | | | |
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 7.98 | 9.77 | 11.79 | 14.03 | 16.51 | 19.23 | - | - | 3.57 | 20 | 43 |
| | | | | | 32 | 7.32 | 8.99 | 10.88 | 12.98 | 15.30 | 17.86 | - | | | | |
| | | | | | 38 | 6.52 | 8.03 | 9.75 | 11.66 | 13.79 | 16.14 | - | | | | |
| | | | | | 43 | - | 7.21 | 8.77 | 10.53 | 12.49 | 14.65 | - | | | | |
| OP-MPXM125ML | 114X4414 | P00 | A1 | E | 27 | 9.49 | 11.63 | 14.05 | 16.76 | 19.75 | 23.04 | - | - | 3.61 | 32 | 46 |
| | | | | | 32 | 8.75 | 10.75 | 13.01 | 15.54 | 18.36 | 21.45 | - | | | | |
| | | | | | 38 | 7.83 | 9.65 | 11.71 | 14.03 | 16.62 | 19.47 | - | | | | |
| | | | | | 43 | - | 8.70 | 10.59 | 12.72 | 15.11 | 17.76 | - | | | | |
| OP-MPXM162ML | 114X4434 | P00 | A1 | E | 27 | 11.54 | 14.31 | 17.45 | 20.98 | 24.90 | 29.18 | - | - | 3.32 | 32 | 46 |
| | | | | | 32 | 10.50 | 13.10 | 16.04 | 19.36 | 23.06 | 27.12 | - | | | | |
| | | | | | 38 | 9.21 | 11.59 | 14.28 | 17.33 | 20.75 | 24.53 | - | | | | |
| | | | | | 43 | - | 10.28 | 12.76 | 15.57 | 18.74 | 22.26 | - | | | | |
| OP-MPIM125ML | 114X4409 | P00 | A1 + A2L | E | 27 | 9.49 | 11.63 | 14.05 | 16.76 | 19.75 | 23.04 | - | - | 3.61 | 32 | 46 |
| | | | | | 32 | 8.75 | 10.75 | 13.01 | 15.54 | 18.36 | 21.45 | - | | | | |
| | | | | | 38 | 7.83 | 9.65 | 11.71 | 14.03 | 16.62 | 19.47 | - | | | | |
| | | | | | 43 | - | 8.70 | 10.59 | 12.72 | 15.11 | 17.76 | - | | | | |
| OP-MPIM162ML | 114X4410 | P00 | A1 + A2L | E | 27 | 11.54 | 14.31 | 17.45 | 20.98 | 24.90 | 29.18 | - | - | 3.32 | 40 | 46 |
| | | | | | 32 | 10.50 | 13.10 | 16.04 | 19.36 | 23.06 | 27.12 | - | | | | |
| | | | | | 38 | 9.21 | 11.59 | 14.28 | 17.33 | 20.75 | 24.53 | - | | | | |
| | | | | | 43 | - | 10.28 | 12.76 | 15.57 | 18.74 | 22.26 | - | | | | |

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K



For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPTM008DY | 114X4107 | P00 | A1 + A2L | G | 27 | 0.57 | 0.73 | 0.91 | 1.09 | 1.29 | 1.5 | - | 2.25 | - | 6 | 31 |
| | | | | | 32 | 0.51 | 0.65 | 0.81 | 0.98 | 1.17 | 1.36 | - | | | | |
| | | | | | 38 | 0.44 | 0.56 | 0.7 | 0.85 | 1.02 | 1.19 | - | | | | |
| | | | | | 43 | 0.38 | 0.49 | 0.61 | 0.74 | 0.89 | 1.05 | - | | | | |
| OP-MPTM009DY | 114X4111 | P00 | A1 + A2L | G | 27 | 0.66 | 0.85 | 1.05 | 1.26 | 1.48 | 1.72 | - | 2.21 | - | 8 | 31 |
| | | | | | 32 | 0.59 | 0.76 | 0.94 | 1.13 | 1.34 | 1.56 | - | | | | |
| | | | | | 38 | 0.51 | 0.65 | 0.81 | 0.98 | 1.17 | 1.36 | - | | | | |
| | | | | | 43 | 0.44 | 0.57 | 0.7 | 0.86 | 1.02 | 1.2 | - | | | | |
| OP-MPTM012DP | 114X4113 | P00 | A1 + A2L | G | 27 | 0.9 | 1.14 | 1.39 | 1.65 | 1.92 | 2.2 | - | 1.97 | - | 8 | 31 |
| | | | | | 32 | 0.8 | 1.02 | 1.24 | 1.48 | 1.73 | 1.98 | - | | | | |
| | | | | | 38 | 0.68 | 0.87 | 1.07 | 1.28 | 1.5 | 1.73 | - | | | | |
| | | | | | 43 | 0.59 | 0.75 | 0.93 | 1.11 | 1.31 | 1.52 | - | | | | |
| OP-MPTM014DP | 114X4114 | P00 | A1 + A2L | G | 27 | 0.93 | 1.16 | 1.42 | 1.69 | 1.99 | 2.3 | - | 1.87 | - | 8 | 31 |
| | | | | | 32 | 0.84 | 1.05 | 1.28 | 1.54 | 1.82 | 2.12 | - | | | | |
| | | | | | 38 | 0.73 | 0.92 | 1.13 | 1.36 | 1.62 | 1.9 | - | | | | |
| | | | | | 43 | 0.64 | 0.81 | 1 | 1.22 | 1.45 | 1.71 | - | | | | |
| OP-MPTM018DX | 114X4115 | P00 | A1 + A2L | G | 27 | 1 | 1.26 | 1.54 | 1.83 | 2.14 | 2.46 | - | 1.71 | - | 10 | 39 |
| | | | | | 32 | 0.89 | 1.12 | 1.37 | 1.64 | 1.93 | 2.22 | - | | | | |
| | | | | | 38 | 0.75 | 0.96 | 1.18 | 1.42 | 1.67 | 1.94 | - | | | | |
| | | | | | 43 | 0.65 | 0.82 | 1.02 | 1.23 | 1.46 | 1.71 | - | | | | |
| OP-MPTM021DX* | 114X4217 | P00 | A1 + A2L | G | 27 | 1.16 | 1.46 | 1.78 | 2.10 | 2.44 | 2.80 | - | 1.66 | - | 10 | 39 |
| | | | | | 32 | 1.03 | 1.30 | 1.59 | 1.89 | 2.20 | 2.53 | - | | | | |
| | | | | | 38 | 0.88 | 1.11 | 1.36 | 1.63 | 1.91 | 2.21 | - | | | | |
| | | | | | 43 | 0.75 | 0.95 | 1.17 | 1.41 | 1.67 | 1.94 | - | | | | |
| OP-MPTM022DS | 114X4237 | P00 | A1 + A2L | G | 27 | 1.46 | 1.82 | 2.24 | 2.7 | 3.22 | 3.79 | - | 1.98 | - | 10 | 40 |
| | | | | | 32 | 1.3 | 1.64 | 2.02 | 2.45 | 2.93 | 3.45 | - | | | | |
| | | | | | 38 | 1.12 | 1.42 | 1.77 | 2.15 | 2.58 | 3.05 | - | | | | |
| | | | | | 43 | 0.97 | 1.25 | 1.56 | 1.9 | 2.29 | 2.71 | - | | | | |
| OP-MPTM026DS | 114X4238 | P00 | A1 + A2L | G | 27 | 1.67 | 2.14 | 2.64 | 3.17 | 3.72 | 4.31 | - | 1.89 | - | 16 | 38 |
| | | | | | 32 | 1.46 | 1.88 | 2.33 | 2.81 | 3.32 | 3.87 | - | | | | |
| | | | | | 38 | 1.21 | 1.57 | 1.97 | 2.39 | 2.85 | 3.35 | - | | | | |
| | | | | | 43 | 1.01 | 1.32 | 1.67 | 2.05 | 2.46 | 2.91 | - | | | | |
| OP-MPTM026DS | 114X4239 | P00 | A1 + A2L | E | 27 | 1.69 | 2.16 | 2.67 | 3.2 | 3.76 | 4.35 | - | 1.85 | - | 6 | 38 |
| | | | | | 32 | 1.48 | 1.9 | 2.36 | 2.84 | 3.36 | 3.91 | - | | | | |
| | | | | | 38 | 1.23 | 1.59 | 1.99 | 2.42 | 2.88 | 3.38 | - | | | | |
| | | | | | 43 | 1.02 | 1.34 | 1.68 | 2.07 | 2.48 | 2.94 | - | | | | |
| OP-MPTM034DS | 114X4241 | P00 | A1 + A2L | G | 27 | 1.66 | 2.26 | 2.95 | 3.73 | 4.62 | 5.59 | - | 1.86 | - | 20 | 39 |
| | | | | | 32 | 1.45 | 2.01 | 2.66 | 3.39 | 4.22 | 5.14 | - | | | | |
| | | | | | 38 | 1.2 | 1.71 | 2.3 | 2.97 | 3.74 | 4.59 | - | | | | |
| | | | | | 43 | 0.98 | 1.45 | 2 | 2.62 | 3.34 | 4.13 | - | | | | |
| OP-MPTM034DS | 114X4242 | P00 | A1 + A2L | E | 27 | 1.68 | 2.28 | 2.98 | 3.77 | 4.66 | 5.64 | - | 1.82 | - | 8 | 39 |
| | | | | | 32 | 1.47 | 2.03 | 2.68 | 3.42 | 4.27 | 5.19 | - | | | | |
| | | | | | 38 | 1.21 | 1.73 | 2.32 | 3 | 3.78 | 4.64 | - | | | | |
| | | | | | 43 | 0.99 | 1.47 | 2.02 | 2.65 | 3.37 | 4.17 | - | | | | |
| OP-MPXM034ML | 114X4264 | P00 | A1 | E | 27 | 2.55 | 3.13 | 3.78 | 4.53 | 5.36 | 6.29 | - | 2.2 | - | 10 | 38 |
| | | | | | 32 | 2.36 | 2.89 | 3.5 | 4.2 | 4.96 | 5.83 | - | | | | |
| | | | | | 38 | 2.12 | 2.61 | 3.15 | 3.78 | 4.48 | 5.27 | - | | | | |
| | | | | | 43 | 1.92 | 2.36 | 2.85 | 3.43 | - | - | - | | | | |

*Preliminary data

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPIM034ML | 114X4204 | P00 | A1+A2L | E | 27 | 2.55 | 3.13 | 3.78 | 4.53 | 5.36 | 6.29 | - | 2.2 | - | 10 | 38 |
| | | | | | 32 | 2.36 | 2.89 | 3.5 | 4.2 | 4.96 | 5.83 | - | | | | |
| | | | | | 38 | 2.12 | 2.61 | 3.15 | 3.78 | 4.48 | 5.27 | - | | | | |
| | | | | | 43 | 1.92 | 2.36 | 2.85 | 3.43 | - | - | - | | | | |
| OP-MPXM034ML | 114X4261 | P00 | A1 | G | 27 | 2.57 | 3.15 | 3.81 | 4.56 | 5.39 | 6.32 | - | 2.21 | - | 20 | 38 |
| | | | | | 32 | 2.37 | 2.91 | 3.52 | 4.23 | 5 | 5.87 | - | | | | |
| | | | | | 38 | 2.13 | 2.62 | 3.17 | 3.81 | 4.51 | 5.32 | - | | | | |
| | | | | | 43 | 1.93 | 2.37 | 2.87 | 3.45 | - | - | - | | | | |
| OP-MPIM034ML | 114X4205 | P00 | A1+A2L | G | 27 | 2.57 | 3.15 | 3.81 | 4.56 | 5.39 | 6.32 | - | 2.21 | - | 20 | 38 |
| | | | | | 32 | 2.37 | 2.91 | 3.52 | 4.23 | 5 | 5.87 | - | | | | |
| | | | | | 38 | 2.13 | 2.62 | 3.17 | 3.81 | 4.51 | 5.32 | - | | | | |
| | | | | | 43 | 1.93 | 2.37 | 2.87 | 3.45 | - | - | - | | | | |
| OP-MPTM038DS* | 114X4218 | P00 | A1+A2L | G | 27 | 1.83 | 2.47 | 3.21 | 4.06 | 4.99 | 6.02 | - | 1.84 | - | 20 | 39 |
| | | | | | 32 | 1.60 | 2.20 | 2.89 | 3.68 | 4.56 | 5.53 | - | | | | |
| | | | | | 38 | 1.31 | 1.86 | 2.50 | 3.22 | 4.03 | 4.93 | - | | | | |
| | | | | | 43 | 1.08 | 1.58 | 2.16 | 2.84 | 3.59 | 4.43 | - | | | | |
| OP-MPXM046ML | 114X4284 | P00 | A1 | E | 27 | 3.43 | 4.22 | 5.1 | 6.1 | 7.2 | 8.43 | - | 2.12 | - | 12 | 38 |
| | | | | | 32 | 3.15 | 3.88 | 4.7 | 5.64 | 6.66 | 7.81 | - | | | | |
| | | | | | 38 | 2.81 | 3.47 | 4.21 | 5.06 | 5.99 | 7.04 | - | | | | |
| | | | | | 43 | 2.52 | 3.12 | 3.79 | 4.56 | - | - | - | | | | |
| OP-MPIM046ML | 114X4206 | P00 | A1+A2L | E | 27 | 3.43 | 4.22 | 5.1 | 6.1 | 7.2 | 8.43 | - | 2.12 | - | 12 | 38 |
| | | | | | 32 | 3.15 | 3.88 | 4.7 | 5.64 | 6.66 | 7.81 | - | | | | |
| | | | | | 38 | 2.81 | 3.47 | 4.21 | 5.06 | 5.99 | 7.04 | - | | | | |
| | | | | | 43 | 2.52 | 3.12 | 3.79 | 4.56 | - | - | - | | | | |
| OP-MPXM046ML | 114X4281 | P00 | A1 | G | 27 | 3.45 | 4.24 | 5.11 | 6.1 | 7.18 | 8.39 | - | 2.04 | - | 32 | 38 |
| | | | | | 32 | 3.19 | 3.92 | 4.72 | 5.64 | 6.64 | 7.77 | - | | | | |
| | | | | | 38 | 2.87 | 3.52 | 4.24 | 5.07 | 5.97 | 7 | - | | | | |
| | | | | | 43 | 2.59 | 3.17 | 3.82 | 4.57 | - | - | - | | | | |
| OP-MPIM046ML | 114X4207 | P00 | A1+A2L | G | 27 | 3.45 | 4.24 | 5.11 | 6.1 | 7.18 | 8.39 | - | 2.04 | - | 32 | 38 |
| | | | | | 32 | 3.19 | 3.92 | 4.72 | 5.64 | 6.64 | 7.77 | - | | | | |
| | | | | | 38 | 2.87 | 3.52 | 4.24 | 5.07 | 5.97 | 7 | - | | | | |
| | | | | | 43 | 2.59 | 3.17 | 3.82 | 4.57 | - | - | - | | | | |
| OP-MPXM057ML | 114X4293 | P00 | A1 | E | 27 | 4.24 | 5.2 | 6.27 | 7.48 | 8.79 | 10.26 | - | - | 3.51 | 12 | 39 |
| | | | | | 32 | 3.89 | 4.78 | 5.76 | 6.88 | 8.1 | 9.47 | - | | | | |
| | | | | | 38 | 3.45 | 4.24 | 5.12 | 6.13 | 7.23 | 8.47 | - | | | | |
| | | | | | 43 | 3.07 | 3.77 | 4.56 | 5.47 | - | - | - | | | | |
| OP-MPIM057ML | 114X4208 | P00 | A1+A2l | E | 27 | 4.24 | 5.2 | 6.27 | 7.48 | 8.79 | 10.26 | - | - | 3.51 | 12 | 39 |
| | | | | | 32 | 3.89 | 4.78 | 5.76 | 6.88 | 8.1 | 9.47 | - | | | | |
| | | | | | 38 | 3.45 | 4.24 | 5.12 | 6.13 | 7.23 | 8.47 | - | | | | |
| | | | | | 43 | 3.07 | 3.77 | 4.56 | 5.47 | - | - | - | | | | |
| OP-MPXM057ML | 114X4290 | P00 | A1 | G | 27 | 4.28 | 5.26 | 6.33 | 7.55 | 8.87 | 10.35 | - | - | 3.31 | 32 | 39 |
| | | | | | 32 | 3.95 | 4.85 | 5.85 | 6.97 | 8.2 | 9.57 | - | | | | |
| | | | | | 38 | 3.54 | 4.35 | 5.23 | 6.24 | 7.34 | 8.58 | - | | | | |
| | | | | | 43 | 3.19 | 3.91 | 4.7 | 5.61 | - | - | - | | | | |
| OP-MPIM057ML | 114X4209 | P00 | A1+A2L | G | 27 | 4.28 | 5.26 | 6.33 | 7.55 | 8.87 | 10.35 | - | - | 3.31 | 32 | 39 |
| | | | | | 32 | 3.95 | 4.85 | 5.85 | 6.97 | 8.2 | 9.57 | - | | | | |
| | | | | | 38 | 3.54 | 4.35 | 5.23 | 6.24 | 7.34 | 8.58 | - | | | | |
| | | | | | 43 | 3.19 | 3.91 | 4.7 | 5.61 | - | - | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPXM068ML | 114X4308 | P00 | A1 | G | 27 | 5.19 | 6.35 | 7.65 | 9.15 | 10.79 | 12.63 | - | - | 3.4 | 40 | 42 |
| | | | | | 32 | 4.8 | 5.87 | 7.07 | 8.46 | 9.98 | 11.7 | - | | | | |
| | | | | | 38 | 4.31 | 5.27 | 6.35 | 7.6 | 8.98 | 10.55 | - | | | | |
| | | | | | 43 | 3.9 | 4.76 | 5.73 | 6.86 | - | - | - | | | | |
| OP-MPIM068ML | 114X4307 | P00 | A1+A2L | G | 27 | 5.19 | 6.35 | 7.65 | 9.15 | 10.79 | 12.63 | - | - | 3.4 | 40 | 42 |
| | | | | | 32 | 4.8 | 5.87 | 7.07 | 8.46 | 9.98 | 11.7 | - | | | | |
| | | | | | 38 | 4.31 | 5.27 | 6.35 | 7.6 | 8.98 | 10.55 | - | | | | |
| | | | | | 43 | 3.9 | 4.76 | 5.73 | 6.86 | - | - | - | | | | |
| OP-MPXM068ML | 114X4311 | P00 | A1 | E | 27 | 5.17 | 6.34 | 7.66 | 9.18 | 10.85 | 12.72 | - | - | 3.59 | 16 | 42 |
| | | | | | 32 | 4.77 | 5.86 | 7.08 | 8.49 | 10.04 | 11.79 | - | | | | |
| | | | | | 38 | 4.29 | 5.26 | 6.36 | 7.63 | 9.04 | 10.64 | - | | | | |
| | | | | | 43 | 3.87 | 4.75 | 5.74 | 6.89 | - | - | - | | | | |
| OP-MPIM068ML | 114X4306 | P00 | A1+A2L | E | 27 | 5.17 | 6.34 | 7.66 | 9.18 | 10.85 | 12.72 | - | - | 3.59 | 16 | 42 |
| | | | | | 32 | 4.77 | 5.86 | 7.08 | 8.49 | 10.04 | 11.79 | - | | | | |
| | | | | | 38 | 4.29 | 5.26 | 6.36 | 7.63 | 9.04 | 10.64 | - | | | | |
| | | | | | 43 | 3.87 | 4.75 | 5.74 | 6.89 | - | - | - | | | | |
| OP-MPXM080ML | 114X4324 | P00 | A1 | E | 27 | 6.02 | 7.38 | 8.89 | 10.62 | 12.49 | 14.59 | - | - | 3.62 | 20 | 42 |
| | | | | | 32 | 5.52 | 6.78 | 8.18 | 9.79 | 11.55 | 13.52 | - | | | | |
| | | | | | 38 | 4.89 | 6.03 | 7.3 | 8.76 | 10.37 | 12.17 | - | | | | |
| | | | | | 43 | 4.35 | 5.38 | 6.54 | 7.87 | - | - | - | | | | |
| OP-MPIM080ML | 114X4309 | P00 | A1+A2L | E | 27 | 6.02 | 7.38 | 8.89 | 10.62 | 12.49 | 14.59 | - | - | 3.62 | 20 | 42 |
| | | | | | 32 | 5.52 | 6.78 | 8.18 | 9.79 | 11.55 | 13.52 | - | | | | |
| | | | | | 38 | 4.89 | 6.03 | 7.3 | 8.76 | 10.37 | 12.17 | - | | | | |
| | | | | | 43 | 4.35 | 5.38 | 6.54 | 7.87 | - | - | - | | | | |
| OP-MPXM080ML | 114X4321 | P00 | A1 | G | 27 | 6.01 | 7.39 | 8.92 | 10.67 | 12.58 | 14.71 | - | - | 3.32 | 45 | 42 |
| | | | | | 32 | 5.53 | 6.8 | 8.22 | 9.85 | 11.63 | 13.63 | - | | | | |
| | | | | | 38 | 4.92 | 6.07 | 7.35 | 8.82 | 10.45 | 12.27 | - | | | | |
| | | | | | 43 | 4.41 | 5.44 | 6.6 | 7.93 | - | - | - | | | | |
| OP-MPIM080ML | 114X4312 | P00 | A1+A2L | G | 27 | 6.01 | 7.39 | 8.92 | 10.67 | 12.58 | 14.71 | - | - | 3.32 | 45 | 42 |
| | | | | | 32 | 5.53 | 6.8 | 8.22 | 9.85 | 11.63 | 13.63 | - | | | | |
| | | | | | 38 | 4.92 | 6.07 | 7.35 | 8.82 | 10.45 | 12.27 | - | | | | |
| | | | | | 43 | 4.41 | 5.44 | 6.6 | 7.93 | - | - | - | | | | |
| OP-MPXM108ML | 114X4344 | P00 | A1 | E | 27 | 8.05 | 9.87 | 11.88 | 14.16 | 16.63 | 19.37 | - | - | 3.55 | 20 | 43 |
| | | | | | 32 | 7.35 | 9.03 | 10.89 | 13 | 15.3 | 17.85 | - | | | | |
| | | | | | 38 | 6.49 | 7.98 | 9.63 | 11.54 | 13.62 | 15.94 | - | | | | |
| | | | | | 43 | 5.74 | 7.07 | 8.55 | 10.27 | - | - | - | | | | |
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 8.05 | 9.87 | 11.88 | 14.16 | 16.63 | 19.37 | - | - | 3.55 | 20 | 43 |
| | | | | | 32 | 7.35 | 9.03 | 10.89 | 13 | 15.3 | 17.85 | - | | | | |
| | | | | | 38 | 6.49 | 7.98 | 9.63 | 11.54 | 13.62 | 15.94 | - | | | | |
| | | | | | 43 | 5.74 | 7.07 | 8.55 | 10.27 | - | - | - | | | | |
| OP-MPXM108ML | 114X4344 | P00 | A1 | E | 27 | 8.05 | 9.87 | 11.88 | 14.16 | 16.63 | 19.37 | - | - | 3.55 | 20 | 43 |
| | | | | | 32 | 7.35 | 9.03 | 10.89 | 13 | 15.3 | 17.85 | - | | | | |
| | | | | | 38 | 6.49 | 7.98 | 9.63 | 11.54 | 13.62 | 15.94 | - | | | | |
| | | | | | 43 | 5.74 | 7.07 | 8.55 | 10.27 | - | - | - | | | | |
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 8.05 | 9.87 | 11.88 | 14.16 | 16.63 | 19.37 | - | - | 3.55 | 20 | 43 |
| | | | | | 32 | 7.35 | 9.03 | 10.89 | 13 | 15.3 | 17.85 | - | | | | |
| | | | | | 38 | 6.49 | 7.98 | 9.63 | 11.54 | 13.62 | 15.94 | - | | | | |
| | | | | | 43 | 5.74 | 7.07 | 8.55 | 10.27 | - | - | - | | | | |

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPXM108ML | 114X4344 | P00 | A1 | E | 27 | 8.05 | 9.87 | 11.88 | 14.16 | 16.63 | 19.37 | - | - | 3.55 | 20 | 43 |
| | | | | | 32 | 7.35 | 9.03 | 10.89 | 13 | 15.3 | 17.85 | - | | | | |
| | | | | | 38 | 6.49 | 7.98 | 9.63 | 11.54 | 13.62 | 15.94 | - | | | | |
| | | | | | 43 | 5.74 | 7.07 | 8.55 | 10.27 | - | - | - | | | | |
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 8.05 | 9.87 | 11.88 | 14.16 | 16.63 | 19.37 | - | - | 3.55 | 20 | 43 |
| | | | | | 32 | 7.35 | 9.03 | 10.89 | 13 | 15.3 | 17.85 | - | | | | |
| | | | | | 38 | 6.49 | 7.98 | 9.63 | 11.54 | 13.62 | 15.94 | - | | | | |
| | | | | | 43 | 5.74 | 7.07 | 8.55 | 10.27 | - | - | - | | | | |
| OP-MPXM125ML | 114X4414 | P00 | A1 | E | 27 | 9.68 | 11.92 | 14.4 | 17.23 | 20.3 | 23.74 | - | - | 3.63 | 32 | 46 |
| | | | | | 32 | 8.87 | 10.95 | 13.25 | 15.89 | 18.75 | 21.97 | - | | | | |
| | | | | | 38 | 7.86 | 9.73 | 11.81 | 14.2 | 16.81 | 19.76 | - | | | | |
| | | | | | 43 | 6.98 | 8.67 | 10.55 | 12.73 | - | - | - | | | | |
| OP-MPXM162ML | 114X4434 | P00 | A1 | E | 27 | 11.77 | 14.55 | 17.62 | 21.08 | 24.79 | 28.88 | - | - | 3.25 | 32 | 46 |
| | | | | | 32 | 10.71 | 13.29 | 16.17 | 19.42 | 22.92 | 26.78 | - | | | | |
| | | | | | 38 | 9.37 | 11.7 | 14.31 | 17.29 | 20.53 | 24.1 | - | | | | |
| | | | | | 43 | 8.21 | 10.33 | 12.66 | 15.4 | - | - | - | | | | |
| OP-MPIM125ML | 114X4409 | P00 | A1 + A2L | E | 27 | 9.76 | 11.97 | 14.46 | 17.25 | 20.33 | 23.70 | - | - | 3.63 | 32 | 46 |
| | | | | | 32 | 8.91 | 10.96 | 13.27 | 15.86 | 18.73 | 21.88 | - | | | | |
| | | | | | 38 | 7.86 | 9.69 | 11.78 | 14.12 | 16.72 | 19.60 | - | | | | |
| | | | | | 43 | 6.95 | 8.60 | 10.48 | 12.60 | - | - | - | | | | |
| OP-MPIM162ML | 114X4410 | P00 | A1 + A2L | E | 27 | 11.85 | 14.60 | 17.68 | 21.08 | 24.77 | 28.75 | - | - | 3.25 | 40 | 46 |
| | | | | | 32 | 10.74 | 13.28 | 16.17 | 19.36 | 22.79 | 26.52 | - | | | | |
| | | | | | 38 | 9.35 | 11.64 | 14.24 | 17.17 | 20.32 | 23.74 | - | | | | |
| | | | | | 43 | 8.15 | 10.22 | 12.54 | 15.23 | - | - | - | | | | |

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K



For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPTM008DY | 114X4107 | P00 | A1 + A2L | G | 27 | 0.59 | 0.75 | 0.93 | 1.12 | 1.32 | 1.54 | - | 2.06 | - | 6 | 31 |
| | | | | | 32 | 0.53 | 0.68 | 0.84 | 1.01 | 1.21 | 1.41 | - | | | | |
| | | | | | 38 | 0.46 | 0.59 | 0.73 | 0.89 | 1.07 | 1.26 | - | | | | |
| | | | | | 43 | 0.40 | 0.52 | 0.65 | 0.79 | 0.96 | 1.14 | - | | | | |
| OP-MPBM008DY | 114X4119 | P00 | A1 | G | 27 | 0.59 | 0.75 | 0.93 | 1.12 | 1.32 | 1.54 | - | 2.06 | - | 6 | 31 |
| | | | | | 32 | 0.53 | 0.68 | 0.84 | 1.01 | 1.21 | 1.41 | - | | | | |
| | | | | | 38 | 0.46 | 0.59 | 0.73 | 0.89 | 1.07 | 1.26 | - | | | | |
| | | | | | 43 | 0.40 | 0.52 | 0.65 | 0.79 | 0.96 | 1.14 | - | | | | |
| OP-MPBM009DY | 114X4120 | P00 | A1 | G | 27 | 0.66 | 0.83 | 1.01 | 1.22 | 1.43 | 1.67 | - | 2.01 | - | 8 | 31 |
| | | | | | 32 | 0.59 | 0.75 | 0.92 | 1.11 | 1.31 | 1.53 | - | | | | |
| | | | | | 38 | 0.52 | 0.66 | 0.81 | 0.98 | 1.16 | 1.37 | - | | | | |
| | | | | | 43 | 0.46 | 0.58 | 0.72 | 0.87 | 1.04 | 1.23 | - | | | | |
| OP-MPTM009DY | 114X4111 | P00 | A1 + A2L | G | 27 | 0.66 | 0.83 | 1.01 | 1.22 | 1.43 | 1.67 | - | 2.01 | - | 8 | 31 |
| | | | | | 32 | 0.59 | 0.75 | 0.92 | 1.11 | 1.31 | 1.53 | - | | | | |
| | | | | | 38 | 0.52 | 0.66 | 0.81 | 0.98 | 1.16 | 1.37 | - | | | | |
| | | | | | 43 | 0.46 | 0.58 | 0.72 | 0.87 | 1.04 | 1.23 | - | | | | |
| OP-MPTM012DP | 114X4113 | P00 | A1 + A2L | G | 27 | 0.89 | 1.11 | 1.35 | 1.60 | 1.87 | 2.15 | - | 1.83 | - | 8 | 31 |
| | | | | | 32 | 0.80 | 1.00 | 1.22 | 1.46 | 1.71 | 1.97 | - | | | | |
| | | | | | 38 | 0.70 | 0.88 | 1.07 | 1.29 | 1.51 | 1.76 | - | | | | |
| | | | | | 43 | 0.62 | 0.77 | 0.95 | 1.14 | 1.35 | 1.58 | - | | | | |
| OP-MPBM012DP | 114X4121 | P00 | A1 | G | 27 | 0.89 | 1.11 | 1.35 | 1.60 | 1.87 | 2.15 | - | 1.83 | - | 8 | 31 |
| | | | | | 32 | 0.80 | 1.00 | 1.22 | 1.46 | 1.71 | 1.97 | - | | | | |
| | | | | | 38 | 0.70 | 0.88 | 1.07 | 1.29 | 1.51 | 1.76 | - | | | | |
| | | | | | 43 | 0.62 | 0.77 | 0.95 | 1.14 | 1.35 | 1.58 | - | | | | |
| OP-MPBM014DP | 114X4122 | P00 | A1 | G | 27 | 0.92 | 1.15 | 1.40 | 1.68 | 1.98 | 2.29 | - | 1.73 | - | 8 | 31 |
| | | | | | 32 | 0.84 | 1.05 | 1.28 | 1.54 | 1.82 | 2.12 | - | | | | |
| | | | | | 38 | 0.74 | 0.93 | 1.14 | 1.37 | 1.63 | 1.91 | - | | | | |
| | | | | | 43 | 0.66 | 0.83 | 1.02 | 1.24 | 1.48 | 1.74 | - | | | | |
| OP-MPTM014DP | 114X4114 | P00 | A1 + A2L | G | 27 | 0.92 | 1.15 | 1.40 | 1.68 | 1.98 | 2.29 | - | 1.73 | - | 8 | 31 |
| | | | | | 32 | 0.84 | 1.05 | 1.28 | 1.54 | 1.82 | 2.12 | - | | | | |
| | | | | | 38 | 0.74 | 0.93 | 1.14 | 1.37 | 1.63 | 1.91 | - | | | | |
| | | | | | 43 | 0.66 | 0.83 | 1.02 | 1.24 | 1.48 | 1.74 | - | | | | |
| OP-MPTM018DX | 114X4115 | P00 | A1 + A2L | G | 27 | 0.96 | 1.21 | 1.47 | 1.76 | 2.07 | 2.40 | - | 1.64 | - | 10 | 39 |
| | | | | | 32 | 0.88 | 1.10 | 1.35 | 1.61 | 1.90 | 2.22 | - | | | | |
| | | | | | 38 | 0.78 | 0.97 | 1.19 | 1.44 | 1.71 | 2.00 | - | | | | |
| | | | | | 43 | 0.70 | 0.87 | 1.07 | 1.29 | 1.54 | 1.82 | - | | | | |
| OP-MPTM021DX* | 114X4217 | P00 | A1 + A2L | G | 27 | 1.12 | 1.40 | 1.70 | 2.02 | 2.37 | - | - | 1.64 | - | 10 | 39 |
| | | | | | 32 | 1.02 | 1.27 | 1.55 | 1.85 | 2.18 | 2.52 | - | | | | |
| | | | | | 38 | 0.90 | 1.13 | 1.37 | 1.65 | 1.94 | 2.27 | - | | | | |
| | | | | | 43 | 0.81 | 1.00 | 1.23 | 1.48 | 1.75 | 2.05 | - | | | | |
| OP-MPTM022DS | 114X4237 | P00 | A1 + A2L | G | 27 | 1.44 | 1.81 | 2.23 | 2.71 | 3.24 | 3.83 | - | 1.87 | - | 10 | 40 |
| | | | | | 32 | 1.29 | 1.63 | 2.02 | 2.46 | 2.95 | 3.49 | - | | | | |
| | | | | | 38 | 1.10 | 1.41 | 1.76 | 2.16 | 2.60 | 3.09 | - | | | | |
| | | | | | 43 | 0.95 | 1.24 | 1.56 | 1.91 | 2.31 | 2.75 | - | | | | |
| OP-MPTM026DS | 114X4238 | P00 | A1 + A2L | G | 27 | 1.73 | 2.18 | 2.67 | 3.18 | 3.74 | 4.32 | - | 1.75 | - | 16 | 38 |
| | | | | | 32 | 1.53 | 1.94 | 2.39 | 2.87 | 3.39 | 3.94 | - | | | | |
| | | | | | 38 | 1.29 | 1.66 | 2.06 | 2.50 | 2.97 | 3.48 | - | | | | |
| | | | | | 43 | 1.10 | 1.42 | 1.78 | 2.18 | 2.62 | 3.10 | - | | | | |

*Preliminary data

**This table continues on the next page**

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L




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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPTM026DS | 114X4239 | P00 | A1 + A2L | E | 27 | 1.75 | 2.20 | 2.69 | 3.22 | 3.77 | 4.36 | - | 1.80 | - | 6 | 38 |
| | | | | | 32 | 1.54 | 1.96 | 2.41 | 2.90 | 3.42 | 3.97 | - | | | | |
| | | | | | 38 | 1.31 | 1.67 | 2.08 | 2.52 | 3.00 | 3.51 | - | | | | |
| | | | | | 43 | 1.11 | 1.44 | 1.80 | 2.21 | 2.65 | 3.13 | - | | | | |
| OP-MPTM034DS | 114X4241 | P00 | A1 + A2L | G | 27 | 1.68 | 2.31 | 3.04 | 3.87 | 4.81 | 5.84 | - | 1.71 | - | 20 | 39 |
| | | | | | 32 | 1.47 | 2.06 | 2.74 | 3.52 | 4.40 | 5.38 | - | | | | |
| | | | | | 38 | 1.21 | 1.74 | 2.37 | 3.08 | 3.90 | 4.81 | - | | | | |
| | | | | | 43 | 0.98 | 1.48 | 2.05 | 2.71 | 3.47 | 4.32 | - | | | | |
| OP-MPTM034DS | 114X4242 | P00 | A1 + A2L | E | 27 | 1.72 | 2.35 | 3.09 | 3.94 | 4.89 | 5.94 | - | 1.76 | - | 8 | 39 |
| | | | | | 32 | 1.50 | 2.09 | 2.79 | 3.58 | 4.47 | 5.47 | - | | | | |
| | | | | | 38 | 1.23 | 1.77 | 2.41 | 3.14 | 3.96 | 4.89 | - | | | | |
| | | | | | 43 | 1.00 | 1.50 | 2.09 | 2.76 | 3.53 | 4.40 | - | | | | |
| OP-MPXM034ML | 114X4264 | P00 | A1 | E | 27 | 2.52 | 3.10 | 3.76 | 4.49 | 5.30 | 6.19 | - | 2.13 | - | 10 | 38 |
| | | | | | 32 | 2.27 | 2.81 | 3.42 | 4.10 | 4.85 | 5.67 | - | | | | |
| | | | | | 38 | 1.94 | 2.44 | 2.99 | 3.60 | 4.28 | 5.02 | - | | | | |
| | | | | | 43 | 1.65 | 2.11 | 2.62 | 3.17 | 3.79 | 4.47 | - | | | | |
| OP-MPIM034ML | 114X4204 | P00 | A1+A2L | E | 27 | 2.52 | 3.10 | 3.76 | 4.49 | 5.30 | 6.19 | - | 2.13 | - | 10 | 38 |
| | | | | | 32 | 2.27 | 2.81 | 3.42 | 4.10 | 4.85 | 5.67 | - | | | | |
| | | | | | 38 | 1.94 | 2.44 | 2.99 | 3.60 | 4.28 | 5.02 | - | | | | |
| | | | | | 43 | 1.65 | 2.11 | 2.62 | 3.17 | 3.79 | 4.47 | - | | | | |
| OP-MPXM034ML | 114X4261 | P00 | A1 | G | 27 | 2.61 | 3.17 | 3.81 | 4.52 | 5.32 | 6.20 | - | 2.09 | - | 20 | 38 |
| | | | | | 32 | 2.39 | 2.91 | 3.50 | 4.17 | 4.91 | 5.73 | - | | | | |
| | | | | | 38 | 2.11 | 2.58 | 3.12 | 3.72 | 4.40 | 5.16 | - | | | | |
| | | | | | 43 | 1.88 | 2.31 | 2.79 | 3.35 | 3.98 | 4.68 | - | | | | |
| OP-MPIM034ML | 114X4205 | P00 | A1+A2L | G | 27 | 2.61 | 3.17 | 3.81 | 4.52 | 5.32 | 6.20 | - | 2.09 | - | 20 | 38 |
| | | | | | 32 | 2.39 | 2.91 | 3.50 | 4.17 | 4.91 | 5.73 | - | | | | |
| | | | | | 38 | 2.11 | 2.58 | 3.12 | 3.72 | 4.40 | 5.16 | - | | | | |
| | | | | | 43 | 1.88 | 2.31 | 2.79 | 3.35 | 3.98 | 4.68 | - | | | | |
| OP-MPTM038DS* | 114X4218 | P00 | A1+A2L | G | 27 | 1.81 | 2.49 | 3.27 | 4.17 | 5.18 | 6.30 | - | 1.67 | - | 20 | 39 |
| | | | | | 32 | 1.58 | 2.21 | 2.94 | 3.78 | 4.73 | 5.79 | - | | | | |
| | | | | | 38 | 1.29 | 1.86 | 2.53 | 3.30 | 4.18 | 5.17 | - | | | | |
| | | | | | 43 | 1.04 | 1.57 | 2.19 | 2.90 | 3.72 | 4.64 | - | | | | |
| OP-MPXM046ML | 114X4284 | P00 | A1 | E | 27 | 3.43 | 4.15 | 4.96 | 5.86 | 6.85 | 7.94 | - | 2.04 | - | 12 | 38 |
| | | | | | 32 | 3.13 | 3.80 | 4.54 | 5.37 | 6.29 | 7.30 | - | | | | |
| | | | | | 38 | 2.75 | 3.34 | 4.01 | 4.75 | 5.58 | 6.51 | - | | | | |
| | | | | | 43 | 2.41 | 2.95 | 3.55 | 4.22 | 4.97 | 5.82 | - | | | | |
| OP-MPIM046ML | 114X4206 | P00 | A1+A2L | E | 27 | 3.43 | 4.15 | 4.96 | 5.86 | 6.85 | 7.94 | - | 2.04 | - | 12 | 38 |
| | | | | | 32 | 3.13 | 3.80 | 4.54 | 5.37 | 6.29 | 7.30 | - | | | | |
| | | | | | 38 | 2.75 | 3.34 | 4.01 | 4.75 | 5.58 | 6.51 | - | | | | |
| | | | | | 43 | 2.41 | 2.95 | 3.55 | 4.22 | 4.97 | 5.82 | - | | | | |
| OP-MPXM046ML | 114X4281 | P00 | A1 | G | 27 | 3.47 | 4.21 | 5.03 | 5.95 | 6.96 | 8.05 | - | 2.00 | - | 32 | 38 |
| | | | | | 32 | 3.17 | 3.84 | 4.60 | 5.45 | 6.38 | 7.40 | - | | | | |
| | | | | | 38 | 2.78 | 3.38 | 4.06 | 4.82 | 5.66 | 6.59 | - | | | | |
| | | | | | 43 | 2.44 | 2.98 | 3.59 | 4.28 | 5.04 | 5.89 | - | | | | |
| OP-MPIM046ML | 114X4207 | P00 | A1+A2L | G | 27 | 3.47 | 4.21 | 5.03 | 5.95 | 6.96 | 8.05 | - | 2.00 | - | 32 | 38 |
| | | | | | 32 | 3.17 | 3.84 | 4.60 | 5.45 | 6.38 | 7.40 | - | | | | |
| | | | | | 38 | 2.78 | 3.38 | 4.06 | 4.82 | 5.66 | 6.59 | - | | | | |
| | | | | | 43 | 2.44 | 2.98 | 3.59 | 4.28 | 5.04 | 5.89 | - | | | | |

**This table continues on the next page**

*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPXM057ML | 114X4293 | P00 | A1 | E | 27 | 4.02 | 4.86 | 5.81 | 6.86 | 8.01 | 9.25 | - | - | 3.05 | 12 | 39 |
| | | | | | 32 | 3.66 | 4.43 | 5.30 | 6.26 | 7.32 | 8.47 | - | | | | |
| | | | | | 38 | 3.23 | 3.90 | 4.67 | 5.52 | 6.46 | 7.49 | - | | | | |
| | | | | | 43 | 2.85 | 3.45 | 4.12 | 4.87 | 5.72 | 6.67 | - | | | | |
| OP-MPIM057ML | 114X4208 | P00 | A1+A2L | E | 27 | 4.02 | 4.86 | 5.81 | 6.86 | 8.01 | 9.25 | - | - | 3.05 | 12 | 39 |
| | | | | | 32 | 3.66 | 4.43 | 5.30 | 6.26 | 7.32 | 8.47 | - | | | | |
| | | | | | 38 | 3.23 | 3.90 | 4.67 | 5.52 | 6.46 | 7.49 | - | | | | |
| | | | | | 43 | 2.85 | 3.45 | 4.12 | 4.87 | 5.72 | 6.67 | - | | | | |
| OP-MPXM057ML | 114X4290 | P00 | A1 | G | 27 | 4.02 | 4.87 | 5.81 | 6.87 | 8.02 | 9.26 | - | - | 2.95 | 32 | 39 |
| | | | | | 32 | 3.67 | 4.44 | 5.31 | 6.27 | 7.33 | 8.48 | - | | | | |
| | | | | | 38 | 3.23 | 3.91 | 4.67 | 5.53 | 6.47 | 7.49 | - | | | | |
| | | | | | 43 | 2.85 | 3.45 | 4.12 | 4.88 | 5.71 | 6.63 | - | | | | |
| OP-MPIM057ML | 114X4209 | P00 | A1+A2L | G | 27 | 4.02 | 4.87 | 5.81 | 6.87 | 8.02 | 9.26 | - | - | 2.95 | 32 | 39 |
| | | | | | 32 | 3.67 | 4.44 | 5.31 | 6.27 | 7.33 | 8.48 | - | | | | |
| | | | | | 38 | 3.23 | 3.91 | 4.67 | 5.53 | 6.47 | 7.49 | - | | | | |
| | | | | | 43 | 2.85 | 3.45 | 4.12 | 4.88 | 5.71 | 6.63 | - | | | | |
| OP-MPXM068ML | 114X4311 | P00 | A1 | E | 27 | 5.32 | 6.50 | 7.85 | 9.38 | 11.08 | 12.95 | - | - | 3.81 | 16 | 42 |
| | | | | | 32 | 4.88 | 5.98 | 7.24 | 8.67 | 10.27 | 12.04 | - | | | | |
| | | | | | 38 | 4.33 | 5.32 | 6.47 | 7.78 | 9.25 | 10.89 | - | | | | |
| | | | | | 43 | 3.85 | 4.76 | 5.80 | 7.00 | 8.36 | 9.89 | - | | | | |
| OP-MPIM068ML | 114X4306 | P00 | A1+A2L | E | 27 | 5.32 | 6.50 | 7.85 | 9.38 | 11.08 | 12.95 | - | - | 3.89 | 16 | 42 |
| | | | | | 32 | 4.88 | 5.98 | 7.24 | 8.67 | 10.27 | 12.04 | - | | | | |
| | | | | | 38 | 4.33 | 5.32 | 6.47 | 7.78 | 9.25 | 10.89 | - | | | | |
| | | | | | 43 | 3.85 | 4.76 | 5.80 | 7.00 | 8.36 | 9.89 | - | | | | |
| OP-MPXM068ML | 114X4308 | P00 | A1 | G | 27 | 5.33 | 6.51 | 7.86 | 9.38 | 11.08 | 12.96 | - | - | 3.73 | 40 | 42 |
| | | | | | 32 | 4.88 | 5.99 | 7.25 | 8.68 | 10.28 | 12.05 | - | | | | |
| | | | | | 38 | 4.33 | 5.33 | 6.48 | 7.78 | 9.26 | 10.90 | - | | | | |
| | | | | | 43 | 3.85 | 4.76 | 5.81 | 7.00 | 8.36 | 9.89 | - | | | | |
| OP-MPIM068ML | 114X4307 | P00 | A1+A2L | G | 27 | 5.33 | 6.51 | 7.86 | 9.38 | 11.08 | 12.96 | - | - | 3.81 | 40 | 42 |
| | | | | | 32 | 4.88 | 5.99 | 7.25 | 8.68 | 10.28 | 12.05 | - | | | | |
| | | | | | 38 | 4.33 | 5.33 | 6.48 | 7.78 | 9.26 | 10.90 | - | | | | |
| | | | | | 43 | 3.85 | 4.76 | 5.81 | 7.00 | 8.36 | 9.89 | - | | | | |
| OP-MPXM080ML | 114X4321 | P00 | A1 | G | 27 | 6.11 | 7.52 | 9.10 | 10.83 | 12.70 | 14.69 | - | - | 3.38 | 45 | 42 |
| | | | | | 32 | 5.55 | 6.85 | 8.32 | 9.95 | 11.71 | 13.60 | - | | | | |
| | | | | | 38 | 4.86 | 6.03 | 7.36 | 8.84 | 10.46 | 12.21 | - | | | | |
| | | | | | 43 | 4.29 | 5.34 | 6.54 | 7.89 | 9.39 | 11.02 | - | | | | |
| OP-MPIM080ML | 114X4312 | P00 | A1+A2L | G | 27 | 6.11 | 7.52 | 9.10 | 10.83 | 12.70 | 14.69 | - | - | 3.43 | 45 | 42 |
| | | | | | 32 | 5.55 | 6.85 | 8.32 | 9.95 | 11.71 | 13.60 | - | | | | |
| | | | | | 38 | 4.86 | 6.03 | 7.36 | 8.84 | 10.46 | 12.21 | - | | | | |
| | | | | | 43 | 4.29 | 5.34 | 6.54 | 7.89 | 9.39 | 11.02 | - | | | | |
| OP-MPXM080ML | 114X4324 | P00 | A1 | E | 27 | 6.28 | 7.62 | 9.14 | 10.85 | 12.76 | 14.84 | - | - | 3.77 | 20 | 42 |
| | | | | | 32 | 5.75 | 6.99 | 8.40 | 9.99 | 11.76 | 13.72 | - | | | | |
| | | | | | 38 | 5.06 | 6.18 | 7.45 | 8.89 | 10.50 | 12.29 | - | | | | |
| | | | | | 43 | 4.46 | 5.46 | 6.62 | 7.92 | 9.38 | 11.03 | - | | | | |
| OP-MPIM080ML | 114X4309 | P00 | A1+A2L | E | 27 | 6.28 | 7.62 | 9.14 | 10.85 | 12.76 | 14.84 | - | - | 3.85 | 20 | 42 |
| | | | | | 32 | 5.75 | 6.99 | 8.40 | 9.99 | 11.76 | 13.72 | - | | | | |
| | | | | | 38 | 5.06 | 6.18 | 7.45 | 8.89 | 10.50 | 12.29 | - | | | | |
| | | | | | 43 | 4.46 | 5.46 | 6.62 | 7.92 | 9.38 | 11.03 | - | | | | |

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPXM108ML | 114X4344 | P00 | A1 | E | 27 | 7.91 | 9.55 | 11.37 | 13.38 | 15.59 | 18.02 | - | - | 3.35 | 20 | 43 |
| | | | | | 32 | 7.19 | 8.70 | 10.37 | 12.23 | 14.27 | 16.53 | - | | | | |
| | | | | | 38 | 6.28 | 7.64 | 9.13 | 10.79 | 12.63 | 14.68 | - | | | | |
| | | | | | 43 | 5.49 | 6.70 | 8.05 | 9.54 | 11.21 | 13.09 | - | | | | |
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 7.91 | 9.55 | 11.37 | 13.38 | 15.59 | 18.02 | - | - | 3.40 | 20 | 43 |
| | | | | | 32 | 7.19 | 8.70 | 10.37 | 12.23 | 14.27 | 16.53 | - | | | | |
| | | | | | 38 | 6.28 | 7.64 | 9.13 | 10.79 | 12.63 | 14.68 | - | | | | |
| | | | | | 43 | 5.49 | 6.70 | 8.05 | 9.54 | 11.21 | 13.09 | - | | | | |
| OP-MPXM125ML | 114X4414 | P00 | A1 | E | 27 | 9.48 | 11.66 | 14.09 | 16.79 | 19.77 | 22.99 | - | - | 3.50 | 32 | 46 |
| | | | | | 32 | 8.58 | 10.62 | 12.90 | 15.41 | 18.21 | 21.24 | - | | | | |
| | | | | | 38 | 7.44 | 9.32 | 11.40 | 13.70 | 16.23 | 19.03 | - | | | | |
| | | | | | 43 | 6.46 | 8.17 | 10.09 | 12.20 | 14.53 | 17.10 | - | | | | |
| OP-MPXM162ML | 114X4434 | P00 | A1 | E | 27 | 12.60 | 15.10 | 17.82 | 20.79 | 24.04 | 27.58 | - | - | 3.24 | 32 | 46 |
| | | | | | 32 | 11.47 | 13.69 | 16.11 | 18.76 | 21.68 | 24.89 | - | | | | |
| | | | | | 38 | 10.08 | 11.94 | 13.97 | 16.22 | 18.73 | 21.54 | - | | | | |
| | | | | | 43 | 8.92 | 10.44 | 12.12 | 14.03 | 16.18 | 18.64 | - | | | | |
| OP-MPIM125ML | 114X4409 | P00 | A1 + A2L | E | 27 | 9.48 | 11.66 | 14.09 | 16.79 | 19.77 | 22.99 | - | - | 3.50 | 32 | 46 |
| | | | | | 32 | 8.58 | 10.62 | 12.90 | 15.41 | 18.21 | 21.24 | - | | | | |
| | | | | | 38 | 7.44 | 9.32 | 11.40 | 13.70 | 16.23 | 19.03 | - | | | | |
| | | | | | 43 | 6.46 | 8.17 | 10.09 | 12.20 | 14.53 | 17.10 | - | | | | |
| OP-MPIM162ML | 114X4410 | P00 | A1 + A2L | E | 27 | 12.60 | 15.10 | 17.82 | 20.79 | 24.04 | 27.58 | - | - | 3.24 | 40 | 46 |
| | | | | | 32 | 11.47 | 13.69 | 16.11 | 18.76 | 21.68 | 24.89 | - | | | | |
| | | | | | 38 | 10.08 | 11.94 | 13.97 | 16.22 | 18.73 | 21.54 | - | | | | |
| | | | | | 43 | 8.92 | 10.44 | 12.12 | 14.03 | 16.18 | 18.64 | - | | | | |

**MBP**
**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K



For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPTM008DY | 114X4107 | P00 | A1 + A2L | G | 27 | - | 0.61 | 0.77 | 0.93 | 1.10 | 1.27 | - | 1.88 | - | 6 | 31 |
| | | | | | 32 | - | 0.54 | 0.68 | 0.83 | 0.98 | 1.15 | - | | | | |
| | | | | | 38 | - | 0.45 | 0.57 | 0.71 | 0.85 | 1.00 | - | | | | |
| | | | | | 43 | - | - | 0.49 | 0.61 | 0.74 | 0.88 | - | | | | |
| OP-MPTM009DY | 114X4111 | P00 | A1 + A2L | G | 27 | - | 0.73 | 0.89 | 1.06 | 1.25 | 1.44 | - | 1.89 | - | 8 | 31 |
| | | | | | 32 | - | 0.67 | 0.82 | 0.98 | 1.16 | 1.34 | - | | | | |
| | | | | | 38 | - | 0.60 | 0.73 | 0.88 | 1.03 | 1.20 | - | | | | |
| | | | | | 43 | - | - | 0.66 | 0.78 | 0.92 | 1.07 | - | | | | |
| OP-MPTM012DP | 114X4113 | P00 | A1 + A2L | G | 27 | - | 1.14 | 1.38 | 1.63 | 1.90 | 2.18 | - | 1.88 | - | 8 | 31 |
| | | | | | 32 | - | 1.02 | 1.24 | 1.48 | 1.72 | 1.99 | - | | | | |
| | | | | | 38 | - | 0.89 | 1.08 | 1.29 | 1.52 | 1.76 | - | | | | |
| | | | | | 43 | - | - | 0.95 | 1.14 | 1.35 | 1.57 | - | | | | |
| OP-MPTM014DP | 114X4114 | P00 | A1 + A2L | G | 27 | - | 1.20 | 1.45 | 1.72 | 2.00 | 2.30 | - | 1.80 | - | 8 | 31 |
| | | | | | 32 | - | 1.08 | 1.31 | 1.56 | 1.83 | 2.11 | - | | | | |
| | | | | | 38 | - | 0.94 | 1.15 | 1.37 | 1.62 | 1.88 | - | | | | |
| | | | | | 43 | - | - | 1.01 | 1.22 | 1.45 | 1.70 | - | | | | |
| OP-MPTM018DX | 114X4115 | P00 | A1 + A2L | G | 27 | - | 1.34 | 1.62 | 1.92 | 2.24 | 2.56 | - | 1.70 | - | 10 | 39 |
| | | | | | 32 | - | 1.21 | 1.46 | 1.74 | 2.03 | 2.34 | - | | | | |
| | | | | | 38 | - | 1.04 | 1.28 | 1.53 | 1.80 | 2.08 | - | | | | |
| | | | | | 43 | - | - | 1.12 | 1.35 | 1.60 | 1.87 | - | | | | |
| OP-MPTM021DX* | 114X4217 | P00 | A1 + A2L | G | 27 | 1.10 | 1.44 | 1.78 | 2.13 | 2.49 | 2.85 | - | 1.61 | - | 10 | 39 |
| | | | | | 32 | 0.99 | 1.29 | 1.61 | 1.93 | 2.26 | 2.60 | - | | | | |
| | | | | | 38 | 0.85 | 1.12 | 1.40 | 1.70 | 2.00 | 2.31 | - | | | | |
| | | | | | 43 | 0.74 | 0.98 | 1.24 | 1.51 | 1.78 | 2.07 | - | | | | |
| OP-MPTM022DS | 114X4237 | P00 | A1 + A2L | G | 27 | - | 1.81 | 2.21 | 2.65 | 3.14 | 3.67 | - | 1.89 | - | 10 | 40 |
| | | | | | 32 | - | 1.63 | 1.99 | 2.40 | 2.85 | 3.33 | - | | | | |
| | | | | | 38 | - | 1.42 | 1.74 | 2.10 | 2.50 | 2.93 | - | | | | |
| | | | | | 43 | - | - | 1.53 | 1.86 | 2.21 | 2.60 | - | | | | |
| OP-MPTM026DS | 114X4238 | P00 | A1 + A2L | G | 27 | - | 2.20 | 2.66 | 3.18 | 3.74 | 4.34 | - | 1.90 | - | 16 | 38 |
| | | | | | 32 | - | 1.98 | 2.41 | 2.88 | 3.39 | 3.93 | - | | | | |
| | | | | | 38 | - | 1.73 | 2.10 | 2.52 | 2.97 | 3.46 | - | | | | |
| | | | | | 43 | - | - | 1.85 | 2.22 | 2.63 | 3.06 | - | | | | |
| OP-MPTM026DS | 114X4239 | P00 | A1 + A2L | E | 27 | - | 2.22 | 2.69 | 3.21 | 3.77 | 4.38 | - | 1.95 | - | 6 | 38 |
| | | | | | 32 | - | 2.00 | 2.43 | 2.90 | 3.42 | 3.97 | - | | | | |
| | | | | | 38 | - | 1.74 | 2.12 | 2.54 | 3.00 | 3.49 | - | | | | |
| | | | | | 43 | - | - | 1.87 | 2.25 | 2.66 | 3.09 | - | | | | |
| OP-MPTM034DS | 114X4241 | P00 | A1 + A2L | G | 27 | - | 2.52 | 3.15 | 3.80 | 4.46 | 5.14 | - | 1.77 | - | 20 | 39 |
| | | | | | 32 | - | 2.27 | 2.84 | 3.43 | 4.04 | 4.67 | - | | | | |
| | | | | | 38 | - | 1.97 | 2.47 | 3.00 | 3.54 | 4.12 | - | | | | |
| | | | | | 43 | - | - | 2.17 | 2.64 | 3.13 | 3.66 | - | | | | |
| OP-MPTM034DS | 114X4242 | P00 | A1 + A2L | E | 27 | - | 2.54 | 3.17 | 3.82 | 4.49 | 5.17 | - | 1.82 | - | 8 | 39 |
| | | | | | 32 | - | 2.28 | 2.86 | 3.45 | 4.07 | 4.70 | - | | | | |
| | | | | | 38 | - | 1.98 | 2.48 | 3.01 | 3.57 | 4.14 | - | | | | |
| | | | | | 43 | - | - | 2.18 | 2.65 | 3.15 | 3.68 | - | | | | |
| OP-MPIM034ML | 114X4205 | P00 | A1+A2L | G | 27 | 2.67 | 3.29 | 4.00 | 4.81 | 5.71 | 6.70 | - | 2.46 | - | 20 | 38 |
| | | | | | 32 | 2.46 | 3.05 | 3.72 | 4.47 | 5.32 | 6.25 | - | | | | |
| | | | | | 38 | 2.22 | 2.75 | 3.37 | 4.06 | 4.84 | 5.71 | - | | | | |
| | | | | | 43 | - | - | 3.07 | 3.72 | 4.44 | 5.25 | - | | | | |

*Preliminary data

This table continues on the next page

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid Point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPIM034ML | 114X4204 | P00 | A1+A2L | E | 27 | 2.69 | 3.31 | 4.02 | 4.83 | 5.74 | 6.75 | - | 2.54 | - | 20 | 38 |
| | | | | | 32 | 2.48 | 3.06 | 3.72 | 4.48 | 5.34 | 6.30 | - | | | | |
| | | | | | 38 | 2.23 | 2.75 | 3.36 | 4.06 | 4.85 | 5.74 | - | | | | |
| | | | | | 43 | - | - | 3.06 | 3.70 | 4.44 | 5.27 | - | | | | |
| OP-MPTM038DS* | 114X4218 | P00 | A1+A2L | G | 27 | 2.34 | 2.83 | 3.36 | 3.93 | 4.54 | 5.20 | - | 1.72 | - | 10 | 39 |
| | | | | | 32 | 2.12 | 2.58 | 3.09 | 3.64 | 4.23 | 4.87 | - | | | | |
| | | | | | 38 | 1.87 | 2.30 | 2.77 | 3.29 | 3.86 | 4.47 | - | | | | |
| | | | | | 43 | 1.66 | 2.06 | 2.51 | 3.01 | 3.55 | 4.14 | - | | | | |
| OP-MPIM046ML | 114X4207 | P00 | A1+A2L | G | 27 | 3.48 | 4.26 | 5.16 | 6.16 | 7.27 | 8.48 | - | 2.22 | - | 32 | 38 |
| | | | | | 32 | 3.20 | 3.94 | 4.77 | 5.71 | 6.75 | 7.90 | - | | | | |
| | | | | | 38 | 2.87 | 3.54 | 4.30 | 5.16 | 6.12 | 7.18 | - | | | | |
| | | | | | 43 | - | - | 3.90 | 4.69 | 5.58 | 6.57 | - | | | | |
| OP-MPIM046ML | 114X4206 | P00 | A1+A2L | E | 27 | 3.54 | 4.33 | 5.23 | 6.23 | 7.34 | 8.55 | - | 2.37 | - | 12 | 38 |
| | | | | | 32 | 3.24 | 3.98 | 4.82 | 5.76 | 6.80 | 7.93 | - | | | | |
| | | | | | 38 | 2.89 | 3.56 | 4.32 | 5.18 | 6.13 | 7.18 | - | | | | |
| | | | | | 43 | - | - | 3.90 | 4.69 | 5.57 | 6.54 | - | | | | |
| OP-MPIM057ML | 114X4208 | P00 | A1+A2L | E | 27 | 4.23 | 5.16 | 6.20 | 7.36 | 8.61 | 9.96 | - | - | 3.61 | 12 | 39 |
| | | | | | 32 | 3.85 | 4.72 | 5.69 | 6.76 | 7.93 | 9.20 | - | | | | |
| | | | | | 38 | 3.40 | 4.18 | 5.06 | 6.03 | 7.11 | 8.27 | - | | | | |
| | | | | | 43 | - | - | 4.53 | 5.42 | 6.40 | 7.48 | - | | | | |
| OP-MPIM057ML | 114X4209 | P00 | A1+A2L | G | 27 | 4.20 | 5.12 | 6.16 | 7.30 | 8.56 | 9.92 | - | - | 3.468 | 32 | 39 |
| | | | | | 32 | 3.85 | 4.70 | 5.66 | 6.73 | 7.90 | 9.18 | - | | | | |
| | | | | | 38 | 3.43 | 4.19 | 5.06 | 6.02 | 7.09 | 8.25 | - | | | | |
| | | | | | 43 | - | - | 4.54 | 5.42 | 6.39 | 7.46 | - | | | | |
| OP-MPIM068ML | 114X4306 | P00 | A1+A2L | E | 27 | 5.43 | 6.64 | 8.04 | 9.62 | 11.39 | 13.35 | - | - | 4.21 | 16 | 42 |
| | | | | | 32 | 4.99 | 6.13 | 7.43 | 8.92 | 10.59 | 12.44 | - | | | | |
| | | | | | 38 | 4.47 | 5.50 | 6.70 | 8.06 | 9.60 | 11.33 | - | | | | |
| | | | | | 43 | - | - | 6.07 | 7.33 | 8.76 | 10.37 | - | | | | |
| OP-MPIM068ML | 114X4307 | P00 | A1+A2L | G | 27 | 5.47 | 6.72 | 8.14 | 9.74 | 11.53 | 13.52 | - | - | 4.039 | 40 | 42 |
| | | | | | 32 | 5.04 | 6.20 | 7.53 | 9.04 | 10.72 | 12.60 | - | | | | |
| | | | | | 38 | 4.51 | 5.58 | 6.80 | 8.18 | 9.75 | 11.50 | - | | | | |
| | | | | | 43 | - | - | 6.18 | 7.46 | 8.92 | 10.56 | - | | | | |
| OP-MPIM080ML | 114X4312 | P00 | A1+A2L | G | 27 | 6.15 | 7.51 | 9.06 | 10.78 | 12.69 | 14.78 | - | - | 3.67 | 45 | 42 |
| | | | | | 32 | 5.70 | 6.97 | 8.41 | 10.02 | 11.81 | 13.77 | - | | | | |
| | | | | | 38 | 5.15 | 6.31 | 7.62 | 9.10 | 10.74 | 12.54 | - | | | | |
| | | | | | 43 | - | - | 6.96 | 8.31 | 9.83 | 11.50 | - | | | | |
| OP-MPIM080ML | 114X4309 | P00 | A1+A2L | E | 27 | 6.31 | 7.70 | 9.27 | 11.04 | 12.99 | 15.11 | - | - | 4.112 | 20 | 42 |
| | | | | | 32 | 5.80 | 7.09 | 8.56 | 10.21 | 12.05 | 14.05 | - | | | | |
| | | | | | 38 | 5.18 | 6.35 | 7.69 | 9.21 | 10.90 | 12.76 | - | | | | |
| | | | | | 43 | - | - | 6.96 | 8.36 | 9.93 | 11.66 | - | | | | |
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 8.11 | 9.85 | 11.79 | 13.93 | 16.26 | 18.76 | - | - | 3.70 | 20 | 43 |
| | | | | | 32 | 7.41 | 9.02 | 10.83 | 12.82 | 14.99 | 17.33 | - | | | | |
| | | | | | 38 | 6.56 | 8.02 | 9.65 | 11.45 | 13.43 | 15.58 | - | | | | |
| | | | | | 43 | - | - | 8.65 | 10.30 | 12.11 | 14.09 | - | | | | |
| OP-MPIM125ML | 114X4409 | P00 | A1 + A2L | E | 27 | 10.06 | 12.21 | 14.63 | 17.29 | 20.25 | 23.43 | - | - | 3.94 | 32 | 46 |
| | | | | | 32 | 9.24 | 11.24 | 13.48 | 15.96 | 18.72 | 21.70 | - | | | | |
| | | | | | 38 | 8.25 | 10.06 | 12.08 | 14.34 | 16.85 | 19.59 | - | | | | |
| | | | | | 43 | - | 9.06 | 10.90 | 12.97 | 15.25 | - | - | | | | |
| OP-MPIM162ML | 114X4410 | P00 | A1 + A2L | E | 27 | 11.28 | 13.86 | 16.71 | 19.86 | 23.27 | 26.81 | - | - | 3.05 | 32 | 46 |
| | | | | | 32 | 10.17 | 12.55 | 15.20 | 18.13 | 21.30 | 24.63 | - | | | | |
| | | | | | 38 | 8.82 | 10.96 | 13.36 | 15.98 | 18.88 | 22.00 | - | | | | |
| | | | | | 43 | 7.69 | 9.62 | 11.79 | 14.18 | 16.82 | 19.69 | - | | | | |

*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid Point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPTM008DY | 114X4107 | P00 | A1 + A2L | G | 27 | - | 0.57 | 0.72 | 0.87 | 1.04 | 1.21 | - | 1.84 | - | 6 | 31 |
| | | | | | 32 | - | 0.50 | 0.63 | 0.78 | 0.93 | 1.09 | - | | | | |
| | | | | | 38 | - | 0.42 | 0.54 | 0.67 | 0.80 | 0.95 | - | | | | |
| | | | | | 43 | - | - | 0.46 | 0.57 | 0.70 | 0.84 | - | | | | |
| OP-MPTM009DY | 114X4111 | P00 | A1 + A2L | G | 27 | - | 0.63 | 0.78 | 0.95 | 1.11 | 1.29 | - | 1.82 | - | 8 | 31 |
| | | | | | 32 | - | 0.56 | 0.70 | 0.85 | 1.00 | 1.17 | - | | | | |
| | | | | | 38 | - | 0.47 | 0.59 | 0.73 | 0.87 | 1.02 | - | | | | |
| | | | | | 43 | - | - | 0.51 | 0.63 | 0.76 | 0.90 | - | | | | |
| OP-MPTM012DP | 114X4113 | P00 | A1 + A2L | G | 27 | - | 1.06 | 1.28 | 1.52 | 1.78 | 2.04 | - | 1.81 | - | 8 | 31 |
| | | | | | 32 | - | 0.95 | 1.16 | 1.38 | 1.61 | 1.86 | - | | | | |
| | | | | | 38 | - | 0.83 | 1.01 | 1.21 | 1.42 | 1.65 | - | | | | |
| | | | | | 43 | - | - | 0.89 | 1.07 | 1.26 | 1.47 | - | | | | |
| OP-MPTM014DP | 114X4114 | P00 | A1 + A2L | G | 27 | - | 1.09 | 1.33 | 1.58 | 1.85 | 2.13 | - | 1.71 | - | 8 | 31 |
| | | | | | 32 | - | 0.98 | 1.20 | 1.44 | 1.69 | 1.96 | - | | | | |
| | | | | | 38 | - | 0.86 | 1.05 | 1.27 | 1.50 | 1.75 | - | | | | |
| | | | | | 43 | - | - | 0.93 | 1.13 | 1.34 | 1.57 | - | | | | |
| OP-MPTM018DX | 114X4115 | P00 | A1 + A2L | G | 27 | - | 1.20 | 1.48 | 1.77 | 2.08 | 2.41 | - | 1.65 | - | 10 | 39 |
| | | | | | 32 | - | 1.07 | 1.32 | 1.59 | 1.88 | 2.19 | - | | | | |
| | | | | | 38 | - | 0.92 | 1.14 | 1.38 | 1.64 | 1.92 | - | | | | |
| | | | | | 43 | - | - | 0.99 | 1.20 | 1.44 | 1.70 | - | | | | |
| OP-MPTM021DX* | 114X4217 | P00 | A1 + A2L | G | 27 | 0.96 | 1.27 | 1.59 | 1.92 | 2.25 | 2.59 | - | 1.61 | - | 10 | 39 |
| | | | | | 32 | 0.86 | 1.14 | 1.44 | 1.74 | 2.05 | 2.37 | - | | | | |
| | | | | | 38 | 0.75 | 1.00 | 1.26 | 1.53 | 1.82 | 2.11 | - | | | | |
| | | | | | 43 | 0.65 | 0.88 | 1.11 | 1.36 | 1.62 | 1.90 | - | | | | |
| OP-MPTM022DS | 114X4237 | P00 | A1 + A2L | G | 27 | - | 1.61 | 2.05 | 2.56 | 3.14 | 3.77 | - | 1.97 | - | 10 | 40 |
| | | | | | 32 | - | 1.45 | 1.86 | 2.33 | 2.86 | 3.46 | - | | | | |
| | | | | | 38 | - | 1.26 | 1.63 | 2.05 | 2.53 | 3.07 | - | | | | |
| | | | | | 43 | - | - | 1.44 | 1.82 | 2.26 | 2.76 | - | | | | |
| OP-MPTM026DS | 114X4238 | P00 | A1 + A2L | G | 27 | - | 2.03 | 2.49 | 2.98 | 3.50 | 4.04 | - | 2.15 | - | 16 | 38 |
| | | | | | 32 | - | 1.80 | 2.22 | 2.68 | 3.16 | 3.67 | - | | | | |
| | | | | | 38 | - | 1.53 | 1.91 | 2.32 | 2.76 | 3.23 | - | | | | |
| | | | | | 43 | - | - | 1.65 | 2.02 | 2.42 | 2.86 | - | | | | |
| OP-MPTM026DS | 114X4239 | P00 | A1 + A2L | E | 27 | - | 2.04 | 2.50 | 2.99 | 3.51 | 4.06 | - | 2.20 | - | 6 | 38 |
| | | | | | 32 | - | 1.81 | 2.23 | 2.69 | 3.18 | 3.69 | - | | | | |
| | | | | | 38 | - | 1.54 | 1.92 | 2.33 | 2.77 | 3.25 | - | | | | |
| | | | | | 43 | - | - | 1.66 | 2.03 | 2.44 | 2.88 | - | | | | |
| OP-MPTM034DS | 114X4241 | P00 | A1 + A2L | G | 27 | - | 2.16 | 2.72 | 3.29 | 3.87 | 4.46 | - | 1.67 | - | 20 | 39 |
| | | | | | 32 | - | 1.95 | 2.45 | 2.97 | 3.51 | 4.06 | - | | | | |
| | | | | | 38 | - | 1.69 | 2.13 | 2.59 | 3.07 | 3.57 | - | | | | |
| | | | | | 43 | - | - | 1.87 | 2.28 | 2.71 | 3.17 | - | | | | |
| OP-MPTM034DS | 114X4242 | P00 | A1 + A2L | E | 27 | - | 2.18 | 2.73 | 3.31 | 3.89 | 4.49 | - | 1.71 | - | 8 | 39 |
| | | | | | 32 | - | 1.96 | 2.46 | 2.99 | 3.53 | 4.08 | - | | | | |
| | | | | | 38 | - | 1.70 | 2.14 | 2.61 | 3.09 | 3.59 | - | | | | |
| | | | | | 43 | 1.13 | - | 1.88 | 2.30 | 2.73 | 3.19 | - | | | | |
| OP-MPIM034ML | 114X4204 | P00 | A1+A2L | E | 27 | 2.44 | 3.01 | 3.67 | 4.42 | 5.27 | 6.21 | - | 2.50 | - | 10 | 38 |
| | | | | | 32 | 2.25 | 2.78 | 3.40 | 4.11 | 4.91 | 5.80 | - | | | | |
| | | | | | 38 | 2.02 | 2.51 | 3.07 | 3.72 | 4.46 | 5.29 | - | | | | |
| | | | | | 43 | - | - | 2.80 | 3.40 | 4.09 | 4.86 | - | | | | |

This table continues on the next page

*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid Point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L





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| Model | Code | Version | Refrigerant group | Electrical code (1) | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -20°C | -15°C | -10°C | -5°C | 0°C | 5°C | 10°C | EcoDesign (3) COP | SEPR | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPIM034ML | 114X4205 | P00 | A1+A2L | G | 27 | 2.48 | 3.07 | 3.74 | 4.50 | 5.36 | 6.31 | - | 2.42 | - | 20 | 38 |
| | | | | | 32 | 2.29 | 2.84 | 3.47 | 4.19 | 5.00 | 5.89 | - | | | | |
| | | | | | 38 | 2.06 | 2.57 | 3.15 | 3.81 | 4.56 | 5.39 | - | | | | |
| | | | | | 43 | - | - | 2.87 | 3.49 | 4.18 | 4.96 | - | | | | |
| OP-MPTM038DS* | 114X4218 | P00 | A1+A2L | G | 27 | 27 | 2.05 | 2.49 | 2.98 | 3.50 | 4.06 | 4.66 | 1.7 | - | 20 | 39 |
| | | | | | 32 | 32 | 1.87 | 2.28 | 2.74 | 3.24 | 3.79 | 4.37 | | | | |
| | | | | | 38 | 38 | 1.64 | 2.03 | 2.46 | 2.94 | 3.46 | 4.02 | | | | |
| | | | | | 43 | 43 | 1.46 | 1.82 | 2.23 | 2.69 | 3.18 | 3.73 | | | | |
| OP-MPIM046ML | 114X4207 | P00 | A1+A2L | G | 27 | 3.19 | 3.92 | 4.76 | 5.70 | 6.75 | 7.91 | - | 2.28 | - | 32 | 38 |
| | | | | | 32 | 2.94 | 3.62 | 4.40 | 5.29 | 6.27 | 7.37 | - | | | | |
| | | | | | 38 | 2.64 | 3.26 | 3.97 | 4.78 | 5.69 | 6.71 | - | | | | |
| | | | | | 43 | - | - | 3.61 | 4.36 | 5.20 | 6.15 | - | | | | |
| OP-MPIM046ML | 114X4206 | P00 | A1+A2L | E | 27 | 3.25 | 4.00 | 4.84 | 5.79 | 6.84 | 8.00 | - | 2.40 | - | 12 | 38 |
| | | | | | 32 | 2.99 | 3.68 | 4.47 | 5.35 | 6.34 | 7.43 | - | | | | |
| | | | | | 38 | 2.67 | 3.29 | 4.01 | 4.82 | 5.73 | 6.74 | - | | | | |
| | | | | | 43 | - | - | 3.62 | 4.37 | 5.21 | 6.15 | - | | | | |
| OP-MPIM057ML | 114X4208 | P00 | A1+A2L | E | 27 | 3.83 | 4.70 | 5.68 | 6.76 | 7.95 | 9.24 | - | - | 3.73 | 12 | 39 |
| | | | | | 32 | 3.49 | 4.30 | 5.21 | 6.23 | 7.34 | 8.55 | - | | | | |
| | | | | | 38 | 3.08 | 3.82 | 4.65 | 5.57 | 6.59 | 7.71 | - | | | | |
| | | | | | 43 | - | - | 4.17 | 5.02 | 5.96 | 6.99 | - | | | | |
| OP-MPIM057ML | 114X4209 | P00 | A1+A2L | G | 27 | 3.83 | 4.69 | 5.66 | 6.75 | 7.94 | 9.24 | - | - | 3.467 | 32 | 39 |
| | | | | | 32 | 3.52 | 4.32 | 5.22 | 6.23 | 7.34 | 8.56 | - | | | | |
| | | | | | 38 | 3.15 | 3.86 | 4.67 | 5.59 | 6.60 | 7.71 | - | | | | |
| | | | | | 43 | - | - | 4.21 | 5.04 | 5.97 | 6.99 | - | | | | |
| OP-MPIM068ML | 114X4307 | P00 | A1+A2L | G | 27 | 4.88 | 6.02 | 7.31 | 8.79 | 10.45 | 12.29 | - | - | 3.83 | 40 | 42 |
| | | | | | 32 | 4.50 | 5.56 | 6.78 | 8.16 | 9.73 | 11.47 | - | | | | |
| | | | | | 38 | 4.03 | 5.00 | 6.12 | 7.40 | 8.84 | 10.47 | - | | | | |
| | | | | | 43 | - | - | 5.57 | 6.75 | 8.10 | 9.62 | - | | | | |
| OP-MPIM068ML | 114X4306 | P00 | A1+A2L | E | 27 | 4.96 | 6.09 | 7.40 | 8.89 | 10.56 | 12.42 | - | - | 4.274 | 16 | 42 |
| | | | | | 32 | 4.57 | 5.63 | 6.85 | 8.25 | 9.82 | 11.58 | - | | | | |
| | | | | | 38 | 4.10 | 5.06 | 6.18 | 7.46 | 8.92 | 10.56 | - | | | | |
| | | | | | 43 | - | - | 5.61 | 6.79 | 8.15 | 9.69 | - | | | | |
| OP-MPIM080ML | 114X4312 | P00 | A1+A2L | G | 27 | 5.55 | 6.80 | 8.24 | 9.85 | 11.63 | 13.60 | - | - | 3.51 | 45 | 42 |
| | | | | | 32 | 5.14 | 6.32 | 7.66 | 9.17 | 10.85 | 12.70 | - | | | | |
| | | | | | 38 | 4.65 | 5.73 | 6.95 | 8.34 | 9.88 | 11.59 | - | | | | |
| | | | | | 43 | - | - | 6.35 | 7.63 | 9.05 | 10.64 | - | | | | |
| OP-MPIM080ML | 114X4309 | P00 | A1+A2L | E | 27 | 5.79 | 7.08 | 8.56 | 10.23 | 12.08 | 14.12 | - | - | 4.241 | 20 | 42 |
| | | | | | 32 | 5.32 | 6.53 | 7.91 | 9.48 | 11.22 | 13.14 | - | | | | |
| | | | | | 38 | 4.76 | 5.86 | 7.12 | 8.56 | 10.17 | 11.95 | - | | | | |
| | | | | | 43 | - | - | 6.45 | 7.77 | 9.27 | 10.93 | - | | | | |
| OP-MPIM108ML | 114X4314 | P00 | A1+A2L | E | 27 | 7.39 | 9.02 | 10.86 | 12.89 | 15.12 | 17.53 | - | - | 3.79 | 20 | 43 |
| | | | | | 32 | 6.77 | 8.29 | 9.99 | 11.88 | 13.96 | 16.23 | - | | | | |
| | | | | | 38 | 6.02 | 7.38 | 8.93 | 10.65 | 12.55 | 14.63 | - | | | | |
| | | | | | 43 | - | - | 8.03 | 9.60 | 11.35 | 13.27 | - | | | | |
| OP-MPIM125ML | 114X4409 | P00 | A1 + A2L | E | 27 | 8.75 | 10.69 | 12.88 | 15.33 | 18.04 | 21.00 | - | - | 3.86 | 32 | 46 |
| | | | | | 32 | 8.06 | 9.85 | 11.89 | 14.17 | 16.69 | 19.48 | - | | | | |
| | | | | | 38 | 7.21 | 8.83 | 10.68 | 12.76 | 15.06 | 17.63 | - | | | | |
| | | | | | 43 | - | 7.97 | 9.66 | 11.56 | 13.68 | 16.06 | - | | | | |
| OP-MPIM162ML | 114X4410 | P00 | A1 + A2L | E | 27 | 10.57 | 12.99 | 15.70 | 18.70 | 21.97 | 25.44 | - | - | 3.31 | 32 | 46 |
| | | | | | 32 | 9.57 | 11.82 | 14.33 | 17.13 | 20.19 | 23.50 | - | | | | |
| | | | | | 38 | 8.36 | 10.38 | 12.66 | 15.19 | 17.99 | 21.04 | - | | | | |
| | | | | | 43 | - | 9.17 | 11.24 | 13.55 | 16.12 | 18.93 | - | | | | |

*Preliminary data

**MBP**

**(1) G** - Compressor 230V/1Ph/50Hz, fan 230V/1Ph/50Hz
**E** - Compressor 400V/3Ph/50Hz, fan 230V/1Ph/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid Point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L

| Application | Code number | Model number | Compressor Model | Electrical Code (1) | Refrigerant (2) | Condenser Coil | | | Fan | | Receiver | Dimensions | | | | Connection | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Type | Airflow | Internal Volume | Number | Blade ø | Volume | Housing | Height | Width | Length | Suction valve | Liquid valve | Gross | Net |
| | | | | | | | ($m^3/h$) | ($dm^3$) | | (mm) | (L) | | mm | mm | mm | inch | inch | Kg | Kg |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 3/8" | 65 | 49 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 5/8" | 3/8" | 102 | 80 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 5/8" | 3/8" | 102 | 80 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 5/8" | 3/8" | 102 | 80 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 5/8" | 3/8" | 102 | 80 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | Q | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1441 | 531 | 7/8" | 1/2" | 129 | 107 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 1/2" | 161 | 135 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 1/2" | 161 | 135 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 1/2" | 162 | 136 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | J7 | 9500 | 1.97 | 2 | 500 | 10 | H4 | 966 | 1835 | 650 | 1 1/8" | 3/4" | 212 | 161 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | J7 | 9500 | 1.97 | 2 | 500 | 10 | H4 | 966 | 1835 | 650 | 1 1/8" | 3/4" | 217 | 166 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | B | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 1/4" | 65 | 49 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | B | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 1/4" | 65 | 49 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | B | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 3/8" | 65 | 49 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | B | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 3/8" | 65 | 49 |
| MBP | 114X4261 | OP-MPXM034MLP00G | MLZ015T5 | G | X | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4281 | OP-MPXM046MLP00G | MLZ021T5 | G | X | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4290 | OP-MPXM057MLP00G | MLZ026T5 | G | X | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4308 | OP-MPXM068MLP00G | MLZ030T5 | G | X | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1441 | 531 | 7/8" | 5/8" | 137 | 101 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1441 | 531 | 7/8" | 5/8" | 137 | 101 |
| MBP | 114X4321 | OP-MPXM080MLP00G | MLZ038T5 | G | X | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1441 | 531 | 7/8" | 5/8" | 137 | 101 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1441 | 531 | 7/8" | 5/8" | 137 | 101 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1441 | 531 | 7/8" | 5/8" | 137 | 101 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | J7 | 9500 | 1.97 | 2 | 500 | 10 | H4 | 966 | 1835 | 650 | 1 1/8" | 3/4" | 218 | 169 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | J7 | 9500 | 1.97 | 2 | 500 | 10 | H4 | 966 | 1835 | 650 | 1 1/8" | 3/4" | 218 | 169 |

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2) G** - R134a, R513A
**X** - R134a, R404A/R507, R407A, R407F, R449A, R448A, R513A, R452A
**B** - R404A/R507, R448A, R449A, R452A
**Q** - R404A/R507, R452A
**O** - R404A/R507, R452A, R448A, R449A




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| Application | Code number | Model number | Compressor Model | Electrical Code (1) | Refrigerant (2) | Condenser Coil | | | Fan | | Receiver | Dimensions | | | | Connection | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Type | Airflow | Internal Volume | Number | Blade ø | Volume | Housing | Height | Width | Length | Suction valve | Liquid valve | Gross | Net |
| | | | | | | | ($m^2$/h) | ($dm^3$) | | (mm) | (L) | | mm | mm | mm | inch | inch | Kg | Kg |
| LBP | 114X3110 | OP-LPVM016DPP00G | DPT16LA | G | V | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 3/8" | 75 | 64 |
| LBP | 114X3201 | OP-LPVM026DSP00G | DST26NA | G | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 3/8" | 78 | 67 |
| LBP | 114X3202 | OP-LPVM034DSP00G | DST34LA | G | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 3/8" | 80 | 70 |
| LBP | 114X3204 | OP-LPVM048NTP00G | NTZ048-5 | G | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 5/8" | 3/8" | 102 | 80 |
| LBP | 114X3205 | OP-LPVM048NTP00E | NTZ048-4 | E | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 5/8" | 3/8" | 102 | 80 |
| LBP | 114X3207 | OP-LPVM068NTP00E | NTZ068-4 | E | V | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 5/8" | 3/8" | 102 | 80 |
| LBP | 114X3304 | OP-LPKM067LLP02E | LLZ013T4B | E | K | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 1/2" | 161 | 135 |
| LBP | 114X3305 | OP-LPKM084LLP02E | LLZ015T4B | E | K | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 1/2" | 161 | 135 |
| LBP | 114X3306 | OP-LPKM098LLP02E | LLZ018T4B | E | K | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 1/2" | 162 | 136 |
| LBP | 114X3405 | OP-LPKM120LLP02E | LLZ024T4B | E | K | G7 | 9500 | 1.97 | 2 | 560 | 5+5 | H4 | 966 | 1835 | 650 | 1 1/8" | 3/4" | 212 | 161 |
| LBP | 114X3406 | OP-LPKM168LLP02E | LLZ034T4B | E | K | G7 | 9500 | 1.97 | 2 | 560 | 5+5 | H4 | 966 | 1835 | 650 | 1 1/8" | 3/4" | 217 | 166 |
| MBP | 114X4107 | OP-MPTM008DYP00G | DLY80RAb | G | T | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 3/8" | 66 | 55 |
| MBP | 114X4111 | OP-MPTM009DYP00G | DLY90RAb | G | T | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 3/8" | 66 | 55 |
| MBP | 114X4113 | OP-MPTM012DPP00G | DPT12RA | G | T | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 3/8" | 66 | 55 |
| MBP | 114X4114 | OP-MPTM014DPP00G | DPT14RA | G | T | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 3/8" | 3/8" | 66 | 55 |
| MBP | 114X4115 | OP-MPTM018DXP00G | DX18Tba | G | T | A7 | 2200 | 0.39 | 1 | 365 | 1.3 | H1 | 650 | 941 | 406 | 1/2" | 1/2" | 66 | 55 |
| MBP | 114X4217 | OP-MPTM021DXP00G | DX21Tba | G | T | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 3/8" | 78 | 67 |
| MBP | 114X4237 | OP-MPTM022DSP00G | DS22TB | G | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 1/2" | 78 | 67 |
| MBP | 114X4238 | OP-MPTM026DSP00G | DS26TB | G | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 1/2" | 78 | 67 |
| MBP | 114X4239 | OP-MPTM026DSP00E | DS26T3 | E | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 1/2" | 78 | 67 |
| MBP | 114X4243 | OP-MPSM026CSP00G | CS26TB | G | S | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 1/2" | 78 | 67 |
| MBP | 114X4244 | OP-MPSM030CSP00G | CS30TB | G | S | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 1/2" | 80 | 70 |
| MBP | 114X4241 | OP-MPTM034DSP00G | DS34TB | G | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 1/2" | 80 | 70 |
| MBP | 114X4242 | OP-MPTM034DSP00E | DS34T3 | E | T | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 1/2" | 80 | 70 |
| MBP | 114X4204 | OP-MPIM034MLP00E | MLZ015T4 | E | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4205 | OP-MPIM034MLP00G | MLZ015T5 | G | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4218 | OP-MPTM038DSP00G | DST38NA | G | T | D7 | 3,300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 1/2" | 3/8" | 80 | 70 |
| MBP | 114X4206 | OP-MPIM046MLP00E | MLZ021T4 | E | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4207 | OP-MPIM046MLP00G | MLZ021T5 | G | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4208 | OP-MPIM057MLP00E | MLZ026T4 | E | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4209 | OP-MPIM057MLP00G | MLZ026T5 | G | I | D7 | 3300 | 0.58 | 1 | 450 | 3.4 | H2 | 813 | 1090 | 480 | 3/4" | 1/2" | 109 | 87 |
| MBP | 114X4306 | OP-MPIM068MLP00E | MLZ030T4 | E | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 5/8" | 140 | 105 |
| MBP | 114X4307 | OP-MPIM068MLP00G | MLZ030T5 | G | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 5/8" | 140 | 105 |
| MBP | 114X4309 | OP-MPIM080MLP00E | MLZ038T4 | E | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 5/8" | 140 | 105 |
| MBP | 114X4312 | OP-MPIM080MLP00G | MLZ038T5 | G | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 5/8" | 140 | 105 |
| MBP | 114X4314 | OP-MPIM108MLP00E | MLZ048T4 | E | I | G7 | 5200 | 1.62 | 1 | 560 | 6.2 | H3 | 965 | 1441 | 531 | 3/4" | 5/8" | 140 | 105 |
| MBP | 114X4409 | OP-MPIM125MLP00E | MLZ058T4 | E | I | J7 | 9500 | 1.97 | 2 | 560 | 5+5 | H4 | 966 | 1835 | 650 | 1 1/8" | 3/4" | 218 | 169 |
| MBP | 114X4410 | OP-MPIM162MLP00E | MLZ076T4 | E | I | J7 | 9500 | 1.97 | 2 | 560 | 5+5 | H4 | 966 | 1835 | 650 | 1 1/8" | 3/4" | 218 | 169 |

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2) S** - R134a, R513A & R1234yf
**T** - R404A/R507,R455A,R454C,R448A/R449A,R452A ;
**V** - R454C, R455A, R452A, R404A/R507;
**I** - R404A / R507, R134a, R407A, R407F, R448A, R513A, R449A, R452A, R454C, R455A

| Designation | LPQM017DP | LPQM026AJ | LPQM048NT | LPQM048NT | LPQM068NT | LPQM068NT | LPQM074FH | LPQM074FH |
|---|---|---|---|---|---|---|---|---|
| Code Number | 114X3118 | 114X3216 | 114X3225 | 114X3233 | 114X3241 | 114X3249 | 114X3252 | 114X3253 |
| Compressor Description | DPT16LA | CAJ2446Z | NTZ048-5 | NTZ048-4 | NTZ068-5 | NTZ068-4 | FH2511Z-XC | FH2511Z-XG |
| Oil (reference) | POE32 | RL32HA/HT | 175PZ-POE | 175PZ-POE | 175PZ-POE | 175PZ-POE | RL32HA/HT | RL32HA/HT |
| Housing | H1 | H2 | H2 | H2 | H2 | H2 | H2 | H2 |
| **Spare Parts** | | | | | | | | |
| Compressor single pack | 123B6014 | 118U3992 | 120F0228 | 120F0226 | 120F0232 | 120F0230 | 118U5335 | 118U5336 |
| Condenser | 118U5217 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| Fan assembly | - | - | - | - | - | - | - | - |
| Fan blade | 118U3480 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 |
| Fan capacitor | 118U3296 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 |
| Fan cowl/grill | 118U3483 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 |
| Fan motor | 118U3477 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 |
| Filter drier | 023Z5039 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7051 | 009L7051 | 009L7051 | 009L7051 | 009L7051 | 009L7051 | 009L7051 | 009L7051 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Receiver | 118U4020 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 |
| Sight glass | 014L0182 | 014L0172 | 014L0172 | 014L0172 | 014L0172 | 014L0172 | 014L0172 | 014L0172 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7051 | 009L7051 | 009L7053 | 009L7053 | 009L7053 | 009L7053 | 009L7053 | 009L7053 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | |
| Crankcase heater | 118U0051 | 118U0051 | 120Z0459 | 120Z0459 | 120Z0459 | 120Z0459 | 120Z0459 | 120Z0459 |
| EMI Filter (Controller) | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3845 | 118U3845 | 118U3846 | 118U3845 | 118U3848 | 118U3845 | 118U3845 | 118U3845 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3853 | 118U3851 | 118U3852 | 118U3853 | 118U3854 | 118U3851 | 118U3853 | 118U3855 |
| Module B+ | - | - | - | - | - | - | - | - |
| Run capacitor | 123B9219 | | 8173041 | - | 8173041 | - | | - |
| Starting capacitor | 123B9316 | 118U5191* | 120Z0400 | - | 120Z0400 | - | 118U5199* | - |
| Starting relay | 123B9151 | | 8173022 | - | 8173022 | - | | - |
| **Accessories (Not Premounted)** | | | | | | | | |
| Acoustic hood | - | - | 120Z0575 | 120Z0575 | 120Z0575 | 120Z0575 | - | - |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| Fusible Plug(1/4") | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| **Adap-Kool Accessories** | | | | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | | | | |
| Top Panel | 118U5121 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 |
| Fan Panel | 118U5122 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 |
| Back Panel | 118U5123 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 |
| Front Panel | 118U5124 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 |
| Access Panel | 118U5125 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 |
| Left side Panel | 118U5163 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 |
| Fan Panel (LH) | - | - | - | - | - | - | - | - |
| Fan Panel (RH) | - | - | - | - | - | - | - | - |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit




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| Designation | LPQM096NT | LPQM136NT | LPQM120LL | LPQM168LL | LPOM067LL | LPOM084LL | LPOM098LL | LPOM120LL | LPOM168LL |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | 114X3357 | 114X3365 | 114X3476 | 114X3482 | 114X3371 | 114X3372 | 114X3373 | 114X3485 | 114X3486 |
| Compressor Description | NTZ096-4 | NTZ136-4 | LLZ024T4 | LLZ034T4 | LLZ013T4A | LLZ015T4A | LLZ018T4A | LLZ024T4A | LLZ034T4A |
| Oil (reference) | 175PZ-POE | 175PZ-POE | 215PZ-POE46 | 215PZ-POE46 | 120Z0648 | 120Z0648 | 120Z0648 | 120Z0648 | 120Z0648 |
| Housing | H3 | H3 | H4 | H4 | H3 | H3 | H3 | H4 | H4 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | 120F0234 | 120F0236 | 121L9541 | 121L9543 | 121L9535 | 121L9537 | 121L9539 | 121L9541 | 121L9543 |
| Condenser | 118U5219 | 118U5219 | 118U5220 | 118U5220 | 118U5219 | 118U5219 | 118U5219 | 118U5220 | 118U5220 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| Fan assembly | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 |
| Fan blade | - | - | - | - | - | - | - | - | - |
| Fan capacitor | - | - | - | - | - | - | - | - | - |
| Fan cowl/grill | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 |
| Fan motor | - | - | - | - | - | - | - | - | - |
| Filter drier | 023Z5044 | 023Z5044 | 023Z5046 | 023Z5046 | 023Z5044 | 023Z5044 | 023Z5044 | 023Z5046 | 023Z5046 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7052 | 009L7052 | 009L7054 | 009L7054 | 009L7052 | 009L7052 | 009L7052 | 009L7054 | 009L7054 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Receiver | 118U4014 | 118U4014 | 118U4017 | 118U4017 | 118U4014 | 118U4014 | 118U4014 | 118U4017 | 118U4017 |
| Sight glass | 014L0173 | 014L0173 | 014L0175 | 014L0175 | 014L0173 | 014L0173 | 014L0173 | 014L0175 | 014L0175 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7055 | 009L7056 | 009L7056 | 009L7056 | 009L7054 | 009L7054 | 009L7054 | 009L7056 | 009L7056 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | 120Z0459 | 120Z0459 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 |
| EMI Filter (Controller) | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3846 | 118U3847 | 118U3848 | 118U3848 | 118U3846 | 118U3847 | 118U3847 | 118U3848 | 118U3849 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3851 | 118U3852 | 118U3855 | 118U3856 | 118U3852 | 118U3852 | 118U3852 | 118U3855 | 118U3856 |
| Module B+ | - | - | - | - | 118U4010 | 118U4010 | 118U4010 | 118U4010 | 118U4010 |
| Run capacitor | - | - | - | - | - | - | - | - | - |
| Starting capacitor | - | - | - | - | - | - | - | - | - |
| Starting relay | - | - | - | - | - | - | - | - | - |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | 120Z0575 | 120Z0575 | 120Z5053 | 120Z5055 | 120Z5052 | 120Z5052 | 120Z5052 | 120Z5053 | 120Z5055 |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| Fusible Plug(1/4") | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| **Adap-Kool Accessories** | | | | | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | | | | | |
| Top Panel | 118U5131 | 118U5131 | 118U5136 | 118U5136 | 118U5131 | 118U5131 | 118U5131 | 118U5136 | 118U5136 |
| Fan Panel | 118U5132 | 118U5132 | - | - | 118U5132 | 118U5132 | 118U5132 | - | - |
| Back Panel | 118U5133 | 118U5133 | 118U5139 | 118U5139 | 118U5133 | 118U5133 | 118U5133 | 118U5139 | 118U5139 |
| Front Panel | 118U5134 | 118U5134 | - | - | 118U5134 | 118U5134 | 118U5134 | - | - |
| Access Panel | 118U5135 | 118U5135 | 118U5140 | 118U5140 | 118U5135 | 118U5135 | 118U5135 | 118U5140 | 118U5140 |
| Left side Panel | 118U5165 | 118U5165 | 118U5166 | 118U5166 | 118U5165 | 118U5165 | 118U5165 | 118U5166 | 118U5166 |
| Fan Panel (LH) | - | - | 118U5137 | 118U5137 | - | - | - | 118U5137 | 118U5137 |
| Fan Panel (RH) | - | - | 118U5138 | 118U5138 | - | - | - | 118U5138 | 118U5138 |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit

| Designation | LPVM016MP | LPVM026MS | LPVM034MS | LPVM048NT | LPVM048NT | LPVM068NT |
|---|---|---|---|---|---|---|
| Code Number | 114X3110 | 114X3201 | 114X3202 | 114X3204 | 114X3205 | 114X3207 |
| Compressor Description | DPT16LA | DST26NA | DST34LA | NTZ048-5 | NTZ048-4 | NTZ068-4 |
| Oil (reference) | POE 32 | POE 46 | POE 46 | 175PZ-POE | 175PZ-POE | 175PZ-POE |
| Housing | H1 | H2 | H2 | H2 | H2 | H2 |
| **Spare Parts** | | | | | | |
| Compressor single pack | 123B6014 | 123B6015 | 123B6016 | 120F0228 | 120F0226 | 120F0230 |
| Condenser | 118U5217 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| E-box Cable gland | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Fan assembly | - | - | - | - | - | - |
| Fan blade | 118U3480 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 |
| Fan capacitor | 118U3296 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 |
| Fan cowl/grill | 118U3483 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 |
| Fan motor | 118U3477 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 |
| Filter drier | 023Z5039 | 023Z5040 | 023Z5040 | 023Z5041 | 023Z5041 | 023Z5041 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7051 | 009L7051 | 009L7051 | 009L7051 | 009L7051 | 009L7051 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Non-Return Valve (Discharge line) | - | - | - | - | - | - |
| Receiver | 118U5297 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 |
| Sight glass | 014L0182 | 014L0172 | 014L0172 | 014L0173 | 014L0173 | 014L0173 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7051 | 009L7052 | 009L7052 | 009L7053 | 009L7053 | 009L7053 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | |
| Crankcase heater | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0459 | 120Z0459 | 120Z0459 |
| EMI Filter (Controller) | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3845 | 118U3846 | 118U3858 | 118U3847 | 118U3845 | 118U3846 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3853 | 118U3851 | 118U3851 | 118U3852 | 118U3853 | 118U3851 |
| Run capacitor | 123B9219 | 123B9215 | 123B9226 | 8173041 | - | - |
| Starting capacitor | 123B9316 | 123B9304 | 123B9304 | 120Z0400 | - | - |
| Starting relay | 123B9151 | 123B9154 | 123B9154 | 8173022 | - | - |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| Acoustic hood | - | - | - | - | - | - |
| **Adap-Kool Accessories** | | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | | |
| Top Panel | 118U5121 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 |
| Fan Panel | 118U5122 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 |
| Back Panel | 118U5123 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 |
| Front Panel | 118U5283 | 118U5285 | 118U5285 | 118U5129 | 118U5129 | 118U5129 |
| Access Panel | 118U5284 | 118U5286 | 118U5286 | 118U5130 | 118U5130 | 118U5130 |
| Left side Panel | 118U5163 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 |
| Fan Panel (LH) | - | - | - | - | - | - |
| Fan Panel (RH) | - | - | - | - | - | - |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit




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| Designation | LPKM067LL | LPKM084LL | LPKM098LL | LPOM120LL | LPOM168LL |
|---|---|---|---|---|---|
| Code Number | 114X3304 | 114X3305 | 114X3306 | 114X3405 | 114X3406 |
| Compressor Description | LLZ013T4B | LLZ015T4B | LLZ018T4B | LLZ024T4B | LLZ034T4B |
| Oil (reference) | 120Z0648 | 120Z0648 | 120Z0648 | 120Z0648 | 120Z0648 |
| Housing | H3 | H3 | H3 | H4 | H4 |
| **Spare Parts** | | | | | |
| Compressor single pack | 121L8455 | 121L8457 | 121L8459 | 121L8461 | 121L8463 |
| Condenser | 118U5219 | 118U5219 | 118U5219 | 118U5220 | 118U5220 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| E-box Cable gland | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Fan assembly | 118U5296 | 118U5296 | 118U5296 | 118U5296 | 118U5296 |
| Fan blade | - | - | - | - | - |
| Fan capacitor | - | - | - | - | - |
| Fan cowl/grill | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 |
| Fan motor | - | - | - | - | - |
| Filter drier | 023Z5044 | 023Z5044 | 023Z5044 | 023Z5046 | 023Z5046 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7052 | 009L7052 | 009L7052 | 009L7054 | 009L7054 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Non-Return Valve (Discharge line) | - | - | - | 020B1059 | 020B1059 |
| Receiver | 118U5299 | 118U5299 | 118U5299 | 118U5505 118U5514 | 118U5505 118U5514 |
| Sight glass | 014L0173 | 014L0173 | 014L0173 | 014L0175 | 014L0175 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7054 | 009L7054 | 009L7054 | 009L7056 | 009L7056 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | |
| Crankcase heater | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 |
| EMI Filter (Controller) | - | - | - | - | - |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3846 | 118U3847 | 118U3847 | 118U3848 | 118U3895 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3852 | 118U3852 | 118U3852 | 118U3852 | 118U3852 |
| Run capacitor | - | - | - | - | - |
| Starting capacitor | - | - | - | - | - |
| Starting relay | - | - | - | - | - |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| Acoustic hood | 120Z5052 | 120Z5052 | 120Z5052 | 120Z5053 | 120Z5055 |
| **Adap-Kool Accessories** | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | |
| Top Panel | 118U5131 | 118U5131 | 118U5131 | 118U5136 | 118U5136 |
| Fan Panel | 118U5332 | 118U5332 | 118U5332 | - | - |
| Back Panel | 118U5333 | 118U5333 | 118U5333 | 118U5139 | 118U5139 |
| Front Panel | 118U5328 | 118U5328 | 118U5328 | - | - |
| Access Panel | - | - | - | 118U5140 | 118U5140 |
| Left side Panel | 118U5165 | 118U5165 | 118U5165 | 118U5166 | 118U5166 |
| Fan Panel (LH) | - | - | - | 118U5137 | 118U5137 |
| Fan Panel (RH) | - | - | - | 118U5138 | 118U5138 |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit

| Designation | DPYM008MY | DPYM009MY | DPYM012MP | DPYM014MP | MPOM024AJ | MPOM026AJ | MPOM026AJ | MPGM033AJ | MPOM034AJ |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | 114X4119 | 114X4120 | 114X4121 | 114X4122 | 114X4200 | 114X4212 | 114X4213 | 114X4220 | 114X4226 |
| Compressor Description | DLY80RAb | DLY90RAb | DPT12RA | DPT14RA | CAJ9513Z | CAJ4517Z | TAJ4517Z | CAJ4511Y | CAJ4519Z |
| Oil (reference) | POE32 | POE32 | POE32 | POE32 | RL32HA/HT | RL32HA/HT | RL32HA/HT | RL32HA/HT | RL32HA/HT |
| Housing | H1 | H1 | H1 | H1 | H2 | H2 | H2 | H2 | H2 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | 123B6003 | 123B6004 | 123B6005 | 123B6006 | 118U3995 | 118U3993 | 118U3991 | 118U3996 | 118U3994 |
| Condenser | 118U5217 | 118U5217 | 118U5217 | 118U5217 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| Fan assembly | - | - | - | - | - | - | - | - | - |
| Fan blade | 118U3480 | 118U3480 | 118U3480 | 118U3480 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 |
| Fan capacitor | 118U3296 | 118U3296 | 118U3296 | 118U3296 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 |
| Fan cowl/grill | 118U3483 | 118U3483 | 118U3483 | 118U3483 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 |
| Fan motor | 118U3477 | 118U3477 | 118U3477 | 118U3477 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 |
| Filter drier | 023Z5039 | 023Z5039 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7050 | 009L7050 | 009L7051 | 009L7051 | 009L7022 | 009L7022 | 009L7022 | 009L7022 | 009L7022 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Receiver | 118U4020 | 118U4020 | 118U4020 | 118U4020 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 |
| Sight glass | 014L0181 | 014L0181 | 014L0182 | 014L0182 | 014L0172 | 014L0172 | 014L0172 | 014L0172 | 014L0172 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7051 | 009L7051 | 009L7051 | 009L7051 | 009L7021 | 009L7021 | 009L7021 | 009L7021 | 009L7021 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 | 118U0051 |
| EMI Filter (Controller) | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3845 | 118U3845 | 118U3845 | 118U3845 | 118U3846 | 118U3847 | 118U3845 | 118U3845 | 118U3847 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3853 | 118U3853 | 118U3853 | 118U3851 | 118U3852 | 118U3852 | 118U3853 | 118U3851 | 118U3852 |
| Run capacitor | 123B9222* | 123B9222* | 123B9215 | 123B9226 | | | - | | |
| Starting capacitor | 123B9315* | 123B9315* | 123B9315 | 123B9315 | 118U5198* | 118U5195* | - | 118U5194* | 118U5196* |
| Starting relay | 123B9133 | 123B9133 | 123B9151 | 123B9139 | | | - | | |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | - | - | - | - | - | - | - | - | - |
| Fusible Plug(1/4") | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Adap-Kool Accessories** | | | | | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | | | | | |
| Top Panel | 118U5121 | 118U5121 | 118U5121 | 118U5121 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 |
| Fan Panel | 118U5122 | 118U5122 | 118U5122 | 118U5122 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 |
| Back Panel | 118U5123 | 118U5123 | 118U5123 | 118U5123 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 |
| Front Panel | 118U5124 | 118U5124 | 118U5124 | 118U5124 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 |
| Access Panel | 118U5125 | 118U5125 | 118U5125 | 118U5125 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 |
| Left side Panel | 118U5163 | 118U5163 | 118U5163 | 118U5163 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 |
| Fan Panel (LH) | - | - | - | - | - | - | - | - | - |
| Fan Panel (RH) | - | - | - | - | - | - | - | - | - |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit




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| Designation | MPOM034AJ | MPOM018AJ | MPXM034ML | MPXM034ML | MPXM046ML | MPXM046ML | MPXM057ML | MPXM057ML | MPXM068ML |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | 114X4227 | 114X4230 | 114X4261 | 114X4264 | 114X4281 | 114X4284 | 114X4290 | 114X4293 | 114X4308 |
| Compressor Description | TAJ4519Z | CAJ9510Z | MLZ015T5 | MLZ015T4 | MLZ021T5 | MLZ021T4 | MLZ026T5 | MLZ026T4 | MLZ030T5 |
| Oil (reference) | RL32HA/HT | RL32HA/HT | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 |
| Housing | H2 | H2 | H2 | H2 | H2 | H2 | H2 | H2 | H3 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | 118U3989 | 118U3988 | 121L8631 | 121L8629 | 121L8635 | 121L8633 | 121L8639 | 121L8637 | 121L8643 |
| Condenser | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5219 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| Fan assembly | - | - | - | - | - | - | - | - | 118U3829 |
| Fan blade | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | - |
| Fan capacitor | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | - |
| Fan cowl/grill | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3485 |
| Fan motor | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | - |
| Filter drier | 023Z5040 | 023Z5040 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5045 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7022 | 009L7022 | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7053 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Receiver | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4012 | 118U4014 |
| Sight glass | 014L0172 | 014L0172 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0174 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7021 | 009L7021 | 009L7054 | 009L7054 | 009L7054 | 009L7054 | 009L7054 | 009L7054 | 009L7055 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | 118U0051 | 118U0051 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 |
| EMI Filter (Controller) | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3845 | 118U3846 | 118U3848 | 118U3845 | 118U3848 | 118U3846 | 118U3849 | 118U3846 | 118U3849 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3853 | 118U3851 | 118U3854 | 118U3851 | 118U3856 | 118U3852 | 118U3856 | 118U3852 | 118U3857 |
| Run capacitor | - | | 8173231 | - | 120Z0051 | - | 120Z0051 | - | 8173233 |
| Starting capacitor | - | 118U5197* | 120Z0399 | - | 120Z0399 | - | 120Z0399 | - | 120Z0040 |
| Starting relay | - | | 120Z0394 | - | 120Z0394 | - | 120Z0394 | - | 120Z0394 |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | - | - | 120Z5083 | 120Z5043 | 120Z5043 | 120Z5043 | 120Z5043 | 120Z5043 | 120Z5044 |
| Fusible Plug(1/4") | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Adap-Kool Accessories** | | | | | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | | | | | |
| Top Panel | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5131 |
| Fan Panel | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5132 |
| Back Panel | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5133 |
| Front Panel | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5134 |
| Access Panel | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5135 |
| Left side Panel | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5165 |
| Fan Panel (LH) | - | - | - | - | - | - | - | - | - |
| Fan Panel (RH) | - | - | - | - | - | - | - | - | - |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit

| Designation | MPXM068ML | MPXM080ML | MPXM080ML | MPXM108ML | MPXM125ML | MPXM162ML |
|---|---|---|---|---|---|---|
| Code Number | 114X4311 | 114X4321 | 114X4324 | 114X4344 | 114X4414 | 114X4434 |
| Compressor Description | MLZ030T4 | MLZ038T5 | MLZ038T4 | MLZ048T4 | MLZ058T4 | MLZ076T4 |
| Oil (reference) | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 |
| Housing | H3 | H3 | H3 | H3 | H4 | H4 |
| **Spare Parts** | | | | | | |
| Compressor single pack | 121L8641 | 121L8647 | 121L8645 | 121L8651 | 121L8653 | 121L8655 |
| Condenser | 118U5219 | 118U5219 | 118U5219 | 118U5219 | 118U5220 | 118U5220 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| Fan assembly | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 | 118U3829 |
| Fan blade | - | - | - | - | - | - |
| Fan capacitor | - | - | - | - | - | - |
| Fan cowl/grill | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 | 118U3485 |
| Fan motor | - | - | - | - | - | - |
| Filter drier | 023Z5045 | 023Z5045 | 023Z5045 | 023Z5045 | 023Z5046 | 023Z5046 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7053 | 009L7053 | 009L7053 | 009L7053 | 009L7054 | 009L7054 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Receiver | 118U4014 | 118U4014 | 118U4014 | 118U4014 | 118U4017 | 118U4017 |
| Sight glass | 014L0174 | 014L0174 | 014L0174 | 014L0174 | 014L0175 | 014L0175 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7055 | 009L7055 | 009L7055 | 009L7055 | 009L7056 | 009L7056 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | |
| Crankcase heater | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 |
| EMI Filter (Controller) | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3847 | 118U3850 | 118U3847 | 118U3848 | 118U3847 | 118U3848 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3852 | 118U3857 | 118U3852 | 118U3854 | 118U3855 | 118U3856 |
| Run capacitor | - | 8173234 | - | - | - | - |
| Starting capacitor | - | 8173001 | - | - | - | - |
| Starting relay | - | 120Z0395 | - | - | - | - |
| **Accessories (Not Premounted)** | | | | | | |
| Acoustic hood | 120Z5044 | 120Z5044 | 120Z5044 | 120Z5044 | 120Z5085 | 120Z5085 |
| Fusible Plug(1/4") | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 | 118U5170 |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Adap-Kool Accessories** | | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | | |
| Top Panel | 118U5131 | 118U5131 | 118U5131 | 118U5131 | 118U5136 | 118U5136 |
| Fan Panel | 118U5132 | 118U5132 | 118U5132 | 118U5132 | - | - |
| Back Panel | 118U5133 | 118U5133 | 118U5133 | 118U5133 | 118U5139 | 118U5139 |
| Front Panel | 118U5134 | 118U5134 | 118U5134 | 118U5134 | - | - |
| Access Panel | 118U5135 | 118U5135 | 118U5135 | 118U5135 | 118U5140 | 118U5140 |
| Left side Panel | 118U5165 | 118U5165 | 118U5165 | 118U5165 | 118U5166 | 118U5166 |
| Fan Panel (LH) | - | - | - | - | 118U5137 | 118U5137 |
| Fan Panel (RH) | - | - | - | - | 118U5138 | 118U5138 |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit




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| Designation | MPIM034ML | MPIM034ML | MPIM046ML | MPIM046ML | MPIM057ML | MPIM057ML | MPIM068ML | MPIM068ML | MPIM080ML |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | 114X4204 | 114X4205 | 114X4206 | 114X4207 | 114X4208 | 114X4209 | 114X4306 | 114X4307 | 114X4309 |
| Compressor Description | MLZ015T4 | MLZ015T5 | MLZ021T4 | MLZ021T5 | MLZ026T4 | MLZ026T5 | MLZ030T4 | MLZ030T5 | MLZ038T4 |
| Oil (reference) | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 |
| Housing | H2 | H2 | H2 | H2 | H2 | H2 | H3 | H3 | H3 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | 121L8421 | 121L8423 | 121L8429 | 121L8431 | 121L8433 | 121L8435 | 121L8437 | 121L8439 | 121L8441 |
| Condenser | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5219 | 118U5219 | 118U5219 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| E-box Cable gland | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Fan assembly | - | - | - | - | - | - | 118U5296 | 118U5296 | 118U5296 |
| Fan blade | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | - | - | - |
| Fan capacitor | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | - | - | - |
| Fan cowl/grill | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3485 | 118U3485 | 118U3485 |
| Fan motor | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | - | - | - |
| Filter drier | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5041 | 023Z5045 | 023Z5045 | 023Z5045 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7053 | 009L7053 | 009L7053 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Non-Return Valve (Discharge line) | - | - | - | - | - | - | - | - | - |
| Receiver | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5299 | 118U5299 | 118U5299 |
| Sight glass | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0173 | 014L0174 | 014L0174 | 014L0174 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7054 | 009L7054 | 009L7054 | 009L7054 | 009L7054 | 009L7054 | 009L7055 | 009L7055 | 009L7055 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 | 120Z5040 |
| EMI Filter (Controller) | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | - | - | - |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N2003 | 084N2003 | 084N2003 | 084N2003 | 084N2003 | 084N2003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3845 | 118U3848 | 118U3846 | 118U3848 | 118U3846 | 118U3895 | 118U3847 | 118U3895 | 118U3847 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3851 | 118U3854 | 118U3851 | 118U3856 | 118U3852 | 118U3856 | 118U3852 | 118U3587 | 118U3854 |
| Run capacitor | - | 8173231 | - | 120Z0051 | - | 120Z0051 | - | 8173233 | - |
| Starting capacitor | - | 120Z0399 | - | 120Z0399 | - | 120Z0399 | - | 120Z0400 | - |
| Starting relay | - | 120Z0394 | - | 120Z0394 | - | 120Z0394 | - | 120Z0394 | - |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | 120Z5043 | 120Z5043 | 120Z5043 | 120Z5043 | 120Z5043 | 120Z5043 | 120Z5084 | 120Z5084 | 120Z5084 |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Adap-Kool Accessories** | | | | | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | | | | | |
| Top Panel | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5131 | 118U5131 | 118U5131 |
| Fan Panel | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5332 | 118U5332 | 118U5332 |
| Back Panel | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5133 | 118U5133 | 118U5133 |
| Front Panel | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5134 | 118U5134 | 118U5134 |
| Access Panel | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5130 | 118U5329 | 118U5329 | 118U5329 |
| Left side Panel | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5328 | 118U5328 | 118U5328 |
| Fan Panel (LH) | - | - | - | - | - | - | - | - | - |
| Fan Panel (RH) | - | - | - | - | - | - | - | - | - |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit

| Designation | MPIM080ML | MPIM108ML | MPIM125ML | MPSM026CS | MPSM030CS | MPTM008DY | MPTM009DY | MPTM012DP | MPTM014DP |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | 114X4312 | 114X4314 | 114X4409 | 114X4243 | 114X4244 | 114X4107 | 114X4111 | 114X4113 | 114X4114 |
| Compressor Description | MLZ038T5 | MLZ048T4 | MLZ058T4B | CS26TB | CS30TB | DLY80RAb | DLY90RAb | DPT12RA | DPT14RA |
| Oil (reference) | 215PZ-POE46 | 215PZ-POE46 | 215PZ-POE46 | POE 32 | POE 32 | POE32 | POE32 | POE32 | POE32 |
| Housing | H3 | H3 | H4 | H2 | H2 | H1 | H1 | H1 | H1 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | 121L8443 | 121L8447 | 121L8449 | 123B6001 | 123B6002 | 123B6003 | 123B6004 | 123B6005 | 123B6006 |
| Condenser | 118U5219 | 118U5219 | 118U5220 | 118U5218 | 118U5218 | 118U5217 | 118U5217 | 118U5217 | 118U5217 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| E-box Cable gland | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Fan assembly | 118U5296 | 118U5296 | 118U5296 | - | - | - | - | - | - |
| Fan blade | - | - | - | 118U3481 | 118U3481 | 118U3480 | 118U3480 | 118U3480 | 118U3480 |
| Fan capacitor | - | - | - | 118U3297 | 118U3297 | 118U3296 | 118U3296 | 118U3296 | 118U3296 |
| Fan cowl/grill | 118U3485 | 118U3485 | 118U3485 | 118U3484 | 118U3484 | 118U3483 | 118U3483 | 118U3483 | 118U3483 |
| Fan motor | - | - | - | 118U3823 | 118U3823 | 118U3477 | 118U3477 | 118U3477 | 118U3477 |
| Filter drier | 023Z5045 | 023Z5045 | 023Z5046 | 023Z5040 | 023Z5040 | 023Z5039 | 023Z5039 | 023Z5040 | 023Z5040 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7053 | 009L7053 | 009L7054 | 009L7051 | 009L7051 | 009L7050 | 009L7050 | 009L7051 | 009L7051 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Non-Return Valve (Discharge line) | - | - | 120Z5046 | - | - | - | - | - | - |
| Receiver | 118U5299 | 118U5299 | 118U5505<br>118U5514 | 118U5298 | 118U5298 | 118U4069 | 118U4069 | 118U4069 | 118U4069 |
| Sight glass | 014L0174 | 014L0174 | 014L0175 | 014L0182 | 014L0182 | 014L0181 | 014L0181 | 014L0182 | 014L0182 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7055 | 009L7055 | 009L7056 | 009L7052 | 009L7052 | 009L7051 | 009L7051 | 009L7051 | 009L7051 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | 120Z5040 | 120Z5040 | 120Z5040 | - | 118U0051 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 |
| EMI Filter (Controller) | - | - | - | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3868 | 118U3848 | 118U3847 | 118U3846 | 118U3846 | 118U3845 | 118U3845 | 118U3845 | 118U3845 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3587 | 118U3854 | 118U3855 | 118U3851 | 118U3851 | 118U3853 | 118U3853 | 118U3853 | 118U3851 |
| Run capacitor | 8173234 | - | - | | 123B9302 | 123B9222 | 123B9222 | 123B9215 | 123B9226 |
| Starting capacitor | 8173001 | - | - | 123B9304 | 123B9146 | 123B9315 | 123B9315 | 123B9315 | 123B9315 |
| Starting relay | 120Z0395 | - | - | 123B9146 | - | 123B9133 | 123B9133 | 123B9151 | 123B9151 |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | 120Z5084 | 120Z5084 | 120Z5085 | - | - | - | - | - | - |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Adap-Kool Accessories** | | | | | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | | | | | |
| Top Panel | 118U5131 | 118U5131 | 118U5131 | 118U5126 | 118U5126 | 118U5121 | 118U5121 | 118U5121 | 118U5121 |
| Fan Panel | 118U5332 | 118U5332 | 118U5332 | 118U5127 | 118U5127 | 118U5122 | 118U5122 | 118U5122 | 118U5122 |
| Back Panel | 118U5133 | 118U5133 | 118U5133 | 118U5128 | 118U5128 | 118U5123 | 118U5123 | 118U5123 | 118U5123 |
| Front Panel | 118U5134 | 118U5134 | 118U5134 | 118U5129 | 118U5129 | 118U5124 | 118U5124 | 118U5124 | 118U5124 |
| Access Panel | 118U5329 | 118U5329 | 118U5329 | 118U5286 | 118U5286 | 118U5284 | 118U5284 | 118U5284 | 118U5284 |
| Left side Panel | 118U5328 | 118U5328 | 118U5328 | 118U5164 | 118U5164 | 118U5163 | 118U5163 | 118U5163 | 118U5163 |
| Fan Panel (LH) | - | - | - | - | - | - | - | - | - |
| Fan Panel (RH) | - | - | - | - | - | - | - | - | - |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit




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| Designation | MPTM018DX | MPTM021DX | MPTM022DS | MPTM026DS | MPTM026DS | MPTM034DS | MPTM034DS | MPTM038DS | MPXM162ML |
|---|---|---|---|---|---|---|---|---|---|
| Code Number | 114X4115 | 114X4217 | 114X4237 | 114X4238 | 114X4239 | 114X4241 | 114X4242 | 114X4218 | 114X4434 |
| Compressor Description | DX18Tba | Dx21Tba | DS22TB | DS26TB | DS26T3 | DS34TB | DS34T3 | DST38NA | MLZ076T4B |
| Oil (reference) | POE32 | POE 46 | POE 46 | POE 46 | POE 46 | POE 46 | POE 46 | POE 46 | 215PZ-POE46 |
| Housing | H1 | H2 | H2 | H2 | H2 | H2 | H2 | H2 | H4 |
| **Spare Parts** | | | | | | | | | |
| Compressor single pack | 123B6007 | 123B6019 | 123B6008 | 123B6009 | 123B6011 | 123B6010 | 123B6012 | 123B6017 | 121L8453 |
| Condenser | 118U5217 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5218 | 118U5220 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| E-box Cable gland | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 | 118U5258 |
| Fan assembly | - | - | - | - | - | - | - | - | 118U5296 |
| Fan blade | 118U3480 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | 118U3481 | - |
| Fan capacitor | 118U3296 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | 118U3297 | - |
| Fan cowl/grill | 118U3483 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3484 | 118U3485 |
| Fan motor | 118U3477 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | 118U3823 | - |
| Filter drier | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5040 | 023Z5046 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Liquid valve | 009L7051 | 009L7052 | 009L7051 | 009L7051 | 009L7051 | 009L7051 | 009L7051 | 009L7052 | 009L7054 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Non-Return Valve (Discharge line) | - | - | - | - | - | - | - | - | 120Z5046 |
| Receiver | 118U4069 | 118U5251 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5298 | 118U5251 | 118U5505<br>118U5514 |
| Sight glass | 014L0182 | 014L0182 | 014L0182 | 014L0182 | 014L0182 | 014L0182 | 014L0182 | 014L0182 | 014L0175 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction valve | 009L7051 | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7052 | 009L7056 |
| Brass plug (3/8" NPT) | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 | 118U4037 |
| **Electrical Spare Parts** | | | | | | | | | |
| Crankcase heater | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z0057 | 120Z5040 |
| EMI Filter (Controller) | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | 118U3974 | - |
| Optyma™ Plus Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Contactor kit | 118U3846 | 118U3846 | 118U3846 | 118U3847 | 118U3845 | 118U3848 | 118U3845 | 118U3845 | 118U3848 |
| Door handle + Shaft | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch kit | 118U3851 | 118U3851 | 118U3851 | 118U3852 | 118U3853 | 118U3854 | 118U3851 | 118U3851 | 118U3856 |
| Run capacitor | 123B9219 | 123B9215 | 123B9215 | 123B9215 | 123B9215 | 123B9226 | - | 123B9226 | - |
| Starting capacitor | 123B9321 | 123B9302 | 123B9302 | 123B9304 | 123B9304 | 123B9304 | - | 123B9304 | - |
| Starting relay | 123B9159 | 123B9154 | 123B9154 | 123B9154 | 123B9154 | 123B9154 | - | 123B9154 | - |
| **Accessories (Not Premounted)** | | | | | | | | | |
| Acoustic hood | - | - | - | - | - | - | - | - | 120Z5085 |
| Pressure Relief Valve | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 | 118U5304 |
| **Adap-Kool Accessories** | | | | | | | | | |
| External Diplay & settings | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 | 084B8575 |
| Cable for EKA Displays 6 m | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 | 084B7299 |
| Mounting kit for EKA Display | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 | 084B8584 |
| MODBUS Communication Module | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 | 084B8571 |
| Lon-Bus Communication Module | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 | 084B8579 |
| Programming Key | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 | 084B8582 |
| **Sheet Metal** | | | | | | | | | |
| Top Panel | 118U5121 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5126 | 118U5131 |
| Fan Panel | 118U5122 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5127 | 118U5332 |
| Back Panel | 118U5123 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5128 | 118U5133 |
| Front Panel | 118U5124 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5129 | 118U5134 |
| Access Panel | 118U5284 | 118U5286 | 118U5286 | 118U5286 | 118U5286 | 118U5286 | 118U5286 | 118U5286 | 118U5329 |
| Left side Panel | 118U5163 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5164 | 118U5328 |
| Fan Panel (LH) | - | - | - | - | - | - | - | - | - |
| Fan Panel (RH) | - | - | - | - | - | - | - | - | - |

MCA - Minimum Circuit Ampacity
MCC - Max Continuous Current
LRA - Locked Rotor Amps
* - Spare part, Starting Kit

| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Access Panel H1 | 118U5125 | SPARE PART, SHEET METAL ACCESS H1 | |
| Access Panel H1 | 118U5284 | SPARE PART, SERVICE DOOR H1 (A2L) | |
| Access Panel H2 | 118U5130 | SPARE PART, SHEET METAL ACCESS H2 | |
| Access Panel H2 | 118U5286 | SPARE PART, SERVICE DOOR H2 (A2L) | |
| Access Panel H3 | 118U5135 | SPARE PART, SHEET METAL ACCESS H3 | |
| Access Panel H4 | 118U5140 | SPARE PART, SHEET METAL ACCESS H4 | |
| Acoustic Hood | 120Z0575 | ACOUSTIC HOOD COMP 1CYL | |
| Acoustic Hood | 120Z5043 | ACCOUSTIC HOOD - SMALL FRAME | |
| Acoustic Hood | 120Z5044 | Acoustic hood for Scroll MLZ compressor | |
| Acoustic Hood | 120Z5045 | ACCOUSTIC HOOD, LARGE FRAME | |
| Acoustic Hood | 120Z5052 | Sound Cover, LLZ013-018 | |
| Acoustic Hood | 120Z5084 | ACCOUSTIC HOOD | |
| Ambient/Suction temperature sensor | 084N0003 | Sensor, AKS11 | |
| Back Panel H1 | 118U5123 | SPARE PART, SHEET METAL BACK H1 | |
| Back Panel H2 | 118U5128 | SPARE PART, SHEET METAL BACK H2 | |
| Back Panel H3 | 118U5133 | SPARE PART, SHEET METAL BACK H3 | |
| Back Panel H4 | 118U5139 | SPARE PART, SHEET METAL BACK H4 | |
| Brass plug (3/8" NPT) | 118U4037 | SPARE PART, 3/8" BRASS PLUG | |
| Cable for EKA Displays 6 m | 084B7299 | EKA Accessory | |
| Capacitor | 8173001 | CAPACITOR 100µF 330V+R | |
| Capacitor | 8173041 | CAPACITOR 30µF 450V | |
| Compressor Single Pack | 118U5335 | SPARE PART COM FH2511 1P FH2 PLUS | |
| Compressor Single Pack | 118U5336 | SPARE PART COM FH2511 3P FH2 PLUS | |
| Compressor Single Pack | 118U3988 | CAJ9510Z - AJ2 range | |
| Compressor Single Pack | 118U3989 | TAJ4519Z - AJ2 range | |
| Compressor Single Pack | 118U3991 | TAJ4517Z - AJ2 range | |
| Compressor Single Pack | 118U3992 | CAJ2446Z - AJ2 range | |
| Compressor Single Pack | 118U3993 | CAJ4517Z - AJ2 range | |
| Compressor Single Pack | 118U3994 | CAJ4519Z - AJ2 range | |
| Compressor Single Pack | 118U3995 | CAJ9513Z - AJ2 range | |
| Compressor Single Pack | 118U3996 | CAJ4511Y - AJ2 range | |
| Compressor Single Pack | 120F0226 | NTZ048-4LR1B | |
| Compressor Single Pack | 120F0228 | NTZ048-5LR1B | |
| Compressor Single Pack | 120F0230 | NTZ068-4LR1B | |
| Compressor Single Pack | 120F0232 | NTZ068-5LR1B | |
| Compressor Single Pack | 120F0234 | NTZ096A4LR1B | |
| Compressor Single Pack | 120F0236 | NTZ136A4LR1B | |
| Compressor Single Pack | 121L8629 | MLZ015T4LP9A | |
| Compressor Single Pack | 121L8631 | MLZ015T5LP9A | |
| Compressor Single Pack | 121L8633 | MLZ021T4LP9A | |
| Compressor Single Pack | 121L8635 | MLZ021T5LP9A | |
| Compressor Single Pack | 121L8637 | MLZ026T4LP9A | |
| Compressor Single Pack | 121L8639 | MLZ026T5LP9A | |
| Compressor Single Pack | 121L8641 | MLZ030T4LC9A | |
| Compressor Single Pack | 121L8643 | MLZ030T5LC9A | |
| Compressor Single Pack | 121L8645 | MLZ038T4LC9A | |
| Compressor Single Pack | 121L8647 | MLZ038T5LC9A | |
| Compressor Single Pack | 121L8651 | MLZ048T4LC9A | |
| Compressor Single Pack | 121L8653 | MLZ058T4LC9A | |
| Compressor Single Pack | 121L8655 | MLZ076T4LC9A | |
| Compressor Single Pack | 121L9541 | LLZ024T4LQ9A | |
| Compressor Single Pack | 121L9543 | LLZ034T4LQ9A | |
| Compressor Single Pack | 123B2127 | MPT16LA | |
| Compressor Single Pack | 123B2510 | MLY80RAb | |
| Compressor Single Pack | 123B2514 | MLY90RAb | |
| Compressor Single Pack | 123B2518 | MPT12RA | |
| Compressor Single Pack | 123B2704 | MPT14RA | |
| Compressor Single Pack | 195B0323 | SC12MLX | CU phased out but spare part still available |
| Compressor Single Pack | 195B0332 | SC18CLX.2 | CU phased out but spare part still available |
| Compressor Single Pack | 195B0345 | SC10MLX | CU phased out but spare part still available |
| Compressor Single Pack | 195B0391 | SC15MLX | CU phased out but spare part still available |
| Compressor Single Pack | 195B0427 | GS26CLX | CU phased out but spare part still available |
| Compressor Single Pack | 195B0435 | GS34MFX | CU phased out but spare part still available |




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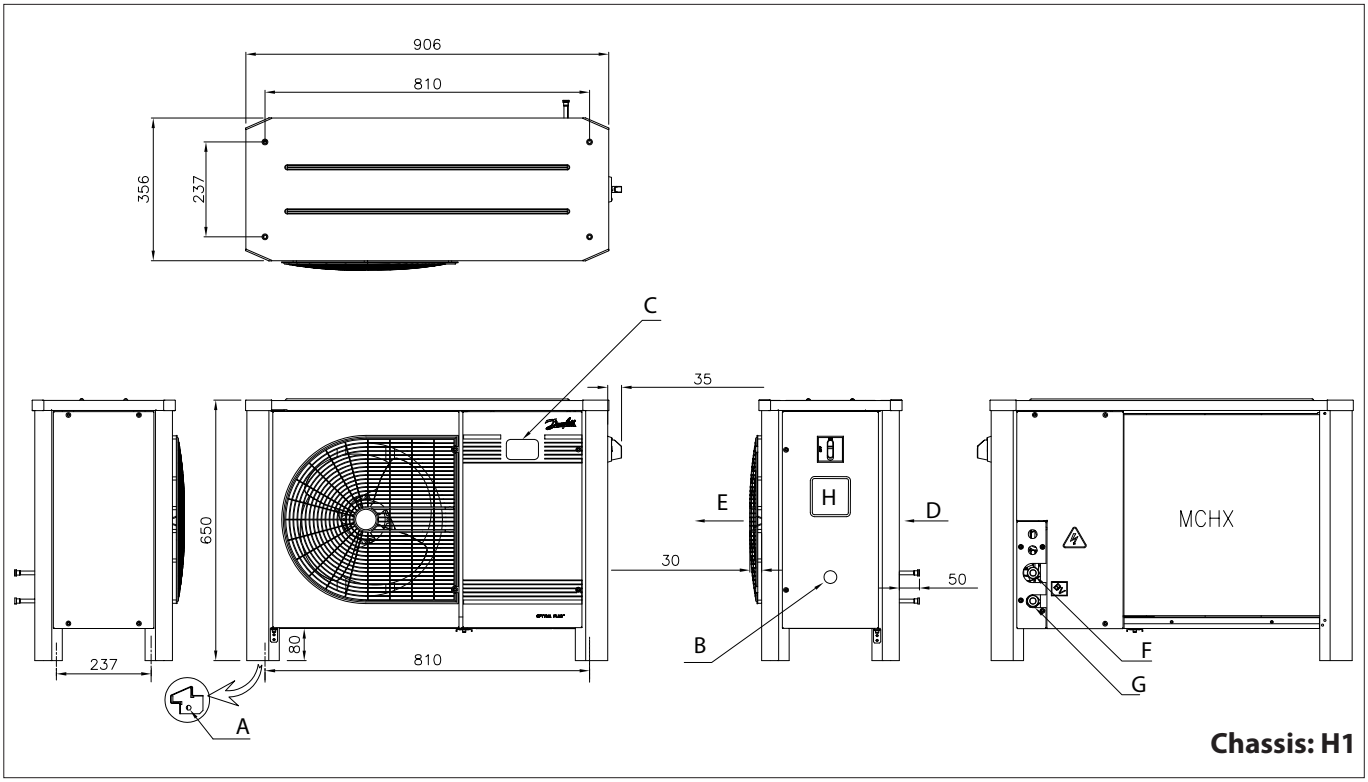
| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Compressor Single Pack | 195B0438 | GS34MLX | CU phased out but spare part still available |
| Compressor Single Pack | 195B0443 | NF7MLX | CU phased out but spare part still available |
| Compressor Single Pack | 195B0624 | SC18MLX | CU phased out but spare part still available |
| Compressor Single Pack | 123B6001 | CS26TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6002 | CS30TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6003 | DLY80RAb; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6004 | DLY90RAb; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6005 | DPT12RA; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6006 | DPT14RA; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6007 | DX18TBa; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6008 | DS22TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6009 | DS26TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6010 | DS34TB; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6011 | DS26T3; 400/440V 50/60Hz ~3; I Pack | |
| Compressor Single Pack | 123B6012 | DS34T3; 400/440V 50/60Hz ~3; I Pack | |
| Compressor Single Pack | 123B6013 | DPT14LA; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6014 | DPT16LA; 220-240V 50Hz ~1; I Pack | |
| Compressor Single Pack | 123B6015 | DST26NA; 220-240V 50Hz; I Pack | |
| Compressor Single Pack | 123B6016 | DST34LA; 220-240V 50Hz ~1; I Pac | |
| Compressor Single Pack | 121L8421 | MLZ015T4; 220-240V 50Hz | |
| Compressor Single Pack | 121L8423 | MLZ015T5; 220-240V 50Hz | |
| Compressor Single Pack | 121L8429 | MLZ021T4; 220-240V 50Hz | |
| Compressor Single Pack | 121L8431 | MLZ021T5; 220-240V 50Hz | |
| Compressor Single Pack | 121L8433 | MLZ026T4; 220-240V 50Hz | |
| Compressor Single Pack | 121L8435 | MLZ026T5; 220-240V 50Hz | |
| Compressor Single Pack | 121L8437 | MLZ030T4; 220-240V 50Hz | |
| Compressor Single Pack | 121L8439 | MLZ030T5; 220-240V 50Hz | |
| Compressor Single Pack | 121L8441 | MLZ038T4; 220-240V 50Hz | |
| Compressor Single Pack | 121L8443 | MLZ038T5; 220-240V 50Hz | |
| Compressor Single Pack | 121L8447 | MLZ048T4; 220-240V 50Hz | |
| Condenser | 118U3492 | Spare part, A7 MCHX | Phased out & replaced by 118U5217 from SN: -096147CG0419 |
| Condenser | 118U3493 | Spare part, D7 MCHX | Phased out & replaced by 118U5218 from SN: -096147CG0419 |
| Condenser | 118U3494 | Spare part, G7 MCHX | Phased out & replaced by 118U5219 from SN: -096147CG0419 |
| Condenser | 118U3717 | Spare part, J7 MCHX | Phased out & replaced by 118U5220 from SN: -096147CG0420 |
| Condenser | 118U5218 | Spare part, D7 MCHX | |
| Condenser | 118U5219 | Spare part, G7 MCHX | |
| Contactor kit | 118U3845 | A 9-30-01-80, DILM07-01, DILM09-01 | |
| Contactor kit | 118U3846 | A12-30-01-80, DILM12-01 | |
| Contactor kit | 118U3847 | A 16-30-01-80, DILM15-01 | |
| Contactor kit | 118U3848 | A 26-30-01-80, DILM17-01 | |
| Contactor kit | 118U3849 | A 30-30-01-80, DILM25-01 | |
| Contactor kit | 118U3850 | A 50-30-00-80, DILM32-01 | |
| Crankcase heater | 120Z0057 | Belt type, 50 W, 230 V, CE mark, UL | |
| Crankcase heater | 120Z0459 | PTC heater 27 W, CE mark, UL | |
| Crankcase heater | 120Z5040 | Belt type, 70 W, 240 V, CE mark, UL | |
| Crankcase heater | 118U0051 | CRANKCASE HEATER 55W | |
| Discharge pressure sensor | 075G1036 | Sensor DST P110 (0 to 32 bar SG) | |
| Discharge pressure sensor | 118U4021 | AKS 32R 0...32 bar | |
| Discharge temperature sensor | 084N2007 | AKS 21 A -70 TIL 160 | |
| Door handle | 118U3858 | Door handle, ABB-OHB2AJM,MSMN,OXS5X131 | |
| E-box Cable gland | 118U5258 | SPARE PART, CABLE GLAND (A2L) | |
| Electric expansion valve | 034G5015 | ETS 6-14 Electric expansion valve | |
| Electric expansion valve coil | 034G5145 | ETS 6 coil for Ele expansion valve | |
| Electric expansion valve coil | 034G5185 | ETS 6 coil for Ele expansion valve | |
| EMI Filter (Controller) | 118U3974 | CONTROLLER EMC/RFI FILTER OPTYMA PLUS | |
| External Diplay & settings | 084B8575 | EKA 164B, Display, Remote setting | |
| Fan assembly | 118U3829 | FAN ASSEMBLIES, EBM, ERP2015 | |
| Fan blade | 118U3480 | FAN BLADE 14" | |
| Fan blade | 118U3481 | FAN BLADE 18" | |
| Fan capacitor | 118U3296 | CAPACITOR 1,8 µF | |
| Fan capacitor | 118U3297 | CAPACITOR 3,5 µF | |
| Fan cowl/grill | 118U3483 | FAN GRILL HOUSING Ø356 mm | |

| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Fan cowl/grill | 118U3484 | FAN GRILL HOUSING Ø457 mm | |
| Fan cowl/grill | 118U3485 | FAN GRILL HOUSING Ø609 mm | |
| Fan LH panel H4 | 118U5137 | SPARE PART, SHEET METAL FAN LH H4 | |
| Fan motor (Capacitor not included) | 118U3477 | FAN MOTOR 25W | |
| Fan motor (Capacitor not included) | 118U3823 | FAN MOTOR 68 W | |
| Fan motor (Capacitor not included) | 118U3478 | FAN MOTOR 75W | |
| Fan panel H1 | 118U5122 | SPARE PART, SHEET METAL FAN H1 | |
| Fan panel H2 | 118U5127 | SPARE PART, SHEET METAL FAN H2 | |
| Fan panel H3 | 118U5132 | SPARE PART, SHEET METAL FAN H3 | |
| Fan RH panel H4 | 118U5138 | SPARE PART, SHEET METAL FAN RH H4 | |
| Filter drier | 023Z5039 | Filter drier DML 082 | |
| Filter drier | 023Z5040 | Filter drier DML083 | |
| Filter drier | 023Z5041 | Filter drier DML084 | |
| Filter drier | 023Z5044 | Filter drier DML164 | |
| Filter drier | 023Z5045 | Filter drier DML165 | |
| Filter drier | 023Z5046 | Filter drier DML166 | |
| Front Panel H1 | 118U5124 | SPARE PART, SHEET METAL FRONT H1 | |
| Front Panel H1 | 118U5283 | SPARE PART, FRONT DOOR H1 (A2L) | |
| Front Panel H2 | 118U5129 | SPARE PART, SHEET METAL FRONT H2 | |
| Front Panel H2 | 118U5285 | SPARE PART, FRONT DOOR H2 (A2L) | |
| Front Panel H3 | 118U5134 | SPARE PART, SHEET METAL FRONT H3 | |
| Fusible plug (1/4") | 118U5170 | SPARE PART, FUSIBLE PLUG | |
| High-pressure switch | 118U3718 | ACB-2UB463W | |
| Left Side Panel H1 | 118U5163 | SPARE PART, SHEET METAL LEFT SIDE H1 | |
| Left Side Panel H2 | 118U5164 | SPARE PART, SHEET METAL LEFT SIDE H2 | |
| Left Side Panel H3 | 118U5165 | SPARE PART, SHEET METAL LEFT SIDE H3 | |
| Left Side Panel H4 | 118U5166 | SPARE PART, SHEET METAL LEFT SIDE H4 | |
| Liquid injection controller | 118U4010 | Spare Part, Module B Plus | |
| Lon-Bus COM Module | 084B8579 | EKA175, LON-module | |
| Low-pressure switch | 118U3720 | ACB-2UA418W | |
| Main switch kit | 118U3855 | MPCB,MS132-25+HK1-12 | |
| Main switch kit | 118U3856 | MPCB,MS132-32+HK1-12 | |
| Main switch kit | 118U3857 | MPCB,MS450-40+HKS4-21 | |
| Main switch kit | 118U5237 | MPCB,MS116-12 | |
| MODBUS COM Module | 084B8571 | EKA 178B, Modbus Module | |
| Module B+ | 118U4010 | SPARE PART, MODULE B PLUS LLZ LI | |
| Mounting kit for EKA Display | 084B8584 | Mounting kit, EKA display | |
| MPCB | 118U3851 | MPCB,MS116-10+HK1-12 | |
| MPCB | 118U3852 | MPCB,MS116-16+HK1-12 | |
| MPCB | 118U3853 | MPCB,MS116-6.3+HK1-12 | |
| MPCB | 118U3854 | MPCB,MS132-20+HK1-12 | |
| Oil | - | POE32 for Light Commercial (MLY / MPT) | |
| Oil | - | RL32HA/HT for light Commercial (CAJ/FH/TAJ/TFH) | |
| Oil | 120Z0638 | 1 litre can of 175PZ - POE (NTZ Platform) | CU with a SN above 051220CG3016 |
| Oil | 120Z0639 | 2,5 litre can of 175PZ - POE (NTZ Platform) | CU with a SN above 051220CG3016 |
| Oil | 120Z0648 | 1 litre can of 215PZ - POE46 (MLZ & LLZ Platform) | CU with a SN above 051220CG3016 |
| Optyma Plus Controller | 118U3465 | OPTYMA PLUS CONTROLLER-084B8080 | |
| Programming Key | 084B8582 | AKA183A | |
| Receiver | 118U4020 | LIQUID RECEIVER 1,3 L | |
| Receiver | 118U4012 | LIQUID RECEIVER 3,4 L | |
| Receiver | 118U4014 | LIQUID RECEIVER 6,2 L | |
| Receiver | 118U3716 | LIQUID RECEIVER 10 L | |
| Receiver | 118U4069 | SPARE PART, RCVR 1.3L, 1/4x3/8 | |
| Receiver | 118U5298 | SPARE PART, RCVR 3.4L, 1/2x1/2 | |
| Receiver | 118U5298 | SPARE PART, RCVR 3.4L, 1/2x1/2 | |
| Receiver | 118U5299 | SPARE PART, RCVR 6.2L | |
| Relay | 117-7027 | SC-RELAY | |
| Relay | 123B9133 | RELAY + CON. BOARD 1149-8 BDG 149S+ NTC | |
| Relay | 123B9139 | RELAY + CON. BOARD 1166-8 BDG 166S+ NTC | |
| Relay | 123B9151 | RELAY + CON. BOARD 1158-8 BDG 158S+ NTC | |
| Run C capacitor | 123B9219 | RUN CAPACITOR 16µF/420V, REF. 321 | |
| Run C capacitor | 123B9222 | RUN CAPACITOR 10µF/420V, REF. 326 | |
| Run C capacitor | 123B9226 | RUN CAPACITOR 25µF/420V, REF. 310 MET. | |
| Run capacitor | 7701035 | PSC starting kit, 30 µF, 15 µF | |
| Run capacitor | 8173231 | Run capacitor 440V, 40 µF | |

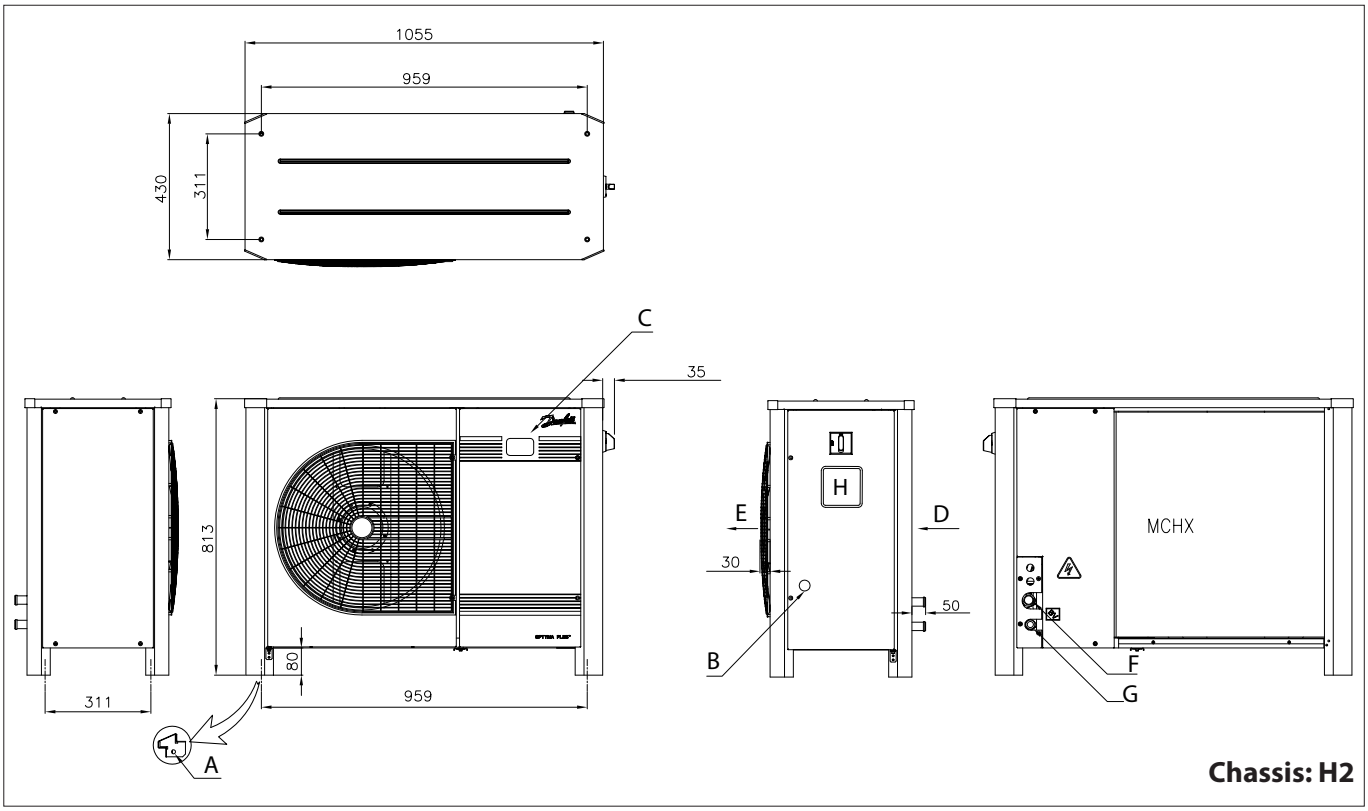



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| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Run capacitor | 8173233 | Run capacitor 440V, 50 µF | |
| Run capacitor | 8173234 | Run capacitor 440V, 55 µF | |
| Run capacitor | 120Z0051 | Run capacitor 70 µF | |
| Run capacitor | 123B9215 | Run capacitor 420V, 20 µF | |
| Run capacitor | 123B9219 | RUN CAPACITOR 16µF/420V, REF. 321 | |
| Service valve | 009G7050 | GBC 6s Ball Valve M/25 | |
| Service valve | 009G7051 | GBC 10s Ball Valve M/25 | |
| Service valve | 009G7052 | GBC 12s Ball Valve M/25 | |
| Service valve | 009G7053 | GBC 16s Ball Valve M/25 | |
| Service valve | 009G7054 | GBC 18s Ball Valve M/25 | |
| Service valve | 009G7055 | GBC 22s Ball Valve M/25 | |
| Service valve | 009G7056 | GBC 28s Ball Valve M/5 | |
| Sight glass | 014L0172 | Sight Glass, SGP 10 N | |
| Sight glass | 014L0173 | Sight Glass, SGP 12 N | |
| Sight glass | 014L0174 | Sight Glass, SGP 16 N | |
| Sight glass | 014L0175 | Sight Glass, SGP 19 N | |
| Sight glass | 014L0181 | Sight Glass, SGP 6s N | |
| Sight glass | 014L0182 | Sight Glass, SGP 10s N | |
| Start capacitor | 123B9302 | Start capacitor 72-88 µF, 330 V | |
| Start capacitor | 123B9316 | STARTING CAPACITOR+CC 72-88µF/330V R216 | |
| Start capacitor | 123B9315 | STARTING CAPACITOR+CC 64-77µF/330V R205 | |
| Start capacitor | 117U5373 | START CAPACITOR 80 mfd | |
| Starting capacitor | 123B9215 | CAPACITOR 20µF/420V, REF. 309 MET | |
| Starting capacitor | 117U5012 | Start capacitor 125 µF, 220V - SC | |
| Starting capacitor | 117U5017 | Start capacitor 80 µF, 220V - SC | |
| Starting capacitor | 117U5018 | Start capacitor 125 µF, 220V - NF,NL | |
| Starting capacitor | 120Z0040 | Start capacitor 161-193 µF | |
| Starting capacitor | 120Z0399 | Start capacitor 145-175 µF | |
| Starting capacitor | 123B9321 | Start capacitor 88-108 µF, 330V+Cover+Cable | |
| Starting capacitor | 123B9302 | Start capacitor 72-88 µF, 330 V | |
| Starting capacitor | 123B9304 | Start capacitor 88-108 µF, 330V | |
| Starting capacitor | 120Z0399 | Start capacitor 145-175 µF, 250V | |
| Starting KIT | 118U5191 | CAJ2446Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5192 | CAJ2464Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5193 | CAJ4492Y _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5194 | CAJ4511Y _ F1KIT Capacitor and relay | |
| Starting KIT | 118U5195 | CAJ4517Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5196 | CAJ4519Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5197 | CAJ9510Z _ F1 KIT Capacitor and relay | |
| Starting KIT | 118U5198 | CAJ9513Z _ F1KIT Capacitor and relay | |
| Starting KIT | 118U5199 | FH2511Z _ F1KIT Capacitor and relay | |
| Starting relay | 123B9146 | Tension Relay 9004 | |
| Starting relay | 8173022 | Starting relay type RVA-6AMKL/3ARR3J4A4 | |
| Starting relay | 117U4139 | RELAY ASSY. HST - "MRP56EN-6; 117U2121 | |
| Starting relay | 120Z0393 | Starting relay type RVA9CKL/3ARR3J4A4 | |
| Starting relay | 120Z0394 | Starting relay type RVA3EKL/3ARR3J24P4 | |
| Starting relay | 120Z0395 | Starting relay type RVA4GKL/3ARR3J25S4 | |
| Starting relay | 123B9159 | Relay + Con. Board R.1180 | |
| Starting relay | 123B9146 | Tension Relay 9004 | |
| Starting relay | 123B9154 | Tension Relay 9002 | |
| Suction pressure sensor | 075G1013 | Sensor DST P110 (-1 to 12 bar SG) | |
| Suction pressure sensor | 118U4025 | AKS 32R -1...12 bar | |
| Top Panel H1 | 118U5121 | SPARE PART, SHEET METAL TOP H1 | |
| Top Panel H2 | 118U5126 | SPARE PART, SHEET METAL TOP H2 | |
| Top Panel H3 | 118U5131 | SPARE PART, SHEET METAL TOP H3 | |
| Top Panel H4 | 118U5136 | SPARE PART, SHEET METAL TOP H4 | |



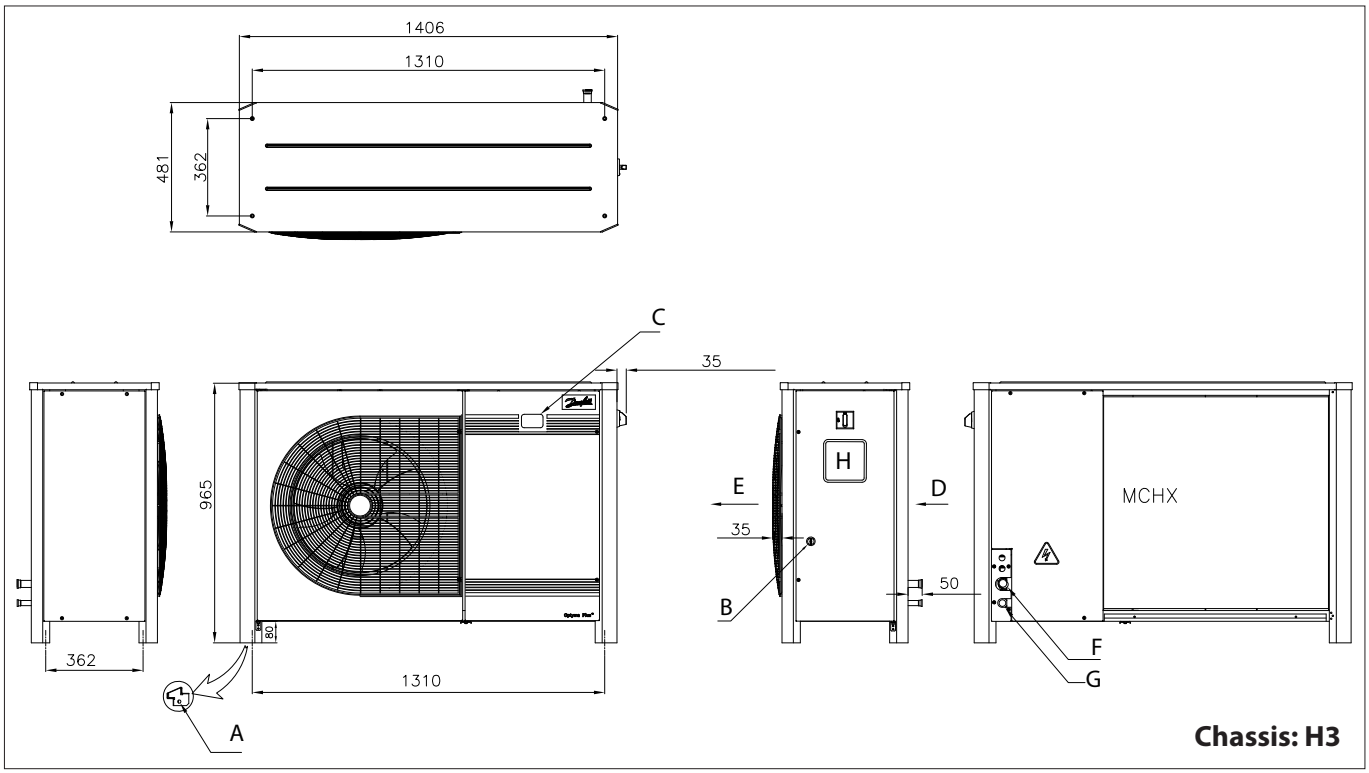

**Chassis: H1**



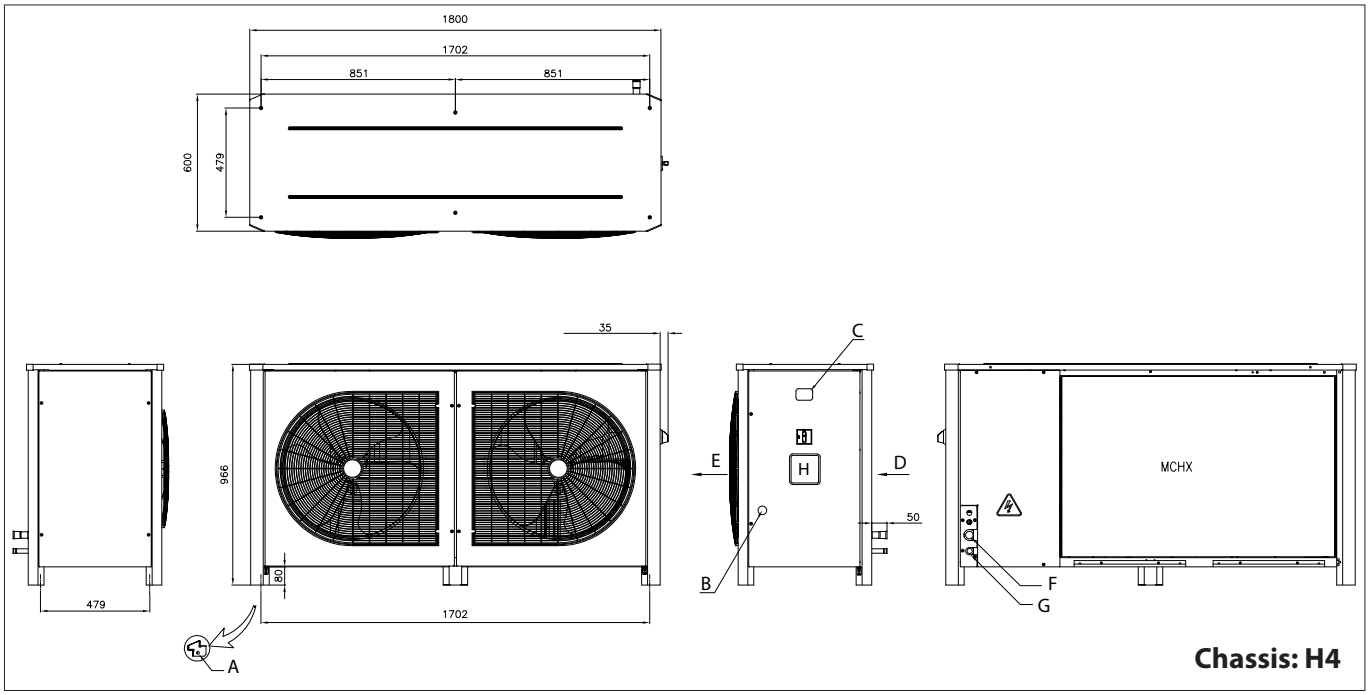

**Chassis: H2**



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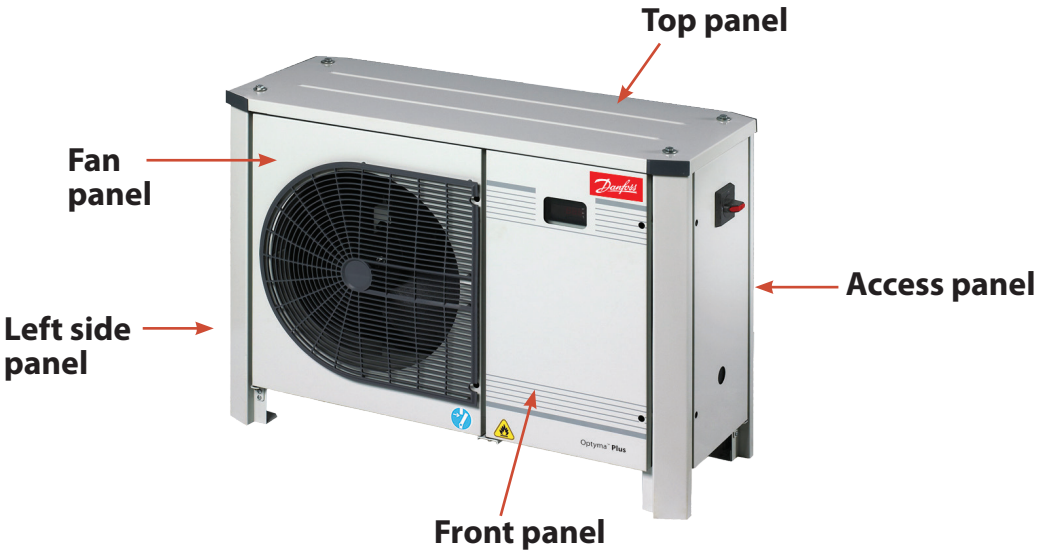



**Chassis: H3**




**Chassis: H4**

A Ø12 Hole for Mounting
B Sight Glass
C Controller Display
D Air in
E Air out
F Suction Port
G Liquid Port
⚠ Electrical Cables
Note: all dimension are in mm







*For electrical wiring diagrams refer to installation guide AN186586434146O3-xxxxxx*


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Notes:

# Optyma™ Plus INVERTER
## **Capacity modulation** in a simple and **adaptive** package

Combines our market-leading expertise in condensing unit design with the unique benefits of stepless inverter scroll technology. The result is energy consumption reduced by up to 30% with better food preservation.

### Quick and safe installation and service

Preset parameters and Modbus communication makes start-up and maintenance of the condensing unit effortlessly quick and easy.

### High SEPR*: 4.19 – certified by ASERCOM

All models in the range are highly efficient and well above EcoDesign 2018 thresholds, contributing to a reduction in energy costs.
**SEPR: Seasonal Energy Performance Ratio.*

### Accurate temperature control

Accurate temperature control and low in-rush current result in a more stable storage temperature and longer product shelf life.

### Extended capacity

Stepless compressor modulation - able to slow down and speed up from 30 to 100 RPS to save energy and match load fluctuations very accurately. The inverter drive incorporates smart logic to increase reliability during operation.



## Designed for **ultimate efficiency**

**Stepless capacity modulation**
From 30 to 100 rps modulation leads to 20-30% higher energy efficiency compared to fixed-speed condensing units.

**Simple commissioning**
Preset drive parameters with dedicated refrigeration software.

**Future-proof**
Working with lower GWP refrigerants such as R448A and R449. Also compatible with R407A/F and R404A.



**Danfoss compressor and drive package**
Dedicated to refrigeration with years of market application and validation.

**Full intelligent control through the Optyma™ Plus Controller**
Control, alarm management, day & night operation, can connect to ADAP-KOOL® software, etc.

**Simple plug-and-play installation**
Safe, simple and hassle-free installation with tried-and-tested components.


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| Model | Code | Version | Compressor | Electrical code (1) | Compressor speed, rps | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15 °C | -10 °C | -5 °C | 0 °C | 5 °C | EcoDesign (3) COP | SEPR | Sound power level dB(A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPPM028VVL | 114X4302 | P01 | VLZ028TGA | E | 30 | 27 | 1.61 | 2.01 | 2.49 | 3.03 | - | - | - | 72 | 41 |
| | | | | | | 32 | 1.52 | 1.90 | 2.35 | 2.87 | - | | | | |
| | | | | | | 38 | - | - | - | - | - | | | | |
| | | | | | | 43 | - | - | - | - | - | | | | |
| | | | | | 50 | 27 | 2.74 | 3.39 | 4.16 | 5.02 | - | - | - | 73 | 41 |
| | | | | | | 32 | 2.58 | 3.20 | 3.93 | 4.75 | - | | | | |
| | | | | | | 38 | - | 2.96 | 3.65 | 4.42 | - | | | | |
| | | | | | | 43 | - | 2.75 | 3.40 | 4.13 | - | | | | |
| | | | | | 75 | 27 | 4.01 | 4.94 | 6.04 | 7.27 | - | - | - | 73 | 42 |
| | | | | | | 32 | 3.78 | 4.66 | 5.70 | 6.87 | - | | | | |
| | | | | | | 38 | - | 4.32 | 5.29 | 6.38 | - | | | | |
| | | | | | | 43 | - | 4.02 | 4.93 | 5.96 | - | | | | |
| | | | | | 100 | 27 | 5.14 | 6.30 | 7.68 | 9.24 | - | - | 3.75 | 74 | 43 |
| | | | | | | 32 | 4.85 | 5.95 | 7.26 | 8.73 | - | | | | |
| | | | | | | 38 | - | 5.53 | 6.74 | 8.11 | - | | | | |
| | | | | | | 43 | - | 5.16 | 6.31 | 7.59 | - | | | | |
| OP-MPPM035VVL | 114X4316 | P01 | VLZ035TGA | E | 30 | 27 | 2.02 | 2.52 | 3.11 | 3.79 | - | - | - | 72 | 41 |
| | | | | | | 32 | 1.90 | 2.37 | 2.94 | 3.58 | - | | | | |
| | | | | | | 38 | - | - | - | - | - | | | | |
| | | | | | | 43 | - | - | - | - | - | | | | |
| | | | | | 50 | 27 | 3.40 | 4.20 | 5.14 | 6.19 | - | - | - | 72 | 41 |
| | | | | | | 32 | 3.19 | 3.96 | 4.85 | 5.85 | - | | | | |
| | | | | | | 38 | - | 3.65 | 4.49 | 5.42 | - | | | | |
| | | | | | | 43 | - | 3.38 | 4.18 | 5.06 | - | | | | |
| | | | | | 75 | 27 | 4.95 | 6.09 | 7.42 | 8.90 | - | - | - | 74 | 43 |
| | | | | | | 32 | 4.66 | 5.73 | 6.99 | 8.40 | - | | | | |
| | | | | | | 38 | - | 5.30 | 6.47 | 7.78 | - | | | | |
| | | | | | | 43 | - | 4.923 | 6.02 | 7.25 | - | | | | |
| | | | | | 100 | 27 | 6.34 | 7.76 | 9.43 | 11.31 | - | - | 3.63 | 74 | 43 |
| | | | | | | 32 | 5.98 | 7.32 | 8.90 | 10.67 | - | | | | |
| | | | | | | 38 | - | 6.79 | 8.25 | 9.90 | - | | | | |
| | | | | | | 43 | - | 6.34 | 7.71 | 9.25 | - | | | | |
| OP-MPPM044VVL | 114X4334 | P01 | VLZ044TGA | E | 30 | 27 | 2.60 | 3.23 | 3.97 | 4.80 | - | - | - | 72 | 41 |
| | | | | | | 32 | 2.44 | 3.04 | 3.75 | 4.54 | - | | | | |
| | | | | | | 38 | - | - | - | - | - | | | | |
| | | | | | | 43 | - | - | - | - | - | | | | |
| | | | | | 50 | 27 | 4.27 | 5.27 | 6.44 | 7.74 | - | - | - | 74 | 43 |
| | | | | | | 32 | 4.01 | 4.96 | 6.07 | 7.30 | - | | | | |
| | | | | | | 38 | - | 4.57 | 5.61 | 6.77 | - | | | | |
| | | | | | | 43 | - | 4.24 | 5.22 | 6.31 | - | | | | |
| | | | | | 75 | 27 | 6.22 | 7.62 | 9.25 | 11.04 | - | - | - | 74 | 43 |
| | | | | | | 32 | 5.83 | 7.16 | 8.70 | 10.40 | - | | | | |
| | | | | | | 38 | - | 6.59 | 8.03 | 9.61 | - | | | | |
| | | | | | | 43 | - | 6.10 | 7.45 | 8.94 | - | | | | |
| | | | | | 100 | 27 | 7.99 | 9.75 | 11.76 | 13.95 | - | - | 4.12 | 74 | 43 |
| | | | | | | 32 | 7.46 | 9.13 | 11.05 | 13.12 | - | | | | |
| | | | | | | 38 | - | 8.36 | 10.14 | 12.08 | - | | | | |
| | | | | | | 43 | - | 7.68 | 9.35 | 11.18 | - | | | | |

This table continues on the next page

**MBP**

**(1) E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

SEPR, Seasonal Energy Performance Ratio
Q [kW], Cooling Capacity
P [kW], Power Input

For regular updates and detailed capacities, please refer to **Coolselector®2** software

| Model | Code | Version | Compressor | Electrical code (1) | Compressor speed, rps | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] | | | | | EcoDesign (3) | | Sound power level dB(A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | -15 °C | -10 °C | -5 °C | 0 °C | 5 °C | COP | SEPR | | |
| OP-MPPM065VVL | 114X4317 | P01 | VLZ065TGNE9B | E | 30 | 27 | 3.60 | 4.58 | 5.69 | 6.92 | - | - | - | 72 | 41 |
| | | | | | | 32 | 3.21 | 4.17 | 5.25 | 6.46 | - | | | | |
| | | | | | | 38 | - | - | - | - | - | | | | |
| | | | | | | 43 | - | - | - | - | - | | | | |
| | | | | | 50 | 27 | 5.79 | 7.27 | 8.94 | 10.83 | - | - | - | 73 | 42 |
| | | | | | | 32 | 5.29 | 6.70 | 8.30 | 10.10 | - | | | | |
| | | | | | | 38 | - | 5.98 | 7.49 | 9.19 | - | | | | |
| | | | | | | 43 | - | 5.35 | 6.78 | 8.39 | - | | | | |
| | | | | | 75 | 27 | 8.41 | 10.42 | 12.68 | 15.21 | - | - | - | 75 | 44 |
| | | | | | | 32 | 7.76 | 9.65 | 11.79 | 14.18 | - | | | | |
| | | | | | | 38 | - | 8.69 | 10.68 | 12.90 | - | | | | |
| | | | | | | 43 | - | 7.86 | 9.71 | 11.79 | - | | | | |
| | | | | | 100 | 27 | 10.87 | 13.33 | 16.07 | 19.08 | - | - | 4.14 | 76 | 45 |
| | | | | | | 32 | 10.06 | 12.37 | 14.94 | 17.77 | - | | | | |
| | | | | | | 38 | - | 11.17 | 13.53 | 16.14 | - | | | | |
| | | | | | | 43 | - | 10.14 | 12.32 | 14.73 | - | | | | |

**MBP**

**(1) E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

SEPR, Seasonal Energy Performance Ratio
Q [kW], Cooling Capacity
P [kW], Power Input



For regular updates and detailed capacities, please refer to **Coolselector®2** software


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| Model | Code | Version | Compressor | Electrical code (1) | Compressor speed, rps | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15 °C | -10 °C | -5 °C | 0 °C | 5 °C | EcoDesign (3) COP | SEPR | Sound power level dB(A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPPM028VVL | 114X4302 | P01 | VLZ028TGA | E | 30 | 27 | 1.61 | 2.00 | 2.46 | 2.99 | - | - | - | 72 | 41 |
| | | | | | | 32 | 1.49 | 1.87 | 2.30 | 2.80 | - | | | | |
| | | | | | | 38 | - | - | - | - | - | | | | |
| | | | | | | 43 | - | - | - | - | - | | | | |
| | | | | | 50 | 27 | 2.72 | 3.36 | 4.11 | 4.96 | - | - | - | 72 | 41 |
| | | | | | | 32 | 2.52 | 3.13 | 3.83 | 4.63 | - | | | | |
| | | | | | | 38 | - | 2.84 | 3.49 | 4.23 | - | | | | |
| | | | | | | 43 | - | 2.60 | 3.19 | 3.88 | - | | | | |
| | | | | | 75 | 27 | 4.03 | 4.96 | 6.02 | 7.24 | - | - | - | 73 | 42 |
| | | | | | | 32 | 3.74 | 4.61 | 5.61 | 6.76 | - | | | | |
| | | | | | | 38 | - | 4.19 | 5.11 | 6.16 | - | | | | |
| | | | | | | 43 | - | 3.82 | 4.68 | 5.65 | - | | | | |
| | | | | | 100 | 27 | 5.25 | 6.44 | 7.79 | 9.32 | - | - | 3.56 | 74 | 43 |
| | | | | | | 32 | 4.88 | 6.00 | 7.27 | 8.70 | - | | | | |
| | | | | | | 38 | - | 5.44 | 6.61 | 7.92 | - | | | | |
| | | | | | | 43 | - | 4.96 | 6.03 | 7.25 | - | | | | |
| OP-MPPM035VVL | 114X4316 | P01 | VLZ035TGA | E | 30 | 27 | 2.04 | 2.53 | 3.11 | 3.76 | - | - | - | 72 | 41 |
| | | | | | | 32 | 1.89 | 2.36 | 2.89 | 3.52 | - | | | | |
| | | | | | | 38 | - | - | - | - | - | | | | |
| | | | | | | 43 | - | - | - | - | - | | | | |
| | | | | | 50 | 27 | 3.43 | 4.22 | 5.14 | 6.20 | - | - | - | 72 | 41 |
| | | | | | | 32 | 3.18 | 3.93 | 4.79 | 5.78 | - | | | | |
| | | | | | | 38 | - | 3.56 | 4.35 | 5.25 | - | | | | |
| | | | | | | 43 | - | 3.24 | 3.97 | 4.80 | - | | | | |
| | | | | | 75 | 27 | 5.01 | 6.14 | 7.44 | 8.93 | - | - | - | 74 | 43 |
| | | | | | | 32 | 4.65 | 5.71 | 6.93 | 8.31 | - | | | | |
| | | | | | | 38 | - | 5.17 | 6.28 | 7.55 | - | | | | |
| | | | | | | 43 | - | 4.71 | 5.73 | 6.90 | - | | | | |
| | | | | | 100 | 27 | 6.42 | 7.85 | 9.48 | 11.34 | - | - | 3.87 | 74 | 43 |
| | | | | | | 32 | 5.96 | 7.29 | 8.82 | 10.55 | - | | | | |
| | | | | | | 38 | - | 6.60 | 7.99 | 9.57 | - | | | | |
| | | | | | | 43 | - | 6.00 | 7.27 | 8.72 | - | | | | |
| OP-MPPM044VVL | 114X4334 | P01 | VLZ044TGA | E | 30 | 27 | 2.64 | 3.26 | 3.98 | 4.80 | - | - | - | 72 | 41 |
| | | | | | | 32 | 2.44 | 3.03 | 3.71 | 4.48 | - | | | | |
| | | | | | | 38 | - | - | - | - | - | | | | |
| | | | | | | 43 | - | - | - | - | - | | | | |
| | | | | | 50 | 27 | 4.36 | 5.34 | 6.47 | 7.75 | - | - | - | 74 | 43 |
| | | | | | | 32 | 4.04 | 4.97 | 6.03 | 7.24 | - | | | | |
| | | | | | | 38 | - | 4.51 | 5.49 | 6.60 | - | | | | |
| | | | | | | 43 | - | 4.10 | 5.01 | 6.04 | - | | | | |
| | | | | | 75 | 27 | 6.32 | 7.72 | 9.31 | 11.10 | - | - | - | 74 | 43 |
| | | | | | | 32 | 5.87 | 7.18 | 8.67 | 10.34 | - | | | | |
| | | | | | | 38 | - | 6.50 | 7.87 | 9.40 | - | | | | |
| | | | | | | 43 | - | 5.91 | 7.17 | 8.59 | - | | | | |
| | | | | | 100 | 27 | 8.09 | 9.86 | 11.85 | 14.06 | - | - | 3.89 | 74 | 43 |
| | | | | | | 32 | 7.49 | 9.14 | 11.00 | 13.06 | - | | | | |
| | | | | | | 38 | - | 8.23 | 9.93 | 11.82 | - | | | | |
| | | | | | | 43 | - | 7.45 | 9.01 | 10.75 | - | | | | |

**This table continues on the next page**

**MBP**

**(1) E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K
**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

SEPR, Seasonal Energy Performance Ratio
Q [kW], Cooling Capacity
P [kW], Power Input

For regular updates and detailed capacities, please refer to **Coolselector®2** software

| Model | Code | Version | Compressor | Electrical code (1) | Compressor speed, rps | Tamb [°C] | Cooling capacity Q [kW] (2) Evaporating Temperature (Mid point) [°C] -15 °C | -10 °C | -5 °C | 0 °C | 5 °C | EcoDesign (3) COP | SEPR | Sound power level dB(A) | Sound pressure level 10 m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP-MPPM065VVL | 114X4317 | P01 | VLZ065TGNE9B | E | 30 | 27 | 3.77 | 4.76 | 5.87 | 7.11 | - | - | | 72 | 41 |
| | | | | | | 32 | 3.35 | 4.31 | 5.38 | 6.58 | - | | | | |
| | | | | | | 38 | 2.82 | 3.73 | 4.75 | 5.90 | - | | | | |
| | | | | | | 43 | 2.38 | 3.23 | 4.20 | 5.30 | - | | | | |
| | | | | | 50 | 27 | 6.02 | 7.52 | 9.23 | 11.15 | - | - | | 73 | 42 |
| | | | | | | 32 | 5.47 | 6.89 | 8.50 | 10.32 | - | | | | |
| | | | | | | 38 | 4.78 | 6.09 | 7.58 | 9.27 | - | | | | |
| | | | | | | 43 | 4.18 | 5.39 | 6.78 | 8.36 | - | | | | |
| | | | | | 75 | 27 | 8.73 | 10.79 | 13.13 | 15.74 | - | - | | 75 | 44 |
| | | | | | | 32 | 7.99 | 9.92 | 12.10 | 14.54 | - | | | | |
| | | | | | | 38 | 7.07 | 8.83 | 10.82 | 13.05 | - | | | | |
| | | | | | | 43 | 6.27 | 7.88 | 9.71 | 11.77 | - | | | | |
| | | | | | 100 | 27 | 11.26 | 13.81 | 16.67 | 19.82 | - | - | 3.97 | 76 | 45 |
| | | | | | | 32 | 10.33 | 12.71 | 15.35 | 18.28 | - | | | | |
| | | | | | | 38 | 9.16 | 11.31 | 13.71 | 16.37 | - | | | | |
| | | | | | | 43 | 8.15 | 10.09 | 12.28 | 14.71 | - | | | | |

**MBP**

**(1) E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz

**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

**(3)** Rated conditions (EN13215), Evaporating temperature (Mid point) -10°C, Ambient air temperature +32°C, Return Gas Temperature 20°C, Subcooling 0K

SEPR, Seasonal Energy Performance Ratio

Q [kW], Cooling Capacity

P [kW], Power Input



For regular updates and detailed capacities, please refer to **Coolselector®2** software



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## Optyma™ Plus INVERTER - Technical data

| Application | Code number | Model number | Compressor Model | Electrical Code (1) | Refrigerant (2) | Condenser Coil | | | Fan | | Receiver | Dimensions | | | | Connection | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Type | Airflow | Internal Volume | Number | Blade ø | Volume | Housing | Height | Width | Depth | Suction valve | Liquid valve | Gross | Net |
| | P01 | | | | | | ($m^3/h$) | ($dm^3$) | | (mm) | (L) | | mm | mm | mm | inch | inch | Kg | Kg |
| MBP | 114X4302 | OP-MPPM028VVLP01E | VLZ028TGA | E | P | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1406 | 481 | 3/4" | 5/8" | 150 | 124 |
| MBP | 114X4316 | OP-MPPM035VVLP01E | VLZ035TGA | E | P | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1406 | 481 | 3/4" | 5/8" | 151 | 125 |
| MBP | 114X4334 | OP-MPPM044VVLP01E | VLZ044TGA | E | P | G7 | 5200 | 1.62 | 1 | 500 | 6.2 | H3 | 965 | 1406 | 481 | 3/4" | 5/8" | 151 | 125 |
| MBP | 114X4317 | OP-MPPM065VVLP01E | VLZ065TGN | E | P | L1 | 6850 | 1.1 | 1 | 560 | 10 | H3+ | 965 | 1408 | 583 | 7/8" | 5/8" | 168 | 140 |

**(1) E** - Compressor 400V/3~/50Hz, fan 230V/1~/50Hz
**(2) P** - R448A, R449A, R407A, R407F, R404A

## Optyma™ Plus INVERTER - Spare parts & accessories - MBP

| Designation | OP-MPPM028 | OP-MPPM035 | OP-MPPM044 | OP-MPPM065 |
|---|---|---|---|---|
| Code Number | 114X4302 | 114X4316 | 114X4334 | 114X4317 |
| Compressor Description | VLZ028TGA | VLZ035TGA | VLZ044TGA | VLZ065TGD |
| Compressor oil | 120Z0648 | 120Z0648 | 120Z0648 | 120Z0648 |
| **Spare Parts** | | | | |
| Compressor | 120G0162 | 120G0159 | 120G0156 | 120G0397 |
| Condenser | 118U5219 | 118U5219 | 118U5219 | 118U5560 |
| Discharge pressure sensor | 118U4021 | 118U4021 | 118U4021 | 118U4021 |
| Oil separator | 118U3981 | 118U3981 | 118U3982 | 118U5561 |
| Fan assembly | 118U3829 | 118U3829 | 118U3829 | 118U5296 |
| Fan cowl/grill | 118U3485 | 118U3485 | 118U3485 | 118U3485 |
| Filter Drier | 023Z5045 | 023Z5045 | 023Z5045 | 023Z5045 |
| High-pressure switch | 118U3718 | 118U3718 | 118U3718 | 118U3718 |
| Low-pressure switch | 118U3720 | 118U3720 | 118U3720 | 118U3720 |
| Receiver | 118U4015 | 118U4015 | 118U4015 | 118U4017 |
| Sight glass | 014L0174 | 014L0174 | 014L0174 | 014L0174 |
| Suction pressure sensor | 118U4025 | 118U4025 | 118U4025 | 118U4025 |
| Suction line valve | 009L7054 | 009L7054 | 009L7054 | 009L7055 |
| Liquid line valve | 009L7053 | 009L7053 | 009L7053 | 009G7053 |
| **Electrical Spare Parts** | | | | |
| Crankcase heater (Compressor) | 120Z5040 | 120Z5040 | 120Z5040 | 120Z0892 |
| Crankcase heater (Oil separator) | 120Z0460 | 120Z0460 | 120Z0460 | 120Z0460 |
| Optyma Controller | 118U3465 | 118U3465 | 118U3465 | 118U3465 |
| Discharge temperature sensor | 084N2007 | 084N2007 | 084N2007 | 084N2007 |
| Ambient/Suction temperature sensor | 084N0003 | 084N0003 | 084N0003 | 084N0003 |
| Compressor contact | 118U3847 | 118U3847 | 118U3847 | 118U3848 |
| Door handle | 118U3858 | 118U3858 | 118U3858 | 118U3858 |
| Main switch | 118U3854 | 118U3854 | 118U3854 | 118U3855 |
| Compressor drive CDS803 | 118U5518 | 118U5519 | 118U5520 | 118U5559 |
| EMI filter (Drive) | 118U4079 | 118U4079 | 118U4079 | 118U5562 |
| EMI filter (Controller) | 118U3974 | 118U3974 | 118U3974 | 118U3974 |
| **Accessories (Not Premounted)** | | | | |
| Acoustic hood | 120Z5083 | 120Z5083 | 120Z5083 | 120Z5084 |
| Adapter Plug (Receiver) | 118U4037 | 118U4037 | 118U4037 | |
| **Sheet Metal** | | | | |
| Top panel | 118U5131 | 118U5131 | 118U5131 | 118U5563 |
| Fan Panel | 118U5132 | 118U5132 | 118U5132 | 118U5330 |
| Back panel | 118U5133 | 118U5133 | 118U5133 | 118U5133 |
| Front panel | 118U5134 | 118U5134 | 118U5134 | 118U5134 |
| Access panel | 118U5135 | 118U5135 | 118U5135 | 118U5564 |
| Left side panel | 118U5165 | 118U5165 | 118U5165 | |

*NOTICE* For service purpose original components (spare parts) recommended by Danfoss should be used.

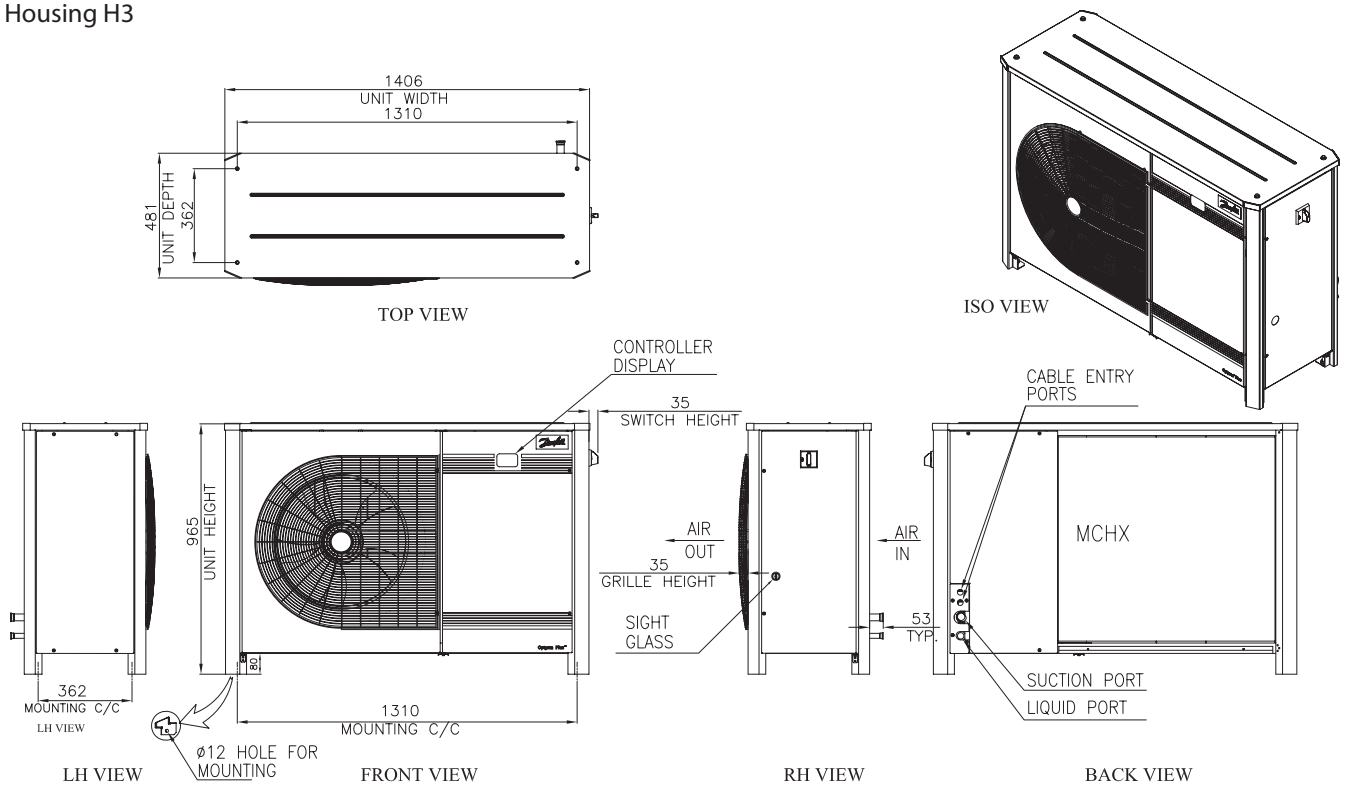
| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Access Panel | 118U5135 | SPARE PART, SHEET METAL ACCESS H3 | |
| Access Panel | 118U5564 | SPARE PART, SHEET METAL ACCESS H3+ | |
| Acoustic hood | 120Z5083 | ACCOUSTIC HOOD | |
| Acoustic hood | 120Z5084 | ACCOUSTIC HOOD | |
| Adapter Plug | 118U4037 | Adapter Plug | |
| Ambient/Suction temperature sensor | 084N0003 | Sensor AKS 11 3.5m | |
| Back panel | 118U5133 | SPARE PART, SHEET METAL BACK H3 | |
| Compressor contactor | 118U3847 | CONT, ABB-A16-30-01-80+CA5-11 | |
| Compressor contactor | 118U3848 | CONT, ABB-A26-30-01-80+CA5-11 | |
| Compressor drive CDS803 | 118U5518 | Inverter Drive VLZ028 | |
| Compressor drive CDS803 | 118U5519 | Inverter Drive VLZ035 | |
| Compressor drive CDS803 | 118U5520 | Inverter Drive VLZ044 | |
| Compressor drive CDS803 | 118U5559 | Inverter Drive VLZ065 | |
| Compressor Single pack | 120G0162 | Compresssor VLZ028TGNE9A/M | |
| Compressor Single pack | 120G0159 | Compresssor VLZ035TGNE9A/M | |
| Compressor Single pack | 120G0156 | Compresssor VLZ044TGNE9A/M | |
| Condenser | 118U5219 | Spare part, 9513 B3, H3, G7 MCHX | |
| Condenser | 118U5560 | Spare Parts, L-Bend MCHE coil Assy. | |
| Controller | 118U3465 | OPTYMA PLUS CONTROLLER-084B8080 | |
| Crankcase heater | 120Z5040 | CRANKCASE HEATER, 240V 70W | |
| Crankcase heater | 120Z0892 | CRANKCASE HEATER 230V 65W | |
| Discharge temperature sensor | 084N2007 | Sensor AKS 21 A 2.5m | |
| Door handle | 118U3858 | HANDLE, ABB-OHB2AJM,MSMN,OXS5X131 | |
| EMI filter (Controller) | 118U3974 | CONTROLLER EMC/RFI FILTER OPTYMA PLUS | |
| EMI filter (Drive) | 118U4079 | SPARE PART, EMC/RFI FILTER FN3288-16-44-C17-R65 | For prior unit upto SN XXXXXXCG3820, follow instruction manual to replace 118U3972 to 118U4079 |
| EMI filter (Drive) | 118U5562 | Spare Part, EMI Filter, FN3288-20-30-C17-R65 | |
| Fan assembly | 118U3829 | FAN ASSEMBLIES, EBM, ERP2015 | |
| Fan assembly | 118U5296 | Spare Part-Fan motor- HIDRIA 560 | |
| Fan cowl/grill | 118U3485 | FAN GRILL HOUSING 3 OP PLUS | |
| Fan panel | 118U5132 | SPARE PART, SHEET METAL FAN H3 | |
| Fan panel | 118U5330 | SPare Part-Sheet Metal Fan B3 A2L | |
| Filter | 023Z5045 | Filter drier DML 165 M/12 | |
| Front Panel | 118U5134 | SPARE PART, SHEET METAL FRONT H3 | |
| High-pressure switch | 118U3718 | HIGH PR SWITCH ACB-2UB463W | |
| High-pressure transmitter | 075G1036 | Sensor DST P110 (0 to 32 bar SG) | For prior units upto SNXXXXXXXX0120, Use 118U4021 to replace AKS pressure transmitter to DST P110. |
| Left Side panel | 118U5165 | SPARE PART, SHEET METAL LEFT SIDE H3 | |
| Liquid valve | 009G7053 | GBC 16s Ball Valve M/25 | |
| Low-pressure switch | 118U3720 | LOW PR SWITCH ACB-2UA418W | |
| Low-pressure transmitter | 075G1013 | Sensor DST P110 (-1 to 12 bar SG) | For prior units upto SNXXXXXXXX0120, Use 118U4025 to replace AKS pressure transmitter to DST P110. |
| Main switch | 118U3854 | MPCB, ABB-MS132-20+HK1-12 | |
| Main switch | 118U3855 | MPCB, ABB-MS132-25+HK1-20 | |
| Oil Separator | 118U3981 | SEPARATEUR HUILE SO/ER-31 OPTYMA INVERT | |
| Oil separator | 118U3982 | SEPARATEUR HUILE SO/ER16101 OPTYMA INVER | |
| Receiver | 118U4015 | Receiver 6.2L, 3/8 NPT (Ods 5/8" - Dia 16.2 Rotor Lock) | |
| Receiver | 118U4017 | spare Part, RCVR 10L, 5/8X1/2 | |
| Sight glass | 014F0174 | Del-SGN+ 16 Sight Glass M/36 | |
| Suction valve | 009L7054 | GBC 18s Ball Valve M/25 | |
| Suction valve | 009L7055 | GBC 22s Ball Valve M/25 | |
| Top Panel | 118U5131 | SPARE PART, SHEET METAL TOP H3 | |
| Top Panel | 118U5563 | Spare part, Top Panel VLZ065 unit | |




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**OP-MPLM028-035-044, OP-MPPM028-035-044**

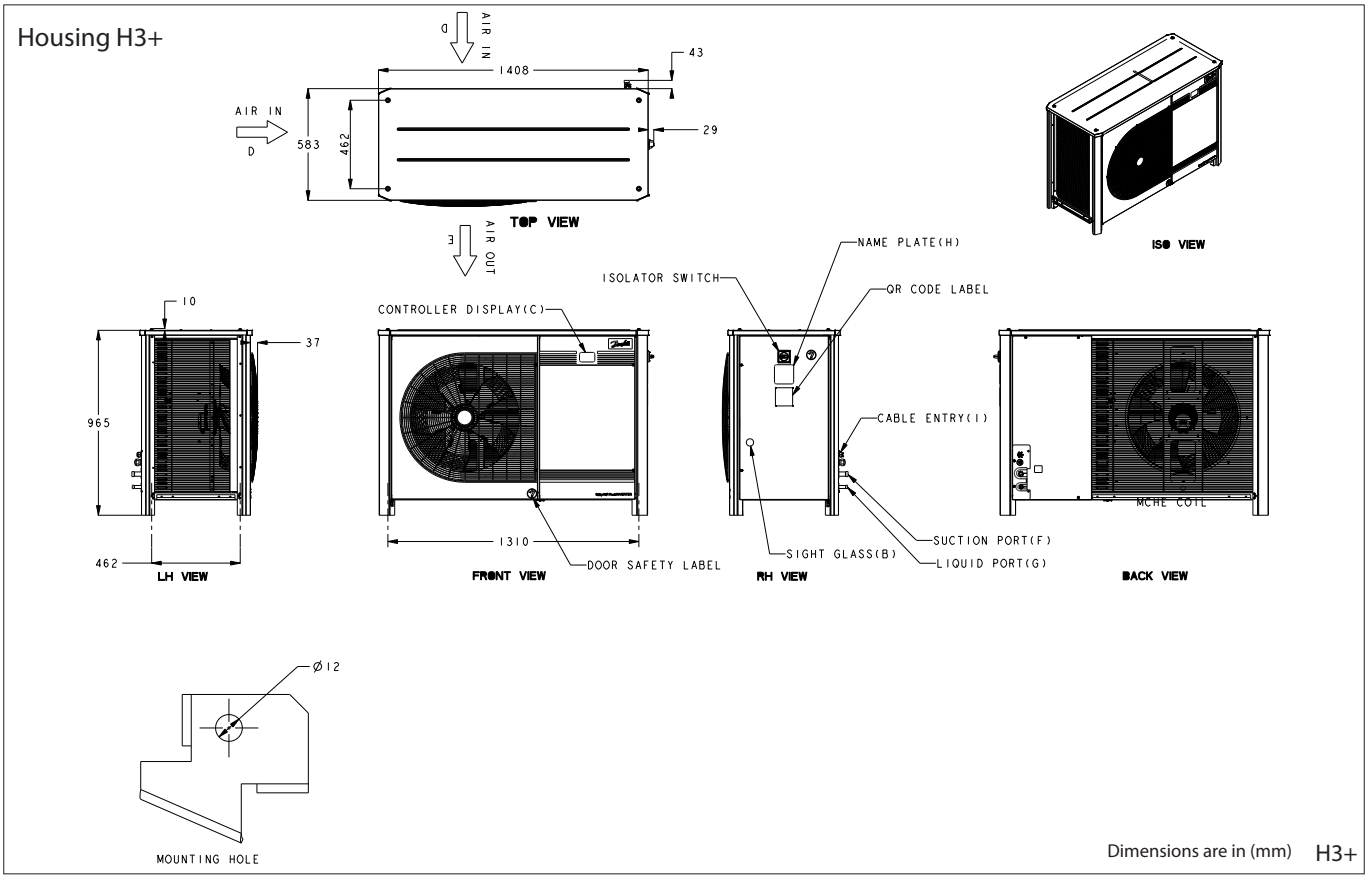
Housing H3




Dimensions are in (mm) H3

**OP-MPPM065**

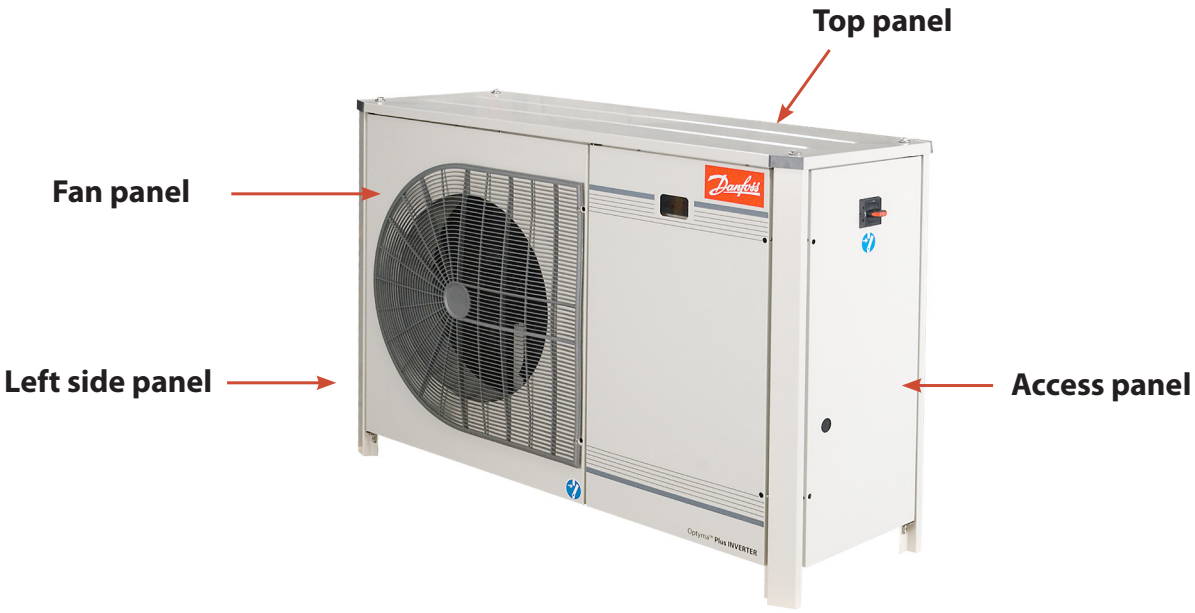
Housing H3+




Dimensions are in (mm) H3+

*For electrical wiring diagrams refer to instalation guide AN18718642524202-xxxxxx*

## Optyma™ Plus INVERTER - Housing spare parts










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Notes:

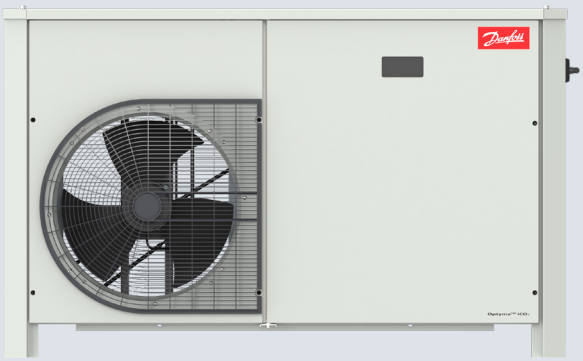
# Optyma™ iCO₂
# **Features** and **benefits**
## MBP - 1.5 to 4.6 kW

- Danfoss GBC service valves
- Danfoss MMILDS display
- Danfoss filter drier
- Stacking up to 2 units
- Gas By Pass Valve
- Connectable to Danfoss System Managers
- Relief valve
- Night mode operation
- Microchannel condenser
- Sight glass
- 2 doors for servicing
- Variable speed scroll compressor: 37 Hz to 117 Hz
- DC fan
- PED class 1
- 2.5 L Suction accumulator
- 2 X 2.5 L Receiver
- Integrated controller and drive
- Main switch
- Charge indication

**Remote monitoring & management** and integration into DES thanks to connectivity to Danfoss System Managers

**Better food preservation** by continuously matching the load fluctuations with variable speed compressor and drive

**Reduce operational costs** as one unit can handle multiple cold rooms or e.g., 1.5 to 5 meters of display cabinets



**Reduce disruption** with a fast setup, commissioning and servicing (2 service doors, preset controller, remote control)

**Reduce commissioning costs** with a PED class 1 unit avoiding check by certified body

**Reduce footprint and installation** time with stack mounting units (up to 2)

**Silent operation,** thanks to best-in-class BLDC compressor, high performance sound insulation and low noise level fan this unit don't exceed 35dB(A) at 10 meter and decrease by nearly two noise level from other variable load systems


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| Model | Code | Version | Electrical code (1) | Compressor load | Tamb [°C] | Cooling capacity Q [kW] (preliminary) (2) Evaporating Temperature (Mid point) [°C] | | | | | EcoDesign (3) | | Min Fuse rating gL/gG (A) | Sound pressure level @ 10m dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | -15 | -10 | -5 | 0 | 5 | COP | SEPR | | |
| OP-MPAM005CO | 114X6001 | P04 | G | Max. speed | 38 | 3.14 | 3.82 | 4.20 | 4.61 | 4.81 | - | 3.2 | 16 | 35 |
| | | | | | 32 | 3.89 | 4.58 | 5.11 | 5.59 | 5.90 | | | | |
| | | | | | 27 | 4.46 | 5.16 | 5.76 | 6.30 | 6.84 | | | | |
| | | | | Min. speed | 38 | 1.02 | 1.24 | 1.40 | 1.50 | 1.56 | | | | |
| | | | | | 32 | 1.26 | 1.49 | 1.66 | 1.79 | 1.96 | | | | |
| | | | | | 27 | 1.45 | 1.68 | 1.87 | 2.05 | 2.22 | | | | |

**(1) G** - Compressor 230V/1~/50Hz, fan 230V/1~/50Hz
**(2)** Nominal conditions (EN13215), Evaporating temperatures at Mid point, Superheat 10K, Subcooling 0K

For regular updates and detailed capacities, please refer to **Coolselector®2** software

A2L



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| Application | Code number | Model number | Compressor Model | Electrical Code (1) | Refrigerant (2) | Condenser Coil | | | Fan | | Receiver | Dimensions | | | | Connection | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Type | Airflow | Internal Volume | Number | Blade ø | Volume | Housing | Height | Width | Length | Suction valve | Liquid valve | Gross | Net |
| | | | | | | | ($m^3/h$) | ($dm^3$) | | (mm) | (L) | | mm | mm | mm | inch | inch | Kg | Kg |
| MBP | 114X6001 | OP-MPAM005COP04G | Scroll | G | R744 | D1 | 2500 | 0.27 | 1 | 400 | 2 x2.5 | TBC | 800 | 480 | 1290 | 3/8' | 3/8' | 136 | 116 |



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| Component type | Component code | Component description | Additional informations |
|---|---|---|---|
| Compressor | 118U4105 | SPARE PART COMPRESSOR 005CO | |
| Circuit breaker | 118U4131 | ABB EP8864 | No safety stocks |
| Contactor | 118U4134 | ABB AF16301013 | No safety stocks |
| Controller | 080G0233 | MMILDS Elect.Control Panel I/25 | |
| EMI Filter | 118U4120 | SPARE PART NOISE FILTER (Type: EMI FILTER) | |
| Fan assembly | 118U4129 | SPARE PART FAN ASSEMBLY (D 415) | |
| Filter drier | 023Z8409 | Filter drier DMT 083S I/12 | |
| Gas cooler | 118U4112 | SPARE PART First GAS COOLER D1 | |
| Gas cooler | 118U4116 | SPARE PART second GAS COOLER D1 | |
| Gateway | 118U4119 | SAPRE PART GATEWAY D1 | |
| Main switch | 118U4130 | ABB MSHDLTB main switch | No safety stocks |
| Main switch bracket | 118U4132 | ABB OXS6X085 | No safety stocks |
| Main switch plastic conection | 118U4133 | ABB MSMNO | No safety stocks |
| Oil | 118U4144 | SPARE PART OIL TANK (1 can, 250 ml) | |
| Optyma Controller | 118U4126 | SPART PART CONTROLLER D1 | |
| Pressure sensore | 118U4108 | SPARE PART PRESSUR SENSOR (0-10 MPa Ratiometric 0.5-4-5 VDC) | |
| Pressure sensore | 118U4109 | SPARE PART HIGH PR SWITCH (14 MPa) | |
| Pressure sensore | 118U4110 | SPARE PART HIGH PR SWITCH (0-19.6 MPa Ratiometric 0.5-4-5 VDC) | |
| Reactor | 118U4124 | SPARE PART REACTOR (Type VFD, Drive) | |
| Reactor | 118U4125 | SPARE PART REACTOR (Type VFD, Drive) | |
| Service valve | 118U4106 | SPARE PART RELEIF VALVE 80B (15.6 mm2) | |
| Service valve | 118U4107 | SPARE PART EXP VALVE (3/8") | |
| Service valve | 118U4117 | SPARE PART EXP VALVE (3/8") | |
| Service valve | 118U4118 | SPARE PART EXP VALVE (3/8") | |
| Service valve | 009L7555 | GBC 10s CO2 45bar BallValve With AP M/25 | |
| Sight glass | 118U4111 | SPARE PART SIGHT GLASS | |
| Temperatur sensore | 118U4121 | SPARE PART THERMAL SWITCH KIT | |
| Temperatur sensore | 118U4122 | SPARE PART REACTOR THERMAL KIT | |
| Temperatur sensore | 118U4123 | SPARE PART THERMISTOR KIT | |

Notes:

## Updates

| Release date (Year/Month) | Guideline codification number | List of changes | Reason for change |
|---|---|---|---|
| 2022/12 | AF283343213825en-010902 | Added new codes 114X3405, 114X3406, 114X4409 and 114X4410 | Model addition, Spare part and Performance addition |
| | | Min fuse rating and sound pressure values updated for OP Slim Pack and OP Plus range | |
| | | 1. Performance data and Spare parts updated for Slim Pack and OP Plus range<br>2. DX21Tba and DST38NA added | |
| | | | |
| | | | |
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| | | | |

ENGINEERING
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ENGINEERING
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**Installation Guide**

080R9293

AN414734678355O1-000301

# Temperature controller for walk-in coolers and freezers, Type **AK-RC 204B** and **AK-RC 205C**

**ENGLISH**


EN : Temperature controller for walk-in coolers and freezers, type AK-RC 204B and AK-RC 205C ..... 1
ES : Controlador de temperatura para cuartos fríos y congeladores, tipo AK-RC 204B y AK-RC 205C ..... 9
FR : Régulateur de température pour chambres froides et congélateurs, type AK-RC 204B et AK-RC 205C ..... 17
DE : Temperaturregler für begehbare Kühl- und Gefrierschränke, typ AK-RC 204B und AK-RC 205C ..... 25
PT-BR : Controlador de temperatura para câmaras frigoríficas e congeladores, tipo AK-RC 204B e AK-RC 205C ..... 33






## Warnings

- Using the unit without observing the manufacturer's instructions may alter the appliance's safety requirements. Only probes supplied by Danfoss should be used for the unit to operate correctly.
- From -40 – +20 °C, if the NTC probe is extended to 1000 m with at least 0.5 mm² cable, the maximum deviation will be 0.25 °C
- It should be installed in a place protected from vibrations, water and corrosive gases, where the ambient temperature does not exceed the value indicated in the technical data.
- For the reading to be correct, the probe should be used in a place without heat influences apart from the temperature you want to measure or control.
- IP65 protection degree is only valid with the protection cover closed.
- IP65 protection degree is only valid if the cables enter the device using a tube for electric conductions + gland with IP65 or above. The size of the glands should be suitable for the diameter of the tube used.
- Do not spray the unit directly with high-pressure hoses, as this could cause damage.

**IMPORTANT:**

- **Before starting the installation, you must take the advice of local regulations in force.**
- The AUXILIARY relays are programmable, and their operation depends on the configuration.
- The function of the digital inputs depends on the configuration.
- The recommended currents and powers are the maximum working currents and powers.

## Wiring

Always disconnect the power supply to do the wiring.
The probes and their cables should **NEVER** be installed in a conduit together with power, control or power supply cables.

For disconnection, the power supply circuit must be equipped with a switch of at least 2 A, 230 V, located near the device. The power supply cable will be H05VV-F or NYM 1x16/3. The section to be used will depend on the local standard in force, but must never be less than 2.5 mm².

Cables for relay or contactor outputs should have a section of 2.5 mm², allow working temperatures equal to or over 70 °C and be installed with as few bends as possible.

The 120/230 V~ wiring must be kept clear of any other external element.

**The wiring to be done depends on the type of installation. Use the appropriate diagram based on the option selected in the wizard. Check the available options on the diagrams included in the controller's packaging.**
**Wizard refers to a built in tool to guide the user through the set up process.**

## Maintenance

- Clean the surface of the unit with a soft cloth, water and soap.
- Do not use abrasive detergents, petrol, alcohol or solvents, as this might damage the unit.

## Keypad

ESC — Pressing it for 3 seconds activates/deactivates Stand-by mode. In this mode, regulation is paused and the ⏻ icon is displayed. In the programming menu, this exits the parameter without saving changes, returns to previous level or exits programming.

▲ — Pressing once displays the temperature of probe S2 for 10 seconds (If it is enabled).
Pressing it for 3 seconds starts/stops the defrost.
In the programming menu, this allows scrolling around the different levels, or, during the setting of a parameter, changing its value.

▼ — Pressing it for 3 seconds activates/deactivates continuous cycle mode.
In the programming menu, this allows scrolling around the different levels, or, during the setting of a parameter, changing its value.

SET — Pressing once activates/deactivates the cold room light.
Pressing it for 3 seconds accesses the condensed programming menu.
Pressing it for 6 seconds accesses the expanded programming menu.
In the programming menu, this accesses the level shown on the display or, during the setting of a parameter, accepts the new value.

SP — Pressing once displays the current effective value of the Set Point, taking into consideration temporary modifications by other parameters (**C10** or **C12**).
When an alarm is underway, pressing once mutes the acoustic alarm. Pressing for 3 seconds accesses the Set Point setting.

## Indicators

**Fixed:** Stand-by mode activated. Regulation is paused.
**Flashing:** Controlled shutdown process for the regulation underway.

**Fixed:** Cold room door open.
**Flashing:** The door has been open for a greater time than has been defined in parameter **A12**.

There is an active alarm, but not an active HACCP alarm.

**Fixed:** HACCP alarm active.
**Flashing:** HACCP alarm registered and unconfirmed. Press the 🔇× key to confirm an HACCP alarm.

**Fixed:** Evaporator fans active.
**Flashing:** The evaporator fans should be active but a delay is preventing this.

**Fixed:** The cold solenoid is active.
**Flashing:** The solenoid should be active but a delay or protection is preventing this.

**Fixed:** Compressor active.
**Flashing:** The compressor should be active but a delay or protection is preventing this.

Defrost relay active.

Continuous cycle mode active.

Cold room light active.

Alarm underway muted.

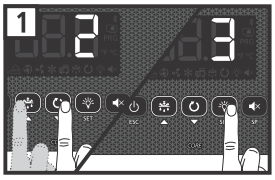
°F °C — Temperature displayed in ° Fahrenheit / ° Centigrade.

PRG — Programming mode active.

**STAND-BY**
If the temperature regulation cannot be instantly stopped due to its configuration, a controlled stop process starts and the ⏻ icon flashes. To stop the controlled stop process and force the step to Stand-by, press the Stand-by key again for 3 seconds.


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## Initial configuration



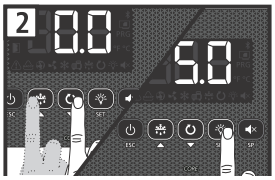

The first time the unit receives the power supply, it will enter into ASSISTANT mode. The display will show the message *InI* flashing with **0**.

**Step 1:**
Select the most suitable InI option based on the type of installation to be carried out and press **SET**. The available options will be shown in the following table:

| InI | Type of installation | | | | Parameters | | | | | | | | | | Diagram to be used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cold regulation | Pump Down | Defrost | Evap. fans | Pd | o00 | I00 | I10 | I11 | I20 | I21 | d1 | d7 | F3 | |
| 0 | Demo Mode: it displays the temperature but does not regulate the temperature or activate relays | | | | | | | | | | | | | | |
| 1 | Solenoid | No | Electric | Yes | 0 | * | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | A |
| 2 | Solenoid + compressor | Yes | Electric | Yes | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 20 | 0 | 0 | B |
| 3 | Solenoid + compressor | No | Electric | Yes | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | B |
| 4 | Solenoid | No | Air | Yes | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | A |
| 5 | Solenoid + compressor | Yes | Air | Yes | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | 1 | B |
| 6 | Solenoid + compressor | No | Air | Yes | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | B |
| 7 | Solenoid + compressor | Yes | Hot gas | Yes | 1 | 1 | 2 | 7 | 1 | 9 | 1 | 5 | 2 | 0 | C |
| 8 | Solenoid + compressor | No | Hot gas | Yes | 0 | 1 | 2 | 0 | 0 | 9 | 1 | 5 | 2 | 0 | C |
| 9 | Solenoid + compressor | Yes | Reversed cycle | Yes | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 5 | 3 | 0 | D |
| 10 | Solenoid + compressor | No | Reversed cycle | Yes | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | D |
| 11 | Solenoid | No | Static | No | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | A |
| 12 | Solenoid + compressor | Yes | Static | No | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | - | B |
| 13 | Solenoid + compressor | No | Static | No | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | B |

*** o00=2** in AK-RC 204B, **o00=0** in AK-RC 205C

**Note:** If options 2, 5, 7, 9 or 12 are chosen, check the configuration of parameter I11 according to the pressure switch type used. (See diagram included with the device).




**Step 2:**
Use keys ▲ and ▼ to enter the desired Temperature Set Point value and press **SET**. The wizard has finished. The unit will begin to regulate the temperature.

If this is not the first time you use the wizard, after completing the last step the display will show the message **dFp** (default parameters). You may choose between two options:
**0**: Only changing the parameters which affect the wizard. The other parameters will remain the same.
**1**: All parameters return to their factory setting except those which have been modified by the wizard.

**Important:** The wizard will not reactivate. To enter the wizard mode, initiate Stand-by mode by pressing the ⏻ key for 3 seconds and wait until the unit completely halts the temperature regulation (the ⏻ indicator will light up permanently) and press the following keys in sequence one after the other, ▲, ▼, **SET**.

⚠ **Warning:** If the pump down function is active, a certain amount of time may elapse between starting the stand-by function and the controller stopping.

## Configuration

**Condensed programming menu**
Enables the rapid configuration of the most frequently-used parameters (**SP, C1, d0, d1, d4, F3, A1** and **A2**). Press the **SET** key for 3 seconds to access it.

**Extended programming menu**
Use the extended programming menu to configure all of the unit's parameters in order to adapt it to installation requirements. Press the **SET** key for 6 seconds to access it.

**Important:**
- If the function of the password has been configured as a keypad block (**b10**=2), or as an access block to parameters (**b10**=1), you will be requested to enter the access code programmed in **PAS** when attempting to access either of the two functions. If the entered password is not correct, the unit will go back to showing the temperature.
- Certain parameters or menus may not be visible depending on the configuration of the rest of the parameters.

**Regulation and control**

| Level 1 | Level 2 | Description | Values | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| rE | SP | Temperature setting (Set Point) | °C/°F | -50 | 0.0 | 99 |
| | C0 | Probe 1 calibration (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | C1 | Probe 1 differential (Hysteresis) | °C/°F | 0.1 | 2.0 | 20.0 |
| | C2 | Set Point top locking (it cannot be set above this value) | °C/°F | C3 | 99 | 99 |
| | C3 | Set Point bottom locking (it cannot be set below this value) | °C/°F | -50 | -50 | C2 |
| | C4 | Type of delay for the protection of the compressor:<br>**0**=Minimum time of compressor in OFF<br>**1**=Minimum time of compressor in OFF and in ON in each cycle | | 0 | 0 | 1 |
| | C5 | Protection delay time (Value of the option selected in parameter C4) | Min. | 0 | 0 | 120 |
| | C6 | COOL relay status with fault in probe 1:<br>**0**=OFF; **1**=ON; **2**=Average according to last 24 h prior to probe error<br>**3**=ON-OFF according to prog. C7 and C8 | | 0 | 2 | 3 |
| | C7 | Relay time in ON in the event of probe 1 failure<br>(If C7=0 and C8≠0, the relay will always be disconnected in OFF) | Min. | 0 | 10 | 120 |
| | C8 | Relay time in OFF in the event of probe 1 failure<br>(If C8=0 and C7≠0, the relay will always be connected in ON) | Min. | 0 | 5 | 120 |
| | C9 | Maximum duration of the continuous cycle mode. (**0**=deactivated) | H. | 0 | 0 | 48 |
| | C10 | Variation of the Set Point (SP) in continuous cycle mode. When it reaches this point (SP+C10), it reverts to the normal mode. (SP+C10 ≥ C3).<br>The value of this parameter is always negative, unless it is 0. (**0**=OFF) | °C/°F | 0 | -50 | C3-SP |
| | C12 | Variation of the Set Point (SP) when the change Set Point function is active. (SP+C12 ≤ C2) (**0**= deactivated) | °C/°F | C3-SP | 0.0 | C2-SP |
| | C19 | Maximum start time from Pump Down<br>(Values between 1 and 9 seconds will not be accepted) (**0**=deactivated) | Sec. | 0 | 0 | 120 |
| | C20 | Maximum time for pump down (**0**= deactivated) | Min. | 0 | 0 | 15 |
| | C21 | Probe to be displayed: **0**=All probes (sequential)<br>**1**=Probe 1 (Cold Room), **2**=Probe 2 (Evaporator), **3**=Probe 3 (According to I20) | | 0 | 1 | 3 |
| | C22 | Stop fans and compressor on opening door **0**=No, **1**=Yes | | 0 | 0 | 1 |
| | C23 | Start-up delay for fans and compressor with door open | Min. | 0 | 0 | 999 |
| | C27 | Probe 3 calibration (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | EP | Exit to level 1 | | | | |


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### Defrost

| Level 1 | Level 2 | Description | Values | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| dEF | d0 | Defrost frequency (Time between 2 starts) | H. | 0 | 6 | 96 |
| | d1 | Maximum defrost duration (**0**=defrost deactivated) | Min. | 0 | * | 255 |
| | d2 | Type of message during the defrost:<br>**0**=Displays the real temperature; **1**=Displays the temperature at the start of the defrost; **2**=Displays the dEF message | | 0 | 2 | 2 |
| | d3 | Maximum duration of the message<br>(Time added at the end of the defrost process) | Min. | 0 | 5 | 255 |
| | d4 | Final defrost temperature (by probe) (If I00 ≠ 1) | °C/°F | -50 | 8.0 | 50 |
| | d5 | Defrost on connecting the unit:<br>**0**=NO First defrost according to d0; **1**=YES, First defrost according to d6 | | 0 | 0 | 1 |
| | d6 | Delay of the defrost start on connecting the unit | Min. | 0 | 0 | 255 |
| | d7[1)] | Type of defrost:<br>**0**=Resistors; **1**=Air/fans, **2**=Hot gas; **3**=Reversal of cycle | | 0 | * | 3 |
| | d8 | Count of time between defrost periods:<br>**0**=Total real time, **1** =Sum of compressor connected time | | 0 | 0 | 1 |
| | d9 | Drip time when completing defrost (Shutdown of compressor and fans) | Min. | 0 | 1 | 255 |
| | EP | Exit to level 1 | | | | |

* According to wizard.
[1)] It can only be modified using the configuration wizard (InI).

### Evaporator fans

| Level 1 | Level 2 | Description | Values | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| FAn | F0 | Shutdown temperature of fans | °C/°F | -50 | 45 | 50 |
| | F1 | Probe 2 differential if fans are shut down | °C/°F | 0.1 | 2.0 | 20.0 |
| | F2 | Status of fans during compressor off cycle; **0**=Shut down, **1**=Running, **2**=Cycling | | 0 | 0 | 2 |
| | F3 | Status of the fans during the defrost: **0**=Shut down; **1**=Running | | 0 | 0 | 1 |
| | F4 | Delay of start-up after defrost (If F3=0)<br>It will only actuate if it is higher than **d9** | Min. | 0 | 2 | 99 |
| | F5 | Fan stop evaporator temperature | °C / °F | -50 | 50 | 50 |
| | F6 | Fan ON Cycle | Min. | 0 | 2 | 15 |
| | F7 | Fan OFF Cycle | Min. | 0 | 2 | 15 |
| | EP | Exit to level 1 | | | | |

### Alarms

| Level 1 | Level 2 | Description | Values | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| AL | A0 | Configuration of the temperature alarms: **0**=Relative to SP, **1**=Absolute | | 0 | 1 | 1 |
| | A1 | Alarm for maximum in probe 1 (It should be higher than the SP) | °C/°F | A2 | 99 | 99 |
| | A2 | Alarm for minimum in probe 1 (It should be lower than the SP) | °C/°F | -50 | -50 | A1 |
| | A3 | Delay of temperature alarms in the start-up | Min. | 0 | 0 | 120 |
| | A4 | Delay of temperature alarms from the end of a defrost | Min. | 0 | 0 | 99 |
| | A5 | Delay of temperature alarms from when the **A1** or **A2** value is reached | | 0 | 30 | 99 |
| | A6 | Delay of the external alarm/Severe external alarm on receiving a signal in digital input (**I10** or **I20** = 2 or 3) | Min. | 0 | 0 | 120 |
| | A7 | Delay of external alarm deactivation/Severe external alarm deactivation when the signal in digital input disappears (**I10** or **I20** = 2 or 3) | Min. | 0 | 0 | 120 |
| | A8 | Show warning if the defrost ends for maximum time: **0**=No, **1**=Yes | | 0 | 0 | 1 |
| | A9 | Relay alarm polarity<br>**0**= Relay ON in alarm (OFF without alarm); **1**= Relay OFF in alarm (ON without alarm) | | 0 | 0 | 1 |
| | A10 | Differential of temperature alarms (**A1** and **A2**) | °C/°F | 0.1 | 1.0 | 20.0 |
| | A12 | Delay of open door alarm (If **I10** or **I20**=1) | Min. | 0 | 10 | 120 |
| | EP | Exit to level 1 | | | | |

### Basic configuration

| Level 1 | Level 2 | Description | Values | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| bcn | b00 | Delay of all functions on receiving power supply | Min. | 0 | 0 | 255 |
| | b01 | Cold room light timing | Min. | 0 | 0 | 999 |
| | b10 | Function of password<br>**0**=Inactive, **1**=Block access to parameters, **2**=Block keypad | | 0 | 0 | 2 |
| | PAS | Access code (Password) | | 0 | 0 | 99 |
| | b20 | MODBUS address | | 0 | 1 | 247 |
| | b21 | Communication speed:<br>**0**=9600 bps, **1**=19200 bps, **2**=38400 bps, **3**=57600 bps | bps | 0 | 1 | 3 |
| | b22 | Acoustic alarm enabled: **0**= No, **1**=Yes | | 0 | 1 | 1 |
| | Unt | Work units: **0**=°C, **1**=°F | | 0 | 1 | 1 |
| | EP | Exit to level 1 | | | | |

### Inputs and outputs

| Level 1 | Level 2 | Description | Values | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| In0 | I00 | Connected probes<br>**1**=Probe 1 (Cold room), **2**=Probe 1 (Cold room) + Probe 2 (Evaporator) | | 1 | 2 | 2 |
| | I10[1)] | Configuration of digital input 1<br>**0**= Deactivated, **1**=Door contact, **2**=External alarm,<br>**3**=Severe external alarm, **4**=Change of SP, **5**=Remote defrost,<br>**6**=Defrost block, **7**= Low pressure switch, **8**=Remote Stand-by | | 0 | * | 8 |
| | I11 | Polarity of the digital input 1<br>**0**=Activates on closing contact; **1**=Activates on opening contact | | 0 | * | 1 |
| | I20 | Configuration of digital input 2<br>**0**= Deactivated, **1**=Door contact, **2**=External alarm,<br>**3**=Severe external alarm, **4**=Change of SP, **5**=Remote defrost,<br>**6**=Defrost block, **7**=Register probe, **8**=Probe 2° evaporator[2)],<br>**9**=High pressure switch for Hot Gas, **10**=Remote Stand-by | | 0 | 0 | 10 |
| | I21 | Polarity of the digital input 2<br>**0**=Activates on closing contact; **1**=Activates on opening contact | | 0 | 0 | 1 |
| | o00[1)] | Configuration of relay AUX1<br>**0**=Deactivated, **1**=Compressor/Resistor sump, **2**=Light, **3**=Virtual control,<br>**4**=Alarm[3)] | | 0 | * | 4 |
| | o10 | Configuration of relay AUX2[2)]<br>**0**=Deactivated, **1**=Alarm, **2**=Light, **3**=Virtual control,<br>**4**=Door frame resistance, **5**=Defrost 2° evaporator,<br>**6**=Same as solenoid status, **7**=Same as unit status | | 0 | 2 | 7 |
| | EP | Exit to level 1 | | | | |

* According to wizard.
[1)] It can only be modified using the configuration wizard (InI).
[2)] Not available in AK-RC 204B
[3)] Available in AK-RC 204B only

### HACCP alarm

| Level 1 | Level 2 | Description | Values | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| HCP | h1 | Maximum temperature of HACCP alarm | °C/°F | -50 | 99 | 99 |
| | h2 | Maximum permitted time for activation of the HACCP alarm (**0**=Disabled) | H. | 0 | 0 | 255 |
| | EP | Exit to level 1 | | | | |


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**Information (reading only)**

| Level 1 | Level 2 | Description | Values | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| tid | InI | Option chosen in the configuration wizard | | | | |
| | Pd[1)] | Pump down active? **0**=No, **1**=Yes | | | | |
| | PU | Program version | | | | |
| | Pr | Program revision | | | | |
| | bU | Bootloader version | | | | |
| | br | Bootloader revision | | | | |
| | PAr | Parameter map revision | | | | |
| | EP | Exit to level 1 | | | | |

[1)] It can only be modified using the configuration wizard (InI).

**Messages**

| Messages | | A | R |
|---|---|---|---|
| Pd | Pump down malfunction error (Shutdown) | | |
| LP | Pump down malfunction error (Start-up) | | |
| E1/E2/E3 | Probe 1/2/3 failure (Open circuit, crossed circuit or temperature outside the limits of the probe) (Equivalent limits in °F) | • | • |
| Ad0 | Open door alarm. Only if the door stays open for a greater time than is indicated in parameter **A12** | • | • |
| AH | Maximum temperature alarm in control probe. The temperature value programmed in **A1** has been reached | • | • |
| AL | Minimum temperature alarm in control probe. The temperature value programmed in **A2** has been reached | • | • |
| AE | External alarm activated (by digital input) | • | • |
| AES | Severe external alarm activated (by digital input) | • | • |
| Adt | Defrost alarm concluded due to time-out. The time established in **d1** has been exceeded | | |
| HCP | HACCP alarm. The temperature has reached the value of parameter **h1** during a longer period than has been established in **h2** | • | • |
| hCP + PF | HACCP alarm due to a fault in the power supply. The temperature established in **h1** has been reached following a fault in the power supply | • | • |
| dEF | Indicates that a defrost is being performed | | |
| PAS | Access code (Password) request. See parameters **b10** and **PAS** | | |
| S1 - S2 | **Shown sequentially with the temperature:** The controller is in demo mode, the configuration has not been made. | | |

**A:** Activates the acoustic alarm
**R:** Activates the alarm relay

## Technical specifications

| Features | | Specifications |
|---|---|---|
| Power supply | | 230 V~ ± 10%, 50 Hz ± 5% |
| Maximum input power in the operation | | 6.3 VA |
| Maximum nominal current | | 15 A |
| Relay SSV / DEFROST - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relay FAN - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relay COOL - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relay AUX 1 - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relay AUX 2 - SPDT - 16 A | NO | EN60730-1: 12 (9) A 250 V~ |
| | NC | EN60730-1: 10 (8) A 250 V~ |
| No. of relay operations | | EN60730-1:100.000 operations |
| Probe temperature range | | -50.0 – +99.9 °C |
| Resolution, setting and differential | | 0.1 °C |
| Thermometric precision | | ±1 °C |
| Loading tolerance of the NTC probe at 25 °C | | ±0.4 °C |
| Working ambient temperature | AK-RC 204B | -10 – +50 °C |
| | AK-RC 205C | -10 – +45 °C |
| Storage ambient temperature | | -30 – +60 °C |
| Protection degree | | IP 65 |
| Installation category | | II s/ EN 60730-1 |
| Pollution degree | | II s/ EN 60730-1 |
| Control device classification | | Built-in assembly, with Type 1.B automatic operation action feature, for use in clean situations, logical support (Software) class A and continuous operation. Degree of contamination 2 acc. to UNE-EN 60730-1.<br>Double isolation between power supply, secondary circuit and relay output. |
| Temperature during ball-pressure test | | Accessible parts: 75 °C<br>Parts which position active elements: 125 °C |
| Current of radio jamming suppression tests | | 270 mA |
| Voltage and current as per EMC tests | | 207 V, 17 mA |
| Type of assembly | | Fixed internal |
| MODBUS address | | Shown on label |
| Dimensions | | 290 mm (W) x 141 mm (H) x 84.4 mm (D) |
| Internal buzzer | | Yes |

## Ordering

### Controller

| Model | Description | Comments | Code no. |
|---|---|---|---|
| AK-RC 204B | AK-RC 204B Gen. 2,5 O/P, Single phase | Includes:<br>• 1 x 1.5 m, NTC 10K sensor<br>• 1 x 3 m, NTC 10K sensor | 080Z5001 |
| AK-RC 205C | AK-RC 205C Gen. 2,5 O/P, Single phase | | 080Z5002 |

**Accessories** (for spares and replacement purposes):

| Name | Features | Qty | Code no. |
|---|---|---|---|
| 3.5 m, NTC 10K Sensor | Thermo plastic rubber probe | 1 | 084N3210 |
| 8.5 m, NTC 10K sensor | Thermo plastic rubber probe | 50 | 084N3208 |
| 1.5 m, NTC 10K sensor | Stainless steel probe | 150 | 084N3200 |


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**ESPAÑOL**

Controlador de temperatura para cuartos fríos y congeladores
Tipo **AK-RC 204B** y **AK-RC 205C**





## ⚠ Warnings

- Utilizar el equipo no respetando las instrucciones del fabricante, puede alterar los requisitos de seguridad del aparato. Para el funcionamiento correcto del mismo sólo deberán utilizarse sondas de las suministradas por Danfoss.
- Entre –40 °C y +20 °C, si se prolonga la sonda NTC hasta 1000 m con cable de mínimo 0.5 mm², la desviación máxima será de 0.25 °C.
- Debe ser instalado en un sitio protegido de las vibraciones, del agua y de los gases corrosivos, donde la temperatura ambiente no supere el valor reflejado en los datos técnicos.
- Para que la lectura sea correcta, la sonda debe ubicarse en un sitio sin influencias térmicas ajenas a la temperatura que se desea medir o controlar.
- El grado de protección IP65 solo es válido con la tapa protectora cerrada.
- El grado de protección IP65 sólo es válido si la entrada de cables al equipo se realiza mediante tubo para conducciones eléctricas + prensastopas con IP65 o superior. El tamaño de los prensastopas debe ser el adecuado para el diametro de tubo utilizado.
- No rociar directamente el equipo con mangueras de alta presión, puede resultar dañado.

**IMPORTANTE:**

- **Antes de comenzar la instalación, debe seguir el consejo de las normas locales vigentes.**
- Los relés AUXILIARES son programables, su funcionamiento depende de la configuración.
- La función de las entradas digitales depende de la configuración.
- Las intensidades y potencias indicadas son las máximas de trabajo admitidas.

## Conexionado

⚡ Desconectar siempre la alimentación para realizar el conexionado.
Las sondas y sus cables **NUNCA** deben instalarse en una conducción junto con cables de potencia, control o alimentación.

El circuito de alimentación debe estar provisto de un interruptor para su desconexión de mínimo 2 A, 230 V, situado cerca del aparato. El cable de alimentación será del tipo H05VV-F o NYM 1x16/3. La sección a utilizar dependerá de la normativa local vigente, pero nunca deberá ser inferior a 2.5 mm².

Los cables para las salidas de los relés o contactor deben tener una sección de 2.5 mm², deben admitir temperaturas de trabajo iguales o superiores a 70 °C y se deben instalar minimizando su flexión.

La zona de conexión a 120 / 230 V~ debe mantenerse despejada de cualquier elemento externo.

**El conexionado a realizar depende del tipo de instalación. Utilice el esquema adecuado en función de la opción escogida en el asistente. Consulte las opciones disponibles en la hoja de esquemas adjunta.**
**Asistente se refiere a una herramienta integrada para guiar al usuario a través del proceso de configuración.**

## Mantenimiento

- Limpie la superficie del equipo con un paño suave, agua y jabón.
- No utilice detergentes abrasivos, gasolina, alcohol o disolventes, el equipo puede resultar dañado.

## Teclado

ESC — Pulsando durante 3 segundos, activa / desactiva el modo Stand-By. En este modo la regulación se detiene y el display muestra el icono ⏻. En el menú de programación, sale del parámetro sin guardar cambios, retrocede al nivel anterior o sale de programación.

▲ — Una pulsación corta muestra la temperatura de la sonda S2 durante 10 segundos (Si está habilitada).
Pulsando durante 3 segundos, inicia / detiene el desescarche.
En el menú de programación, permite desplazarse por los diferentes niveles, o, durante el ajuste de un parámetro, variar el valor del mismo.

▼ — Pulsando durante 3 segundos, activa / desactiva el modo ciclo contínuo.
En el menú de programación, permite desplazarse por los diferentes niveles, o, durante el ajuste de un parámetro, variar el valor del mismo.

SET — Una pulsación corta activa / desactiva la luz de la cámara.
Pulsando durante 3 segundos, accede al menú de programación reducido.
Pulsando durante 6 segundos, accede al menú de programación extendido.
En el menú de programación, accede al nivel mostrado en pantalla o, durante el ajuste de un parámetro, acepta el nuevo valor.

SP — Una pulsación corta muestra el valor efectivo actual del Set Point, teniendo en cuenta las modificaciones temporales por otros parámetros (**C10** ó **C12**).
Con una alarma en curso, una pulsación corta silencia la alarma acústica.
Pulsando durante 3 segundos, accede al ajuste del Set Point.

## Indicadores

**Fijo:** Modo Stand-By activo, la regulación está detenida.
**Intermitente:** Proceso de paro controlado de la regulación en curso.

**Fijo:** Puerta de la cámara abierta.
**Intermitente:** La puerta lleva abierta un tiempo superior al definido en el parámetro **A12**.

Hay una alarma activa, pero no de HACCP.

**Fijo:** Alarma HACCP activa.
**Intermitente:** Alarma de HACCP registrada y sin confirmar. Para confirmar una alarma HACCP, pulsar la tecla 🔇.

**Fijo:** Ventiladores de evaporador activos.
**Intermitente:** Los ventiladores de evaporador deberían estar activos pero algún retardo se lo impide.

**Fijo:** La solenoide de frío esta activa.
**Intermitente:** La solenoide debería estar activa pero algún retardo o protección se lo impide.

**Fijo:** Compresor activo.
**Intermitente:** El compresor debería estar activo pero algún retardo o protección se lo impide.

Relé de desescarche activo.

Modo ciclo contínuo activo.

Luz de la cámara activa.

Alarma en curso silenciada.

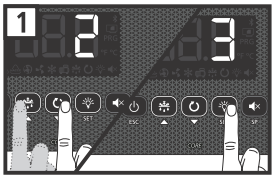
°F °C — Temperatura indicada en °Fahrenheit / °Centigrados.

PRG — Modo de programación activo.

**STAND-BY**
Si la regulación no puede detenerse al instante debido a su configuración, se inicia un proceso de paro controlado y el icono ⏻ parpadea. Para detener el proceso de paro controlado y forzar el paso a Standby, pulsar la tecla Stand-by de nuevo durante 3 segundos.


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## Configuración inicial (asistente)



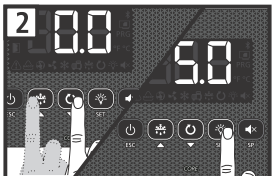

Al recibir alimentación por primera vez, el equipo entra en modo ASISTENTE. El display muestra el mensaje *InI* intermitente con **0**.

**Paso 1:**
Seleccionar la opción InI adecuada según el tipo de instalación a realizar y pulsar **SET**. Las opciones disponibles se muestran en la siguiente tabla:

| InI | Tipo de instalación | | | | Parámetros | | | | | | | | | | Esquema a utilizar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Regulación del frío | Pump Down | Desescarche | Ventiladores evaporador | Pd | o00 | I00 | I10 | I11 | I20 | I21 | d1 | d7 | F3 | |
| 0 | Modo demo, muestra temperatura en display pero no regula temperatura ni activa relés. | | | | | | | | | | | | | | |
| 1 | Solenoide | No | Eléctrico | Si | 0 | * | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | A |
| 2 | Solenoide + compresor | Si | Eléctrico | Si | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 20 | 0 | 0 | B |
| 3 | Solenoide + compresor | No | Eléctrico | Si | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | B |
| 4 | Solenoide | No | Aire | Si | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | A |
| 5 | Solenoide + compresor | Si | Aire | Si | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | 1 | B |
| 6 | Solenoide + compresor | No | Aire | Si | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | B |
| 7 | Solenoide + compresor | Si | Hot gas | Si | 1 | 1 | 2 | 7 | 1 | 9 | 1 | 5 | 2 | 0 | C |
| 8 | Solenoide + compresor | No | Hot gas | Si | 0 | 1 | 2 | 0 | 0 | 9 | 1 | 5 | 2 | 0 | C |
| 9 | Solenoide + compresor | Si | Inversión de ciclo | Si | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 5 | 3 | 0 | D |
| 10 | Solenoide + compresor | No | Inversión de ciclo | Si | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | D |
| 11 | Solenoide | No | Estático | No | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | A |
| 12 | Solenoide + compresor | Si | Estático | No | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | - | B |
| 13 | Solenoide + compresor | No | Estático | No | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | B |

*** o00=2** en AK-RC 204B, **o00=0** en AK-RC 205C

**Nota:** En caso de escoger las opciones 2, 5, 7, 9 ó 12, revisar a configuración del parámetro I11 en función del presostato utilizado. (Ver esquema incluido en el equipo).




**Paso 2:**
Introducir el valor del punto de ajuste (Set Point) deseado mediante las teclas ▲ y ▼ y pulsar **SET**.
El asistente de configuración ha finalizado, el equipo comienza a regular la temperatura.

Si no es la primera vez que se ejecuta el asistente, al finalizar el último paso, el display muestra el mensaje **dFp** (parametros por defecto) pudiendo elegir entre dos opciones:
**0**: Sólo se modifican los parámetros que afectan al asistente, el resto permanecen igual.
**1**: Todos los parámetros retornan a su valor de fábrica excepto los modificados por el asistente.

**Importante:** El asistente de configuración no vuelve a activarse. Para activarla de nuevo, activar el modo Stand-By (pulsando la tecla ⏻ durante 3 segundos) y esperar a que el equipo detenga la regulación completamente (El indicador ⏻ se ilumina de forma permanente) y pulsar en este orden las siguientes teclas (una detrás de otra, no a la vez) ▲, ▼, **SET**.

⚠ **Advertencia:** Si la función recogida de gas está activa, puede transcurrir un cierto tiempo desde que iniciamos la función Stand-by hasta que el controlador se detiene.

## Configuración

**Menu de programación reducido**
Permite configurar rápidamente los parámetros más utilizados (**SP**, **C1**, **d0**, **d1**, **d4**, **F3**, **A1** y **A2**). Para acceder, pulsar la tecla **SET** durante 3 segundos.

**Menú de programación extendido**
Mediante el menú de programación extendido, podrá configurar todos los parámetros del equipo para adaptarlo a las necesidades de su instalación. Para acceder, pulsar la tecla **SET** durante 6 segundos.

**Importante:**
- Si se ha configurado la función del código de acceso como bloqueo del teclado (**b10**=2), o como bloqueo acceso a parámetros (**b10**=1) al intentar acceder a cualquiera de las dos funciones, se solicitará la introducción del código de acceso programado en **PAS**. Si el código introducido no es correcto, el equipo volverá a mostrar la temperatura.
- Determinados parámetros o menús pueden no ser visibles en función de la configuración del resto de parámetros.

**Regulación y control**

| Nivel 1 | Nivel 2 | Descripción | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| rE | SP | Ajuste de temperatura (Set Point) | °C/°F | -50 | 0.0 | 99 |
| | C0 | Calibración de la sonda 1 (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | C1 | Diferencial de la sonda 1 (Histéresis) | °C/°F | 0.1 | 2.0 | 20.0 |
| | C2 | Bloqueo superior del punto de ajuste (no se podrá fijar por encima de este valor) | °C/°F | C3 | 99 | 99 |
| | C3 | Bloqueo inferior del punto de ajuste (no se podrá fijar por debajo de este valor) | °C/°F | -50 | -50 | C2 |
| | C4 | Tipo de retardo para protección del compresor:<br>**0**=Tiempo mínimo del compresor en OFF<br>**1**=Tiempo mínimo del compresor en OFF y en ON en cada ciclo | | 0 | 0 | 1 |
| | C5 | Tiempo de retardo de la protección (Valor de la opción elegida en parámetro C4) | Min. | 0 | 0 | 120 |
| | C6 | Estado del relé COOL con fallo en sonda 1:<br>**0**=OFF; **1**=ON; **2**=Media según últimas 24h previas al error de sonda;<br>**3**=ON-OFF según prog. C7 y C8 | | 0 | 2 | 3 |
| | C7 | Tiempo del relé en ON en caso de sonda 1 averiada<br>(Si C7=0 y C8≠0, el relé estará siempre en OFF desconectado) | Min. | 0 | 10 | 120 |
| | C8 | Tiempo del relé en OFF en caso de sonda 1 averiada<br>(Si C8=0 y C7≠0, el relé estará siempre en ON conectado) | Min. | 0 | 5 | 120 |
| | C9 | Duración máxima del modo de ciclo contínuo. (**0**=desactivado) | H. | 0 | 0 | 48 |
| | C10 | Variación del punto de ajuste (SP) en modo de ciclo continuo, una vez llegado a este punto (SP+C10), vuelve al modo normal. (SP+C10 ≥ C3).<br>El valor de este parámetro es siempre negativo, excepto si es 0. (**0**=OFF) | °C/°F | 0 | -50 | C3-SP |
| | C12 | Variación del punto de ajuste (SP) cuando la función cambio de Set point está activa. (SP+C12 ≤ C2) (**0**= desactivado) | °C/°F | C3-SP | 0.0 | C2-SP |
| | C19 | Tiempo máximo para arranque desde recogida de gas<br>(No se aceptan valores entre 1 y 9 segundos) (**0**=desactivado) | Sec. | 0 | 0 | 120 |
| | C20 | Tiempo máximo de recogida de gas (**0**=desactivado) | Min. | 0 | 0 | 15 |
| | C21 | Sonda a visualizar: **0**=Todas las sondas (secuencial)<br>**1**=Sonda 1 (Cámara), **2**=Sonda 2 (Evaporador), **3**=Sonda 3 (Según **I20**) | | 0 | 1 | 3 |
| | C22 | Parar ventiladores y compresor al abrir puerta; **0**=No, **1**=Si | | 0 | 0 | 1 |
| | C23 | Retardo de arranque de ventiladores y compresor con puerta abierta | Min. | 0 | 0 | 999 |
| | C27 | Calibración de la sonda 3 (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | EP | Salida a nivel 1 | | | | |


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### Desescarche

| Nivel 1 | Nivel 2 | Descripción | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| dEF | d0 | Frecuencia de desescarche (Tiempo entre 2 inicios) | H. | 0 | 6 | 96 |
| | d1 | Duración máxima del desescarche (**0**=desescarche desactivado) | Min. | 0 | * | 255 |
| | d2 | Tipo de mensaje durante el desescarche:<br>**0**=Muestra la temperatura real; **1**=Muestra la temperatura al inicio del desescarche; **2**=Muestra el mensaje dEF | | 0 | 2 | 2 |
| | d3 | Duración máxima del mensaje<br>(Tiempo añadido al final del proceso de desescarche) | Min. | 0 | 5 | 255 |
| | d4 | Temperatura final de desescarche (por sonda ) (Si I00 ≠ 1) | °C/°F | -50 | 8.0 | 50 |
| | d5 | Desescarche al conectar el equipo:<br>**0**=NO Primer desescarche según d0; **1**=SI, Primer desescarche según d6 | | 0 | 0 | 1 |
| | d6 | Retardo de inicio del desescarche al conectar el equipo | Min. | 0 | 0 | 255 |
| | d7[1)] | Tipo de desescarche:<br>**0**=Resistencias; **1**=Aire / ventiladores, **2**=Hot gas; **3**=Inversión de ciclo | | 0 | * | 3 |
| | d8 | Cómputo de tiempo entre períodos de desescarche:<br>**0**=Tiempo real total, **1**=Suma de tiempo del compresor conectado | | 0 | 0 | 1 |
| | d9 | Tiempo de goteo al finalizar un desescarche (Paro de compresor y ventiladores) | Min. | 0 | 1 | 255 |
| | EP | Salida a nivel 1 | | | | |

* Según asistente de configuración.
[1)] Solo se puede modificar mediante el asistente de configuración (InI).

### Ventiladores de evaporador

| Nivel 1 | Nivel 2 | Descripción | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| FAn | F0 | Temperatura de paro de los ventiladores | °C/°F | -50 | 45 | 50 |
| | F1 | Diferencial de la sonda 2 si los ventiladores están parados | °C/°F | 0.1 | 2.0 | 20.0 |
| | F2 | Estado de los ventiladores durante el ciclo de apagado del compresor;<br>**0**=Apagar, **1**=En funcionamiento, **2**= Ciclismo | | 0 | 0 | 2 |
| | F3 | Estado de los ventiladores durante el desescarche: **0**=Parados; **1**=En marcha | | 0 | 0 | 1 |
| | F4 | Retardo de arranque después del desescarche (Si F3=0)<br>Solo actúa si es superior a **d9** | Min. | 0 | 2 | 99 |
| | F5 | Parada del ventilador Temperatura del evaporador | °C / °F | -50 | 50 | 50 |
| | F6 | Ciclo de encendido del ventilador | Min. | 0 | 2 | 15 |
| | F7 | Ciclo de apagado del ventilador | Min. | 0 | 2 | 15 |
| | EP | Salida a nivel 1 | | | | |

### Alarmas

| Nivel 1 | Nivel 2 | Descripción | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| AL | A0 | Configuración de las alarmas de temperatura; **0**=Relativa al SP, **1**=Absoluta | | 0 | 1 | 1 |
| | A1 | Alarma de máxima en sonda 1 (Debe ser mayor que el SP) | °C/°F | A2 | 99 | 99 |
| | A2 | Alarma de mínima en sonda 1 (Debe ser menor que el SP) | °C/°F | -50 | -50 | A1 |
| | A3 | Retardo de alarmas de temperatura en la puesta en marcha | Min. | 0 | 0 | 120 |
| | A4 | Retardo de alarmas de temperatura desde que finaliza un desescarche | Min. | 0 | 0 | 99 |
| | A5 | Retardo de alarmas de temperatura desde que se alcanza el valor de **A1** o **A2** | | 0 | 30 | 99 |
| | A6 | Retardo de alarma externa / Alarma externa severa al recibir señal en entrada digital (**I10** ó **I20** =2 ó 3) | Min. | 0 | 0 | 120 |
| | A7 | Retardo de desactivación de alarma externa / Alarma externa severa al desaparecer la señal en entrada digital (**I10** ó **I20**=2 ó 3) | Min. | 0 | 0 | 120 |
| | A8 | Mostrar aviso si el desescarche finaliza por tiempo máximo; **0**=No, **1**=Si | | 0 | 0 | 1 |
| | A9 | Polaridad relé alarma<br>**0**=Relé ON en alarma (OFF sin alarma); **1**=Relé OFF en alarma (ON sin alarma) | | 0 | 0 | 1 |
| | A10 | Diferencial de alarmas de temperatura (**A1** y **A2**) | °C/°F | 0.1 | 1.0 | 20.0 |
| | A12 | Retardo de alarma de puerta abierta (Si **I10** ó **I20**=1) | Min. | 0 | 10 | 120 |
| | EP | Salida a nivel 1 | | | | |

### Configuración básica

| Nivel 1 | Nivel 2 | Descripción | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| bcn | b00 | Retardo de todas las funciones al recibir alimentación eléctrica | Min. | 0 | 0 | 255 |
| | b01 | Temporización luz cámara | Min. | 0 | 0 | 999 |
| | b10 | Función del código de acceso (Password)<br>**0**=Inactivo, **1**=Bloqueo acceso a parámetros, **2**=Bloqueo del teclado | | 0 | 0 | 2 |
| | PAS | Código de acceso (Password) | | 0 | 0 | 99 |
| | b20 | Dirección MODBUS | | 0 | 1 | 247 |
| | b21 | Velocidad de comunicación:<br>**0**=9600 bps, **1**=19200 bps, **2**=38400 bps, **3**=57600 bps | bps | 0 | 1 | 3 |
| | b22 | Alarma acústica habilitada: **0**= No, **1**=Si | | 0 | 1 | 1 |
| | Unt | Unidades de trabajo: **0**=°C, **1**=°F | | 0 | 1 | 1 |
| | EP | Salida a nivel 1 | | | | |

### Entradas y salidas

| Nivel 1 | Nivel 2 | Descripción | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| In0 | I00 | Sondas conectadas<br>**1**=Sonda 1 (Cámara), **2**=Sonda 1 (Cámara) + Sonda 2 (Evaporador) | | 1 | 2 | 2 |
| | I10[1)] | Configuración de la entrada digital 1<br>**0**=Desactivada, **1**=Contacto puerta, **2**=Alarma externa,<br>**3**=Al. externa severa, **4**=Cambio de SP, **5**=Desescarche remoto,<br>**6**=Bloqueo de desescarche, **7**=Presostato de baja, **8**=Stand-by remoto | | 0 | * | 8 |
| | I11 | Polaridad de la entrada digital 1<br>**0**=Activa al cerrar contacto; **1**=Activa al abrir contacto | | 0 | * | 1 |
| | I20 | Configuración de la entrada 2<br>**0**=Desactivada, **1**=Contacto puerta, **2**=Alarma externa,<br>**3**=Al. externa severa, **4**=Cambio de SP, **5**=Desescarche remoto,<br>**6**=Bloqueo de desescarche, **7**=Sonda de registro, **8**=Sonda 2° evaporador[2)],<br>**9**=Presostato de alta para Hot Gas, **10**=Stand-by remoto | | 0 | 0 | 10 |
| | I21 | Polaridad de la entrada digital 2<br>**0**=Activa al cerrar contacto; **1**=Activa al abrir contacto | | 0 | 0 | 1 |
| | o00[1)] | Configuración del relé AUX1<br>**0**=Desactivado, **1**=Compresor/Resistencia cárter, **2**=Luz, **3**=Control virtual,<br>**4**=Alarma[3)] | | 0 | * | 4 |
| | o10 | Configuración del relé AUX2[2)]<br>**0**=Desactivado, **1**=Alarma, **2**=Luz, **3**=Control virtual,<br>**4**=Resitencia marco puerta, **5**=Desescarche 2° evaporador,<br>**6**=Igual estado solenoide, **7**=Igual estado equipo | | 0 | 2 | 7 |
| | EP | Salida a nivel 1 | | | | |

* Según asistente de configuración.
[1)] Solo se puede modificar mediante el asistente de configuración (InI).
[2)] No disponible en AK-RC 204B
[3)] Disponible solo en AK-RC 204B

### Alarma HACCP

| Nivel 1 | Nivel 2 | Descripción | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| HCP | h1 | Temperatura máxima alarma HACCP | °C/°F | -50 | 99 | 99 |
| | h2 | Tiempo máximo admitido para activación de alarma HACCP<br>(**0**=Deshabilitada) | H. | 0 | 0 | 255 |
| | EP | Salida a nivel 1 | | | | |


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**Información (Solo lectura)**

| Nivel 1 | Nivel 2 | Descripción | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| tid | InI | Opción escogida en el asistente de configuración | | | | |
| | Pd[1)] | Recogida de gas activa? **0**=No, **1**=Si | | | | |
| | PU | Versión de programa | | | | |
| | Pr | Revisión de programa | | | | |
| | bU | Versión de bootloader | | | | |
| | br | Revisión de bootloader | | | | |
| | PAr | Revisión de mapa de parámetros | | | | |
| | EP | Salida a nivel 1 | | | | |

[1)] Solo se puede modificar mediante el asistente de configuración (InI).

**Mensajes**

| Mensajes | | A | R |
|---|---|---|---|
| Pd | Error de funcionamiento de la recogida de gas (Paro) | | |
| LP | Error de funcionamiento de la recogida de gas (Arranque) | | |
| E1/E2/E3 | Sonda 1/2/3 averiada (Circuito abierto, cruzado, o temperatura fuera de los límites de la sonda)<br>(Límites equivalentes en °F) | • | • |
| Ad0 | Alarma de puerta abierta. Sólo si la puerta permanece abierta un tiempo superior al indicado en el parámetro **A12** | • | • |
| AH | Alarma de temperatura máxima en sonda de control. Se ha alcanzado el valor de temperatura programado en **A1** | • | • |
| AL | Alarma de temperatura mínima en sonda de control. Se ha alcanzado el valor de temperatura programado en **A2** | • | • |
| AE | Alarma externa activada (por entrada digital) | • | • |
| AES | Alarma externa severa activada (por entrada digital) | • | • |
| Adt | Alarma de desescarche finalizado por tiempo, se ha superado el tiempo definido en **d1**. | | |
| HCP | Alarma HACCP, la temperatura ha alcanzado el valor del parámetro **h1** durante un tiempo superior al definido en **h2**. | • | • |
| hCP + PF | Alarma HACCP por fallo en el suministro eléctrico, se ha alcanzado la temperatura definida en **h1** después de un fallo en el suministro eléctrico. | • | • |
| dEF | Indica que se está efectuando un desescarche | | |
| PAS | Petición de código de acceso (Password). Ver parámetros **b10** y **PAS** | | |
| S1 - S2 | **Mostrados de forma secuencial con la temperatura:** El controlador está en modo demo, la configuración no se ha realizado. | | |

**A:** Activa la alarma acústica
**R:** Activa el relé de alarma

## Especificaciones técnicas

| Características | | Especificaciones |
|---|---|---|
| Alimentación | | 230 V~ ± 10%, 50 Hz ± 5% |
| Potencia máxima absorbida en la maniobra | | 6.3 VA |
| Intensidad máxima nominal | | 15 A |
| Relé SSV / DEFROST - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relé FAN - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relé COOL - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relé AUX 1 - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relé AUX 2 - SPDT - 16 A | NO | EN60730-1: 12 (9) A 250 V~ |
| | NC | EN60730-1: 10 (8) A 250 V~ |
| Nº de operaciones de los relés | | EN60730-1:100.000 operaciones |
| Rango de temperatura de la sonda | | -50.0 a +99.9 °C |
| Resolución, ajuste y diferencial | | 0.1 °C |
| Precisión termométrica | | ±1 °C |
| Tolerancia de la sonda NTC a 25 °C | | ±0.4 °C |
| Temperatura ambiente de trabajo | AK-RC 204B | -10 – +50 °C |
| | AK-RC 205C | -10 – +45 °C |
| Temperatura ambiente de almacenaje | | -30 – +60 °C |
| Grado de protección | | IP 65 |
| Categoría de instalación | | II s/ EN 60730-1 |
| Grado de polución | | II s/ EN 60730-1 |
| Clasificación | | Conjunto incorporado, con función de acción de operación automática Tipo 1.B, para uso en situaciones limpias, soporte lógico (Software) clase A y operación continua. Grado de contaminación 2 según a UNE-EN 60730-1.<br>Aislamiento doble entre alimentación, circuito secundario y salida relé. |
| Temperatura del ensayo de la bola de presión | | Partes accesibles: 75 °C<br>Partes que posicionan elementos activos: 125 °C |
| Corriente de ensayo de supresión de radiointerferencias | | 270 mA |
| Tensión y corriente declarados por los ensayos de EMC | | 207 V, 17 mA |
| Tipo de montaje | | Interior fijo |
| Dirección MODBUS | | Indicada en la etiqueta |
| Dimensiones | | 290 mm (W) x 141 mm (H) x 84.4 mm (D) |
| Zumbador interno | | Si |

## Pedidos

### Controlador

| Modelo | Descripción | Comentarios | Numero de código. |
|---|---|---|---|
| AK-RC 204B | AK-RC 204B Gen. 2,5 O/P, Monofásico | Incluye:<br>• 1 x 1.5 m, NTC 10K sensor<br>• 1 x 3 m, NTC 10K sensor | 080Z5001 |
| AK-RC 205C | AK-RC 205C Gen. 2,5 O/P, Monofásico | | 080Z5002 |

**Accesorios** (para partes de repuesto y expansión):

| Nombre | Caracteristicas | Cantidad | Numero de código. |
|---|---|---|---|
| 3.5 m, NTC 10K Sensor | Sensor de Goma termoplástica | 1 | 084N3210 |
| 8.5 m, NTC 10K sensor | Sensor de Goma termoplástica | 50 | 084N3208 |
| 1.5 m, NTC 10K sensor | Sensor de acero inoxidable | 150 | 084N3200 |


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## FRANÇAIS

Régulateur de température pour chambres froides et congélateurs
Type **AK-RC 204B** et **AK-RC 205C**





### ⚠ Avertissements

- Le non-respect des instructions du fabricant lors de l'utilisation de l'appareil peut avoir une répercussion sur les conditions de sécurité. Pour un fonctionnement correct, n'utilisez que des sondes fournies par Danfoss.
- Entre –40 °C et +20 °C, si la sonde NTC est prolongée jusqu'à 1000 m avec un câble d'au moins 0.5 mm², l'écart maximum sera de 0.25 °C.
- L'équipement doit être installé dans un endroit à l'abri des vibrations, de l'eau et des gaz corrosifs, où la température ambiante ne dépasse pas la valeur indiquée dans les indications techniques.
- Pour que la lecture soit correcte, la sonde doit être placée dans un endroit à l'abri des influences thermiques autres que la température que vous souhaitez mesurer ou contrôler.
- Le degré de protection IP65 n'est valable que lorsque le couvercle de protection est fermé.
- Le degré de protection IP65 n'est valable que si l'entrée de câbles dans l'appareil est réalisée au moyen d'un tube pour conduites électriques + presse-étoupes possédant un degré de protection IP65 ou supérieur. La taille des presse-étoupes doit être adaptée au diamètre du tube utilisé.
- Ne pas asperger directement l'appareil avec des tuyaux haute pression pour éviter de l'endommager.

**IMPORTANT:**

- **Avant de commencer l'installation, vous devez prendre l'avis des réglementations locales en vigueur.**
- Les relais AUXILIAIRES sont programmables, leur fonctionnement dépend de la configuration.
- La fonction des entrées numériques dépend de la configuration.
- Les intensités et puissances indiquées sont les valeurs maximales de travail autorisées.

### Câblage

⚡ Coupez systématiquement l'alimentation avant de procéder au câblage.
Les sondes et leurs câbles **NE DOIVENT JAMAIS** être installés dans une conduite à côté de câbles électriques, de commande ou d'alimentation.

Le circuit d'alimentation doit être muni d'un interrupteur de déconnexion situé à proximité de l'appareil (2 A, 230 V minimum). Le câble d'alimentation doit être de type H05VV-F ou NYM 1x16/3. La section à utiliser dépend de la réglementation locale en vigueur. Toutefois, elle ne doit jamais être inférieure à 2.5 mm².

Les câbles des sorties des relais ou du contacteur doivent posséder une section de 2.5 mm², doivent pouvoir être exposés à des températures de travail supérieures ou égales à 70 °C et doivent être installés de manière à ce que leur flexion soit minimisée.

La zone de connexion à 120/230 V~ doit être maintenue dégagée de tout élément externe.

**Le câblage à réaliser dépend du type d'installation. Utilisez le schéma approprié en fonction de l'option choisie dans l'assistant. Consultez les options disponibles sur la feuille de schémas cijointe.**
**L'assistant fait référence à un outil intégré pour guider l'utilisateur tout au long du processus de configuration.**

### Maintenance

- Nettoyez la surface de l'appareil avec un chiffon doux, de l'eau et du savon.
- N'utilisez ni détergents abrasifs, ni essence, ni alcool ni solvants pour éviter d'endommager l'appareil.

## Clavier

ESC

Appuyez pendant 3 secondes pour activer/désactiver le mode Stand-By. Dans ce mode, le réglage s'arrête et l'écran affiche l'icône ⏻. Dans le menu de programmation, sortez du paramètre sans enregistrer les changements, revenez au niveau précédent ou sortez de la programmation.

Un appui court affiche la température de la sonde S2 pendant 10 secondes (Si elle est activée). Appuyez pendant 3 secondes pour démarrer/arrêter le dégivrage. Dans le menu de programmation, il est possible de se déplacer dans les différents niveaux ou, pendant le réglage d'un paramètre, de modifier sa valeur.

Appuyez pendant 3 secondes pour activer/désactiver le mode cycle continu.
Dans le menu de programmation, il est possible de se déplacer dans les différents niveaux ou, pendant le réglage d'un paramètre, de modifier sa valeur.

SET

Un appui court active/désactive la lumière de la chambre.
Appuyez pendant 3 secondes pour accéder au menu de programmation réduit. Appuyez pendant 6 secondes pour accéder au menu de programmation étendu. Dans le menu de programmation, pour accéder au niveau affiché à l'écran ou, pendant le réglage d'un paramètre, acceptez la nouvelle valeur.

SP

Un appui court affiche la valeur effective actuelle du Set Point, en tenant compte des modifications temporaires par d'autres paramètres (**C10** ou **C12**).
Avec une alarme en cours, un appui court coupe le son de l'alarme sonore.
Appuyez pendant 3 secondes pour accéder au réglage du Set Point.

## Indicateurs

**Fixe:** Mode Stand-By actif, le réglage est arrêté.
**Clignotant:** Processus d'arrêt contrôlé du réglage en cours.

**Fixe:** Porte de la chambre ouverte.
**Clignotant:** La porte est ouverte depuis une durée supérieure à celle définie dans le paramètre **A12**.

Il existe une alarme active, mais aucune d'HACCP.

**Fixe:** Alarme HACCP active.
**Clignotant:** Alarme d'HACCP enregistrée et non-confirmée. Pour confirmer une alarme HACCP, appuyez sur la touche 🔇×.

**Fixe:** Ventilateurs d'évaporateur actifs.
**Clignotant:** Les ventilateurs d'évaporateur devraient être actifs mais un retard les en empêche.

**Fixe:** Le solénoïde de froid est actif.
**Clignotant:** Le solénoïde devrait être actif mais un retard ou une protection l'en empêche.

**Fixe:** Compresseur actif.
**Clignotant:** Le compresseur devrait être actif mais un retard ou une protection l'en empêche.

Relais de dégivrage actif.

Mode cycle continu actif.

Lumière de la chambre active.

Alarme en cours en mode muet.

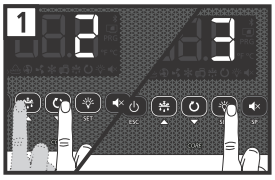
°F °C Température indiquée en °Fahrenheit / °Celsius.

PRG Mode de programmation actif.

**STAND-BY**
Si le réglage ne peut pas être arrêté immédiatement en raison de sa configuration, un processus d'arrêt contrôlé débute et l'icône ⏻ clignote. Pour stopper le processus d'arrêt contrôlé et forcer le passage en Stand-by, appuyer de nouveau sur la touche Stand-by pendant 3 secondes.


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## Configuration initiale



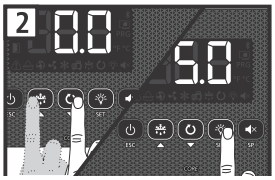

Lorsqu'il est alimenté pour la première fois, l'appareil entre en mode ASSISTANT. L'écran affiche le message *InI* clignotant avec **0**.

**Étape 1:**
Sélectionner l'option InI appropriée en fonction du type d'installation à réaliser et appuyer sur **SET**.
Les options disponibles sont affichées sur le tableau suivant:

| InI | Type d'installation | | | | Paramètres | | | | | | | | | | Schéma a utiliser |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Contrôle du froid | Pump Down | Dégivrage | Ventilateurs évaporateur | Pd | o00 | I00 | I10 | I11 | I20 | I21 | d1 | d7 | F3 | |
| 0 | Mode démo, affiche la température sur l'écran mais ne régule pas la température et n'active pas les relais. | | | | | | | | | | | | | | |
| 1 | Solénoïde | Non | Électrique | Qui | 0 | * | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | A |
| 2 | Solénoïde + compresseur | Qui | Électrique | Qui | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 20 | 0 | 0 | B |
| 3 | Solénoïde + compresseur | Non | Électrique | Qui | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | B |
| 4 | Solénoïde | Non | Air | Qui | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | A |
| 5 | Solénoïde + compresseur | Qui | Air | Qui | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | 1 | B |
| 6 | Solénoïde + compresseur | Non | Air | Qui | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | B |
| 7 | Solénoïde + compresseur | Qui | Hot gas | Qui | 1 | 1 | 2 | 7 | 1 | 9 | 1 | 5 | 2 | 0 | C |
| 8 | Solénoïde + compresseur | Non | Hot gas | Qui | 0 | 1 | 2 | 0 | 0 | 9 | 1 | 5 | 2 | 0 | C |
| 9 | Solénoïde + compresseur | Qui | Inversion de cycle | Qui | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 5 | 3 | 0 | D |
| 10 | Solénoïde + compresseur | Non | Inversion de cycle | Qui | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | D |
| 11 | Solénoïde | Non | Statique | Non | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | A |
| 12 | Solénoïde + compresseur | Qui | Statique | Non | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | - | B |
| 13 | Solénoïde + compresseur | Non | Statique | Non | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | B |

*** o00=2** sur AK-RC 204B, **o00=0** sur AK-RC 205C

**Noter:** Si les options 2, 5, 7, 9 ou 12 sont choisies, vérifier la configuration du paramètre I11 en fonction du pressostat utilisé. (Voir le schéma inclus dans l'équipement).




**Étape 2:**
Introduire la valeur du point de consigne (Set Point) souhaitée à l'aide des touches ▲ et ▼ et appuyer sur **SET**. L'assistant de configuration a été réalisé, l'appareil commence à réguler la température.

Si ce n'est pas la première fois que l'assistant est exécuté, à la fin de la dernière étape, l'écran affiche le message **dFp** (paramètres par défaut) et il est possible de choisir entre deux options:
**0**: Seuls les paramètres qui concernent l'assistant sont modifiés, le reste demeure inchangé.
**1**: Tous les paramètres retournent à leur valeur d'usine, sauf ceux modifiés par l'assistant.

**Important:** L'assistant de configuration ne se réactive pas. Pour l'activer à nouveau, activer le mode Stand-By (en appuyant sur la touche m pendant 3 secondes) et attendre que l'appareil arrête complètement la régulation (l'indicateur ⏻ reste allumé en permanence) puis appuyer dans cet ordre sur les touches suivantes (l'une après l'autre et non toutes en même temps) ▲, ▼ et **SET**.

⚠ **Avertissement:** Si la fonction Pump Down est active, un certain temps peut s'écouler entre le moment du démarrage de la fonction Stand-by jusqu'à ce que le contrôleur s'arrête.

## Configuration

**Menu de programmation réduit**
Permet de configurer rapidement les paramètres les plus utilisés (**SP, C1, d0, d1, d4, F3, A1** et **A2**). Pour y accéder, appuyer sur la touche **SET** pendant 3 secondes.

**Menu de programmation étendu**
Dans le menu de programmation étendu, vous pouvez configurer tous les paramètres de l'appareil pour l'adapter aux besoins de votre installation. Pour y accéder, appuyer sur la touche **SET** pendant 6 secondes.

**Important:**
- Si la fonction du mot de passe a été configurée comme blocage du clavier (**b10** = 2), ou comme blocage de l'accès aux paramètres (**b10** = 1) lors d'une tentative d'accès à n'importe laquelle des fonctions, l'introduction du code d'accès programmé en **PAS** sera demandé. Si le code introduit est incorrect, l'appareil affiche de nouveau la température.
- Il est possible que certains paramètres ou menus ne soient pas visibles en fonction de la configuration du reste des paramètres.

**Réglage et contrôle**

| Niveau 1 | Niveau 2 | Description | Valeurs | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| rE | SP | Réglage de température (Set Point) | °C/°F | -50 | 0.0 | 99 |
| | C0 | Calibrage de la sonde 1 (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | C1 | Différentiel de la sonde 1 (Hystérésis) | °C/°F | 0.1 | 2.0 | 20.0 |
| | C2 | Blocage supérieur du point de consigne (il est impossible de fixer au-delà de cette valeur) | °C/°F | C3 | 99 | 99 |
| | C3 | Blocage inférieur du point de consigne (il est impossible de fixer en-dessous de cette valeur) | °C/°F | -50 | -50 | C2 |
| | C4 | Type de retard pour la protection du compresseur:<br>**0**=Temps minimum du compresseur sur OFF<br>**1**=Temps minimum du compresseur sur OFF et ON au cours de chaque cycle | | 0 | 0 | 1 |
| | C5 | Temps de retard de la protection (Valeur de l'option choisie dans le paramètre C4) | Min. | 0 | 0 | 120 |
| | C6 | État du relais COOL avec erreur sur sonde 1:<br>**0**=OFF; **1**=ON; **2**=Moyenne selon dernières 24h avant l'erreur de sonde<br>**3**=ON-OFF selon progr. C7 et C8 | | 0 | 2 | 3 |
| | C7 | Temps de relais sur ON en cas de panne de la sonde 1<br>(Si C7 = 0 et C8≠0, le relais sera toujours sur OFF déconnecté) | Min. | 0 | 10 | 120 |
| | C8 | Temps de relais sur OFF en cas de panne de la sonde 1<br>(Si C8 = 0 et C7≠0, le relais sera toujours sur ON connecté) | Min. | 0 | 5 | 120 |
| | C9 | Durée maximale du mode de cycle continu. (**0** = désactivé) | H. | 0 | 0 | 48 |
| | C10 | Variation du point de consigne (SP) en mode de cycle continu, une fois arrivé à ce point (SP + C10), il revient en mode normal. (SP + C10 ≥ C3).<br>La valeur de ce paramètre est toujours négative, sauf si elle est de 0. (**0** = OFF) | °C/°F | 0 | -50 | C3-SP |
| | C12 | Variation du point de consigne (SP) lorsque la fonction changement de Set point est active. (SP+C12 ≤ C2) (**0**=désactivé) | °C/°F | C3-SP | 0.0 | C2-SP |
| | C19 | Temps maximum pour démarrage depuis Pump Down<br>(Les valeurs entre 1 et 9 secondes ne sont pas acceptées) (**0** = désactivé) | Sec. | 0 | 0 | 120 |
| | C20 | Temps maximum de Pump Down (**0** = désactivé) | Min. | 0 | 0 | 15 |
| | C21 | Sonde à afficher: **0**=Toutes les sondes (séquentielle)<br>**1**=Sonde 1 (Chambre), **2**=Sonde 2 (Évaporateur), **3**=Sonde 3 (Selon I20) | | 0 | 1 | 3 |
| | C22 | Arrêter les ventilateurs et le compresseur lors de l'ouverture de la porte;<br>**0**=Non, **1**=Qui | | 0 | 0 | 1 |
| | C23 | Retard de démarrage des ventilateurs et du compresseur porte ouverte | Min. | 0 | 0 | 999 |
| | C27 | Calibrage de la sonde 3 (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | EP | Sortir au niveau 1 | | | | |


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### Dégivrage

| Niveau 1 | Niveau 2 | Description | Valeurs | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| dEF | d0 | Fréquence de dégivrage (délai entre 2 démarrages) | H. | 0 | 6 | 96 |
| | d1 | Durée maximale du dégivrage (**0**=dégivrage désactivé) | Min. | 0 | * | 255 |
| | d2 | Type de message pendant le dégivrage:<br>**0**=Montre la température réelle; **1**=Montre la température au début du dégivrage; **2**=Montre le message dEF | | 0 | 2 | 2 |
| | d3 | Durée maximale du message<br>(Durée ajoutée à la fin du processus du dégivrage) | Min. | 0 | 5 | 255 |
| | d4 | Température finale de dégivrage (par sonde) (Si I00 ≠ 1) | °C/°F | -50 | 8.0 | 50 |
| | d5 | Dégivrage lors de la connexion de l'équipement:<br>**0**=NON Premier dégivrage selon d0; **1**=OUI, Premier dégivrage selon d6 | | 0 | 0 | 1 |
| | d6 | Retard de démarrage du dégivrage lors de la connexion de l'équipement | Min. | 0 | 0 | 255 |
| | d7[1)] | Type de dégivrage:<br>**0**=Résistances; **1**=Air/ventilateurs, **2**=Gaz chaud; **3**=Inversion de cycle | | 0 | * | 3 |
| | d8 | Calcul de temps entre périodes de dégivrage:<br>**0**=Temps réel total, **1**=Somme du temps du compresseur connecté | | 0 | 0 | 1 |
| | d9 | Temps d'égouttement à la fin d'un dégivrage (Arrêt du compresseur et des ventilateurs) | Min. | 0 | 1 | 255 |
| | EP | Sortir au niveau 1 | | | | |

* Selon l'assistant de configuration..
[1)] Elle ne peut être modifiée qu'à travers l'assistant de configuration (InI).

### Ventilateurs d'évaporateur

| Niveau 1 | Niveau 2 | Description | Valeurs | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| FAn | F0 | Température d'arrêt des ventilateurs | °C/°F | -50 | 45 | 50 |
| | F1 | Différentiel de la sonde 2 si les ventilateurs sont arrêtés | °C/°F | 0.1 | 2.0 | 20.0 |
| | F2 | État des ventilateurs pendant le cycle d'arrêt du compresseur ; **0** = Arrêt, **1** = En cours d'exécution, **2** = Cyclisme | | 0 | 0 | 2 |
| | F3 | État des ventilateurs lors du dégivrage: **0**=Arrêtés; **1**=En marche | | 0 | 0 | 1 |
| | F4 | Retard de démarrage après le dégivrage (si **F3**=0)<br>N'agit que si supérieur à **d9** | Min. | 0 | 2 | 99 |
| | F5 | Arrêt du ventilateur Température de l'évaporateur | °C / °F | -50 | 50 | 50 |
| | F6 | Cycle de mise en marche du ventilateur | Min. | 0 | 2 | 15 |
| | F7 | Cycle d'arrêt du ventilateur | Min. | 0 | 2 | 15 |
| | EP | Sortir au niveau 1 | | | | |

### Alarmes

| Niveau 1 | Niveau 2 | Description | Valeurs | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| AL | A0 | Configuration des alarmes de température: **0**=Relative au SP, **1**=Absolue | | 0 | 1 | 1 |
| | A1 | Alarme de maximum sur sonde 1 (Doit être supérieur au SP) | °C/°F | A2 | 99 | 99 |
| | A2 | Alarme de minimum sur sonde 1 (Doit être inférieur au SP) | °C/°F | -50 | -50 | A1 |
| | A3 | Retard d'alarmes de température à la mise en marche | Min. | 0 | 0 | 120 |
| | A4 | Retard d'alarmes de température depuis la fin d'un dégivrage | Min. | 0 | 0 | 99 |
| | A5 | Retard d'alarmes de température depuis que la valeur d'**A1** ou **A2** est atteinte | | 0 | 30 | 99 |
| | A6 | Retard d'alarme externe/Alarme externe sévère à la réception d'un signal en entrée numérique (**I10** ou **I20** = 2 ou 3) | Min. | 0 | 0 | 120 |
| | A7 | Retard de désactivation d'alarme externe/Alarme externe sévère lors de la disparition du signal en entrée numérique (**I10** ou **I20** = 2 ou 3) | Min. | 0 | 0 | 120 |
| | A8 | Afficher un avertissement si le dégivrage est finalisé pour temps maximal:<br>**0**=Non, **1**=Qui | | 0 | 0 | 1 |
| | A9 | Polarité relais alarme<br>**0**=Relais ON sur alarme (OFF sans alarme); **1**=Relais OFF sur alarme (ON sans alarme) | | 0 | 0 | 1 |
| | A10 | Différentiel d'alarmes de température (**A1** et **A2**) | °C/°F | 0.1 | 1.0 | 20.0 |
| | A12 | Retard d'alarme de porte ouverte (Si **I10** ou **I20** = 1) | Min. | 0 | 10 | 120 |
| | EP | Sortir au niveau 1 | | | | |

### Configuration de base

| Niveau 1 | Niveau 2 | Description | Valeurs | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| bcn | b00 | Retard de toutes les fonctions lors de la réception d'alimentation électrique | Min. | 0 | 0 | 255 |
| | b01 | Temporisation éclairage chambre | Min. | 0 | 0 | 999 |
| | b10 | Fonction du mot de passe (Password)<br>**0**=Inactif, **1**=Blocage de l'accès aux paramètres, **2**=Blocage du clavier | | 0 | 0 | 2 |
| | PAS | Mot de passe (Password) | | 0 | 0 | 99 |
| | b20 | Adresse MODBUS | | 0 | 1 | 247 |
| | b21 | Vitesse de communication:<br>**0**=9600 bps, **1**=19200 bps, **2**=38400 bps, **3**=57600 bps | bps | 0 | 1 | 3 |
| | b22 | Alarme sonore activée: **0**= No, **1**=Yes | | 0 | 1 | 1 |
| | Unt | Unités de travail: **0**=°C, **1**=°F | | 0 | 1 | 1 |
| | EP | Sortir au niveau 1 | | | | |

### Entrées et sorties

| Niveau 1 | Niveau 2 | Description | Valeurs | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| In0 | I00 | Sondes connectées<br>**1**=Sonda 1 (Chambre), **2**=Sonde 1 (Chambre) + Sonde 2 (Évaporateur) | | 1 | 2 | 2 |
| | I10[1)] | Configuration de l'entrée numérique 1<br>**0**=Désactivée, **1**=Contact porte, **2**=Alarma externe, **3**=Al. externe sévère, **4**=Changement de SP, **5**=Dégivrage à distance, **6**=Blocage de dégivrage, **7**=Pressostat de basse pression, **8**=Stand-by à distance | | 0 | * | 8 |
| | I11 | Polarité de l'entrée numérique 1<br>**0**=Active à la fermeture du contact; **1**=Active à l'ouverture du contact | | 0 | * | 1 |
| | I20 | Configuration de l'entrée numérique 2<br>**0**=Désactivée, **1**=Contact porte, **2**=Alarma externe, **3**=Al. externe sévère, **4**=Changement de SP, **5**=Dégivrage à distance, **6**=Blocage de dégivrage, **7**=Sonde d'enregistrement, **8**=Sonde 2° évaporateur[2)], **9**=Pressostat de haute pression pour gaz chaud, **10**=Stand-by à distance | | 0 | 0 | 10 |
| | I21 | Polarité de l'entrée numérique 2<br>**0**=Active à la fermeture du contact; **1**=Active à l'ouverture du contact | | 0 | 0 | 1 |
| | o00[1)] | Configuration du relais AUX1<br>**0**=Désactivé, **1**=Compresseur/Résistance carter, **2**=Lumière, **3**=Contrôle virtuel, **4**=Alarme[3)] | | 0 | * | 4 |
| | o10 | Configuration du relais AUX2[2)]<br>**0**=Désactivé, **1**=Alarme, **2**=Lumière, **3**=Contrôle virtuel, **4**=Résistance cadre porte, **5**=Dégivrage 2° évaporateur, **6**=État du solénoïde identique, **7**=État de l'appareil identique | | 0 | 2 | 7 |
| | EP | Sortir au niveau 1 | | | | |

* Selon l'assistant de configuration.
[1)] Elle ne peut être modifiée qu'à travers l'assistant de configuration (InI).
[2)] Non disponible dans AK-RC 204B
[3)] Disponible uniquement en AK-RC 204B

### Alarme HACCP

| Niveau 1 | Niveau 2 | Description | Valeurs | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| HCP | h1 | Température maximum alarme HACCP | °C/°F | -50 | 99 | 99 |
| | h2 | Temps maximum autorisé pour l'activation de l'alarme HACCP (**0**=Désactivée) | H. | 0 | 0 | 255 |
| | EP | Sortir au niveau 1 | | | | |


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**Informations (lecture seule)**

| Niveau 1 | Niveau 2 | Description | Valeurs | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| tid | InI | Option choisie dans l'assistant de configuration | | | | |
| | Pd[1)] | Pump down actif? **0**=Non, **1**=Qui | | | | |
| | PU | Version du logiciel | | | | |
| | Pr | Révision du logiciel | | | | |
| | bU | Version du bootloader | | | | |
| | br | Révision du bootloader | | | | |
| | PAr | Révision du plan de paramètres | | | | |
| | EP | Sortir au niveau 1 | | | | |

[1)] Elle ne peut être modifiée qu'à travers l'assistant de configuration (InI).

**Messages**

| Messages | | A | R |
|---|---|---|---|
| Pd | Erreur de fonctionnement du Pump Down (arrêt) | | |
| LP | Erreur de fonctionnement du Pump Down (démarrage) | | |
| E1/E2/E3 | Sonde 1/2/3 en panne (Circuit ouvert, croisé, ou hors limites de la sonde) (Limites équivalentes en °F) | • | • |
| Ad0 | Alarme de porte ouverte. Uniquement si la porte est ouverte depuis une durée supérieure à celle définie dans le paramètre **A12** | • | • |
| AH | Alarme de température maximum dans la sonde de contrôle. La valeur de température programmée en **A1** a été atteinte | • | • |
| AL | Alarme de température minimum dans la sonde de contrôle. La valeur de température programmée en **A2** a été atteinte | • | • |
| AE | Alarme externe activée (par entrée numérique) | • | • |
| AES | Alarme externe sévère activée (par entrée numérique) | • | • |
| Adt | Alarme de dégivrage interrompue pour durée écoulée, le temps défini en **d1** a été dépassé | | |
| HCP | Alarme HACCP, la température a atteint la valeur du paramètre **h1** pendant une durée supérieure à celle définie en **h2** | • | • |
| hCP + PF | Alarme HACCP en raison d'une coupure électrique, la température définie en **h1** après une coupure électrique a été atteinte | • | • |
| dEF | Indique qu'un dégivrage est en cours | | |
| PAS | Demande de mot de passe (Password). Voir paramètres **b10** et **PAS** | | |
| S1 - S2 | **Affichés de manière séquentielle avec la température:** Le contrôleur est en mode démo, la configuration n'a pas été effectuée. | | |

**A:** Active l'alarme sonore
**R:** Active le relais d'alarme

## Spécifications techniques

| Fonctionnalités | | Caractéristiques |
|---|---|---|
| Alimentation | | 230 V~ ± 10%, 50 Hz ± 5% |
| Puissance maximale absorbée dans la manoeuvre | | 6.3 VA |
| Intensité maximale nominale | | 15 A |
| Relais SSV / DEFROST - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relais FAN - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relais COOL - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relais AUX 1 - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relais AUX 2 - SPDT - 16 A | NO | EN60730-1: 12 (9) A 250 V~ |
| | NC | EN60730-1: 10 (8) A 250 V~ |
| Nbre d'opérations des relais | | EN60730-1:100.000 opérations |
| Plage de température de la sonde | | -50.0 à +99.9 °C |
| Résolution, réglage et différentiel | | 0.1 °C |
| Précision thermométrique | | ±1 °C |
| Tolérance de la sonde NTC à 25 °C | | ±0.4 °C |
| Température ambiante de travail | AK-RC 204B | -10 à +50 °C |
| | AK-RC 205C | -10 à +45 °C |
| Température ambiante de stockage | | -30 à +60 °C |
| Degré de protection | | IP 65 |
| Catégorie d'installation | | II s/ EN 60730-1 |
| Degré de pollution | | II s/ EN 60730-1 |
| Classement du dispositif de contrôle | | À montage incorporé, type de fonctionnement automatique action Type 1 B, à utiliser dans un environnement propre, support logique (logiciel), classe A et fonctionnement en continu. Degré de contamination 2 s/ UNE-EN 60730-1.<br>Isolation double entre alimentation, circuit secondaire et sortie relais. |
| Température de test de boule de pression | | Parties accessibles: 75 °C<br>Parties qui positionnent des éléments actifs: 125 °C |
| Courant de test de suppression des radiointerférences | | 270 mA |
| Tension et courant déclarés par les essais d'EMC | | 207 V, 17 mA |
| Type de montage | | Intérieur fixe |
| Adresse MODBUS | | Indiquée sur l'étiquette |
| Dimensions | | 290 mm (W) x 141 mm (H) x 84.4 mm (D) |
| Vibreur interne | | Qui |

## Commande

### Manette

| Maquette | Description | Commentaires | N° de code |
|---|---|---|---|
| AK-RC 204B | AK-RC 204B Gen. 2,5 O/P, Monophasé | Comprend:<br>• 1 x 1.5 m, NTC 10K capteur<br>• 1 x 3 m, NTC 10K capteur | 080Z5001 |
| AK-RC 205C | AK-RC 205C Gen. 2,5 O/P, Monophasé | | 080Z5002 |

**Accessoires** (pour les pièces de rechange et à des fins de remplacement):

| Nom | Caractéristiques | Quantité | N° de code |
|---|---|---|---|
| 3.5 m, NTC 10K Capteur | Sonde en caoutchouc thermoplastique | 1 | 084N3210 |
| 8.5 m, NTC 10K Capteur | Sonde en caoutchouc thermoplastique | 50 | 084N3208 |
| 1.5 m, NTC 10K Capteur | Sonde en acier inoxydable | 150 | 084N3200 |


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## DEUTSCH

Temperaturregler für begehbare Kühl- und Gefrierschränke
Typ **AK-RC 204B** und **AK-RC 205C**





## Warnungen

- Wenn Sie das Gerät nicht entsprechend den Herstelleranweisungen verwenden, können sich seine Sicherheitsanforderungen ändern. Für den einwandfreien Betrieb des Geräts dürfen nur von der Danfoss gelieferte Fühler verwendet werden.
- Zwischen -40 °C und +20 °C beträgt die maximale Abweichung 0.25 °C, wenn der NTC-Fühler bis zu 1000 m mit einem Kabel mit Mindestquerschnitt 0.5 mm² verlängert wird.
- Das Gerät muss an einer Stelle installiert werden, wo es vor Vibrationen, Wasser und ätzenden Gasen geschützt ist, und wo die Umgebungstemperatur den in den technischen Daten angegebenen Wert nicht überschreitet.
- Um eine korrekte Wertanzeige zu gewährleisten, muss der Fühler an einem Ort ohne andere thermische Einflüsse montiert werden als die Temperatur, die gemessen oder geregelt werden soll.
- Der Schutzgrad IP65 gilt nur mit geschlossenem Schutzdeckel.
- Der Schutzgrad IP65 gilt nur dann, wenn der Eingang der Kabel zum Gerät mithilfe eines Rohrs für elektrische Leitungen + Stopfbuchse mit IP65 oder höher gelegt wird. Die Größe der Stopfbuchsen muss passend für den Durchmesser des dazu eingesetzten Rohres sein.
- Das Gerät nicht direkt mit Hochdruckschläuchen abspritzen, da dies Schäden verursachen kann.

**WICHTIG:**

- **Bevor Sie mit der Installation beginnen, müssen Sie die geltenden örtlichen Vorschriften beachten.**
- Die HILFSRELAIS sind programmierbar, ihre Funktion ist jeweils von der Konfiguration abhängig.
- Die Funktion der Digitaleingänge hängt von der Konfiguration ab.
- Bei den Stromstärke- und Leistungsangaben handelt es sich um die zulässigen Arbeitshöchstwerte.

## Kabelanschlüsse

Vor dem Durchführen der Kabelanschlüsse ist immer die Stromversorgung zu unterbrechen.
Die Fühler und ihre Kabel dürfen **NIEMALS** in einem Kabelkanal zusammen mit Leistungs-, Steuer- oder Stromversorgungskabeln verlegt werden.

Der Stromversorgungskreis muss mit einem in der Nähe des Geräts angebrachten Trennschalter (min. 2 A, 230 V) ausgestattet sein. Das Zuleitungskabel muss vom Typ H05VV-F oder NYM 1x16/3 sein. Der zu verwendende Querschnitt ist je nach den vor Ort geltenden Richtlinien unterschiedlich, er darf jedoch in keinem Fall unter 2.5 mm² betragen.

Die Kabel für die Ausgänge der Relais oder des Schützes müssen einen Querschnitt von 2.5 mm² haben, müssen Betriebstemperaturen gleich oder höher als 70 °C standhalten können und müssen mit möglichst geringer Biegung installiert werden.

Der Bereich für den Anschluss an 120 / 230 V~ muss stets frei von externen Elementen sein.

**Die Kabelanschlüsse müssen unter Berücksichtigung der Installationsart durchgeführt werden. Das passende Schema in Abstimmung auf die im Assistenten gewählte Option verwenden. Siehe beiliegendes Schematablatt für die verfügbaren Optionen.**
**Wizard bezieht sich auf ein eingebautes Tool, das den Benutzer durch den Einrichtungsprozess führt.**

## Wartung

- Die Oberfläche des Geräts mit einem weichen Tuch, Wasser und Seife reinigen.
- Es dürfen keine scheuernden Reinigungsmittel, Benzin, Alkohol oder Lösungsmittel verwendet werden, weil diese das Gerät beschädigen können.

## Tastenfeld

ESC — Durch 3 Sekunden langes Drücken wird der Standby-Modus aktiviert oder deaktiviert. In diesem Modus wird der Regelungsvorgang unterbrochen und auf der Anzeige erscheint das Symbol ⏻. Im Programmierungsmenü wird mit dieser Taste der Parameter ohne Speichern der Änderungen verlassen, in die vorherige Ebene zurückgekehrt oder die Programmierung verlassen.

▲ — Durch kurzes Drücken wird 10 Sekunen lang die Temperatur des Fühlers S2 angezeigt (sofern diese aktiviert ist).
3 Sekunden langes Drücken aktiviert / deaktiviert die Abtauung.
Im Programmierungsmenü ermöglicht diese Taste das Navigieren zwischen den Ebenen bzw. das Ändern des Parameterwertes während des Einstellens eines Parameters.

▼ — Durch 3 Sekunden langes Drücken wird der Modus „kontinuierlicher Zyklus" aktiviert oder deaktiviert.
Im Programmierungsmenü ermöglicht diese Taste das Navigieren zwischen den Ebenen bzw. das Ändern des Parameterwertes während des Einstellens eines Parameters .

SET — Durch kurzes Drücken wird die des Kühlraumes aktiviert / deaktiviert.
Durch 3 Sekunden langes Drücken wird das reduzierte Programmierungsmenü aufgerufen. Durch 6 Sekunden langes Drücken wird das erweiterte Programmierungsmenü aufgerufen. Im Programmierungsmenü kann mit dieser Taste auf die Ebene zugegriffen werden, die auf dem Bildschirm angezeigt wird bzw. beim Einstellen eines Parameters der neue Wert akzeptiert werden.

SP — Durch kurzes Drücken wird der aktuelle Sollwerts angezeigt, wobei die vorübergehenden Änderungen durch andere Parameter (**C10** oder **C12**) berücksichtigt werden. Bei aktiviertem Alarm wird durch kurzes Drücken das akustische Alarmsignal ausgeschaltet. Durch 3 Sekunden langes Drücken wird auf die Einstellung des Sollwerts zugegriffen.

## Anzeigen

⏻ — **Leuchtet:** Standby-Modus aktiviert, der Regelungsvorgang ist unterbrochen.
**Blinkt:** Befindet sich im kontrollierten Abschaltverfahren des Regelungsvorgangs.

**Leuchtet:** Offene Kühlraumtür.
**Blinkt:** Die Tür ist über einen längeren Zeitraum offen, als im Parameter **A12** definiert.

Es gibt einen aktivierten Alarm, jedoch nicht für HACCP.

HACCP — **Leuchtet:** HACCP-Alarm aktiviert.
**Blinkt:** HACCP-Alarm registriert und ohne Bestätigung. Zur Bestätigung eines HACCP-Alarms die Taste 🔇 drücken.

**Leuchtet:** Aktive Verdampferlüfter.
**Blinkt:** Die Verdampferlüfter müssten aktiviert sein, aber eine Verzögerung verhindert dies.

**Leuchtet:** Kältemittel-Magnetventil aktiviert.
**Blinkt:** Magnetventil sollte aktiviert sein, aber eine Verzögerung oder ein Schutz verhindert dies.

**Leuchtet:** Kompressor aktiviert.
**Blinkt:** Kompressor sollte aktiviert sein, aber eine Verzögerung oder ein Schutz verhindert dies.

Abtauungsrelais aktiviert.

Modus „kontinuierlicher Zyklus“ aktiviert.

Beleuchtung des Kühlraumes ist aktiviert.

Anstehender Alarm stummgeschaltet.

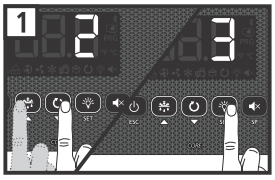
°F °C — Angezeigte Temperatur in °Fahrenheit / °Celsius.

PRG — Aktivierter Programmierungsmodus.

**STAND-BY**
Falls die Regelung aufgrund ihrer Konfiguration nicht sofort gestoppt werden kann, wird ein kontrollierter Stoppvorgang ausgelöst, und das Symbol ⏻ blinkt. Um den kontrollierten Stoppvorgang zu stoppen und den Standby-Modus zu erzwingen, drücken Sie die Standby-Taste erneut 3 Sekunden lang.


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## Erstkonfiguration



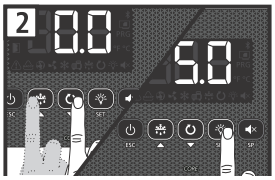

Beim ersten Einschalten der Stromversorgung wechselt das Gerät in den Modus ASSISTENT. Am Display wird blinkend die Meldung *InI* mit **0** angezeigt.

**Schritt 1:**
Die zur Installationsart passende InI-Option auswählen und **SET** drücken. Die verfügbaren Optionen werden in der nachfolgenden Tabelle dargestellt:

| InI | Installationsart | | | | Parameters | | | | | | | | | | Zu verwendendes Schema |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Kälteregulierung | Pump Down | Abtauung | Verdampfer -lüftungen | Pd | o00 | I00 | I10 | I11 | I20 | I21 | d1 | d7 | F3 | |
| 0 | Demo-Modus, zeigt die Temperatur auf dem Display an, jedoch keine Temperaturregelung oder Aktivierung der Relais. | | | | | | | | | | | | | | |
| 1 | Magnetventil | Nein | Elektrisch | Ja | 0 | * | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | A |
| 2 | Magnetventil + Kompressor | Ja | Elektrisch | Ja | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 20 | 0 | 0 | B |
| 3 | Magnetventil + Kompressor | Nein | Elektrisch | Ja | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | B |
| 4 | Magnetventil | Nein | Luft | Ja | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | A |
| 5 | Magnetventil + Kompressor | Ja | Luft | Ja | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | 1 | B |
| 6 | Magnetventil + Kompressor | Nein | Luft | Ja | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | B |
| 7 | Magnetventil + Kompressor | Ja | Hot gas | Ja | 1 | 1 | 2 | 7 | 1 | 9 | 1 | 5 | 2 | 0 | C |
| 8 | Magnetventil + Kompressor | Nein | Hot gas | Ja | 0 | 1 | 2 | 0 | 0 | 9 | 1 | 5 | 2 | 0 | C |
| 9 | Magnetventil + Kompressor | Ja | Zyklusumkehrung | Ja | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 5 | 3 | 0 | D |
| 10 | Magnetventil + Kompressor | Nein | Zyklusumkehrung | Ja | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | D |
| 11 | Magnetventil | Nein | Statisch | Nein | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | A |
| 12 | Magnetventil + Kompressor | Ja | Statisch | Nein | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | - | B |
| 13 | Magnetventil + Kompressor | Nein | Statisch | Nein | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | B |

*** o00=2** bei AK-RC 204B, **o00=0** bei AK-RC 205C

**Notiz:** Bei Wahl der Optionen 2, 5, 7, 9 oder 12 sicherstellen, dass die Konfiguration des Parameters I11 dem verwendeten Druckwächter entspricht. (Siehe Schema, das der Anlage beiliegt.)




**Schritt 2:**
Gewünschten Sollwert (Set Point) mit den Tasten ▲ und ▼ eingeben und **SET** drücken.
Der Konfigurationsassistent ist fertig, das Gerät beginnt die Temperaturregelung.

Wenn der Assistent nicht zum ersten Mal ausgeführt wird, wird am Display am Ende des letzten Schritts die Meldung **dFp** (Standardparameter) angezeigt und es stehen zwei Optionen zur Verfügung:
**0**: Es werden nur die Parameter geändert, die den Assistenten betreffen, die restlichen bleiben unverändert.
**1**: Alle Parameter nehmen ihren werksseitigen Wert an, mit Ausnahme der Werte, die vom Assistenten geändert werden.

**Wichtig:** Der Konfigurationsassistent wird nicht wieder aktiviert. Um diesen erneut zu aktivieren, den Standby-Modus aktivieren (durch 3 Sekunden langes Drücken der Taste ⏻ ) und warten, bis das Gerät den Regelungsvorgang vollständig einstellt (die Anzeige ⏻ leuchtet kontinuierlich) und dann die Tasten ▲, ▼, **SET** kurz nacheinander drücken.

⚠ **Warnung:** Wenn die Funktion Pump Down aktiv ist, kann es ab dem Start der Stand-by-Funktion bis zum Stopp des Reglers einige Zeit dauern.

## Konfiguration

**Reduziertes Programmierungsmenü**
Schnelle Konfiguration der am häufigsten verwendeten Parameter (**SP, C1, d0, d1, d4, F3, A1** und **A2**). Um darauf zuzugreifen, 3 Sekunden die Taste **SET** drücken.

**Erweitertes Programmierungsmenü**
Im erweiterten Programmierungsmenü können die einzelnen Parameter des Geräts konfiguriert werden, um es auf die Anforderungen der jeweiligen Anlage abzustimmen. Um darauf zuzugreifen, 6 Sekunden die Taste **SET** drücken.

**WICHTIG:**
- Wenn die Funktion des Zugangscodes als Sperre der Tastatur (**b10**=2) oder als Zugangssperre zu Parametern (**b10**=1) konfiguriert ist, wird bei Aufruf einer dieser zwei Funktionen zur Eingabe des in **PAS** programmierten Zugangscodes aufgefordert. Wenn der eingegebene Code falsch ist, zeigt das Gerät wieder die Temperatur an.
- Bestimmte Parameter oder Menüs sind je nach Konfiguration der restlichen Parameter möglicherweise nicht sichtbar.

**Regelung und Steuerung**

| Ebene 1 | Ebene 2 | Beschreibung | Werte | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| rE | SP | Temperatureinstellung (Sollwert) | °C/°F | -50 | 0.0 | 99 |
| | C0 | Kalibrieren des Fühlers 1 (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | C1 | Differenzwert des Fühlers 1 (Hysterese) | °C/°F | 0.1 | 2.0 | 20.0 |
| | C2 | Obere Blockierung des Sollwerts (kann nicht über diesen Wert eingestellt werden) | °C/°F | C3 | 99 | 99 |
| | C3 | Untere Blockierung des Sollwerts (kann nicht unter diesen Wert eingestellt werden) | °C/°F | -50 | -50 | C2 |
| | C4 | Verzögerungsart für den Schutz des Kompressors:<br>**0**=min. Zeit des Kompressors im OFF-Zustand<br>**1**=min. Zeit des Kompressors im OFF- und ON-Zustand in jedem Zyklus | | 0 | 0 | 1 |
| | C5 | Verzögerungszeit für den Schutz (Wert der in Parameter C4 gewählten Option) | Min. | 0 | 0 | 120 |
| | C6 | Status des Relais COOL mit Fehler in Fühler 1: **0**=OFF; **1**=ON;<br>**2**= Mittelwert basierend auf den letzten 24 h vor dem Fühlerfehler;<br>**3**=ON-OFF gemäß Prog. C7 und C8 | | 0 | 2 | 3 |
| | C7 | Zeit des Relais im ON-Zustand bei Störung in Fühler 1<br>(wenn C7=0 and C8≠0, ist das Relais immer im OFF-Zustand abgeschaltet) | Min. | 0 | 10 | 120 |
| | C8 | Zeit des Relais im OFF-Zustand bei Störung in Fühler 1<br>(wenn C8=0 and C7≠0, ist das Relais immer im ON-Zustand eingeschaltet) | Min. | 0 | 5 | 120 |
| | C9 | Maximale Dauer des Modus kontinuierlicher Zyklus. (**0**=deaktiviert) | H. | 0 | 0 | 48 |
| | C10 | Ändern des Sollwerts (SP) im Modus kontinuierlicher Zyklus; sobald dieser Punkt (SP+C10) erreicht worden ist, kehrt das Gerät zum normalen Modus zurück. (SP+C10 ≥ C3). Der Wert dieses Parameters ist immer negativ, es sei denn, er ist 0. (**0**=OFF) | °C/°F | 0 | -50 | C3-SP |
| | C12 | Ändern des Sollwerts (SP), wenn die Funktion zum Ändern des Set Points aktiviert ist. (SP+C12 ≤ C2) (**0**= deaktiviert) | °C/°F | C3-SP | 0.0 | C2-SP |
| | C19 | Max. Zeit für Anlauf ab Pump Down<br>(Werte zwischen 1 und 9 Sekunden nicht zulässig) (**0**=deaktiviert) | Sec. | 0 | 0 | 120 |
| | C20 | Max. Zeit für Pump Down (**0**=deaktiviert) | Min. | 0 | 0 | 15 |
| | C21 | Anzuzeigender Fühler: **0**=alle Fühler (sequenziell),<br>**1**=Fühler 1 (Raum), **2**=Fühler 2 (Verdampfer), **3**=Fühler 3 (entsprechend I20) | | 0 | 1 | 3 |
| | C22 | Für Lüfter und Kompressoren beim Öffnen der Tür, **0**=nein, **1**=ja | | 0 | 0 | 1 |
| | C23 | Anlaufverzögerung der Lüfter und des Kompressors bei geöffneter Tür | Min. | 0 | 0 | 999 |
| | C27 | Kalibrieren des Fühlers 3 (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | EP | Zurück zu Ebene 1 | | | | |


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### Abtauung

| Ebene 1 | Ebene 2 | Beschreibung | Werte | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| dEF | d0 | Abtauhäufigkeit (Zeit zwischen 2 Starts) | St. | 0 | 6 | 96 |
| | d1 | Max. Dauer der Abtauung (**0**=Abtauung deaktiviert) | Min. | 0 | * | 255 |
| | d2 | Meldungsart während der Abtauung:<br>**0**=Anzeige der Ist-Temperatur; **1**=Anzeige der Temperatur bei Abtauungsbeginn; **2**=Anzeige der Meldung dEF | | 0 | 2 | 2 |
| | d3 | Max. Dauer der Meldung<br>(zusätzliche Zeit nach Ende des Abtauungsvorgangs) | Min. | 0 | 5 | 255 |
| | d4 | End-Abtauungstemperatur (je Fühler) (wenn I00 ≠ 1) | °C/°F | -50 | 8.0 | 50 |
| | d5 | Abtauung beim Anschließen des Geräts:<br>**0=**NEIN erste Abtauung entsprechend d0;<br>**1=**JA, erste Abtauung entsprechend d6 | | 0 | 0 | 1 |
| | d6 | Verzögerung des Abtauungsbeginns beim Anschließen des Geräts | Min. | 0 | 0 | 255 |
| | d7[1)] | Abtauungsart:<br>**0**=Elektrisch, **1**=Luft / Lüfter, **2**=Heißgas, **3**=Zyklusumkehrung | | 0 | * | 3 |
| | d8 | Zeitmessung zwischen Abtauungsperioden:<br>**0**=Ist-Zeit gesamt, **1**=Summe der Zeit des angeschlossenen Kompressors | | 0 | 0 | 1 |
| | d9 | Tropfzeit bei Abschluss einer Abtauung (Kompressor- und Lüftungsstopp) | Min. | 0 | 1 | 255 |
| | EP | Zurück zu Ebene 1 | | | | |

* Je nach Konfigurationsassistent.
[1)] Änderung nur mit Hilfe des Konfigurationsassistenten möglich.

### Verdampferlüfter

| Ebene 1 | Ebene 2 | Beschreibung | Werte | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| FAn | F0 | Temperatur für Lüfterstopp | °C/°F | -50 | 45 | 50 |
| | F1 | Differenzwert Lüfterstopp | °C/°F | 0.1 | 2.0 | 20.0 |
| | F2 | Status der Lüfter während des Kompressor-Aus-Zyklus; **0**=Herunterfahren, **1**=Laufen, **2**=Radfahren | | 0 | 0 | 2 |
| | F3 | Status der Lüfter während der Abtauung; **0**=abgeschaltet, **1**=in Betrieb | | 0 | 0 | 1 |
| | F4 | Lüfter-Anlaufverzögerung nach Abtauung (wenn F3=0)<br>Nur wirksam, wenn größer als **d9** | Min. | 0 | 2 | 99 |
| | F5 | Ventilatorstopp Verdampfertemperatur | °C / °F | -50 | 50 | 50 |
| | F6 | Lüfter EIN-Zyklus | Min. | 0 | 2 | 15 |
| | F7 | Lüfter AUS-Zyklus | Min. | 0 | 2 | 15 |
| | EP | Zurück zu Ebene 1 | | | | |

### Alarme

| Ebene 1 | Ebene 2 | Beschreibung | Werte | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| AL | A0 | Konfiguration der Temperaturalarme, **0**=relativ zu SP, **1**=absolut | | 0 | 1 | 1 |
| | A1 | Max. Alarm in Fühler 1 (muss größer sein als SP) | °C/°F | A2 | 99 | 99 |
| | A2 | Min. Alarm in Fühler 1 (muss kleiner sein als SP) | °C/°F | -50 | -50 | A1 |
| | A3 | Verzögerung der Temperaturalarme bei der Inbetriebnahme | Min. | 0 | 0 | 120 |
| | A4 | Verzögerung der Temperaturalarme ab Abtauende | Min. | 0 | 0 | 99 |
| | A5 | Verzögerung der Temperaturalarme ab dem Zeitpunkt, an dem der Wert **A1** oder **A2** erreicht wird | | 0 | 30 | 99 |
| | A6 | Verzögerung externer Alarm / schwerwiegender externer Alarm bei Empfang eines Signals im Digitaleingang (**I10** oder **I20** =2 oder 3) | Min. | 0 | 0 | 120 |
| | A7 | Deaktivierungsverzögerung externer Alarm / schwerwiegender externer Alarm bei Erlöschen eines Signals im Digitaleingang (**I10** oder **I20** =2 oder 3) | Min. | 0 | 0 | 120 |
| | A8 | Meldungsanzeige bei Abtauung wegen Zeitüberschreitung; **0**=nein, **1**=ja | | 0 | 0 | 1 |
| | A9 | Polarität Alarmrelais,<br>**0**= Relais ON bei Alarm (OFF ohne Alarm);<br>**1**= Relais OFF bei Alarm (ON ohne Alarm) | | 0 | 0 | 1 |
| | A10 | Differenzwert Temperaturalarme (**A1** und **A2**) | °C/°F | 0.1 | 1.0 | 20.0 |
| | A12 | Verzögerung des Alarms für offene Tür (wenn **I10** oder **I20**=1) | Min. | 0 | 10 | 120 |
| | EP | Zurück zu Ebene 1 | | | | |

### Grundkonfiguration

| Ebene 1 | Ebene 2 | Beschreibung | Werte | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| bcn | b00 | Verzögerung von allen Funktionen beim Herstellen der Stromversorgung | Min. | 0 | 0 | 255 |
| | b01 | Zeitschaltung der Raumbeleuchtung | Min. | 0 | 0 | 999 |
| | b10 | Funktion des Zugangscodes (Passwort)<br>**0**=inaktiv, **1**=Zugangssperre zu Parametern, **2**=Tastensperre | | 0 | 0 | 2 |
| | PAS | Zugangscode (Passwort) | | 0 | 0 | 99 |
| | b20 | MODBUS-Adresse | | 0 | 1 | 247 |
| | b21 | Kommunikationsgeschwindigkeit:<br>**0**=9600 bps, **1**=19200 bps, **2**=38400 bps, **3**=57600 bps | bps | 0 | 1 | 3 |
| | b22 | Akustischer Alarm aktiviert, **0**=nein, **1**=ja | | 0 | 1 | 1 |
| | Unt | Arbeitseinheiten: **0**=°C, **1**=°F | | 0 | 1 | 1 |
| | EP | Zurück zu Ebene 1 | | | | |

### Ein- und Ausgänge

| Ebene 1 | Ebene 2 | Beschreibung | Werte | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| In0 | I00 | Angeschlossene Fühler<br>**1**=Fühler 1 (Raum), **2**=Fühler 1 (Raum) + Fühler 2 (Verdampfer) | | 1 | 2 | 2 |
| | I10[1)] | Konfiguration des Digitaleingangs 1<br>**0**=deaktiviert, **1**=Türkontakt, **2**=externer Alarm,<br>**3**=schwerwiegender externer Al., **4**=Sollwertschiebung,<br>**5**=ferngesteuerte Abtauung **6**=Abtauungssperre, **7**= Saugdruckschalter,<br>**8**=Stand-by per Fernzugriff | | 0 | * | 8 |
| | I11 | Polarität des Digitaleingangs 1<br>**0**=aktiviert bei Kontaktschließung, **1**=aktiviert bei Kontaktöffnung | | 0 | * | 1 |
| | I20 | Konfiguration des Eingangs 2<br>**0**= deaktiviert, **1**=Türkontakt, **2**=externer Alarm, **3**=schwerwiegender externer Al., **4**=Sollwertschiebung, **5**=ferngesteuerte Abtauung,<br>**6**=Abtauungssperre, **7**= Aufzeichnungsfühler, **8**=Fühler 2. Verdampfer[2)],<br>**9**=Überdruckwächter für Heißgas, **10**=Stand-by per Fernzugriff | | 0 | 0 | 10 |
| | I21 | Polarität des Digitaleingangs 2<br>**0**=aktiviert bei Kontaktschließung, **1**=aktiviert bei Kontaktöffnung | | 0 | 0 | 1 |
| | o00[1)] | Konfiguration des Relais AUX1<br>**0**=deaktiviert, **1**=Kompressor/Ölsumpfheizung, **2**=Licht,<br>**3**=virtuelle Steuerung, **4**=Alarma[3)] | | 0 | * | 4 |
| | o10 | Konfiguration des Relais AUX2[2)]<br>**0**=deaktiviert, **1**=Alarm, **2**=Licht, **3**=virtuelle Steuerung,<br>**4**=Heizung Türrahmen, **5**=Abtauung 2. Verdampfer,<br>**6**=folgt dem Magentventil Solenoidzustand, **7**=folgt dem Gerätezustand | | 0 | 2 | 7 |
| | EP | Zurück zu Ebene 1 | | | | |

* Je nach Konfigurationsassistent.
[1)] Änderung nur mit Hilfe des Konfigurationsassistenten möglich.
[2)] Nicht verfügbar für AK-RC 204B
[3)] Nur in AK-RC 204B verfügbar

### HACCP alarm

| Ebene 1 | Ebene 2 | Beschreibung | Werte | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| HCP | h1 | Max. Temperatur HACCP-Alarm | °C/°F | -50 | 99 | 99 |
| | h2 | Max. zulässige Zeit für die Aktivierung des HACCP-Alarms (**0**=deaktiviert) | H. | 0 | 0 | 255 |
| | EP | Zurück zu Ebene 1 | | | | |


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**Information (nur lesen)**

| Ebene 1 | Ebene 2 | Beschreibung | Werte | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| tid | InI | Im Konfigurationsassistenten gewählte Option | | | | |
| | Pd[1)] | Pump Down aktiviert? **0**=Nein, **1**=Ja | | | | |
| | PU | Programmversion | | | | |
| | Pr | Programmrevision | | | | |
| | bU | Bootloader-Version | | | | |
| | br | Bootloader-Revision | | | | |
| | PAr | Revision Parameterkarte | | | | |
| | EP | Zurück zu Ebene 1 | | | | |

[1)] Änderung nur mit Hilfe des Konfigurationsassistenten möglich.

**Meldungen**

| Meldungen | | A | R |
|---|---|---|---|
| Pd | Funktionsfehler beim Pump Down (Stillstand) | | |
| LP | Funktionsfehler beim Pump Down (Anlauf) | | |
| E1/E2/E3 | Fühler 1/2/3 defekt (offener bzw. kurzgeschlossener Schaltkreis oder nicht innerhalb der Grenzwerte des Fühlers) (entsprechende Grenzwerte in °F) | • | • |
| Ad0 | Alarm für offene Tür. Nur, wenn die Tür über einen längeren Zeitraum offen ist, als im Parameter **A12** angegeben | • | • |
| AH | Alarm für max. Temperatur an Raumfühler. Der in **A1** programmierte Temperaturwert wurde erreicht | • | • |
| AL | Alarm für min. Temperatur an Raumfühler. Der in **A2** programmierte Temperaturwert wurde erreicht | • | • |
| AE | Externer Alarm aktiviert (per Digitaleingang) | • | • |
| AES | Schwerwiegender externer Alarm aktiviert (per Digitaleingang) | • | • |
| Adt | Abtauungsalarm mittels Zeit abgeschlossen, die in **d1** definierte Zeit wurde überschritten | | |
| HCP | HACCP-Alarm, die Temperatur hat den Wert des Parameters **h1** innerhalb eines Zeitraums erreicht, der höher als der in **h2** definierte ist | • | • |
| hCP + PF | HACCP-Alarm wegen Ausfalls der Stromversorgung, die in **h1** definierte Temperatur wurde nach einem Ausfall der Stromversorgung erreicht | • | • |
| dEF | Zeigt an, dass eine Abtauung durchgeführt wird | | |
| PAS | Anforderung des Zugangscodes (Passwort). Siehe Parameter **b10** und **PAS** | | |
| S1 - S2 | **Sequenzielle Anzeige mit der Temperatur:** Der Regler befindet sich im Demo-Modus, die Konfiguration wurde nicht durchgeführt. | | |

**A:** Aktiviert den akustischen Alarm
**R:** Aktiviert das Alarm-Relais

## Technische angaben

| Merkmale | | Spezifikationen |
|---|---|---|
| Stromversorgung | | 230 V~ ± 10%, 50 Hz ± 5% |
| Max. Leistungsaufnahme in der Steuerung | | 6.3 VA |
| Max. Nenn-Stromstärke | | 15 A |
| Relais SSV / DEFROST - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relais FAN - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relais COOL - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relais AUX 1 - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relais AUX 2 - SPDT - 16 A | NO | EN60730-1: 12 (9) A 250 V~ |
| | NC | EN60730-1: 10 (8) A 250 V~ |
| Anzahl der Relaisoperationen | | EN60730-1:100.000 operationen |
| Temperaturbereich des Fühlers | | -50.0 bis +99.9 °C |
| Auflösung, Einstellung und Differenzwert | | 0.1 °C |
| Temperaturmessgenauigkeit | | ±1 °C |
| Toleranz des NTC-Fühlers bei 25 °C | | ±0.4 °C |
| Arbeitstemperaturbereich | AK-RC 204B | -10 bis +50 °C |
| | AK-RC 205C | -10 bis +45 °C |
| Lagerumgebungstemperatur | | -30 bis +60 °C |
| Schutzgrad | | IP 65 |
| Installationsklasse | | II s/ EN 60730-1 |
| Verschmutzungsgrad | | II s/ EN 60730-1 |
| Klassifizierung des Steuerungsgeräts | | Zur Einbaumontage, Automatikbetrieb als Steuereinrichtung mit Wirkung vom Typ 1.B, zur Verwendung in nicht verschmutzter Umgebung, Software Klasse A und Dauerbetrieb. Verschmutzungsgrad 2, nach EN 60730-1.<br><br>Doppelte Isolierung zwischen Stromversorgung, Sekundärschaltkreis und Relaisausgang. |
| Testtemperatur mit Druckball | | Zugängliche Teile: 75 °C<br>Teile mit aktiven Elementen: 125 °C |
| Teststrom mit Unterdrückung von Funkstörungen | | 270 mA |
| Spannung und Strom laut EMC-Test | | 207 V, 17 mA |
| Montageart | | Festes Inneres |
| MODBUS-Adresse | | Auf dem Typenschild angegeben |
| Abmessungen | | 290 mm (W) x 141 mm (H) x 84.4 mm (D) |
| Interner Summer | | Ja |

## Bestellung

### Regler

| Modell | Beschreibung | Kommentare | Code-Nr. |
|---|---|---|---|
| AK-RC 204B | AK-RC 204B Gen. 2,5 O/P, Einzelphase | Beinhaltet:<br>• 1 x 1.5 m, NTC 10K sensor<br>• 1 x 3 m, NTC 10K sensor | 080Z5001 |
| AK-RC 205C | AK-RC 205C Gen. 2,5 O/P, Einzelphase | | 080Z5002 |

**Zubehör** (für Ersatzteile und Austauschzwecke):

| Name | Merkmale | Menge | Code-Nr. |
|---|---|---|---|
| 3.5 m, NTC 10K Sensor | Sonde aus thermoplastischem Gummi | 1 | 084N3210 |
| 8.5 m, NTC 10K sensor | Sonde aus thermoplastischem Gummi | 50 | 084N3208 |
| 1.5 m, NTC 10K sensor | Sonde aus Edelstahl | 150 | 084N3200 |


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## PORTUGUÊS

Controlador de temperatura para câmaras frigoríficas e congeladores
Tipo **AK-RC 204B** e **AK-RC 205C**





## ⚠ Avisos

- Utilizar o equipamento violando as instruções do fabricante pode alterar os requisitos de segurança do aparelho. Para o funcionamento correto do mesmo, só devem ser utilizadas sondas fornecidas pela Danfoss.
- Entre -40 °C e +20 °C, se se prolongar a sonda NTC até 1000 m com um cabo de no mínimo 0.5 $mm^2$ , o desvio máximo será de 0.25 °C
- Deve ser instalado num local protegido das vibrações, da água e dos gases corrosivos, onde a temperatura ambiente não ultrapasse o valor indicado nos dados técnicos.
- Para que a leitura seja correta, a sonda deve localizar-se num local sem influências térmicas alheias à temperatura que se deseja medir ou controlar.
- O grau de proteção IP65 é válido apenas com a tampa protetora fechada.
- O grau de proteção IP65 é válido apenas no caso da entrada dos cabos no equipamento ser efetuada mediante tubagem para cabos elétricos + bucim com proteção IP65 ou superior. A dimensão dos bucins deve ser a adequada para o diâmetro da tubagem utilizada.
- Não pulverizar diretamente o equipamento com mangueiras de alta pressão, pois pode provocar danos.

**IMPORTANTE:**

- **Antes de iniciar a instalação, você deve seguir o conselho dos regulamentos locais em vigor.**
- Os relés AUXILIARES são programáveis; o seu funcionamento depende da configuração.
- A função das entradas digitais depende da configuração.
- As intensidades e potências indicadas são as máximas de trabalho admissíveis.

## Ligações

Desligar sempre a alimentação para efetuar as ligações.
As sondas e os seus cabos **NUNCA** devem ser instalados num sistema de condução junto dos cabos de potência, controlo ou alimentação.

O circuito de alimentação deve estar equipado com um interruptor para se desligar com o mínimo de 2 A, 230 V, situado próximo do aparelho. O cabo de alimentação será do tipo H05VV-F ou NYM 1x16/3. A secção a utilizar dependerá dos regulamentos locais em vigor, mas nunca deverá ser inferior a 2.5 $mm^2$.

Os cabos de saída dos relés ou contactores devem ter uma secção de 2.5 $mm^2$, devem admitir temperaturas de trabalho iguais ou superiores a 70 °C e devem ser instalados de forma a minimizar a sua flexão.

A zona de ligação de 120 / 230 V~ deve manter-se desprovida de qualquer elemento externo.

**As ligações a realizar dependem do tipo de instalação. Use o esquema adequado em função da opção escolhida no assistente. Consulte as opções disponíveis na folha de esquemas anexada.**
**Assistente refere-se a uma ferramenta integrada para guiar o usuário através do processo de configuração.**

## Manutenção

- Limpar a superfície do equipamento com um pano macio, água e sabão.
- Não utilize detergentes abrasivos, gasolina, álcool ou solventes, poderão danificar o equipamento.

## Teclado

ESC — Premindo durante 3 segundos, ativa/desativa o modo Stand-by. Neste modo, a regulação para e o display mostra o ícone ⏻.
No menu de programação, sai do parâmetro sem guardar alterações, regressa ao nível anterior ou sai de programação.

▲ — Um breve toque mostra a temperatura da sonda S2 durante 10 segundos (se estiver ativada).
Premindo durante 3 segundos, inicia/para o degelo.
No menu de programação, permite deslocar-se pelos vários níveis ou, durante o ajuste de um parâmetro, alterar o valor do mesmo.

▼ — Premindo durante 3 segundos, ativa/desativa o modo ciclo contínuo.
No menu de programação, permite deslocar-se pelos vários níveis ou, durante o ajuste de um parâmetro, alterar o valor do mesmo.

SET — Um breve toque ativa/desativa a luz da câmara.
Premindo durante 3 segundos, acede ao menu de programação reduzido.
Premindo durante 6 segundos, acede ao menu de programação completo.
No menu de programação, acede ao nível mostrado no ecrã ou, durante o ajuste de um parâmetro, aceita o novo valor.

SP — Um breve toque mostra o valor efetivo real do Set Point, tendo em conta as modificações temporárias por outros parâmetros (**C10** ó **C12**).
Com um alarme em curso, um breve toque silencia o alarme acústico.
Premindo durante 3 segundos, acede ao ajuste do Set Point.

## Indicadores

**Fixo:** Modo Stand-By ativo, a regulação está parada.
**Intermitente:** Processo de paragem controlado da regulação em curso.

**Fixo:** Porta da câmara aberta.
**Intermitente:** A porta está aberta há mais tempo do que o definido no parâmetro **A12**.

Há um alarme ativo, mas não de HACCP.

**Fixo:** Alarme HACCP ativo.
**Intermitente:** Alarme de HACCP registado e sem confirmar. Para confirmar um alarme HACCP, premir a tecla 🔇.

**Fixo:** Ventiladores de evaporador ativos.
**Intermitente:** Os ventiladores de evaporador deveriam estar ativos, mas há um atraso que o impede.

**Fixo:** O solenoide de frio está ativo.
**Intermitente:** O solenoide deveria estar ativo, mas há algum atraso ou proteção que o impede.

**Fixo:** Compressor ativo.
**Intermitente:** O compressor deveria estar ativo, mas há algum atraso ou proteção que o impede.

Relé de degelo ativo.

Modo ciclo contínuo ativo.

Luz da câmara ativa.

Alarme em curso silenciado.

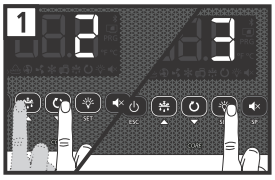
°F °C — Temperatura indicada em ° Fahrenheit / ° Centígrados.

PRG — Modo de programação ativo.

**STAND-BY**
Se não for possível parar a regulação de imediato devido à sua configuração, tem início um processo de paragem controlada e o ícone ⏻ pisca. Para travar o processo de paragem controlada e forçar a passagem para stand-by, premir a tecla stand-by novamente durante 3 segundos.


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## Configuração inicial



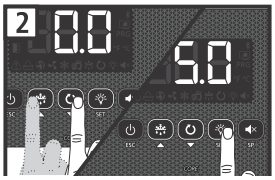

Quando recebe alimentação pela primeira vez, o equipamento entra em modo ASSISTENTE. O display mostra a mensagem *InI* intermitente com **0**.

**Passo 1:**
Selecionar a opção InI adequada conforme o tipo de instalação a realizar e premir **SET**. As opções disponíveis são apresentadas na tabela seguinte:

| InI | Tipo de instalação | | | | Parâmetros | | | | | | | | | | Esquema a utilizar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Controlo del frío | Pump Down | Degelo | Ventilador evaporador | Pd | o00 | I00 | I10 | I11 | I20 | I21 | d1 | d7 | F3 | |
| 0 | Modo demo, mostra a temperatura no display mas não regula a temperatura nem ativa relés. | | | | | | | | | | | | | | |
| 1 | Solenoide | Não | Elétrico | Sim | 0 | * | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | A |
| 2 | Solenoide + compressor | Sim | Elétrico | Sim | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 20 | 0 | 0 | B |
| 3 | Solenoide + compressor | Não | Elétrico | Sim | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | B |
| 4 | Solenoide | Não | Ar | Sim | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | A |
| 5 | Solenoide + compressor | Sim | Ar | Sim | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | 1 | B |
| 6 | Solenoide + compressor | Não | Ar | Sim | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | B |
| 7 | Solenoide + compressor | Sim | Hot gas | Sim | 1 | 1 | 2 | 7 | 1 | 9 | 1 | 5 | 2 | 0 | C |
| 8 | Solenoide + compressor | Não | Hot gas | Sim | 0 | 1 | 2 | 0 | 0 | 9 | 1 | 5 | 2 | 0 | C |
| 9 | Solenoide + compressor | Sim | Inversão de ciclo | Sim | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 5 | 3 | 0 | D |
| 10 | Solenoide + compressor | Não | Inversão de ciclo | Sim | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | D |
| 11 | Solenoide | Não | Estático | Não | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | A |
| 12 | Solenoide + compressor | Sim | Estático | Não | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | - | B |
| 13 | Solenoide + compressor | Não | Estático | Não | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | B |

*** o00=2** em AK-RC 204B, **o00=0** em AK-RC 205C

**Observação:** Caso sejam escolhidas as opções 2, 5, 7, 9 ou 12, rever a configuração do parâmetro I11 em função do pressóstato utilizado. (Ver esquema incluído no equipamento).




**Passo 2:**
Introduzir o valor do ponto de ajuste (Set Point) desejado através das teclas ▲ e ▼ e premir **SET**.
O assistente de configuração terminou, o equipamento começa a regular a temperatura

Se não for a primeira vez que se executa o assistente, ao finalizar o último passo, o display mostra a mensagem **dFp** (parâmetros por defeito), podendo escolher-se uma das duas opções:
**0**: Só se modificam os parâmetros que afetam o assistente, os restantes permanecem iguais.
**1**: Todos os parâmetros regressam aos seus valores de fábrica, exceto os modificados pelo assistente.

**Importante:** O assistente de configuração não volta a ativar-se. Para reativá-lo, ativar o modo Stand-By (premindo a tecla ⏻ durante 3 segundos) e esperar que o equipamento pare a regulação completamente (o indicador ⏻ ilumina-se de forma permanente) e premir, por esta ordem, as seguintes teclas (uma a seguir à outra e não uma de cada vez) ▲, ▼, **SET**.

⚠ **Aviso:** Se a função de pump down estiver ativada, pode decorrer algum tempo desde que a função Stand-by inicia até o controlador parar

## Configuração

**Menu de programação reduzido**
Permite configurar rapidamente os parâmetros mais utilizados (**SP, C1, d0, d1, d4, F3, A1** e **A2**). Para aceder, premir a tecla SET durante 3 segundos.

**Menu de programação completo**
Através do menu de programação completo, é possível configurar todos os parâmetros do equipamento para adaptá-lo às necessidades da sua instalação. Para aceder, premir a tecla **SET** durante 6 segundos.

**Importante:**
- Se se configurou a função do código de acesso como bloqueio do teclado (**b10**=2) ou como bloqueio acesso a parâmetros (**b10**=1), ao tentar aceder a qualquer uma das duas funções, será solicitada a introdução do código de acesso programado em **PAS**. Se o código introduzido não estiver correto, o equipamento voltará a apresentar a temperatura.
- Determinados parâmetros ou menus podem não ser visíveis na função de configuração dos restantes parâmetros.

**Regulação e controlo**

| Nível 1 | Nível 2 | Descrição | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| rE | SP | Ajuste de temperatura (Set Point) | °C/°F | -50 | 0.0 | 99 |
| | C0 | Calibração da sonda 1 (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | C1 | Diferencial da sonda 1 (Histerese) | °C/°F | 0.1 | 2.0 | 20.0 |
| | C2 | Bloqueio superior do ponto de ajuste (não são possíveis valores superiores) | °C/°F | C3 | 99 | 99 |
| | C3 | Bloqueio inferior do ponto de ajuste (não são possíveis valores inferiores) | °C/°F | -50 | -50 | C2 |
| | C4 | Tipo de atraso para a proteção do compressor:<br>**0**=Tempo mínimo do compressor em OFF<br>**1**=Tempo mínimo do compressor em OFF e em ON em cada ciclo | | 0 | 0 | 1 |
| | C5 | Tempo de atraso da proteção (valor da opção escolhida no parâmetro C4) | Min. | 0 | 0 | 120 |
| | C6 | Estado do relé COOL com falha na sonda 1:<br>**0**=OFF; **1**=ON; **2**=Média segundo 24h prévias ao erro de sonda;<br>**3**=ON-OFF segundo prog. C7 e C8 | | 0 | 2 | 3 |
| | C7 | Tempo do relé em ON em caso de sonda 1 avariada<br>(Se C7=0 e C8≠0, o relé ficará sempre em OFF desligado) | Min. | 0 | 10 | 120 |
| | C8 | Tempo do relé em OFF em caso de sonda 1 avariada<br>(Se C8=0 e C7≠0, o relé ficará sempre em OFF ligado) | Min. | 0 | 5 | 120 |
| | C9 | Duração máxima do modo de ciclo contínuo. (**0**=desativado) | H. | 0 | 0 | 48 |
| | C10 | Variação do ponto de ajuste (SP) em modo de ciclo contínuo; uma vez alcançado este ponto (SP+C10), volta ao modo normal. (SP+C10 ≥ C3).<br>O valor deste parâmetro é sempre negativo, exceto se for 0. (**0**=OFF) | °C/°F | 0 | -50 | C3-SP |
| | C12 | Variação do ponto de ajuste (SP) quando a função de alteração de Set point está ativa. (SP+C12 ≤ C2) (**0**=desativado)) | °C/°F | C3-SP | 0.0 | C2-SP |
| | C19 | Tempo máximo para arranque desde pump down<br>(não se aceitam valores entre 1 e 9 segundos) (**0**=desativado) | Sec. | 0 | 0 | 120 |
| | C20 | Tempo máximo de pump down (**0**=desativado) | Min. | 0 | 0 | 15 |
| | C21 | Sonda a visualizar; **0**=Todas as sondas (sequencial)<br>**1**=Sonda 1 (Câmara), **2**=Sonda 2 (Evaporador), **3**=Sonda 3 (Segundo I20) | | 0 | 1 | 3 |
| | C22 | Parar ventiladores e compressor ao abrir porta; **0**=Não, **1**=Sim | | 0 | 0 | 1 |
| | C23 | Atraso de arranque de ventiladores e compressor com porta aberta | Min. | 0 | 0 | 999 |
| | C27 | Calibração da sonda 3 (Offset) | °C/°F | -20.0 | 0.0 | 20.0 |
| | EP | Saída a nível 1 | | | | |


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**Degelo**

| Nível 1 | Nível 2 | Descrição | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| dEF | d0 | Frequência de degelo (tempo entre 2 inícios) | H. | 0 | 6 | 96 |
| | d1 | Duração máxima do degelo (**0**=degelo desativado) | Min. | 0 | * | 255 |
| | d2 | Tipo de mensagem durante o degelo:<br>**0**=Mostra a temperatura real; **1**=Mostra a temperatura no início do degelo;<br>**2**=Mostra a mensagem dEF | | 0 | 2 | 2 |
| | d3 | Duração máxima da mensagem<br>(tempo acrescentado ao final do processo de degelo) | Min. | 0 | 5 | 255 |
| | d4 | Temperatura final de degelo (por sonda) (Se I00 ≠ 1) | °C/°F | -50 | 8.0 | 50 |
| | d5 | Degelo ao ligar o equipamento:<br>**0**=NÃO, primeiro degelo segundo d0; **1**=SIM, primeiro degelo segundo d6 | | 0 | 0 | 1 |
| | d6 | Atraso de início de degelo ao ligar o equipamento | Min. | 0 | 0 | 255 |
| | d7[1)] | Tipo de degelo:<br>**0**=Resistências, **1**=Ar / ventiladores, **2**=Hot gas, **3**=Inversão de ciclo | | 0 | * | 3 |
| | d8 | Cômputo de tempo entre períodos de degelo:<br>**0**=Tempo real total, **1** =Soma de tempo do compressor ligado | | 0 | 0 | 1 |
| | d9 | Tempo de gotejamento ao finalizar um degelo (paragem de compressor e ventiladores) | Min. | 0 | 1 | 255 |
| | EP | Saída a nível 1 | | | | |

* Segundo assistente de configuração.

[1)] Só se pode modificar através do assistente de configuração.

**Ventiladores de evaporador**

| Nível 1 | Nível 2 | Descrição | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| FAn | F0 | Temperatura de paragem dos ventiladores | °C/°F | -50 | 45 | 50 |
| | F1 | Diferencial da sonda 2 se os ventiladores estiverem parados | °C/°F | 0.1 | 2.0 | 20.0 |
| | F2 | Estado do ventilador durante o ciclo de compressor desligado;<br>**0**=Desligado, **1**=Correr, **2**=ciclismo | | 0 | 0 | 2 |
| | F3 | Estado dos ventiladores durante o degelo;<br>**0**=Parados, **1**=Em funcionamento | | 0 | 0 | 1 |
| | F4 | Atraso de arranque depois do degelo (Se F3=0)<br>Só atua se for superior a **d9** | Min. | 0 | 2 | 99 |
| | F5 | Temperatura do evaporador com parada do ventilador | °C / °F | -50 | 50 | 50 |
| | F6 | Ciclo de ativação do ventilador | Min. | 0 | 2 | 15 |
| | F7 | Ciclo de desligamento do ventilador | Min. | 0 | 2 | 15 |
| | EP | Saída a nível 1 | | | | |

**Alarmes**

| Nível 1 | Nível 2 | Descrição | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| AL | A0 | Configuração dos alarmes de temperatura; **0**=Relativa ao SP, **1**=Absoluta | | 0 | 1 | 1 |
| | A1 | Alarme de máximo na sonda 1 (deve ser maior do que o SP) | °C/°F | A2 | 99 | 99 |
| | A2 | Alarme de mínimo na sonda 1 (deve ser menor do que o SP) | °C/°F | -50 | -50 | A1 |
| | A3 | Atraso de alarmes de temperatura na colocação em funcionamento | Min. | 0 | 0 | 120 |
| | A4 | Atraso de alarmes de temperatura desde que termina um degelo | Min. | 0 | 0 | 99 |
| | A5 | Atraso de alarmes de temperatura desde que se regista o valor de **A1** ou **A2** | | 0 | 30 | 99 |
| | A6 | Atraso de alarme externo / Alarme externo severo ao receber sinal em entrada digital (**I10** ou **I20** =2 ou 3) | Min. | 0 | 0 | 120 |
| | A7 | Atraso de desativação de alarme externo / Alarme externo severo ao desaparecer o sinal em entrada digital (**I10** ou **I20** =2 ou 3) | Min. | 0 | 0 | 120 |
| | A8 | Mostrar aviso se o degelo termina por tempo máximo; **0**=Não, **1**=Sim | | 0 | 0 | 1 |
| | A9 | Polaridade relé alarme;<br>**0**= Relé ON em alarme (OFF sem alarme);<br>**1**= Relé OFF em alarme (ON sem alarme) | | 0 | 0 | 1 |
| | A10 | Diferencial de alarmes de temperatura (**A1** e **A2**) | °C/°F | 0.1 | 1.0 | 20.0 |
| | A12 | Atraso de alarme de porta aberta (Se **I10** ou **I20**=1) | Min. | 0 | 10 | 120 |
| | EP | Saída a nível 1 | | | | |

### Configuração básica

| Nível 1 | Nível 2 | Descrição | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| bcn | b00 | Atraso de todas as funções ao receber alimentação elétrica | Min. | 0 | 0 | 255 |
| | b01 | Temporização luz câmara | Min. | 0 | 0 | 999 |
| | b10 | Função do código de acesso (Password)<br>**0**=Inativo, **1**=Bloqueio acesso a parâmetros, **2**=Bloqueio do teclado | | 0 | 0 | 2 |
| | PAS | Código de acesso (Password) | | 0 | 0 | 99 |
| | b20 | Direção MODBUS | | 0 | 1 | 247 |
| | b21 | Velocidade de comunicação:<br>**0**=9600 bps, **1**=19200 bps, **2**=38400 bps, **3**=57600 bps | bps | 0 | 1 | 3 |
| | b22 | Alarme acústico ativo; **0**= Não, **1**=Sim | | 0 | 1 | 1 |
| | Unt | Unidades de trabalho; **0**=ºC, **1**=ºF | | 0 | 1 | 1 |
| | EP | Saída a nível 1 | | | | |

### Entradas e saídas

| Nível 1 | Nível 2 | Descrição | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| In0 | I00 | Sondas ligadas<br>**1**=Sonda 1 (Câmara), **2**=Sonda 1 (Câmara) + Sonda 2 (Evaporador) | | 1 | 2 | 2 |
| | I10[1)] | Configuração da entrada digital 1<br>**0**= Desativada, **1**=Contacto porta, **2**=Alarme externo<br>**3**=Al. externo severo, **4**=Alteração de SP, **5**=Degelo remoto<br>**6**=Bloqueio de degelo, **7**= Pressóstato de baixa, **8**=Stand-by remoto | | 0 | * | 8 |
| | I11 | Polaridade da entrada digital 1<br>**0**=Ativa ao fechar contacto, **1**=Ativa ao abrir contacto | | 0 | * | 1 |
| | I20 | Configuração da entrada 2<br>**0**= Desativada, **1**=Contacto porta, **2**=Alarme externo,<br>**3**=Al. externo severo, **4**=Alteração de SP, **5**=Degelo remoto,<br>**6**=Bloqueio de degelo, **7**=Sonda de registo, **8**=Sonda 2º evaporador[2)],<br>**9**=Pressóstato de alta para Hot Gas, **10**=Stand-by remoto | | 0 | 0 | 10 |
| | I21 | Polaridade da entrada digital 2<br>**0**=Ativa ao fechar contacto; **1**=Ativa ao abrir contacto | | 0 | 0 | 1 |
| | o00[1)] | Configuração do relé AUX1<br>**0**=Desativado, **1**=Compressor/Resistência cárter, **2**=Luz, **3**=Controlo virtual,<br>**4**=Alarme[3)] | | 0 | * | 4 |
| | o10 | Configuração do relé AUX2[2)]<br>**0**=Desativado, **1**=Alarme, **2**=Luz, **3**=Controlo virtual<br>**4**=Resistência marco porta, **5**=Degelo 2º evaporador<br>**6**=Igual estado solenoide, **7**=Igual estado equipamento | | 0 | 2 | 7 |
| | EP | Saída a nível 1 | | | | |

* Segundo assistente de configuração.
[1)] Só se pode modificar através do assistente de configuração.
[2)] Não disponível no AK-RC 204B
[3)] Disponível apenas em AK-RC 204B

### Alarme HACCP

| Nível 1 | Nível 2 | Descrição | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| HCP | h1 | Temperatura máxima alarme HACCP | °C/°F | -50 | 99 | 99 |
| | h2 | Tempo máximo admitido para ativação de alarme HACCP (**0**=Desativado) | H. | 0 | 0 | 255 |
| | EP | Saída a nível 1 | | | | |


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**Informação (apenas leitura)**

| Nível 1 | Nível 2 | Descrição | Valores | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| tid | InI | Opção escolhida no assistente de configuração | | | | |
| | Pd[1)] | Pump down ativa? **0**=Não, **1**=Sim | | | | |
| | PU | Versão do programa | | | | |
| | Pr | Revisão do programa | | | | |
| | bU | Versão de bootloader | | | | |
| | br | Revisão de bootloader | | | | |
| | PAr | Revisão de mapa de parâmetros | | | | |
| | EP | Saída a nível 1 | | | | |

[1)] Só se pode modificar através do assistente de configuração.

**Mensagens**

| Mensagens | | A | R |
|---|---|---|---|
| Pd | Erro de funcionamento da pump down (paragem) | | |
| LP | Erro de funcionamento da pump down (arranque) | | |
| E1/E2/E3 | Sonda 1/2/3 avariada (Circuito aberto, cruzado ou temperatura fora dos limites da sonda)<br>(Limites equivalentes em °F) | • | • |
| Ad0 | Alarme de porta aberta. Só se a porta estiver aberta há mais tempo do que o indicado no parâmetro **A12** | • | • |
| AH | Alarme de temperatura máxima na sonda de controlo. Foi alcançado o valor de temperatura programado em **A1** | • | • |
| AL | Alarme de temperatura mínima na sonda de controlo. Foi alcançado o valor de temperatura programado em **A2** | • | • |
| AE | Alarme externo ativado (por entrada digital) | • | • |
| AES | Alarme externo severo ativado (por entrada digital) | • | • |
| Adt | Alarme de degelo terminado por tempo, foi superado o tempo definido em **d1** | | |
| HCP | Alarme HACCP, a temperatura atingiu o valor do parâmetro h1 durante um tempo superior ao definido em **h2** | • | • |
| hCP + PF | Alarme HACCP por falha da alimentação elétrica, foi atingida a temperatura definida em **h1** após uma falha da alimentação elétrica | • | • |
| dEF | Indica que se está a realizar um degelo | | |
| PAS | Pedido de código de acesso (Password). Ver parâmetros **b10** e **PAS** | | |
| S1 - S2 | **Mostrados de forma sequencial com a temperatura:** O controlador está em modo de demonstração, a configuração não se realizou. | | |

**A:** Ativa o alarme acústico
**R:** Ativa o relé do alarme

## Especificações técnicas

| Características | | Especificações |
|---|---|---|
| Alimentação | | 230 V~ ± 10%, 50 Hz ± 5% |
| Potência máxima absorvida na manobra | | 6.3 VA |
| Intensidade máxima nominal | | 15 A |
| Relé SSV / DEFROST - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relé FAN - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relé COOL - SPST - 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relé AUX 1 - SPDT - 20 A | NO | EN60730-1: 15 (15) A 250 V~ |
| | NC | EN60730-1: 15 (13) A 250 V~ |
| Relé AUX 2 - SPDT - 16 A | NO | EN60730-1: 12 (9) A 250 V~ |
| | NC | EN60730-1: 10 (8) A 250 V~ |
| N.º de operações dos relés | | EN60730-1:100.000 operações |
| Intervalo de temperatura da sonda | | -50.0 a +99.9 °C |
| Resolução, ajuste e diferencial | | 0.1 °C |
| Precisão termométrica | | ±1 °C |
| Tolerância da sonda NTC a 25 °C | | ±0.4 °C |
| Temperatura ambiente de trabalho | AK-RC 204B | -10 a +50 °C |
| | AK-RC 205C | -10 a +45 °C |
| Temperatura ambiente de armazenamento | | -30 a +60 °C |
| Grau de proteção | | IP 65 |
| Categoria de instalação | | II s/ EN 60730-1 |
| Grau de poluição | | II s/ EN 60730-1 |
| Classificação dispositivo de controlo | | De montagem incorporada, de característica de funcionamento automático ação Tipo 1.B, para utilização em situação limpa, suporte lógico (software) classe A e funcionamento contínuo. Grau de poluição 2 s/ UNE-EN 60730-1.<br><br>Duplo isolamento entre a alimentação, circuito secundário e output do relé. |
| Temperatura de ensaio da bola de pressão | | Partes acessíveis: 75 °C<br>Partes que posicionam elementos activos: 125 °C |
| Corrente de ensaio de supressão de radiointerferências | | 270 mA |
| Tensão e corrente declaradas pelos ensaios de EMC | | 207 V, 17 mA |
| Tipo de montagem | | Interior fixo |
| Direção MODBUS | | Indicada na etiqueta |
| Dimensões | | 290 mm (W) x 141 mm (H) x 84.4 mm (D) |
| Vibrador interno | | Sim |

## Encomenda

### Controlador

| Modelo | Descrição | Comentários | Código não. |
|---|---|---|---|
| AK-RC 204B | AK-RC 204B Gen. 2,5 O/P, Fase única | Incluir:<br>• 1 x 1.5 m, NTC 10K sensor<br>• 1 x 3 m, NTC 10K sensor | 080Z5001 |
| AK-RC 205C | AK-RC 205C Gen. 2,5 O/P, Fase única | | 080Z5002 |

**Acessórios** (para fins de reposição e substituição):

| Modelo | Característicos | Quantidade | Código não. |
|---|---|---|---|
| 3.5 m, NTC 10K Sensor | Sonda de borracha termoplástica | 1 | 084N3210 |
| 8.5 m, NTC 10K sensor | Sonda de borracha termoplástica | 50 | 084N3208 |
| 1.5 m, NTC 10K sensor | Sonda de aço inoxidável | 150 | 084N3200 |

EN : For more details, see full User Manual and other information, scan the QR code.
ES : Para obtener más detalles, el Manual de usuario completo y otra información, escanee el código QR.
FR : Pour plus de détails, consultez le manuel d'utilisation complet et d'autres informations, scannez le code QR.
DE : Für weitere Details, siehe vollständiges Benutzerhandbuch und andere Informationen, scannen Sie den QR-Code.
PT-BR : Para obter mais detalhes, consulte o Manual do Usuário completo e outras informações, digitalize o código QR.


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# Optyma™ Plus
# Controller installation V3.61

Dedicated for Optyma™ Plus INVERTER & New Generation.





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Optyma™
by Danfoss

**English** ..... **8**
**Dansk / Danish** ..... **14**
**Deutsch / German** ..... **20**
**Français / French** ..... **26**
**Svenska / Swedish** ..... **32**


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**Annex**

Optyma™ Plus condensing units are pre-parameterized, depending on the model of compressor mounted and the type of refrigerant. Controller parameter "o30" for refrigerant is Factory Preset as per below table and must be changed for other refrigerants (see chapter Commissioning - Quick start of the unit / Refrigerant change).

**Supplement**

Optyma™ Plus-kondenseringsaggregater er parameterafstemt på forhånd afhængigt af den monterede kompressormodel og kølemiddeltypen. Regulatorparameter "o30" for kølemiddel er i fabriksindstillingen, som vist ovenfor i tabellen og skal ændres ved anvendelse af andet kølemidle (se kapitlet Idriftsættelse – hurtig start af enheden/kølemiddelskift).

**Anhang**

Optyma™ Plus Verflüssigungssätze sind vorparametriert für das installierte Verdichtermodell und verwendete Kältemittel. Der Reglerparameter „o30" für Kältemittel ist gemäß der folgenden Tabelle werksseitig voreingestellt und muss für andere Kältemittel geändert werden (siehe Kapitel zu Inbetriebnahme – Schnellstart der Einheit/Kältemittelwechsel).

**Annexe**

Les groupes de condensation Optyma™ Plus sont pré-paramétrés, en fonction du modèle de compresseur et du type de réfrigérant. Le paramètre du contrôleur "o30" pour le réfrigérant est préréglé en usine comme indiqué ci-dessus table et doit être changé pour les autres réfrigérants (voir le chapitre Mise en service - Démarrage rapide de l'unité / Changement de réfrigérant).

**Bilaga**

De luftkylda aggregaten Optyma Plus™ är förprogamerade beroende på monterad kompressormodell och typ av köldmedium. Styrparametern "o30" för kylmedel är fabriksinställd enligt ovan bord och måste ändras för andra kylmedel (se kapitel Idriftsättning – Snabbstart av aggregatet/Byte av köldmedium).

| Code (controller parameter o61)* | Model* Optyma™ Plus New Generation | Code-no. | Compressor* | Refrigerant (controller parameter o30)* (13 = user defined via Modbus / ADAP-KOOL®) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | settings are adjustable* | | | Factory Presetting | R404A (19) | R507 (17) | R134a (3) | R513A (36) | R407C (20) | R22 (2) | R407A (21) | R407F (37) | R448A (40) | R449A (41) | R452A (42) | R1234yf (39) | R454C (51) | R455A (52) |
| 1 | OP-MPHM007NFP00G | 114X4101 | NF7MLX | R404A | X | X | | | | | | | | | | | | |
| 2 | OP-MPHM010SCP00G | 114X4102 | SC10MLX | R404A | X | X | | | | | | | | | | | | |
| 3 | OP-MPHM012SCP00G | 114X4104 | SC12MLX | R404A | X | X | | | | | | | | | | | | |
| 4 | OP-MPHM015SCP00G | 114X4105 | SC15MLX | R404A | X | X | | | | | | | | | | | | |
| 5 | OP-MPHM018SCP00G | 114X4109 | SC18MLX | R404A | X | X | | | | | | | | | | | | |
| 6 | OP-MPGM034GSP00G | 114X4210 | GS34MFX | R134a | | | X | | | | | | | | | | | |
| 7 | OP-MPHM026GSP00G | 114X4214 | GS26MLX | R404A | X | X | | | | | | | | | | | | |
| 8 | OP-MPHM034GSP00G | 114X4229 | GS34MLX | R404A | X | X | | | | | | | | | | | | |
| 9 | OP-MPTM018DXP00G | 114X4115 | DX18Tba | R454C | X | X | | | | | | | X | X | X | | X | X |
| 10 | OP-MPTM021DXP00G | 114X4217 | DX21Tba | R454C | X | X | | | | | | | X | X | X | | X | X |
| 10 | OP-MPTM022DSP00G | 114X4237 | DS22TB | R454C | X | X | | | | | | | X | X | X | | X | X |
| 10 | OP-MPTM038DSP00G | 114X4218 | DST38NA | R454C | X | X | | | | | | | X | X | X | | X | X |
| 11 | OP-MPTM026DSP00G | 114X4238 | DS26TB | R454C | X | X | | | | | | | X | X | X | | X | X |
| 12 | OP-MPTM026DSP00E | 114X4239 | DS26T3 | R454C | X | X | | | | | | | X | X | X | | X | X |
| 13 | OP-MPTM034DSP00E | 114X4242 | DS34T3 | R454C | X | X | | | | | | | X | X | X | | X | X |
| 14 | OP-MPTM034DSP00G | 114X4241 | DS34TB | R454C | X | X | | | | | | | X | X | X | | X | X |
| 16 | OP-MPGM026DSP00G | 114X4243 | CS26TB | R1234yf | | | X | X | | | | | | | | X | | |
| 17 | OP-MPGM030DSP00G | 114X4244 | CS30TB | R1234yf | | | X | X | | | | | | | | X | | |
| 18 | OP-MPIM034MLP00G | 114X4205 | MLZ015T5LP9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM034MLP00E | 114X4204 | MLZ015T4LP9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM046MLP00G | 114X4207 | MLZ021T5LP9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM046MLP00E | 114X4206 | MLZ021T4LP9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM057MLP00G | 114X4209 | MLZ026T4LP9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM057MLP00E | 114X4208 | MLZ026T5LP9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM068MLP00E | 114X4306 | MLZ030T4LC9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM068MLP00G | 114X4307 | MLZ030T5LC9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM080MLP00E | 114X4309 | MLZ038T4LC9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM080MLP00G | 114X4312 | MLZ038T5LC9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM108MLP00E | 114X4314 | MLZ048T4LC9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM125MLP00E | 114X4409 | MLZ058T4LC9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 18 | OP-MPIM162MLP00E | 114X4410 | MLZ076T4LC9B | R454C | X | X | X | X | | | X | X | X | X | X | | X | X |
| 19 | OP-LPKM067LLP02E | 114X3304 | LLZ013T4LQ9B | R454C | X | X | | | | | | | X | X | X | | X | X |
| 19 | OP-LPKM084LLP02E | 114X3305 | LLZ015T4LQ9B | R454C | X | X | | | | | | | X | X | X | | X | X |
| 19 | OP-LPKM098LLP02E | 114X3306 | LLZ018T4LQ9B | R454C | X | X | | | | | | | X | X | X | | X | X |
| 19 | OP-LPKM120LLP02E | 114X3405 | LLZ024T4LQ9B | R454C | X | X | | | | | | | X | X | X | | X | X |
| 19 | OP-LPKM168LLP02E | 114X3406 | LLZ034T4LQ9B | R454C | X | X | | | | | | | X | X | X | | X | X |
| 20 | OP-LPHM018SCP00G | 114X3109 | SC18CLX.2 | R404A | X | X | | | | | | | | | | | | |
| 21 | OP-LPHM026GSP00G | 114X3217 | GS26CLX | R404A | X | X | | | | | | | | | | | | |
| 22 | OP-LPQM048NTP00G | 114X3225 | NTZ48-5VM | R452A | X | X | | | | | | | | | X | | | |
| 22 | OP-LPWM048NTP00G | 114X3204 | NTZ48-5VM | R454C | X | X | | | | | | | | | X | | X | X |
| 23 | OP-LPQM048NTP00E | 114X3233 | NTZ48-4VM | R452A | X | X | | | | | | | | | X | | | |
| 23 | OP-LPWM048NTP00E | 114X3205 | NTZ48-4VM | R454C | X | X | | | | | | | | | X | | X | X |
| 24 | OP-LPQM068NTP00G | 114X3241 | NTZ68-5VM | R452A | X | X | | | | | | | | | X | | | |
| 24 | OP-LPWM068NTP00G | 114X3206 | NTZ68-5VM | R454C | X | X | | | | | | | | | X | | X | X |
| 25 | OP-LPQM068NTP00E | 114X3249 | NTZ68-4VM | R452A | X | X | | | | | | | | | X | | | |
| 25 | OP-LPWM068NTP00E | 114X3207 | NTZ68-4VM | R454C | X | X | | | | | | | | | X | | X | X |
| 26 | OP-LPQM096NTP00E | 114X3357 | NTZ96-4VM | R452A | X | X | | | | | | | | | X | | | |
| 27 | OP-LPQM136NTP00E | 114X3365 | NTZ136-4VM | R452A | X | X | | | | | | | | | X | | | |
| 28 | OP-MPXM034MLP00G | 114X4261 | MLZ015T5LP9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 29 | OP-MPXM034MLP00E | 114X4264 | MLZ015T4LP9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 30 | OP-MPXM046MLP00G | 114X4281 | MLZ021T5LP9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 31 | OP-MPXM046MLP00E | 114X4284 | MLZ021T4LP9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 32 | OP-MPXM068MLP00G | 114X4308 | MLZ030T5LC9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 33 | OP-MPXM068MLP00E | 114X4311 | MLZ030T4LC9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 34 | OP-MPXM080MLP00G | 114X4321 | MLZ038T5LC9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 35 | OP-MPXM080MLP00E | 114X4324 | MLZ038T4LC9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 36 | OP-MPXM108MLP00E | 114X4344 | MLZ048T4LC9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 37 | OP-MPXM125MLP00E | 114X4414 | MLZ058T4LC9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 37 | OP-MPXM125MLP06E | 114X4403 | MLZ058T4LC9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 38 | OP-MPXM162MLP00E | 114X4434 | MLZ076T4LC9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 38 | OP-MPXM162MLP06E | 114X4404 | MLZ076T4LC9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 39 | OP-LPOM120LLP02E | 114X3485 | LLZ024T4LC9 | R452A | X | X | | | | | | | X | X | X | | | |
| 39 | OP-LPQM215LLP06E | 114X3403 | LLZ024T4LC9 | R452A | X | X | | | | | | | | | X | | | |
| 40 | OP-LPOM168LLP02E | 114X3486 | LLZ034T4LC9 | R452A | X | X | | | | | | | X | X | X | | | |
| 40 | OP-LPQM271LLP06E | 114X3404 | LLZ034T4LC9 | R452A | X | X | | | | | | | | | X | | | |
| 41 | OP-MPXM057MLP00G | 114X4290 | MLZ026T5LP9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |


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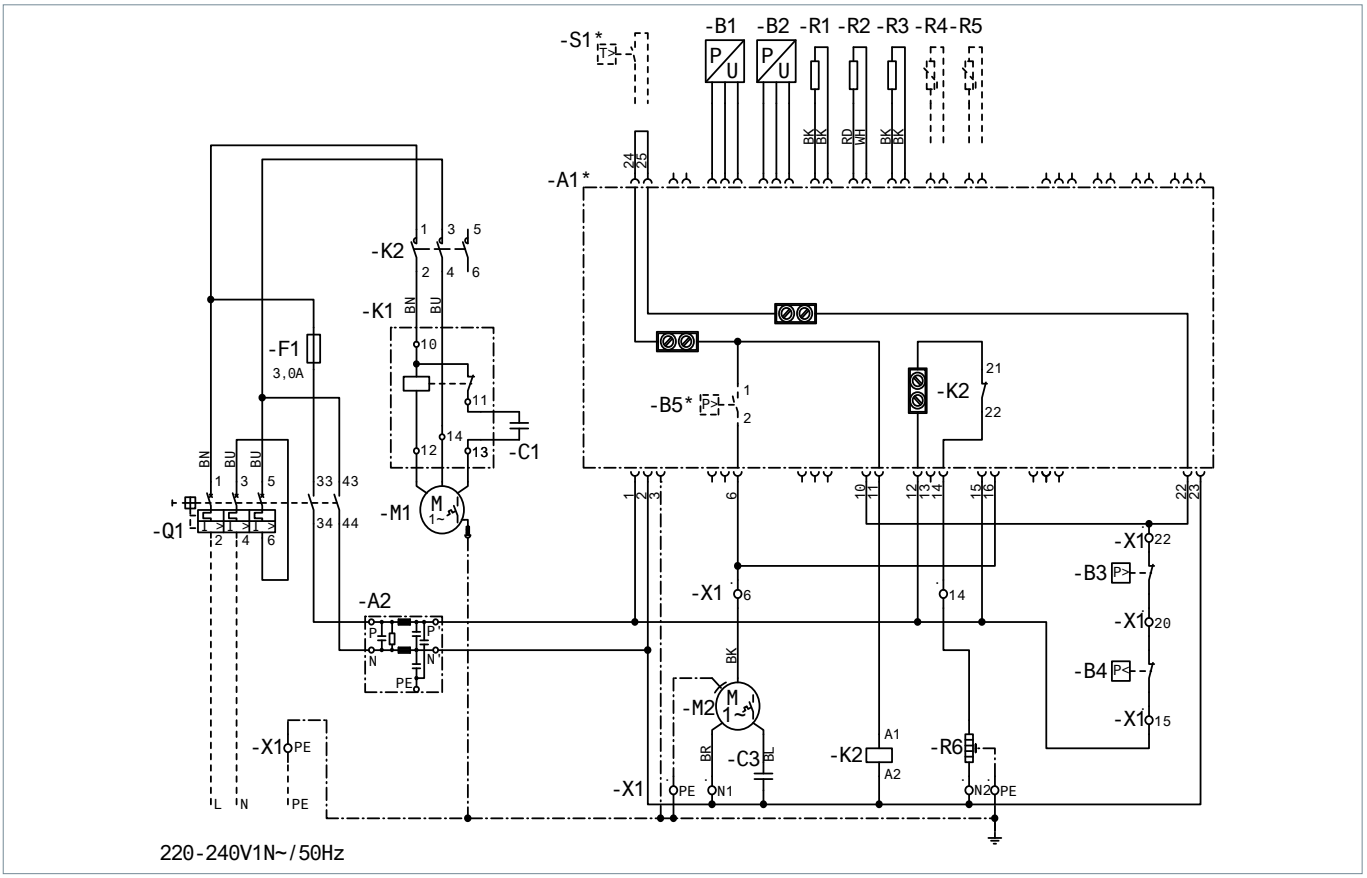
| Code (controller parameter o61)* | Model* Optyma™ Plus New Generation | Code-no. | Compressor* | Refrigerant (controller parameter o30)* (13 = user defined via Modbus / ADAP-KOOL®) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | settings are adjustable* | | | Factory Presetting | R404A (19) | R507 (17) | R134a (3) | R513A (36) | R407C (20) | R22 (2) | R407A (21) | R407F (37) | R448A (40) | R449A (41) | R452A (42) | R1234yf (39) | R454C (51) | R455A (52) |
| 42 | OP-MPXM057MLP00E | 114X4293 | MLZ026T4LP9 | R449A | X | X | X | X | | | X | X | X | X | X | | | |
| 43 | OP-LPOM067LLP02E | 114X3371 | LLZ013T4LC9 | R452A | X | X | | | | | | | X | X | X | | | |
| 44 | OP-LPOM084LLP02E | 114X3372 | LLZ015T4LC9 | R452A | X | X | | | | | | | X | X | X | | | |
| 45 | OP-LPOM098LLP02E | 114X3373 | LLZ018T4LC9 | R452A | X | X | | | | | | | X | X | X | | | |
| 46 | OP-MPBM024AJP00G | 114X4200 | CAJ9513Z | R449A | X | X | | | | | | | X | X | X | | | |
| 47 | OP-MPBM026AJP00G | 114X4212 | CAJ4517Z | R449A | X | X | | | | | | | X | X | X | | | |
| 48 | OP-MPBM026AJP00E | 114X4213 | TAJ4517Z | R449A | X | X | | | | | | | X | X | X | | | |
| 49 | OP-MPBM034AJP00G | 114X4226 | CAJ4519Z | R449A | X | X | | | | | | | X | X | X | | | |
| 50 | OP-MPBM034AJP00E | 114X4227 | TAJ4519Z | R449A | X | X | | | | | | | X | X | X | | | |
| 51 | OP-LPQM026AJP00G | 114X3216 | CAJ2446Z | R452A | X | X | | | | | | | | | X | | | |
| 52 | OP-MPGM033AJP00G | 114X4220 | CAJ4511Y | R134a | | | X | X | | | | | | | | | | |
| 53 | OP-LPQM074FHP00G | 114X3252 | FH2511Z | R452A | X | X | | | | | | | | | X | | | |
| 54 | OP-LPQM074FHP00E | 114X3253 | TFH2511Z | R452A | X | X | | | | | | | | | X | | | |
| 55 | OP-MPLM028VVZP01E | 114X4300 | VLZ028TGNE9 | R404A | X | X | | | | | X | X | | | | | | |
| 55 | OP-MPPM028VVZP01E | 114X4302 | VLZ028TGA | R449A | X | X | | | | | X | X | X | X | | | | |
| 56 | OP-MPLM035VVZP01E | 114X4315 | VLZ035TGNE9 | R404A | X | X | | | | | X | X | | | | | | |
| 56 | OP-MPPM035VVZP01E | 114X4316 | VLZ035TGA | R449A | X | X | | | | | X | X | X | X | | | | |
| 57 | OP-MPLM044VVZP01E | 114X4333 | VLZ044TGNE9 | R404A | X | X | | | | | X | X | | | | | | |
| 57 | OP-MPPM044VVZP01E | 114X4334 | VLZ044TGA | R449A | X | X | | | | | X | X | X | X | | | | |
| 58 | OP-LPVM016DPP00G | 114X3110 | DPT16LA | R454C | X | X | | | | | | | X | X | X | | X | X |
| 59 | OP-LPVM026DSP00G | 114X3201 | DST26NA | R454C | X | X | | | | | | | X | X | X | | X | X |
| 60 | OP-LPVM034DSP00G | 114X3202 | DST34LA | R454C | X | X | | | | | | | X | X | X | | X | X |
| 64 | OP-LPQM017MPP00G | 114X3118 | DPT16LA | R452A | X | X | | | | | | | | | X | | | |
| 65 | OP-MPOM008MYP00G | 114X4119 | DLY80RAb | R449A | X | X | | | | | | | | X | | | | |
| 65 | OP-MPTM008DLP00G | 114X4107 | DLY80RAb | R454C | X | X | | | | | | | X | X | X | | X | X |
| 66 | OP-MPOM009MYP00G | 114X4120 | DLY90RAb | R449A | X | X | | | | | | | | X | | | | |
| 66 | OP-MPTM009DLP00G | 114X4111 | DLY90RAb | R454C | X | X | | | | | | | X | X | X | | X | X |
| 67 | OP-MPOM012MPP00G | 114X4121 | DPT12RA | R449A | X | X | | | | | | | | X | | | | |
| 67 | OP-MPTM012DPP00G | 114X4113 | DPT12RA | R454C | X | X | | | | | | | X | X | X | | X | X |
| 68 | OP-MPOM014MPP00G | 114X4122 | DPT14RA | R449A | X | X | | | | | | | | X | | | | |
| 68 | OP-MPTM014DPP00G | 114X4114 | DPT14RA | R454C | X | X | | | | | | | X | X | X | | X | X |
| 69 | OP-MPBM018AJP00G | 114X4230 | CAJ9510Z | R449A | X | X | | | | | | | X | X | X | | | |

**Code (controller parameter o61)**: Kode (regulatorparameter o61) / Code (Reglerparameter o61) / Code (contrôleur paramètre o61) / Code (controller parameter o61)
**Model** : Model / Modell / Modèle / Modell
**Code-no.** : Bestillingsnr. / Art-Nr. / Code n° / Artikelnummer
**Compressor** : Kompressor / Verdichter / Compresseur / Kompressor
**Refrigerant** : Kølemiddel (regulatorparameter o30) / Kältemittel (Reglerparameter o30) / Réfrigérant (contrôleur paramètre o30) / Köldmedium
***Settings are adjustable** : indstillinger er justerbare / Werte einstellbar / parameters sont réglables / Inställningarna kan justeras

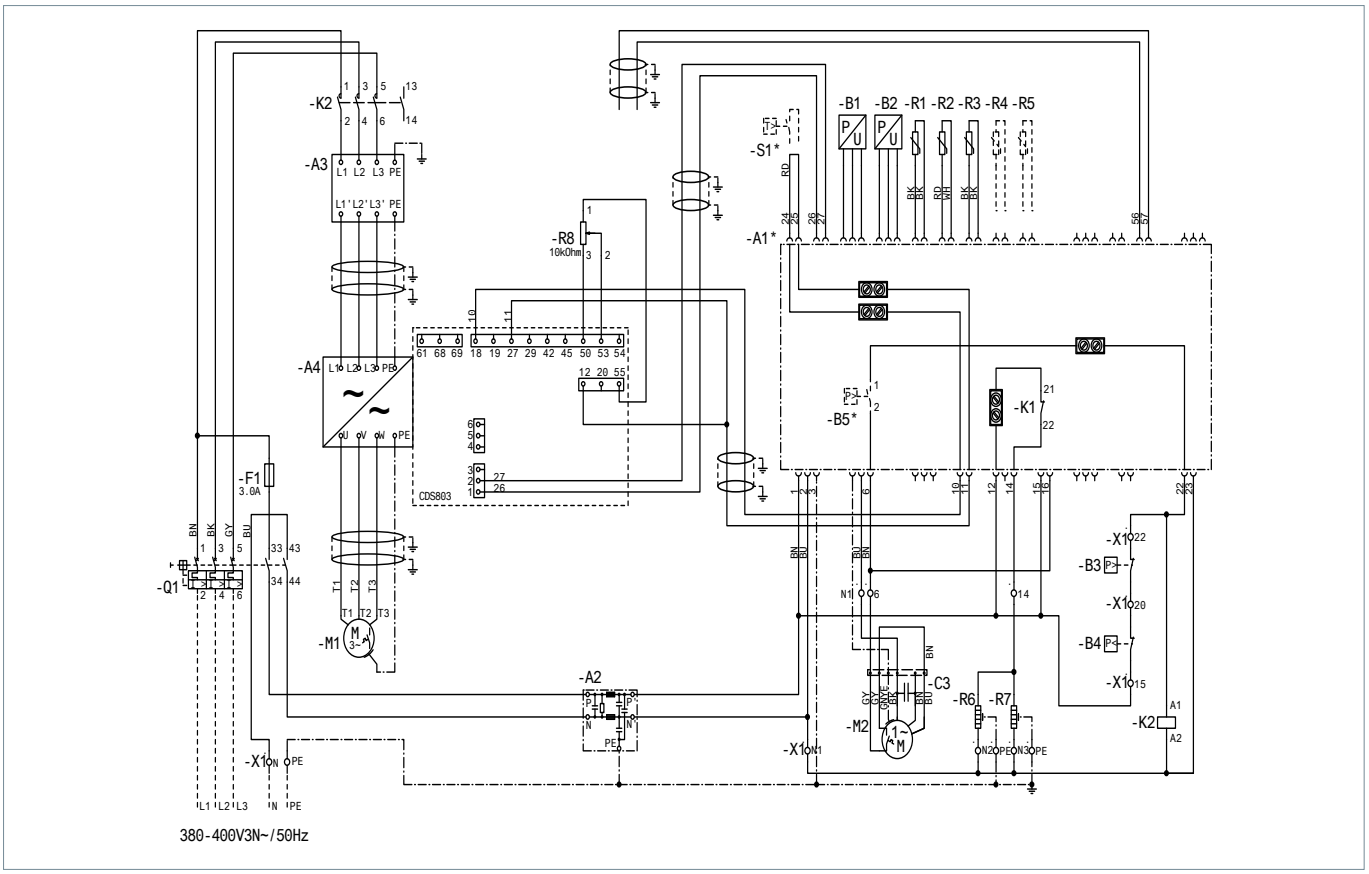
**Controller parameter o61 (A2L models only)**

| Fluid Group | Refrigerant | Parameter (o61*) |
|---|---|---|
| A2L | R455A & R454C | LLZ LI compressors = 19 |
| | | MLZ Scroll compressors = 18 |
| A1 | R134a, R404A/R507, R452A, R448A, R449A & R513A | Refer above table |

**Optyma™ Plus equipped with fixed speed compressor**




**Optyma™ Plus INVERTER equipped with variable speed compressor**





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**English Legend**

A1* Controller (option)
A2 EMI filter (control circuit)
A3 EMC/RFI Filter (Compressor)
A4 Frequency Converter
B1 Condensing pressure transducer
B2 Suction pressure transducer
B3 High pressure switch
B4 Low pressure switch
B5* Fan speed controller/pressure switch (option)
C1 Start capacitor (compressor)
C3 Run capacitor (fan)
E1 Crankcase heater
F1 Fuse (control circuit)
K1 Start Relay
K2 Contactor
M1 Compressor
M2 Fan motor
Q1 Main switch
R1 Ambient temp. sensor
R2 Discharge temp. sensor
R3 Suction temp. sensor
R4,R5 Auxiliary temp. sensor
R7 Oil separator heater
R8 Potentiometer
S1* Room thermostat (option)
X Terminals

**Dansk Legend**

A1* Regulator (ekstraudstyr)
A2 EMIFilter (Styrekredsløb)
A3 EMC/RFI-filter (Kompressor)
A4 frekvensomformer
B1 Kondenseringstryktransducer
B2 Sugetryktransducer
B3 Højtrykspressostat
B4 Lavtrykspressostat
B5* Ventilatorhastighedsregulator/Pressostat (ekstraudstyr)
C1 Startkondensator (Kompressor)
C3 Driftskondensator (Ventilator)
E1 Krumtaphusvarmer
F1 Sikring (Styrekredsløb)
K1 Startrelæ
K2 Kontaktor
M1 Kompressor
M2 Ventilatormotor
Q1 Hovedafbryder
R1 Omg. temp. føler
R2 Afgangstemp. Føler
R3 Sugetemp. Føler
R4,R5 Hjælpetemp. Sensor
R7 Olieudskillervarmeelement
R8 Potentiometer
S1* Rumtermostat (ekstraudstyr)
X Terminal

**Deutsch Legende**

A1* Regler (optional)
A2 EMV Filter (Steuerkreis)
A3 EMV Filter (Frequenzumformer)
A4 Frequenzumformer
B1 Druckmessaufnehmer (Hochdruck)
B2 Druckmessaufnehmer (Niederdruck)
B3 Hochdruckschalter
B4 Niederdruckschalter
B5* Drehzahlregler / Druckschalter (optional)
C1 Anlaufkondensator (Verdichter)
C3 Betriebskondensator (Lüfter)
E1 Kurbelwannenheizung
F1 Sicherung (Steuerkreis)
K1 Anlaufrelais
K2 Schütz
M1 Verdichter
M2 Lüftermotor
Q1 Hauptschalter
R1 Umgebungstemp. Fühler
R2 Heißgastemp. Fühler
R3 Saugstutzentemp. Fühler
R4,R5 Zusatztemp. Fühler
R7 Ölabscheiderheizung
R8 Potentiometer
S1* Raumthermostat (optional)
X Anschlussklemme

**Français Légende**

A1* contrôleur (en option)
A2 Filtre EMI (Circuit de commande)
A3 Filtre RFI/EMC (Compresseur)
A4 Convertisseur de fréquence
B1 transducteur de pression de condensation
B2 transducteur de pression d'aspiration
B3 pressostat haute pression
B4 pressostat basse pression
B5* Régulateur de vitesse du ventilateur/Pressostat (en option)
C1 Condensateur de démarrage (Compresseur)
C3 Condensateur de marche (ventilateur)
E1 résistance de carter
F1 fusible (Circuit de commande)
K1 relais de démarrage
K2 contacteur
M1 compresseur
M2 moteur de ventilateur
Q1 sectionneur principal
R1 sonde de température ambiante
R2 sonde de température de refoulement
R3 sonde de température d'aspiration
R4,R5 sonde de température auxiliaire (en option)
R7 Résistance de séparateur d'huile
R8 Potentiomètre
S1* thermostat d'ambiance (en option)
X borne

**Svenska Legend**

A1* regulator (tillval)
A2 EMI-filter (styrkrets)
A3 EMC/RFI-filter (kompressor)
A4 Frekvensomformare
B1 Kondensortrycksgivare
B2 Högtrycksbrytare
B3 Högtrycksbrytare
B4 Lågtrycksbrytare
B5* Fläkthastighetsregulator/pressostat (tillval)
C1 Startkondensator (kompressor)
C3 Driftkondensator (fläkt)
E1 Vevhusvärmare
F1 Säkring (styrkrets)
K1 Startrelä
K2 Kontaktor
M1 Kompressor
M2 Fläktmotor
Q1 Huvudbrytare
R1 Omgivningstemp. sensor
R2 Tryckrörstemp. sensor
R3 Sugtemp. sensor
R4,R5 Extra temp. sensor (tillval)
R7 Värmare för oljeavskiljare
R8 Potentiometer
S1* Rumstermostat (tillval)
X Terminal

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## Commissioning

**Electrical installations**

- Arrange electrical connections as mentioned in the table below
- Remove temporarily bridge DI1 (terminals 24 - 25 of the controller) to get access to parameters and values of the controller without starting the condensing unit

| Room Thermostat control without Pump Down function | Pump Down control with factory delivered low pressure transmitter |
|---|---|
| - Connect room thermostat(24 - 25 i.e. DI1) to these terminals | - Connect power supply to main switch acc. wiring diagram, located in front door inner side |
| - Connect power supply to main switch acc. wiring diagram, located in front door inner side | - Increase the Setting of controller Par. c33 (Pump Down CUT-OUT value):<br>e.g. Piston : 0,7bar<br>e.g. Scroll : 1,7bar<br>Note: To avoid low pressure alarm, the Setting of c33 and r23 (for INVERTER units) should be higher than c75 |

**Main display (after controller start-up)**

- By default the controller's screen displays the Evaporating temp. in deg. C
- Press the lower button to see the condensing temp. in eg. c,
- The display returns to its default screen after few seconds if no key is pressed

**Parameter Menu**

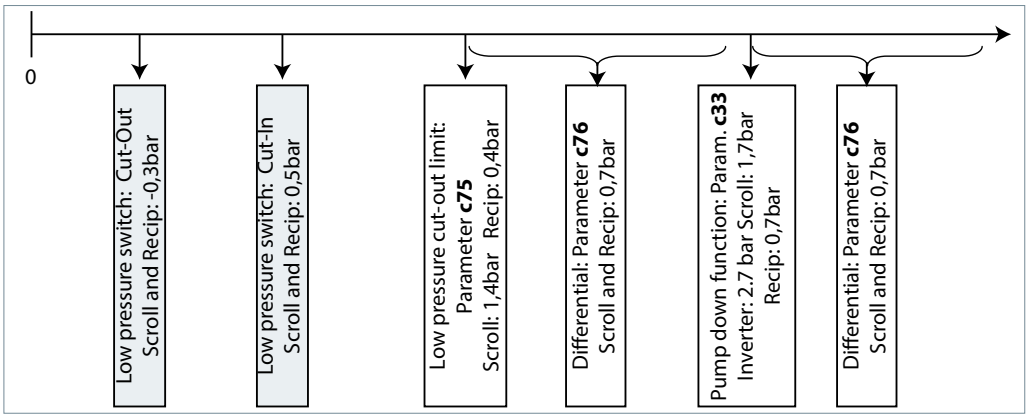
- Press upper button for 5 seconds to get access to parameter menu.
- After entering parameters menu "r05" will be shown on display.
- Press upper or lower button to go to other parameters.
- Press middle button to see the value of any parameter. 3 LEDs on controller will start flashing after this step.
- Press upper or lower button to change the value of that parameter. Press middle button to save the value. Or the value will be stored after 20 seconds if no key is pressed after changing the value.
- The display returns to its default screen if no key is pressed for 20 seconds.

**Quick start of the unit / Refrigerant change**

- Optyma™ Plus new generation is preset, depending on the compressor model and refrigerant type. In the case of a "multi-refrigerant" compressor, the controller of the condensing unit is Factory Preset as per above table (see table on page 4). If this factory setting fits for the requirement of your application, no controller parameter to be changed.
- For refrigerant change go into parameter menu (hold upper button for 5 seconds).
- Select parameter r12 from parameter menu by pressing lower button.
- Select r12 by pressing middle button, change value to "0" and save.
- Now select the parameter "o30" from parameter menu and set its value as per required refrigerant to 3 (R134a), 17 (R507), 20 (R407C), 19 (R404A), 21 (R407A), 37 (R407F), 40 (R448A), 41 (R449A), 42 (R452A), 36 (R513A)
- Again select parameter r12 and set its value to 1.
- Condensing unit will start after this step as per logic.
- After 20 seconds the display returns to the evaporation temperature in °C, the new refrigerant and all relevant parameters are changed

**Pump Down - Function**

- A "pump-down" limit can be activated with the setting of parameter c33
- To avoid unwanted low pressure alarms, the setting ot this parameter should be higher than the low pressure cut-out limit parameter c75, … e.g. below




**Day/Night - Function**

In some areas it may be necessary to reduce noise level during night time. This is possible with the "Day / Night" function of the Optyma™ Plus controller which limits the fan speed for all units and the compressor speed for INVERTER units. For activation follow the next steps …

- Activate the parameter menu (press upper button min. 5 sec.)
- Select parameter "r13" Night Offset (temperature offset related to condensing temperature setpoint for daytime which is parameter "r29")
- Push middle button and set the desired value, e.g. 005 for 5 Kelvin
- Confirm the value with a short press on the middle button. Do the same with the next parameters which are required for the "Day / Night" - function …
- Select and set parameter "t17" Day start (hours), e.g. 006 for 06:00 a.m.
- Select and set parameter "t18" Night start (hours), e.g. 022 for 22:00 p.m.
- Select and set parameter "t07" Clock setting (hours), e.g. 011 for 11:xx a.m.
- Select and set parameter "t08" Clock setting (minutes), e.g. 035 for 11:35 a.m.
- Select and set parameter "t45" Clock setting (date), e.g. 010 for 10.xx.xx
- Select and set parameter "t46" Clock setting (month), e.g. 004 for 10.04.xx
- Select and set parameter "t47" Clock setting (year), e.g. 012 for 10.04.12
- All values will be stored with the middle button or after 20s without pressing any button

## Service and Maintenance

**Main Display**
(Evaporating and Condensing Temperature, Setpoint Temperature Difference)

- The controller displays the evaporation temperature in °C (main screen)
- It will show condensing temperature in °C after pressing short the lower button
- The difference between condensing temp. and ambient temp. in deg. C can be shown by pressing middle button. It can be modified by pressing upper or lower button.
- The display returns to main screen after a few seconds without any action on the buttons

**Operating Parameters**

- Operation conditions of the condensing unit can be displayed in the parameter menu by selecting parameters "U" … below some examples

| | |
|---|---|
| u01 | Condensing Pressure |
| u10 | Status of DI1 (room thermostat) |
| u21 | Superheat |
| u37 | Status of DI2 (frequency converter alarm) |
| u52 | Compressor Capacity |
| U22 | Condensing Temperature |
| U23 | Evaporation Pressure |
| U24 | Evaporation Temperature |
| U25 | Ambient Temperature |
| U26 | Discharge Temperature |
| U27 | Suction Temperature |
| U44 | Voltage on A01 |
| U56 | Voltage on A02 |


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**Alarm and Error Messages**

- In case of "malfunctions" 3 small LED symbols will flash on the controller's screen. Acknowledge with a short press on upper button. Here some examples below …

| | |
|---|---|
| A2 | Low Suction Pressure Alarm |
| A17 | Safety Input Alarm (DI3: High condensing / low suction pressure) |
| A96 | Discharge Gas Temperature High |
| A97 | Digital Input Alarm (DI2: Frequency converter alarm) |
| E20 | Condensing Pressure Transmitter Error |
| E31 | Ambient Temperature Sensor Error |
| E32 | Discharge Temperature Sensor Error |
| E33 | Suction Gas Temperature Sensor Error |
| E39 | Evaporating Pressure Transmitter Error |

## Repair

**Controller failure**
(if the controller fails, there is a possibility to run the condensing unit in "manual" mode. Proceed as follows)

**Fixed speed units:**

See wiring diagrams on page 5

- Disconnect the condensing unit from power supply (turn hardware main switch off)
  - Remove wire from controller terminal 22 (safety input DI3) and terminal 25 (room thermostat DI1) and put them together
  - Remove wire from controller terminal 24 (room thermostat DI1) and terminal 11 (compressor supply) and put them together
  - Remove wire 6* and connect it with terminal bridge for wire 11 and 24.
  - Remove wire from terminal 14 (crankcase heater) and connect it to compressor contactor K2 terminal 22
  - Remove wire from controller terminal 12 (supply crankcase heater), extend this wire approximately 40cm and connect it to compressor contactor K2 terminal 21
- Pay attention: Remove the big terminal block from the controller or remove the complete controller
- Connect the condensing unit back to power supply (turn hardware main switch on)

**Variable speed units:**

See wiring diagrams on p. 5.

- Disconnect the condensing unit from power supply (turn hardware main switch off)
  - Remove wire from controller terminal 22 (safety input) and terminal 6* (fan) and put them together
  - Remove wire from controller terminal 10 (compressor relay) and terminal 24 (room thermostat) and put them together
  - Remove wire from controller terminal 11 (compressor relay) and terminal 25 (room thermostat) and put them together
  - Remove wire from Inverter terminal 50 and connect to Potentiometer terminal 3
  - Remove wire from Inverter terminal 53 and connect to Potentiometer terminal 2
  - Remove wire from Inverter terminal 55 and connect to Potentiometer terminal 1
  - Remove wire from terminal 14 (crankcase heater) and connect it to compressor contactor K1 terminal 22
  - Remove wire from controller terminal 12 (supply crankcase heater), extend this wire approximately 40cm and connect it to compressor contactor K1 terminal 21
- Pay attention: Remove the big terminal block from the controller or remove the complete controller
- Connect the condensing unit back to power supply (turn hardware main switch on)

*Option: A fan pressure switch or fan speed controller can be connected in series to wire n°6

**Factory reset**
(all factory parameters can be restored by the following procedure)

- Turn OFF the main power switch
- While holding simultaneously the up and down button, turn ON the main switch
- Message FAC is displayed, means "FACTORY RESET" restores factory settings
- After a short time message "typ" appears on the screen
- Activate parameter menu and go to parameter o61 (unit type)
- Enter the value 1 to 57 depending on the type of condensing unit (see table 1 on page 3)
- Store the entered value by pressing the middle button of the controller
- After 15 seconds without action the message "ref" appears on the screen
- Activate parameter menu and go to parameter o30 (refrigerant)
- Change the value to 3 (for refrigerant R134a),17(R507), 20(R407C), 19(R404A), 21(R407A), 37(R407F), 40(R448A), 41(R449A), 42(R452A) or 36 (R513A)

For INVERTER units only:
- Set parameter c71 to 2 (variable speed compressor)
- Set parameter o37 to 7 (frequency converter alarm on DI2)

- Store the entered value by pressing the middle button of the controller
- Go to parameter o67 (store values as factory setting)
- Change the value to "on"
- Validate the parameter entered by pressing the middle button of the controller
- After 15 seconds without action the message "OFF" appears on the screen
- Activate parameter menu and go to parameter r12 (main switch)
- Change the value to 1 (condensing unit will start if cooling demand from cold room controller)
- The "Day / Night" function must be reprogrammed too (see chapter Commissioning - Day/Night - Function)

For Liquid injection models only (OP-xxxxxxxxxP02E), if o30 value is 19= R404A or 40=R448A or 41=R449A in controller,
- Push the upper or lower button to find parameter code r84.
- Push the middle button until the value for this parameter is shown as 125
- Push the upper button to select the new value: 130.

**Controller Replacement of a unit on site**

- Turn OFF the main power switch
- Remove the new controller (remove all plugs, 2 x I-type screws and controller)
- Install the new controller
- Turn ON main power switch again, no factory reset needed
- After a short time message "typ" appears on the screen
- Follow same steps as shown in preceding chapter fifth row and following

spare part code controller SINGLE pack: 118U3465


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## Control

**Control of condensing pressure**

- The setpoint condensing temperature is calculated from the measured ambient temperature plus an adjustable Temperature Offset (called Reference) and controlled by the fan speed
- Factory setting of Reference = 8.0K
- The Reference is accessible by pressing short the middle button of the controller
- When Reference is shown, it can be modified with the upper or lower button
- Additionally to this the control of the condensing temperature can be limited by following parameters:
  "r82" = minimal condensing temperature (factory set: 10.0°C)
  "r83" = maximal condensing temperature (factory set: 40.0°C)

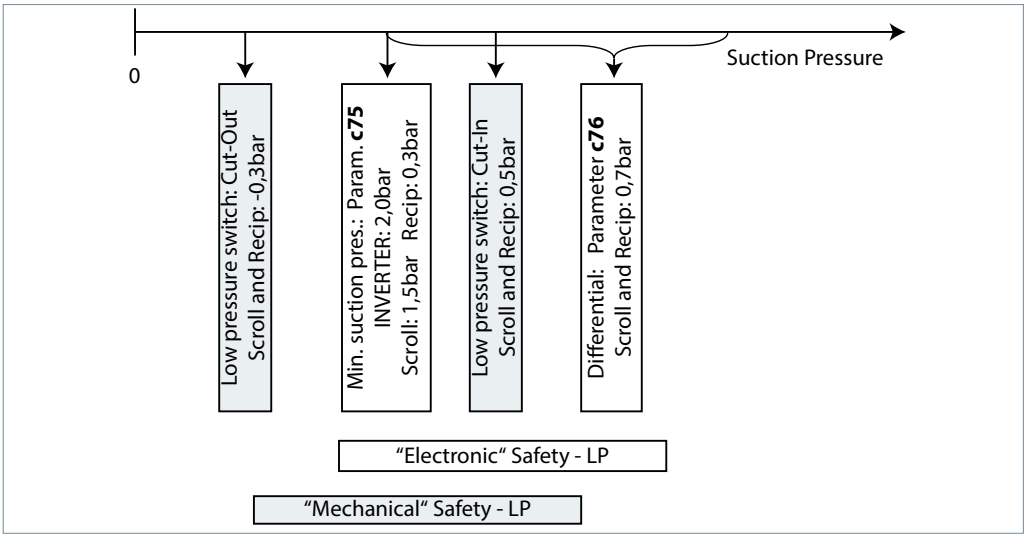
**Control of crankcase heater**

- The controller optimizes the regulation of the crankcase heater itself. The heating power depends on the ambient temperature and suction pressure and is controlled by Pulse Width modulation
- There is no change of parameters "P45", "P46" and "P47" necessary on site

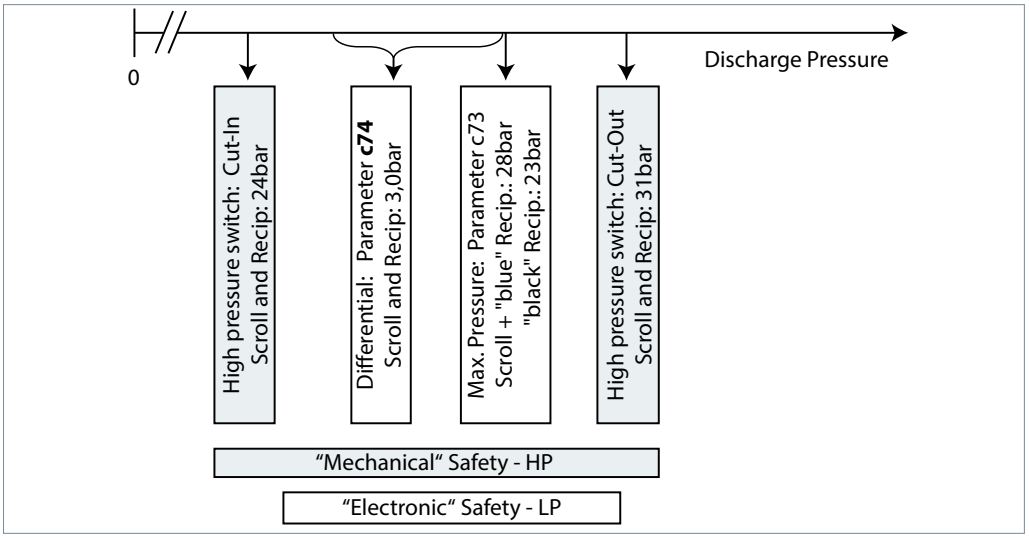
**Control of Fan Speed**

- The fan speed is controlled by PI-control, depends on the actual value and the setpoint of the condensing temperature
- There is no change of parameters "F14" and "F21" to be provided on site

**Safety Parameter "Low Pressure" for R448A / R449A / R452A**




**Safety Parameter "High Pressure" for R448A / R449A / R452A**



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## Idriftsættelse

**Elektriske installationer**

- Arranger elektriske tilslutninger som nævnt i tabellen nedenfor
- Afmonter midlertidigt bro DI1 (regulatorens terminal 24-25) for at få adgang til parametre og værdier for regulatoren uden at starte kondenseringsaggregatet

| Rumtermostat uden pump down-funktion | Pump down-regulering med fabriksmonteret lavtrykstransmitter |
|---|---|
| - Tilslut rumtermostat (24 - 25 i.e. DI1) til disse terminaler<br><br>- Tilslut strømforsyning til hovedafbryderen i henhold til el-diagram, der er placeret i sidedørens inderside | - Tilslut strømforsyning til hovedafbryderen i henhold til el-diagram, der er placeret på indersiden af døren foran<br><br>- Forøg indstillingen for regulatorpar. c33 (udkoblingsværdi for "pump down"):<br>f.eks. stempel: 0,7 bar<br>f.eks. scroll: 1,7 bar<br>Bemærk: For at undgå lavtryksalarm skal indstillingen for c33 og r23 (for INVERTER-enheder) være højere end c75 |

**Regulatorvisning (efter opstart)**

- Regulatorens skærm viser som standard fordampningstemperaturen i grader. C
- Tryk på den nederste knap for at se kondenseringstemperaturen i f.eks. C.
- Displayet vender tilbage til standardskærmbilledet efter nogle få sekunder, hvis der ikke trykkes på en tast

**Parametermenu**

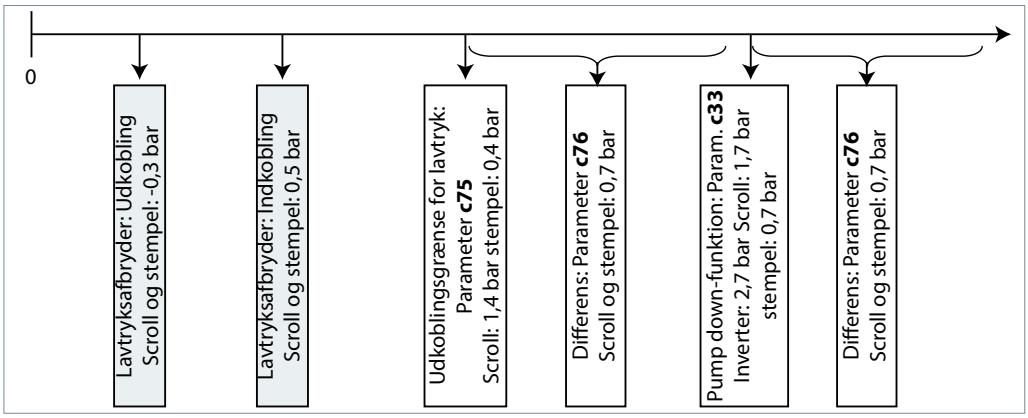
- Tryk på den øverste knap i fem sekunder for at få adgang til parametermenuen.
- Når man er kommet ind i menuen, vil parametermenu "r05" blive vist i displayet.
- Tryk på den øverste eller nederste knap for at gå til andre parametre.
- Tryk på den midterste knap for at se værdien af en parameter. Tre LED'er på regulatoren begynder at blinke efter dette trin.
- Tryk på den øverste eller nederste knap for at ændre værdien af den pågældende parameter. Tryk på den midterste knap for at gemme værdien. Eller værdien gemmes efter 20 sekunder, hvis der ikke trykkes på en tast efter ændring af værdien.
- Displayet vender tilbage til standardskærmbilledet, hvis der ikke trykkes på en tast i 20 sekunder.

**Hurtigstart af enheden/ kølemiddelskift**

- Optyma™ Plus New Generation er forudindstillet, afhængig af kompressormodel og kølemiddeltype. I tilfælde af en kompressor til flere kølemidler er kondenseringsaggregatets regulator er fabriksindstillet som i nedenstående tabel (se tabel på side 4). Hvis denne fabriksindstilling passer til dine anvendelsesbehov, skal ingen regulatorparametre ændres.
- Gå til parametermenuen for kølemiddelskift (hold den øverste knap inde i fem sekunder).
- Vælg parameter r12 fra parametermenuen ved at trykke på den nederste knap.
- Vælg r12 ved at trykke på den midterste knap, og skift værdien til "0", og gem.
- Vælg derefter parameteren "o30" fra parametermenuen, og indstil værdien i henhold til det påkrævede kølemiddel til 3 (R134a), 17 (R507), 20 (R407C), 19 (R404A), 21 (R407A), 37 (R407F), 40 (R448A), 41 (R449A), 42 (R452A), 36 (R513A)
- Vælg igen parameter r12, og indstil dens værdi til 1.
- Kondenseringsaggregatet starter efter dette trin i henhold til logikken.
- Efter 20 sekunder vender visningen tilbage til fordampningstemperaturen i ° C. Det nye kølemiddel og alle relevante parametre er ændret

**Pump down – funktion**

- En grænse for "pump down" kan aktiveres ved indstilling af parameter c33
- For at undgå uønskede lavtryksalarmer skal indstillingen for dette parameter være højere end parameter c75 for lavtryksudkobling, f.eks. som herunder




**Dag/nat-funktion**

I nogle områder kan det være nødvendigt at reducere støjniveauet om natten. Dette er muligt med Optyma™ Plus-regulatorens dag/nat-funktion, som begrænser ventilatorhastigheden for alle drev og kompressorhastigheden for INVERTER-drev. Følg nedenstående trin ved aktivering.

- Aktiver parametermenuen (tryk på øverste knap i min. 5 sek.)
- Vælg parameter "r13" natforskydning (temperaturforskydning relateret til kondenseringstemperaturens indstillingspunkt for dag, hvilket er parameter "r29"
- Tryk på den midterste knap, og indstil den ønskede værdi, f.eks. 005 for 5 Kelvin
- Bekræft værdien med et kort tryk på den midterste knap. Gør det samme med de næste parametre, der er påkrævet for "dag/nat"-funktionen.
- Vælg og indstil parameter "t17" dagstart (timer), f.eks. 006 for kl. 6.00
- Vælg og indstil parameter "t18" natstart (timer), f.eks. 022 for kl. 22.00
- Vælg og indstil parameter "t07" indstilling af ur (timer), f.eks. 011 for kl. 11.xx
- Vælg og indstil parameter "t08" indstilling af ur (minutter), f.eks. 035 for kl. 11.35
- Vælg og indstil parameter "t45" indstilling af ur (dato), f.eks. 010 for 10.xx.xx
- Vælg og indstil parameter "t46" indstilling af ur (måned), f.eks. 004 for 10.04.xx
- Vælg og indstil parameter "t47" indstilling af ur (år), f.eks. 012 for 10.04.12
- Alle værdier gemmes ved at trykke på den midterste knap

## Service og vedligeholdelse

**Hovedvisning**
(Fordampnings- og kondenseringstemperatur, indstillingspunkt for temperaturforskel)

- Regulatoren viser fordampningstemperaturen i ° C ("hovedbilledet" på displayet)
- Den viser kondenseringstemperaturen i °C efter et kort tryk på den nederste knap
- Forskellen mellem kondenseringstemp. og omgivelsestemp. i grader C kan vises ved at trykke på den midterste knap. Den kan ændres ved at trykke på den øverste eller nederste knap.
- Visningen vender tilbage til "hovedbilledet" på displayet efter få sekunder uden betjening af knapperne

**Driftsparametre**

- Driftsforhold for kondenseringsaggregatet kan vises i parametermenuen ved valg af parametrene "U". Se eksempler her:

| | |
|---|---|
| u01 | Kondenseringstryk |
| u10 | Status for DI1 (rumtermostat) |
| u21 | Overhedning |
| u37 | Status for DI2 (frekvensomformeralarm) |
| u52 | Kompressorkapacitet |
| U22 | Kondenseringstemperatur |
| U23 | Fordampningstryk |
| U24 | Fordampningstemperatur |
| U25 | Omgivelsestemperatur |
| U26 | Afgangstemperatur |
| U27 | Sugetemperatur |
| U44 | Spænding på A01 |
| U56 | Spænding på A02 |


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**Alarm- og fejlmeddelelser**

- I tilfælde af "fejlfunktion" blinker 3 små LED-symboler på regulatorens display. Godkend med et kort tryk på øverste knap. Se nogle eksempler her.

| | |
|---|---|
| A2 | Alarm for lavt sugetryk |
| A17 | Sikkerhedsindgangsalarm (DI3: Højt kondenseringstryk/lavt sugetryk) |
| A96 | Trykrørstemperatur høj |
| A97 | Digital indgangsalarm (DI2: frekvensomformeralarm) |
| E20 | Fejl i kondenseringstryktransmitter |
| E31 | Fejl i omgivelsestemperaturføler |
| E32 | Fejl i afgangstemperaturføler |
| E33 | Fejl i sugegastemperaturføler |
| E39 | Fejl i fordampningstryktransmitter |

## Reparation

**Regulatorfejl**
(hvis regulatoren har fejlfunktion, er det muligt at køre kondenseringsaggregatet i "manuel" tilstand. Gå frem som følger)

**Drev med fast hastighed:**

Se el-diagram på s. 5.

- Afbryd kondenserings aggregatet fra strømforsyningen (sluk for udstyrets hovedafbryder)
  - Fjern ledning fra regulatorterminal 22 (sikkerhedsindgang DI3) og terminal 25 (rumtermostat DI1), og sæt dem sammen
  - Fjern ledning fra regulatorterminal 24 (rumtermostat DI1) og terminal 11 (kompressorforsyning DI1), og sæt dem sammen
  - Fjern ledning 6*, og forbind den med terminalbroen for ledning 11 og 24.
  - Fjern ledningen fra regulatorterminal 14 (varmelegeme til krumtaphus), og tilslut den til kompressorkontaktor K2 terminal 22
  - Fjern ledningen fra regulatorterminal 12 (forsyning, krumtaphusvarmelegeme), forlæng denne ledning ca. 40 cm, og tilslut den til kompressorkontaktor K2 terminal 21
- Vær omhyggelig: Afmonter den store terminalblok fra regulatoren, eller afmonter hele regulatoren
- Tilslut kondenserings aggregatet til strømforsyningen igen (slå hovedafbryder for hardware til)

**Drev med variabel hastighed:**

Se el-diagram på s. 5.

- Afbryd kondenserings aggregatet fra strømforsyningen (sluk for udstyrets hovedafbryder)
  - Fjern ledning fra regulatorterminal 22 (sikkerhedsindgang DI3) og terminal 6* (ventilator), og sæt dem sammen
  - Fjern ledning fra regulatorterminal 10 (kompressorrelæ) og terminal 24 (rumtermostat), og sæt dem sammen
  - Fjern ledning fra regulatorterminal 11 (kompressorrelæ) og terminal 25 (rumtermostat), og sæt dem sammen
  - Fjern ledningen fra Inverter-terminal 50 og tilslut til potentiometer terminal 3
  - Fjern ledningen fra Inverter terminal 53 og tilslut til potentiometer terminal 2
  - Fjern ledningen fra Inverter terminal 55 og tilslut til potentiometer terminal 1
  - Fjern ledningen fra regulatorterminal 14 (varmelegeme til krumtaphus), og tilslut den til kompressorkontaktor K1 terminal 22
  - Fjern ledningen fra regulatorterminal 12 (forsyning, krumtaphusvarmelegeme), forlæng denne ledning ca. 40 cm, og tilslut den til kompressorkontaktor K1 terminal 21
- Vær omhyggelig: Afmonter den store terminalblok fra regulatoren, eller afmonter hele regulatoren
- Tilslut kondenserings aggregatet til strømforsyningen igen (slå hovedafbryder for hardware til)

*Mulighed En ventilator pressostat eller ventilatorhastighedsregulator kan serieforbindes til ledning nr. 6

**Fabriksreset**
(alle fabriksparametre kan gendannes ved følgende procedure)

- Slå hovedafbryderen FRA
- Hold op- og nedknappen nede samtidig og slå hovedafbryderen TIL
- Beskeden FAC vises, hvilket betyder "fabriksreset", gendanner fabriksindstillinger
- Efter kort tid vises beskeden "typ" på displayet
- Aktiver parametermenu, og gå til parameter o61 (enhedstype)
- Indtast værdien 1 til 57, afhængigt af typen af kondenseringsaggregat (se tabel 1 på side 3)
- Gem den indtastede værdi ved at trykke på regulatorens midterste knap
- Efter 15 sekunder uden betjening ses beskeden "ref" på displayet
- Aktiver parametermenuen, og gå til parameter o30 (kølemiddel)
- Indstil værdien til f.eks. 3 (med kølemiddel R134a), 17(R507), 20(R407C), 19(R404A), 21(R407A), 37(R407F), 40(R448A), 41(R449A), 42(R452A) eller 36 (R513A)

Kun for INVERTER-enheder:
- Indstil parameter c71 til 2 (kompressor med variabel hastighed)
- Indstil parameter o37 til 7 (frekvensomformeralarm på DI2)

- Gem den indtastede værdi ved at trykke på regulatorens midterste knap
- Gå til parameter o67 (gem værdier som fabriksindstilling)
- Indstil værdien til "on"
- Bekræft det indtastede parameter ved at trykke på regulatorens midterste knap
- Efter 15 sekunder uden betjening ses beskeden "OFF" på displayet
- Aktiver parametermenu, og gå til parameter r12 (hovedafbryder)
- Indstil værdien til 1 (kondenseringsenhed starter ved kølebehov fra kølerumsregulator)
- Dag/nat-funktionen skal også genprogrammeres (se kapitlet Idriftsættelse – Dag/nat-funktion)

For modeller i P02-version (OP-xxxxxxxxxP02E): Hvis o30-værdien er 19 = R404A eller 40 = R448A eller 41 = R449A i regulatoren:
- Tryk på den øverste eller nederste knap for at finde parameterkoden r84.
- Tryk på den midterste knap, indtil værdien for denne parameter vises som 125
- Tryk på den øverste knap for at vælge den nye værdi: 130.

**Udskiftning af regulator for et aggregat på stedet**

- Slå hovedafbryderen FRA
- Afmonter den "gamle" regulator (afmonter alle propper, 2 skruer af I-type og regulator)
- Montér den nye regulator
- Slå hovedafbryderen TIL igen, fabriksreset ikke nødvendigt
- Efter kort tid vises beskeden "typ" på displayet
- Følg samme trin som vist i foregående kapitel fra femte række og frem

reservedelskode regulator, enkelt stk: 118U3465

## Regulering

**Regulering af kondenseringstryk**

- Indstillingspunktet for kondenseringstemperaturen beregnes ud fra den målte omgivelsestemperatur plus en indstillelig temperaturforskydning (reference) og styres af ventilatorhastigheden
- Fabriksindstilling for reference = 8,0 K
- Referencen er tilgængelig ved kort tryk på regulatorens midterste knap
- Når referencen vises, kan den modificeres med øverste eller nederste knap
- Ud over dette kan reguleringen af kondenseringstemperaturen begrænses af følgende parametre:
  "r82" = minimal kondenseringstemperatur (fabriksindstillet: 10,0° C)
  "r82" = maksimal kondenseringstemperatur (fabriksindstillet: 40,0° C)

**Regulering af krumtaphusvarmelegeme**

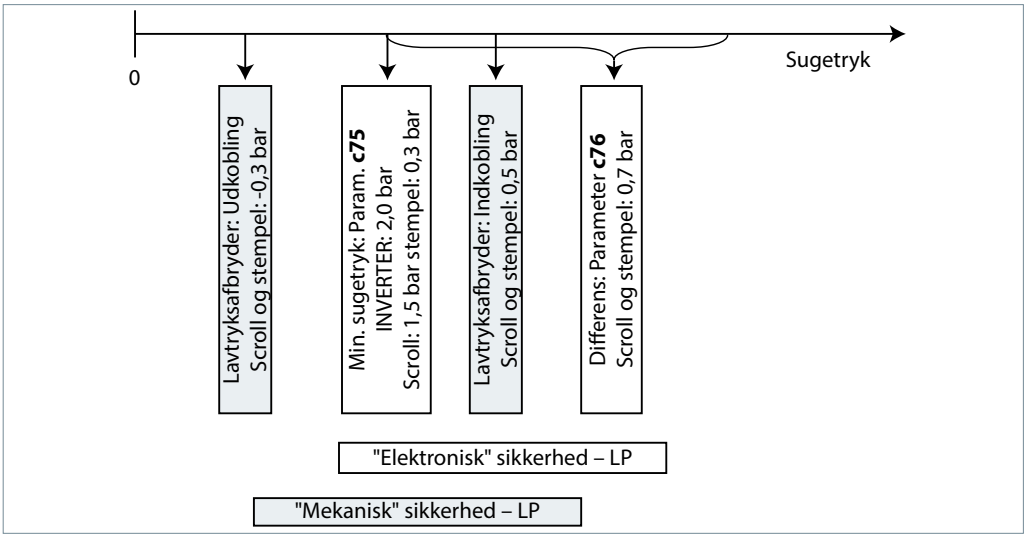
- Regulatoren optimerer reguleringen af selve krumtaphusvarmelegemet. Varmeeffekten afhænger af omgivelsestemperaturen og sugetrykket og reguleres af pulsbreddemodulation
- Der kræves ingen ændring af parameter "P45", "P46" og "P47" på stedet

**Regulering af ventilatorhastighed**

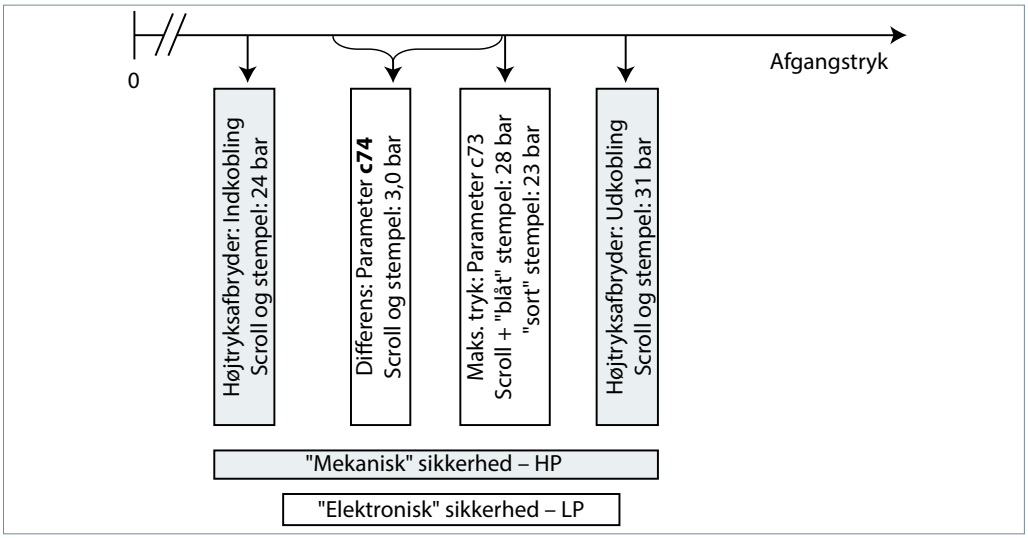
- Ventilatorhastigheden reguleres ved PI-regulering, afhænger af den faktiske værdi og indstillingspunkt for kondenseringstemperaturen
- Der er ingen ændring af parameter "F14" og "F21", der skal laves på stedet


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**Sikkerhedsparameter "lavtryk" for R448A / R449A / R452A**




**Sikkerhedsparameter "højtryk" for R448A / R449A / R452A**



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## Inbetriebnahme

**Elektrische Installation**

- Stellen Sie die elektrischen Verbindungen wie in der Tabelle unten beschrieben her.
- Entfernen Sie vorrübergehend die Verbindungsbrücke DI1 (Klemmen 24 – 25 am Regler), um ohne Start des Verflüssigungssatzes auf die Parameter und Werte zugreifen zu können.

| Raumthermostatregelung ohne Pump-down-Funktion | Pump-down-Regelung mit Niederdruckmessumformer ab Werk |
|---|---|
| - Raumthermostat (24 - 25 i.e. DI1) an diese Klemmen anschließen.<br><br>- Stromversorgung mit Hauptschalter verbinden, wie im Schaltplan auf der Innenseite der Fronttür gezeigt. | - Stromversorgung mit Hauptschalter verbinden, wie im Schaltplan auf der Innenseite der Fronttür gezeigt.<br><br>- Einstellung von Reglerparameter c33 (Pump-down-ABSCHALT-Wert) erhöhen:<br>z. B. Normalkühlung Hubkolben: 0,7 bar,<br>Tiefkühlung Hubkolben: 0,2 bar<br>z. B. Scroll: 0,7 bar<br>Hinweis: Um Niederdruckalarme zu vermeiden, sollte die Einstellung von c33 und r23 (für drehzahlgeregelte-Geräte) höher sein als c75. |

**Displayanzeige (nach Reglerstart)**

- Standardmäßig zeigt der Reglerbildschirm die Verdampfungstemperatur in Grad C an.
- Drücken Sie die untere Taste, um die Verflüssigungstemperatur z. B. in c anzuzeigen,
- Sollte keine Taste gedrückt werden, wird nach wenigen Sekunden erneut der Standardbildschirm angezeigt.

**Parametermenü**

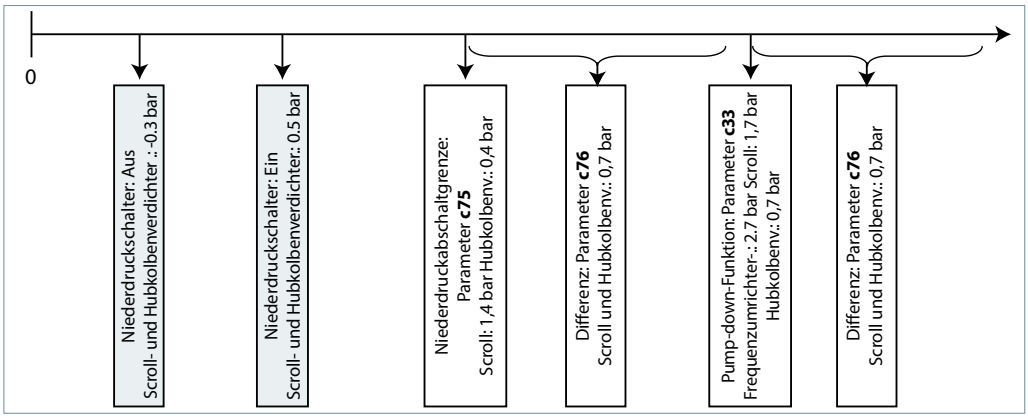
- Drücken Sie die obere Taste fünf Sekunden lang, um auf das Parameter-Menü zuzugreifen.
- Nach Eingabe der Parameter wird im Display das Menü „r05“ angezeigt.
- Drücken Sie kurz die obere (oder untere) Taste, um zum nächsten Parameter im Parameter-Menü zu wechseln.
- Drücken Sie die mittlere Taste, um den Wert eines Parameters anzuzeigen. Nach diesem Schritt blinken drei LEDs am Regler.
- Drücken Sie die obere oder untere Taste, um den Wert dieses Parameters zu ändern. Drücken Sie die mittlere Taste, um den Wert zu speichern. Sollte nach Änderung des Werts keine Taste gedrückt werden, wird der Wert nach 20 Sekunden gespeichert.
- Sollte 20 Sekunden lang keine Taste gedrückt werden, wird auf dem Display erneut der Standardbildschirm angezeigt.

**Schnellstart der Einheit/ Kältemittelwechsel**

- Optyma™ Plus neue Generation ist entsprechend dem installierten Verdichtermodell und verwendeten Kältemittel voreingestellt. Im Fall eines Verdichters für mehrere Kältemittel ist der Regler des Verflüssigungssatzes werkseitig gemäß obiger Tabelle voreingestellt (siehe Tabelle auf Seite 4). Wenn diese Werkseinstellung zu Ihrer Anwendung passt, muss kein Reglerparameter geändert werden.
- Zum Wechseln des Kältemittels öffnen Sie das Parameter-Menü (obere Taste fünf Sekunden lang gedrückt halten).
- Wählen Sie den Parameter r12 aus dem Parameter-Menü aus, indem Sie die untere Taste drücken.
- Wählen Sie „r12“ durch Drücken der mittleren Taste, ändern Sie den Wert auf „0“, und speichern Sie ihn.
- Wählen Sie nun den Parameter „o30“ aus dem Parameter-Menü aus und stellen Sie seinen Wert gemäß dem erforderlichen Kältemittel auf „3“ (R134a), „17“ (R507), „20“ (R407C), „19“ (R404A), „21“ (R407A), „37“ (R407F), „40“ (R448A), „41“ (R449A), „42“ (R452A) oder „36“ (R513A) ein.
- Wählen Sie erneut den Parameter r12 und setzen Sie seinen Wert auf „1.“
- Der Verflüssigungssatz startet nach diesem Schritt gemäß der Logik.
- Nach 20 Sekunden kehrt die Anzeige in die Hauptansicht (Verdampfungstemperatur in °C) zurück. Die Kältemitteleinstellung und alle relevanten Parameter wurden geändert.

**Pump-down-Funktion**

- Mithilfe des Parameters c33 kann ein Pump-down-Grenzwert aktiviert werden.
- Um ungewollte Niederdruckalarme zu vermeiden, sollte dieser Parameter höher gewählt sein als der Parameter c75 für die Niederdruckabschaltgrenze, siehe unten.




**Tag-/Nachtfunktion**

In einigen Anwendungsbereichen kann ein reduzierter Geräuschpegel bei Nacht erforderlich sein. Dies wird durch die Tag-/Nachtfunktion des Optyma™-Plus-Reglers ermöglicht. Sie begrenzt die Lüfterdrehzahl bei allen Einheiten und die Verdichterdrehzahl bei drehzahlgeregelten -Verdichtern. Zur Aktivierung gehen Sie wie folgt vor:

- Rufen Sie das Parametermenü auf (obere Taste min. 5 Sekunden drücken).
- Wählen Sie Parameter r13 Nacht-Offset (Temperatur-Offset in Bezug auf den Verflüssigungstemperatur-Sollwert bei Tage; dies ist Parameter r29).
- Drücken Sie die mittlere Taste und stellen Sie den gewünschten Wert ein, z. B. 005 für 5 Kelvin.
- Bestätigen Sie den Wert durch kurzes Drücken der mittleren Taste. Verfahren Sie genauso mit den nächsten Parametern für die Tag-/Nachtfunktion.
- Wählen und setzen Sie Parameter t17 – Beginn Tag (Stunden), z. B. 006 für 6:00 Uhr.
- Wählen und setzen Sie Parameter t18 – Beginn Nacht (Stunden), z. B. 022 für 22:00 Uhr.
- Wählen und setzen Sie Parameter t07 – Einstellung Uhr (Stunden), z. B. 011 für 11:xx Uhr.
- Wählen und setzen Sie Parameter t08 – Einstellung Uhr (Minuten), z. B. 035 für 11:35 Uhr.
- Wählen und setzen Sie Parameter t45 – Einstellung Uhr (Tag), z. B. 010 für 10.xx.xx.
- Wählen und setzen Sie Parameter t46 – Einstellung Uhr (Monat), z. B. 004 für 10.04.xx.
- Wählen und setzen Sie Parameter t47 – Einstellung Uhr (Jahr), z. B. 012 für 10.04.12.
- Alle Werte werden entweder durch Drücken der mittleren Taste oder automatisch nach 20 Sekunden ohne Betätigung einer Taste gespeichert.

## Instandhaltung und Wartung

**Displayanzeige**
(Verdampfungs- und Verflüssigungstemperatur, Sollwert Temperaturdifferenz)

- Das Display des Reglers zeigt die Verdampfungstemperatur in °C an (Hauptansicht).
- Durch kurzes Drücken der unteren Taste wird die Verflüssigungstemperatur in °C angezeigt.
- Die Differenz zwischen Verflüssigungstemperatur und Umgebungstemperatur in Grad C kann durch Drücken der mittleren Taste angezeigt werden. Der Wert kann durch Drücken der oberen oder unteren Taste geändert werden.
- Die Anzeige kehrt automatisch nach ein paar Sekunden ohne Betätigung einer Taste in die Hauptansicht zurück.

**Betriebsparameter**

- Durch Wählen der u-Parameter können Sie die Betriebsbedingungen anzeigen, z. B.:

| | |
|---|---|
| u01 | Verflüssigungsdruck |
| u10 | Status von DI1 (Raumthermostat) |
| u21 | Überhitzung |
| u37 | Status von DI2 (Alarm Frequenzumrichter) |
| u52 | Verdichterleistung |
| u22 | Verflüssigungstemperatur |
| u23 | Verdampfungsdruck |
| u24 | Verdampfungstemperatur |
| u25 | Umgebungstemperatur |
| u26 | Verdichtungsendtemperatur |
| u27 | Saugtemperatur |
| u44 | Spannung an A01 |
| u56 | Spannung an A02 |


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**Alarm- und Fehlermeldungen**

- Bei einer Fehlfunktion blinken die drei kleinen LED-Symbole in der Regleranzeige. Bestätigen Sie die Meldung durch Drücken der oberen Taste. Hier einige Beispiele für Warn-/ Fehlermeldungen:

| | |
|---|---|
| A2 | Alarm niedriger Saugdruck |
| A17 | Alarm Sicherheitseingang (DI3: hoher Verflüssigungsdruck/niedriger Saugdruck) |
| A96 | Druckgastemperatur hoch |
| A97 | Alarm für den digitalen Eingang (DI2: Alarm Frequenzumrichter) |
| E20 | Fehler Verflüssigungsdruckmessumformer |
| E31 | Fehler Umgebungstemperaturfühler |
| E32 | Fehler Verdichtungsendtemperaturfühler |
| E33 | Fehler Sauggastemperaturfühler |
| E39 | Fehler Verdampfungsdruckmessumformer |

## Reparatur

**Reglerdefekt**
(Für den Fall, dass der Regler ausfällt, kann der Verflüssigungssatz manuell betrieben werden. Gehen Sie dazu wie folgt vor.)

**Verdichter mit fester Drehzahl:**
Siehe Schaltpläne auf S. 5.

- Trennen Sie den Verflüssigungssatz von der Stromversorgung (drehen Sie den Gerätehauptschalter in die Aus-Position).
  - Entfernen Sie die Ader von Reglerklemme 22 (Sicherheitseingang DI3) und Klemme 25 (Raumthermostat DI1) und verbinden Sie diese miteinander.
  - Entfernen Sie die Ader von Reglerklemme 24 (Raumthermostat DI1) und Klemme 11 (Verdichterstromversorgung) und verbinden Sie diese miteinander.
  - Entfernen Sie die Ader 6* und verbinden Sie sie mit der Klemmbrücke für Ader 11 und 24.
  - Entfernen Sie die Ader von Reglerklemme 14 (Kurbelwannenheizung) und schließen Sie sie an die Klemme 22 des Verdichterschützes K2 an.
  - Entfernen Sie die Ader von Reglerklemme 12 (Stromversorgung Kurbelwannenheizung), verlängern Sie die Ader um ca. 40 cm und schließen Sie sie an die Klemme 21 des Verdichterschützes K2 an.
- Bitte beachten Sie Folgendes: Entfernen Sie den großen Klemmblock vom Regler oder entfernen Sie den gesamten Regler.
- Schließen Sie den Verflüssigungssatz wieder an die Stromversorgung an (drehen Sie den Gerätehauptschalter in die Ein-Position).

**Drehzahlgeregelte Geräte:**
Siehe Schaltpläne auf S. 5.

- Trennen Sie den Verflüssigungssatz von der Stromversorgung (drehen Sie den Gerätehauptschalter in die Aus-Position).
  - Entfernen Sie die Ader von Reglerklemme 22 (Sicherheitseingang) und Klemme 6* (Lüfter) und verbinden Sie sie miteinander.
  - Entfernen Sie die Ader von Reglerklemme 10 (Verdichterrelais) und Klemme 24 (Raumthermostat) und verbinden Sie sie miteinander.
  - Entfernen Sie die Ader von Reglerklemme 11 (Verdichterrelais) und Klemme 25 (Raumthermostat) und verbinden Sie sie miteinander.
  - Entfernen Sie die Ader von Frequenzumrichterklemme 50 und schließen Sie sie an die Klemme 3 des Potentiometers an.
  - Entfernen Sie die Ader von Frequenzumrichterklemme 53 und schließen Sie sie an die Klemme 2 des Potentiometers an.
  - Entfernen Sie die Ader von Frequenzumrichterklemme 55 und schließen Sie sie an die Klemme 1 des Potentiometers an.
  - Entfernen Sie die Ader von Reglerklemme 14 (Kurbelwannenheizung) und schließen Sie sie an die Klemme 22 des Verdichterschützes K1 an.
  - Entfernen Sie die Ader von Reglerklemme 12 (Stromversorgung Kurbelwannenheizung), verlängern Sie die Ader um ca. 40 cm und schließen Sie sie an die Klemme 21 des Verdichterschützes K1 an.
- Bitte beachten Sie Folgendes: Entfernen Sie den großen Klemmblock vom Regler oder entfernen Sie den gesamten Regler.
- Schließen Sie den Verflüssigungssatz wieder an die Stromversorgung an (drehen Sie den Gerätehauptschalter in die Ein-Position).

*Möglichkeit: An die Ader 6 kann ein Lüfterdruckschalter oder ein Lüfterdrehzahlregler in Reihe geschaltet werden.

**Zurücksetzen auf Werkseinstellungen**
(Alle Werkseinstellungen lassen sich wie folgt wiederherstellen.)

- Schalten Sie die Einheit über den Gerätehauptschalter aus.
- Während Sie gleichzeitig die obere und untere Taste gedrückt halten, schalten Sie das Gerät am Hauptschalter wieder ein.
- Die Meldung „FAC" wird angezeigt. Sie bedeutet, dass das Gerät auf die Werkseinstellungen zurückgesetzt wird.
- Anschließend wird im Display die Meldung „typ" angezeigt.
- Rufen Sie das Parametermenü auf und wechseln Sie zum Parameter o61 (Gerätetyp).
- Geben Sie je nach verwendetem Verflüssigungssatz einen Wert zwischen „1" und „57" ein (siehe Tabelle 1 auf Seite 3).
- Speichern Sie den eingegebenen Wert durch Betätigen der mittleren Taste am Regler.
- Nach 15 Sekunden ohne Betätigung einer Taste wird im Display die Meldung „ref" angezeigt.
- Rufen Sie das Parametermenü auf und wechseln Sie zum Parameter o30 (Kältemittel).
- Ändern Sie den Wert auf 3(R134a), 17(R507), 20(R407C), 19(R404A), 21(R407A), 37(R407F), 40(R448A), 41(R449A), 42(R452A) oder 36 (R513A).

Nur für FREQENZUMRICHTER-:
- Stellen Sie Parameter c71 auf 2 (drehzahlgeregelter Verdichter) ein.
- Stellen Sie Parameter o37 auf 7 (Alarm Frequenzumrichter an DI2) ein.
- Speichern Sie den eingegebenen Wert durch Betätigen der mittleren Taste am Regler.
- Wechseln Sie zum Parameter o67 (Werte als Werkseinstellung speichern).
- Ändern Sie den Wert auf „on".
- Bestätigen Sie den eingegebenen Parameterwert durch Drücken der mittleren Taste am Regler.
- Nach 15 Sekunden ohne Betätigung einer Taste wird im Display die Meldung „OFF" angezeigt.
- Rufen Sie das Parametermenü auf und wechseln Sie zum Parameter r12 (Hauptschalter).
- Ändern Sie den Wert auf „1" (Verflüssigungssatz startet, wenn Kühlstellenregler/Thermostat Kühlung anfordert).
- Auch die Tag-/Nachtfunktion muss neu programmiert werden (siehe Kapitel zu Inbetriebnahme – Tag-/Nachtfunktion).

Für Modelle der Version P02 (OP-xxxxxxxxxP02E), falls Reglerparamerter o30 den Wert 19 = R404A oder 40 = R448A oder 41 = R449A hat:
- Drücken Sie die obere oder untere Taste, um Parameter r84 zu suchen.
- Drücken Sie kurz die mittlere Taste, bis der Wert 125 angezeigt.
- Drücken Sie die obere Taste, um den neuen Wert 130 einzustellen.

**Reglerаustausch bei einer Einheit vor Ort**

- Schalten Sie die Einheit über den Gerätehauptschalter aus.
- Bauen Sie den defekten Regler aus (alle Stecker, 2 x Schrauben Typ I und Regler entfernen).
- Installieren Sie den neuen Regler.
- Schalten Sie die Einheit über den Gerätehauptschalter wieder ein. Es ist kein Zurücksetzen auf Werkseinstellungen erforderlich.
- Anschließend wird im Display die Meldung „typ" angezeigt.
- Gehen Sie genauso wie im vorherigen Kapitel (Zeile 5 ff.) vor.

Ersatzteilnummer Regler Einzelpack: 118U3465

## Regelung

**Regelung des Verflüssigungsdrucks**

- Der Sollwert der Verflüssigungstemperatur ergibt sich aus der gemessenen Umgebungstemperatur plus einem einstellbaren Temperatur-Offset (als Referenz bezeichnet) und wird von der Lüfterdrehzahl bestimmt.
- Werkseinstellung der Referenz = 8,0 K.
- Um auf die Referenz zuzugreifen, betätigen Sie kurz die mittlere Taste am Regler.
- Wenn die Referenz angezeigt wird, kann sie über die obere oder untere Taste geändert werden.
- Zudem kann die Regelung der Verflüssigungstemperatur mithilfe der folgenden Parameter begrenzt werden:
  r82 = min. Verflüssigungstemperatur (Werkeinstellung: 10,0 °C)
  r83 = max. Verflüssigungstemperatur (Werkeinstellung: 40,0 °C)

**Regelung der Kurbelwannenheizung**

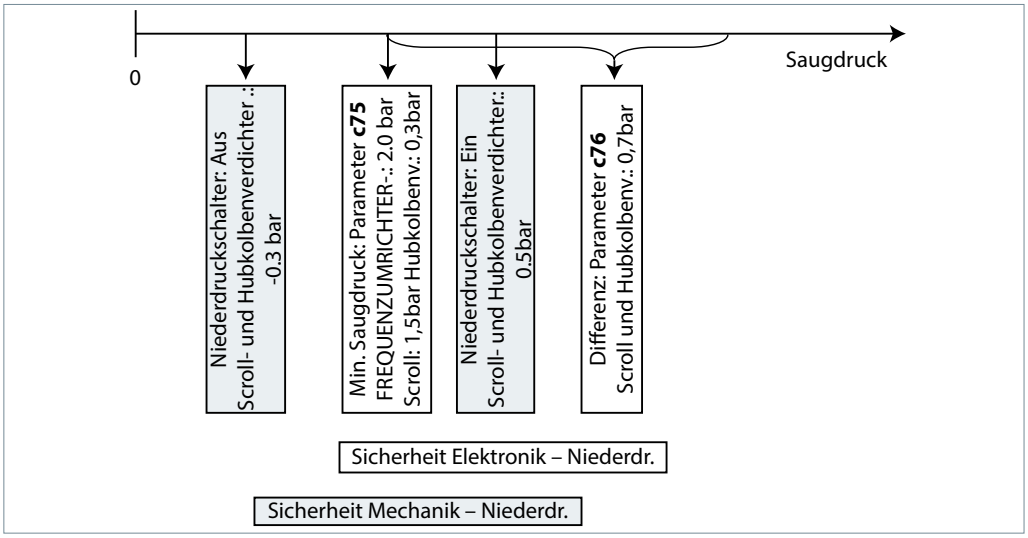
- Der Regler sorgt selbstständig für eine optimale Regelung der Kurbelwannenheizung. Die Heizleistung hängt von der Umgebungstemperatur und dem Saugdruck ab und wird durch Pulsbreitenmodulation bestimmt.
- Eine Änderung der Parameter P45, P46 und P47 vor Ort ist nicht erforderlich.

**Regelung der Lüfterdrehzahl**

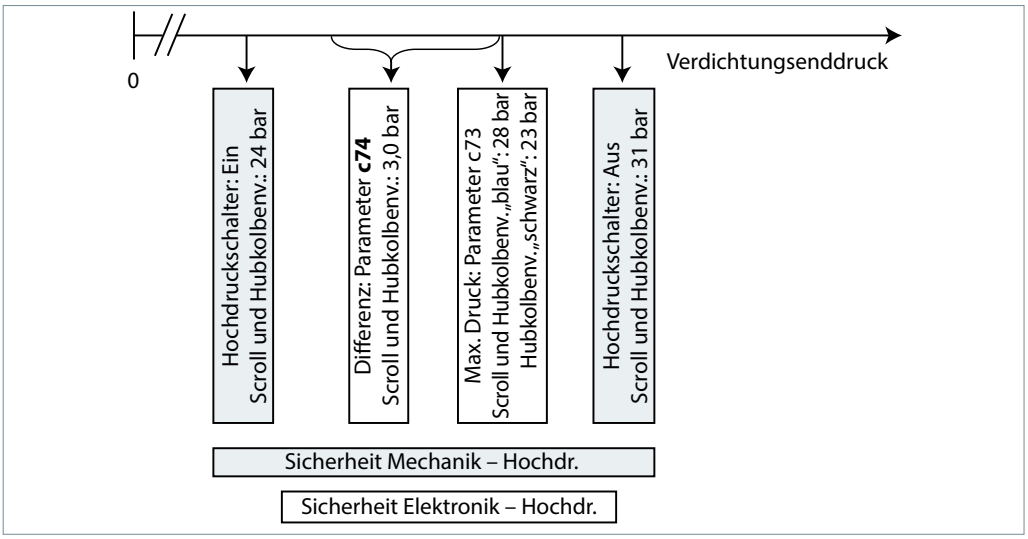
- Die Lüfterdrehzahl wird durch PI-Regelung bestimmt und hängt vom Ist- und Sollwert der Verflüssigungstemperatur ab.
- Eine Änderung der Parameter F14 und F21 vor Ort ist nicht möglich.


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**Sicherheitsparameter „Niederdruck“ für R448A / R449A / R452A**




**Sicherheitsparameter „Hochdruck“ für R448A / R449A / R452A**



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## Mise en service

### Installations électriques

- Effectuez les raccordements électriques comme indiqué dans le tableau ci-dessous.
- Retirez temporairement le raccord DI1 (bornes 24 et 25 du contrôleur), afin d'accéder aux paramètres et aux valeurs du contrôleur sans avoir à démarrer le groupe de condensation.

| Régulation par thermostat d'ambiance sans fonction pump down | Régulation pump down avec transmetteur de basse pression livré d'usine |
|---|---|
| - Connectez le thermostat (24 - 25 i.e. DI1) d'ambiance à ces bornes<br><br>- Connectez l'alimentation électrique au sectionneur principal conformément au schéma électrique, situé sur la face interne de la porte avant | - Connectez l'alimentation électrique au sectionneur principal conformément au schéma électrique, situé sur la face interne de la porte avant<br><br>- Augmentez la valeur du paramètre c33 du contrôleur (valeur de COUPURE pump down) :<br>Exemple piston : 0,7 bar<br>Exemple Scroll : 1,7 bar<br>Remarque : pour éviter les alarmes de basse pression, le réglage de c33 et r23 (pour les unités de l'INVERTER) doit être supérieur à c75 |

### Écran principal (après le démarrage du contrôleur)

- Par défaut, l'écran du régulateur affiche la température d'évaporation en degrés C.
- Appuyez sur le bouton inférieur pour voir la température de condensation en degrés C.
- L'affichage revient à son écran par défaut après quelques secondes si aucune touche n'est pressée.

### Menu des paramètres

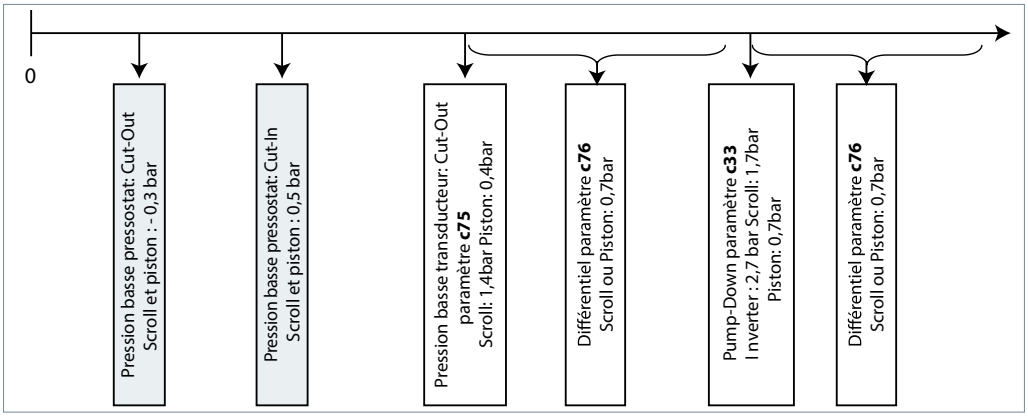
- Appuyez sur le bouton supérieur pendant 5 secondes pour accéder au menu des paramètres.
- Après avoir accédé au menu des paramètres, « r05 » s'affiche à l'écran.
- Appuyez sur le bouton supérieur ou inférieur pour accéder à d'autres paramètres.
- Appuyez sur le bouton du milieu pour afficher la valeur d'un paramètre. 3 LED sur le régulateur commenceront à clignoter après cette étape.
- Appuyez sur le bouton supérieur ou inférieur pour modifier la valeur de ce paramètre. Appuyez sur le bouton du milieu pour sauvegarder la valeur. La valeur sera également sauvegardée après 20 secondes si aucune touche n'est enfoncée après la modification de la valeur.
- L'affichage revient à son écran par défaut si aucune touche n'est enfoncée pendant 20 secondes.

### Démarrage rapide de l'unité/ Changement de réfrigérant

- L'Optyma™ Plus nouvelle génération est préparamétré, en fonction du modèle de compresseur et du type de réfrigérant. Dans le cas d'un compresseur « multiréfrigérant », le contrôleur du groupe de condensation est configuré préréglé en usine conformément au tableau ci-dessous (voir le tableau à la page 4). Si ce réglage d'usine répond aux besoins de votre application, les paramètres du contrôleur n'ont pas à être modifiés.
- Pour modifier le réfrigérant, allez dans le menu des paramètres (maintenez le bouton supérieur enfoncé pendant 5 secondes).
- Sélectionnez le paramètre r12 dans le menu des paramètres en appuyant sur le bouton inférieur.
- Sélectionnez r12 en appuyant sur le bouton du milieu, définissez la valeur sur « 0 » et sauvegardez.
- Sélectionnez maintenant le paramètre « o30 » dans le menu des paramètres et définissez sa valeur en fonction du réfrigérant requis : à 3 (R134a), 17 (R507), 20 (R407C), 19 (R404A), 21 (R407A), 37 (R407F), 40 (R448A), 41 (R449A), 42 (R452A), 36 (R513A).
- Sélectionnez à nouveau le paramètre r12 et définissez sa valeur sur 1.
- Le groupe de condensation démarre après cette étape conformément à la logique.
- Après 20 secondes, l'écran affiche à nouveau la température d'évaporation en °C, le réfrigérant et tous les paramètres liés à ce refrigérant sont modifiés.

**Fonction «pump-down»**

- Une valeur limite du « pump-down » peut être activée à l'aide du paramètre c33.
- La valeur de ce paramètre devra être supérieure à celle du paramètre c75 (valeur limite de la coupure sécurité BP), pour éviter une alarme basse pression indésirable.




**Fonction Jour/Nuit**

Dans certains endroits, il peut être nécessaire de réduire le niveau sonore durant la nuit. Pour ce faire, vous pouvez utiliser la fonction « Jour/Nuit » du contrôleur Optyma™ Plus qui limite la vitesse du ventilateur pour toutes les unités et la vitesse du compresseur des unités INVERTER. Pour activer cette fonction, effectuez les étapes suivantes…

- Activez le menu des paramètres (appuyez sur le bouton supérieur pendant au moins 5 secondes).
- Sélectionnez le paramètre « r13 », décalage nocturne (le décalage de température est lié au point de consigne de la température de condensation en journée, qui est défini par le paramètre « r29 »).
- Appuyez sur le bouton du milieu et définissez la valeur de votre choix, p. ex. 005 pour 5K.
- Confirmez cette valeur en appuyant brièvement sur le bouton du milieu. Répétez cette procédure pour les autres paramètres à définir pour la fonction « Jour/Nuit »…
- Sélectionnez et réglez le paramètre « t17 » Démarrage jour (heure), p. ex. 006 pour 06 h 00
- Sélectionnez et réglez le paramètre « t18 » Démarrage nuit (heure), p. ex. 022 pour 22 h 00
- Sélectionnez et réglez le paramètre « t07 » Réglage de l'horloge (heure), p. ex. 011 pour 11 h xx
- Sélectionnez et réglez le paramètre « t08 » Réglage de l'horloge (minutes), p ex. 035 pour 11 h 35
- Sélectionnez et réglez le paramètre « t45 » Réglage de l'horloge (jour), p. ex. 010 pour le 10/xx/xx
- Sélectionnez et réglez le paramètre « t46 » Réglage de l'horloge (mois), p. ex. 004 pour le 10/04/xx
- Sélectionnez et réglez le paramètre « t47 » Réglage de l'horloge (année), p. ex. 012 pour le 10/04/12
- Pour enregistrer ces valeurs, appuyez sur le bouton du milieu ou n'appuyez sur aucun bouton pendant 20 secondes

## Service et maintenance

**Écran du contrôleur - Affichage «permanent»**
(Températures d'évaporation et de condensation, différence de température de point de consigne)

- Le contrôleur affiche la température d'évaporation en °C (écran principal).
- La température de condensation en °C sera affichée après une pression brève sur le bouton inférieur.
- La différence entre la température de condensation et la température ambiante en degrés C peut être affichée en appuyant sur le bouton du milieu. Elle peut être modifiée en appuyant sur le bouton supérieur ou inférieur.
- Au bout de quelques secondes, l'afficheur revient sur la température d'évaporation en °C.

**Visualisation des paramètres de fonctionnement**

- Les conditions de fonctionnement du groupe de condensation peuvent être affichées dans le menu des paramètres en sélectionnant les paramètres « U »…voir les exemples ci-dessous.

| | |
|---|---|
| U01 | Pression de condensation |
| U10 | État de DI1 (thermostat d'ambiance) |
| U21 | Surchauffe |
| u37 | État de DI2 (alarme convertisseur de fréquence) |
| u52 | Puissance du compresseur |
| U22 | Température de condensation |
| U23 | Pression d'évaporation |
| U24 | Température d'évaporation |
| U25 | Température ambiante |
| U26 | Température de refoulement |
| U27 | Température d'aspiration |
| U44 | Tension sur A01 |
| U56 | Tension sur A02 |


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**Alarmes et messages d'erreur**

- En cas de « dysfonctionnement » de l'installation, 3 petites LED, au niveau de l'écran du contrôleur, se mettent à clignoter. Pour accéder au code «Erreur», appuyez sur le bouton supérieur. Voici quelques exemples:

| | |
|---|---|
| A2 | Alarme BP – Pression d'aspiration trop basse |
| A17 | Alarme BP ou HP (Mécanique) |
| A96 | Alarme température de refoulement trop élevée |
| A97 | Alarme entrée digitale (DI2 : alarme convertisseur de fréquence) |
| E20 | Incident sur capteur de pression HP |
| E31 | Incident sur la sonde d'ambiance S2 |
| E32 | Incident sur la sonde température de refoulement S3 |
| E33 | Incident sur la sonde température d'aspiration S4 |
| E39 | Incident sur capteur de pression BP |

## Dépannage

**Défaillance du contrôleur**
(En cas de défaillance du contrôleur, il est possible de faire fonctionner le groupe de condensation en mode « manuel », moyennant quelques adaptations mineures. Pour ce faire, effectuez la procédure suivante.)

**Unités à vitesse fixe :**
voir schémas électriques page 4.

- Déconnectez l'alimentation électrique du groupe de condensation (coupez le sectionneur principal).
  - Raccordez directement le fil de la borne 22 (entrée de sécurité DI3) à la borne 25 du contrôleur (thermostat d'ambiance DI1).
  - Raccordez directement le fil de la borne 24 (thermostat d'ambiance DI1) à la borne 11 du contrôleur (alimentation du compresseur)
  - Retirez le fil 6* et raccordez-le aux fils 11 et 24 à l'aide d'un raccord de borne.
  - Raccordez le fil de la borne 14 (résistance de carter) à la borne 22 du contacteur du compresseur K2.
  - Retirez le fil de la borne 12 du contrôleur (alimentation de la résistance de carter), allongez ce fil de 40 cm environ et connectez-le à la borne 21 du contacteur du compresseur K2.
- Attention : retirez du contrôleur le large bloc de raccordements*** ou retirez le contrôleur dans son ensemble.
- Remettez sous tension le groupe de condensation (allumez le sectionneur principal)

**Unités de vitesse variable :**
voir schémas électriques page 5.

- Déconnectez l'alimentation électrique du groupe de condensation (coupez le sectionneur principal).
  - Raccordez directement le fil de la borne 22 du contrôleur (entrée de sécurité) à la borne 6 * (ventilateur).
  - Raccordez directement le fil de la borne 10 du contrôleur (relais du compresseur) à la borne 24 (thermostat d'ambiance).
  - Raccordez directement le fil de la borne 11 du contrôleur (relais du compresseur) à la borne 25 (thermostat d'ambiance).
  - Raccordez le fil de la borne 50 de l'inverter à la borne 3 du potentiomètre.
  - Raccordez le fil de la borne 53 de l'inverter à la borne 2 du potentiomètre.
  - Raccordez le fil de la borne 55 de l'inverter à la borne 1 du potentiomètre.
  - Raccordez le fil de la borne 14 (résistance de carter) à la borne 22 du contacteur du compresseur K1.
  - Retirez le fil de la borne 12 du contrôleur (alimentation de la résistance de carter), allongez ce fil de 40 cm environ et connectez-le à la borne 21 du contacteur du compresseur K1.
- Attention : retirez du contrôleur le large bloc de raccordements*** ou retirez le contrôleur dans son ensemble.
- Remettez sous tension le groupe de condensation (allumez le sectionneur principal)

*Option : il est possible de raccorder en série un pressostat ou un variateur de vitesse du ventilateur au fil n° 6

**Réinitialisation du paramétrage usine**
(vous pouvez restaurer tous les réglages d'usine en effectuant la procédure suivante)

- Coupez l'alimentation générale au niveau du sectionneur.
- Appuyez simultanément sur les boutons supérieur et inférieur du contrôleur, et réenclenchez le sectionneur tout en maintenant la pression sur les boutons supérieur et inférieur.
- Le message « FAC » (pour FACTORY RESET) s'affiche, ce qui signifie que la réinitialisation des réglages d'usine est lancée.
- Après quelques instants, le message « typ » s'affiche à l'écran.
- Avec le menu déroulant accédez, au paramètre o61 (type de groupe).
- Saisissez une valeur comprise entre 1 et 57 en fonction du type de groupe de condensation (voir le tableau 1 à la page 3).
- Validez le paramètre saisi en appuyant sur le bouton du milieu du contrôleur.
- Après 15 secondes sans aucune action, le message « ref » s'affiche à l'écran.
- Avec le menu déroulant, accédez au paramètre o30 (réfrigérant).
- Définissez sa valeur sur 3 (pour le fluide frigorigène R134a), 17(R507), 20(R407C), 19(R404A), 21(R407A), 37(R407F), 40(R448A), 41(R449A), 42(R452A) ou 36 (R513A).

Pour les unités de l'INVERTER uniquement :
- Régler le paramètre c71 à 2 (compresseur à vitesse variable)
- Régler le paramètre o37 à 7 (alarme convertisseur de fréquence sur DI2)

- Validez le paramètre saisi en appuyant sur le bouton du milieu du contrôleur.
- Avec le menu déroulant, accédez au paramètre o67 (enregistrer les valeurs comme réglages d'usine).
- Sélectionnez sa valeur sur « ON » (activer).
- Validez le paramètre saisi en appuyant sur le bouton du milieu du contrôleur.
- Après 15 secondes sans aucune action, le message « OFF » (désactivé) s'affiche à l'écran.
- Avec le menu déroulant, accédez au paramètre r12 (sectionneur principal).
- Sélectionnez sa valeur sur 1 (démarrage du groupe de condensation en cas de demande de la part du contrôleur de chambre froide).
- La fonction « Jour/Nuit » doit également être reprogrammée (voir le chapitre Mise en service - Jour/Nuit - Fonction).

Pour les modèles version P02 (OP-xxxxxxxxxP02E), si la valeur o30 est 19= R404A ou 40=R448A ou 41=R449A dans le régulateur,
- Appuyez sur le bouton du haut ou du bas pour trouver le paramètre r84.
- Appuyez sur le bouton du milieu jusqu'à ce que la valeur de ce paramètre affiche 125
- Appuyez sur le bouton du haut pour sélectionner la nouvelle valeur : 130.

**Remplacement du contrôleur d'une unité sur site**

- Coupez l'alimentation générale au niveau du séctionneur.
- Retirez l'ancien contrôleur (retirez toutes les prises, les deux vis type I et le contrôleur).
- Câbler électriquement le nouveau contrôleur sur l'unité de condensation
- Mettez l'interrupteur d'alimentation principale sous tension
- Après quelques instants, le message « typ » s'affiche à l'écran.
- Suivez les étapes de la section précédente, à partir de la cinquième ligne.

pièce de rechange, code du contrôleur à l'unité : 118U3465

## Régulation

**Régulation de la condensation**

- Le point de consigne de régulation de la température de condensation est égal à:
o Température Ambiante Extérieure + Delta T
o avec Delta T = 8.0K (paramétré en usine)
- Ce Delta T est accessible directement en exerçant une pression sur le bouton du milieu du contrôleur
- A ce stade, en appuyant sur le bouton du haut (ou du bas) la valeur « usine » (8.0K) est augmentée (bouton du haut) ou diminuée (bouton du bas) à chacune des impulsions exercées
- De plus, la possibilité est offerte de limiter cette variation du point de consigne en agissant sur les paramètres « r82 » et « r83 » du menu déroulant
« r82 » = température de condensation minimale (réglage d'usine : 10,0 °C)
« r83 » = température de condensation maximale (réglage d'usine : 40,0 °C)

**Régulation de la résistance de carter**

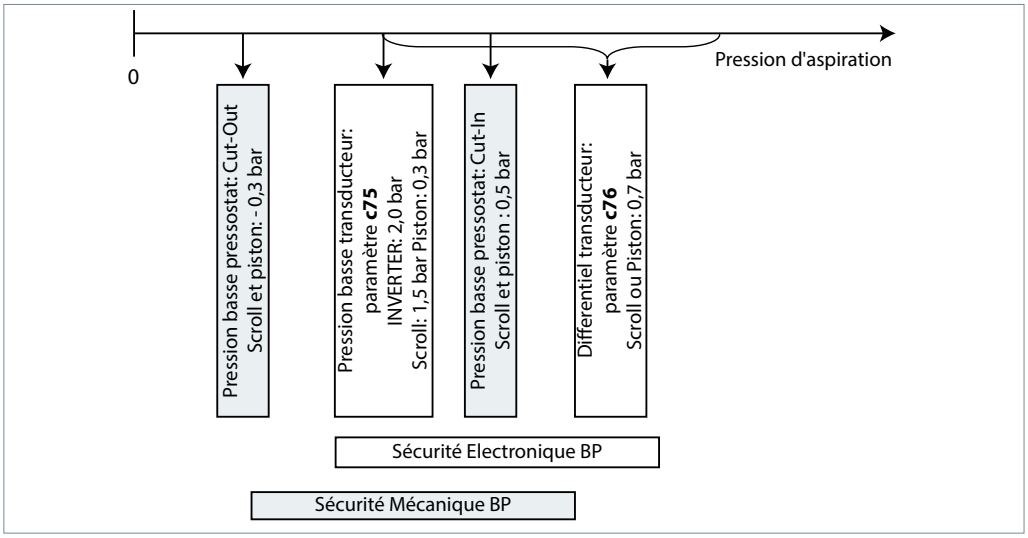
- Le contrôleur, de par les paramètres rentrés en usine, assure une optimisation de la régulation de la résistance de carter (temps de fonctionnement et puissance de chauffe)
- Aucune modification des paramètres « P45 », « P46 » et « P47 » n'est à prévoir sur site.

**Régulation de la vitesse de rotation du ventilateur**

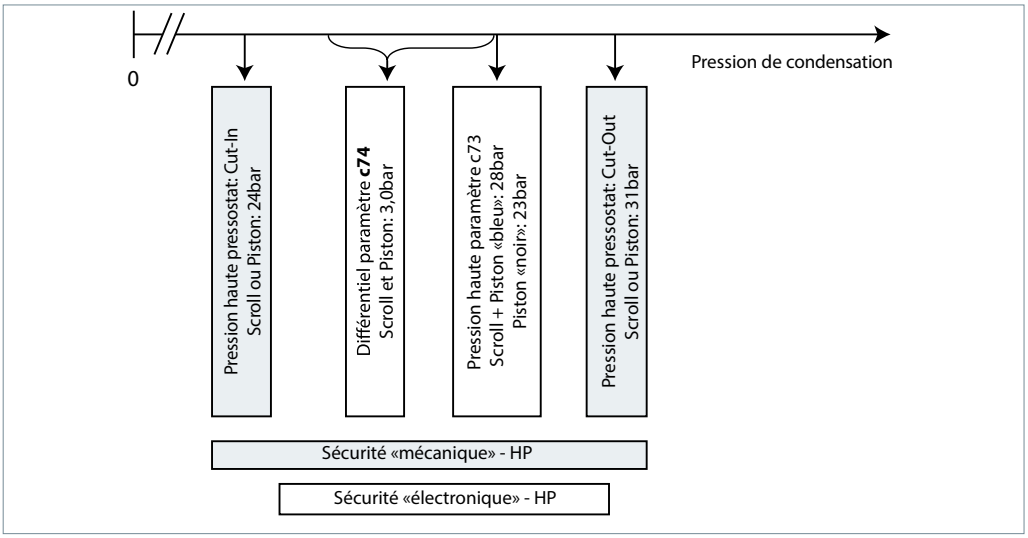
- Le contrôleur, de par les paramètres rentrés en usine, assure une optimisation de la régulation de la vitesse de rotation du ventilateur.
- Aucune modification des paramètres « F14 » et « F21 » n'est à prévoir sur site.


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**Paramétrage de sécurité côté « basse pression » pour le R448A / R449A / R452A**




**Paramétrage de sécurité côté « haute pression » pour le R448A / R449A / R452A**



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## Idriftsättning

**Elektriska installationer**

- Arrangera elektriska anslutningar enligt tabellen nedan
- Ta tillfälligt bort brygga DI1 (plint 24 – 25 i regulatorn) för att få tillgång till regulatorns parametrar och värden utan att starta det luftkylda aggregatet

| Rumstermostatreglering utan pump down funktion | Pump down reglering med fabriksmonterad lågtryckstransmitter |
|---|---|
| - Anslut rumstermostat (24 - 25 i.e. DI1) till dessa plintar | - Anslut strömtillförsel till huvudbrytaren enligt kopplingsschemat på den främre luckans insida |
| - Anslut strömtillförsel till huvudbrytaren enligt kopplingsschemat på den främre luckans insida | - Öka inställningen av regulator par. c33 (pump down cut-out värde):<br>t.ex. Kolv: 0,7 bar<br>t.ex. Scroll: 1,7 bar<br>Obs! För att undvika lågtryckslarm ska inställningen av c33 och r23 (för INVERTER) vara högre än c75 |

**Huvuddisplay (efter regulatorstart)**

- Regulatorns skärm visar förångningstemperaturen i °C som standard.
- Tryck på den nedre knappen för att se kondenseringstemperaturen i t.ex. °C,
- Displayen återgår till huvudskärmen efter några sekunder om knapparna inte används

**Parametermeny**

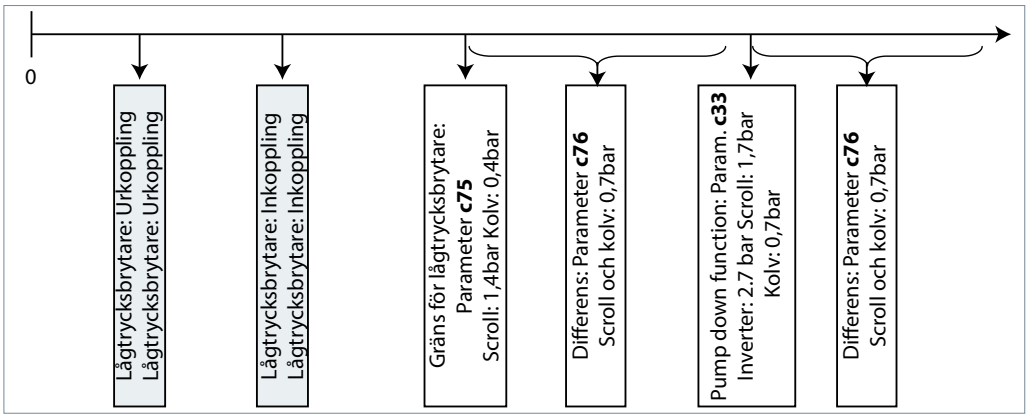
- Tryck på den övre knappen i 5 sekunder för att komma åt parametermenyn.
- När du har öppnat parametermenyn visas ”r05” på displayen.
- Tryck på den övre eller nedre knappen för att gå till andra parametrar.
- Tryck på mittknappen för att se värdet för en parameter. Tre lysdioder på regulatorn börjar blinka efter detta steg.
- Tryck på den övre eller nedre knappen för att ändra parameterns värde. Tryck på mittknappen för att spara värdet. Annars lagras värdet efter 20 sekunder om ingen tangent trycks in efter att värdet har ändrats.
- Displayen återgår till huvudskärmen om ingen knapp trycks in under 20 sekunder.

**Snabbstart av aggregatet/Byte av köldmedium**

- Optyma Plus™ New Generation är förinställt beroende på kompressormodell och typ av köldmedium. När det gäller en kompressor med flera kylmedel är kondensorens styrenhet fabriksinställd enligt ovanstående tabell (se tabell på sidan 4). Om denna fabriksinställning passar kraven för din applikation behöver inga regulatorparametrar ändras.
- För att byta köldmedium går du in i parametermenyn (håll ned den övre knappen i 5 sekunder).
- Välj parameter r12 från parametermenyn genom att trycka på den nedre knappen.
- Välj r12 genom att trycka på mittknappen, ändra värdet till ”0” och spara.
- Välj nu parametern ”o30” från parametermenyn och ställ in dess värde enligt önskat köldmedium till 3 (R134a), 17 (R507), 20 (R407C), 19 (R404A), 21 (R407A), 37 (R407F), 40 (R448A), 41 (R449A), 42 (R452A), 36 (R513A)
- Välj återigen parameter r12 och sätt dess värde till 1.
- Det luftkylda aggregatet startar efter detta steg enligt logiken.
- Efter 20 sekunder återgår displayen till förångningstemperaturen i °C och det nya köldmediumet och alla relevanta parametrar ändras

**Pump down funktion**

• En pump down gräns kan aktiveras med inställning av parameter c33
• För att undvika oönskade lågtryckslarm ska inställningen av denna parameter vara högre än lågtrycksbrytarens gränsparameter c75, … ex. nedan




**Dag/natt-funktion**

I vissa områden kan det vara nödvändigt att minska ljudnivån nattetid. Det är möjligt med dag/natt-funktionen i regulatorn Optyma Plus™ som begränsar fläkthastigheten för samtliga aggregat och kompressor varvtal för INVERTER. Följ nedanstående steg för att aktivera. Följ nedanstående steg för att aktivera .

• Aktivera parametermenyn (håll ned den övre knappen i minst 5 sek.)
• Välj parameter "r13" Nattjustering (temperaturjustering relaterad till kondenseringstemperaturens börvärde för dagtid som är parameter "r29")
• Tryck på mittknappen och ställ in önskat värde, t.ex. 005 för 5 Kelvin
• Bekräfta värdet med ett kort tryck på mittknappen. Gör likadant med de nästa parametrarna som är nödvändiga för dag/natt-funktionen ...
• Välj och ställ in parameter "t17" Dagens start (timmar), t.ex. 006 för 06:00
• Välj och ställ in parameter "t18" Nattens start (timmar), t.ex. 022 för 22:00
• Välj och ställ in parameter "t07" Klockinställning (timmar), t.ex. 011 för 11:xx
• Välj och ställ in parameter "t08" Klockinställning (minuter), t.ex. 035 för 11:35
• Välj och ställ in parameter "t45" Klockinställning (dag), t.ex. 010 för 10.xx.xx
• Välj och ställ in parameter "t46" Klockinställning (månad), t.ex. 004 för 10.04.xx
• Välj och ställ in parameter "t47" Klockinställning (år), t.ex. 012 för 10.04.12
• Alla värden lagras med mittknappen eller efter 20 sekunder om ingen knapp trycks ned

## Service och underhåll

**Hovedvisning**
(Förångnings- och kondenseringstemperatur, Börvärde för temperaturskillnad)

• Regulatorn visar förångningstemperaturen i °C (huvudskärmen)
• Den visar kondenseringstemperaturen i °C när den nedre knappen trycks in kort.
• Skillnaden mellan kondenseringstemperatur och omgivningstemperatur i grader °C kan visas genom att man trycker in mittknappen. Du kan ändra inställningen genom att trycka på den övre eller nedre knappen.
• Displayen återgår till huvudskärmen efter några sekunder om knapparna inte används

**Driftparametrar**

• Driftsförhållanden för det luftkylda aggregatet kan visas i parametermenyn genom att välja parametrarna "U" … nedan visas några exempel

| | |
|---|---|
| u01 | Kondenseringstryck |
| u10 | Status på DI1 (rumstermostat) |
| u21 | Överhettning |
| u37 | Status för DI2 (Frekvensomformare larm) |
| u52 | Kompressor kapacitet |
| U22 | Kondenseringstemperatur |
| U23 | Förångningstryck |
| U24 | Förångningstemperatur |
| U25 | Omgivningstemperatur |
| U26 | Hetgastemperatur |
| U27 | Sugtemperatur |
| U44 | Spänning AO1 |
| U56 | Spänning AO2 |


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**Larm- och felmeddelanden**

- Vid "fel" blinkar 3 små lysdiodsymboler på regulatorskärmen. Kvittera med ett kort tryck på den övre knappen. Här följer några exempel...

| | |
|---|---|
| A2 | Larm för lågt sugtryck |
| A17 | Larm för säkerhetsingång (DI3: högt kondenseringstryck/lågt sugtryck) |
| A96 | Hetgastemperatur är hög |
| A97 | Larm digital ingång (DI2: Frekvensomformare larm) |
| E20 | Fel på transmitter för kondenseringstryck |
| E31 | Fel på givare för omgivningstemperatur |
| E32 | Fel på givare för hetgastemperatur |
| E33 | Fel på givare för suggastemperatur |
| E39 | Fel på transmitter för förångningstryck |

## Reparation

**Regulatorfel**
(om regulatorn upphör att fungera finns det en möjlighet att köra det luftkylda aggregatet i "manuellt" läge. Fortsätt enligt följande)

**Enheter med fast varvtal:**

Se kopplingsscheman på s. 4.

- Koppla från det luftkylda aggregatet från strömtillförseln (stäng av den med huvudbrytaren)
  - Ta bort kabeln från regulatorplint 22 (säkerhetsingång DI3) och plint 25 (rumstermostat DI1) och koppla samman dem
  - Ta bort kabeln från regulatorplint 24 (rumstermostat DI1) och plint 11 (strömtillförsel för kompressor) och koppla samman dem
  - Ta bort kabel 6* och anslut den med plintbygel för kabel 11 och 24.
  - Ta bort kabeln från regulatorplint 14 (vevhusvärmare) och anslut den till kompressorkontaktor K2, plint 22
  - Ta bort kabeln från regulatorplint 12 (strömtillförsel för vevhusvärmare), förläng den med ungefär 40 cm och anslut den till kompressorkontaktor K2, plint 21
- Observera: Ta bort det stora plint blocket från regulatorn eller ta bort hela regulatorn
- Återanslut det luftkylda aggregatet till strömtillförseln (slå på huvudbrytaren)

**INVERTER:**

Se kopplingsscheman på s. 5.

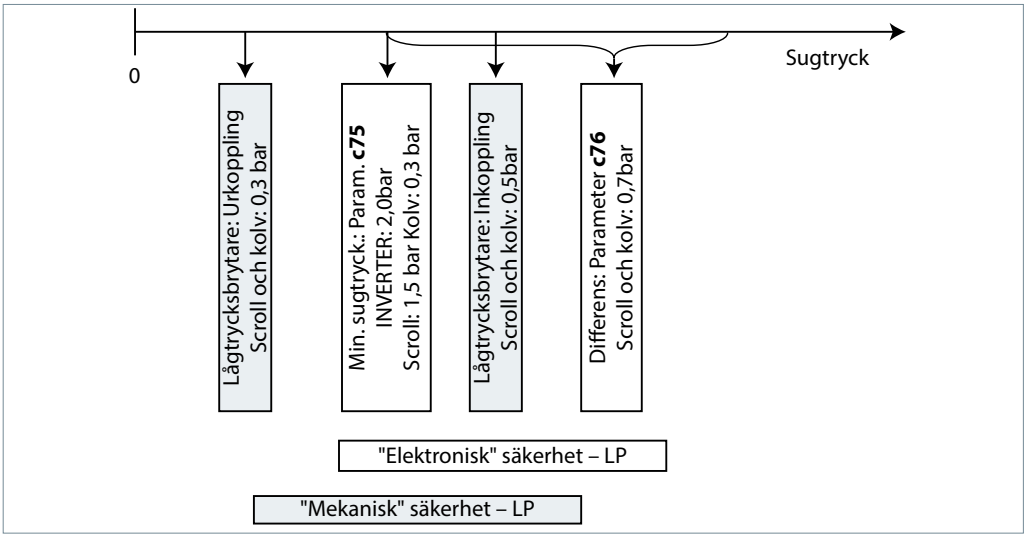
- Koppla från det luftkylda aggregatet från strömtillförseln (stäng av den med huvudbrytaren)
  - Ta bort kabeln från regulatorplint 22 (säkerhetsingång DI3) och plint 6* (fläkt) och koppla samman dem
  - Ta bort kabeln från regulatorplint 10 (Kompressor relä) och plint 24 (rumstermostat DI1) och koppla samman dem
  - Ta bort kabeln från regulatorplint 11 (Kompressor relä) och plint 25 (rumstermostat DI1) och koppla samman dem
  - Ta bort kabel från inverterplint 50 och anslut till potentiomneter plint 3
  - Ta bort kabel från inverterplint 53 och anslut till potentiomneter plint 2
  - Ta bort kabel från inverterplint 55 och anslut till potentiomneter plint 1
  - Ta bort kabeln från regulatorplint 14 (vevhusvärmare) och anslut den till kompressorkontaktor K1, plint 22
  - Ta bort kabeln från regulatorplint 12 (strömtillförsel för vevhusvärmare), förläng den med ungefär 40 cm och anslut den till kompressorkontaktor K1, plint 21
- Observera: Ta bort det stora plint blocket från regulatorn eller ta bort hela regulatorn
- Återanslut det luftkylda aggregatet till strömtillförseln (slå på huvudbrytaren)

*Option En pressostat eller varvtalsregulator för fläkten kan anslutas i serie med kabel 6

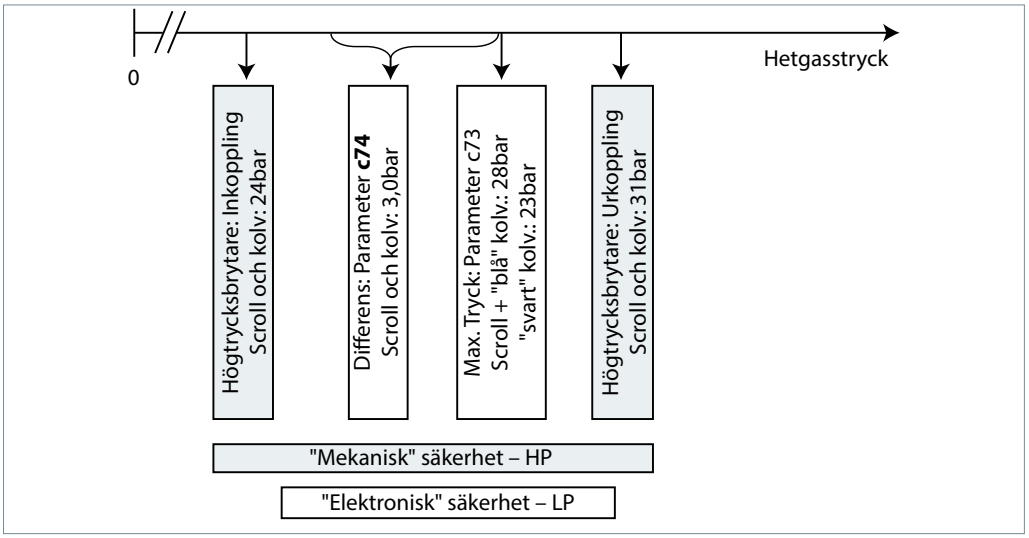
| Manuel | Regulatorinstallation |
|---|---|
| **Återställa fabriksinställningarna** (alla fabriksinställda parametrar kan återställas med följande procedur) | • Stäng AV huvudströmbrytaren<br>• Håll samtidigt ned upp- och nedknappen och slå PÅ huvudströmbrytaren<br>• Meddelandet "FAC" visas, vilket betyder "FACTORY RESET", och fabriksinställningarna återställs<br>• Efter en kort stund visas meddelandet "typ" på skärmen<br>• Aktivera parametermenyn och gå till parameter o61 (aggregattyp)<br>• Ange värde 1 till 42 beroende på typen av luftkylt aggregat (se tabell 1 på sidan 3)<br>• Lagra det angivna värdet genom att trycka på regulatorns mittknapp<br>• Efter 15 sekunder utan åtgärd visas meddelandet "ref" på skärmen<br>• Aktivera parametermenyn och gå till parameter o30 (köldmedium)<br>• Ändra värdet till 3(står för köldmedium R134a), 17(R507), 20(R407C), 19(R404A), 21(R407A), 37(R407F), 40(R448A), 41(R449A), 42(R452A) eller 36 (R513A)<br><br>Endast för INVERTER:<br>- Välj och ställ in parameter c71 till 2 (varvtalsreglerad kompressor)<br>- Välj och ställ in parameter o37 till 7 (larm från frekvensomformare på DI2)<br><br>• Lagra det angivna värdet genom att trycka på regulatorns mittknapp<br>• Gå till parameter o67 (lagra värden som fabriksinställning)<br>• Ändra värdet till "on"<br>• Validera den angivna parametern genom att trycka på regulatorns mittknapp<br>• Efter 15 sekunder utan åtgärd visas meddelandet "OFF" på skärmen<br>• Aktivera parametermenyn och gå till parameter r12 (huvudbrytare)<br>• Ändra värdet till 1 (det luftkylda aggregatet startar om regulatorn för kylrummet har ett kylbehov)<br>• Dag/natt-funktionen måste också programmeras om (se kapitlet Idriftsättning – Dag/natt-funktion)<br><br>För P02-versionsmodeller (OP-xxxxxxxxxP02E): om o30-värdet är 19=R404A eller 40=R448A eller 41=R449A i regulatorn,<br>• Tryck på den övre eller undre knappen för att hitta parameterkoden r84.<br>• Tryck på knappen i mitten tills parametervärdet visas som 125<br>• Tryck på den övre knappen för att välja ett nytt värde: 130. |
| **Byte av regulator på aggregat på plats** | • Stäng AV huvudströmbrytaren<br>• Ta bort den nya regulatorn (ta bort alla pluggar, 2 x I-typskruvar och regulator)<br>• Installera den nya regulatorn<br>• Slå PÅ huvudströmbrytaren igen. Ingen återställning av fabriksinställningarna behövs<br>• Efter en kort stund visas meddelandet "typ" på skärmen<br>• Följ samma steg som visas i föregående kapitel, från femte raden och framåt<br><br>reservdelskod för regulator i enkelpack: 118U3465 |
| **Reglering** | |
| **Reglering av kondenseringstryck** | • Börvärdet för kondenseringstemperaturen beräknas från den uppmätta omgivningstemperaturen plus en justerbar Temperaturjustering (kallad Referens) och styrs av fläkthastigheten<br>• Fabriksinställning för Referens = 8,0 K<br>• Referensen kommer du åt genom att trycka kort på regulatorns mittknapp<br>• När Referensen visas kan den modifieras med det övre eller nedre knappen<br>• Förutom detta kan regleringen av kondenseringstemperaturen begränsas av följande parametrar:<br>"r82" = lägsta kondenseringstemperatur (fabriksinställning: 10,0 °C)<br>"r83" = högsta kondenseringstemperatur (fabriksinställning: 40,0 °C) |
| **Reglering av vevhusvärmare** | • Regulatorn optimerar själv regleringen av vevhusvärmaren. Värmeeffekten beror på omgivningstemperaturen och sugtrycket och styrs med pulsbreddsmodulering<br>• Parametrarna "P45 ", "P46" och "P47" behöver inte ändras på plats |
| **Styrning av fläktvarvtal** | • Fläkthastigheten styrs av PI-reglering och beror på det aktuella värdet och börvärdet för kondenseringstemperaturen<br>• Parametrarna "F14" och "F21" ska inte ändras på plats |


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**Säkerhetsparameter "Lågt tryck" för R448A / R449A / R452A**




**Säkerhetsparameter "Högt tryck" för R448A / R449A / R452A**



ENGINEERING
TOMORROW

# Danfoss Commercial Compressors

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We have 40 years of experience within the development of hermetic compressors which has brought us amongst the global leaders in our business, and positioned us as distinct variable speed technology specialists. Today we operate from engineering and manufacturing facilities spanning across three continents.



Danfoss Turbocor Compressors



Danfoss Inverter Scrolls



Danfoss Scrolls



Danfoss Optyma Condensing Units



Danfoss Maneurop Reciprocating Compressors



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ENGINEERING
**TOMORROW**

**Instructions / Anleitung / Instructions / Instrucciones / Istruzioni / Instruções / Instruktioner / Instrukcje / Инструкция**

# OPTYMA™ Plus Condensing Units

## OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM


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ENGINEERING
**TOMORROW**

**Instructions (English)**

# Optyma™ Plus

## OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM

| |
|---|
| **Installation and servicing of the condensing units by qualified personnel only. Follow these instructions and sound refrigeration engineering practice relating to installation, commissioning, maintenance and service.** |
| **This product is not subject to the UK PSTI regulation, as it is for supply to and use only by professionals with the necessary expertise and qualifications. Any misuse or improper handling may result in unintended consequences. By purchasing or using this product, you acknowledge and accept the professional-use-only nature of its application. Danfoss does not assume any liability for damages, injuries, or adverse consequences ("damage") resulting from the incorrect or improper use of the product and you agree to indemnify Danfoss for any such damage resulting from your incorrect or improper use of the product.** |
| The condensing unit must only be used for its designed purpose(s) and within its scope of application. **Refrigerant to be used as per specification with respect to model.** |
| Under all circumstances, the EN378 (or other applicable local safety regulation) requirements must be fulfilled. |
| The condensing unit is delivered under nitrogen gas pressure (1 bar) and hence it cannot be connected as it is; refer to the «installation» section for further details. |
| The condensing unit must be handled with caution in the vertical position (maximum offset from the vertical : 15°) |
| **For PED Cat I and II models:** Pressure relief valve shall be mounted in refrigerant system during field installation. PRV should be mounted on receiver vessel. |

**Relevant Standards and Directive**
**EN 378 -2:2016:** Refrigerating Systems And Heat Pumps-Safety And Environmental Requirements.
**EN 60335-1:** Household And Similar Electrical Appliances – Safety –Part 1: General Requirements
**Low Voltage Directive n° 2014 / 35 / UE**
**Machinary Directive n° 2006 / 42 / CE**
**Pressure Equipment Directive (PED) no. 2014/68/EU**
**RoHS Directive 2011/65/EU**
**WEEE Directive 2012/19/EU**
(Other local applicable standards)

### 1 – Introduction

These instructions pertain to Optyma™ Plus condensing units OP-MPBM, OP-MPXM, OP-MPGM, OP-LPQM & OP-LPOM used for refrigeration systems. They provide necessary information regarding safety and proper usage of this product.

The condensing unit includes following:
- Microchannel heat exchanger
- Reciprocating or scroll compressor
- Receiver with stop valve
- Ball valves
- Sight glass
- High & low pressure switches
- Replaceable filter drier
- Electronic controller
- Main circuit breaker (Main switch with overload protection)
- Fan and compressor capacitors
- Compressor contactor
- Supply monitoring relay**
- Robust weather proof housing
- Liquid injection controller (Module B Plus)*
- Electronic expansion valve (ETS6)*
- Components connected are equipped with Schrader port

**Only for P02 version,*
***only for P05 models*

### 2 – Handling and storage

- It is recommended not to open the packaging before the unit is at the final place for installation.
- Handle the unit with care. The packaging allows for the use of a forklift or pallet jack. Use appropriate and safe lifting equipment..
- Store and transport the unit in an upright position.
- Store the unit between -35°C and 50°C.
- Don't expose the packaging to rain or corrosive atmosphere.
- After unpacking, check that the unit is complete and undamaged.

### 3 – Installation precautions

| |
|---|
| Never place the unit in a flammable atmosphere. |
| Place the unit in such a way that it is not blocking or hindering walking areas, doors, windows or similar. |
| PRV: For PED Cat I and II models, PRV shall be mounted at field during installation. |

- Ensure adequate space around the unit for air circulation and to open doors. Refer to picture 1 for minimal values of distance to walls.
- Avoid installing the unit in locations which are daily exposed to direct sunshine for longer periods.
- Avoid installing the unit in aggressive and dusty environments.
- Ensure a foundation with horizontal surface (less than 3° slope), strong and stable enough to carry the entire unit weight and to eliminate vibrations and interference.
- The unit ambient temperature may not exceed 50°C during off-cycle.
- Ensure that the power supply corresponds to the unit characteristics (see nameplate).
- When installing units for HFC refrigerants, use equipment specifically reserved for HFC refrigerants which was never used for CFC or HCFC refrigerants.
- Use clean and dehydrated refrigeration-grade Copper / Aluminium tubes with appropriate thickness and silver alloy brazing material.
- Use clean and dehydrated system components.
- The suction piping connected to the compressor must be flexible in 3 dimensions to dampen vibrations. Furthermore piping has to be done in such a way that oil return for the compressor is ensured and the risk of liquid slug over in compressor is eliminated.
- In Optyma condensing unit has suction and liquid service valve with schrader port for field service operation

### 3.1 – PRV Valve

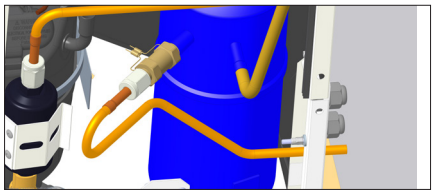
| |
|---|
| For Optyma™ Plus, Condensing units which are fall in PED cat I and II, PRV shall be fitted (See Technical data for PED category in Annex **A**). |
| PRV is provided as Spare part,. Refer Coolselector2 |

- PRV to be fitted on liquid receiver at 3/8" NPT Connection. (Refer Coolselector2 for PRV spare part code). Use Locatite 554 for PRV fitment.
- Torque: 40Nm (Don't exceed given torque )


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- Installer need to take care of where to blow the leaked refrigerant. Danfoss recommended to blow refrigerant away form condensing unit.
- Recommended to change PRV when after discharge, Changing refrigerant
- Valves must be installed vertically or Horizontally, but ensure PRV to be fitted above system's liquid level.
- Ensure refrigerant is released safely to the atmosphere directly.
- Incase of hazard, additional spare kit has been designed in order to collect the released refrigerant. Kit should be installation with proper piping routing for discharge of refrigerant safely. (See picture below)



- PRV should not be installed on service valve.
- Replace PRV after clean out of system or bared out.
- No Detachable joints and valves should not accessible to public. All brazing joints should comply with EN 14276-2 and other permanent joints should comply with EN-16084.

## 4 – Installation

- The installation in which the condensing unit is installed must comply to pressure Equipment Directive (PED) 2014/68/EU. The condensing unit itself is not a "unit" in the scope this directive.
- It is recommended to install the unit on rubber grommets or vibration dampers (not supplied).
- It is possible to stack units on top of each other.

| Unit | Maximum stacking |
|---|---|
| Housing 1 (Code no. 114X31-- or 114X41--) | 3 |
| Housing 2 (Code no. 114X32-- or 114X42--) | 2 |
| Housing 3 (Code no. 114X33-- or 114X43--) | 2 |
| Housing 4 (Code no. 114X34-- or 114X44--) | 2 |

- When stacking, the topmost unit must be secured to the wall, as shown in picture 2.
- Slowly release the nitrogen holding charge through the schrader port.
- Connect the unit to the system as soon as possible to avoid oil contamination from ambient moisture.
- Avoid material entering into the system while cutting tubes. Never drill holes where burrs cannot be removed.
- Braze with great care using state-of-the-art technique and vent piping with nitrogen gas flow.
- Connect the required safety and control devices. When the schrader port is used for this, remove the internal valve.
- It is recommended to insulate the suction pipe up to the compressor inlet with 19 mm thick insulation.
- Copper piping material should comply with EN12735-1. And all pipe joints should comply with EN14276-2
- At filed installation, support to added according to size and weight. Recommended maximum spacing for pipe support as per EN12735-1 & EN12735-2
- Connecting pipes shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts.

## 5 – Leak detection

| | |
|---|---|
| ⚠ | Never pressurize the circuit with oxygen or dry air. This could cause fire or explosion. |

- Do not use dye for leak detection.
- Perform a leak detection test on the complete system.
- The maximum test pressure is 31*) bar.
- When a leak is discovered, repair the leak and repeat the leak detection.

*) *25 bar for OP-.....AJ.... & OP-.....FH.... models*

## 6 – Vacuum dehydration

- Never use the compressor to evacuate the system.
- Connect a vacuum pump to both the LP & HP sides.
- Pull down the system under a vacuum of 500 µm Hg (0.67 mbar) absolute.
- Do not use a megohmmeter nor apply power to the compressor while it is under vacuum as this may cause internal damage.

## 7 – Electrical connections

- Switch off and isolate the main power supply.
- Ensure that power supply can not be switched on during installation.
- All electrical components must be selected as per local standards and unit requirements.
- Refer to wiring diagram for electrical connections details.
- Ensure that the power supply corresponds to the unit characteristics and that the power supply is stable (nominal voltage ±10% and nominal frequency ±2,5 Hz).
- Dimension the power supply cables according to unit data for voltage and current.
- Protect the power supply and ensure correct earthing.
- Make the power supply according to local standards and legal requirements.
- The unit is equipped with an electronic controller. Refer to Manual 118U3808 for details.
- P02 version models (OP-xxxxxxxxxP02E) are equipped with Electronic circuit board (Module B Plus). Refer to section " Module B Plus User Guide " of this manual.
- The unit is equipped with a main switch with overload protection. The overload protection is factory preset but it is recommended to check the value before taking the unit in operation. The value for the overload protection can be found in the wiring diagram in the front door of the unit.
- The unit is equipped with high and low pressure switches, which directly cut the power supply to the compressor in case of activation. Parameters for high and low pressure cut outs are preset in the controller, adapted to the compressor installed in the unit.
- P05 models are also equipped with phase sequence relay to protect the unit against phase loss/sequence/ asymmetry and under-/over-voltage.

For units with a 3-phase scroll compressor (OP-MPXMxxxxxxxxE), correct phase sequence for compressor rotation direction shall be observed.

- Determine the phase sequence by using a phase meter in order to establish the phase orders of line phases L1, L2 and L3.
- Connect line phases L1, L2 and L3 to main switch terminals T1, T2 and T3 respectively.

## 8 – Safety

| | |
|---|---|
| ⚠ | Electrical box door should be in closed condition before connecting to power supply. |
| | Discharge tube temperature will go upto 120°C during unit running condition. |
| | Recommended to install PRV inside unit and release of refrigerant should routed to atmosphere directly. |

Fusible Plug is not installed in unit, it is replaced with adapter blanking plug.

Unit has liquid receiver with an Adapter Plug with 3/8" NPT connection. installer/end user can select various options as mentioned in EN378-2 : 2016 Article § 6.2.2.3

- The unit/installation into which the condensing unit is mounted/integrated, must be in accordance with the PED.
- Beware of extremely hot and cold components.
- Beware of moving components. Power supply should be disconnected while servicing.
- Compressor has Internal overload protector (OLP). Its will protect compressor pressure going beyond 32 bar pressure.
- No valves and detachable joints shall be located

in areas accessible to the general public except when they comply with EN 16084
- Refrigerant piping shall be protected or enclosed to avoid damage.
- Field piping should be installed such that it will be free from corrosive or salty environment to avoid corrosion in copper /Aluminum piping.
- In case of fire incidence, pressure increases due to increasing in temperature at receiver. Hence it is very important to install the PRV.

## 9 – Filling the system

- Never start the compressor under vacuum. Keep the compressor switched off.
- Use only the refrigerant for which the unit is designed for.
- Fill the refrigerant in liquid phase into the condenser or liquid receiver. Ensure a slow charging of the system to 4 – 5 bar for R404A/ R448A/R449A/R407A/R407F/R452A and approx. 2 bar for R134a and R513A.
- The remaining charge is done until the installation has reached a level of stable nominal condition during operation.
- Never leave the filling cylinder connected to the circuit.
- Suction, Liquid valves and Receiver Rotolock valves as Schrader port for service operation like Gas Charging, pressure measurement.

## 10 – Setting the electronic controller

| | |
|---|---|
| ⚠ | For P02 version models (OP-xxxxxxxxxP02E), if o30 value is 19= R404A or 40=R448A or 41=R449A in controller. |
| | Change controller parameter o37 to 1 in case of SPPR retrofit. In case you add the SPPR (Supply monitoring relay) option to protect the compressor please change the setting o37 from 0 to 1 |

- The unit is equipped with an electronic controller which is factory programmed with parameters for use with the actual unit. Refer to Manual 118U3808 for details.
- By default, the electronic controller display shows the temperature value for the suction pressure in °C. To show the temperature value for the condensing pressure, push the lower button (picture 3).

The electronic controller is factory preset for R404A or R449A or R452A or R134a depending on the model of compressor mounted and application (Refer Annexx in Optyma Controller installation manual). If another refrigerant is used, the refrigerant setting must be changed. Parameter r12 must be set to 0 before (software main switch= off).

- Push the upper button for a couple of seconds. The column with parameter codes appears.
- Push the upper or lower button to find parameter code o30.
- Push the middle button until the value for this parameter is shown.
- Push the upper or lower button to select the new value: 3 = R134a, 36 = R513A, 17 = R507, 19 = R404A, 20 = R407C , 21 = R407A, 37 = R407F, 40 = R448A, 41 = R449A, 42 = R452A.
- Push the middle button to confirm the selected value.
- Push the upper or lower button to find parameter code r84 (r84 = Maximum allowable discharge temperature).
- Push the middle button, default maximum discharge temperature is 125°C
- If customer want to increase the valve, push the upper button to select the new value: 130 push middle button to confirm the selected value.
- Maximum allowable discharge temperature (r84) should not exceed 130 °C

## 11 – Verification before commissioning

| | |
|---|---|
| ⚠ | Use safety devices such as safety pressure switch and mechanical relief valve in compliance with both generally and locally applicable regulations and safety standards. Ensure that they are operational and properly set. |
| | Check that the settings of high-pressure switches and relief valves don't exceed the maximum service pressure of any system component. |

- Verify that all electrical connections inside the condensing unit are properly fastened as they could have worked loose during transportation.
- When a crankcase heater is required, the unit must be energized at least 12 hours before initial start-up and start-up after prolonged shutdown for belt type crankcase heaters.
- The unit is equipped with a main switch with overload protection. Overload protection is preset from factory, but it is recommended to check the value before taking the unit in operation. The overload protection value can be found in the wiring diagram in the unit front door.
- Check if discharge temperature sensor is firm and has proper contact with discharge pipe.
- Pressure drop in the suction and liquid line pipes must be evaluated as per evaporator location and distance (refer coolselector2).

## 12 – Start-up

- Never start the unit when no refrigerant is charged.
- All service valves must be in the open position.
- Rotalock valve on the receiver must be turned 1 round to close direction to get the right condensing pressure for the pressure transmitter
- Check compliance between unit and power supply.
- Check that the crankcase heater is working.
- Check that the fan can rotate freely.
- Check that the protection sheet has been removed from the backside of condenser.
- Balance the HP/LP pressure.
- Energize the unit. It must start promptly. If the compressor does not start, check wiring conformity and voltage on terminals.
- Eventual reverse rotation of a 3-phase compressor can be detected by following phenomena; the compressor doesn't build up pressure, it has abnormally high sound level and abnormally low power consumption. P05 models are equipped with a phase-reversal relay and compressor doesn't start, the compressor doesn't build up pressure, in case of wrong phase sequences. In such case, shut down the unit immediately and connect the phases to their proper terminals.
- If the rotation direction is correct the low pressure indication on the controller (or low pressure gauge) shall show a declining pressure and the high pressure indication (or high pressure gauge) shall show an increasing pressure.

## 13 – Check with running unit

- Check the fan rotation direction. Air must flow from the condenser towards the fan.
- Check current draw and voltage.
- Check suction superheat to reduce risk of slugging.
- When a sight glass is provided observe the oil level at start and during operation to confirm that the oil level remains visible.
- Respect the operating limits.
- Check all tubes for abnormal vibration. Movements in excess of 1.5 mm require corrective measures such as tube brackets.
- When needed, additional refrigerant in liquid phase may be added in the low-pressure side as far as possible from the compressor. The compressor must be operating during this process.
- For P02 version models (OP-xxxxxxxxxP02E) :
- Check sight glass and make sure no bubbles in liquid line for proper liquid injection.
- When o30 is set 19= R404A or 40=R448A or 41=R449A and readout U26 > 125 in controller, check and make sure liquid injection is ON. Economizer inlet pipe should be cold.
- Do not overcharge the system.
- Follow the local regulations for restoring the refrigerant from unit.
- Never release refrigerant to atmosphere.
- Before leaving the installation site, carry out a general installation inspection regarding cleanliness, noise and leak detection.
- Record type and amount of refrigerant charge as well as operating conditions as a reference for future inspections.

## 14 – Emergency running without controller

In case of controller failure, the condensing unit can still be operated when the controller standard wiring (picture 4) is modified into a temporary


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wiring (picture 5) as described below.

| | |
|---|---|
| ⚠ | This modification may be done by authorized electricians only. Country legislations have to be followed. |
| | Disconnect the condensing unit from power supply (turn hardware main switch off) |

- Contact of Room Thermostat must be possible to switch 250VAC.
- Remove wire 22 (safety input DI3) and wire 24 (room thermostat DI1) and put them together with an insulated 250 Vac 10mm² terminal bridge.
- Remove wire 25 (room thermostat DI1) and wire 11 (compressor supply) and put them together with an insulated 250VAC 10mm² terminal bridge.
- Remove wire 6 and connect it with terminal bridge for wire 11 and 25. A fan pressure switch or fan speed controller can be connected in series to wire 6.
- Remove wire 14 (crankcase heater) and connect it to the compressor contactor terminal 22.
- Remove wire 12 (supply crankcase heater), extend this wire by using an 250 Vac 10mm² terminal bridge and 1,0mm² brown cable and connect it to compressor contactor terminal 21
- Remove the large terminal block from the controller terminals 10 to 19.
- Connect the condensing unit to power supply (turn hardware main switch on).

## 15 – Maintenance

| | |
|---|---|
| ⚠ | Always switch off the unit at main switch before opening the fan door (s). |
| | Internal pressure and surface temperature are dangerous and may cause permanent injury.Maintenance operators and installers require appropriate skills and tools. Tubing temperature may exceed 100°C and can cause severe burns. |
| | Ensure that periodic service inspections to ensure system reliability and as required by local regulations are performed. |

To prevent system related problems, following periodic maintenance is recommended:

- Verify that safety devices are operational and properly set.
- Ensure that the system is leak tight.
- Check the compressor current draw.
- Confirm that the system is operating in a way consistent with previous maintenance records and ambient conditions.
- Check that all electrical connections are still adequately fastened.
- Keep the unit clean and verify the absence of rust and oxidation on the unit components, tubes and electrical connections.

The condenser must be checked at least once a year for clogging and be cleaned if deemed necessary. Access to the internal side of the condenser takes place through the fan door. Microchannel coils tend to accumulate dirt on the surface rather than inside, which makes them easier to clean than fin-&-tube coils.

- Switch off the unit at main switch before opening the fan door.
- Remove surface dirt, leaves, fibres, etc. with a vacuum cleaner, equipped with a brush or other soft attachment. Alternatively, blow compressed air through the coil from the inside out, and brush with a soft bristle. Do not use a wire brush. Do not impact or scrape the coil with the vacuum tube or air nozzle.
- Before closing the fan door, turn the fan blade in a safe position, to avoid that the door hits the fan.

If the refrigerant system has been opened, the system has to be flushed with dry air or nitrogen to remove moisture and a new filter drier has to be installed. If evacuation of refrigerant has to be done, it shall be done in such a way that no refrigerant can escape to the environment.

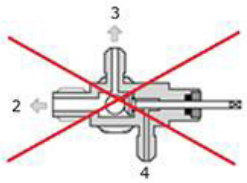



**Fig A:** Fully opened condition, Port 2 and 3 is fully opened and port 4 is fully closed

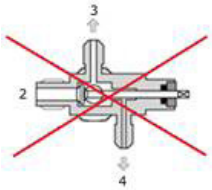



**Fig B:** Fully closed condition, Port 3 and 4 is partially open and port 2 is fully closed

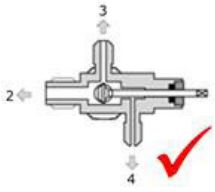



**Fig C:** Partially Opened Condition (5.5 turns clock wise from fully opened condition. Port 2, 3, 4 is fully opened).

## 16 – Declaration of incorporation

- **Pressure Equipment Directive 2014/68/EU**

**EN 378-2:2016** - Refrigerating systems and Heat Pumps - Safety and environmental requirements- Parts 2: Design, construction, testing, marking and documentation.

**Low Voltage Directive 2014/35/EU** EN 60335-1:2012 + A11:2014- Household and similar electrical appliances-Safety-Part 1: General requirements-for all above mentioned condensing units **Eco-design DIRECTIVE 2009/125/ EC**, establishing a framework for the setting of Eco-design requirements for energy-related products. REGULATION (EU) 2015/1095, implementing Eco-design Directive 2009/125/EC with regard to Eco-design requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process Chiller.

- Condensing unit measurements are made according to standard "EN 13771-2:2017" – Compressor and condensing units for refrigeration-performance testing and test methods- part 2: Condensing units.

## 17 - Warranty

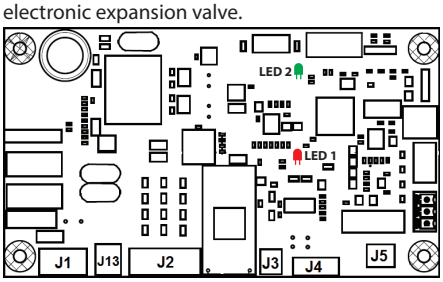
Always transmit the model number and serial number with any claim filed regarding this product. The product warranty may be void in following cases:

- Absence of nameplate.
- External modifications, in particular, drilling, welding, broken feet and shock marks.
- Compressor opened or returned unsealed.
- Rust, water or leak detection dye inside the compressor.
- Use of a refrigerant or lubricant not approved by Danfoss.
- Any deviation from recommended instructions pertaining to installation, application or maintenance.
- Use in mobile applications.
- Use in explosive atmospheric environment.
- No model and serial number transmitted with the warranty claim.

## 18 – Disposal

Danfoss recommends that condensing units and oil should be recycled by a suitable company at its site.

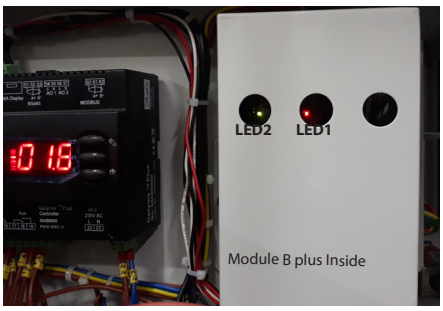
Module B plus is an electronic circuit board used in P02 version models for automatic liquid injection into compressor scrolls set using an electronic expansion valve.




*Module B Plus*

Module B plus is covered by touch protection cover as Picture 6.

⚠ Do not remove touch protection cover unless required. Switch of the unit before removing this cover.




*Picture 6*

**Application**

Module B Plus controls liquid injection, and it also monitors the following parameters: Discharge gas temperature, phase sequence and phase failure.

**Functional description**

• Liquid injection

- Module B Plus can control discharge gas temperature. The default set point is 125 °C, this is required to run the condensing unit within safe envelope.

⚠ Do not change this set point.

- When compressor stops the liquid injection valve will be closed within 6 seconds.

• Discharge gas temperature overheat protection

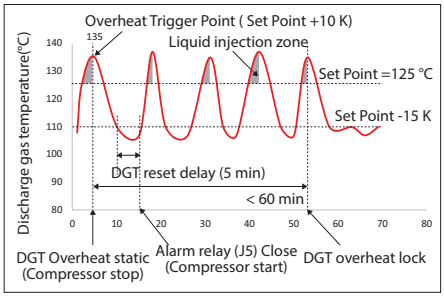
- Discharge gas temperature sensor from Module B Plus can detect discharge gas temperature within the range -50 to 180°C, temperature measurement accuracy ±0.5°C. Discharge sensor is installed within 150mm from compressor discharge port.
- If the discharge gas temperature is higher than Overheat Trigger Point (set point + 10 K)within 1 second, alarm relay (J5) will open. This status is named as DGT Overheat Static referring to Table 1. If the discharge gas temperature lower than Reset Point (Set Point -15 °C) continuously for 5 minutes, the alarm relay (J5) will close. This 5 minutes delay status is named as DGT Reset Delay.
- If the discharge gas temperature overheat more than 5 times within 1 hour, alarm relay (J5) locks on open status and only can be reset by resetting Module B Plus power supply manually (switch-off the unit and switch-on again after some time). This status is named as DGT Overheat Lock, refer table 1 for error identification.
- If discharge gas temperature sensor is malfunction, i.e. Sensor Open, Sensor Short circuit or Out of Range, alarm relay (J5) locks on open status too, refer table 1 for error identification.

• Phase protection

- Phase sequence and missing phase detection will only be performed every time the compressor was powered on. If a wrong phase status Phase Loss or Phase Reverse detected, within 4.5s to 5s, alarm relay (J5) will open and lock on open status. This lock on open status only can be reset by resetting Module B Plus power supply manually, refer table 1 for error identification.

• User interface

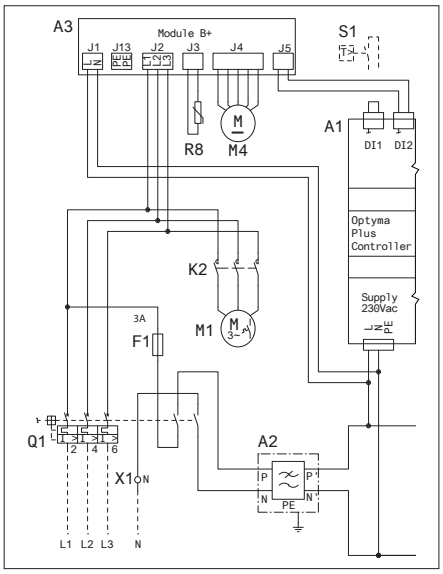
- Module B Plus powers on, power LED 1 will be solid red all the time. When the Module is powered off, power LED 1 will be off. If Module B Plus powers on and has no error, status LED 2 will be solid green on. Refer picture 6 for LED 1 and LED 2 location on module B plus.
- If Module B Plus powers on, and detects an error, status LED 2 will be yellow and red blinking one second alternately. Detail blink code see table 1.




*Picture 7.*

• Module B plus communication with Optyma Plus controller.

- When alarm relay (J5) is open, signal is communicated to Optyma controller digital input 2 (DI2), which enables safety alarm (A97) in Optyma plus controller and power supply to compressor will be stopped immediately.




*Model B Plus wiring diagram*

| Category | Yellow Blink Times | Red Blink Times | Error | Description | Action |
|---|---|---|---|---|---|
| Discharge gas temperature | 1 | 1 | DGT Overheat static/ DGT Reset Delay | Discharge gas temperature is higher than compressor stop trip point | Check if Optyma Controller shows safety alarm (A97). If yes, wait till it gets resolved automatically. If this error is observed frequently, check if unit is running in recommended envelope. |
| | | 2 | DGT Overheat Lock | DGT Overheat Static occurs 5 times within 1 hour | Reset Module B Plus supply manually (switch-off the unit and switch-on again after some time). |
| | | 3 | DGT out of range | DGT is out of normal range (-50 ... 180°C) | Check if discharge gas temperature sensor is mounted properly on discharge line. Check discharge gas temperature on Optyma Plus controller parameter U27 (should be within -50 ... 180°C). |
| | | 4 | DGT Sensor Open / DGT Sensor Short | Discharge gas temperature sensor open/short circuit | Check discharge temperature sensor and connection. |
| Triple Phase | 2 | 1 | Phase Loss | One phase signal loss | Check 3-Phase power supply (J2) to Module B Plus, if one of the 3 phases is missing. If yes, do correct power supply connection and reset Module B Plus manually (switch-off the unit and switch-on again after some time). |
| | | 2 | Phase Reverse | Incorrect phase connection | Check 3-Phase power supply (J2) to Module B Plus, if 3 phases are in correct sequence. If not, do correct power supply connection in sequence and reset Module B Plus manually (switch-off the unit and switch-on again after some time). |

*Table 1: Error Blink Code (LED 2 Yellow -Red Blink code)*


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ENGINEERING
**TOMORROW**

**Anleitung (Deutsch)**

# Optyma™ Plus

## OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM

| |
|---|
| **Montage und Wartung der Verflüssigungssätze dürfen ausschließlich durch qualifiziertes Fachpersonal erfolgen. Befolgen Sie diese Anleitung sowie die allgemein gültigen Regeln der Technik für Einbau, Inbetriebnahme, Wartung und Instandhaltung von kältetechnischen Anlagen.** |
| **Dieses Produkt unterliegt nicht der britischen PSTI-Verordnung, da es nur für die Lieferung an und Verwendung durch Fachkräfte mit der erforderlichen Expertise und Qualifikation bestimmt ist. Jeder Missbrauch oder unsachgemäße Umgang kann unbeabsichtigte Folgen nach sich ziehen. Durch den Kauf oder die Verwendung dieses Produkts bestätigen und akzeptieren Sie die ausschließliche professionelle Verwendung des Produkts. Danfoss übernimmt keine Haftung für Schäden, Verletzungen oder nachteilige Folgen („Schäden»), die sich aus der falschen oder unsachgemäßen Verwendung des Produkts ergeben, und Sie erklären sich damit einverstanden, Danfoss von solchen Schäden schadlos zu halten, die sich aus Ihrer falschen oder unsachgemäßen Verwendung des Produkts ergeben.** |
| Der Verflüssigungssatz darf nur für den vorgesehenen Zweck und im entsprechenden Anwendungsbereich gemäß der Anleitung eingesetzt werden. Zu verwendendes Kältemittel gemäß Spezifikation für den Typ. |
| Die Bestimmungen gemäß EN378 und alle anderen in Ihrem Land geltenden Sicherheitsvorschriften müssen unbedingt eingehalten werden. |
| Bei Lieferung ist der Verflüssigungssatz mit gasförmigem Stickstoff gefüllt, der unter einem Druck von 1 bar steht. In diesem Zustand darf der Verflüssigungssatz nicht angeschlossen und betrieben werden. Näheres hierzu erfahren Sie im Abschnitt„Montage“. |
| Der Verflüssigungssatz muss in vertikaler Position montiert werden (maximale Abweichung von der Senkrechten: 15 °). |
| **Für Typen der PED-Kategorie I und II:** Das Sicherheitsventil muss während der Installation vor Ort im Kältemittelsystem installiert werden. Das Sicherheitsventil muss am Sammelbehälter installiert werden. |

**Relevante Normen und Richtlinien**
**EN 378-2:2016:** Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen
**EN60335-1:** Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke – Teil 1: Allgemeine Anforderungen
**Niederspannungsrichtlinie 2014/35/EU**
**Maschinenrichtlinie 2006/42/EG**
**Druckgeräterichtlinie (Pressure Equipment Directive) (DGRL(PED)) 2014/68/EU**
**RoHS-Richtlinie 2011/65/EU**
**WEEE-Richtlinie 2012/19/EU**
(Sonstige vor Ort geltende Normen)

### 1. Einleitung

Diese Anleitung bezieht sich auf die Verflüssigungssätze der Produktreihe Optyma™ Plus neue Generation (OP-MPBM, OP-MPXM, OP-MPGM, OP-LPQM, OP-LPOM und OP-MPBM) für Kälteanlagen. Sie enthält die erforderlichen Angaben für eine sichere und ordnungsgemäße Nutzung dieser Produkte.

Der Verflüssigungssatz enthält folgende Bauteile:
- Microchannel-Wärmeübertrager
- Hubkolben- oder Scrollverdichter
- Sammler mit Absperrventil
- 2 Kugelabsperrventile
- Schauglas
- Hoch- & Niederdruckschalter (Patrone)
- Austauschbarer Filtertrockner
- Elektronischer Regler
- Notausschalter (Hauptschalter mit Überlastschutz)
- Lüfter- und ggf. Verdichterkondensatoren
- Verdichterschütz
- Spannungsüberwachungsrelais**
- Robustes wetterfestes Gehäuse
- Regler zur Flüssigkeitseinspritzung (Modul B Plus)*
- Elektronisches Expansionsventil (ETS6) *
- Komponenten sind ggf. mit Schraderanschluss ausgestattet

**Nur für P02-Version,*
***nur für P05-Modelle*

### 2. Handhabung und Lagerung

- Es wird empfohlen, die Verpackung erst am endgültigen Montageort zu öffnen.
- Handhaben Sie das Gerät pfleglich. Die Verpackung gestattet den Einsatz eines Gabelstaplers oder -hubwagens. Verwenden Sie ausschließlich geeignete und sichere Hebezeuge.
- Der Verflüssigungssatz darf nur aufrecht stehend transportiert und gelagert werden.
- Zulässige Lagertemperatur: -35 °C bis 50 °C.
- Die Verpackung darf weder Regen, noch ätzenden Atmosphären ausgesetzt werden.
- Vergewissern Sie sich nach dem Auspacken, dass der Verflüssigungssatz vollständig und unbeschädigt ist.

### 3. Sicherheitsvorkehrungen bei der Installation

| |
|---|
| Stellen Sie den Verflüssigungssatz niemals in einer explosionsfähigen Atmosphäre auf. |
| Achten Sie bei der Positionierung des Verflüssigungssatzes darauf, dass keine Durchgänge, Türen, Fenster oder Ähnliches blockiert werden. |
| Sicherheitsventil (PRV): Bei Typen der PED-Kategorie I und II muss das Sicherheitsventil während der Installation vor Ort montiert werden. |

- Achten Sie darauf, dass ausreichend Platz um den Verflüssigungssatz gelassen wird, damit die Luft zirkulieren kann und sich sämtliche Türen öffnen lassen. Die Mindestabstände zu den Wänden entnehmen Sie bitte Bild 1.
- Installieren Sie den Verflüssigungssatz NICHT an Orten, die täglich längerer Sonneneinstrahlung ausgesetzt sind.
- Installieren Sie den Verflüssigungssatz NICHT in aggressiven oder staubigen Umgebungen.
- Stellen Sie den Verflüssigungssatz auf einer horizontalen Fläche (mit weniger als 3 Grad Neigung) auf. Der Boden sollte eine ausreichende Tragfähigkeit besitzen, um das Gewicht des gesamten Verflüssigungssatzes tragen zu können, und stabil genug sein, um Vibrationen und Interferenzen zu eliminieren.
- Im Aus-Zustand darf die Umgebungstemperatur des Verflüssigungssatzes 50 °C nicht überschreiten.
- Vergewissern Sie sich, dass die Versorgungsspannung den Motoreigenschaften des Verflüssigungssatzes entspricht (siehe Typenschild).
- Verwenden Sie bei der Installation der Verflüssigungssätze für FKW-Kältemittel nur Teile, die speziell für FKW-Kältemittel vorgesehen sind und die zuvor nicht in Anlagen mit FCKW- oder HFCKW-Kältemitteln eingesetzt wurden.
- Verwenden Sie saubere und trockene für Kältemittel geeignete Kupfer-/Aluminiumrohre in geeigneter Stärke und eine Silberlegierung als Lötmaterial.
- Verwenden Sie saubere und trockene Anlagenkomponenten.
- Die an den Verdichter angeschlossene Saugleitung muss in alle 3 Dimensionen flexibel sein, um Vibrationen zu dämpfen. Darüber hinaus muss die Verrohrung so erfolgen, dass der Ölrücklauf zum Verdichter sichergestellt ist und dass das Risiko von Flüssigkeitsschlägen im Verdichter ausgeschlossen ist.
- Der Verflüssigungssatz Optyma verfügt über ein Saug- und Flüssigkeits-Serviceventil mit Manometeranschluss für den Zugriff bei Wartungen.

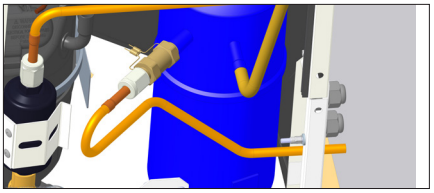
### 3.1 – Sicherheitsventil (PRV)

| |
|---|
| Bei den Verflüssigungssätzen von Optyma™ Plus, die unter die Druckgeräterichtlinie (PED) der Kategorie I und II fallen, müssen Sicherheitsventile eingebaut werden (siehe technische Daten für die PED-Kategorie in Anhang A). |
| PRV wird als Ersatzteil geliefert. Siehe Coolselector2 |

- Das Sicherheitsventil wird am 3/8"-NPT-Anschluss des Flüssigkeitssammlers installiert. (Ersatzteil-Sicherheitsventil-Bestellnummer siehe Coolselector2). Verwenden Sie für die Installation des Sicherheitsventils Loctite 554.
- Drehmoment: 40 Nm (vorgegebenes Drehmoment nicht überschreiten)



- Der Monteur muss darauf achten, wohin ggf. das ausgetretene Kältemittel ausgeblasen wird. Danfoss empfiehlt, das Kältemittel vom Verflüssigungssatz weg auszublasen.
- Es wird empfohlen, das Sicherheitsventil nach dem Abblasefall zu tauschen. Kältemittelwechsel
- Die Ventile müssen vertikal oder horizontal installiert werden. Stellen Sie sicher, dass das Sicherheitsventil über dem Flüssigkeitsstand des Systems installiert wird.
- Stellen Sie sicher, dass das Kältemittel sicher und direkt in die Atmosphäre abgegeben wird.
- Für den Fall einer Gefahr wurde ein zusätzliches Ersatzteilset entwickelt, um das abgeblasene Kältemittel aufzufangen. Das Set muss mit geeigneter Leitungsführung verlegt werden, damit das Kältemittel ggf. sicher abgeblasen werden kann. (Siehe Abbildung unten.)



- Das Sicherheitsventil (PRV) sollte nicht am Serviceventil installiert werden.
- Tauschen Sie das Sicherheitsventil (PRV) nach einer Entleerung oder dem Abblasen des Systems aus.
- Lösbare Verbindungen und Ventile sollten nicht offen zugänglich sein. Alle Lötverbindungen müssen EN 14276-2 und alle sonstigen Dauerverbindungen müssen EN 16084 konform sein.

## 4. Installation

- Die Anlage, in die der Verflüssigungssatz verbaut wird, muss der Pressure Equipment Directive (PED) 2014/68/EU entsprechen. Der Verflüssigungssatz selbst ist kein „Gerät" im Sinne dieser Richtlinie.
- Es wird empfohlen, den Verflüssigungssatz auf Montagegummis oder Schwingungsdämpfern (nicht im Lieferumfang enthalten) zu montieren.
- Es ist möglich, mehrere Verflüssigungssätze übereinander zu stapeln.

| Verflüssigungssatz | Maximale Stapelhöhe |
|---|---|
| Gehäuse 1 (Bestellnr.°114X31-- bzw. 114X41--) | 3 |
| Gehäuse 2 (Bestellnr.°114X32-- bzw. 114X42--) | 2 |
| Gehäuse 3 (Bestellnr.°114X33-- bzw. 114X43--) | 2 |
| Gehäuse 4 (Bestellnr.°114X34-- bzw. 114X44--) | 2 |

- Bei der Stapelmontage muss der oberste Verflüssigungssatz an der Wand befestigt werden (siehe Bild 2).
- Lassen Sie die Stickstoff-Füllung langsam durch den Schraderanschluss ab.
- Schließen Sie den Verflüssigungssatz möglichst schnell an die Anlage an, um eine Kontamination des Öls mit Umgebungsfeuchtigkeit zu vermeiden.
- Verhindern Sie, dass beim Zuschneiden der Rohrleitungen Fremdkörper in die Anlage eindringen. Bohren Sie niemals Löcher, deren Grate nicht entfernt werden können.
- Lassen Sie beim Löten größte Vorsicht walten. Verwenden Sie nur modernste Lötverfahren und durchströmen Sie dabei die Rohrleitungen mit gasförmigem Stickstoff.
- Schließen Sie die erforderlichen Sicherheits- und Steuergeräte an. Falls der Schraderanschluss verwendet wird, entfernen Sie das interne Ventil.
- Es wird empfohlen, die Saugleitung bis zum Verdichtereintritt mit einer 19 mm dicken Isolierung zu dämmen.
- Der Werkstoff für das Kupferrohr muss EN 12735-1 entsprechen. Alle Rohrverbindungen müssen EN 14276-2 entsprechen.
- Bei der Installation vor Ort muss auf Größe und Gewicht geachtet werden. Empfohlener maximaler Abstand für Rohrschellen entsprechend EN 12735-1 und EN 12735-2
- Vor dem Öffnen der Ventile müssen die Rohrleitungen angeschlossen werden, damit das Kältemittel zwischen den Teilen der Kälteanlage zirkulieren kann.

## 5. Lecksuche

| | |
|---|---|
| ⚠ | Setzen Sie den Kreislauf niemals mit Sauerstoff oder trockener Luft unter Druck. Das könnte einen Brand oder eine Explosion verursachen. |

- Benutzen Sie für die Lecksuche keinen Farbstoff.
- Unterziehen Sie die gesamte Anlage einer Dichtigkeitsprüfung.
- Der maximale Prüfdruck beträgt 31*) bar.
- Reparieren Sie entdeckte Lecks und wiederholen Sie dann die Lecksuche.

*) *25 bar für OP-.....AJ.... & OP-.....FH.... Modelle*

## 6. Evakuieren

- Benutzen Sie niemals den Verdichter zur Evakuierung der Anlage.
- Schließen Sie sowohl an die Nieder- als auch an die Hochdruckseite eine Vakuumpumpe an.
- Evakuieren Sie die Anlage bis auf einen Absolutwert von 500 µm Hg (0,67 mbar).
- Verwenden Sie während der Evakuierung kein Megohmmeter und legen Sie auch keine Spannung an den Verdichter an, um eine Beschädigung des Verdichters zu vermeiden.

## 7. Elektrische Anschlüsse

- Schalten Sie die Spannungsversorgung ab und trennen Sie den Verflüssigungssatz vom Netz.
- Stellen Sie sicher, dass die Spannungsversorgung während der Installation nicht eingeschaltet werden kann.
- Die Auswahl aller elektrischen Bauteile muss gemäß den landesspezifischen Normen und Vorschriften für Verflüssigungssätze erfolgen.
- Näheres zu den elektrischen Anschlüssen entnehmen Sie dem Schaltplan.
- Stellen Sie sicher, dass die Versorgungsspannung den Eigenschaften des Verflüssigungssatzes entspricht und stabil anliegt (Nennspannung ±10 % und Nennfrequenz = ±2,5 Hz)
- Dimensionieren Sie die Spannungsversorgungskabel gemäß der für den Verflüssigungssatz vorgegebene Spannung und Stromstärke.
- Schützen Sie die Spannungsversorgung und stellen Sie deren ordnungsgemäße Erdung sicher.
- Die Spannungsversorgung muss den Normen und gesetzlichen Bestimmungen Ihres Landes entsprechen.
- Der Verflüssigungssatz ist mit einem elektronischen Regler ausgestattet. Näheres entnehmen Sie dem Handbuch „Manual 118U3808".
- Modelle der Version P02 (OP-xxxxxxxxxP02E) sind bestückt mit Flüssigkeit-Einspritzregler Modul B Plus, Funktion siehe Abschnitt "Modul B Plus - Benutzer Anleitung" dieses Handbuchs.
- Der Verflüssigungssatz ist mit einem Hauptschalter mit Überlastschutz ausgestattet. Der Überlastschutz ist werkseitig voreingestellt. Es wird jedoch empfohlen, den Wert vor der Inbetriebnahme des Verflüssigungssatzes zu überprüfen. Den Wert für den Überlastschutz finden Sie im Schaltplan auf der Innenseite der Fronttür am Verflüssigungssatz.
- Die Anlage ist mit Hoch- und Niederdruckschaltern ausgestattet, die bei Aktivierung die Spannungsversorgung des Verdichters direkt unterbrechen. Die Parameter für die Hoch- und Niederdruck-Abschaltung durch den Regler sind im Regler voreingestellt und an den Verdichter in der Anlage angepasst.
- Die Typen P05 sind außerdem mit einem Phasenfolgerelais ausgestattet, um das Gerät vor Phasenverlust/Sequenz/Asymmetrie und Unter-/Überspannung zu schützen.

Bei Anlagen mit einem 3-Phasen-Scrollverdichter (OP-MPXMxxxxxxxxE) muss die korrekte Phasensequenz für die Drehrichtung des Verdichters beachtet werden.

- Ermitteln Sie die Phasensequenz mit einem Phasenmesser, um die Phasenreihenfolge der Leitungsphasen L1, L2 und L3 festzustellen.
- Schließen Sie die Leitungsphasen L1, L2 und L3 an die entsprechenden Hauptschalterklemmen T1, T2 und T3 an.

## 8 – Sicherheit

| | |
|---|---|
| ⚠ | Die Tür des Schaltkastens muss vor dem Anschluss an die Versorgungsspannung geschlossen sein. |
| | Die Temperatur des Heißgasrohrs erhöht sich bei laufendem Gerät auf bis zu 120 °C. |
| | Es wird empfohlen, das Sicherheitsventil in der Einheit zu installieren und das ggf. freizusetzende Kältemittel direkt in die Atmosphäre abzuleiten. |

Ein Sicherungsstecker ist in der Einheit nicht verfügbar, an seiner Stelle befindet sich ein Adapterstecker.
Die Einheit verfügt über einen Flüssigkeitssammler mit Adapterstecker mit 3/8" NPT-Anschluss. Installateure/Endverbraucher können verschiedene Optionen auswählen gemäß EN 378-2: 2016 Artikel § 6.2.2.3

- Die Kälteanlage, in die der Verflüssigungssatz integriert wird, muss der Druckgeräterichtlinie entsprechen.
- Vorsicht vor heißen und kalten Oberflächen.
- Achten Sie auf bewegliche Komponenten. Während der Wartung muss die Versorgungsspannung getrennt sein.
- Der Verdichter verfügt über einen internen Überlastschutz (Overload Protector, OLP). Dieser sorgt dafür, dass der Verdichterdruck nicht über 32 bar steigt.
- Ventile und lösbare Verbindungen dürfen sich nicht in offen zugänglichen Bereichen befinden, es sei denn, sie entsprechen EN 16084.


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- Kältemittelleitungen müssen geschützt oder ummantelt sein, um Beschädigungen zu vermeiden.
- Die Rohrleitungen vor Ort müssen so verlegt werden, dass sie nicht in einer korrosiven oder salzhaltigen Umgebung liegen, um Korrosion in Kupfer-/Aluminiumrohrleitungen zu vermeiden.
- Bei einem Brand erhöht sich der Druck aufgrund des Temperaturanstiegs am Sammler. Die Installation des Sicherheitsventils ist daher sehr wichtig.

## 9. Füllen der Anlage

- Nehmen Sie den Verdichter niemals unter Vakuum in Betrieb. Sorgen Sie dafür, dass der Verdichter ausgeschaltet ist und nicht plötzlich anspringt.
- Verwenden Sie ausschließlich das Kältemittel, auf das der Verflüssigungssatz ausgelegt ist.
- Füllen Sie das flüssige Kältemittel in den Verflüssiger oder Sammler. Stellen Sie sicher, dass die Anlage langsam befüllt wird (auf 4 bis 5 bar bei R404A/R448A/R449A/R407A/R407F/R452A und auf ca. 2 bar bei R134a, R513A).
- Die Anlage wird dann weiter befüllt, bis die Installation beim Betrieb einen stabilen Nennzustand erreicht hat.
- Lassen Sie den Einfüllstutzen niemals an den Kreislauf angeschlossen.
- Saug-, Flüssigkeits- und Sammler-Rotolock-Ventile als Schraderanschluss für Servicebetrieb wie Gasbefüllung, Druckmessung.

## 10. Einstellen des elektronischen Reglers

| | |
|---|---|
| ⚠ | Ändern Sie den Reglerparameter o37 bei Nachrüstung eines SPPR (Spannungsüberwachungsrelais) auf 1. Wenn Sie zum Schutz des Verdichters die Option SPPR hinzufügen, ändern Sie bitte die Einstellung o37 von 0 auf 1. |
| | Für Modelle der Version P02 (OP-xxxxxxxxxP02E), falls Reglerparamerter o30 den Wert 19 = R404A oder 40 = R448A oder 41 = R449A hat … |

- Der Verflüssigungssatz ist ab Werk mit Parametern für den Einsatz in der jeweiligen Anlage programmiert. Näheres entnehmen Sie dem Handbuch „Manual 118U3808".
- Standardmäßig wird auf dem Display des elektronischen Reglers der Temperaturwert für den Saugdruck in °C angezeigt. Drücken Sie die untere Taste (Bild 3), um den Temperaturwert für den Verflüssigungsdruck anzuzeigen.

Der elektronische Regler ist werkseitig auf R404A R449A, R452A oder R134a voreingestellt - je nach eingebautem Verdichtertyp und Anwendung (siehe Anhang der Optyma Plus Regler-Betriebsanleitung). Bei Verwendung eines anderen Kältemittels muss die Kältemitteleinstellung geändert werden. Der Parameter r12 muss zuerst auf 0 gesetzt werden (Software-Hauptschalter = Off), dann:

- Halten Sie die obere Taste einige Sekunden gedrückt. Daraufhin wird ein Parametercodes eingeblendet.
- Drücken Sie die obere oder untere Taste, um zum Parametercode o30 zu navigieren.
- Halten Sie die mittlere Taste gedrückt, bis der Wert für diesen Parameter angezeigt wird.
- Drücken Sie die obere bzw. untere Taste, um den neuen Wert auszuwählen: 2 = R22, 3 = R134a, 36 = R513A, 17 = R507, 19 = R404A, 20 = R407C, 21 = R407A, 37 = R407F, 40 = R448A, 41 = R449A, 42 = R452A.
- Drücken Sie die mittlere Taste, um den ausgewählten Wert zu bestätigen
- Drücken Sie die obere oder untere Taste, um Parameter r84 zu suchen. (r84 = maximal zulässige Heißgastemperatur)
- Drücken Sie die mittlere Taste; standardmäßig beträgt die maximal zulässige Heißgastemperatureinstellung 125 °C.
- Wenn der Kunde den Wert vergrößern möchte, drücken Sie die obere Taste, um den neuen Wert auszuwählen: 130 °C. Drücken Sie die mittlere Taste, um den ausgewählten Wert zu bestätigen.
- Die maximal zulässige Heißgastemperatur (r84) darf 130 °C nicht überschreiten.

## 11. Abschließende Prüfung vor der Inbetriebnahme

| | |
|---|---|
| ⚠ | Verwenden Sie gemäß den allgemeinen und landesspezifischen Sicherheitsnormen und -vorschriften Sicherheitsvorrichtungen wie Sicherheitsdruckschalter und mechanische Überdruckventile. Vergewissern Sie sich, dass diese Sicherheitsvorrichtungen funktionstüchtig und ordnungsgemäß eingestellt sind. |
| | Überprüfen Sie, dass die Einstellungen für die Hochdruckschalter und Überdruckventile den maximalen Betriebsdruck jeglicher Bauteile der Anlage nicht überschreiten. |

- Vergewissern Sie sich, dass sämtliche elektrischen Anschlüsse innen im Verflüssigungssatz ordnungsgemäß befestigt sind, da sie sich während des Transports möglicherweise gelöst haben könnten.
- Um der Kurbelwannenheizung etwas Vorlauf zu geben (besonders bei niedrigen Umgebungstemperaturen), muss die Einheit mindestens 12 Stunden vor der ersten Inbetriebnahme und vor einer erneuten Inbetriebnahme nach längeren Stillstandszeiten der Anlage eingeschaltet werden.
- Der Verflüssigungssatz ist mit einem Hauptschalter mit Überlastschutz ausgestattet. Der Überlastschutz ist werkseitig voreingestellt. Es wird jedoch empfohlen, den Wert vor der Inbetriebnahme des Verflüssigungssatzes zu überprüfen. Den Wert für den Überlastschutz finden Sie im Schaltplan auf der Innenseite der Fronttür am Verflüssigungssatz.
- Überprüfen Sie, ob der Druckgas-Temperatursensor sicher befestigt ist und richtigen Kontakt mit dem Druckrohr hat.
- Der Druckabfall in den Saug- und Flüssigkeitsleitungen muss je nach Verdampferposition und -abstand bewertet werden (siehe Coolselector2).

## 12. Inbetriebnahme

- Der Verflüssigungssatz darf niemals ohne Kältemittel betrieben werden.
- Alle Serviceventile müssen geöffnet sein.
- Beim Rotalockventil am Sammler ist eine Umdrehung in Schließrichtung vorzunehmen, um den richtigen Verflüssigungsdruck für den Druckmessumformer zu erhalten
- Überprüfen Sie, ob die vorhandene Versorgungsspannung mit dem erforderlichen Wert für den Verflüssigungssatz übereinstimmt.
- Überprüfen Sie, ob der Startregler funktioniert.
- Überprüfen Sie, ob sich der Lüfter frei drehen kann.
- Überprüfen Sie, ob die Schutzfolie auf der Rückseite des Verflüssigers entfernt wurde.
- Nehmen Sie einen Ausgleich zwischen Hoch- und Niederdruckseite vor.
- Schalten Sie den Verflüssigungssatz ein. Der Verflüssigungssatz muss sofort anlaufen. Falls der Verdichter nicht anläuft, überprüfen Sie die Verdrahtung und die Spannung an den Klemmen.
- Ob sich ein 3-Phasen-Verdichter in die Gegenrichtung dreht, lässt sich an folgenden Phänomenen erkennen: Der Verdichter baut keinen Druck auf. Der Verdichter arbeitet mit einem ungewöhnlichen hohen Geräuschpegel. Die Leistungsaufnahme des Verdichters ist ungewöhnlich gering. P05-Typen sind mit einem Phasenfolgerelais ausgestattet. Das bedeutet, der Verdichter läuft bei falscher Phasenfolge nicht an. Bei falscher Drehrichtung des Verdichters muss der Verdichter sofort abgeschaltet werden, um die Leitungsphasen an die korrekten Klemmen anzuschließen.
- Bei korrekter Drehrichtung ist an der Niederdruckanzeige bzw. am Niederdruckmanometer ein sinkender Druck abzulesen – und an der Hochdruckanzeige bzw. am Hochdruckmanometer ein steigender Druck.

## 13. Überprüfung bei laufendem Verflüssigungssatz

- Überprüfen Sie die Drehrichtung des Lüfters. Die Luft muss vom Verflüssiger zum Lüfter strömen.
- Überprüfen Sie Stromaufnahme und Spannung.
- Überprüfen Sie die Überhitzung der Saugleitung, um das Risiko von Flüssigkeitsschlägen zu vermindern.
- Sofern ein Schauglas vorhanden ist, beobachten Sie den Ölstand beim Anlaufen und während des Betriebs, um sicherzustellen, dass der Ölstand sichtbar bleibt.
- Beachten Sie die Betriebsgrenzen.
- Überprüfen Sie alle Leitungen auf übermäßige Vibrationen. Bewegungen von mehr als 1,5 mm erfordern Korrekturmaßnahmen wie z. B. die Verwendung von Rohrhalterungen.
- Ggf. kann auf der Niederdruckseite in größtmöglichem Abstand zum Verdichter flüssiges Kältemittel nachgefüllt werden. Während dieses Nachfüllvorgangs muss der Verdichter in Betrieb sein.
- Für Modelle der Version P02 (OP-xxxxxxxxP02E):
- Überprüfen sie dass im Schauglas in der Flüssigkeitsleitung keine Luftblasen auftreten für eine ordnungsgemäße Flüssigkeitseinspritzung.
- Wenn Reglerparameter o30 auf 19 = R404A oder 40 = R448A oder 41 = R449A eingestellt ist und die Druckgastemperatur U26 mehr als 125°C zeigt, überprüfen sie ob der Economizer Anschluss gekühlt wird und die Flüssigkeitseinspritzung eingeschaltet ist.
- Überfüllen Sie die Anlage nicht.
- Beachten Sie die in Ihrem Land geltenden Vorschriften zum Recycling des Kältemittels aus dem Gerät.
- Lassen Sie niemals Kältemittel in die Atmosphäre entweichen.
- Führen Sie eine allgemeine Inspektion der Installation hinsichtlich Sauberkeit, Geräuschpegel und Lecks durch, bevor Sie den Installationsort verlassen.
- Dokumentieren Sie die Art und Menge des Kältemittels sowie die Betriebsbedingungen als Referenz für künftige Inspektionen.

## 14. Notbetrieb ohne Regler

Bei Ausfall des Reglers kann der Verflüssigungssatz weiter betrieben werden, sofern die Standardverdrahtung (Bild 4) des Reglers wie unten beschrieben modifiziert und in eine vorübergehende Verdrahtung geändert wird.

| | |
|---|---|
| ⚠ | Diese Modifikation darf nur von qualifizierten Elektrikern und Personal mit der erforderlichen Sachkunde vorgenommen werden. Hierbei müssen die Vorschriften und Bestimmungen Ihres Landes beachtet werden. |
| | Trennen Sie den Verflüssigungssatz von der Spannungsversorgung (drehen Sie den Notausschalter in die Aus-Position). |

- Der Kontakt des Raumthermostats muss 250 VAC schalten können.
- Entfernen Sie die Ader 22 (Sicherheitseingang DI3) sowie die Ader 24 (Raumthermostat DI1) und verbinden Sie diese Adern mit einer isolierten Klemmenbrücke (250 Vac, 10 mm²).
- Entfernen Sie die Ader 25 (Raumthermostat DI1) und 11 (Spannungsversorgung des Verdichters) und verbinden Sie die beiden Adern mit einer isolierten Klemmenbrücke (250 Vac, 10 mm²).
- Entfernen Sie Ader 6 und verbinden Sie ihn mit der Klemmenbrücke für die Adern 11 und 25. An die Ader 6 kann ein Lüfterdruckschalter bzw. eine Lüfterdrehzahlregelung in Reihe geschaltet, angeschlossen werden.
- Entfernen Sie den Draht 14 (Startregler) und schließen Sie ihn an die Klemme 22 des Verdichterschutzes an.
- Entfernen Sie den Draht 12 (Spannungsversorgung des Startreglers) und verlängern Sie diesen Draht. Verwenden Sie hierzu eine Klemmenbrücke (250 Vac, 10 mm²) und einen braunen Draht (1,0 mm²). Schließen Sie den Draht dann an die Klemme 21 des Verdichterschutzes an.
- Entfernen Sie den großen Klemmenblock von den Reglerklemmen 10 bis 19.
- Schließen Sie den Verflüssigungssatz an die Spannungsversorgung an (schalten Sie den Gerätehauptschalter ein).

## 15. Wartung

| | |
|---|---|
| ⚠ | Schalten Sie die Stromversorgung des Verflüssigungssatzes immer aus, indem Sie den Hauptschalter ausschalten, bevor Sie das Lüfterblech öffnen. |
| | Der in der Anlage herrschende Druck und die Oberflächentemperatur können dauerhafte körperliche Schäden verursachen. Wartungspersonal und Installateure müssen über geeignete persönliche Schutzausrüstung, Fähigkeiten und Werkzeuge verfügen, um die Wartungsarbeiten durchführen zu können. Die Rohrtemperatur kann 100 °C überschreiten und schwere Verbrennungen verursachen. |
| | Stellen Sie sicher, dass regelmäßig Service-Inspektionen gemäß den Vorschriften Ihres Landes durchgeführt werden, um einen zuverlässigen Betrieb der Anlage zu gewährleisten. |

Um systembedingte Probleme zu vermeiden, werden die folgenden regelmäßigen Wartungsarbeiten empfohlen:

- Vergewissern Sie sich, dass die Sicherheitsvorrichtungen funktionstüchtig und ordnungsgemäß eingestellt sind.
- Stellen Sie sicher, dass keine Lecks in der Anlage vorhanden sind.
- Überprüfen Sie die Stromaufnahme des Verdichters.
- Vergewissern Sie sich anhand der Wartungsunterlagen, dass die Anlage entsprechend den bisherigen Werten und Betriebsbedingungen läuft.
- Überprüfen Sie, ob sämtliche elektrischen Anschlüsse noch ordnungsgemäß befestigt sind.
- Sorgen Sie dafür, dass der Verflüssigungssatz sauber ist und bleibt, und vergewissern Sie sich, dass die Bauteile des Verflüssigungssatzes, die Rohre und die elektrischen Anschlüsse frei von Rost und Oxidation sind.

Der Verflüssiger muss mindestens einmal im Jahr auf Verschmutzungen überprüft und ggf. gereinigt werden. An der innenseite des Verflüssigers gelangen Sie über die Lüftertür. Bei Microchannel-Wärmeübertragern lagert sich der Schmutz eher auf als im Verflüssiger. Deshalb sind sie leichter zur reinigen als Lamellenrohrverflüssiger.

- Schalten Sie den Verflüssigungssatz mit dem Hauptschalter aus, bevor Sie die Lüftertür öffnen.
- Entfernen Sie oberflächlichen Schmutz, Blätter, Fasern usw. mit einem Staubsauger mit Bürstenaufsatz bzw. mit einem anderen weichen Aufsatz. Alternativ hierzu können Sie auch Druckluft von innen nach außen durch das Register blasen und mit einer weichen Bürste abbürsten. Verwenden Sie keine Drahtbürste. Stoßen Sie nicht mit dem Rohr oder der Düse des Staubsaugers gegen die Spule und vermeiden Sie Kratzer.
- Drehen Sie vor dem Schließen der Lüfterservicetür das Lüfterblatt in eine sichere Position, um zu vermeiden, dass die Tür gegen das Lüfter stößt.

Falls der Kältemittelkreislauf geöffnet wurde und Anlagenteile ohne Kältemittel sind, muss die Anlage mit trockenem Stickstoff und durch Evakuierung getrocknet werden, um jegliche Feuchtigkeit zu entfernen. Zudem muss ein neuer Filtertrockner eingebaut werden. Wenn eine Evakuierung des Kältemittels nötig sein sollte, muss diese so vorgenommen werden, dass kein Kältemittel in die Umwelt entweicht.

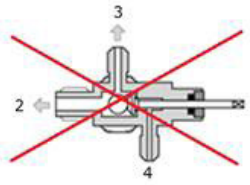



**Abb. A:** vollständig geöffneter Zustand, Anschluss 2 und 3 sind vollständig geöffnet und Anschluss 4 ist vollständig geschlossen

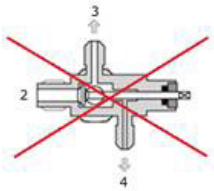



**Abb. B:** vollständig geschlossener Zustand, Anschluss 3 und 4 sind teilweise geöffnet und Anschluss 2 ist vollständig geschlossen

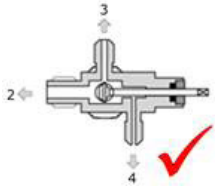



**Abb. C:** teilweise geöffneter Zustand (5,5 Umdrehungen im Uhrzeigersinn vom vollständig geöffneten Zustand. Anschluss 2, 3, 4 ist vollständig geöffnet).

## 16 – Konformitätserklärung

- **PED Druckgeräterichtlinie 2014/68/EU EN 378-2:2016 -** Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 2: Konstruktion, Herstellung, Prüfung, Kennzeichnung und Dokumentation **Niederspannungsrichtlinie 2014/35/EU** EN 60335-1:2012 + A11:2014 - Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke – Teil 1: Allgemeine Anforderungen – für alle oben genannten Verflüssigungssätze

**Ökodesign-Richtlinie 2009/125/EG** zur Schaffung eines Rahmens für die Festlegung von Anforderungen an die umweltgerechte Gestaltung energieverbrauchsrelevanter Produkte.
VERORDNUNG (EU) 2015/1095 zur Durchführung der Richtlinie 2009/125/EG im Hinblick auf die Festlegung von Anforderungen an die umweltgerechte Gestaltung von gewerblichen Kühllagerschränken, Schnellkühlern/-frostern, Verflüssigungssätzen und Prozesskühlern.

- Verflüssigungssatzmessungen erfolgen gemäß der Norm „ EN 13771-2:2017“ – Kältemittel-Verdichter und Verflüssigungssätze für die Kälteanwendung – Leistungsprüfung und Prüfverfahren – Teil 2: Verflüssigungssätze

## 17. Garantie

Zur Geltendmachung eines Garantieanspruchs müssen stets die Typenbezeichnung und Seriennummer des Produkts übermittelt werden.
Unter Umständen erlischt die Produktgarantie in folgenden Fällen:

- Fehlen des Typenschilds.
- Äußere Modifikationen, vor allem durch Bohren, Schweißen, gebrochene Füße und Stoßspuren.
- Öffnung des Verdichters/Rückgabe eines unversiegelten Verdichters.
- Rost, Wasser oder Farbstoff zur Lecksuche im Inneren des Verdichters.
- Verwendung eines von Danfoss nicht zugelassenen Kältemittels oder Schmierstoffes.
- Jegliche Abweichung von den Hinweisen zur Installation, Anwendung oder Wartung.
- Benutzung in mobilen Anwendungen.
- Benutzung in einer explosionsfähigen Atmosphäre.
- Keine Angabe der Typen- oder Seriennummer bei der Geltendmachung des Gewährleistungsanspruchs.

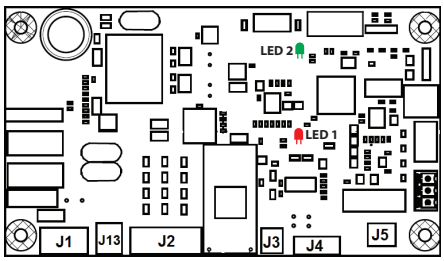
## 18. Entsorgung

Only for Norway

Danfoss empfiehlt die Entsorgung der Verflüssigungssätze und des Öls durch ein entsprechend qualifiziertes Unternehmen am Standort der Anlage.


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Modul B Plus ist eine Elektronikplatine für Typen mit P02-Version zur automatischen Flüssigkeitseinspritzung in Scroll-Verdichter mit elektronischem Expansionsventil.




*Modul B Plus*

Modul B Plus wird vom Berührungsschutz (Bild 6) abgedeckt.

⚠ Entfernen Sie den Berührungsschutz nur dann, wenn dies erforderlich ist. Schalten Sie das Gerät aus, bevor Sie diese Abdeckung entfernen.

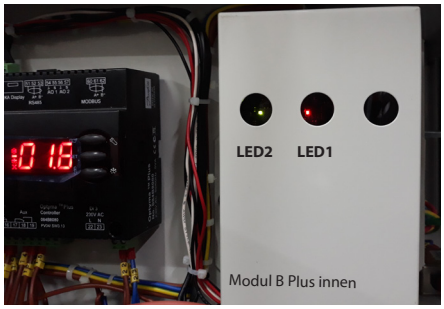



*Bild 6*

**Anwendung**

Modul B Plus regelt die Flüssigkeitseinspritzung und überwacht zudem die folgenden Parameter: Heißgastemperatur, Phasenfolge und Phasenausfall.

**Funktionsbeschreibung**

• Flüssigkeitseinspritzung

- Modul B Plus kann die Heißgastemperatur regeln. Der standardmäßige Einstellungswert ist 125 °C. Dieser ist erforderlich, um den Verflüssigungssatz zuverlässig innerhalb seiner Anwendungsgrenzen zu betreiben.

⚠ Ändern Sie diesen Einstellungswert nicht.

- Sobald der Verdichter stoppt, wird innerhalb von 6 Sekunden das Flüssigkeitseinspritzungsventil geschlossen.

• Heißgastemperatur-Überhitzungsschutz

- Der Heißgastemperaturfühler von Modul B Plus kann die Heißgastemperatur in einem Bereich zwischen -50 und 180 °C bei einer Messtoleranz von ±0,5 °C erfassen. Der Heißgasfühler ist in einem Abstand von 150 mm zum Verdichter-Druckstutzen angebracht.
- Wenn die Heißgastemperatur über dem Hochtemperaturauslösepunkt (Einstellungswert + 10 K) liegt, wird das Alarmrelais (J5) innerhalb von 1 Sekunde geöffnet. Der Status heißt „DGT Überhitzung statisch“ (siehe Tabelle 1). Wenn die Heißgastemperatur 5 Minuten lang durchgehend unter dem Zurücksetzungspunkt (Einstellungswert -15 °C) liegt, wird das Alarmrelais (J5) geschlossen. Dieser 5-Minuten-Verzögerungsstatus heißt „DGT Rücksetzungsverzögerung“.
- Wenn die Heißgastemperatur öfter als 5-mal innerhalb von 1 Stunde den Grenzwert überschreitet, wird das Alarmrelais (J5) im offenen Zustand gesperrt und kann nur zurückgesetzt werden, indem das Netzteil von Modul B Plus manuell zurückgesetzt wird (Einheit aus- und nach einiger Zeit wieder einschalten). Der Status heißt „DGT Überhitzungssperre“ (siehe Fehlerbehebung in Tabelle 1).
- Bei einer Fehlfunktion des Heißgastemperaturfühlers, z. B. „Sensor unterbrochen“, „Sensor-Kurzschluss“ oder „Außerhalb Bereich“, wird das Alarmrelais (J5) ebenfalls im offenen Zustand gesperrt (siehe Fehlerbehebung Tabelle 1).

• Phasenschutz

- Die Funktionen für die Phasenfolge und Erkennung einer fehlenden Phase werden nur beim Einschalten des Verdichters ausgeführt. Wenn ein Phasenfehler vom Typ „Phasenverlust“ oder „Phasenumkehrung“ innerhalb von 4,5 bis 5 Sekunden erfasst wird, wird das Alarmrelais (J5) geöffnet und im offenen Zustand gesperrt. Dieser Sperrstatus kann nur durch manuelles Zurücksetzen des Netzteils von Modul B Plus zurückgesetzt werden (siehe Fehlerbehebung in Tabelle 1).

• Benutzerschnittstelle

- Nach dem Einschalten von Modul B Plus leuchtet LED 1 (Stromversorgung) durchgehend rot. Nach dem Ausschalten von Modul B Plus erlischt LED 1 (Stromversorgung). Nach dem Einschalten von Modul B Plus, leuchtet LED 2 (Status) durchgehend grün, sofern das Modul keine Störung aufweist. Die Anordnung von LED 1 und LED 2 an Modul B Plus sind auf Abbildung 6 zu sehen.
- Wenn Modul B Plus eingeschaltet wird und eine Störung erfasst wird, leuchtet LED 2 (Status) abwechselnd jeweils eine Sekunde lang gelb und rot. Weitere Informationen zum Blinkcode in Tabelle 1.

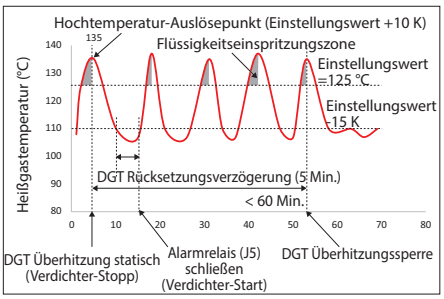
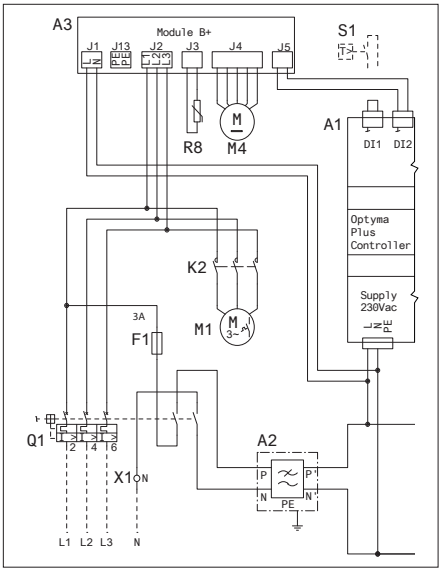



*Bild 7.*

• Modul B Plus Kommunikation mit dem Optyma Plus Regler.

- Wenn Alarmrelais (J5) geöffnet ist, wird das Signal an Digitaleingang 2 (DI2) des Optyma Plus Reglers gesendet, der den Sicherheitsalarm (A97) im Optyma Plus Regler aktiviert, und die Stromversorgung des Verdichters wird sofort unterbrochen.




*Model B Plus Schaltplan*

| Kategorie | Blink-dauer Gelb | Blink-dauer Rot | Fehler | Beschreibung | Maßnahme |
|---|---|---|---|---|---|
| Heißgastem-peratur | 1 | 1 | DGT Hochtemperatur statisch/DGT Rück-setzungsverzögerung | Die Heißgastemperatur ist höher als der Auslösepunkt für den Verdichter-Stopp | Überprüfen Sie, ob der Optyma Regler einen Sicherheitsalarm (A97) ausgibt. Falls ja, warten Sie, bis dieser automatisch behoben ist. Tritt dieser Fehler öfter auf, prüfen Sie, ob das Gerät innerhalb seiner Anwendungsgrenzen betrieben wird. |
| | | 2 | DGT Hochtemperatur-sperre | „DGT Überhitzung statisch“ tritt 5-mal innerhalb 1 Stunde auf | Setzen Sie das Netzteil von Modul B Plus manuell zurück (Einheit ausschalten und nach einiger Zeit wieder einschalten). |
| | | 3 | DGT außerhalb des Bereichs | DGT außerhalb des normalen Bereichs (-50 ... 180 °C) | Überprüfen Sie, ob der Heißgastemperaturfühler ordnungsgemäß an der Druckleitung montiert ist. Überprüfen Sie die Heißgastemperatur unter Optyma Plus Regler-Parameter U27 (sollte sich innerhalb -50 ... 180 °C befinden). |
| | | 4 | DGT Sensorbruch/DGT Sensor-Kurzschluss | Heißgastemperaturfühler gebrochen/Kurzschluss | Überprüfen Sie den Heißgastemperaturfühler und den Anschluss. |
| Dreiphasig | 2 | 1 | Phasenverlust | Verlust einphasiges Signal | Überprüfen Sie am 3-phasigen Netzteil (J2) von Modul B Plus, ob eine der 3 Phasen fehlt. Falls ja, schließen Sie das Netzteil von Modul B Plus richtig an und setzen Sie Modul B Plus manuell zurück (Einheit ausschalten und nach einiger Zeit wieder einschalten). |
| | | 2 | Phasenumkehrung | Falscher Phasenanschluss | Überprüfen Sie am 3-phasigen Netzteil (J2) von Modul B Plus, ob die Reihenfolge der 3 Phasen richtig ist. Falls nicht, schließen Sie das Netzteil von Modul B Plus in der richtigen Phasenreihenfolge an und setzen Sie Modul B Plus manuell zurück (Einheit ausschalten und nach einiger Zeit wieder einschalten). |

*Tabelle 1: Störungs-Blinkcode (LED 2 Gelb-Rot-Blinkcode)*

ENGINEERING
**TOMORROW**

**Instructions (Français)**

# Optyma™ Plus

## OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM

| |
|---|
| **L'installation et l'entretien des groupes de condensation doivent être effectués uniquement par du personnel qualifié. Le montage, la mise en service, l'entretien et la maintenance doivent être effectués conformément aux présentes instructions ainsi qu'aux règles de l'art en matière de réfrigération.** |
| **Ce produit n'est pas soumis à la réglementation britannique PSTI, car il est destiné à être fourni et utilisé uniquement par des professionnels possédant l'expertise et les qualifications nécessaires. Toute mauvaise utilisation ou manipulation incorrecte peut avoir des conséquences involontaires. En achetant ou en utilisant ce produit, vous reconnaissez et acceptez que son application soit réservée à un usage professionnel. Danfoss décline toute responsabilité pour les dommages, blessures ou conséquences négatives (« dommages ») résultant d'une utilisation incorrecte ou inappropriée du produit et vous acceptez d'indemniser Danfoss pour tout dommage résultant de votre utilisation incorrecte ou inappropriée du produit.** |
| Le groupe de condensation doit être utilisé uniquement dans le ou les buts pour lesquels il a été conçu et en respectant sa plage d'utilisation. Réfrigérant à utiliser conformément aux spécifications du modèle. |
| Dans tous les cas, il est impératif de respecter les spécifications de la norme EN 378 et de toute autre réglementation locale en vigueur en matière de sécurité. |
| Le groupe de condensation est livré à une pression d'azote gazeux de 1 bar et ne doit donc pas être raccordé en l'état ; reportez-vous à la section « installation » pour plus de détails. |
| Le groupe de condensation doit être manipulé avec précaution et en position verticale (inclinaison maximale : 15°). |
| **Pour les modèles PED Cat I et II :** La soupape de sécurité doit être montée sur le système de réfrigérant pendant l'installation sur site. Une soupape de sécurité doit être montée sur le réservoir. |

**Normes et directives pertinentes**
**EN 378-2:2016 :** Systèmes de réfrigération et pompes à chaleur – Exigences de sécurité et environnementales
**EN 60335-1 :** Appareils électrodomestiques et analogues – Sécurité – Partie 1 : Exigences générales
**Directive basse tension nº 2014 / 35 / UE**
**Directive Machines nº 2006 / 42 / CE**
**Directive des équipements sous pression (PED) nº 2014/68/UE**
**Directive RoHS 2011/65/UE**
**Directive DEEE 2012/19/EU**
(Autres normes locales applicables)

### 1 – Introduction

Ces instructions concernent les groupes de condensation Optyma™ Plus OP-MPBM, OP-MPXM, OP-MPGM, OP-LPQM et OP-LPOM utilisés pour les systèmes de réfrigération. Elles fournissent les informations nécessaires pour la sécurité et l'utilisation appropriée de ces produits.

Le groupe de condensation comprend les éléments suivants :

- Échangeur de chaleur à microcanaux
- Compresseur à piston ou scroll
- Réservoir avec vanne d'arrêt
- Vannes à boule
- Voyant de liquide
- Pressostats HP/BP
- Udskifteligt tørrefilter
- Contrôleur électronique
- Sectionneur principal (Interrupteur principal avec protection contre les surcharges)
- Ventilateur et condensateurs de compresseurs
- Contacteur du compresseur
- Relais de surveillance de l'alimentation**
- Logement robuste et résistant aux intempéries
- Régulateur d'injection de liquide (Module B Plus)*
- Détendeur électronique (ETS6)*
- Les composants connectés sont équipés d'un port Schrader

**Pour version P02 uniquement,*
***pour les modèles P05 uniquement*

### 2 – Manipulation et stockage

- Il est recommandé de ne pas ouvrir l'emballage avant d'avoir positionné le groupe à son emplacement d'installation
- Manipulez le groupe avec soin. L'emballage permet l'utilisation d'un chariot élévateur ou d'un transpalette. Utilisez un équipement de levage approprié et sûr.
- Stockez et transportez le groupe en position verticale.
- Stockez le groupe à une température comprise entre -35 °C et 50 °C.
- N'exposez pas l'emballage à la pluie ou à une atmosphère corrosive.
- Après le déballage, vérifiez que le groupe est complet et qu'il n'est pas endommagé.

### 3 – Précautions d'installation

| |
|---|
| Ne placez jamais le groupe dans une atmosphère inflammable. |
| Positionnez le groupe de manière à ne pas bloquer ou gêner le passage, les portes, les fenêtres, etc. |
| Soupape de sécurité : Pour les modèles PED de catégorie I et II, la soupape de sécurité doit être montée pendant l'installation sur site. |

- Assurez-vous de laisser un espace adéquat autour du groupe afin de permettre la circulation de l'air et l'ouverture des portes. Référez-vous à l'illustration 1 pour obtenir les distances minimales à respecter entre le groupe et les murs.
- Évitez d'installer le groupe à un emplacement exposé quotidiennement au rayonnement direct du soleil pendant de longues périodes.
- Évitez d'installer le groupe dans un environnement agressif et poussiéreux.
- Assurez-vous de disposer d'une fondation horizontale (inclinaison inférieure à 3°), suffisamment stable et résistante pour pouvoir supporter l'intégralité du poids du groupe et éliminer les vibrations et les interférences.
- La température ambiante d'utilisation du groupe ne doit pas dépasser 50 °C lors du cycle d'arrêt.
- Assurez-vous que l'alimentation électrique correspond aux caractéristiques du groupe (voir la plaque signalétique).
- Lors de l'installation de groupes pour réfrigérants HFC, utilisez l'équipement spécialement réservé aux réfrigérants HFC n'ayant jamais été utilisé pour des réfrigérants CFC ou HCFC.
- Utilisez des tubes en cuivre/aluminium de qualité frigorifique, propres et déshydratés, et d'épaisseur adaptée ainsi que du matériau de brasage en alliage d'argent.
- Utilisez des composants de système propres et déshydratés.
- La tuyauterie d'aspiration raccordée au compresseur doit être flexible dans les 3 dimensions afin d'amortir les vibrations. En outre, la tuyauterie doit être installée de manière à assurer le retour d'huile du compresseur et à éviter tout risque d'accumulation de liquide dans le compresseur.
- Dans l'Optyma, le groupe de condensation est équipé d'une vanne d'aspiration et de service de liquide avec un port Schrader pour la maintenance sur site

### 3.1 – Soupape de sécurité

| |
|---|
| Pour les groupes de condensation Optyma™ Plus PED catégorie I et II, la soupe de sécurité doit être montée (voir les caractéristiques techniques de la catégorie PED à l'annexe A). |
| PRV est fourni en tant que pièce de rechange. Reportez-vous à Coolselector2 |

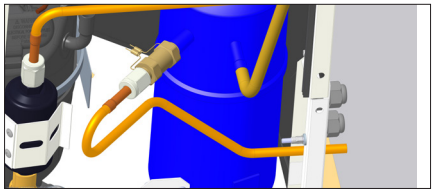
- Soupape de sécurité à monter sur le réservoir de liquide avec raccord NPT 3/8". (Voir Coolselector2


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pour le code de pièce de rechange de la soupape de sécurité). Utilisez Locatite 554 pour l'installation de la soupape de sécurité.
- Couple de serrage : 40Nm (ne pas dépasser le couple indiqué)



- L'installateur doit veiller à savoir vers où disperser les fuites de réfrigérant. Danfoss recommande de les disperser à l'opposé du groupe de condensation.
- Il est recommandé de changer la soupape de sécurité après le refoulement lors du changement de réfrigérant
- Les soupapes doivent être installées verticalement ou horizontalement, mais assurez-vous que la soupape de sécurité est installée au-dessus du niveau de liquide du système.
- Assurez-vous que le réfrigérant est libéré directement dans l'atmosphère en toute sécurité.
- En cas de danger, un kit de rechange supplémentaire a été conçu pour récupérer le réfrigérant libéré. Le kit doit être installé avec une tuyauterie adéquate pour le refoulement du réfrigérant en toute sécurité. (Voir l'illustration ci-dessous)



- La soupape de sécurité ne doit pas être installée sur la vanne de service.
- Remplacez la soupape de sécurité après nettoyage ou démontage du système.
- Aucun joint et aucune vanne amovibles ne doivent être accessibles au public. Tous les joints de brasage doivent être conformes à la norme EN 14276-2 et les autres joints permanents à la norme EN 16084.

## 4 – Installation

- L'installation dans laquelle le groupe de condensation est mis en place doit être conforme à la Directive des Equipements sous Pression (PED) 2014/68/UE. Le groupe de condensation en lui-même ne constitue pas un « groupe » au sens de cette directive.
- Il est recommandé d'installer le groupe sur des silent blocs ou des amortisseurs de vibrations (non fournis).
- Il est possible de superposer les groupes les uns sur les autres.

| Groupe | Superposition maximum |
|---|---|
| Logement 1 (Code n ° 114X31-- ou 114X41--) | 3 |
| Logement 2 (Code n ° 114X32-- ou 114X42--) | 2 |
| Logement 3 (Code n ° 114X33-- ou 114X43--) | 2 |
| Logement 4 (Code n ° 114X34-- ou 114X44--) | 2 |

- En cas de montage superposé, le groupe situé au sommet doit être fixé au mur, tel indiqué à l'illustration 2.
- Libérez lentement l'azote sous charge d'attente, par l'orifice schrader.
- Raccordez le groupe au système dès que possible pour éviter toute contamination de l'huile par l'humidité ambiante.
- Évitez toute entrée de matériau dans le système lors de la coupe des tubes. Ne percez jamais d'orifices à des emplacements où les ébarbures ne peuvent être éliminées.
- Brasez très soigneusement, en utilisant les techniques les plus récentes et pointues, et dégazez les tuyauteries au moyen d'un flux d'azote gazeux.
- Connectez les dispositifs de sécurité et de contrôle requis. En cas d'utilisation de l'orifice schrader à cet effet, retirez la valve interne.
- Il est recommandé d'isoler le tube d'aspiration jusqu'à l'entrée du compresseur avec une isolation de 19 mm d'épaisseur.
- Le matériau des tuyaux en cuivre doit être conforme à la norme EN12735-1. Et tous les joints de tuyaux doivent être conformes à la norme EN14276-2
- Lors de l'installation sur le terrain, ajoutez du support en fonction de la taille et du poids. Espacement maximum recommandé pour le support de tuyau conformément aux normes EN12735-1 et EN12735-2
- Les tuyaux doivent être raccordés avant d'ouvrir les vannes pour permettre au réfrigérant de circuler entre les pièces du système de réfrigération.

## 5 – Détection des fuites

| | |
|---|---|
| ⚠ | Ne mettez jamais le circuit sous pression avec de l'oxygène ou de l'air sec. Ceci pourrait provoquer un incendie ou une explosion. |

- N'utilisez pas de traceur pour la détection de fuites.
- Effectuez un test de détection de fuites sur le système complet.
- La pression de test maximum est de 31*) bar.
- Si vous détectez une fuite, réparez-la et répétez la détection de fuites.

*) *25 bar pour les modèles OP-..... AJ.... & OP-.... FH....*

## 6 – Déshydratation sous vide

- N'utilisez jamais le compresseur pour faire le vide dans le système.
- Raccordez une pompe à vide aux côtés BP et HP.
- Faites le vide dans le système, à une pression absolue de 500 µm Hg (0,67 mbar).
- N'utilisez pas de mégohmmètre et ne mettez pas le compresseur sous tension lorsqu'il se trouve sous vide, car cela peut entraîner des dommages internes.

## 7 – Raccordements électriques

- Coupez et isolez l'alimentation électrique secteur.
- Assurez-vous qu'il est impossible de mettre l'alimentation sous tension lors de l'installation.
- Tous les composants électriques doivent être sélectionnés conformément aux normes locales et aux exigences du groupe.
- Référez-vous au schéma de raccordement électrique pour plus de détails.
- Assurez-vous que l'alimentation électrique correspond aux caractéristiques du groupe et qu'elle est stable (tension nominale ± 10 % et fréquence nominale ± 2,5 Hz)
- Dimensionnez les câbles de l'alimentation conformément aux données du groupe relatives à la tension et au courant.
- Protégez l'alimentation et assurez-vous de sa bonne mise à la terre.
- Assurez-vous que l'alimentation est conforme aux normes locales et aux exigences légales.
- Le groupe est équipé d'un régulateur électronique. Référez-vous au manuel 118U3808 pour plus de détails.
- es modèles version P02 (OP-xxxxxxxxxP02E) sont équipés de cartes électroniques (Module B Plus). Voir section « Mode d'emploi Module B Plus » de ce manuel.
- Le groupe est équipé d'un sectionneur principal avec protection contre les surcharges. La protection contre les surcharges est préréglée en usine. Il est toutefois recommandé de vérifier la valeur avant de mettre le groupe en marche. La valeur de la protection contre les surcharges peut être trouvée à l'aide du schéma de raccordement situé sur la porte avant du groupe.
- Le groupe est équipé de pressostats HP/BP, qui coupent directement l'alimentation du compresseur en cas d'activation. Les paramètres relatifs aux coupures découlant d'une pression trop élevée ou trop basse sont préréglés dans le régulateur et adaptés au compresseur installé dans le groupe.
- Les modèles P05 sont également équipés d'un relais de séquence de phase pour protéger l'unité contre la perte, les défauts d'ordre et l'asymétrie des phases ainsi que la sous-tension ou la surtension.

Pour les groupes équipés d'un compresseur scroll triphasé (OP-MPXMxxxxxxxxE), il est impératif de respecter l'ordre des phases adéquat pour le sens de rotation du compresseur.
- Déterminez l'ordre des phases à l'aide d'un phasemètre, afin d'établir l'ordre des phases des lignes L1, L2 et L3.
- Raccordez les phases des lignes L1, L2 et L3 aux bornes de l'interrupteur principal T1, T2 et T3 respectivement.

## 8 – Sécurité

| | |
|---|---|
| ⚠ | La porte du boîtier électrique doit être en position fermée avant le raccordement à l'alimentation électrique. |
| | La température du tuyau de refoulement peut atteindre 120 °C pendant le fonctionnement du groupe. |
| | Il est recommandé d'installer la soupape de sécurité à l'intérieur du groupe et de libérer les fuites de réfrigérant directement vers l'atmosphère. |

**Le bouchon fusible n'est pas disponible sur l'unité, il est remplacé par le bouchon adaptateur.** L'unité est dotée d'un réservoir de liquide avec un bouchon adaptateur comportant un raccord 3/8" NPT. L'installateur/utilisateur final peut choisir différentes options comme indiqué dans la norme EN378-2 : 2016 Article § 6.2.2.3
- L'unité/installation dans laquelle le groupe de condensation est monté/intégré doit être conforme à la directive PED.
- Attention aux composants extrêmement froids et chauds.
- Attention aux composants mobiles. L'alimentation électrique doit être déconnectée pendant l'entretien.
- Le compresseur est équipé d'un protecteur interne contre la surcharge (OLP). Celui-ci empêche la pression du compresseur d'excéder 32 bar.
- Aucune soupape et aucun joint amovible ne doivent être situés dans des zones accessibles au public, sauf lorsqu'ils sont conformes à la norme EN 16084

- La tuyauterie de réfrigérant doit être protégée ou fermée pour éviter tout dommage.
- La tuyauterie de terrain doit être installée de manière à ne pas être exposée à un environnement corrosif ou salin afin d'éviter toute corrosion dans la tuyauterie en cuivre/aluminium.
- En cas d'incendie, l'augmentation de la température au niveau du réservoir fait monter la pression. Il est donc très important d'installer une soupape de sécurité.

## 9 – Charge du système

- Ne démarrez jamais le compresseur lorsqu'il se trouve sous vide. Maintenez le compresseur hors tension.
- Utilisez uniquement un réfrigérant pour lequel le groupe est conçu.
- Chargez le réfrigérant en phase liquide dans le condenseur ou le réservoir de liquide. Laissez le système se charger lentement jusqu'à 4 à 5 bars pour le réfrigérant R404A/ R448A/R449A/R407A/ R407F/R452A et jusqu'à environ 2 bars pour le réfrigérant R134a, R513A.
- La charge restante est effectuée une fois que l'installation a atteint des conditions de fonctionnement nominales stables.
- Ne laissez jamais le cylindre de remplissage connecté au circuit.
- Vannes d'aspiration, vannes de liquides et vannes Rotolock du réservoir en tant que port Schrader pour les opérations de service telles que le chargement de gaz et la mesure de pression.

## 10 – Réglage du régulateur électronique

| | |
|---|---|
| ⚠ | Modifiez le paramètre du régulateur o37 sur 1 en cas de mise à niveau du SPPR (relais de surveillance de l'alimentation). Si vous ajoutez l'option SPPR pour protéger le compresseur, veuillez modifier le réglage o37 de 0 à 1. |
| | Pour les modèles version P02 (OP-xxxxxxxxxP02E), si la valeur o30 est 19= R404A ou 40=R448A ou 41=R449A dans le régulateur. |

- Le groupe est équipé d'un contrôleur électronique programmé en usine contenant des paramètres destinés à être utilisés avec le groupe. Référez-vous au manuel 118U3808 pour plus de détails.
- Par défaut, l'affichage du contrôleur électronique affiche la valeur de la température pour la pression d'aspiration, exprimée en degrés Celsius. Pour afficher la valeur de la température pour la pression de condensation, appuyez sur le bouton inférieur (illustration 3).

Den elektroniske regulator er fabriksindstillet til R404A, R449A, R452A eller R134a, afhængigt af den monterede kompressormodel og applikation (se bilag i installationsmanualen til Optyma-regulatoren). Si un réfrigérant différent est utilisé, le réglage du réfrigérant doit être modifié en conséquence. Le paramètre r12 doit être, au préalable, réglé sur 0 (interrupteur principale du logiciel = off).

- Appuyez sur le bouton supérieur pendant quelques secondes. La colonne contenant les paramètres s'affiche.
- Utilisez les boutons supérieur et inférieur pour trouver le paramètre o30.
- Appuyez sur le bouton du milieu jusqu'à ce que la valeur de ce paramètre s'affiche.
- Utilisez les boutons supérieur et inférieur pour définir la nouvelle valeur : 2 = R22, 3 = R134a, 13 = R513A, 17 = R507, 19 = R404A, 20 = R407C , 21 = R407A, 37 = R407F, 40 = R448A, 41 = R449A, 42 = R452A.
- Appuyez sur le bouton du milieu pour confirmer la valeur sélectionnée.
- Appuyez sur le bouton du haut ou du bas pour trouver le paramètre r84 (r84 = Température de refoulement maximum admissible).
- Appuyez sur le bouton central. La température de refoulement maximum par défaut est de 125 °C.
- Si le client souhaite augmenter la valeur de la vanne, appuyez sur le bouton supérieur pour sélectionner la nouvelle valeur : 130 °C. Appuyer sur le bouton central pour confirmer la valeur sélectionnée.
- La température de refoulement maximum admissible (r84) ne doit pas dépasser 130 °C

## 11 – Vérification avant mise en service

| | |
|---|---|
| ⚠ | Utilisez des dispositifs tels que des pressostats de sécurité et des soupapes de sécurité mécaniques, conformément aux normes de sécurité et aux réglementations générales et locales applicables. Veillez au bon fonctionnement et au réglage correct de ces dispositifs. |
| | Vérifiez que les réglages des pressostats haute pression et des soupapes de sécurité ne dépassent pas la pression de service maximale de chaque composant du système. |

- Vérifiez que tous les raccordements électriques à l'intérieur du groupe de condensation sont correctement fixés, car ils ont pu se desserrer pendant le transport.
- Lorsqu'il est nécessaire d'utiliser une résistance de carter, le groupe doit être mis sous tension au moins 12 heures avant le premier démarrage mais également avant un démarrage après une mise à l'arrêt prolongée, s'il s'agit d'une résistance de carter de type ceinture.
- Le groupe est équipé d'un sectionneur principal avec protection contre les surcharges. La protection contre les surcharges est préréglée en usine. Il est toutefois recommandé de vérifier la valeur avant de mettre le groupe en marche. La valeur de la protection contre les surcharges peut être trouvée à l'aide du schéma de raccordement situé sur la porte avant du groupe.
- Vérifiez que le capteur de température de refoulement est bien fixé et entre correctement en contact avec le tube de refoulement.
- La chute de pression dans les conduites de liquide et d'aspiration doit être évaluée en fonction de l'emplacement de l'évaporateur et de la distance (voir Coolselector 2).

## 12 – Démarrage

- Ne démarrez jamais le groupe si le réfrigérant n'est pas chargé.
- Toutes les vannes de service doivent être ouvertes.
- La vanne Rotalock du réservoir doit être tournée d'un tour dans le sens de la fermeture pour obtenir la pression de condensation adéquate pour le transmetteur de pression.
- Assurez-vous que l'alimentation est compatible avec le groupe.
- Assurez-vous que la résistance de carter fonctionne.
- Assurez-vous que le ventilateur tourne librement.
- Assurez-vous que la couche protectrice a été retirée de l'arrière du condenseur.
- Équilibrez les pressions HP/BP.
- Alimentez le groupe. Celui-ci doit démarrer rapidement. S'il ne démarre pas, vérifiez la conformité des câblages et de la tension aux bornes.
- Il est possible de déterminer si le sens de rotation d'un compresseur Scroll est inversé. Si c'est le cas, les phénomènes suivants sont observés : la pression du compresseur n'augmente pas, le compresseur génère un niveau de bruit anormalement élevé et sa consommation électrique est anormalement basse. Les modèles P05 sont équipés d'un relais d'inversion de phase. Le compresseur ne démarre pas et n'augmente pas la pression en cas de séquences de phase incorrectes. Dans ce cas, arrêtez immédiatement le groupe et raccordez les phases aux bornes appropriées.
- Si le sens de rotation est correct, l'indicateur de pression basse du contrôleur (ou manomètre de pression basse) doit indiquer une baisse de la pression et l'indicateur de pression haute (ou manomètre de pression haute) doit indiquer une augmentation de la pression.

## 13 – Vérifications en cours de fonctionnement

- Vérifier le sens de rotation du ventilateur. L'air doit circuler depuis le condenseur vers le ventilateur.
- Vérifiez l'appel de courant et la tension.
- Vérifiez la surchauffe de l'aspiration pour réduire le risque de coups de liquide.
- Si un voyant de niveau d'huile est présent, vérifiez le niveau d'huile au démarrage et pendant le fonctionnement afin vous assurer que le niveau d'huile reste bien visible.
- Respectez les limites de fonctionnement.
- Vérifiez l'absence de vibrations anormales au niveau de tous les tubes. En cas de mouvements dépassant 1,5 mm, vous devez prendre des mesures correctives telles que l'installation de supports de tubes.
- Si nécessaire, vous pouvez ajouter du réfrigérant supplémentaire en phase liquide, côté basse pression, aussi loin que possible du compresseur. Le compresseur doit fonctionner pendant cette opération.
- Pour les modèles version P02 (OP-xxxxxxxxx P02E):
  - Vérifiez le voyant liquide et assurez-vous que la ligne liquide est exempte de bulles pour une injection de liquide correcte.
  - Lorsque, dans le régulateur, o30 est réglé à 19= R404A ou 40=R448A ou 41=R449A et U26 > 125 s'affiche, vérifiez et assurez-vous que l'injection de liquide est ON. Le tuyau d'entrée de l'économiseur devrait être froid.
- Ne surchargez pas le système.
- Se conformer aux règlements locaux pour la restauration du réfrigérant de l'unité.
- Ne libérez jamais de réfrigérant dans l'atmosphère.
- Avant de quitter le site d'installation, effectuez une inspection générale de l'installation en termes de propreté, de niveau sonore et de détection des fuites.
- Notez le type et la quantité de charge de réfrigérant, ainsi que les conditions de fonctionnement, comme référence pour les inspections ultérieures.

## 14 – Fonctionnement sans contrôleur

En cas de défaillance du contrôleur, le groupe de condensation peut continuer à fonctionner en modifiant le câblage normal du contrôleur (illustration 4) en câblage temporaire (illustration 5) selon la procédure ci-dessous.

| | |
|---|---|
| ⚠ | Cette modification ne peut être effectuée que par un électricien autorisé. Cette opération doit être effectuée dans le respect de la réglementation locale en vigueur. |
| | Déconnectez l'alimentation du groupe de condensation (coupez le sectionneur principal). |

- Le contact du thermostat d'ambiance doit pouvoir basculer en mode 250 Vca.
- Retirez le fil 22 (entrée de sécurité DI3) et le fil 24 (thermostat d'ambiance DI1) et raccordez-les à l'aide d'un raccord de borne isolé de 10 mm² pour 250 Vca.


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- Retirez le fil 25 (thermostat d'ambiance DI1), et le fil 11 (alimentation du compresseur) et raccordez-les à l'aide d'un raccord de borne isolé de 10 mm² pour 250 Vca.
- Retirez le fil 6 et raccordez-le à l'aide d'un raccord de borne pour fils 11 et 25. Il est possible de raccorder en série un pressostat ou un régulateur de vitesse pour le ventilateur sur le fil 6.
- Retirez le fil 14 (résistance de carter) et raccordez-le à la borne 22 du contacteur du compresseur.
- Retirez le fil 12 (alimentation de la résistance de carter), allongez ce fil à l'aide d'un raccord de borne isolé de 10 mm² pour 250 Vca et d'un fil marron, puis connectez-le à la borne 21 du contacteur du compresseur.
- Retirez le grand bornier qui se trouve sur les bornes 10 à 19 du contrôleur.
- Connectez le groupe de condensation à l'alimentation (allumez l'interrupteur matériel principal).

## 15 – Maintenance

| | |
|---|---|
| ⚠ | Toujours arrêter le groupe à l'aide de l'interrupteur principal avant d'ouvrir la porte du ventilateur. |
| | La pression interne et la température en surface sont dangereuses et peuvent causer des blessures irréversibles. Les opérateurs de maintenance et les installateurs doivent posséder les compétences et les outils appropriés. La température de la tuyauterie peut dépasser 100 °C et causer des brûlures graves. |
| | Veillez à effectuer les inspections de service périodiques, tant pour assurer la fiabilité du système que pour respecter les réglementations locales. |

Pour éviter tout problème lié au système, la maintenance périodique suivante est recommandée :

- Vérifiez que les dispositifs de sécurité fonctionnent et sont bien réglés.
- Vérifiez que le système ne présente aucune fuite.
- Vérifiez l'appel de courant du compresseur.
- Confirmez que le système fonctionne conformément aux archives de maintenance antérieure et aux conditions ambiantes.
- Vérifiez que tous les raccordements électriques restent bien serrés.
- Préservez la propreté du groupe et vérifiez l'absence de rouille et d'oxydation sur les composants du groupe, les tubes et les raccordements électriques.

Le condenseur doit faire l'objet d'au moins une vérification de l'encrassement par an et doit être nettoyé si cela s'avère nécessaire. L'accès à la face interne du condenseur se fait par la porte du ventilateur. La poussière à tendance à se déposer à la surface et non à l'intérieur des échangeurs à microcanaux, ce qui rend ces derniers plus faciles à nettoyer que les échangeurs à tubes ailettes.

- Éteignez le groupe à l'aide de l'interrupteur principal avant d'ouvrir la porte du ventilateur.
- Retirez la poussière, les feuilles, les fibres, etc. qui se trouvent à surface à l'aide d'un aspirateur équipé d'une brosse ou de tout autre embout souple. Vous pouvez également souffler de l'air comprimé depuis l'intérieur de l'échangeur et évacuer la saleté à l'aide d'une brosse à poils souples. N'utilisez pas de brosse métallique. Veillez à ne pas endommager ou rayer l'échangeur avec le tube de l'aspirateur ou l'embout du compresseur à air.
- Avant de refermer la porte du ventilateur, placez les hélices du ventilateur dans la position indiquée à l'illustration 6 afin d'éviter tout contact entre la porte et le ventilateur.

Si le système de réfrigération a été ouvert, il doit être nettoyé à l'azote sec afin d'éliminer toute trace d'humidité. En outre, un nouveau filtre déshydrateur doit être installé. S'il s'avère nécessaire d'évacuer le réfrigérant, il ne doit en aucun cas être libéré dans l'environnement.

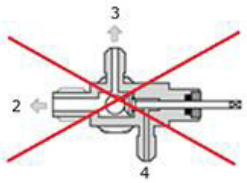



**Fig A:** Condition d'ouverture complète, ports 2 et 3 complètement ouverts et port 4 complètement fermé

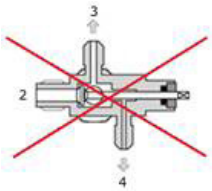



**Fig B:** Condition de fermeture complète, ports 3 et 4 partiellement ouverts et port 2 complètement fermé

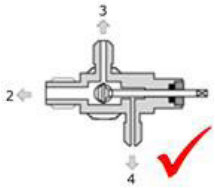



**Fig C:** Condition d'ouverture partielle (5,5 tours dans le sens horaire à partir de la condition d'ouverture complète. Les ports 2, 3, 4 sont complètement ouverts).

## 16 – Déclaration d'incorporation

- **Directive relative aux équipements sous pression 2014/68/UE EN 378-2:2016 -** Systèmes de réfrigération et pompes à chaleur - Exigences de sécurité et environnementales-
Partie 2 : conception, construction,
test, marquage et documentation

**Directive basse tension 2014/35/UE** EN 60335-1:2012 + A11:2014 - Appareils électrodomestiques et analogues - Sécurité - Partie 1 : Exigences générales - pour tous les groupes de condensation mentionnés ci-dessus

**DIRECTIVE écoconception 2009/125/CE** établissant un cadre d'exigences en matière d'écoconception applicables aux produits liés à l'énergie.
RÈGLEMENT (UE) 2015/1095 portant application de la directive écoconception 2009/125/CE en ce qui concerne les exigences d'écoconception applicables aux armoires frigorifiques professionnelles, aux cellules de refroidissement et de congélation rapides, aux groupes de condensation et aux refroidisseurs industriels.

- Les mesures des groupes de condensation
sont effectuées conformément à la norme « EN 13771-2:2017» – Compresseurs et unités de condensation pour la réfrigération - Tests de performances et méthodes d'essai - Partie 2 : Groupes de condensation

## 17 - Garantie

En cas de réclamation relative au produit, signalez toujours le numéro de modèle et le numéro de série. La garantie du produit peut être nulle dans les cas suivants :

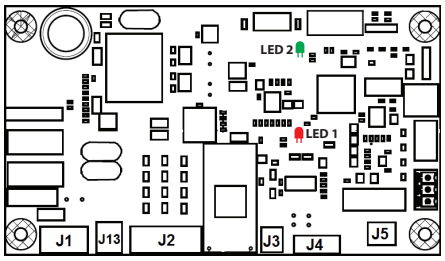
- Absence de plaque signalétique.
- Modifications externes, en particulier perçage, soudage, impacts et pieds endommagés.
- Compresseur ouvert ou retourné non scellé.
- Présence de rouille, d'eau ou de traceur de détection de fuites à l'intérieur du compresseur.
- Utilisation d'un réfrigérant ou d'un lubrifiant non approuvé par Danfoss.
- Tout non-respect des instructions recommandées relatives à l'installation, l'utilisation ou la maintenance.
- Utilisation mobile.
- Utilisation sous atmosphère explosive.
- Absence de numéro de modèle et de série accompagnant la réclamation au titre de la garantie.

## 18 – Mise au rebut

Danfoss recommande que les groupes de condensation et leur huile soient recyclés par une société appropriée, sur le site de celle-ci.

19 - Module B Plus - Mode d'emploi

Le module B plus est une carte électronique utilisée dans les modèles version P02 pour l'injection automatique de liquide dans le compresseur réglée par un détendeur électronique.




*Module B Plus*

Le module B plus est couvert par une protection contre le contact direct comme indiqué sur l'illustration 6.

⚠ N'enlevez pas la protection contre le contact direct sauf en cas de nécessité. Éteignez l'unité avant de retirer la protection.

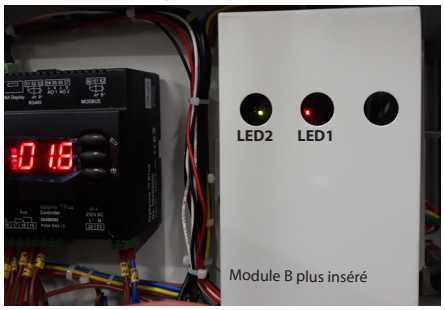



*Illustration 6*

**Application**

Le module B Plus régule l'injection de liquide et il contrôle aussi les paramètres suivants : Température des gaz de refoulement, contrôle de phase et défaillance de phase.

**Description fonctionnelle**

• Injection de liquide

- Le module B Plus peut réguler la température du gaz de refoulement. La valeur de consigne par défaut est de 125 °C, ceci est nécessaire pour faire fonctionner le groupe de condensation dans son enveloppe de fonctionnement.

⚠ Ne modifiez pas cette consigne.

- Lorsque le compresseur s'arrête, la vanne d'injection de liquide se fermera en moins de 6 secondes.

• Protection anti-surchauffe de la température des gaz de refoulement

- Le capteur de température de gaz de refoulement du module B Plus peut détecter la température des gaz de refoulement dans un intervalle allant de -50 à 180 °C, avec une précision de ±0,5 °C. Le capteur de refoulement est installé à moins de 150 mm du port de refoulement du compresseur.
- Si la température des gaz de refoulement est supérieure au point de déclenchement de surchauffe (consigne + 10 K), le relais d'alarme (J5) va s'ouvrir en moins de 1 seconde. Cet état est nommé Surchauffe TGR d'après le tableau 1. Si la température des gaz de refoulement est inférieure au point de réinitialisation (consigne -15 °C) continuellement pendant 5 minutes, le relais d'alarme (J5) va se fermer. Ce délai de 5 minutes est nommé Délai réinitialisation TGR.
- Si plus de 5 surchauffes de température des gaz de refoulement se produisent en 1 heure, le relais d'alarme (J5) se verrouille dans l'état ouvert et ne peut être réinitialisé qu'en réinitialisant manuellement l'alimentation électrique du Module B Plus (éteignez l'unité puis rallumez-la après un certain temps). Cet état est nommé Verrouillage surchauffe TGR, voir tableau 1 pour l'identification des erreurs.
- En cas de dysfonctionnement du capteur de température de gaz de refoulement, par exemple Capteur ouvert, Capteur en court-circuit ou Hors plage, le relais d'alarme (J5) se verrouille également dans l'état ouvert, voir tableau 1 pour l'identification des erreurs.

• Protection de phase

- Le contrôle de phase et la détection de phase manquante ne sont accomplies qu'à chaque allumage du compresseur. En cas de détection d'un état de phase défaillant, Perte de Phase ou Inversion de Phase, le relais d'alarme (J5) va s'ouvrir en 4,5 s à 5 s et se verrouiller dans l'état ouvert. Cet état ouvert verrouillé ne peut être réinitialisé qu'en réinitialisant manuellement l'alimentation électrique du Module B Plus, voir tableau 1 pour identification des erreurs.

• Interface utilisateur

- Lors de l'allumage du module B Plus, le voyant d'alimentation LED 1 sera rouge fixe en permanence. Lors de l'extinction du module, le voyant d'alimentation LED 1 sera éteint. Si le module B Plus s'allume et qu'il n'y a pas d'erreur, le voyant d'état LED 2 sera vert fixe. Voir illustration 6 pour l'emplacement des voyants LED 1 et LED 2 sur le module B Plus.
- Lors de l'allumage du module B Plus, si une erreur est détectée, le voyant d'état LED 2 clignotera en jaune et rouge toutes les secondes. Pour plus de détails sur les codes clignotants, voir tableau 1.

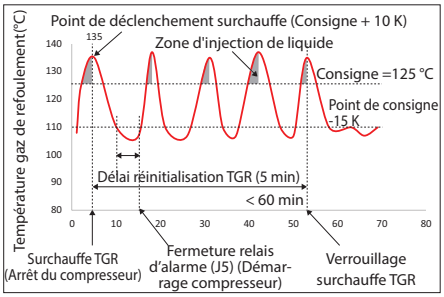



*Illustration 7*

• communication du module B Plus avec le régulateur Optyma Plus Controller.

- Lorsque le relais d'alarme (J5) est ouvert, le signal est communiqué à l'entrée digitale 2 (DI2) du régulateur Optyma, ce qui déclenche l'alarme de sécurité (A97) dans le régulateur Optyma Plus Controller et interrompra immédiatement l'alimentation électrique du compresseur.

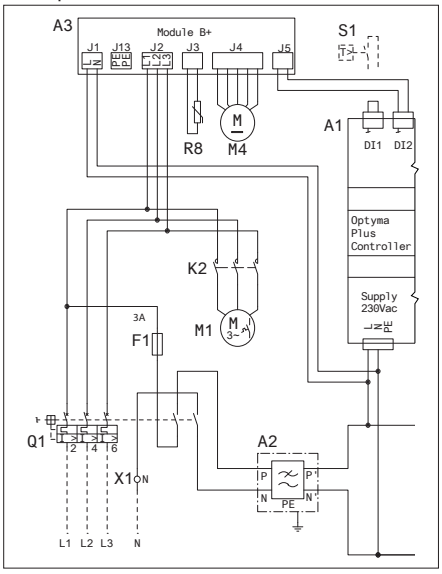



*Schéma de câblage modèle B Plus*

| Catégorie | Nombre de clignotements jaunes | Nombre de clignotements rouges | Erreur | Description | Action |
|---|---|---|---|---|---|
| Température des gaz de refoulement | 1 | 1 | Surchauffe TGR/ Délai réinitialisation TGR | La température des gaz de refoulement est supérieure au point de déclenchement de l'arrêt du compresseur | Vérifiez si le Contrôleur Optyma affiche l'alarme de sécurité (A97). Si oui, attendez jusqu'à résolution automatique. Si cette erreur se produit fréquemment, vérifiez que l'unité fonctionne dans ses paramètres recommandés. |
| | | 2 | Verrouillage surchauffe TGR | La surchauffe TGR se produit 5 fois en moins de 1 heure | Réinitialisez manuellement l'alimentation du module B Plus (éteignez l'unité et rallumez-la après avoir attendu un certain temps). |
| | | 3 | TGR hors plage | TGR hors plage normale (-50... 180 °C) | Vérifiez si le capteur de température des gaz de refoulement est monté correctement sur la conduite de refoulement. Vérifiez la température des gaz de refoulement sur le paramètre U27 du régulateur Optyma Plus Controller (elle devrait se trouver dans une plage de -50... 180 °C). |
| | | 4 | Capteur TGR ouvert/ en court-circuit | Capteur de température des gaz de refoulement ouvert/en court-circuit | Vérifiez le capteur de température de refoulement et le raccordement. |
| Triphasé | 2 | 1 | Perte de phase | Perte de signal sur une phase | Vérifiez que l'alimentation triphasée (J2) du Module B Plus n'a pas de phase manquante. Si oui, raccordez correctement l'alimentation électrique et réinitialisez manuellement le Module B Plus (éteignez l'unité puis rallumez-la après un certain temps). |
| | | 2 | Inversion de phase | Raccordement incorrect des phases | Vérifiez que les 3 phases de l'alimentation triphasée (J2) du Module B Plus sont dans la séquence correcte. Si ce n'est pas le cas, raccordez l'alimentation électrique avec la bonne séquence et réinitialisez manuellement le Module B Plus (éteignez l'unité puis rallumez-la après un certain temps). |

*Tableau 1 : Code clignotement erreur (code clignotement jaune-rouge LED 2)*


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ENGINEERING
**TOMORROW**

**Instrucciones (Español)**

# Optyma™ Plus
## OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM

| |
|---|
| **La instalación y el mantenimiento de la unidad condensadora deben ser llevados a cabo exclusivamente por personal cualificado. Siga estas instrucciones y las adecuadas prácticas de ingeniería de refrigeración, relacionadas con la instalación, puesta en marcha, mantenimiento y servicio técnico.** |
| **Este producto no está sujeto a la normativa PSTI del Reino Unido, ya que está destinado al suministro y uso exclusivo por parte de profesionales con los conocimientos y cualificaciones necesarios. Cualquier uso indebido o manipulación incorrecta puede tener consecuencias no deseadas. Al adquirir o utilizar este producto, usted reconoce y acepta el carácter exclusivamente profesional de su aplicación. Danfoss no asume ninguna responsabilidad por daños, lesiones o consecuencias adversas («daños») derivados del uso incorrecto o inadecuado del producto en cuestión, y usted acepta indemnizar a Danfoss por cualquier daño de este tipo que resulte del uso incorrecto o inadecuado del producto.** |
| Las unidades condensadoras solo deben utilizarse para los fines para los que han sido diseñadas, dentro de su campo de aplicación y siguiendo las instrucciones. El refrigerante debe utilizarse de acuerdo con las especificaciones del modelo. |
| En cualquier circunstancia, deben cumplirse los requisitos establecidos por la norma EN378 y otros reglamentos locales vigentes en materia de seguridad. |
| Esta unidad condensadora se suministra con gas nitrógeno a presión (1 bar) y, por lo tanto, no puede conectarse tal cual; consulte la sección "Instalación" si desea obtener más información. |
| Manipule la unidad condensadora con precaución y en posición vertical (desviación máxima respecto a la vertical: 15°). |
| **Para los modelos de Cat. PED I y II: La válvula de alivio de presión debe montarse en el sistema de refrigerante durante la instalación de campo. La PRV debe montarse en el recipiente.** |

**Normas y directivas relevantes**
**EN 378-2:2016:** Sistemas de refrigeración y bombas de calor: requisitos de seguridad y medioambientales
**EN 60335-1:** Aparatos electrodomésticos y análogos. Seguridad. Parte 1: Requisitos generales
**Directiva de baja tensión n.º 2014/35/UE**
**Directiva de máquinas n.º 2006/42/CE**
**Directiva de Equipos a Presión (PED) n.º 2014/68/UE**
**Directiva RoHS 2011/65/UE**
**Directiva WEEE 2012/19/UE**
(Otras normas locales aplicables)

### 1 – Introducción

Estas instrucciones son válidas para las unidades condensadoras Optyma™ Plus OP-MPBM, OP-MPXM, OP-MPGM, OP-LPQM, OP-LPOM y OP-MPBM utlizadas como parte de un sistema de refrigeración. En ellas encontrará información necesaria acerca de la seguridad y el uso correcto de este producto.

La unidad condensadora incluye los siguientes componentes:
- Intercambiador de calor de microcanales
- Compresor alternativo o *scroll*
- Recipiente con válvula de cierre
- Válvulas de bola
- Visor de líquido
- Presostatos de alta y baja presión
- Filtro secador reemplazable
- Controlador electrónico
- Disyuntor principal (interruptor principal con protección contra sobrecarga)
- Condensadores de ventilador y compresor
- Contactor de compresor
- Relé de control de suministro**
- Carcasa robusta con protección de intemperie
- Controlador de inyección de líquido (Módulo B Plus)*
- Válvula de expansión electrónica (ETS6)*
- Los componentes conectados están equipados con un puerto Schrader

**Solo para la versión P02,*
***solo para los modelos P05*

### 2 – Manipulación y almacenamiento

- No se recomienda abrir el embalaje hasta que la unidad se encuentre en el lugar destinado a su instalación.
- Manipule la unidad con cuidado. El embalaje se puede transportar por medio de una carretilla elevadora o un transpalet. Emplee un equipo de elevación seguro y adecuado.
- Almacene y transporte la unidad en posición vertical.
- Almacene la unidad a temperaturas comprendidas entre -35 °C y 50 °C.
- No exponga el embalaje a la lluvia o a atmósferas de carácter corrosivo.
- Una vez desembalada la unidad, compruebe que se encuentre completa y que no haya sufrido daños.

### 3 – Precauciones relativas a la instalación

| |
|---|
| La unidad no debe permanecer en una atmósfera de carácter inflamable. |
| Coloque la unidad de tal modo que no obstruya ni obstaculice áreas de paso, puertas, ventanas u otros elementos similares. |
| PRV: En el caso de los modelos de Cat. PED I y II , la válvula PRV debe montarse en el campo durante la instalación. |

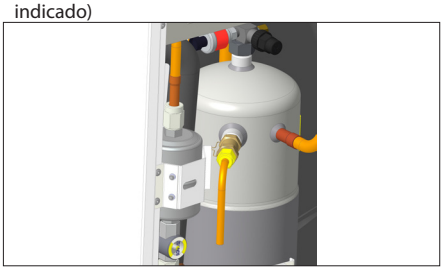
- La unidad debe contar con espacio suficiente a su alrededor para la circulación de aire y la apertura de las compuertas. Consulte la ilustración 1 si desea conocer las distancias mínimas que deben existir entre los laterales de la unidad y las paredes.
- No instale la unidad en lugares en los que pueda sufrir la exposición diaria a la luz solar directa durante periodos de tiempo prolongados.
- No instale la unidad en lugares que presenten ambientes agresivos o con polvo.
- Garantice la existencia de un cimiento con superficie horizontal (y pendiente inferior a 3°), lo suficientemente robusto y estable como para soportar el peso de la unidad completa y amortiguar las vibraciones e interferencias.
- La temperatura ambiente de la unidad no debe superar los 50 °C durante el ciclo de apagado.
- Compruebe que la fuente de alimentación satisfaga los requisitos de la unidad (consulte la placa de características).
- Durante la instalación de unidades aptas para el uso de refrigerantes HFC, emplee un equipo diseñado específicamente para refrigerantes HFC que no haya mantenido contacto con refrigerantes CFC o HCFC.
- Utilice tubos de refrigeración de cobre/aluminio limpios y deshidratados del grosor apropiado y material de soldadura de aleación de plata.
- Use componentes de sistema limpios y secos.
- La tubería de aspiración conectada al compresor debe ser flexible en las 3 dimensiones para amortiguar las vibraciones. Además, la tubería debe disponerse de tal forma que el retorno de aceite hacia el compresor esté garantizado y que se evite el riesgo de que se produzcan golpes de líquido en el compresor.
- En las unidades condensadoras Optyma, las válvulas de aspiración y servicio de líquido cuentan con un puerto Schrader para su uso in situ.

### 3.1 – PRV Válvula

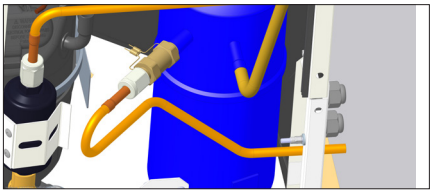
| |
|---|
| En el caso de las unidades condensadoras Optyma™ Plus, que pertenecen a la cat. PED I y II, deberá instalarse una válvula PRV (consulte los datos técnicos para la categoría PED en el Anexo A). |
| PRV se proporciona como pieza de repuesto. Consulte Coolselector2 |

- La válvula PRV debe instalarse en el recipiente de

líquido con una conexión NPT de 3/8". (Consulte Coolselector2 para ver el código de la pieza de repuesto PRV). Utilice Loctite 554 para el montaje de la PRV.
- Par de apriete: 40 Nm (no exceda el par de apriete indicado)



- El instalador debe ocuparse de saber dónde soplar el refrigerante que se ha filtrado. Danfoss recomienda eliminar el refrigerante de la unidad condensadora.
- Se recomienda cambiar la válvula PRV tras la descarga, cuando se cambie el refrigerante.
- Las válvulas deben instalarse en posición vertical u horizontal, pero asegúrese de que la PRV se instale por encima del nivel de líquido del sistema.
- Asegúrese de que el refrigerante se libere de forma segura directamente a la atmósfera.
- En caso de peligro, se ha diseñado un kit de repuesto adicional para recoger el refrigerante liberado. El kit debe instalarse con un tendido de tuberías adecuado para la descarga segura del refrigerante. (Consulte la imagen a continuación)



- La PRV no debe instalarse en la válvula de servicio.
- Sustituya la PRV después de limpiar el sistema o cuando esté desnuda.
- No debe haber juntas desmontables y las válvulas no deben ser accesibles al público. Todas las juntas soldadas deben cumplir con la norma EN 14276-2 y otras juntas permanentes deben cumplir con la norma EN-16084.

## 4 – Instalación

- La instalación de la que forma parte la unidad condensadora debe satisfacer los requisitos establecidos por la Directiva de Equipos a Presión (PED) 2014/68/EU. En el ámbito de dicha directiva, la unidad condensadora no es, en sí, una "unidad".
- Se recomienda instalar la unidad sobre arandelas de goma o amortiguadores de vibraciones (no suministrados).
- Las unidades se pueden apilar unas sobre otras.

| Unidad | Apilamiento máximo |
|---|---|
| Carcasa 1 (N.° de código 114X31-- o 114X41--) | 3 |
| Carcasa 2 (N.° de código 114X32-- o 114X42--) | 2 |
| Carcasa 3 (N.° de código 114X33-- o 114X43--) | 2 |
| Carcasa 4 (N.° de código 114X34-- o 114X44--) | 2 |

- En una pila de unidades, aquella situada más arriba debe fijarse a la pared, tal y como muestra la ilustración 2.
- Libere paulatinamente la carga de nitrógeno a través del puerto Schraeder.
- Conecte la unidad al sistema lo antes posible para evitar que el aceite sufra contaminación como resultado de la humedad ambiental.
- Evite que penetren materiales extraños en el sistema durante el corte de los tubos. No practique orificios en lugares en los que no sea posible eliminar las rebabas.
- Lleve a cabo las soldaduras con cuidado, empleando técnicas modernas; purgue los conductos haciendo circular gas nitrógeno.
- Conecte los dispositivos de seguridad y control necesarios. Retire la válvula interna cuando use el puerto Schraeder a este efecto.
- Se recomienda aislar el conducto de aspiración hasta la entrada del compresor empleando aislante de 19 mm de grosor.
- El material de las tuberías de cobre debe cumplir con la norma EN12735-1. Todas las uniones de tuberías deben cumplir con la norma EN14276-2.
- En la instalación de campo, se puede añadir soporte según el tamaño y el peso. La separación máxima recomendada para el soporte de tuberías deberá ser según las normas EN12735-1 y EN12735-2.
- Las tuberías de conexión deben instalarse antes de abrir las válvulas para permitir que el refrigerante fluya entre las piezas del sistema de refrigeración.

## 5 – Detección de fugas

| | |
|---|---|
| ⚠ | No presurice nunca el circuito con oxígeno o aire seco. Esto podría provocar un incendio o una explosión. |

- No use tintes para la detección de fugas.
- Lleve a cabo una prueba de detección de fugas en el sistema completo.
- La presión máxima de prueba es de 31*) bar.
- Si detecta una fuga, repárela y lleve a cabo una nueva prueba de detección de fugas.

*) *25 bar para modelos OP-.....AJ.... y OP-.....FH....*

## 6 – Deshidratación por vacío

- No use el compresor para vaciar el sistema.
- Conecte una bomba de vacío a los lados LP y HP.
- Vacíe el sistema hasta una presión absoluta de 500 µm Hg (0,67 mbar).
- No use un megohmmetro ni conecte la alimentación al compresor mientras este se encuentre sometido a vacío; podría causar daños internos.

## 7 – Conexiones eléctricas

- Apague el sistema y aísle la fuente de alimentación principal.
- Asegúrese de que no sea posible encender la fuente de alimentación durante la instalación.
- La elección de los componentes eléctricos debe llevarse a cabo de acuerdo con las normas locales y los requisitos de la unidad.
- Consulte el esquema eléctrico si desea obtener información detallada acerca de las conexiones eléctricas.
- Asegúrese de que la fuente de alimentación responda a las características de la unidad y sea estable (tensión nominal ±10 % y frecuencia nominal ±2,5 Hz).
- Las dimensiones de los cables de la fuente de alimentación deben satisfacer los requisitos de la unidad en cuanto a tensión y corriente.
- Proteja la fuente de alimentación y garantice su correcta conexión a tierra.
- La fuente de alimentación debe cumplir las normas locales y los requisitos legales establecidos.
- La unidad está equipada con un controlador electrónico. Consulte el manual 118U3808 si desea obtener más información.
- Los modelos de la versión P02 (OP-xxxxxxxxxP02E) están equipados con placa de circuitos electrónicos (Módulo B Plus). Consulte el apartado «Guía del usuario del módulo B plus» de este manual.
- La unidad está equipada con un interruptor principal con protección contra sobrecarga. La función de protección contra sobrecarga posee una configuración predeterminada de fábrica; no obstante, se recomienda comprobar el valor asignado antes de poner en marcha la unidad. El valor asignado a la función de protección contra sobrecarga se encuentra en el esquema eléctrico situado en la compuerta delantera de la unidad.
- La unidad está equipada con presostatos de alta y baja presión que interrumpen directamente el suministro eléctrico del compresor al activarse. Las presiones de interrupción alta y baja se establecen en el controlador de acuerdo con el compresor instalado en la unidad.
- Los modelos P05 también están equipados con un relé de secuencia de fases como medida de protección contra la pérdida/asimetría/secuencia de fases, así como contra efectos de subtensión y sobretensión.

En unidades con compresor *scroll* trifásico (OP-MPXMxxxxxxxxE), debe prestarse especial atención a la secuencia de fases con objeto de garantizar que la dirección de rotación sea correcta.
- Determine la secuencia de fases empleando un medidor de fase para establecer el orden de las fases de línea L1, L2 y L3.
- Conecte las fases de línea L1, L2 y L3 a los terminales del interruptor principal T1, T2 y T3, respectivamente.

## 8 – Seguridad

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|---|---|
| ⚠ | La puerta de la caja eléctrica debe estar cerrada antes de conectarla a la fuente de alimentación. |
| | La temperatura del tubo de descarga alcanzará los 120 °C durante el funcionamiento de la unidad. |
| | Se recomienda instalar la PRV en el interior de la unidad y la liberación de refrigerante debe dirigirse directamente a la atmósfera. |

El tapón fusible no está disponible de forma individual; se sustituye junto con el conector adaptador.
La unidad cuenta con un colector de líquido con un conector adaptador con una conexión NPT de 3/8". El instalador / usuario final puede seleccionar diferentes opciones, tal como se menciona en la norma EN 378-2: 2016, artículo § 6.2.2.3.
- La unidad/instalación en la que está montada/integrada la unidad condensadora debe satisfacer los requisitos establecidos por la PED.
- Tenga cuidado con los componentes extremadamente calientes y fríos.
- Tenga cuidado con los componentes móviles. La fuente de alimentación se debe desconectar durante las tareas de reparación y mantenimiento.
- El compresor tiene un protector interno contra sobrecargas (OLP). Este protegerá la presión del compresor por encima de los 32 bar.
- No debe haber válvulas ni juntas desmontables en áreas accesibles al público general, excepto cuando cumplan con la norma EN 16084.
- Las tuberías de refrigerante deben estar protegidas o encapsuladas para evitar daños.
- Las tuberías de campo se deben instalar de tal forma que no tengan un entorno corrosivo o salino para, de este modo, evitar la corrosión en las tuberías de cobre/aluminio.
- En caso de incendio, la presión aumentará debido


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al aumento de la temperatura en el recipiente. Por lo tanto, es muy importante instalar la PRV.

### 9– Carga del sistema

- No ponga en marcha el compresor en vacío. Mantenga el compresor apagado.
- Use sólo el refrigerante para el que ha sido diseñada la unidad.
- Cargue el condensador o el recipiente de líquido con refrigerante en fase líquida. Cargue el sistema paulatinamente hasta alcanzar una presión de 4 – 5 bar (para el refrigerante R404A/R448A/R449A/R407A/R407F/R452A) o 2 bar (para el refrigerante R134a, R513A).
- El resto de la carga deberá llevarse a cabo hasta que la instalación haya alcanzado sus niveles nominales y los mantenga con estabilidad durante el funcionamiento.
- No deje la botella de carga conectada al circuito.
- Válvulas de succión, de líquido y Rotolock del recipiente como puerto Schrader para operaciones de servicio como carga de gas, medición de presión.

### 10 – Configuración del controlador electrónico

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|---|---|
| ⚠ | Cambie el parámetro del controlador o37 a 1 en caso de retrofit SPPR (Relé de control de suministro). Si añade la opción SPPR para proteger el compresor, cambie el valor del ajuste o37 de 0 a 1. |
| | Para los modelos de la versión P02 (OP-xxxxxxxxxP02E), si el valor o30 es 19=R404A, 40=R448A o 41=R449A en el controlador. |

- La unidad está equipada con un controlador electrónico programado de fábrica con parámetros aptos para el uso con la unidad real. Consulte el Manual 118U3808 si desea obtener más información.
- De forma predeterminada, el controlador electrónico muestra la temperatura a la presión de aspiración en °C. Pulse el botón inferior para que se muestre la temperatura a la presión de condensación (ilustración 3).

El controlador electrónico viene predeterminado de fábrica para el R404A, R449A, R452A o R134a según el modelo de compresor instalado y la aplicación (consulte el anexo del manual de instalación del controlador Optyma). Cambie la configuración del refrigerante si el refrigerante en uso no coincide con el indicado. El parámetro r12 debe establecerse antes en 0 (interruptor principal software: apagado).

- Mantenga pulsado el botón superior durante un par de segundos. Aparecerá una columna con códigos de parámetros.
- Pulse los botones superior e inferior para buscar el código de parámetro o30.
- Mantenga pulsado el botón central hasta que se muestre el valor de dicho parámetro.
- Pulse los botones superior e inferior para seleccionar un valor nuevo: 2 = R22, 3 = R134a, 36 = R513A, 17 = R-507, 19 = R-404A y 20 = R-407C, 21 = R407A, 37 = R407F, 40 = R448A, 41 = R449A, 42 = R452A.
- Pulse el botón central para confirmar el valor seleccionado.
- Pulse el botón superior o inferior para encontrar el código de parámetro r84. (r84 = Temperatura de descarga máxima permitida).
- Pulse el botón central; la temperatura de descarga máxima predeterminada es de 125 °C.
- Si el cliente desea aumentar la válvula, pulse el botón superior para seleccionar el valor nuevo: 130 C. Pulse el botón central para confirmar el valor seleccionado.
- La temperatura de descarga máxima permitida (r84) no debe superar los 130 °C.

### 11 – Verificación previa a la puesta en servicio

| | |
|---|---|
| ⚠ | Emplee dispositivos de seguridad (como el presostato de seguridad o la válvula mecánica de alivio) que satisfagan los requisitos de las normas de ámbito general y local vigentes, así como las normas de seguridad aplicables. Asegúrese de que los dispositivos funcionen y su ajuste sea correcto. |
| | Compruebe que los niveles de los presostatos de alta presión y las válvulas de alivio no superen la presión de servicio máxima de los componentes del sistema. |

- Compruebe que todas las conexiones eléctricas del interior de la unidad condensadora estén bien fijadas, ya que se podrían haber aflojado durante el transporte.
- Si es preciso el uso de una resistencia de cárter, el equipo deberá mantenerse conectado a la red eléctrica durante, al menos, 12 horas antes de la puesta en marcha inicial o si la puesta en marcha tiene lugar tras un período de inactividad prolongado en el caso de las resistencias de cárter de tipo cinturón.
- La unidad está equipada con un interruptor principal con protección contra sobrecarga. La función de protección contra sobrecarga posee una configuración predeterminada de fábrica; no obstante, se recomienda comprobar el valor asignado antes de poner en marcha la unidad. El valor asignado a la función de protección contra sobrecarga se encuentra en el esquema eléctrico situado en la compuerta delantera de la unidad.
- Compruebe que el sensor de temperatura de descarga esté firme y tenga un buen contacto con la tubería de descarga.
- La caída de presión en las tuberías de la línea de aspiración y de líquido debe evaluarse según la ubicación y la distancia del evaporador (consulte coolselector2).

### 12 – Puesta en marcha

- No ponga en marcha la unidad sin haber cargado antes el refrigerante.
- Todas las válvulas de servicio deben estar en posición de apertura.
- La válvula Rotalock del recipiente debe girarse 1 vuelta en el sentido de cierre para conseguir la presión de condensación adecuada para el transmisor de presión.
- Compruebe que la fuente de alimentación satisfaga las características de la unidad.
- Compruebe que la resistencia del cárter funcione.
- Compruebe que el ventilador pueda girar libremente.
- Compruebe que la lámina protectora haya sido retirada de la cara posterior del condensador.
- Equilibre las presiones de los lados HP y LP.
- Ponga en marcha la unidad. Debe arrancar de inmediato. Si el compresor no arranca, compruebe el estado de los cables y la tensión en los terminales.
- La rotación inversa de un compresor trifásico se puede detectar a partir de los siguientes fenómenos: el compresor no acumula presión, el sistema genera un nivel de ruido anormalmente elevado y el consumo energético resulta anormalmente reducido. Los modelos P05 cuentan con un relé de inversión de fase y el compresor no arranca ni acumula presión si las secuencias de fases son incorrectas. Si se enfrenta a una situación como la anterior, apague la unidad inmediatamente y conecte las fases a los terminales que correspondan.
- Si la dirección de rotación es correcta, el indicador de baja presión del controlador (o el manómetro de baja presión) mostrará un nivel de presión en descenso y el indicador de alta presión (o el manómetro de alta presión) mostrará un nivel de presión en aumento.

### 13 – Comprobaciones con la unidad en funcionamiento

- Compruebe la dirección de rotación del ventilador. El aire debe fluir desde el condensador hacia el ventilador.
- Compruebe el consumo de corriente y la tensión.
- Compruebe el recalentamiento en el lado de aspiración para reducir el riesgo de generación de golpes de líquido.
- Si el sistema cuenta con un visor de líquido, observe el nivel de aceite en el momento del arranque y durante el funcionamiento para confirmar que sea posible consultarlo en todo momento.
- Respete los límites de funcionamiento.
- Compruebe si los tubos sufren alguna vibración anormal. Los movimientos superiores a 1,5 mm exigirán la implantación de medidas correctoras (como la instalación de abrazaderas).
- Si es necesario, es posible agregar refrigerante líquido a través del lado de baja presión (tan lejos del compresor como sea posible). El compresor debe permanecer en funcionamiento durante este proceso.
- Para los modelos de la versión P02 (OP-xxxxxxxxxP02E):
  - Compruebe el visor y asegúrese de que no haya burbujas en la línea de líquido para una correcta inyección de líquido.
  - Si o30 está ajustado a 19=R404A, 40=R448A o 41=R449A y la lectura es U26 > 125 en el controlador, compruebe que la inyección de líquido esté en ON. La tubería de entrada del economizador debería estar fría.
- No sobrecargue el sistema.
- Siga las normativas locales para restaurar el refrigerante de la unidad.
- No libere refrigerante a la atmósfera.
- Antes de abandonar el lugar de instalación, lleve a cabo una inspección general de la misma en cuanto a limpieza, ruido y detección de fugas.
- Anote el tipo y la cantidad de refrigerante cargado, así como las condiciones de funcionamiento, como referencia para la ejecución de futuras inspecciones.

### 14 – Funcionamiento de emergencia sin controlador

Si el controlador se avería, aún será posible poner en marcha la unidad condensadora modificando el cableado estándar del controlador (ilustración 4) y aplicando el cableado temporal (ilustración 5) descrito a continuación.

| | |
|---|---|
| ⚠ | Esta modificación sólo debe ser llevada a cabo por un electricista autorizado. Debe respetarse la legislación nacional a este respecto. |
| | Desconecte la unidad condensadora de la fuente de alimentación (apague el interruptor principal del equipo). |

- Debe ser posible establecer contacto con el termostato ambiente para suministrar 250 VAC.

- Desconecte el cable 22 (entrada de seguridad DI3) y el cable 24 (termostato ambiente DI1), y únalos empleando un puente terminal aislado de 10 mm² y 250 VAC.
- Desconecte el cable 25 (termostato ambiente DI1) y el cable 11 (alimentación del compresor) y únalos empleando un puente terminal aislado de 10 mm² y 250 VAC.
- Desconecte el cable 6 y conéctelo a los cables 11 y 25 empleando un puente terminal. Es posible conectar un presostato de ventilador o un controlador de velocidad de ventilador en serie con el cable 6.
- Desconecte el cable 14 (resistencia del cárter) y conéctelo al terminal 22 del contactor del compresor.
- Desconecte el cable 12 (alimentación de la resistencia del cárter), prolónguelo empleando un puente terminal de 10 mm² y 250 VAC y cable marrón de 1,0 mm², y conéctelo al terminal 21 del contactor del compresor.
- Desconecte de la regleta grande los terminales 10 a 19 del controlador.
- Conecte la unidad condensadora a la fuente de alimentación (encienda el interruptor principal del equipo).

## 15 – Mantenimiento

| | |
|---|---|
| ⚠ | Apague siempre el interruptor principal de la unidad antes de abrir las compuertas del ventilador. |
| | La presión interna y la temperatura de la superficie son peligrosas y pueden ocasionar lesiones permanentes. Los operarios de mantenimiento e instaladores deben contar con las herramientas y los conocimientos adecuados. La temperatura de los tubos puede superar los 100 °C, como resultado de lo cual podrían producirse quemaduras de carácter grave. |
| | Garantice la periodicidad de las inspecciones de servicio para asegurar la fiabilidad del equipo y el cumplimiento de la legislación local. |

Para evitar problemas derivados del sistema, se recomienda llevar a cabo periódicamente las siguientes tareas de mantenimiento:

- Comprobar que los dispositivos de seguridad funcionen y su ajuste sea correcto.
- Garantizar la ausencia de fugas en el sistema.
- Comprobar el consumo de corriente del compresor.
- Confirmar que el sistema funcione de modo coherente con los registros de mantenimiento anteriores y las condiciones ambientales.
- Comprobar que todas las conexiones eléctricas se encuentren correctamente fijadas.
- Mantener limpia la unidad y comprobar la ausencia de óxido y herrumbre en los componentes, los tubos y las conexiones eléctricas.

Al menos una vez al año, debe comprobarse si el condensador sufre alguna obstrucción y ejecutarse una limpieza si se considera necesario. El acceso a la cara interna del condensador se lleva a cabo a través de la compuerta del ventilador. Las baterías de microcanales tienden a acumular más suciedad en su superficie que en su interior, lo cual las hace más fáciles de limpiar que las baterias de tubos y aletas.

- Apague el interruptor principal de la unidad antes de abrir la compuerta del ventilador.
- Elimine la suciedad, las hojas, las fibras, etc. de la superficie empleando un aspirador equipado con un cepillo o algún otro accesorio delicado. También puede inyectar aire comprimido a través de la batería desde dentro hacia fuera y pasar después un cepillo de cerdas suaves. No use cepillos metálicos. No golpee ni raspe la batería con el tubo del aspirador o la boquilla de aire.
- Antes de cerrar la compuerta del ventilador, coloque las aspas en una posición segura para evitar que la compuerta entre en contacto con el ventilador.

Si el sistema refrigerante se ha abierto, deberá lavarse empleando aire seco o nitrógeno para eliminar la humedad e instalarse en él un filtro secador nuevo. Si es necesario vaciarla de refrigerante, la operación deberá llevarse a cabo de tal modo que este no pueda escapar a la atmósfera.

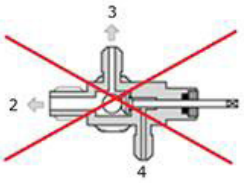



**Fig A:** Estado completamente abierto, los puertos 2 y 3 están completamente abiertos y el puerto 4 está completamente cerrado.

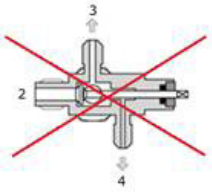



**Fig B:** Estado completamente cerrado, los puertos 3 y 4 están parcialmente abiertos y el puerto 2 está completamente cerrado.

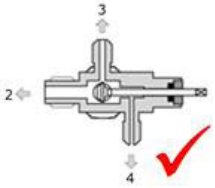



**Fig C:** Estado parcialmente abierto (5,5 vueltas a la derecha desde el estado completamente abierto. Los puertos 2, 3 y 4 están completamente abiertos).

## 16 – Declaración de incorporación

• **Directiva de Equipos a Presión 2014/68/UE EN 378-2:2016** - Sistemas de refrigeración y bombas de calor - Requisitos de seguridad y ambientales, parte 2: Diseño, construcción, ensayos, marcado y documentación

**Directiva de Baja Tensión 2014/35/UE** EN 60335-1:2012 + A11:2014: Seguridad en electrodomésticos y equipos similares, parte 1: Requisitos generales para todas las unidades condensadoras mencionadas anteriormente

**DIRECTIVA sobre Eco-diseño 2009/125/CE** que establece un marco para determinar los requisitos de Eco-diseño para productos relacionados con la energía.

REGULACIÓN (UE) 2015/1095 que implementa la Directiva sobre Eco-diseño 2009/125/CE en relación con los requisitos de Eco-diseño para armarios profesionales de almacenamiento refrigerado, expositores de enfriamiento rápido, unidades condensadoras y enfriadores de proceso.

• Las mediciones de la unidad condensadora se realizan de acuerdo con la norma « EN 13771-2:2017»: Compresores y unidades condensadoras para pruebas de rendimiento de refrigeración y métodos de prueba, parte 2: Unidades condensadoras

## 17 – Garantía

En cualquier reclamación que presente al respecto de este producto, indique siempre el número de modelo y el número de serie.

La garantía del producto puede quedar anulada por los siguientes motivos:

- Ausencia de placa de características.
- Modificaciones externas; en particular, perforaciones, soldaduras, patas rotas y marcas de impactos.
- Apertura del compresor o devolución del mismo sin los precintos correspondientes.
- Presencia de óxido, agua o tinte de detección de fugas en el interior del compresor.
- Uso de un refrigerante o lubricante no autorizado por Danfoss.
- Cualquier divergencia en relación con las instrucciones recomendadas en materia de instalación, aplicación o mantenimiento.
- Uso como parte de aplicaciones móviles.
- Uso en atmósferas explosivas.
- No se ha transmitido el modelo o el número de serie en la reclamación de la garantía.

## 18 – Eliminación

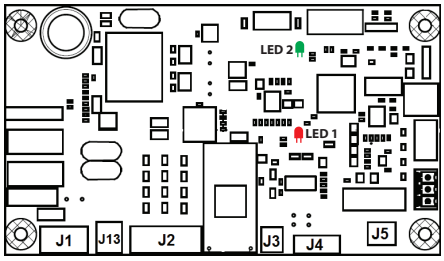
Only for Norway

Danfoss recomienda que la unidad condensadora y el aceite empleado para su funcionamiento sean reciclados por una empresa apta para ello y en sus instalaciones.


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19 - Módulo B plus - Guía del usuario

El módulo B plus es una placa de circuitos electrónicos utilizada en los modelos de la versión P02 para la inyección de líquido automática en compresores scroll con una válvula de expansión electrónica.




*Módulo B plus*

El módulo B plus está equipado con una cubierta de protección táctil según se muestra en la imagen 6.

⚠ No retire la cubierta de protección táctil a menos que sea necesario. Apague la unidad antes de retirar esta cubierta.




*Imagen 6*

**Aplicación**

El módulo B plus controla la inyección de líquido y también monitoriza los siguientes parámetros: temperatura de gas de descarga, secuencia de fase y fallo de fase.

**Descripción funcional**

• Inyección de líquido

- El módulo B plus puede controlar la temperatura del gas de descarga. El punto de ajuste predeterminado es de 125 °C, esto es necesario para utilizar la unidad condensadora en un intervalo seguro.

⚠ No cambie este punto de ajuste.

- Cuando el compresor se detenga, la válvula de inyección de liquido se cerrará pasados 6 segundos.

• Protección frente al sobrecalentamiento de la temperatura del gas de descarga

- El sensor de temperatura del gas de descarga del módulo B plus puede detectar la temperatura del gas de descarga en un rango de entre -50 y 180 °C y con una precisión de la medición de la temperatura de ±0,5 °C. El sensor de descarga está instalado a un máximo de 150 mm del puerto de descarga del compresor.
- Si la temperatura del gas de descarga supera el punto de activación de sobrecalentamiento (punto de ajuste +10 K) en un plazo de 1 segundo, el relé de alarma (J5) se activará. Este estado se llama Sobrecalentamiento estático de la DGT en la tabla 1. Si la temperatura del gas de descarga es inferior al punto de restablecimiento (punto de ajuste -15 °C) de manera continuada durante 5 minutos, el relé de alarma (J5) se cerrará. Este estado de retardo de 5 minutos se llama Retardo de restablecimiento de la DGT.
- Si la temperatura del gas de descarga se sobrecalienta más de 5 veces en 1 hora, el relé de alarma (J5) se bloquea en estado abierto y solo se puede recuperar restableciendo manualmente la fuente de alimentación del módulo B plus (apagando y volviendo a encender la unidad pasado un tiempo). Este estado se llama Bloqueo de sobrecalentamiento de la DGT, consulte la tabla 1 para identificar el error.
- Si se produce un funcionamiento incorrecto en el sensor de temperatura del gas de descarga, p. ej. sensor abierto, cortocircuito del sensor o fuera de rango, el relé de alarma (J5) también se bloquea en estado abierto, consulte la tabla 1 para identificar el error.

• Protección de fase

- La detección de secuencia de fase y de fase ausente solo se lleva a cabo cada vez que se encienda el compresor. Si se detecta un estado de fase incorrecto, como pérdidas de fase o inversión de fase, entre 4,5 s y 5 s, el relé de alarma (J5) se abrirá y se bloqueará en el estado abierto. Este bloqueo de estado abierto solo se puede recuperar restableciendo manualmente la fuente de alimentación del módulo B plus, consulte la tabla 1 para identificar el error.

• Interfaz de usuario

- Cuando el módulo B plus se enciende, el LED 1 de alimentación permanecerá todo el tiempo de color rojo fijo. Cuando el módulo se apague, el LED 1 de alimentación se apagará. Si el módulo B plus se enciende y no tiene errores, el LED 2 de estado estará en verde fijo. Consulte la imagen 6 para conocer la ubicación del LED 1 y del LED 2 en el módulo B plus.
- Si el módulo B plus se enciende y detecta un error, el LED 2 de estado parpadeará en amarillo y rojo alternándose un segundo cada uno. Para conocer los detalles del código de parpadeo, consulte la tabla 1.

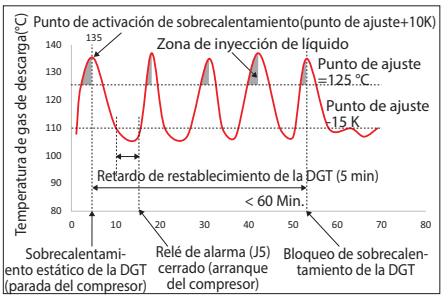
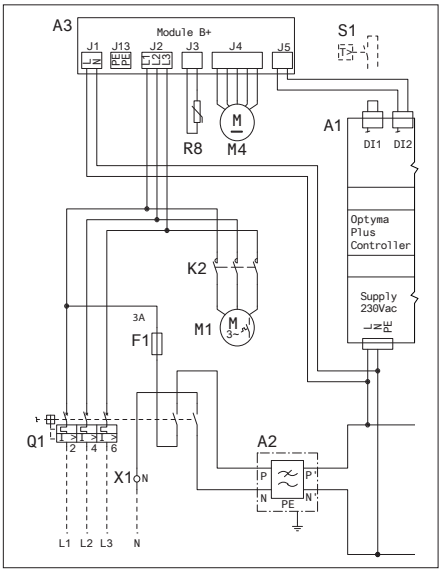



*Imagen 7.*

• Comunicación del módulo B plus con el Optyma Plus Controller.

- Cuando el relé de alarma (J5) está abierto, la señal se comunica a la entrada digital 2 (DI2) del controlador Optyma, que activa la alarma de seguridad (A97) en el Optyma Plus Controller, y la fuente de alimentación del compresor se detiene inmediatamente.




*Esquema eléctrico del módulo B plus*

| Categoría | Tiempos de parpadeos en amarillo | Tiempos de parpadeos en rojo | Error | Descripción | Acción |
|---|---|---|---|---|---|
| Temperatura del gas de descarga | 1 | 1 | Sobrecalentamiento estático de la DGT / Retardo de restablecimiento de la DGT | La temperatura del gas de descarga supera el punto de disparo de parada del compresor | Compruebe que el controlador Optyma muestre la alarma de seguridad (A97). Si es así, espere hasta que se resuelva automáticamente. Si observa este error frecuentemente, compruebe que la unidad está funcionando dentro del rango de trabajo recomendado. |
| | | 2 | Bloqueo de sobrecalentamiento de la DGT | El sobrecalentamiento estático de la DGT se produce 5 veces en 1 hora | Restablezca manualmente la alimentación del módulo B plus (apague la unidad y vuelva a encenderla pasado un tiempo). |
| | | 3 | DGT fuera de rango | La DGT está fuera del rango normal (-50 … 180 °C) | Compruebe que el sensor de temperatura del gas de descarga esté correctamente montado en la línea de descarga. Compruebe la temperatura del gas de descarga en el parámetro U27 del Optyma Plus Controller (este debe encontrarse entre -50 y 180°C). |
| | | 4 | Sensor de la DGT abierto / Sensor de la DGT cortocircuitado | El sensor de temperatura del gas de descarga está abierto/cortocircuitado | Compruebe el sensor de temperatura de descarga y la conexión. |
| Fase triple | 2 | 1 | Pérdidas de fase | Pérdida de señal de una fase | Compruebe en la fuente de alimentación trifásica (J2) al módulo B plus, si falta una de las 3 fases. En ese caso, realice una conexión correcta de la fuente de alimentación y restablezca manualmente el módulo B plus (apague la unidad y vuelva a encenderla pasado un tiempo). |
| | | 2 | Inversión de fase | Conexión de fase incorrecta | Compruebe en la fuente de alimentación trifásica (J2) al módulo B Plus, si las 3 fases están en la secuencia correcta. Si no es así, realice una conexión correcta de la fuente de alimentación en secuencia y restablezca manualmente el módulo B plus (apague la unidad y vuelva a encenderla pasado un tiempo). |

*Tabla 1: Código de parpadeo de errores (código de parpadeo del LED 2 en amarillo-rojo)*

ENGINEERING
**TOMORROW**

**Istruzioni (Italiano)**

# Optyma™ Plus
## OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM

| |
|---|
| **Installazione e manutenzione dell'unità condensatrice devono essere eseguite solo da personale qualificato. Seguire queste istruzioni e le valide procedure dell'ingegneria di refrigerazione relative a installazione, messa in servizio, manutenzione e riparazione.** |
| **Questo prodotto non è soggetto al regolamento PSTI del Regno Unito, in quanto può essere fornito e utilizzato solo da professionisti con le competenze e le qualifiche necessarie. Qualsiasi uso improprio o non corretto può avere conseguenze indesiderate. Acquistando o utilizzando questo prodotto, l'utente riconosce e accetta la natura esclusivamente professionale della sua applicazione. Danfoss non si assume alcuna responsabilità per danni, lesioni o conseguenze negative («danni») derivanti dall'uso scorretto o improprio del prodotto e l'utente accetta di manlevare Danfoss da qualsiasi danno derivante dall'uso scorretto o improprio del prodotto.** |
| L'unità condensatrice deve essere utilizzata solo per lo scopo previsto, nel suo ambito di applicazione e secondo le istruzioni. Refrigerante da utilizzare in base alle specifiche del modello. |
| È necessario rispettare in ogni circostanza i requisiti della norma EN378 o di altre normative di sicurezza locali applicabili. |
| Il compressore viene consegnato pressurizzato con azoto (1 bar) e quindi non può essere allacciato in queste condizioni; vedere la sezione «Installazione» per ulteriori dettagli. |
| Maneggiare l'unità condensatrice con cautela, in posizione verticale (massimo offset rispetto alla verticale: 15°). |
| **Per i modelli di categoria PED I e II:** La valvola limitatrice di pressione deve essere montata nel sistema del refrigerante durante l'installazione sul campo. La valvola PRV deve essere montata sul serbatoio di accumulo. |

**Standard e direttiva pertinenti**
**EN 378-2:2016:** Impianti di refrigerazione e pompe di calore – Requisiti di sicurezza e ambientali
**EN 60335-1:** Elettrodomestici e apparecchi simili – Sicurezza – Parte 1: Requisiti generali
**Direttiva sulla bassa tensione n. 2014/35/UE**
**Direttiva Macchine n. 2006/42 /CE**
**Direttiva Attrezzature a Pressione (PED) n. 2014/68/UE**
**Direttiva RoHS 2011/65/UE**
**Direttiva RAEE 2012/19/UE**
(Altre norme locali applicabili)

### 1 – Introduzione

Queste istruzioni riguardano le unità di condensazione Optyma™ Plus OP-MPBM, OP-MPXM, OP-MPGM, OP-LPQM e OP-LPOM utilizzate negli impianti di refrigerazione. Forniscono le informazioni necessarie in materia di sicurezza e uso corretto di questo prodotto.

L'unità di condensazione include i seguenti componenti:
- Scambiatore di calore a microcanali
- Compressore ermetico a pistoni o scroll
- Ricevitore con valvola di arresto
- Valvole a sfera
- Spia di liquido
- Pressostati - alta e bassa pressione
- Sostituire filtro deidratatore
- Regolatore elettronico
- Interruttore di circuito principale (interruttore con protezione del sovraccarico)
- Consensatore per il motore della ventola e compressore
- Contattore compressore
- Relè di monitoraggio alimentazione**
- Robusto alloggiamento impermeabile
- Regolatore iniezione di liquido (Modulo B Plus)*
- Electronic expansion valve (ETS6)*
- I componenti collegati sono dotati di una porta Schrader

**Solo per versione P02,*
***Solo per modelli P05*

### 2 – Movimentazione e stoccaggio

- Si consiglia di non aprire l'imballaggio prima di aver trasportato l'unità sul posto d'installazione.
- Prestare particolare attenzione quando si movimenta l'unità. L'imballaggio consente l'utilizzo di un carrello elevatore o di un carrello trasportatore. Utilizzare apparecchiature di sollevamento adeguate e sicure.
- Magazzinare e trasportare l'unità in posizione verticale.
- Magazzinare l'unità tra -35 °C e 50 °C.
- Non esporre l'imballaggio a pioggia o ad atmosfere corrosive.
- Dopo il disimballaggio, controllare che l'unità sia completa e priva di danni.

### 3 – Precauzioni per l'installazione

| |
|---|
| Non usare mai l'unità in ambienti infiammabili. |
| Posizionare l'unità in modo che non blocchi o sia di intralcio in zone di transito, davanti a porte, finestre, ecc. |
| PRV: Per i modelli di categoria PED I e II, la valvola PRV deve essere montata sul campo durante l'installazione. |

- Assicurarsi che intorno all'unità vi sia spazio sufficiente per la circolazione dell'aria e l'apertura di porte e finestre. Fare riferimento alla Figura 1 per i valori minimi di distanza dalle pareti.
- Evitare di installare l'unità in luoghi quotidianamente esposti alla luce solare diretta per lunghi periodi.
- Evitare di installare l'unità in ambienti aggressivi e polverosi.
- Assicurarsi che l'unità sia installata su una superficie orizzontale (inclinazione inferiore a 3°), sufficientemente solida e stabile da supportare il peso dell'intera unità, prevenendo vibrazioni e altre interferenze.
- La temperatura ambiente dell'unità non deve superare i 50 °C durante il ciclo di inattività.
- Verificare che l'alimentazione corrisponda alle caratteristiche dell'unità (vedere targhetta).
- Se si installa l'unità per l'uso con refrigeranti HFC, utilizzare attrezzature specifiche per i refrigeranti HFC, che non siano state mai utilizzate per i refrigeranti CFC o HCFC.
- Utilizzare tubi di rame/alluminio puliti e disidratati, con spessore adeguato e materiale per la brasatura in lega d'argento.
- Utilizzare componenti di sistema puliti e deidratati.
- Le tubazioni collegate al compressore devono essere flessibili in tre dimensioni per smorzare le vibrazioni. Il sistema delle tubazioni deve essere inoltre configurato in modo da garantire il ritorno dell'olio per il compressore e da eliminare il rischio di formazione di morchia nel compressore.
- Nell'unità condensatrice Optyma è presente una valvola di aspirazione e di servizio del liquido con porta Schrader per le operazioni di assistenza sul campo

### 3.1 – Valvola PRV

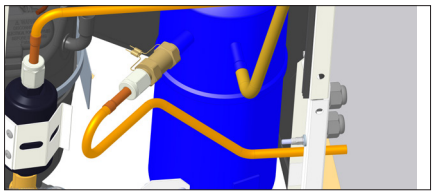
| |
|---|
| Per Optyma™ Plus, le unità condensatrici che rientrano nella categoria PED I e II, è necessario installare la valvola PRV (vedere i Dati tecnici per la categoria PED nell'Allegato A). |
| PRV è fornito come pezzo di ricambio. Fare riferimento a Coolselector2 |


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- La valvola PRV deve essere montata sul serbatoio di accumulo del liquido con attacco 3/8" NPT. (Fare riferimento a Coolselector2 per il codice parte di ricambio PRV). Utilizzare Loctite 554 per l'installazione della valvola PRV.
- Coppia: 40 Nm (non superare la coppia indicata)



- Spetta all'installatore scegliere il punto in cui soffiare via il refrigerante fuoriuscito. Danfoss consiglia di soffiare via il refrigerante dall'unità condensatrice.
- Si consiglia di sostituire la valvola PRV dopo lo scarico, cambiando il refrigerante
- Le valvole devono essere installate verticalmente o orizzontalmente, assicurandosi che la valvola PRV sia montata sopra il livello del liquido del sistema.
- Verificare che il refrigerante venga rilasciato direttamente nell'atmosfera in modo sicuro.
- In caso di pericolo, è stato progettato un kit di ricambio aggiuntivo per raccogliere il refrigerante rilasciato. Installare il kit con un sistema di tubazioni adeguato per scaricare il refrigerante in modo sicuro (vedere l'immagine sottostante).



- La valvola PRV non deve essere installata sulla valvola di servizio.
- Sostituire la valvola PRV dopo la pulizia del sistema o dopo che è stata spenta.
- I giunti e le valvole rimovibili non devono essere accessibili al pubblico. Tutti i giunti brasati devono essere conformi alla norma EN 14276-2, mentre gli altri giunti permanenti devono essere conformi alla norma EN-16084.

## 4 – Installazione

- L'impianto in cui l'unità condensatrice viene installata deve essere conforme alla direttiva sulle apparecchiature a pressione (PED) 2014/68/UE. L'unità di condensazione di per sé non è considerata un'"unità" nel campo di applicazione della direttiva.
- Si consiglia di installare l'apparecchio su gommini antivibrazione o smorzatori di vibrazioni (non forniti).
- È possibile impilare le unità una sull'altra.

| Unità | nr max unità impilate |
|---|---|
| Alloggiamento 1 (Codice n. 114X31-- o 114X41--) | 3 |
| Alloggiamento 2 (Codice n. 114X32-- o 114X42--) | 2 |
| Alloggiamento 3 (Codice n. 114X33-- o 114X43--) | 2 |
| Alloggiamento 4 (Codice n. 114X34-- o 114X44--) | 2 |

- Quando si impilano le unità, quella superiore deve essere fissata a parete, come mostrato alla Figura 2.
- Rilasciare lentamente la carica di azoto attraverso la porta Schrader.
- Collegare l'unità all'impianto il più presto possibile per evitare la contaminazione dell'olio da parte dell'umidità ambientale.
- Prevenire l'ingresso di contaminanti nell'impianto quando si tagliano i tubi. Non praticare mai fori nei punti in cui le bave non possono essere rimosse.
- Brasare con grande attenzione utilizzando le migliori tecniche e sfiatare le tubazioni con il flusso d'azoto.
- Collegare tutti i dispositivi di sicurezza e controllo. Quando la porta Schrader è utilizzata a questo scopo, rimuovere la valvola interna.
- Si raccomanda di isolare il tubo di aspirazione sull'ingresso del compressore con materiale isolante di 19 mm di spessore.
- Il materiale delle tubazioni in rame deve essere conforme alla norma EN12735-1. Tutti i giunti dei tubi devono essere conformi alla norma EN14276-2
- Al momento dell'installazione, viene aggiunto un supporto in base alle dimensioni e al peso. Distanza massima consigliata per il supporto del tubo secondo le norme EN12735-1 ed EN12735-2
- I tubi di collegamento devono essere posizionati prima di aprire le valvole, per consentire al refrigerante di fluire tra le parti del sistema di refrigerazione.

## 5 – Rilevamento di perdite

| | |
|---|---|
| ⚠ | Non pressurizzare mai il circuito con ossigeno o aria secca. Ciò potrebbe causare incendio o esplosione. |

- Non utilizzare coloranti per il rilevamento delle perdite.
- Eseguire un test di tenuta su tutto l'impianto.
- Pressione di test massima: 31*) bar.
- Se si rileva una perdita, riparare la perdita e ripetere il test di tenuta.

*) *25 bar per modelli OP-.....AJ.... e OP-.....FH....*

## 6 - Deidratazione sotto vuoto

- Non usare mai il compressore per svuotare l'impianto.
- Collegare una pompa a vuoto sia sul lato LP sia sul lato HP.
- Svuotare l'impianto in condizioni di vuoto assoluto pari a 500 µm Hg (0,67 mbar).
- Non utilizzare un megaohmetro né ricollegare l'alimentazione elettrica al compressore mentre è sotto vuoto, in quanto ciò può causare danni interni.

## 7 – Collegamenti elettrici

- Scollegare e isolare l'alimentazione di rete.
- Assicurarsi che l'alimentazione elettrica non possa essere ripristinata durante l'installazione.
- Tutti i componenti elettrici devono essere selezionati conformemente alle norme locali e ai requisiti dell'unità.
- Consultare lo schema elettrico per i dettagli relativi ai collegamenti elettrici.
- Assicurarsi che l' alimentazione corrisponda alle caratteristiche dell'unità e che l'alimentazione sia stabile (tensione nominale ± 10% e frequenza nominale ± 2,5 Hz)
- Il dimensionamento dei cavi dell'alimentazione deve essere basato sui dati dell'unità relativi a tensione e corrente.
- Proteggere l'alimentatore e assicurarsi che l'unità sia messa a terra correttamente.
- Effettuare il collegamento all'alimentazione elettrica in base agli standard locali e ai requisiti legali.
- L'unità è dotata di un regolatore elettronico. Consultare il Manuale 118U3808 per dettagli.
- I modelli versione P02 (OP-xxxxxxxxxP02E) sono dotati di scheda elettronica (modulo B Plus). Fare riferimento alla sezione "Guida utente del modulo B Plus" del presente manuale.
- L'unità è dotata di un interruttore principale con protezione da sovraccarico. La protezione da sovraccarico è preimpostata in fabbrica, ma si consiglia di controllare il valore prima di mettere in funzione l'unità. Il valore della protezione da sovraccarico è reperibile nello schema elettrico ubicato sullo sportello anteriore dell'unità.
- L'unità è equipaggiata con pressostati per l'alta e la bassa pressione, i quali interrompono l'alimentazione elettrica al compressore in caso di attivazione. I parametri per l'interruzione dell'alimentazione in caso di attivazione dei pressostati sono preimpostati nel regolatore, adattato al compressore installato nell'unità.
- I modelli P05 sono provvisti anche di relè di sequenza di fase per proteggere l'unità da perdita di fase/sequenza/asimmetria e sotto/sovratensione.

Per unità con un compressore scroll a tre fasi (OP- MPXMxxxxxxxxE ), è necessario osservare la sequenza di fase corretta per la direzione di rotazione del compressore.

- Determinare la sequenza delle fasi utilizzando un misuratore di fase e stabilire l'ordine delle fasi di linea L1, L2 e L3.
- Collegare le fasi linea L1, L2 e L3 ai terminali dell'interruttore principale, rispettivamente T1, T2 e T3.

## 8 – Sicurezza

| | |
|---|---|
| ⚠ | Lo sportello della centralina elettrica deve essere chiuso prima del collegamento all'alimentazione. |
| | La temperatura del tubo di scarico raggiunge i 120 °C durante il funzionamento dell'unità. |
| | Si consiglia di installare la valvola PRV all'interno dell'unità e di rilasciare il refrigerante direttamente nell'atmosfera. |

Sull'unità non è presente un tappo fusibile, sostituito da un tappo adattatore.
Sull'unità è presente un ricevitore liquido con tappo fusibile provvisto di attacco NPT 3/8". L'installatore/utente finale può scegliere tra le diverse opzioni menzionate nella norma EN378-2 : 2016 Articolo § 6.2.2.3

- L'unità/impianto su cui è integrata/montata l'unità condensatrice deve essere conforme alla direttiva sulle apparecchiature a pressione (PED).
- Prestare attenzione ai componenti estremamente caldi o freddi.
- Prestare attenzione ai componenti in movimento. Scollegare l'alimentazione elettrica durante la manutenzione.
- Il compressore è dotato di protezione da sovraccarico interna (OLP). Protegge contro una pressione del compressore che supera i 32 bar.
- Nessuna valvola e nessun giunto smontabile

devono essere posizionati in aree accessibili al pubblico, a meno che non siano conformi alla norma EN 16084
- Le tubazioni del refrigerante devono essere protette o chiuse per evitare danni.
- Le tubazioni sul campo devono essere installate lontano da ambienti corrosivi o salini per evitare la corrosione nelle tubazioni in rame/alluminio.
- In caso di incendio, la pressione aumenta a causa dell'aumento della temperatura nel serbatoio di accumulo. Pertanto, è molto importante installare la valvola PRV.

## 9 – Riempimento dell'impianto

- Non avviare mai il compressore sotto vuoto. Il compressore deve essere spento.
- Utilizzare solo refrigeranti per i quali l'unità è stata progettata.
- Immettere il refrigerante in fase liquida nel condensatore o nel ricevitore di liquido. Assicurare un caricamento lento del sistema, a 4 - 5 bar per l'R404A/ R448A/R449A/R407A/ R407F/R452A e circa 2 bar per l'R134a, R513A.
- Portare a termine la carica solo quando l'impianto ha raggiunto un livello di condizione nominale stabile durante il funzionamento.
- Non lasciare mai il cilindro collegato al circuito in corso di riempimento.
- Valvole di aspirazione, valvole del liquido e valvole Rotolock del serbatoio di accumulo come porta Schrader, per operazioni di servizio quali carica del gas e misurazione della pressione.

## 10 – Impostazione del regolatore elettronico

| | |
|---|---|
| ⚠ | Modificare il parametro o37 del regolatore in 1 in caso di retrofit dell'SPPR (relè di monitoraggio alimentazione). Se si aggiunge l'opzione SPPR per proteggere il compressore, modificare l'impostazione o37 da 0 a 1 |
| | Per i modelli versione P02 (OP-xxxxxxxxxP02E), se il valore o30 è 19 = R404A o 40=R448A o 41=R449A nel regolatore, |

- L' unità è dotata di un regolatore elettronico con parametri di funzionamento pre-impostati. Consultare il Manuale 118U3808 per dettagli.
- Per impostazione predefinita, il display del regolatore elettronico visualizza il valore della temperatura per la pressione di aspirazione in °C. Per visualizzare il valore della temperatura per la pressione di condensazione, premere il pulsante inferiore (Figura 3).

Il regolatore elettronico è preimpostato in fabbrica per R404A o R449A o R452A o R134a a seconda del modello di compressore montato e dell'applicazione (consultare l'allegato contenuto nel Manuale di installazione del regolatore Optyma Controller). Se si utilizza un altro refrigerante, l'impostazione per il refrigerante deve essere modificata. Il parametro r12 deve essere impostato prima su 0 (interruttore principale software = off).
- Premere il pulsante superiore per un paio di secondi. La colonna con i codici di parametro viene visualizzata.
- Premere i pulsanti superiore e inferiore per reperire il codice parametro o30.
- Premere il pulsante centrale fino a quando il valore di questo parametro non viene visualizzato.
- Premere i pulsanti superiore e inferiore per selezionare il nuovo valore: 2 = R22, 3 = R134a, 36 = R513A, 17 = R507, 19 = R404A, 20 = R407C, 21 = R407A, 37 = R407F, 40 = R448A, 41 = R449A, 42 = R452A.
- Premere il pulsante centrale per confermare il valore selezionato.
- Premere il pulsante superiore o inferiore per trovare il codice parametro r84. (r84 = Temperatura di scarico massima ammissibile).
- Premere il pulsante centrale, la temperatura di scarico massima predefinita è 125 °C
- Se il cliente desidera aumentare la temperatura, deve premere il pulsante superiore per selezionare il nuovo valore: 130 °C. Premere il pulsante centrale per confermare il valore selezionato.
- La temperatura di scarico massima ammissibile (r84) non deve superare i 130 °C

## 11 – Verifiche prima della messa in esercizio

| | |
|---|---|
| ⚠ | Utilizzare dispositivi di sicurezza, come un pressostato di sicurezza e una valvola di sicurezza meccanica, conformemente alle norme locali applicabili e agli standard di sicurezza. Assicurarsi che siano funzionanti e correttamente settati. |
| | Verificare che i settaggi dei pressostati alta pressione e delle valvole di sicurezza non superino la pressione massima di esercizio di qualsiasi componente dell'impianto. |

- Verificare che tutti i collegamenti elettrici all'interno dell'unità condensatrice siano correttamente allacciati, poiché potrebbero essersi allentati durante il trasporto.
- Se una resistenza del carter è stata installata, l'unità deve essere messa in tensione almeno 12 ore prima della messa in servizio iniziale e prima dell'avviamento dopo un arresto prolungato nel caso di resistenze carter di tipo a cinghia.
- L'unità è dotata di un interruttore principale con protezione da sovraccarico. La protezione da sovraccarico è preimpostata in fabbrica, ma si consiglia di controllare il valore prima di mettere in funzione l'unità. Il valore di protezione del sovraccarico può essere reperito nello schema elettrico sullo sportello anteriore dell'unità.
- Check if discharge temperature sensor is firm and has proper contact with discharge pipe.
- La caduta di pressione nelle tubazioni della linea di aspirazione e del liquido deve essere valutata in base alla posizione e alla distanza dell'evaporatore (fare riferimento a coolselector2).

## 12 – Avviamento

- Non avviare l'unità priva di carica refrigerante.
- Tutte le valvole di servizio devono essere in posizione aperta.
- La valvola Rotalock sul ricevitore deve essere ruotata di 1 giro nella direzione di chiusura per ottenere la pressione di condensazione corretta per il trasmettitore di pressione.
- Verificare la conformità tra l'unità e l'alimentatore.
- Verificare che la resistenza del carter funzioni.
- Verificare che la ventola ruoti liberamente.
- Verificare che la protezione sia stata rimossa dalla parte posteriore del condensatore.
- Bilanciare la pressione HP/LP.
- Mettere in tensione l'unità. Deve avviarsi immediatamente. Se il compressore non si avvia, controllare la conformità del cablaggio e la tensione sui terminali.
- Una possibile rotazione inversa di un compressore a 3 fasi può essere rilevata se si osserva uno dei seguenti fenomeni: il compressore non è in grado di pressurizzarsi sufficientemente, il livello di rumorosità è eccessivamente elevato e il consumo di energia energetico è eccessivamente basso. I modelli P05 sono provvisti di un relè di inversione di fase; di conseguenza, nel caso di sequenze di fase errate, il compressore non si avvia e non accumula pressione. In tal caso, spegnere immediatamente l'unità e collegare le fasi ai terminali corretti.
- Se il senso di rotazione è corretto, l'indicatore della bassa pressione sul regolatore (o manometro bassa pressione) deve visualizzare un calo di pressione e l'indicatore dell'alta pressione (o un manometro alta pressione) deve indicare una pressione crescente.

## 13 – Controlli dell'unità durante il funzionamento

- Controllare il senso di rotazione della ventola. L'aria deve fluire dal condensatore verso il ventilatore.
- Controllare l'assorbimento di corrente e la tensione.
- Controllare il surriscaldamento di aspirazione per ridurre il rischio di colpi di liquido.
- Se una finestra di livello è presente, osservare il livello dell'olio all'avviamento e durante il funzionamento per confermare che il livello dell'olio rimanga visibile.
- Rispettare i limiti di funzionamento.
- Controllare tutti i tubi per vibrazioni anomale. Movimenti superiori a 1,5 mm richiedono misure correttive, come il montaggio di apposite staffe per i tubi.
- Se necessario, è possibile aggiungere ulteriore refrigerante nella fase liquida sul lato bassa pressione, il più lontano possibile dal compressore. Il compressore deve essere in funzione durante questo processo.
- Per i modelli versione P02 (OP-xxxxxxxxxP02E):
- Controllare la spia di vetro e assicurarsi che non vi siano bolle nella linea del liquido per la corretta iniezione di liquido.
- Quando o30 è impostato a 19= R404A o 40=R448A o 41=R449A e la lettura U26 > 125 nel regolatore, controllare e assicurarsi che l'iniezione di liquido sia ON. Il tubo di aspirazione dell'economizzatore deve essere freddo.
- Non immettere una quantità eccessiva di liquido nell'impianto.
- Seguire le norme locali per ripristinare il refrigerante nell'unità.
- Non rilasciare mai il refrigerante nell'atmosfera.
- Prima di lasciare il luogo di installazione, effettuare un controllo generale dell'installazione in termini di pulizia, rumore e rilevamento delle perdite.
- Annotare il tipo e la quantità della carica del refrigerante e le condizioni di funzionamento come riferimento per future ispezioni.

## 14 – Funzionamento di emergenza senza il regolatore

In caso di guasto del regolatore, l'unità di condensazione può continuare ad essere utilizzata se il cablaggio standard del regolatore (Figura 4) viene modificato in cablaggio temporaneo (Figura 5), come descritto di seguito.

| | |
|---|---|
| ⚠ | Questa modifica può essere effettuata solo da un elettricista autorizzato. È necessario attenersi alle leggi nazionali. |
| | Scollegare l'unità di condensazione dall'alimentazione elettrica (disattivare l'interruttore principale) |


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- Il contatto del termostato ambiente deve essere in grado di commutarsi su 250 V CA.
- Rimuovere il cavo 22 (ingresso di sicurezza DI3) e il cavo 24 (termostato ambiente DI1) e quindi unirli utilizzando una morsettiera isolata di 10 mm² e 250 V CA.
- Rimuovere il cavo 25 (termostato ambiente DI1) e il cavo 11 (alimentazione compressore) e unirli utilizzando una morsettiera isolata di 10 mm² e 250 V CA.
- Rimuovere il cavo 6 e collegarlo alla morsettiera isolata per il cavo 11 e 25. Un pressostato ventola o un regolatore della velocità della ventola possono essere collegati in serie al cavo 6.
- Rimuovere il cavo 14 (resistenza carter) e collegarlo al contattore K2 del compressore, terminale 22.
- Rimuovere il cavo 12 (alimentazione resistenza carter), prolungarlo di 0,4 m utilizzando una morsettiera di 10 mm² e 250 V CA e un cavo marrone di 1,0 mm² e collegarlo al contattore del compressore, terminale 21.
- Rimuovere la grande morsettiera dai terminali del regolatore 10-19.

Collegare l'unità di condensazione all'alimentazione elettrica (attivare l'interruttore principale)

## 15 – Manutenzione

| | |
|---|---|
| ⚠ | Spegnere sempre l'unità tramite l'interruttore principale prima di aprire lo sportello o gli sportelli della ventola. |
| | La pressione interna e la temperatura superficiale sono pericolose e possono causare lesioni permanenti. Gli operatori della manutenzione e gli installatori devono possedere le necessarie competenze e attrezzatura adeguata. La temperatura nei tubi può superare i 100 °C e causare gravi ustioni. |
| | Assicurarsi che vengano effettuate le ispezioni di servizio periodiche, per garantire l'affidabilità dell'impianto come richiesto dalle normative locali, siano eseguite. |

Per prevenire problemi all'impianto, a seguito della manutenzione periodica, è consigliabile:

- Verificare che i dispositivi di sicurezza siano in funzione e correttamente settati.
- Assicurarsi che l'impianto sia a tenuta.
- Controllare l'assorbimento elettrico del compressore.
- Verificare che l'impianto funzioni in modo coerente con i record di manutenzione precedenti e le condizioni ambientali.
- Controllare che tutti i collegamenti elettrici siano adeguatamente allacciati.
- Mantenere l'unità pulita e verificare l'assenza di ruggine e ossidazione sui componenti dell'unità, i tubi e i collegamenti elettrici.

Il condensatore deve essere controllato almeno una volta all'anno per rilevare possibili intasamenti ed essere pulito, se necessario. L'accesso all'interno del condensatore è tramite lo sportello della ventola. La sporcizia tende ad accumularsi sulla superficie delle bobine dei microcanali e non all'interno e sono quindi più facili da pulire rispetto ai modelli convenzionali (ad alette e tubi).

- Spegnere sempre l'unità tramite l'interruttore principale prima di aprire lo sportello della ventola.
- Rimuovere lo sporco superficiale, foglie, fibre, ecc. con un aspirapolvere, dotato di una spazzola o un altro accessorio morbido. In alternativa, soffiare aria compressa attraverso la bobina dall'interno verso l'esterno e pulire con un pennello a setole morbide. Non usare una spazzola metallica. Non colpire o raschiare la bobina con il tubo o l'ugello dell'aria.
- Prima di chiudere lo sportello del ventilatore, ruotare la pala del ventilatore in posizione sicura, per evitare che lo sportello colpisca il ventilatore.

Se il sistema refrigerante è stato aperto, deve essere pulito con aria secca o azoto per eliminare l'umidità e un nuovo filtro deidratatore deve essere installato. Se il refrigerante deve essere spurgato, adottare una procedura che prevenga il rilascio del refrigerante nell'ambiente.

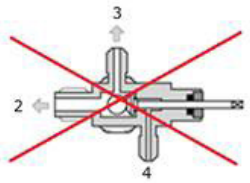



**Fig A:** Condizione completamente aperta, le porte 2 e 3 sono completamente aperte e la porta 4 è completamente chiusa

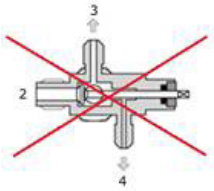



**Fig B:** Condizione completamente chiusa, le porte 3 e 4 sono parzialmente aperte e la porta 2 è completamente chiusa

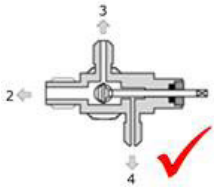



**Fig C:** Condizione parzialmente aperta (5,5 giri in senso orario dalla condizione completamente aperta. Le porte 2, 3, 4 sono completamente aperte).

## 16 – Dichiarazione di incorporazione

• **Direttiva sulle apparecchiature a pressione 2014/68/UE EN 378-2:2016** - Impianti di refrigerazione e pompe di calore - Requisiti di sicurezza e ambientali - Parte 2: Progettazione, costruzione, collaudo, marcatura e documentazione
**Direttiva sulla bassa tensione 2014/35/UE** EN 60335-1:2012 + A11:2014 - Sicurezza degli apparecchi elettrici d'uso domestico e similare - Parte
1: Requisiti generali per tutte le unità condensatrici sopra menzionate
**DIRETTIVA Ecodesign 2009/125/ CE** relativa all'istituzione di un quadro per l'elaborazione di requisiti per la progettazione ecocompatibile dei prodotti connessi all'energia.
REGOLAMENTO (UE) 2015/1095, recante misure di esecuzione della direttiva Ecodesign 2009/125/CE in merito ai requisiti di progettazione ecocompatibile degli armadi refrigerati professionali, degli abbattitori, delle unità condensatrici e dei chiller di processo.

• Le misure dell'unità condensatrice sono eseguite in base alla norma « EN 13771-2:2017» - Compressori e unità condensatrici per la refrigerazione - Verifica delle prestazioni e metodi di prova - parte 2: Unità condensatrici

## 17 – Garanzia

Comunicare sempre il numero di modello e il numero di serie per qualsiasi reclamo presentato per questo prodotto.
La garanzia del prodotto può essere nulla nei seguenti casi:

- Assenza di targhetta.
- Modifiche esterne, in particolare forature, saldature, piedini rotti e segni di urti.
- Compressore aperto o restituito non sigillato.
- Ruggine, presenza di colorante per il rilevamento di perdite all'interno del compressore.
- Uso di un refrigerante o lubrificante non approvati da Danfoss.
- Qualsiasi deviazione dalle istruzioni raccomandate relative a installazione, applicazione o manutenzione.
- Utilizzo in applicazioni mobili.
- Utilizzo in atmosfere esplosive.
- Non è stato comunicato nessun numero di modello e di serie insieme alla richiesta di intervento in garanzia.

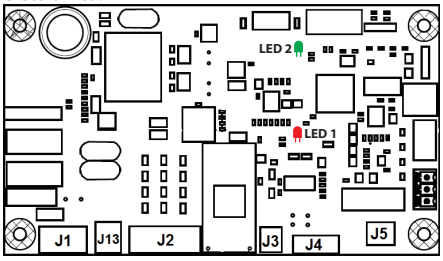
## 18 – Smaltimento

Only for Norway

Danfoss raccomanda che le unità di condensazione e l'olio vengano riciclati da una società specializzata presso il proprio sito.

19 - Modulo B Plus - Guida utente

Il modulo B Plus è una scheda elettronica utilizzata nei modelli versione P02 per l'iniezione automatica di liquido nel set scroll del compressore attraverso una valvola di espansione elettronica.




*Modulo B Plus*

Il modulo B Plus è coperto da un coperchio di protezione touch come mostrato nella Figura 6.

⚠ Rimuovere il coperchio di protezione touch solo se necessario. Spegnere sempre l'unità prima di rimuovere questo coperchio.




*Figura 6*

**Applicazione**

Il modulo B Plus comanda l'iniezione di liquido e controlla i seguenti parametri: temperatura gas di mandata, sequenza fasi e guasto di fase.

**Descrizione funzionale**

• Iniezione di liquido

- Il modulo B Plus è in grado di controllare la temperatura del gas di mandata. Il setpoint predefinito è 125 °C, ed è necessario per il funzionamento dell'unità condensatrice in un campo sicuro.

⚠ Non modificare questo setpoint.

- Quando il compressore si arresta, la valvola di iniezione di liquido si chiude entro 6 secondi.

• Protezione surriscaldamento temperatura gas di mandata

- Il sensore temperatura gas di mandata del modulo B Plus è in grado di rilevare la temperatura del gas di mandata nell'intervallo -50 – 180 °C, precisione di misurazione temperatura ±0,5 °C. Il sensore di mandata è installato a 150 mm dalla porta di mandata del compressore.
- Se la temperatura del gas di mandata è superiore al punto di intervento surriscaldamento (setpoint + 10 K) entro 1 secondo, il relè allarme (J5) si apre. Questo stato è chiamato surriscaldamento statico DGT, fare riferimento alla Tabella 1. Se la temperatura del gas di mandata è costantemente inferiore al punto di reset (setpoint -15 °C) per 5 minuti, il relè allarme (J5) si chiude. Questo ritardo di 5 minuti è chiamato ritardo di reset DGT.
- Se la temperatura del gas di mandata si surriscalda per più di 5 volte in 1 ora, il relè allarme (J5) si blocca in stato di apertura e può essere ripristinato solo resettando manualmente l'alimentazione del modulo B Plus (spegnere e riaccendere l'unità dopo alcuni minuti). Questo stato è chiamato blocco surriscaldamento DGT, fare riferimento alla Tabella 1 per l'identificazione dell'errore.
- Se si verifica un malfunzionamento nel sensore temperatura gas di mandata, cioè con sensore aperto, corto circuito sensore o fuori campo, anche il relè allarme (J5) si blocca in stato di apertura. Fare riferimento alla Tabella 1 per l'identificazione dell'errore.

• Protezione fase

- Il rilevamento della sequenza fasi e dalla fase mancante viene eseguito ogni volta che il compressore è alimentato. Se viene rilevato uno stato della fase Perdita Fase o Inversione Fase entro 4,5 - 5 sec., il relè allarme (J5) si apre e si blocca in stato di apertura. Questo blocco in stato di apertura può essere ripristinato solo resettando manualmente l'alimentazione del modulo B Plus, fare riferimento alla Tabella 1 per l'identificazione dell'errore.

• Interfaccia utente

- Quando il modulo B Plus si accende, il LED 1 di alimentazione sarà sempre di colore rosso fisso. Quando il modulo si spegne, il LED 1 di alimentazione sarà spento. Se il modulo B Plus si accende e non presenta errori, il LED 2 di stato sarà di colore verde fisso. Per la posizione del LED 1 e del LED 2 sul modulo B Plus, fare riferimento alla Figura 6.
- Se il modulo B Plus si accende e rileva un errore, il LED 2 di stato lampeggerà alternativamente per un secondo in giallo e rosso. Per il dettaglio del codice di lampeggio, vedere la Tabella 1.

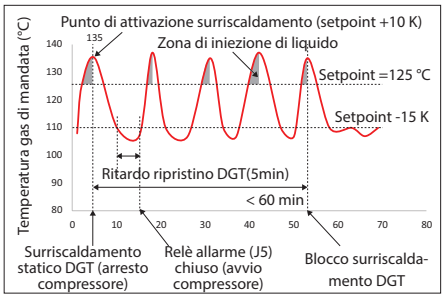
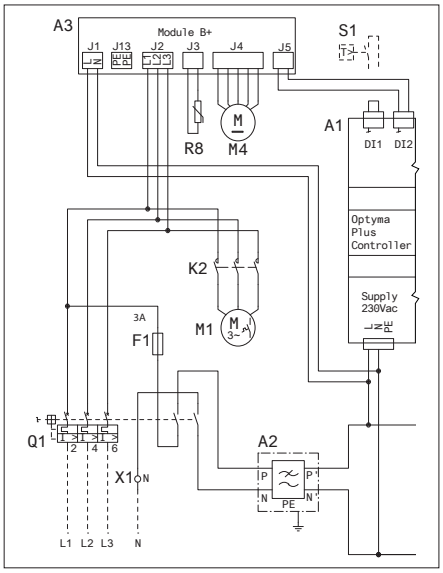



*Figura 7*

• Comunicazione modulo B Plus con Optyma Plus Controller.

- Quando il relè allarme (J5) si apre, il segnale viene comunicato all'ingresso digitale 2 (DI2) del regolatore Optyma, che attiva l'allarme di sicurezza (A97) in Optyma Plus Controller e l'alimentazione al compressore si arresta immediatamente.




*Schema elettrico modello B Plus*

| Categoria | Tempi di lampeggio giallo | Tempi di lampeggio rosso | Errore | Descrizione | Azione |
|---|---|---|---|---|---|
| Temperatura del gas di mandata | 1 | 1 | Surriscaldamento statico DGT / Ritardo reset DGT | La temperatura del gas di mandata è superiore al punto di intervento per l'arresto del compressore | Controllare se il regolatore Optyma indica l'allarme di sicurezza (A97). Se sì, attendere fino a quando viene risolto automaticamente. Se questo errore si verifica spesso, controllare se l'unità sta funzionando all'interno del campo raccomandato. |
| | | 2 | Blocco surriscaldamento DGT | Il surriscaldamento statico DGT si verifica 5 volte in 1 ora | Ripristinare manualmente l'alimentazione del modulo B Plus (spegnere e riaccendere l'unità dopo alcuni minuti). |
| | | 3 | DGT fuori campo | DGT è al di fuori dell'intervallo normale (-50... 180 °C) | Controllare se il sensore temperatura gas di mandata è montato correttamente sulla linea di mandata. Controllare la temperatura gas di mandata sul parametro U27 di Optyma Plus Controller (deve essere tra -50 e 180 °C). |
| | | 4 | Sensore DGT aperto / Corto circuito sensore DGT | Sensore temperatura gas di mandata aperto/in corto circuito | Controllare il sensore temperatura di mandata e la connessione. |
| Trifase | 2 | 1 | Perdita di fase | Perdita di segnale monofase | Controllare l'alimentazione trifase (J2) al modulo B Plus e verificare se manca una delle tre fasi. Se sì, eseguire la connessione corretta dell'alimentazione e ripristinare manualmente il modulo B Plus (spegnere e riaccendere l'unità dopo alcuni minuti). |
| | | 2 | Inversione fase | Connessione fase non corretta | Controllare l'alimentazione trifase (J2) al modulo B Plus e verificare se le tre fasi sono in sequenza corretta. In caso contrario, correggere la connessione di alimentazione in sequenza e ripristinare manualmente il modulo B Plus (spegnere e riaccendere l'unità dopo alcuni minuti). |

*Tabella 1: Codice di lampeggio errore (codice di lampeggio LED 2 giallo - rosso)*


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ENGINEERING
**TOMORROW**

**Instruções (Português)**

# Optyma™ Plus

## OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM

| |
|---|
| **A instalação e manutenção das unidades de condensação apenas devem ser realizadas por pessoal qualificado. Siga estas instruções, assim como as boas práticas de engenharia de refrigeração no que diz respeito à instalação, colocação em funcionamento, assistência e manutenção.** |
| **Este produto não está sujeito ao regulamento PSTI do Reino Unido, pois é destinado ao fornecimento e uso apenas de profissionais com a especialização e qualificações necessárias. Qualquer uso incorreto ou manuseio inadequado pode resultar em consequências não intencionais. Ao comprar ou usar este produto, você reconhece e aceita a natureza de uso profissional exclusivo da sua aplicação. A Danfoss não assume qualquer responsabilidade por danos, violações ou consequências adversas ("danos") resultantes do uso incorreto ou inadequado do produto, e você concorda em indenizar a Danfoss por qualquer dano resultante do seu uso incorreto ou inadequado do produto.** |
| A unidade de condensação apenas deverá ser utilizada para os fins a que se destina, dentro do respetivo âmbito de aplicação e de acordo com as instruções. Refrigerante a ser usado de acordo com a especificação relativa ao modelo. |
| Em qualquer circunstância, terão de ser cumpridos os requisitos EN378 e outros regulamentos de segurança locais aplicáveis. |
| A unidade de condensação é entregue sob pressão de gás nitrogénio (1 bar) e como tal não pode ser ligada tal como está; consulte a secção «instalação» para mais pormenores. |
| A unidade de condensação deve ser manuseada com cuidado na posição vertical (desvio máximo da posição vertical: 15°) |
| **Para modelos PED Cat I e II:** A válvula de descarga de pressão deve ser montada no sistema de refrigeração durante a instalação no local. A PRV deve ser montada no recipiente recetor. |

**Normas e diretiva relevantes**
**EN 378-2:2016:** Sistemas frigoríficos e bombas de calor – Requisitos de segurança e proteção ambiental.
**EN 60335-1:** Aparelhos eletrodomésticos e análogos – Segurança – Parte 1: Requisitos gerais.
**Diretiva de Baixa Tensão n.º 2014 / 35 / UE**
**Diretiva Máquinas n.º 2006 / 42 / CE**
**Diretriz de Equipamentos Sob Pressão (PED) n.º 2014/68/UE**
**Diretiva RoHS 2011/65/EU**
**Diretiva REEE 2012/19/EU**
(Outras normas locais aplicáveis)

### 1 – Introdução

Estas instruções são válidas para as unidades de condensação Optyma™ Plus OP-MPBM, OP-MPXM, OP-MPGM, OP-LPQM e OP-LPOM utilizadas em sistemas de refrigeração. Fornecem a informação necessária relativa à segurança e à utilização correcta deste produto.

A unidade de condensação inclui o seguinte:
- Permutador de calor de microcanais
- Compressor reciproco ou scroll
- Depósito de líquido com válvula de segurança
- Válvulas de esfera
- Visor de líquido
- Pressóstatos de alta e baixa pressão
- Filtro secador permutável
- Controlador electrónico
- Disjuntor principal (Interruptor principal com protecção de sobrecarga)
- Condensadores do ventilador e do compressor
- Contactor do compressor
- Relé de monitorização de alimentação**
- Caixa robusta e protegida contra a intempérie
- Controlador de injeção de líquido (Módulo B Plus)*
- Válvula de expansão eletrónica (ETS6)*
- Os componentes conectados estão equipados com uma porta Schrader

**Apenas para a versão P02,*
***apenas para os modelos P05*

### 2 – Manuseamento e armazenamento

- Recomenda-se que não abra a embalagem antes da unidade se encontrar no local destinado à sua instalação.
- Manuseie a unidade com cuidado. A embalagem permite que utilize uma empilhadora ou um porta-paletes. Utilize um equipamento de elevação apropriado e seguro.
- Armazene e transporte a unidade na posição vertical.
- Armazene a unidade a uma temperatura situada entre os -35 °C e 50 °C.
- Não exponha a embalagem à chuva ou a uma atmosfera corrosiva.
- Após desembalar, verifique se a unidade se encontra completa e livre de danos.

### 3 – Precauções de instalação

| |
|---|
| Jamais coloque a unidade numa atmosfera inflamável |
| Coloque a unidade de modo a que não bloqueie ou obstrua as áreas de passagem, portas, janelas ou elementos similares. |
| PRV: Para os modelos PED Cat I e II, a PRV deve ser montada em campo durante a instalação. |

- Assegure que existe suficiente espaço à volta da unidade para o ar circular e para abrir portas. Consulte a imagem 1 para obter os valores mínimos de distância para com as paredes.
- Evite instalar a unidade em locais que estejam expostos diariamente à luz solar directa por períodos alargados.
- Evite instalar a unidade em ambientes agressivos e poeirentos.
- Certifique-se de que existe uma superfície de suporte horizontal (com uma inclinação inferior a 3°), forte e com suficiente estabilidade para suportar a totalidade do peso da unidade e eliminar vibrações e interferências.
- A temperatura ambiente da unidade não deve exceder os 50 ºC, durante o repouso.
- Assegure que a fonte de alimentação corresponde às características da unidade (consulte a placa de caraterísticas).
- Na instalação de unidades para refrigerantes HFC, utilize equipamento especialmente reservado para refrigerantes HFC, que nunca tenha sido utilizado para refrigerantes CFC ou HCFC.
- Utilize tubos de cobre/alumínio limpos e desidratados para refrigeração com espessura adequada e materiais de soldadura de liga de prata.
- Utilize componentes de sistema limpos e desidratados.
- A tubagem de aspiração ligada ao compressor deverá ser flexível em 3 dimensões para amortecer as vibrações. Além disso, deve ser construída de uma forma que garanta o retorno do óleo ao compressor e que elimine o risco de golpe de líquido no compressor.
- Na Optyma, a unidade de condensação possui válvula de serviço de sucção e de líquido com porta schrader para operações de assistência no local

### 3.1 – Válvula PRV

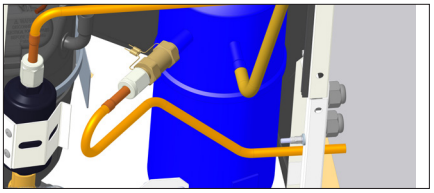
| |
|---|
| Para a Optyma™ Plus, unidades de condensação classificadas como PED cat I e II, a PRV deve estar instalada (Consulte os Dados técnicos para a categoria PED no Anexo A). |
| PRV é fornecido como peça de reposição. Consulte Coolselector2 |

- PRV para instalação no receptor de líquido na conexão NPT de 3/8". (Consulte o Coolselector2

para obter o código de peça sobresselente da PRV). Utilize Locatite 554 para a colocação da PRV.
- Binário de aperto: 40Nm (Não exceda o binário de aperto indicado)



- O instalador precisa de ter cuidado com o local onde deve soprar o refrigerante derramado. A Danfoss recomenda que o refrigerante seja soprado para longe da unidade de condensação.
- Recomenda-se trocar a PRV após a descarga, com mudança do refrigerante
- As válvulas devem ser instaladas na vertical ou na horizontal, mas certifique-se de que a PRV é instalada acima do nível de líquido do sistema.
- Certifique-se de que o refrigerante seja liberado diretamente para atmosfera de forma segura.
- Em caso de perigo, foi concebido um kit sobresselente adicional para recolher o refrigerante liberado. O kit deve ser instalado com uma tubulação adequada para a descarga de refrigerante em segurança. (Ver imagem abaixo)



- A PRV não deve ser instalada na válvula de serviço.
- Substitua a PRV depois de limpar o sistema ou de esvaziado.
- As juntas e válvulas não destacáveis não devem ser acessíveis ao público. Todas as juntas de brasagem devem cumprir a norma EN 14276-2 e as outras juntas permanentes devem estar em conformidade com a norma EN-16084.

## 4 – Instalação

- A instalação em que a unidade de condensação está instalada deve estar em conformidade com a diretiva de equipamentos sob pressão (PED) 2014/68/UE. No âmbito desta directiva a unidade de condensação não é considerada uma "unidade".
- Recomenda-se que instale a unidade em suportes de borracha ou em amortecedores da vibrações (não fornecidos).
- É possível empilhar unidades em cima umas das outras.

| Unidade | Empilhamento máximo |
|---|---|
| Caixa 1 (Código n.º 114X31-- ou 114X41--) | 3 |
| Caixa 2 (Código n.º 114X32-- ou 114X42--) | 2 |
| Caixa 3 (Código n.º 114X33-- ou 114X43--) | 2 |
| Caixa 4 (Código n.º 114X34-- ou 114X44--) | 2 |

- Numa pilha, a unidade do topo deve estar fixa contra a parede, conforme apresentado na imagem 2.
- Liberte lentamente a carga de nitrogénio através da válvula schrader.
- Assim que possível, ligue a unidade ao sistema para evitar a contaminação do oleo, proveniente da humidade ambiente.
- Evite a entrada de materiais estranhos no sistema enquanto corta os tubos. Nunca perfure em locais onde não podem ser removidas as reberbas.
- Efectue a soldadura com extremo cuidado, utilizando a mais recente tecnologia; purgue as condutas fazendo circular azoto.
- Ligue os dispositivos de controlo e segurança necessários. Retire a válvula interna quando a válvula schrader é utilizada para este fim.
- Recomenda-se que isole o tubo de aspiração até à entrada do compressor com um isolamento de 19mm de espessura.
- O material da tubulação de cobre deve estar em conformidade com a norma EN12735-1. E todas as juntas dos tubos devem cumprir a norma EN14276-2
- Na instalação no local, adicione suporte de acordo com o tamanho e o peso. Espaçamento máximo recomendado para o suporte do tubo de acordo com as normas EN12735-1 e EN12735-2
- Devem ser feitos tubos de ligação antes de abrir as válvulas para permitir o fluxo de refrigerante entre as peças do sistema de refrigeração.

## 5 – Deteção de fugas

| | |
|---|---|
| ⚠ | Nunca pressurize o circuito com oxigénio ou ar seco. Isso poderá provocar um incêndio ou explosão. |

- Não utilize tinta para detecção de fugas
- Execute um ensaio de detecção de fugas na totalidade do sistema
- A pressão máxima do ensaio não deve exceder os 31*) bar.
- Quando for detectada uma fuga, repare a fuga e repita a detecção de fugas.

*) *25 bar para os modelos OP-..... AJ.... & OP-....FH....*

## 6 – Desidratação por vácuo

- Jamais utilize o compressor para fazer vácuo ao sistema.
- Ligue uma bomba de vácuo aos lados de Baixa e Alta Pressão.
- Baixe o sistema a uma pressão absoluta de 500 µm Hg (0,67 mbar).
- Não utilize um megaohmímetro, nem ligue a alimentação do compressor, enquanto este se encontrar sob vácuo, já que tal poderá provocar danos internos.

## 7 – Ligações eléctricas

- Desligue e isole a principal fonte de alimentação.
- Assegure-se que a fonte de alimentação não pode ser ligada durante a instalação.
- Todas as componentes eléctricas deverão ser seleccionadas segundo os padrões locais e os requisitos da unidade.
- Consulte o esquema electrico para obter informação detalhada das ligações eléctricas.
- Assegure que a fonte de alimentação corresponde às características da unidade e que a fonte de alimentação se encontra estável (voltagem nominal de ±10% e frequência nominal de ±2,5 Hz)
- Dimensione os cabos da fonte de alimentação em conformidade com os dados da unidade relativamente à voltagem e à corrente.
- Proteja a fonte de alimentação e assegure-se que existe uma correcta ligação à massa.
- Coloque a fonte de alimentação em conformidade com os padrões e requisitos legais locais
- A unidade está equipada com um controlador electrónico. Consulte o Manual 118U3808 para mais detalhes.
- Os modelos da versão P02 (OP-xxxxxxxxxP02E) são equipados com um painel de circuito eletrónico (Módulo B Plus). Consulte a secção "Manual do Utilizador do Módulo B Plus" neste manual.
- A unidade é equipada com um interruptor principal com uma protecção de sobrecarga. A protecção de sobrecarga é predefinida na fábrica mas recomenda-se que verifique o valor antes de colocar a unidade em funcionamento. O valor da protecção de sobrecarga pode ser encontrado no esquema electrico colocado na porta dianteira da unidade.
- A unidade está equipada com pressóstatos de alta e baixa pressão, que cortam directamente a alimentação ao compressor caso sejam activados. As pressões de corte alta e baixa são predefinidos no controlador de acordo com o compressor instalado na unidade.
- Os modelos P05 estão igualmente equipados com um relé de sequência de fases para proteger a unidade contra a assimetria de perda/sequência de fase e sub/sobretensão.

Para unidades com um compressor scroll trifásico (OP-MPXMxxxxxxxxE), deve-se ter especial atenção à sequência das fases, de forma a garantir uma correcta direcção de rotação.
- Determine a sequência de fases utilizando um medidor de fase de modo a estabelecer a ordem das fases de linha L1, L2 e L3.
- Ligue as fases de linha L1, L2 e L3 aos terminais do interruptor principal T1, T2 e T3, respectivamente.

## 8 – Segurança

| | |
|---|---|
| ⚠ | A porta da caixa elétrica deve estar fechada antes de ser ligada à fonte de alimentação. |
| | A temperatura do tubo de descarga irá subir até aos 120 °C durante o funcionamento da unidade. |
| | Recomenda-se a instalação da PRV no interior da unidade e que a liberação de refrigerante seja encaminhada diretamente para a atmosfera. |

A ficha de fusível não está disponível na unidade, foi substituída por uma ficha de adaptador.
A unidade possui um recetor de líquidos com uma Ficha de adaptador com ligação NPT de 3/8". O instalador/utilizador final pode selecionar várias opções, como mencionado em EN378-2: 2016 Artigo § 6.2.2.3
- A unidade/instalação em que a unidade de condensação está montada/integrada deve estar em conformidade com a PED.
- Preste atenção a componentes extremamente quentes e frios.
- Preste atenção a componentes em movimento. A alimentação elétrica deverá ser desligada durante a assistência.
- O compressor tem um protetor de sobrecarga interno (OLP). Irá impedir que a pressão do compressor ultrapasse os 32 bar.
- Nenhuma válvula e juntas destacáveis devem estar localizadas em áreas acessíveis ao público em geral, exceto quando estiverem em conformidade com a norma EN 16084


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- A tubulação de refrigerante deve estar protegida ou fechada, para evitar danos.
- A tubulação de campo deve ser instalada de forma que esteja livre de ambientes corrosivos ou salgados, para evitar a corrosão na tubulação de cobre/alumínio.
- Em caso de incêndio, a pressão aumenta devido à maior temperatura no receptor. Por isso, é muito importante instalar a PRV.

## 9 – Carregamento do sistema

- Nunca arranque o compressor sob vácuo. Mantenha o compressor desligado.
- Utilize apenas o refrigerante para o qual a unidade foi concebida.
- Encha o condensador ou o depósito de líquido com refrigerante em estado líquido. Assegure-se de um carregamento lento do sistema até 4 - 5 bar para R404A/R448A/R449A/R407A/R407F/R452A e de aproximadamente 2 bar para R134a, R513A.
- A carga restante é efectuada quando a instalação atingiu o seu nível nominal e o mantenha estável durante o funcionamento.
- Nunca deixe o cilindro de carga ligado ao circuito.
- Válvulas de sucção, de líquidos e de bloqueio de rotação do receptor como porta Schrader para operações de assistência como Carregamento de gás, medição de pressão.

## 10 – Configuração do controlador eletrónico

| | |
|---|---|
| ⚠ | Altere o parâmetro do controlador o37 para 1 no caso de uma adaptação SPPR (relé de monitorização de alimentação). Caso adicione a opção SPPR para proteger o compressor, altere a definição o37 de 0 para 1 |
| | Para os modelos da versão P02 (OP-xxxxxxxxxP02E) se o valor o30 for 19=R404A ou 40=R448A ou 41=R449A no controlador. |

- A unidade está equipada com um controlador electrónico programado de fábrica com parâmetros aptos para a utilização com a unidade. Para obter mais informações consulte o Manual 118U3808.
- Por predefinição, o visor do controlador electrónico apresenta a temperatura para a pressão de aspiração em ºC. Para apresentar a temperatura para a pressão de condensação, prima o botão inferior (imagem 3).

O controlador eletrónico é predefinido na fábrica para R404A ou R449A ou R452A ou R134a, dependendo do modelo do compressor montado e da aplicação (consulte o anexo no manual de instalação do controlador Optyma).. Se for utilizado outro refrigerante, a definição do refrigerante tem de ser alterada. O Parâmetro r12 tem de ser definido para 0 antes (interruptor geral do software= desligado).

- Prima o botão superior durante alguns segundos. Aparece a coluna com os códigos do parâmetro.
- Prima o botão superior ou inferior para encontrar o código do parâmetro o30.
- Prima o botão central até que o valor deste parâmetro seja indicado.
- Prima o botão superior ou inferior para seleccionar o novo valor: 2 = R22, 3 = R134a, 36 = R513A, 17 = R507, 19 = R404A, 20 = R407C, 21 = R407A, 37 = R407F, 40 = R448A, 41 = R449A, 42 = R452A
- Prima o botão central para confirmar o valor seleccionado.
- Prima o botão superior ou inferior para encontrar o código de parâmetro r84 (r84 = Temperatura de descarga máxima permitida).
- Pressione o botão do meio. A temperatura de descarga máxima predefinida é de 125 °C
- Se o cliente quiser aumentar a válvula, pressione o botão superior para selecionar o novo valor: 130°C. Pressione o botão do meio para confirmar o valor selecionado.
- A temperatura de descarga máxima permitida (r84) não deve exceder os 130 °C.

## 11 – Verificação antes do arranque

| | |
|---|---|
| ⚠ | Utilize os dispositivos de segurança, tais como o pressóstato de segurança e a válvula mecânica de descarga, em conformidade com os regulamentos e padrões de segurança geralmente e localmente aplicáveis. Assegure-se de que estão operacionais e ajustados correctamente. |
| | Verifique que os ajustes dos pressóstatos de alta pressão e as válvulas de descarga não excedem a pressão de serviço máxima de qualquer componente de sistema. |

- Certifique-se de que todas as ligações elétricas dentro da unidade de condensação estão devidamente apertadas, pois podem ter-se soltado durante o transporte.
- Quando é necessária uma resistência de cárter, a unidade tem de ser energizada pelo menos 12 horas antes do arranque inicial e tem de arrancar após um encerramento prolongado para as resistências de cárter com correia.
- A unidade está equipada com um interruptor principal com protecção de sobrecarga. A protecção de sobrecarga é predefinida na fábrica mas recomenda-se que verifique o valor antes de colocar a unidade em funcionamento. O valor da protecção de sobrecarga encontra-se no esquema eléctrico colocado na porta dianteira da unidade.
- Verifique se o sensor de temperatura de descarga está firme e tem um contacto adequado com o tubo de descarga.
- A queda de pressão nos tubos da linha de sucção e líquido deve ser avaliada de acordo com a localização e a distância do evaporador (consulte o Coolselector2).

## 12 – Arranque

- Nunca arranque a unidade sem estár carre gada com refrigerante.
- Todas as válvulas de serviço deverão estar na posição aberta.
- A válvula Rotalock do recetor deve ser rodada 1 vez na direção de fecho para obtenção da pressão de condensação correta para o transmissor de pressão.
- Verifique a conformidade entre a unidade e a fonte de alimentação.
- Verifique que a resistência de cárter está a funcionar.
- Verifique que o ventilador pode rodar livremente.
- Verifique que a folha de protecção foi removida da parte posterior do condensador.
- Equilibre as pressões HP/LP.
- Arranque a unidade. Deve arrancar de imediato. Se o compressor não arrancar, verifique o estado dos cabos e a tensão nos terminais.
- A rotação invertida de um compressor trifásico pode ser detectada através dos seguintes fenómenos; o compressor não acumula pressão, possui um nível sonoro anormalmente alto e um consumo energético anormalmente baixo. Os modelos P05 estão equipados com um relé de inversão da fase e o compressor não arranca, o compressor não acumula pressão, no caso de sequências de fase erradas. Se tal ocorrer, desligue a unidade imediatamente e ligue as fases aos terminais adequados.
- Se a direcção da rotação for a correcta, o indicador de baixa pressão do controlador (ou o manómetro de baixa pressão) irá mostrar uma diminuição de pressão e o indicador de alta pressão (ou o manómetro de alta pressão) irá apresentar um aumento de pressão.

## 13 – Verificações com a unidade em funcionamento

- Verifique a direcção da rotação do ventilador. O ar deve fluir do condensador para o ventilador.
- Verifique o consumo de corrente e a tensão.
- Verifique o sobreaquecimento na aspiração para reduzir o risco de golpes de líquido.
- Se existe no sistema um visor de líquido, observe o nível do óleo no início e durante o funcionamento para confirmar que este permanece visível.
- Respeite os limites de funcionamento.
- Verifique se existe alguma vibração anormal nas tubagens. Movimentos que excedam 1,5 mm necessitam de medidas de correcção, como a instalação de abraçadeiras.
- Quando necessário, poderá ser adicionado algum refrigerante extra em estado líquido no lado de baixa pressão, o mais longe possível do compressor. O compressor deverá estar em funcionamento durante este processo.
- Para modelos da versão P02 (OP-xxxxxxxxxP02E):
- Verifique o visor e assegure-se de que não há bolhas na linha de líquido para injeção de líquido adequada.
- Quando o30 está definido 19=R404A ou 40=R448A ou 41=R449A e a leitura U26 > 125 no controlador, verifique e assegure que a injeção de líquido está LIGADA. O tubo de entrada economizador deve estar frio.
- Não sobrecarregue o sistema.
- Siga os regulamentos locais para recolher o refrigerante da unidade.
- Nunca liberte refrigerante na atmosfera.
- Antes de abandonar o local da instalação, leve a cabo uma inspecção geral da instalação com incidência na limpeza, ruído e detecção de fugas.
- Registe o tipo e a quantidade da carga de refrigerante, assim como as condições de funcionamento, como referência para futuras inspecções.

## 14 – Funcionamento de emergência sem controlador

Caso o controlador avarie, a unidade de condensação continua a poder ser utilizada se a cablagem padrão do controlador (imagem 4) for modificada para uma cablagem temporária (imagem 5) conforme descrito abaixo.

| | |
|---|---|
| ⚠ | Esta modificação apenas pode ser efectuada por um electricista autorizado. Deve ser respeitada a legislação nacional. |
| | Desligue a unidade de condensação da fonte de alimentação (desligue o interruptor principal do equipamento). |

- Deve ser possível estabelecer contacto com o termóstato ambiente para fornecer 250 V CA.
- Remova o cabo 22 (entrada de segurança DI3) e o cabo 24 (termóstato ambiente DI1) e junte-os

com uma ponte terminal isolada de 10 mm² com 250 V ca.
- Remova o fio 25 (termóstato ambiente DI1) e o fio 11 (alimentação do compressor) e, em seguida, una-os com uma ponte de terminais isolada de 250 VCA de 10 mm².
- Remova o fio 6 e ligue-o à ponte de terminais para o fio 11 e 25. Um interruptor de pressão do ventilador ou um controlador de velocidade do ventilador podem ser ligados em série ao fio 6.
- Remova o fio 14 (resistência do cárter) e ligue-o ao terminal 22 do contactor do compressor.
- Remova o fio 12 (alimentação da resistência de cárter), aumente este fio utilizando uma ponte de terminais de 250 Vca de 10mm² e um cabo castanho de 1,0 mm² e, em seguida, ligue-o ao terminal 21 do contactor do compressor
- Remova da régua grande os terminais 10 a 19 do controlador.
- Ligue a unidade de condensação à fonte de alimentação (ligue o interruptor principal do equipamento).

## 15 – Manutenção

| | |
|---|---|
| ⚠ | Desligue sempre a unidade no interruptor geral antes de abrir a(s) porta(s) do ventilador. |
| | A pressão interna, assim como a temperatura da superfície constituem um perigo e poderão provocar lesões permanentes. Os operadores de manutenção e instaladores necessitam dos conhecimentos e ferramentas adequadas. A temperatura das tubagens poderá exceder os 100 °C e provocar queimaduras severas. |
| | Assegure-se de que são executadas inspecções de manutenção periódicas, com o objectivo de assegurar a fiabilidade do sistema, no cumprimento dos regulamentos locais. |

Para impedir problemas derivados do sistema, recomenda-se lever a cabo periodicamente as seguintes tarefas de manutenção:
- Verifique que os dispositivos de segurança se encontram operacionais e correctamente ajustados.
- Assegure-se da ausência de fugas no sistema.
- Verifique o consumo de corrente do compressor.
- Confirme que o sistema está a funcionar de uma forma consistente com anteriores registos de manutenção e condições ambientais.
- Verifique que todas as ligações eléctricas ainda se encontram correctamente apertadas.
- Mantenha a unidade limpa e constate a ausência de ferrugem e oxidação nos componentes da unidade, tubos e ligações eléctricas.

O condensador deve ser verificado pelo menos uma vez por ano relativamente a obstruções e limpeza, se considerado necessário. O acesso ao interior do condensador é efectuado através da porta do ventilador. As baterias de microcanais têm a tendência de acumular sujidade na superfície em vez de no interior, o que facilita a sua limpeza em comparação com as baterias de tubo e aletas.

- Desligue a unidade no interruptor geral antes de abrir a porta do ventilador.
- Remova a sujidade na superfície, folhas, fibras, etc. com um aspirador, equipado com uma escova ou outro anexo suave. Em alternativa, injecte ar comprimido através da bateria do interior para fora, e escove com um instrumento com cerdas suaves. Não utilize uma escova metálica. Não bata nem arranhe a bateria com o tubo do aspirador ou com o bocal de ar.
- Antes de fechar a porta do ventilador, rode a pá do ventilador para uma posição de segurança de forma a evitar que a porta atinja o ventilador.

Se o sistema de refrigeração tiver sido aberto, terá de ser limpo com ar seco ou nitrogénio para eliminar a humidade e terá de ser instalado um novo filtro secador. Se tiver de ser efectuada uma evacuação do refrigerante, esta será feita de modo a que nenhum refrigerante possa escapar para o ambiente.

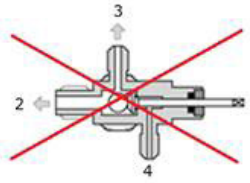



**Fig A:** Condição de abertura total, as portas 2 e 3 estão completamente abertas e a porta 4 está totalmente fechada

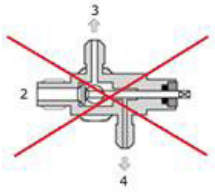



**Fig B:** Condição de fecho total, as portas 3 e 4 estão parcialmente abertas e a porta 2 está totalmente fechada

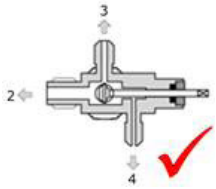



**Fig C:** Condição de abertura parcial (5,5 voltas para a direita a partir da posição de abertura total. As portas 2, 3, 4 estão totalmente abertas).

## 16 – Declaração de incorporação

•**Diretiva sobre equipamentos sob pressão 2014/68/EU EN 378-2:2016** - Sistemas de refrigeração e bombas térmicas - Requisitos de segurança e ambientais-Partes 2: Projeto, construção, testes, marcação e documentação
**Diretiva sobre material elétrico de baixa tensão 2014/35/EU** EN 60335-1:2012 + A11:2014- Aparelhos elétricos domésticos e similares -Parte 1: Requisitos gerais-para todas as unidades de condensação supra mencionadas Diretiva sobre **eco-design 2009/125/ EC**, estabelecimento de um enquadramento para a definição dos requisitos de eco-design para produtos relacionados com energia.
REGULAMENTO (UE) 2015/1095, que implementa a Diretiva sobre eco-design 2009/125/EC relativamente aos requisitos de eco-design para compartimentos de armazenamento refrigerado profissionais, compartimentos de jateamento, unidades condensadoras e refrigeradores de líquido aplicados em processos de produção.
• As medições das unidades condensadoras são realizadas de acordo com a norma « EN 13771-2:2017» – Compressores e unidades condensadoras para testes de desempenho da refrigeração e métodos de testes- parte 2: Unidades condensadoras

## 17 - Garantia

Indique sempre o modelo e o número de série em qualquer reclamação relativa a este produto.
A garantia do produto poderá ser anulada nos seguintes casos:
- Ausência da placa de características.
- Modificações externas; em particular, perfurações, soldaduras, pés partidos e marcas de choques.
- Abertura do compressor ou a devolução do mesmo sem os cuidados necessários.
- Presença de ferrugem, água ou tinta de detecção de fugas no interior do compressor.
- Uso de um refrigerante ou lubrificante não aprovado pela Danfoss.
- Qualquer desvio em relação às instruções recomendadas relativas à instalação, aplicação ou manutenção.
- Utilização em aplicações móveis.
- Utilização em atmosferas explosivas.
- Nenhum número de modelo e de série transmitido com o pedido de garantia.

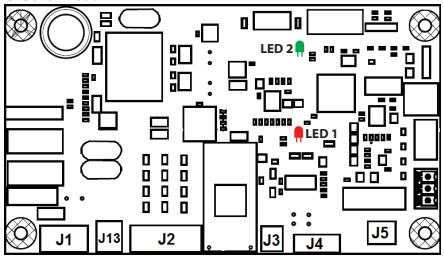
## 18 – Eliminação




A Danfoss recomenda que as unidades de condensação e o oleo nelas contido sejam reciclados por uma empresa apta para tal e nas suas instalações.


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O Módulo B Plus é um painel de circuito eletrónico usado nos modelos da versão P02 para injeção automática de líquido em volutas de compressor definida utilizando uma válvula de expansão eletrónica.




*Module B Plus*

O Módulo B plus é coberto pela cobertura de proteção de toque tal como na Imagem 6.

⚠ Não remova a cobertura de proteção de toque a não ser que seja necessário. Desligue a unidade antes de remover esta cobertura.

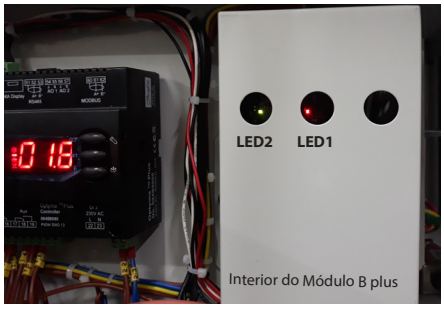



*Imagem 6*

**Aplicação**

O Módulo B Plus controla a injeção de líquido e também monitoriza os parâmetros seguintes: Temperatura do gás de descarga, sequência de fase e falha de fase.

**Descrição funcional**

• Injeção de líquido

- Module B Plus can control discharge gas temperature. The default set point is 125 °C, this is required to run the condensing unit within safe envelope.

⚠ Não altere este ponto de definição.

- Quando o compressor para, a válvula de injeção de líquido fecha em 6 segundos.

• Proteção de sobreaquecimento de temperatura do gás de descarga

- O sensor de temperatura do gás de descarga do Módulo B Plus pode detetar temperatura do gás de descarga no intervalo de -50 a 180 °C, precisão da medição de temperatura ±0,5°C. O sensor de descarga está instalado a uma distância de até 150 mm da porta de descarga do compressor.
- Se a temperatura do gás de descarga for mais elevada do que o ponto de disparo de sobreaquecimento (ponto de definição + 10 K), dentro de 1 segundo, o relé de alarme (J5) abre. Este estado é chamado DGT Estático de sobreaquecimento com referência à Tabela 1. Se a temperatura do gás de descarga estiver abaixo do ponto de definição (ponto de definição -15 °C) continuamente por 5 minutos, o relé de alarme (J5) fecha. Este estado de atraso de 5 minutos é chamado DGT Atraso de reposição.
- Se a temperatura do gás de descarga sobreaquecer mais do que 5 vezes em 1 hora, o relé de alarme (J5) bloqueia no estado aberto e só pode ser reposto repondo manualmente a alimentação elétrica do Módulo B Plus (desligue a unidade e volte a ligar após algum tempo). Este estado é chamado DGT Bloqueio de sobreaquecimento, consulte a Tabela 1 para identificação de erro.
- Se o sensor de temperatura do gás de descarga estiver a funcionar mal, isto é, Sensor Aberto, Curto-circuito do sensor ou Fora da gama, o relé de alarme (J5) também bloqueia no estado aberto, consulte a Tabela 1 para identificação de erro.

• Proteção de fase

- A deteção de sequência de fase e de fase em falta só será realizada quando o compressor for ligado. Se for detetado um estado de fase incorreto, Perda de fase ou Fase inversa, dentro de 4,5 segundos a 5 segundos, o relé de alarme (J5) abre e bloqueia no estado aberto. Este bloqueio no estado aberto só pode ser reposto repondo manualmente a alimentação elétrica do Módulo B Plus, consulte a Tabela 1 para identificação de erro.

• Interface do utilizador

- O Módulo B Plus liga, o LED 1 está sempre vermelho. Quando o Módulo é desligado, o LED 1 está desligado. Se o Módulo B Plus for ligado e não tiver erro, o LED 2 de estado será verde. Consulte a imagem 6 para ver a localização do LED 1 e do LED 2 no módulo B plus.
- Se o Módulo B Plus for ligado e detetar um erro, o LED 2 de estado será amarelo e vermelho intermitente durante um segundo alternativamente. Para os detalhes do código de intermitência, consulte a Tabela 1.

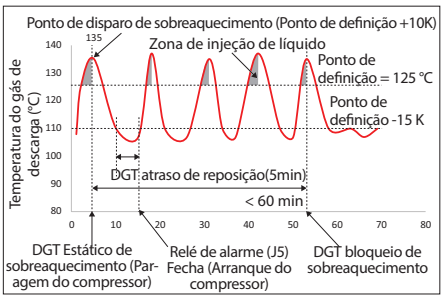



*Imagem 7*

• Comunicação do Módulo B plus com o Optyma Plus Controller.

- Quando o relé de alarme (J5) está aberto, o sinal é comunicado à entrada 2 digital do controlador Optyma (DI2) o que ativa o alarme de segurança (A97) no Optyma Plus Controller e a alimentação elétrica ao compressor será interrompida imediatamente.

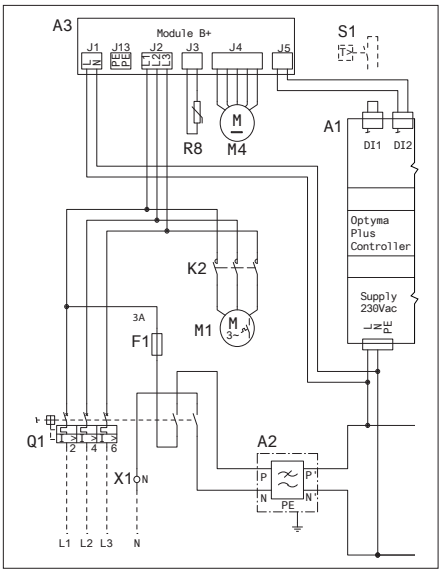



*Diagrama de ligações do Módulo B Plus*

| Categoria | Tempos de intermitência amarela | Tempos de intermitência vermelha | Erro | Descrição | Ação |
|---|---|---|---|---|---|
| Temperatura do gás de descarga | 1 | 1 | DGT Estático de sobreaquecimento/DGT Atraso de reposição | A temperatura do gás de descarga é superior ao ponto de disparo de corte do compressor | Verifique se o controlador Optyma apresenta o alarme de segurança (A97). Se sim, espere até que se resolva automaticamente. Se este erro for observado frequentemente, verifique se a unidade está a funcionar nas condições recomendadas. |
| | | 2 | DGT Bloqueio de sobreaquecimento | DGT Estático de sobreaquecimento ocorre 5 vezes em 1 hora | Reponha manualmente a alimentação elétrica do Módulo B Plus (desligue a unidade e volte a ligar após algum tempo). |
| | | 3 | DGT fora da gama | DGT está fora da gama normal (-50 ... 180°C) | Verifique se o sensor de temperatura do gás de descarga está montado corretamente na linha de descarga. Verifique a temperatura do gás de descarga no parâmetro U27 do Optyma Plus Controller (deve estar entre -50 ... 180°C). |
| | | 4 | DGT Sensor aberto/DGT Sensor curto | Sensor de temperatura do gás de descarga aberto/curto-circuito | Verifique o sensor de temperatura de descarga e a conexão. |
| Fase tripla | 2 | 1 | Perda de fase | Perda de sinal de monofase | Verifique a alimentação elétrica trifásica (J2) ao Módulo B Plus, se uma das 3 fases estiver em falta. Se sim, faça a conexão de alimentação elétrica correta e reponha manualmente o Módulo B Plus (desligue a unidade e volte a ligar após algum tempo). |
| | | 2 | Inversão de fase | Conexão de fase incorreta | Verifique a alimentação elétrica trifásica (J2) ao Módulo B Plus, se as 3 fases estiverem na sequência correta. Se não, faça a conexão de alimentação elétrica correta em sequência e reponha manualmente o Módulo B Plus (desligue a unidade e volte a ligar após algum tempo). |

*Tabela 1: Código de intermitência de erro (LED 2 amarelo - código de intermitência vermelho)*

ENGINEERING
**TOMORROW**

**Instruktioner (Svenska)**

# Optyma™ Plus

## OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM

| |
|---|
| **Installation och servicearbete får endast utföras av kvalificerad personal. Följ dessa instruktioner och goda kylningsteknikmetoder vid installation, driftsättning, underhåll och service.** |
| **Denna produkt omfattas inte av den brittiska PSTI-förordningen, eftersom den endast är avsedd att levereras till och användas av yrkespersoner med nödvändig kompetens och kvalifikationer. Felaktig användning eller hantering kan leda till oavsiktliga konsekvenser. Genom att köpa eller använda denna produkt bekräftar och godtar du att den endast är avsedd för professionellt bruk. Danfoss ansvarar inte för skador, personskador eller negativa konsekvenser ("skador") som uppstår till följd av felaktig eller otillåten användning av produkten och du samtycker till att hålla Danfoss skadeslös mot sådana skador som uppstår till följd av felaktig eller otillåten användning av produkten från din sida.** |
| Aggregatet får endast användas i de syften som den är ämnad för och inom dess tilltänkta användningsområden samt enligt anvisningarna. Köldmediet ska användas enligt specifikationen för respektive modell. |
| Under alla omständigheter måste EN378-kraven och andra tillämpliga lokala säkerhetsföreskrifter uppfyllas. |
| Aggregatet levereras med ett kvävgastryck (1 bar) och kan därför inte anslutas i befintligt skick. Läs avsnittet installation för ytterligare information. |
| Aggregatet ska hanteras med försiktighet och i upprätt position (maximal förskjutning från upprätt position: 15°). |
| **För modeller i PED-kat. I och II**: Överströmningsventilen ska monteras i köldmediesystemet vid fältinstallation. Överströmningsventilen ska monteras på mottagarkärlet. |

**Relevanta standarder och direktiv**
**EN 378-2:2016:** Kylningssystem och värmepumpar – Säkerhets- och miljökrav
**EN 60335-1:** Elektriska hushållsapparater och liknande bruksföremål – Säkerhet – Del 1: Allmänna krav
**Lågspänningsdirektivet nr 2014/35/EU**
**Maskindirektivet nr 2006/42/EU**
**Tryckkärlsdirektivet (PED) nr 2014/68/EU**
**RoHS-direktivet 2011/65/EU**
**WEEE-direktivet 2012/19/EU**
(Andra lokala tillämpliga standarder)

### 1 – Inledning

Dessa anvisningar avser Optyma™ Plus kondenseringsenheter OP-MPBM, OP-MPXM, OP-MPGM, OP-LPQM, OP-LPOM och OP-MPBM som används för kylsystem. De innehåller väsentlig information om säkerhet och korrekt användning av produkten.

Kondenseringsenheten innehåller följande:
- Mikrokanalens värmeväxlare
- Kolv- eller scrollkompressor
- Mottagare med stoppventil
- Kulventiler
- Synglas
- Hög- och lågtrycksbrytare
- Utbytbart Torkfilter
- Elektronisk regulator
- Huvudkretsbrytare (huvudbrytare med överlastskydd)
- Fläkt- och kompressorkondensatorer
- Kompressorkontaktor
- Relä för försörjningsövervakning**
- Robust väderskyddat hus
- Vätskeinsprutningsregulator (Module B Plus)*
- Elektronisk expansionsventil (ETS6)*
- Anslutna komponenter är utrustade med Schrader-port

**Endast för P02-versionen,*
***endast för P05-modeller*

### 2 – Hantering och förvaring

- Du bör inte öppna förpackningen innan enheten befinner sig på den slutliga installationsplatsen.
- Hantera enheten med försiktighet. Förpackningen kan lyftas med en gaffeltruck eller pallyft. Använd lämplig och säker lyftutrustning.
- Förvara och transportera enheten i upprätt position.
- Förvara enheten i temperaturer på mellan –35 °C och 50 °C.
- Utsätt inte förpackningen för regn eller frätande miljöer.
- Kontrollera att enheten är komplett och oskadad efter uppackningen.

### 3 – Förebyggande åtgärder vid installation

| |
|---|
| Placera aldrig enheten i en omgivning där det finns risk för brand. |
| Placera enheten så att den inte blockerar eller hindrar gångar, dörrar, fönster eller liknande. |
| Överströmningsventil: För modellerna i PED-kat. I och II ska överströmningsventilen monteras på plats under installationen. |

- Kontrollera att det finns tillräckligt utrymme runt enheten för luftcirkulationen och för att öppna dörrarna. Se bild 1 för uppgifter om minsta avstånd till väggarna.
- Installera inte enheten på platser som utsätts för solsken dagligen och/eller under längre perioder.
- Installera inte enheten i aggressiva eller dammiga omgivningar.
- Kontrollera att grunden är plan (mindre än 3° lutning), samt tillräckligt stark och stabil för att bära upp enhetens hela vikt och eliminera vibrationer och störningar.
- Omgivningstemperaturen får aldrig överstiga 50 °C när enheten är ur bruk.
- Kontrollera att strömförsörjningen motsvarar enhetens egenskaper (se namnplattan).
- När du installerar enheter som är avsedda för HFC-köldmedier måste du använda utrustning som är ämnad just för HFC-köldmedier och som aldrig tidigare har använts för CFC- eller HCFC-köldmedier.
- Använd rena och vattenfria koppar-/aluminiumrör godkända för kylning med lämplig tjocklek och silverlegeringsmaterial vid lödning.
- Använd rena och vattenfria system-komponenter.
- Sugledningarna som kopplas till kompressorn måste vara flexibla i 3 dimensioner för att dämpa vibrationer. Rördragningen måste även göras så att oljereturen till kompressorn garanteras och risken för vätskeslag i kompressorn elimineras.
- Optyma luftkylt aggregat är utrustat med en sug- och vätskeventil med Schrader-port för fältservicearbete

### 3.1 – Överströmningsventil

| |
|---|
| För Optyma Plus™ luftkylda aggregat i PED-kat I och II. måste överströmningsventilen monteras (se tekniska data för PED-kategori i Bilaga A). |
| PRV tillhandahålls som reservdel. Se Coolselector2 |

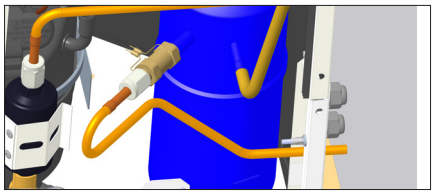
- Överströmningsventilen ska monteras på vätskebehållaren med 3/8 tums NPT-koppling. (Se Coolselector2 för reservdelskod för


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överströmningsventilen). Använd Locatite 554 vid montering av överströmningsventilen.
- Vridmoment: 40Nm (Överskrid inte angivet vridmoment)



- Installatören måste ta reda på vart köldmediet som läckt ska blåsas. Danfoss rekommenderar att köldmediet blåses bort från det luftkylda aggregatet.
- Vi rekommenderar att överströmningsventilen byts ut efter utsläpp eller byte av köldmedium
- Ventilerna ska installeras vertikalt eller horisontellt, men se till att tryckreduceringsventilen monteras ovanför systemets vätskenivå.
- Säkerställ att köldmediet släpps ut i atmosfären på ett säkert sätt.
- I händelse av fara har en extra reservdelssats tagits fram för uppsamling av det utsläppta köldmediet. Satsen ska installeras med korrekt rördragning för att säker avledning av köldmediet ska säkerställas. (Se bild nedan)



- Överströmningsventilen ska inte installeras på serviceventilen.
- Byt ut överströmningsventilen efter rengöring eller spärrning av systemet.
- Löstagbara fogar och ventiler får inte vara åtkomliga för allmänheten. Alla lödfogar ska uppfylla kraven i EN 14276-2, andra permanenta fogar ska uppfylla kraven i EN-16084.

## 4 – Installation

- Installationen som aggregatet monteras i måste överensstämma med direktivet om tryckbärande anordningar 2014/68/EU. Själva kondenseringsenheten är inte en ”enhet” inom ramen för det här direktivet.
- Enheten bör installeras på gummidämpare eller vibrationsdämpare (medföljer ej).
- Flera enheter kan staplas ovanpå varandra.

| Enhet | Maximal stapling |
|---|---|
| Hus 1 (Kodnr 114X31-- eller 114X41--) | 3 |
| Hus 2 (Kodnr 114X32-- eller 114X42--) | 2 |
| Hus 3 (Kodnr 114X33-- eller 114X43--) | 2 |
| Hus 4 (Kodnr 114X34-- eller 114X44--) | 2 |

- Vid stapling måste den översta enheten säkras mot väggen, enligt bild 2.
- Släpp långsamt ut kvävfyllningen genom schraderporten.
- Anslut enheten till systemet så snart du kan för att undvika att oljan kontamineras av luftfuktighet.
- Se till att inget material kommer in i systemet medan du skär till rören. Borra aldrig hål där det inte går att ta bort borrskägg.
- Löd med stor försiktighet och använd den allra senaste tekniken och använd skyddsgas.
- Anslut alla nödvändiga säkerhets- och styrenheter. Om schraderporten används till detta ska du ta bort ventilen som sitter på insidan.
- Vi rekommenderar att sugröret isoleras upp till kompressorinloppet med 19 mm tjock isolering.
- Rörmaterial av koppar ska uppfylla kraven i SS-EN12735-1. Alla rörkopplingar ska uppfylla kraven i SS-EN14276-2
- Vid fältinstallation ska stöd läggas till baserat på storlek och vikt. Rekommenderat största avstånd mellan stöden för rörledningar enligt EN12735-1 och EN12735-2
- Anslutning av rörledningar ska utföras innan ventilerna öppnas så att köldmedium kan flöda mellan kylsystemets delar.

## 5 – Läckavkänning

| | |
|---|---|
| ⚠ | Fyll aldrig kretsen med syre eller torr luft. Detta kan orsaka brand eller explosion. |

- Använd inte färg för att kontrollera efter läckage.
- Kontrollera efter läckage i hela systemet.
- Det maximala provtrycket är 31*) bar.
- Då ett läckage upptäcks ska det repareras och ytterligare en kontroll utföras.

*) *25 bar för OP-.....AJ-.... & OP-.....FH-.... modeller*

## 6 – Vakuumsugning

- Använd aldrig kompressorn för att evakuera systemet.
- Anslut en vakuumpump till både lågtrycks- och högtryckssidorna.
- Sug ner systemet under ett vakuum på 500 µm Hg (0,67 mbar) absolut tryck.
- Använd inte en megohmmeter och tillför ingen ström till kompressorn medan den är under vakuum eftersom det kan leda till skador inuti systemet.

## 7 – Elektriska anslutningar

- Stäng av och isolera huvudströmsmatningen.
- Kontrollera att spänningsmatningen inte kan slås till under installationen.
- Alla elektriska komponenter ska väljas enligt lokala standarder och vara kompatibla med enheten.
- Se kopplingsschemat för uppgifter om elektriska anslutningar.
- Kontrollera att strömförsörjningen motsvarar enhetens egenskaper och att strömförsörjningen är stabil (märkspänning ±10 % och märkfrekvens ±2,5 Hz)
- Dimensionera strömförsörjningskablarna enligt enhetens data för spänning och ström.
- Skydda strömförsörjningen och kontrollera att jordningen är korrekt utförd.
- Kontrollera att strömförsörjningen uppfyller lokala standarder och lagstadgade krav.

- Enheten har en elektronisk regulator. Mer information finns i bruksanvisningen till 118U3808.
- P02-versionsmodeller (OP-xxxxxxxxxP02E) är utrustade med ett elektroniskt kretskort (Module B Plus). Se avsnittet ”Module B Plus – bruksanvisning” i denna användarhandbok.
- Enheten har en huvudbrytare med överlastskydd. Överlastskyddet är förinställt men du bör kontrollera värdet innan du startar enheten. Överlastskyddets värde finns i kopplingsschemat i enhetens främre lucka.
- Enheten har hög- och lågtrycksbrytare som stänger av strömförsörjningen till kompressorn omedelbart om de aktiveras. Parametrarna för hög- och lågtrycksfrånslag är förinställda i styrenheten och anpassade till kompressorn som är installerad i enheten.
- P05-modellerna har också ett fasföljdsrelä som skyddar enheten mot fasförlust/fel fasföljd/asymmetri och under-/överspänning.

För enheter med trefasmatad scrollkompressor (OP-MPXMxxxxxxxxE) måste fassekvensen vara rätt inställd för kompressorns rotationsriktning.
- Fastställ fassekvensen med en fasmätare så att ordningen på ledningsfaserna L1, L2 och L3 blir korrekt.
- Anslut ledningsfaserna L1, L2 och L3 till huvudbrytarens anslutningar T1, T2 respektive T3.

## 8 – Säkerhet

| | |
|---|---|
| ⚠ | Elskåpets dörr ska vara stängd innan den ansluts till strömförsörjningen. |
| | Temperaturen i utloppsröret når upp till 120 °C när enheten är i drift. |
| | Vi rekommenderar att överströmningsventilen installeras inuti enheten och att utsläpp av köldmedium ska ledas direkt ut i atmosfären. |

Smältsäkringen sitter inte i enheten utan i stället används en säkringsadapter.
Enheten har en vätskebehållare med en säkringsadapter med en 3/8" NPT-koppling.
Installatören/slutanvändaren kan välja olika alternativ utifrån SS-EN 378-2: 2016, punkt 6.2.2.3
- Den enhet/installation som det luftkylda aggregatet ska monteras/byggas in i måste uppfylla kraven i tryckkärlsdirektivet (PED).
- Var uppmärksam på mycket varma och kalla komponenter.
- Var uppmärksam på rörliga komponenter. Strömtillförseln ska vara frånkopplad vid service.
- Kompressorn har ett internt överbelastningsskydd. Den skyddar kompressorn mot trycket högre än 32 bar.
- Ventiler och löstagbara fogar får inte finnas i områden som är tillgängliga för allmänheten, förutom när de överensstämmer med SS-EN 16084
- Köldmedierörledningar ska skyddas eller inneslutas för att skador ska undvikas.
- Fältrörledningar ska installeras i korrosions- och saltfria miljöer för att korrosion i koppar-/aluminiumrörledningar ska undvikas.
- Vid brand ökar trycket på grund av ökad temperatur vid behållaren. Därför är det mycket viktigt att en överströmningsventil installeras.

## 9 – Fylla på systemet

- Starta aldrig kompressorn under vakuum. Kompressorn ska vara avstängd.
- Använd bara det köldmedium som enheten är konstruerad för.

- Fyll på flytande köldmedium i kondensorn eller köldmediebehållaren. Systemet ska fyllas långsamt till 4–5 bar för R404A/R448A/R449A/R407A/R407F/R452A och cirka 2 bar för R134a, R513A.
- Fortsätt fyllningen tills installationen har uppnått ett stabilt nominellt tillstånd under drift.
- Låt aldrig påfyllningscylindern sitta kvar vid kretsen.
- Sug-, vätske- och mottagar-Rotolock-ventiler finns vid Schrader-porten för servicearbete som gasladdning och tryckmätning.

## 10 – Ställa in den elektroniska styrenheten

| | |
|---|---|
| ⚠ | Ändra styrenhetens parameter o37 till 1 vid eftermontering av SPPR (relä för försörjningsövervakning). Om du lägger till tillvalet SPPR för att skydda kompressorn ska inställning o37 ändras från 0 till 1. |
| | För P02-versionsmodeller (OP-xxxxxxxxxP02E): om o30-värdet är 19=R404A eller 40=R448A eller 41=R449A i regulatorn. |

- Enheten har en elektronisk styrenhet som är fabriksprogrammerad med parametrar för den aktuella enheten. Se bruksanvisningen 118U3808 för mer information.
- Den elektroniska styrenheten visar temperaturvärdet för sugtrycket i °C som standard. Om du vill visa temperaturvärdet för kondenseringstrycket trycker du på den nedre knappen (bild 3).

Den elektroniska regulatorn är förinställd från fabriken för R404A, R449A, R452A och R134a beroende på kompressormodell som installerats och tillämpning (se bilaga i installationshandboken för Optyma Controller). Om ett annat köldmedium används måste köldmedieinställningen ändras. Parameter r12 måste ställas in på 0 först (programvarans huvudbrytare = av).

- Tryck på den övre knappen i några sekunder. Kolumnen med parameterkoderna visas.
- Tryck på den övre eller nedre knappen för att hitta parameterkoden o30.
- Tryck på mittenknappen tills värdet för den här parametern visas.
- Tryck på den övre eller nedre knappen för att välja det nya värdet. 2 = R22, 3 = R134a, 36 = R513A, 17 = R507, 19 = R404A, 20 = R407C, 21 = R407A, 37 = R407F, 40 = R448A, 41 = R449A, 42 = R452A.
- Tryck på mittenknappen för att bekräfta det valda värdet.
- Tryck på den övre eller undre knappen för att hitta parameterkoden r84.
- Tryck på knappen i mitten tills parametervärdet visas som 125
- Tryck på den övre knappen för att välja ett nytt värde: 130.

## 11 – Verifiering före driftsättning

| | |
|---|---|
| ⚠ | Använd säkerhetsenheter som t.ex. tryckbrytare och mekaniska säkerhetsventiler som överensstämmer med både allmänna och lokala föreskrifter och säkerhetsstandarder. Se till att de fungerar och är ordentligt installerade. |
| | Kontrollera att tryckbrytarnas och säkerhetsventilernas inställningar inte överstiger det maximala drifttrycket för någon komponent i systemet. |

- Kontrollera att alla elektriska anslutningar inne i det luftkylda aggregatet är ordentligt anslutna eftersom de kan ha lossnat under transporten.
- Om en vevhusvärmare behövs måste enheten startas minst 12 timmar före första uppstart och start efter långvarig avstängning för vevhusvärmare av bältestyp.
- Enheten har en huvudbrytare med överlastskydd. Överlastskyddet är förinställt från fabrik, men du bör kontrollera värdet innan du tar enheten i drift. Överlastskyddets värde hittar du på kopplingsschemat på enhetens främre lucka.
- Kontrollera om givaren för hetgastemperatur sitter ordentligt fast och har ordentlig kontakt med hetgaspumpen.
- Tryckfall i sug- och vätskeledningsrören måste utvärderas efter förångarens placering och avstånd (se Coolselector2).

## 12 – Start

- Enheten får bara startas om köldmedium har fyllts på i den.
- Alla serviceventiler måste vara öppna.
- Rotolock-ventilen på köldmediebehållare måste vridas 1 varv i stängningsriktningen för att få rätt kondenseringstryck till trycktransmittern
- Kontrollera att enhetens och elnätets spänningar stämmer överens.
- Kontrollera att vevhusvärmaren arbetar.
- Kontrollera att fläkten kan rotera fritt.
- Kontrollera att skyddsarket har tagits bort från kondenseringsenhetens baksida.
- Balansera högtrycket och lågtrycket.
- Starta enheten. Den måste starta omedelbart. Om kompressorn inte startar ska du kontrollera anslutningarna och spänningen på terminalerna.
- Eventuell backrotation hos en trefas scrollkompressor kan identifieras på följande sätt: kompressorn bygger inte upp tryck, den avger onormalt högt buller och har en onormalt låg effektförbrukning. P05-modellerna har ett fasvändningsrelä och vid fel fasföljd kan kompressorn inte bygga upp trycket och starta. Om detta inträffar ska enheten stängas av omedelbart varefter faserna ska anslutas till korrekt anslutningar.
- Om rotationsriktningen är korrekt ska lågtrycksindikeringen på styrenheten (eller lågtrycksmätaren) visa ett sjunkande tryck och högtrycksindikatorn (eller högtrycksmätaren) ska visa ett ökande tryck.

## 13 – Kontroll medan enheten är i drift

- Kontrollera fläktens rotationsriktning. Luften måste flöda från kondenseringsenheten och mot fläkten.
- Kontrollera aktuell strömförbrukning och spänning.
- Kontrollera suggasöverhettningen för att minska risken för vätskeslag.
- Om kompressorn har ett synglas ska du kontrollera oljenivån vid start och under drift. Oljenivån ska alltid vara synlig.
- Respektera alla driftgränsvärden.
- Kontrollera att inga rör vibrerar på ett onormalt sätt. Om de rör sig mer än 1,5 mm måste du åtgärda problemet genom att fästa t.ex. rörkonsoler.
- När det behövs kan mer flytande köldmedium fyllas på på lågtryckssidan så långt från kompressorn som möjligt. Kompressorn måste vara i drift under den här processen.
- För P02 versionsmodeller (OP-xxxxxxxxxP02E):
- Kontrollera synglaset så att det inte finns några bubblor i vätskeledningen för att säkerställa korrekt vätskeinsprutning.
- När o30 är inställd på 19= R404A eller 40=R448A eller 41=R449A och avläsning U26 > 125 i regulatorn ska du kontrollera att vätskeinsprutningen är PÅ. Ekonomiserns inloppsrör ska vara kallt.
- Överbelasta inte systemet.
- Följ lokala föreskrifter beträffande återställning av köldmediet från enheten.
- Släpp aldrig ut köldmedium i atmosfären.
- Innan du lämnar installationsplatsen ska du utföra en allmän inspektion av installationen för att kontrollera renlighet, ljudnivå och läckage.
- Notera vilken typ av köldmedium som används och hur mycket samt driftsförhållanden, så att du kan använda detta som referens för framtida inspektioner.

## 14 – Körning utan styrenhet i nödläge

Om styrenheten slutar fungera kan kondenseringsenheten fortfarande köras om styrenhetens standardanslutning (bild 4) har ändrats till en tillfällig anslutning (bild 5) enligt beskrivningen nedan.

| | |
|---|---|
| ⚠ | Den här modifieringen får bara utföras av behörig elektriker. Följ alltid gällande lagar och bestämmelser i det aktuella landet. |
| | Koppla från kondenseringsenheten från strömförsörjningen (stäng av den med huvudbrytaren) |

- Rumstermostatens kontakt måste kunna klara 250 V AC.
- Ta bort kabel 22 (säkerhetsingång DI3) och kabel 24 (rumstermostat DI1) och koppla samman dem med en isolerad anslutningsbrygga 250 V AC, 10 mm².
- Ta bort kabel 25 (rumstermostat DI1) och kabel 11 (kompressortillförsel) och koppla ihop dem med en isolerad 250 V AC-terminalbrygga på 10 mm².
- Ta bort kabel 6 och koppla ihop den med terminalbryggan för kabel 11 och 25. En fläkttryckvakt eller fläkthastighetsregulator kan seriekopplas till kabel 6.
- Ta bort kabel 14 (vevhusvärmare) och koppla ihop den med kontaktorterminal 22 för kompressorn.
- Ta bort kabel 12 (matning för vevhusvärmare), förläng kabeln med hjälp av en 250 V AC-terminalbrygga på 10 mm² och en brun kabel på 1,0 mm² och koppla ihop den med


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kontaktorterminal 21 för kompressorn.
- Ta bort det stora anslutningsblocket från styrenhetens anslutningar 10 till 19.
- Anslut kondenseringsenheten till strömförsörjningen (slå till huvudbrytaren).

## 15 – Underhåll

| | |
|---|---|
| ⚠ | Stäng alltid av enheten med huvudbrytaren innan du öppnar fläktdörren/fläktdörrarna. |
| | Det interna trycket och yttemperaturen utgör en fara och kan orsaka permanenta skador. Underhållsarbetare och installatörer besitter den kunskap som krävs och har tillgång till lämpliga verktyg. Rörens temperatur kan överstiga 100 °C och kan orsaka allvarliga brännskador. |
| | Rutinmässiga serviceinspektioner ska utföras för att systemet ska fungera pålitligt och enligt lokala föreskrifter. |

För att förhindra att systemrelaterade problem med kompressorn uppstår rekommenderar vi att följande rutinmässiga underhållsarbete utförs:
- Kontrollera att säkerhetsenheterna fungerar och är korrekt inställda.
- Kontrollera att systemet är tätt och att det inte läcker.
- Kontrollera kompressorns strömförbrukning.
- Bekräfta att systemet fungerar på ett sätt som är konsekvent med observationer från tidigare underhållsarbete och nuvarande miljöförhållanden.
- Kontrollera att alla elektriska anslutningar sitter ordentligt.
- Håll kompressorn ren och kontrollera att det inte finns någon rost eller oxidering på kompressorns hölje, rör och elektriska anslutningar.

Kondenseringsenheten måste kontrolleras minst en gång om året och rengöras vid behov. Åtkomst till kondenseringsenhetens innerutrymmen sker genom fläktluckan. Mikrokanalens kondensor tenderar att ackumulera smuts på utsidan vilket gör dem lättare att rengöra än kondensorer med flänsar och rör.

- Stäng av enheten med huvudbrytaren innan du öppnar fläktdörren.
- Ta bort smuts, löv, fibrer osv. med en dammsugare som har en borste eller något annat mjukt verktyg. Du kan även blåsa tryckluft igenom spolen från insidan och utåt, och borsta av med en mjuk borste. Använd inte stålborste. Slå inte och skrapa inte spolen med sugröret eller luftmunstycket.
- Innan du stänger fläktluckan ska du ställa in fläktbladet i ett säkert läge så att luckan inte slår emot fläkten.

Om köldmediesystemet har öppnats måste systemet rensas med torr luft eller kväve för att få bort fukt, varefter ett nytt torkfilter ska monteras. Om köldmediet behöver tappas av får inget köldmedium läcka ut i omgivningarna.

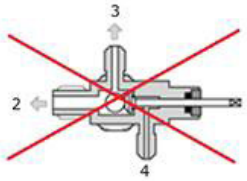



**Fig A:** Helt öppet tillstånd, port 2 och 3 är helt öppna och port 4 är helt stängd

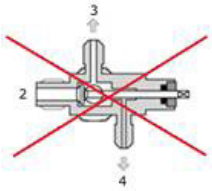



**Fig B:** Helt stängt tillstånd, port 3 och 4 är delvis öppna och port 2 är helt stängd

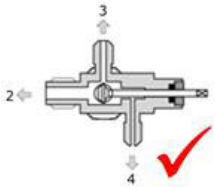



**Fig C:** Delvis öppet tillstånd (5,5 varv medurs från helt öppet läge. Port 2, 3, 4 är helt öppna).

## 16 – Deklaration om överensstämmelse

- **Pressure Equipment Directive 2014/68/EU SS-EN 378-2:2016** – kylningssystem och värmepumpar - säkerhets- och miljökrav-Del 2: Utformning, konstruktion, provning, märkning och dokumentation.

**Lågspänningsdirektivet 2014/35/EU** SS-EN 60335-1:2012 + A11:2014 – Elektriska hushållsapparater och liknande bruksföremål - Säkerhet - Del 1: Allmänna krav för alla ovannämnda luftkylda aggregat.

**Ekodesigndirektivet 2009/125/EG** som utgör ett ramverk som fastställer ekodesignkrav för energirelaterade produkter.

FÖRORDNING (EU) 2015/1095 där ekodesigndirektivet 2009/125/EG implementeras avseende ekodesignkrav för kylskåp och frysar för professionellt bruk, snabbnedkylningsskåp, luftkylda aggregat och processkylaggregat.

- Luftkylda aggregat mäts i enlighet med standarden SS- EN 13771-2:2017 – Kylkompressorer och kondensorenheter - Prestandaprovning och provningsmetoder - Del 2: Kondensorenheter

## 17 – Garanti

Skicka alltid med modellnumret och serienumret med alla krav som anmäls med avseende på produkten.

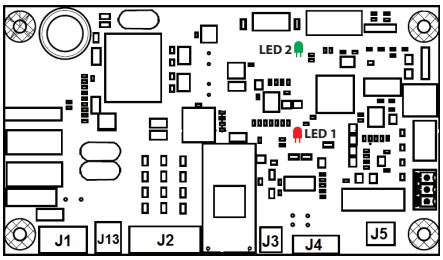
Produktgarantin kanske inte gäller i följande fall:
- Namnplattan saknas.
- Ändringar har gjorts på utsidan, t.ex. borrning, svetsning, trasiga fötter och märken.
- Kompressorn är öppnad eller skickas tillbaka oförseglad.
- Det finns rost, vatten eller läckagedetekteringsfärg inuti kompressorn.
- Ett köldmedium eller smörjmedel som inte godkänts av Danfoss har använts.
- De rekommenderade instruktionerna för installation, användning eller underhåll har inte följts.
- Användning i mobila applikationer.
- Användning i explosiva miljöer.
- Modellnumret eller serienumret har inte skickats med kravet.

## 18 – Kassering

Danfoss rekommenderar att kondenseringsenheterna och oljan återvinns av ett lämpligt företag inom deras område.

19 - Module B Plus – bruksanvisning

Module B Plus är ett elektroniskt kretskort som används i P02-versionsmodeller för automatisk vätskeinsprutning i en scrollkompressoruppsättning med en elektronisk expansionsventil.




*Module B Plus*

Module B Plus täcks av ett beröringsskydd som visas i bild 6.

⚠ Ta inte bort beröringsskyddet om det inte behövs. Stäng av enheten innan du tar bort det här skyddet.

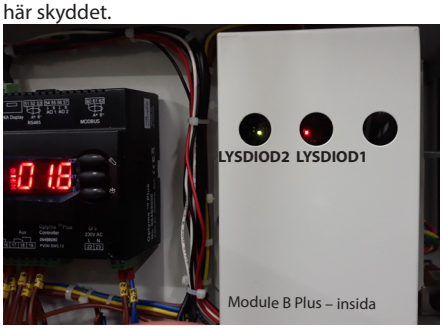



*Bild 6*

**Applikation**

Module B Plus styr vätskeinsprutningen och övervakar även följande parametrar: hetgastemperatur, fasföljd och fasfel.

**Funktionsbeskrivning**

- Vätskeinsprutning
- Module B Plus kan reglera hetgastemperaturen. Standardinställningspunkten är 125 °C. Denna temperatur krävs för att det luftkylda aggregatet ska kunna köras inom ett säkert område.

⚠ Ändra inte denna inställningspunkt.

- När kompressorn stoppas stängs vätskeinsprutningsventilen under sex sekunder
- Överhettningsskydd för hetgastemperatur
  - Module B Plus hetgastemperaturgivare kan känna av hetgastemperaturer inom området -50 till 180 °C, mätnoggrannhet ±0,5 °C. Hetgastemperaturgivaren är monterad 150 mm från kompressorns utloppsport.
  - Om hetgastemperaturen är högre än tröskelpunkten för överhettning (inställningspunkt + 10 K) inom en sekund öppnas larmreläet (J5). Denna status kallas DGT statisk överhettning med hänvisning till tabell 1. Om hetgastemperaturen är lägre än återställningspunkten (inställningspunkt -15°C) kontinuerligt under fem minuter stängs larmreläet (J5). Denna fem minuters fördröjningsstatus kallas DGT återställningsfördröjning.
  - Om hetgastemperaturen blir för hög fler än fem gånger under en timme låses larmreläet (J5) i det öppna läget och kan endast återställas genom att strömförsörjningen till Module B Plus återställs manuellt (stäng av enheten, vänta en stund och sätt sedan på den igen). Denna status kallas DGT överhettningslås, se tabell 1 för felidentifiering.
  - Om det blir något fel på hetgastemperaturgivaren, t.ex. givare öppen, kortslutning i givare eller utanför område, låses larmreläet (J5) också i det öppna läget. Se tabell 1 för felidentifiering.
- Fasskydd
- Fasföljd och detektering av faser som saknas genomförs bara varje gång kompressorn sätts på. Om en felaktig fasstatus av typen fasförlust eller fasomkastning detekteras öppnas larmreläet (J5) inom 4,5 till 5 sekunder och låses i det öppna läget. Detta låsta öppna läge kan endast återställas genom att strömförsörjningen till Module B Plus återställs manuellt. Se tabell 1 för felidentifiering.
- Användargränssnitt
- När Module B Plus är igång lyser LYSDIOD 1 kontinuerligt med ett fast rött sken. När modulen är avstängd är LYSDIOD 1 släckt. Om Module B Plus är igång och inget fel förekommer lyser LYSDIOD 2 kontinuerligt med ett fast grönt sken. I bild 6 kan du se var LYSDIOD 1 och LYSDIOD 2 är placerade på Module B Plus.
- Om Module B Plus är igång och detekterar ett fel blinkar LYSDIOD 2 gult och rött en sekund i taget. I tabell 1 finns en detaljerad blinkkod.

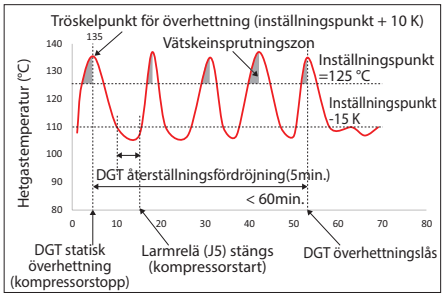
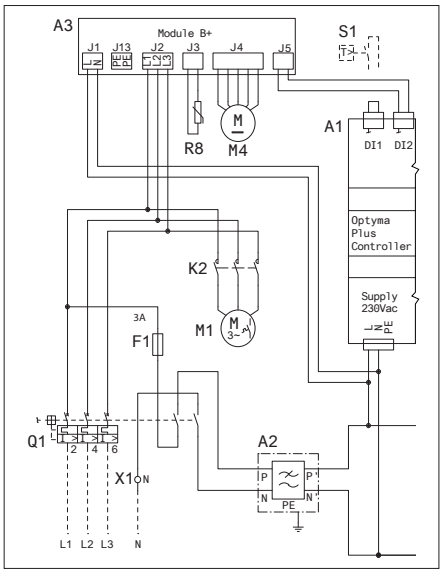



*Bild 7*

- Module B Plus kommunikation med Optyma Plus Controller.
- När larmreläet (J5) är öppet kommuniceras signalen till Optyma Plus Controllers digitala ingång 2 (DI2), vilket utlöser säkerhetslarmet (A97) i Optyma Plus Controller. Strömtillförseln till kompressorn stoppas då omedelbart.




*Kopplingsschema för Module B Plus*

| Kategori | Antal blinkningar i gult | Antal blinkningar i rött | Fel | Beskrivning | Åtgärd |
|---|---|---|---|---|---|
| Hetgastemperatur | 1 | 1 | DGT statisk överhettning/DGT återställningsfördröjning | Hetgastemperaturen är högre än tröskelpunkten för kompressorstopp | Kontrollera om säkerhetslarmet (A97) visas på Optyma Controller. Om så är fallet väntar du tills felet åtgärdas automatiskt. Om felet förekommer ofta ska du kontrollera om enheten körs inom det rekommenderade området. |
| | | 2 | DGT överhettningslås | DGT statisk överhettning inträffar fem gånger inom en timme | Återställ strömtillförseln till Module B Plus manuellt (stäng av enheten, vänta en stund och sätt sedan på den igen). |
| | | 3 | DGT utanför området | DGT är utanför det normala området (-50– 180 °C) | Kontrollera om givaren för hetgastemperatur är korrekt monterad på hetgasledningen. Kontrollera hetgastemperaturen på Optyma Plus Controller-parametern U27 (den ska vara inom området -50– 180 °C). |
| | | 4 | DGT givare öppen/DGT kortslutning i givare | Givaren för hetgastemperatur är öppen/kortsluten | Kontrollera givaren för hetgastemperatur och anslutningen. |
| Trefas | 2 | 1 | Fasförlust | Enfassignalförlust | Kontrollera trefasströmtillförseln (J2) till Module B Plus för att se om någon av de tre faserna saknas. Om så är fallet ska du ansluta strömtillförseln på ett korrekt sätt och återställa Module B Plus manuellt (stäng av enheten, vänta en stund och sätt sedan på den igen). |
| | | 2 | Fasomkastning | Felaktig fasanslutning | Kontrollera trefasströmtillförseln (J2) till Module B Plus för att se om de tre faserna har rätt följd. Om så inte är fallet ska du ansluta strömtillförseln på ett korrekt sätt och återställa Module B Plus manuellt (stäng av enheten, vänta en stund och sätt sedan på den igen). |

*Tabell 1: Blinkkoder vid fel (LYSDIOD 2 gul-röd blinkkod)*


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ENGINEERING
**TOMORROW**

**Instrukcje (Polski)**

# Optyma™ Plus
## OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM

| |
|---|
| **Agregaty skraplające mogą być instalowane i serwisowane wyłącznie przez wykwalifikowany personel. Należy postępować zgodnie z poniższymi instrukcjami i zasadami dobrej praktyki inżynierskiej w chłodnictwie, odnoszącymi się do instalacji, oddawania do użytku, konserwacji i serwisowania.** |
| **Ten produkt nie podlega brytyjskim przepisom PSTI, ponieważ jest przeznaczony do zakupu i wykorzystania wyłącznie przez profesjonalistów posiadających niezbędną wiedzę oraz kwalifikacje. Niewłaściwe użycie lub nieprawidłowa obsługa mogą prowadzić do nieprzewidzianych konsekwencji. Nabywca lub użytkownik tego produktu przyjmuje do wiadomości, że jest on przeznaczony wyłącznie do użytku profesjonalnego. Firma Danfoss nie ponosi odpowiedzialności za szkody, obrażenia ciała ani niepożądane konsekwencje („szkody") wynikające z nieprawidłowego lub niewłaściwego użytkowania produktu, a użytkownik zgadza się zwolnić firmę Danfoss z odpowiedzialności za wszelkie takie szkody wynikające z nieprawidłowego lub niewłaściwego użytkowania produktu.** |
| Agregat skraplający należy używać wyłącznie do celów zgodnych z przeznaczeniem oraz w zakresie przewidzianych dla niego zastosowań i zgodnie z instrukcją. Czynnik chłodniczy należy stosować zgodnie ze specyfikacją danego modelu. |
| Niezależnie od okoliczności należy bezwzględnie przestrzegać normy EN378 i innych obowiązujących przepisów lokalnych. |
| Dostarczany agregat skraplający jest napełniony azotem (o ciśnieniu 1 bara), dlatego nie należy go podłączać w takim stanie; należy zapoznać się z dodatkowymi informacjami podanymi w części «montaż». |
| Zachować ostrożność podczas transportu agregatu skraplającego i nie odchylać go od pionu (maksymalne dopuszczalne odchylenie od pionu: 15°). |
| **Dla modeli kat. I i II PED:** Zawór bezpieczeństwa PRV należy zamontować w układzie chłodniczym podczas instalacji. Zawór PRV powinien być zamontowany na zbiorniku. |

**Obowiązujące normy i dyrektywy**
**EN 378-2:2016:** Instalacje chłodnicze i pompy ciepła – Wymagania dotyczące bezpieczeństwa i ochrony środowiska
**EN 60335-1:** Elektryczny sprzęt do użytku domowego i podobnego – Bezpieczeństwo użytkowania – Część 1: Wymagania ogólne
**Dyrektywa niskonapięciowa nr 2014/35/UE**
**Dyrektywa maszynowa nr 2006/42/WE**
**Dyrektywa ciśnieniowa (PED) nr 2014/68/UE**
**Dyrektywa RoHS 2011/65/EU**
**Dyrektywa WEEE 2012/19/EU**
(Inne obowiązujące normy lokalne)

### 1 – Wprowadzenie

Niniejsze instrukcje odnoszą się do agregatów skraplających Optyma™ Plus OP-MPBM, OP-MPXM, OP-MPGM, OP-LPQM i OP-LPOM stosowanych w układach chłodniczych. Zawierają podstawowe informacje na temat bezpieczeństwa i prawidłowego użytkowania tego produktu.

Skraplarki składają się z następujących elementów:
- Mikrokanałowy wymiennik ciepła
- Sprężarka tłokowa lub spiralna
- Zbiornik czynnika z zaworem odcinającym
- Zawory kulowe
- Wziernik
- Przełączniki wysokiego i niskiego ciśnienia
- Filtr odwadniacz
- Regulator elektroniczny
- Bezpiecznik główny (wyłącznik główny z zabezpieczeniem przeciążeniowym)
- Kondensatory wentylatora i sprężarki
- Stycznik sprężarki
- Przekaźnik monitorowania zasilania**
- Solidna obudowa chroniąca przed czynnikami atmosferycznymi
- Sterownik wtrysku cieczy (moduł B Plus)*
- Elektroniczny zawór rozprężny (ETS6)*
- *Podłączone komponenty są wyposażone w przyłącze Schradera*

**Tylko dla wersji P02,*
***tylko dla modeli P05*

### 2 – Przenoszenie i magazynowanie

- Zaleca się nie otwierać opakowania przed umieszczeniem urządzenia w docelowym miejscu instalacji.
- Zachowywać ostrożność podczas przenoszenia. Opakowanie jest przystosowane do przenoszenia za pomocą wózka widłowego lub wózka ręcznego do palet. Używać wyłącznie przystosowanego i bezpiecznego sprzętu do podnoszenia.
- Magazynować i transportować urządzenie w pozycji pionowej.
- Magazynować urządzenie w temp. od -35°C do 50°C.
- Nie narażać urządzenia ani jego opakowania na opady deszczu czy też warunki atmosferyczne powodujące korozję.
- Po rozpakowaniu sprawdzić, czy urządzenie jest kompletne i nieuszkodzone.

### 3 – Środki ostrożności podczas montażu

| | |
|---|---|
| | Nigdy nie używać urządzenia w atmosferze łatwopalnej. |
| | Urządzenie należy usytuować w taki sposób, aby nie utrudniało poruszania się i nie blokowało przejść roboczych, drzwi oraz nie zasłaniało okien itp. |
| | PRV: W przypadku modeli kat. I i II PED zawór PRV należy montować podczas instalacji. |

- Zapewnić odpowiednią przestrzeń wokół urządzenia dla umożliwienia obiegu powietrza i otwierania drzwiczek. Minimalne odległości od ścian przedstawiono na rys. 1.
- Unikać montażu urządzenia w miejscach, które są przez dłuższy czas wystawione na bezpośrednie działanie promieni słonecznych.
- Unikać montażu urządzenia w miejscach narażonych na działanie kurzu i innych niebezpiecznych czynników otoczenia.
- Wybrać podłoże o poziomej nawierzchni (nachylenie poniżej 3°), odpowiednio mocne i stabilne, aby mogło podtrzymywać całą masę urządzenia oraz eliminować drgania i zakłócenia.
- Temperatura otoczenia urządzenia nie może przekraczać 50°C.
- Upewnić się, że napięcie zasilania odpowiada charakterystyce urządzenia (patrz tabliczka znamionowa).
- Podczas instalacji urządzeń HFC stosować sprzęt przeznaczony specjalnie do czynników chłodniczych HFC, który nigdy wcześniej nie był używany do czynników chłodniczych CFC ani HCFC.
- Stosować tylko czyste i osuszone rury miedziane/aluminiowe o odpowiedniej grubości przeznaczone do systemów chłodzenia. Połączenia wykonywać z lutu z dodatkiem srebra.
- Używać czystych i osuszonych podzespołów układu.
- Rurociąg ssawny podłączony do sprężarki musi być elastyczny w 3 wymiarach, aby tłumić drgania. Dodatkowo przewody rurowe należy wykonać w taki sposób, aby umożliwić powrót oleju sprężarki i wyeliminować ryzyko przemieszczenia płynu do sprężarki.
- W agregatach skraplających Optyma zawory serwisowe ssawny i cieczy są wyposażone w przyłącze Schradera umożliwiającym serwisowanie w terenie.

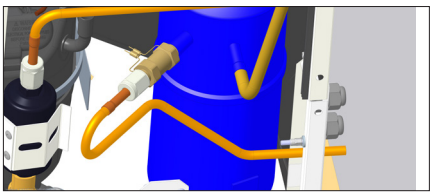
### 3.1 – Zawór PRV

| | |
|---|---|
| ⚠ | W przypadku Optyma™ Plus, agregatów skraplających należących do kategorii PED I i II, zawór PRV należy zamontować (patrz Dane techniczne dla kategorii PED w załączniku A). |
| | PRV jest dostarczany jako część zamienna. Zobacz Coolselector2 |

- PRV do montażu na zbiorniku cieczy, złącze 3/8" NPT. (Użyć Coolselector2 w celu sprawdzenia kodu produktowego PRV). Do montażu PRV użyć Locatite 554.
- Moment dokręcania: 40Nm (nie przekraczać podanego momentu dokręcania)



- Instalator musi zadbać o wydmuchanie wyciekającego czynnika chłodniczego z odpowiednich miejsc. Firma Danfoss zaleca opróżnienie agregatu skraplającego z czynnika chłodniczego.
- Zaleca się wymianę PRV po opróżnieniu agregatu oraz przy wymianie czynnika chłodniczego
- Zawory muszą być montowane pionowo lub poziomo, przy czym należy upewnić się, że zawór PRV jest montowany powyżej poziomu cieczy w układzie.
- Upewnić się, że czynnik chłodniczy jest bezpiecznie uwalniany bezpośrednio do atmosfery.
- W przypadku zagrożenia opracowano dodatkowy zestaw zapasowy do zebrania uwolnionego czynnika chłodniczego. Przy instalacji zestawu należy zadbać o odpowiednie poprowadzenie rur zapewniające bezpieczne odprowadzenie czynnika chłodniczego. (Patrz rysunek poniżej)



- Zawór PRV nie powinien być montowany na zaworze serwisowym.
- Wymienić zawór PRV po wyczyszczeniu lub zablokowaniu systemu.
- Połączenia rozłączne i zawory nie powinny być ogólnie dostępne. Wszystkie połączenia lutowane powinny być zgodne z normą EN 14276-2, a pozostałe trwałe połączenia powinny być zgodne z normą EN-16084.

### 4 – Montaż

- Instalacja, do której ma zostać podłączony agregat skraplający, musi być zgodna z wymogami dyrektywy ciśnieniowej (PED) 2014/68/UE. W świetle tej dyrektywy opisywane agregaty skraplającei nie stanowią samodzielnego urządzenia.
- Zaleca się montować agregat skraplający na gumowych tulejach lub tłumikach drgań (nie dołączono do zestawu).
- Istnieje możliwość montażu spiętrzonego, jednego urządzenia na drugim.

| Jednostka | Maks. ilość spiętrzonych urządzeń |
|---|---|
| Obudowa 1 (Nr kodowy 114X31-- lub 114X41--) | 3 |
| Obudowa 2 (Nr kodowy 114X32-- lub 114X42--) | 2 |
| Obudowa 3 (Nr kodowy 114X33-- lub 114X43--) | 2 |
| Obudowa 4 (Nr kodowy 114X34-- lub 114X44--) | 2 |

- W przypadku montażu spiętrzonego szczytowe urządzenie musi być zamontowane do ściany, jak przedstawiono na rys. 2.
- Powoli usunąć azot przez zawór Schradera.
- Jak najszybciej podłączyć urządzenie do układu, aby uniknąć zanieczyszczenia oleju wilgocią z otoczenia.
- Nie dopuścić do przedostania się materiału do układu podczas cięcia rur. Nigdy nie wiercić otworów w przypadku braku możliwości wyjęcia zadziorów.
- Lutować z zachowaniem szczególnej ostrożności, stosując najnowocześniejsze techniki oraz przepuszczając azot przez przewody rurowe.
- Podłączyć wymagane urządzenia bezpieczeństwa i sterowania. W przypadku używania zaworu Schradera wymontować zawór wewnętrzny.
- Zaleca się zaizolować rurę ssawną dochodzącą do wlotu sprężarki za pomocą izolacji o grubości 19 mm.
- Rury miedziane powinny być wykonane z materiału zgodnego z normą EN12735-1. Wszystkie złącza rur powinny być zgodne z normą EN14276-2
- W przypadku złożonego montażu, należy dobrać wspornik odpowiedni do rozmiaru i masy instalacji. Zalecane maksymalne odstępy między wspornikami rur podano w normach EN12735-1 i EN12735-2.
- Przed otwarciem zaworów należy wykonać wszystkie połączenia rur, aby umożliwić przepływ czynnika chłodniczego między częściami układu chłodniczego.

### 5 – Wykrywanie nieszczelności

| | |
|---|---|
| ⚠ | Nigdy nie wykorzystywać do próby ciśnieniowej czystego tlenu lub powietrza. Może to spowodować pożar lub eksplozję. |

- Nie używać barwników do wykrywania nieszczelności.
- Przeprowadzić próbę szczelności na kompletnym układzie.
- Maksymalne ciśnienie próbne wynosi 31*) bary.
- Po wykryciu nieszczelności należy ją usunąć i powtórzyć próbę.

*) *25 bar dla modeli OP-.....AJ.... & OP-.....FH....*

### 6 – Osuszanie próżniowe

- Nigdy nie używać sprężarki do usuwania gazu z układu.
- Podłączyć pompę próżniową do stron niskiego i wysokiego ciśnienia.
- Obciążyć układ podciśnieniem bezwzględnym 500 µm Hg (0,67 mbar).
- Nie używać megaomomierza ani nie podłączać sprężarki do zasilania podczas obciążenia podciśnieniem, ponieważ mogłoby to spowodować wewnętrzne uszkodzenie.

### 7 – Podłączenie podzespołów elektrycznych

- Wyłączyć i odizolować główne źródło zasilania.
- Upewnić się, że zasilanie nie będzie mogło zostać przypadkowo włączone podczas montażu.
- Wszystkie podzespoły elektryczne należy dobierać zgodnie z normami lokalnymi i wymogami urządzenia.
- Szczegółowe informacje dotyczące połączeń elektrycznych zamieszczono na schemacie okablowania.
- Upewnić się, że napięcie zasilania odpowiada charakterystyce urządzenia i jest stabilne (napięcie znamionowe ±10% i częstotliwość znamionowa ±2,5 Hz).
- Przekroje przewodów zasilających należy dobrać zgodnie z parametrami napięcia i prądu wymaganymi przez urządzenie.
- Zabezpieczyć zasilanie i zapewnić prawidłowe uziemienie.
- Zasilanie należy doprowadzić zgodnie z obowiązującymi lokalnie normami i przepisami prawa.
- Agregat jest wyposażony w sterownik elektroniczny. Szczegółowe informacje można znaleźć w instrukcji 118U3808.
- Modele w wersji P02 (OP-xxxxxxxxxP02E) są wyposażone w elektroniczną płytkę drukowaną (moduł B Plus). Patrz rozdział „Podręcznik użytkownika modułu B Plus" w niniejszej instrukcji.
- Urządzenie jest wyposażone w wyłącznik główny z zabezpieczeniem przeciążeniowym. Zabezpieczenie przeciążeniowe zostało ustawione fabrycznie, ale zaleca się sprawdzić jego nastawę przed uruchomieniem urządzenia. Wartość nastawy zabezpieczenia przeciążeniowego można odczytać ze schematu połączeń elektrycznych znajdującego się na przednich drzwiczkach urządzenia.
- Urządzenie jest wyposażone w przełączniki wysokiego i niskiego ciśnienia, które w przypadku uaktywnienia bezpośrednio odcinają zasilanie od sprężarki. Parametry odcięcia zasilania przy wysokim i niskim ciśnieniu zostały ustawione w regulatorze, stosownie do sprężarki zastosowanej w urządzeniu.
- Modele P05 są również wyposażone w przekaźnik kolejności faz, który chroni urządzenie przed utratą / sekwencją / asymetrią faz oraz zbyt niskim / wysokim napięciem.

W przypadku urządzeń z 3-fazową sprężarką spiralną (OP-MPXMxxxxxxxxE) należy przestrzegać ustalonej kolejności faz dla zapewnienia odpowiedniego kierunku obrotów sprężarki.

- Za pomocą czujnika kolejności faz określić kolejność faz L1, L2 i L3.
- Podłączyć przewody faz L1, L2 i L3 do odpowiednich zacisków wyłącznika (odpowiednio T1, T2 i T3).

### 8 – Bezpieczeństwo

| | |
|---|---|
| ⚠ | Zamknąć drzwiczki skrzynki elektrycznej przed podłączeniem zasilania. |
| | W czasie pracy urządzenia temperatura króćca tłocznego wzrośnie do 120°C. |
| | Zaleca się zainstalowanie zaworu PRV wewnątrz urządzenia i umożliwiać wypuszczenie czynnika chłodniczego bezpośrednio do atmosfery. |

Wtyczka bezpiecznikowa nie jest dostępna w urządzeniu, jest zastąpiona wtyczką adaptera.
Urządzenie wyposażone jest w zbiornik cieczy z wtyczką adaptera ze złączem 3/8" NPT. Instalator/ użytkownik końcowy może wybrać różne opcje wymienione w EN378-2: 2016 Artykuł § 6.2.2.3

- Urządzenie/instalacja, w której zamontowany/ zintegrowany jest agregat skraplający, musi być zgodna z PED.
- Uważać na bardzo gorące i zimne elementy.
- Uważać na elementy będące w ruchu. Podczas serwisowania należy odłączyć zasilanie elektryczne.
- Sprężarka jest wyposażona w wewnętrzne


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zabezpieczenie przeciwprzeciążeniowe (OLP). Zabezpiecza ono sprężarkę przed ciśnieniem przekraczającym 32 bary.
- Zabrania się umieszczania zaworów i połączeń rozłącznych w miejscach ogólnodostępnych, chyba że są one zgodne z normą EN 16084.
- Aby zapobiec uszkodzeniom, rury czynnika chłodniczego należy zabezpieczyć lub zabudować.
- Rury montowane w terenie należy zabezpieczyć przed działaniem substancji żrących i słonych w celu uniknięcia korozji w rurach miedzianych/aluminiowych.
- W przypadku wystąpienia pożaru ciśnienie rośnie z powodu wzrostu temperatury w zbiorniku. Dlatego bardzo istotna jest instalacja zaworu PRV.

## 9 – Napełnianie układu

- Nigdy nie uruchamiać sprężarki obciążonej podciśnieniem. Sprężarka musi być wyłączona.
- Używać wyłącznie czynnika chłodniczego, do którego urządzenie jest przystosowane.
- Nalać czynnik chłodniczy do skraplacza lub zbiornik cieczy. Powoli napełnić układ do uzyskania ciśnienia 4–5 barów w przypadku czynnika R404A/R448A/R449A/R407A/R407F/R452A lub do około 2 barów w przypadku czynnika R134a, R513A.
- Ostateczne napełnienie wykonuje się do momentu osiągnięcia przez instalację stabilnych, znamionowych warunków roboczych.
- Nigdy nie pozostawiać cylindra napełniania podłączonego do obwodu.
- Zawory ssawne, zawory na linii cieczowej i zawory Rotolock na zbiorniku posiadają przyłącze Schradera do obsługi serwisowej, takiej jak napełnianie gazem i pomiar ciśnienia.

## 10 – Konfiguracja sterownika elektronicznego

| | |
|---|---|
| ⚠ | W przypadku modernizacji SPPR (przekaźnika monitorowania zasilania) zmienić parametr sterownika o37 na 1. W przypadku dodania opcji SPPR w celu ochrony sprężarki należy zmienić ustawienie o37 z 0 na 1. |
| | W przypadku wersji P02 (OP-xxxxxxxxxP02E), jeśli wartość o30 wynosi 19= R404A lub 40=R448A lub 41=R449A w sterowniku. |

- Urządzenie jest wyposażone w sterownik elektroniczny, w którym fabrycznie zaprogramowano parametry wymagane przez dane urządzenie. Należy się zapoznać ze szczegółowymi informacjami zamieszczonymi w podręczniku 118U3808.
- Domyślnie wyświetlacz regulatora elektronicznego pokazuje wartość temperatury w °C dla ciśnienia ssania. Aby wyświetlić wartość temperatury dla ciśnienia skraplania, nacisnąć dolny przycisk (rys. 3).

Sterownik elektroniczny jest ustawiony fabrycznie na: R404A, R449A, R452A lub R134a w zależności od modelu zamontowanej sprężarki oraz zastosowania (patrz Aneks do instrukcji instalacji sterownika Optyma). Jeśli używany jest inny czynnik chłodniczy, trzeba zmienić ustawienie czynnika w sterowniku. Wcześniej trzeba ustawić parametr r12 na wartość 0 (parametr „Main Switch" sterownika w położeniu wyłączone chłodzenie).
- Wcisnąć górny przycisk na kilka sekund. Pojawi się kolumna z kodami parametrów.
- Naciskać górny lub dolny przycisk, aby znaleźć kod parametru o30.
- Nacisnąć środkowy przycisk, aż zostanie wyświetlona wartość tego parametru.
- Naciskać górny lub dolny przycisk, aby wybrać nową wartość: 2 = R22, 3 = R134a, 36 = R513A, 17 = R507, 19 = R404A, 20 = R407C, 21 = R407A, 37 = R407F, 40 = R448A, 41 = R449A, 42 = R452A.
- Nacisnąć środkowy przycisk, aby zatwierdzić wybraną wartość.
- Nacisnąć górny lub dolny przycisk, aby odnaleźć kod parametru r84 (r84 = Maksymalna dopuszczalna temperatura tłoczenia).
- Nacisnąć środkowy przycisk, domyślna maksymalna temperatura tłoczenia wynosi 125°C.
- Jeśli klient chce zwiększyć nastawę zaworu, należy nacisnąć górny przycisk, aby wybrać nową wartość: 130°C. Nacisnąć środkowy przycisk, aby zatwierdzić wybór.
- Maksymalna dopuszczalna temperatura tłoczenia (r84) nie powinna przekraczać 130°C.

## 11 – Sprawdzenie przed uruchomieniem

| | |
|---|---|
| ⚠ | Używać urządzeń bezpieczeństwa takich jak ciśnieniowe wyłączniki bezpieczeństwa oraz mechaniczny zawór nadmiarowy zgodne z obowiązującymi przepisami ogólnymi i lokalnymi oraz normami bezpieczeństwa. Sprawdzić, czy te urządzenia są sprawne i prawidłowo ustawione. |
| | Sprawdzić, czy ustawienia wyłączników wysokiego ciśnienia i zaworów nadmiarowych nie przekraczają maksymalnego ciśnienia roboczego któregokolwiek z podzespołów układu. |

- Sprawdzić, czy wszystkie połączenia elektryczne wewnątrz agregatu skraplającego są prawidłowo zamocowane, ponieważ mogły się poluzować podczas transportu.
- Gdy wymagana jest grzałka karteru sprężarki, należy podłączyć zasilanie agregatu co najmniej 12 godzin przed pierwszym uruchomieniem i uruchomić po dłuższym wyłączeniu (w przypadku grzałki opaskowej karteru sprężarki).
- Urządzenie jest wyposażone w wyłącznik główny z zabezpieczeniem przeciążeniowym. Zabezpieczenie przeciążeniowe zostało ustawione fabrycznie, ale zaleca się sprawdzić jego nastawę przed uruchomieniem urządzenia. Wartość nastawy zabezpieczenia przeciążeniowego można odczytać ze schematu połączeń elektrycznych znajdującego się na przednich drzwiczkach urządzenia.
- Sprawdzić, czy czujnik temperatury tłoczenia jest stabilnie zamocowany i w odpowiedni sposób styka się z rurą tłoczną.
- Spadek ciśnienia w przewodach ssawnych i cieczowych należy oceniać zgodnie z lokalizacją i odległością parownika (zob. Coolselector2).

## 12 – Uruchomienie

- Nigdy nie uruchamiać urządzenia przy braku czynnika chłodniczego.
- Wszystkie zawory serwisowe muszą być otwarte.
- Zawór rotalock na odbiorniku musi zostać obrócony o 1 obrót w kierunku zamknięcia, aby uzyskać właściwe ciśnienie skraplania dla przetwornika ciśnienia.
- Sprawdzić zgodność parametrów urządzenia z dostępnym zasilaniem.
- Sprawdzić, czy grzałka skrzyni korbowej jest włączona.
- Sprawdzić, czy wentylator może swobodnie się obracać.
- Sprawdzić, czy zdjęto osłonę z tylnej części skraplacza.
- Zrównoważyć wartości ciśnienia po stronie wysokiego i niskiego ciśnienia.
- Podłączyć urządzenie do zasilania energią elektryczną. Sprężarka musi się niezwłocznie uruchomić. Jeżeli sprężarka się nie uruchamia, sprawdzić zgodność okablowania i napięcie na zaciskach.
- Ewentualne odwrotne obroty sprężarki 3-fazowej można wykryć na podstawie następujących objawów: praca sprężarki nie powoduje wzrostu ciśnienia, sprężarka jest wyjątkowo głośna i pobiera bardzo mało prądu. Modele P05 są wyposażone w przekaźnik odwróconej fazy — sprężarka nie uruchomi się oraz nie wytwarza ciśnienia w przypadku nieprawidłowych sekwencji faz. W takiej sytuacji należy niezwłocznie wyłączyć urządzenie i prawidłowo podłączyć przewody faz do zacisków na urządzeniu.
- Gdy kierunek obrotów jest prawidłowy, wskazanie niskiego ciśnienia na regulatorze (lub manometrze niskiego ciśnienia) powinno pokazywać spadek ciśnienia, a wskazanie wysokiego ciśnienia na regulatorze (lub manometrze wysokiego ciśnienia) powinno pokazywać wzrost ciśnienia.

## 13 – Kontrola działania

- Sprawdzić kierunek obrotów wentylatora. Powietrze musi przepływać od skraplacza w kierunku wentylatora.
- Sprawdzić pobór prądu i napięcie.
- Sprawdzić ciepło przegrzania ssania w celu zmniejszenia ryzyka zawirowań.
- Jeśli urządzenie jest wyposażone we wziernik, sprawdzać poziom oleju podczas rozruchu i w trakcie eksploatacji — olej musi pozostawać widoczny.
- Przestrzegać roboczych wartości granicznych.
- Sprawdzić wszystkie rurki pod kątem niepożądanych drgań. Ruchy przekraczające 1,5 mm wymagają działań naprawczych takich jak zastosowanie wsporników rurek.
- W razie potrzeby można uzupełnić czynnik chłodniczy po stronie niskiego ciśnienia w jak największej odległości od sprężarki. Podczas tego procesu sprężarka musi pracować.
- W przypadku modeli w wersji P02 (OP-xxxxxxxxxP02E) :
  - Sprawdzić przez wziernik, czy w rurociągu cieczowym nie ma pęcherzyków powietrza, aby zapewnić prawidłowy wtrysk cieczy.
  - Jeśli wartość o30 wynosi 19= R404A lub 40=R448A lub 41=R449A oraz wartość U26 > 125 w sterowniku, sprawdzić, czy wtrysk cieczy jest włączony. Rura wlotowa ekonomizera powinna być zimna.
- Nie przegrzewać układu.
- Przestrzegaj lokalnych przepisów dotyczących zbierania czynnika chłodniczego z urządzenia.
- Nigdy nie usuwać czynnika chłodniczego do atmosfery.
- Przed opuszczeniem miejsca instalacji przeprowadzić ogólną kontrolę instalacji dotyczącą czystości, hałasu i wykrywania nieszczelności.
- Zanotować typ i ilość zastosowanego czynnika chłodniczego, jak też warunki pracy na użytek przyszłych kontroli.

## 14 – Praca w trybie awaryjnym bez regulatora

W przypadku usterki regulatora agregat skraplający nadal może pracować, jeśli standardowe okablowanie regulatora (rys. 4) zmodyfikuje się w sposób opisany poniżej w celu uzyskania tymczasowego okablowania (rys. 5).

| | |
|---|---|
| ⚠ | Ta modyfikacja może być wykonywana wyłącznie przez elektryków z uprawnieniami. Należy przestrzegać przepisów krajowych. |
| | Odłączyć agregat skraplający od zasilania elektrycznego (użyć wyłącznika głównego) |

- Element stykowy sterownika komorowego ( w zależności od aplikacji) musi być przystosowany do przełączania napięcia 250 V AC.
- Wymontować przewód 22 (wejście zabezpieczenia DI3) i przewód 24 (termostat pokojowy DI1) i połączyć je za pomocą zaizolowanego mostka 250 V AC, 10 mm².
- Odłączyć przewód 25 (termostat w pomieszczeniu DI1) i przewód 11 (zasilanie sprężarki), a następnie połączyć je izolowanym mostkiem zaciskowym 250 V AC / 10 mm².
- Odłączyć przewód 6 i połączyć go mostkiem zaciskowym z przewodem 11 i 25. Do przewodu 6 można podłączyć szeregowo ciśnieniowy wyłącznik wentylatora lub regulator prędkości wentylatora.
- Odłączyć przewód 14 (grzałka karteru sprężarki) i podłączyć go do zacisku 22 stycznika sprężarki.
- Odłączyć przewód 12 (zasilanie grzałki karteru), przedłużyć go z użyciem mostka zaciskowego 250 V AC / 10 mm² i brązowego kabla 1,0 mm², a następnie podłączyć do zacisku 21 stycznika sprężarki.
- Wymontować duży zespół stykowy z zacisków regulatora od 10 do 19.
- Podłączyć agregat skraplający do zasilania (za pomocą wyłącznika głównego).

## 15 – Konserwacja

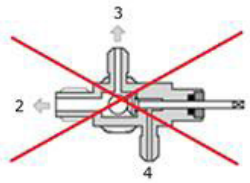
| | |
|---|---|
| ⚠ | Należy wyłączyć urządzenie wyłącznikiem głównym przed otworzeniem drzwi do wentylatora (-ów). |
| | Ciśnienie wewnętrzne i temperatura powierzchni stanowią zagrożenie i mogą spowodować trwały uszczerbek na zdrowiu. Konserwatorzy i monterzy muszą mieć odpowiednie kwalifikacje i stosować odpowiednie narzędzia. Temperatura przewodów rurowych może przekroczyć 100°C, co grozi poważnymi oparzeniami. |
| | Przeprowadzać okresowe przeglądy serwisowe w celu zapewnienia niezawodności układu oraz zgodnie z wymogami przepisów lokalnych. |

Aby zapobiec problemom związanym z układem, zaleca się poniższą konserwację okresową:
- Sprawdzić, czy urządzenia bezpieczeństwa są sprawne i prawidłowo ustawione.
- Sprawdzić szczelność układu.
- Sprawdzić pobór prądu sprężarki.
- Upewnić się, że układ pracuje w sposób spójny z poprzednimi zapisami dotyczącymi konserwacji i warunkami otoczenia.
- Sprawdzić, czy wszystkie połączenia elektryczne są w dalszym ciągu odpowiednio przymocowane.
- Utrzymywać sprężarkę w czystości oraz sprawdzić, czy na osłonie urządzenia, rurkach i połączeniach elektrycznych nie ma rdzy ani nie dochodzi do ich utleniania.

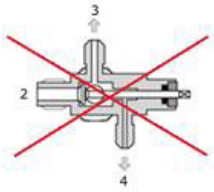
Agregat skraplający musi być co najmniej raz w roku sprawdzany pod kątem drożności przepływu, a w razie konieczności musi zostać oczyszczony. Dostęp do wnętrza agregatu skraplającego uzyskuje się poprzez drzwiczki wentylatora. Brud odkłada się zazwyczaj na zewnątrz skraplacza c mikrokanałowego, a nie wewnątrz, dzięki czemu łatwiej je czyścić niż skraplacze lamelowe.

- Należy wyłączyć urządzenie wyłącznikiem głównym przed otworzeniem drzwi do wentylatora.
- Usunąć zabrudzenia powierzchniowe, liście itp. za pomocą odkurzacza wyposażonego w końcówkę z włosiem lub inne miękkie zakończenie. Alternatywnie można przedmuchać skraplacz sprężonym powietrzem od środka i oczyścić za pomocą miękkiego pędzla. Nie używać szczotki drucianej. Nie wolno uderzać ani skrobać skraplacza końcówką odkurzacza lub dyszą powietrzną.
- Przed zamknięciem drzwiczek wentylatora obrócić łopaty wentylatora do bezpiecznego położenia, aby drzwiczki nie uderzyły w wentylator.

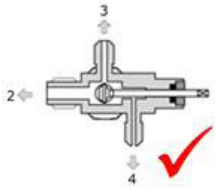
Jeśli otwarto układ czynnika chłodniczego, należy go przeczyścić suchym powietrzem lub azotem w celu usunięcia wilgoci, a następnie zamontować nowy filtr-osuszacz. Jeśli wymagane jest usunięcie z układu czynnika chłodzącego, należy to wykonać w taki sposób, aby nie dostał się od środowiska naturalnego.




**Rys. A:** Pełne otwarcie, przyłącza 2 i 3 całkowicie otwarte, przyłącze 4 całkowicie zamknięte




**Rys. B:** Pełne zamknięcie, przyłącza 3 i 4 częściowo otwarte, przyłącze 2 całkowicie zamknięte




**Rys. C:** Częściowe otwarcie (5,5 obrotu w prawo od stanu całkowicie otwartego. Przyłącza 2, 3, 4 całkowicie otwarte).

## 16 – Deklaracja włączenia

- **Pressure Equipment Directive 2014/68/EU EN 378-2:2016** – Systemy chłodnicze i pompy ciepła – wymagania bezpieczeństwa i środowiskowe – Część 2: Projektowanie, budowa, testowanie, znakowanie i dokumentacja.

**Dyrektywa niskonapięciowa 2014/35/UE** EN 60335-1:2012 + A11:2014 – Urządzenia gospodarstwa domowego i podobne urządzenia elektryczne – Bezpieczeństwo – Część 1: Ogólne wymagania dla wszystkich wyżej wymienionych agregatów skraplających. **DYREKTYWA dotycząca ekoprojektowania 2009/125/WE** ustanawiająca ogólne zasady ustalania wymogów dotyczących ekoprojektowania dla produktów związanych z energią. ROZPORZĄDZENIE (UE) 2015/1095, wdrażające Dyrektywę ekoprojektowania 2009/125/WE w odniesieniu do wymogów dotyczących dla profesjonalnych chłodni kominów chłodniczych, komór hutniczych, agregatów skraplających i chłodniczych. • Pomiary agregatów skraplających należy wykonywać zgodnie z normą „ EN 13771-2:2017" – Sprężarki i agregaty skraplające do celów chłodniczych – badanie wydajności oraz metody testowania – Część 2: Agregaty skraplające

## 17 – Gwarancja

Do reklamacji tego produktu należy zawsze dołączać numer modelu i numer seryjny.
Gwarancja na produkt może zostać unieważniona w następujących przypadkach:
- Brak tabliczki znamionowej.
- Modyfikacje zewnętrzne; w szczególności wiercenie, spawanie, wyłamane stopy i ślady po wstrząsach.
- Odesłana sprężarka jest otwarta lub niezapakowana.
- Rdza, woda lub barwnik do wykrywania nieszczelności wewnątrz sprężarki.
- Użycie czynnika chłodniczego lub środka smarującego niezatwierdzonego przez firmę Danfoss.
- Wszelkie odstępstwa od zaleceń dotyczących instalacji, zastosowania i konserwacji.
- Używanie w zastosowaniach przenośnych.
- Używanie w atmosferze wybuchowej.
- Brak numeru modelu lub numeru seryjnego, przekazanych z reklamacją gwarancyjną.

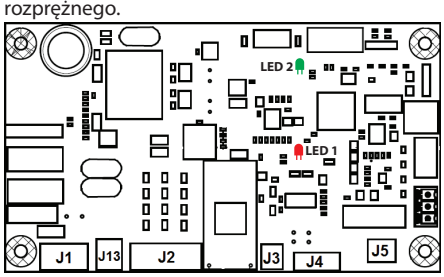
## 18 – Usuwanie




Firma Danfoss zaleca, aby przeprowadzenie recyklingu agregatu skraplającego i oleju zostało zlecone specjalistycznej firmie i przeprowadzone na jej terenie.


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Moduł B Plus to elektroniczna płytka drukowana używana w modelach w wersji P02 do automatycznego wtrysku cieczy do sprężarek spiralnych za pomocą elektronicznego zaworu rozprężnego.




*Modul B Plus*

Moduł B Plus posiada pokrywę zabezpieczającą pokazaną na rysunku 6.

⚠ Nie demontować pokrywy zabezpieczającej, jeśli nie jest to wymagane. Przed zdemontowaniem pokrywy wyłączyć urządzenie.




*Rysunek 6*

**Zastosowanie**

Moduł B Plus kontroluje wtrysk cieczy oraz monitoruje następujące parametry: temperaturę gazu wylotowego, kolejność faz i błąd fazy.

**Opis działania**

• Wtrysk cieczy

- Moduł B Plus może kontrolować temperaturę gazu wylotowego. Domyślna nastawa to 125°C; jest to wartość wymagana do bezpiecznej pracy agregatu skraplającego.

⚠ Nie zmieniać tej nastawy.

- W przypadku zatrzymania sprężarki zawór wtrysku cieczy zostanie zamknięty w ciągu 6 sekund.

• Zabezpieczenie przed nadmiernym wzrostem temperatury gazu wylotowego

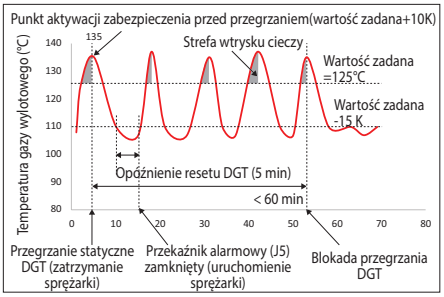
- Czujnik temperatury gazu wylotowego w module B Plus może wykryć temperaturę gazu wylotowego w zakresie od -50 do 180°C z dokładnością pomiaru ±0,5°C. Czujnik jest montowany w odległości do 150 mm od króćca tłocznego sprężarki.
- Jeśli temperatura gazu wylotowego jest większa od punktu aktywacji zabezpieczenia przed przegrzaniem (wartość zadana + 10 K) przez 1 sekundę, nastąpi otwarcie przekaźnika alarmowego (J5). Ten status jest określony w tabeli 1 jako przegrzanie statyczne DGT. Jeśli temperatura gazu wylotowego jest niższa od punktu resetowania (wartość zadana -15°C) przez 5 minut, nastąpi zamknięcie przekaźnika alarmowego (J5). To 5-minutowe opóźnienie jest określone w tabeli jako opóźnienie resetu DGT.
- Jeśli temperatura gazu wylotowego przekroczy dopuszczalną wartość więcej niż 5 razy w ciągu 1 godziny, przekaźnik alarmowy (J5) zablokuje się w położeniu otwartym i może zostać zresetowany tylko poprzez ręczne zresetowanie modułu B Plus (wyłączenie i ponowne włączenie urządzenia po pewnym czasie). Ten status jest określony jako blokada przegrzania DGT, patrz oznaczenia błędów w tabeli 1.
- W przypadku nieprawidłowego działania czujnika temperatury gazu wylotowego, tj. czujnik otwarty, zwarcie czujnika lub czujnik poza zakresem, przekaźnik alarmowy (J5) zablokuje się w położeniu otwartym; patrz oznaczenia błędów w tabeli 1.

• Ochrona fazy

- Wykrywanie sekwencji faz i brakującej fazy będzie wykonywane tylko przy każdym włączeniu sprężarki. W przypadku wykrycia błędu fazy, braku fazy lub odwrócenia faz w ciągu 4,5 s do 5 s, nastąpi otwarcie i zablokowanie przekaźnika alarmowego (J5) w położeniu otwartym. Statusy blokady lub otwarcia mogą zostać zresetowane poprzez ręczne wyłączenie i ponowne włączenie zasilania modułu B Plus, patrz oznaczenia błędów w tabeli 1.

• Interfejs użytkownika

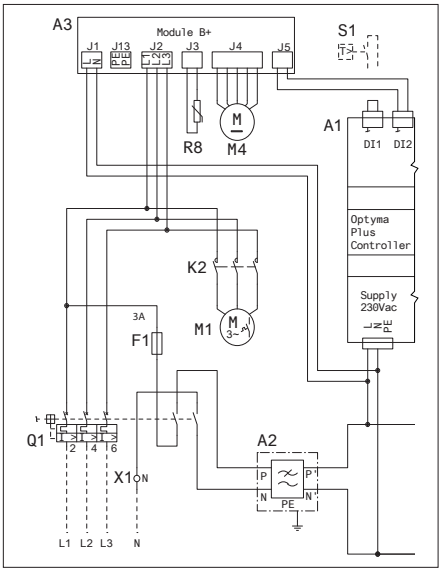
- Po włączeniu zasilania modułu B Plus kontrolka LED 1 będzie świeciła stale na czerwono. Po wyłączeniu zasilania modułu, kontrolka LED 1 zgaśnie. Po włączeniu modułu B Plus, w przypadku braku błędów, kontrolka LED 2 będzie świeciła stale na zielono. Umiejscowienie kontrolek LED 1 i LED 2 na module B Plus pokazano na rysunku 6.
- Po włączeniu modułu B Plus, w przypadku wykrycia błędu, kontrolka LED 2 będzie migać na przemian na żółto i na czerwono w odstępach jednosekundowych. Szczegóły dotyczące migania kontrolek podano w tabeli 1.




*Rysunek 7*

• Komunikacja modułu B Plus ze sterownikiem Optyma Plus.

- Gdy przekaźnik alarmowy (J5) jest otwarty, sygnał jest przesyłany do wejścia cyfrowego 2 (DI2) sterownika Optyma, co powoduje włączenie alarmu bezpieczeństwa (A97) w sterowniku Optyma Plus i natychmiastowe wyłączenie zasilania sprężarki.




*Schemat połączeń elektrycznych modułu B Plus*

| Kategoria | Częstotliwość migania na żółto | Częstotliwość migania na czerwono | Błąd | Opis | Działanie |
|---|---|---|---|---|---|
| Temperatura gazu wylotowego | 1 | 1 | Przegrzanie statyczne DGT/opóźnienie resetu DGT | Temperatura gazu wylotowego jest większa od punktu aktywacji wyłącznika sprężarki | Sprawdzić, czy na sterowniku Optyma nie pojawił się alarm bezpieczeństwa (A97). Jeśli tak, poczekać na automatyczne rozwiązanie problemu. Jeśli błąd będzie często się pojawiał, sprawdzić, czy jednostka działa zgodnie z zalecanymi parametrami bezpiecznej pracy. |
| | | 2 | Blokada przegrzania DGT | Przegrzanie statyczne DGT wystąpiło 5-krotnie w ciągu 1 godziny | Zresetować moduł B Plus ręcznie (wyłączyć urządzenie i włączyć ponownie po pewnym czasie). |
| | | 3 | DGT poza zakresem | DGT jest poza normalnym zakresem (-50 – 180°C) | Sprawdzić, czy czujnik temperatury gazu wylotowego jest prawidłowo zamocowany w przewodzie tłocznym. Sprawdzić temperaturę gazu wylotowego w sterowniku Optyma Plus, parametr U27 (wartość powinna wynosić od -50 do 180°C). |
| | | 4 | Czujnik DGT otwarty/ zwarcie czujnika DGT | Otwarcie/zwarcie czujnika temperatury gazu wylotowego | Sprawdzić czujnik temperatury na tłoczeniu oraz jego podłączenie. |
| Trzy fazy | 2 | 1 | Brak fazy | Utrata sygnału jednej fazy | Sprawdzić zasilanie 3-fazowe (J2) modułu B Plus, czy nie brakuje jednej z 3 faz. Jeśli brakuje, prawidłowo podłączyć zasilanie i zresetować ręcznie moduł B Plus (wyłączyć urządzenie i włączyć je ponownie po pewnym czasie). |
| | | 2 | Odwrócenie faz | Nieprawidłowe podłączenie faz | Sprawdzić zasilanie 3-fazowe (J2) modułu B Plus pod kątem nieprawidłowej kolejności 3 faz. Jeśli kolejność jest nieprawidłowa, prawidłowo podłączyć zasilanie i zresetować ręcznie moduł B Plus (wyłączyć urządzenie i włączyć je ponownie po pewnym czasie). |

*Tabela 1: Kod błędu – miganie kontrolki (miganie kontrolki LED 2 na żółto i czerwono)*

ENGINEERING
**TOMORROW**

**Инструкция (Русский)**

# Optyma™ Plus
# OP-LPQM, OP-MPBM, OP-MPXM, OP-MPGM, OP-LPOM

| |
|---|
| **Установку и обслуживание компрессорно-конденсаторных агрегатов должен осуществлять только квалифицированный персонал. Следуйте настоящим указаниям и общепринятым методикам в отношении установки, ввода в эксплуатацию, технического и сервисного обслуживания холодильной техники.** |
| **Данное изделие не подпадает под действие положений Закона PSTI Великобритании, поскольку предназначено для поставки исключительно специалистам, обладающим необходимыми знаниями и квалификацией, и для использования такими специалистами. Любое ненадлежащее использование изделия или неправильное обращение с ним может привести к непредусмотренным последствиям. Приобретая или используя данное изделие, вы подтверждаете и принимаете тот факт, что оно предназначено только для профессионального использования. Компания Danfoss не несет ответственности за ущерб, травмы или неблагоприятные последствия («ущерб»), возникшие в результате неправильного или ненадлежащего использования изделия, и вы соглашаетесь возместить компании Danfoss любой подобный ущерб, возникший в результате неправильного или ненадлежащего использования изделия вами.** |
| Компрессорно-конденсаторный агрегат необходимо использовать только по назначению, в допустимых границах его области применения и в соответствии с инструкциями. Используемый хладагент должен соответствовать техническим характеристикам модели. |
| В любых условиях необходимо соблюдать требования стандарта EN378 и других применяемых местных норм безопасности. |
| Поставляемый агрегат заправлен газообразным азотом под избыточным давлением 1 бар. Перед подключением агрегата к системе, необходимо стравить азот; подробную информацию см. в разделе «Установка». |
| Перемещать компрессорно-конденсаторный агрегат следует с осторожностью и в вертикальном положении (максимальное отклонение от вертикали — 15°) |
| **Для моделей категории PED I и II**: Предохранительный клапан необходимо установить в систему охлаждения во время монтажа на месте эксплуатации. Он должен располагаться на ресивере. |

**Стандарты и директивы, относящиеся к данному оборудованию**
**EN 378-2:2016:** Холодильные системы и тепловые насосы. Требования по безопасности и охране окружающей среды
**EN 60335-1:** Безопасность бытовых и аналогичных электрических приборов. Часть 1: Общие требования
**Директива 2014/35/EU по низковольтному оборудованию**
**Директива 2006/42/CE по машинам, механизмам и машинному оборудованию**
**Директива 2014/68/EU по оборудованию, работающему под давлением (PED)**
**Директива RoHS 2011/65/EU**
**Директива WEEE 2012/19/EU**
(Прочие применимые местные стандарты)

## 1 - Введение

Настоящая инструкция относится к компрессорно-конденсаторным агрегатам Optyma™ Plus OP-MPBM, OP-MPXM, OP-MPGM, OP-LPQM и OP-LPOM, используемых в холодильных системах. В ней содержится необходимая информация, касающаяся безопасности и правильного использования данного изделия.

В состав конденсаторного агрегата входит следующее:
- Микроканальный теплообменник
- Поршневой или спиральный компрессор
- Ресивер с запорным клапаном
- Шаровые клапаны
- Смотровое стекло
- Реле высокого и низкого давления
- Сменный фильтр-осушитель
- Электронный контроллер
- Главный выключатель с защитой от перегрузок
- Конденсаторы вентилятора и компрессора
- Контактор компрессора
- Реле контроля питания**
- Прочный стойкий к воздействию окружающей среды корпус
- Контроллер впрыска жидкости (модуль B Plus)*
- Электронный расширительный клапан (ETS6)*
- Подключенные компоненты оснащены клапаном Шредера

**Только для версии P02,*
***только для моделей P05*

## 2 - Правила обращения и хранения

- Рекомендуется не открывать упаковку до доставки изделия к месту установки.
- Обращаться с осторожностью. Упаковка позволяет использовать вилочный погрузчик или устройство для подъема поддонов. Используйте соответствующие и безопасные подъемные устройства.
- Хранение и транспортировка изделия должны производиться в строго вертикальном положении.
- Изделие должно храниться при температуре от -35°C до 50°C.
- Не допускайте попадания упаковки под дождь или в коррозийно-активную атмосферу.
- После распаковки проверьте комплектацию изделия и убедитесь в отсутствие повреждений.

## 3 - Меры предосторожности при установке

| |
|---|
| Категорически запрещается устанавливать изделие в огнеопасной атмосфере. |
| Изделие должно располагаться таким образом, чтобы оно не блокировало или не загораживало проходы, двери, окна и т. п. |
| Предохранительный клапан: Для моделей категории PED I и II клапан необходимо установить во время монтажа на месте эксплуатации. |

- Обеспечьте наличие достаточного пространства вокруг изделия для циркуляции воздуха и открытия дверей. Минимальные значения расстояний до стен указаны на рисунке 1.
- Избегайте установки изделия в местах, подвергающихся длительному воздействию прямого солнечного света.
- Избегайте установки изделия в агрессивной и пыльной среде.
- Обеспечьте наличие горизонтальной поверхности (уклон менее 3°), достаточно прочной и стабильной для того, чтобы выдержать вес всего изделия и исключить вибрации и помехи.
- Температура окружающей среды изделия не должна превышать 50°C в нерабочую часть цикла.
- Обеспечьте соответствие электропитания характеристикам изделия (см. заводскую табличку).
- При установке изделий для хладагентов HFC используйте оборудование, предназначенное специально для хладагентов HFC, и которое никогда не использовалось для хладагентов CFC или HCFC.
- Используйте трубы из чистых дегидратированных меди/алюминия надлежащей толщины для холодильной техники и твердый серебряный припой.
- Используйте системные компоненты из чистых дегидратированных материалов.
- Трубопровод линии всасывания, подключенный к компрессору, должен иметь достаточную гибкость по трем осям для снижения вибрации. Кроме того, трубопровод должен быть выполнен таким образом, чтобы обеспечить возврат масла в компрессор и исключить риск скопления


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жидкости в компрессоре.
- Компрессорно-конденсаторный агрегат Optyma оснащен всасывающим и жидкостным служебным клапаном с клапаном Шредера для эксплуатации в полевых условиях.

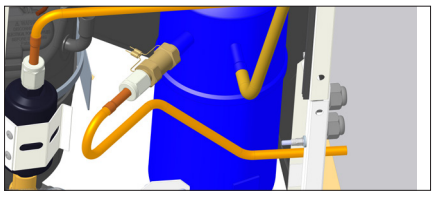
### 3.1 – Предохранительный клапан

| | |
|---|---|
| ⚠ | Для компрессорно-конденсаторных агрегатов Optyma™ Plus категории PED I и II предохранительный клапан необходимо установить отдельно (см. категорию PED в технических данных в приложении A). |
| | PRV предоставляется как запасная часть. См. Coolselector2 |

- Предохранительный клапан необходимо установить на ресивер жидкости с соединением NPT 3/8" (код запчасти предохранительного клапана см. в Coolselector2). Используйте Loctite 554 для установки предохранительного клапана.
- Момент затяжки: 30 Н·м (не превышайте указанный момент затяжки).



- Монтажник должен обеспечить правильное направление выпуска хладагента через клапан. Компания Danfoss рекомендует выпускать хладагент в сторону от компрессорно-конденсаторного агрегата.
- После сброса давления через предохранительный клапан, его рекомендуется заменить вместе с хладагентом в системе.
- Предохранительные клапаны можно устанавливать вертикально или горизонтально, но обязательно выше уровня жидкости в системе.
- Убедитесь, что хладагент безопасно выпускается непосредственно в атмосферу.
- Для предотвращения опасных ситуаций разработан дополнительный комплект запасных частей для сбора выпускаемого хладагента. Комплект необходимо установить с правильным расположением трубопроводов для безопасного отвода хладагента (см. рисунок ниже).



- Предохранительный клапан нельзя устанавливать на сервисный клапан.
- Заменяйте предохранительный клапан после очистки или опорожнения системы.
- Необходимо предотвратить доступ посторонних лиц к съемным соединениям и клапанам. Все паяные соединения должны соответствовать стандарту EN 14276-2, а другие постоянные соединения — стандарту EN-16084.

### 4 - Установка

- Агрегат, в котором установлен компрессорно-конденсаторный блок, должен соответствовать директиве ЕС по оборудованию, работающему под давлением (PED) 2014/68/EU. Сам компрессорно-конденсаторный агрегат не подпадает под действие данной директивы.
- Рекомендуется устанавливать изделие на резиновых элементах или амортизаторах вибраций (не входят в комплект поставки).
- Допускается устанавливать изделия друг на друга.

| Изделие | Максимальное кол-во |
|---|---|
| Корпус 1 (Код 114X31-- или 114X41--) | 3 |
| Корпус 2 (Код 114X32-- или 114X42--) | 2 |
| Корпус 3 (Код 114X33-- или 114X43--) | 2 |
| Корпус 4 (Код 114X34-- или 114X44--) | 2 |

- При установке изделия друг на друга, самое верхнее изделие должно быть прикреплено к стене, как показано на рисунке 2.
- Медленно стравите заправку азота через клапан Шредера.
- Подсоедините изделие к системе незамедлительно во избежание попадания влаги в систему в виду высокой гигроскопичности масла.
- Избегайте попадания материалов в систему во время резки труб. Категорически запрещается выполнять отверстия в местах, где невозможно удалить заусенцы.
- Осуществляйте пайку с особой осторожностью по современной технологии, продувая трубопровод азотом.
- Подсоедините необходимые устройства обеспечения безопасности и управления. При использовании клапана Шредера демонтируйте внутренний клапан.
- Рекомендуется изолировать впускную трубу до входа в компрессор изоляционным материалом толщиной 19 мм.
- Материал медных труб должен соответствовать стандарту EN12735-1. Все трубные соединения должны соответствовать стандарту EN14276-2.
- При монтаже на месте эксплуатации необходимо предусмотреть опоры в соответствии с размером и весом. Рекомендованное максимальное расстояние между опорами для труб согласно EN12735-1 и EN12735-2
- Соединение труб необходимо выполнить до открытия клапанов, чтобы хладагент мог протекать между компонентами системы охлаждения.

### 5 — Обнаружение утечек

| | |
|---|---|
| ⚠ | Запрещается опрессовывать контур кислородом или сухим воздухом. Это может привести к пожару или взрыву. |

- Не используйте красители для определения утечек
- Осуществляйте поиск утечек во всей системе.
- Максимальное давление при испытании - 31*) бар.
- Устраните обнаруженную утечку и повторите поиск утечек.

*) *25 бар для моделей OP-..... AJ.... и OP-..... FH....*

### 6 - Вакуумная сушка

- Категорически запрещается использовать компрессор для вакуумирования системы.
- Подсоедините вакуумный насос к штуцерам НД и ВД.
- Создайте в системе абсолютное давление 500 мкм рт. ст. (0.67 мбар).
- Запрещается использовать мегаомметр и подавать питание на компрессор, пока он находится под вакуумом, так как это может привести к внутренним повреждениям.

### 7 - Электрические соединения

- Отключите и изолируйте основной источник электропитания.
- Убедитесь в том, что подача электропитания не может быть осуществленна во время монтажа.
- Все электрические компоненты должны выбираться согласно местным стандартам и требованиям к изделию.
- Подробную информацию об электрических соединениях смотрите в электромонтажной схеме.
- Убедитесь в том, что электропитание соответствует характеристикам изделия и является стабильным (номинальное напряжение ±10% и номинальная частота ±2,5 Гц).
- Параметры кабелей электропитания должны соответствовать характеристикам изделия по току и напряжению.
- Установите защиту источника электропитания и обеспечьте правильное заземление.
- Электропитание должно соответствовать местным стандартам и нормативно-правовым требованиям.
- Изделие оснащено электронным контроллером. Подробную информацию см. в руководстве 118U3808.
- Модели версии P02 (OP-xxxxxxxxxP02E) оснащены электронной платой управления (модуль B Plus). См. раздел «Руководство пользователя модуля B Plus» настоящего руководства.
- Изделие оснащено главным выключателем с защитой от перегрузок. Защита от перегрузок устанавливается производителем, однако рекомендуется проверить установленное значение перед началом эксплуатации изделия. Значение защиты от перегрузок можно найти на электромонтажной схеме на передней створке изделия.
- Изделие оснащено датчиками высокого и низкого давления, прерывающими электроснабжение компрессора в случае активации. Параметры отключения высокого и низкого напряжения предварительно заданы в контроллере, адаптированном под компрессор, установленный в изделии.
- Модели P05 также оснащены реле последовательности фаз для защиты устройства от пропадания/чередования/асимметрии фаз и пониженного/повышенного напряжения.

Для изделий с 3-фазным спиральным компрессором (OP-MPXMxxxxxxxxE), необходимо соблюдать правильность чередования фаз для направления вращения компрессора.
- Определите чередование фаз с помощью фазометра для установления порядка линейных фаз L1, L2 и L3.
- Подсоедините линейные фазы L1, L2 и L3 к клеммам T1, T2 и T3 главного выключателя соответственно.

### 8 – Безопасность

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| ⚠ | Перед подключением электрошкафа к источнику питания необходимо закрыть его дверцу. |
| | Во время работы устройства температура нагнетающей трубки может подниматься до 120 °C. |
| | Рекомендуется устанавливать предохранительный клапан внутри агрегата и отводить хладагент непосредственно в атмосферу. |

Плавкий пробочный предохранитель не установлен, вместо него установлена заглушка.
В устройстве имеется жидкостный ресивер с резьбовым отверстием под пробку NPT 3/8". Монтажник/конечный пользователь может использовать различные варианты, указанные в EN378-2: 2016, § 6.2.2.3

- Блок/установка, в которую монтируется/встраивается конденсаторный агрегат, должны соответствовать Директиве PED.
- Будьте осторожны, компоненты могут быть очень горячими или холодными.
- Остерегайтесь движущихся компонентов. На время обслуживания необходимо отключить агрегат от сети электропитания.
- Компрессор оснащен внутренним устройством защиты от перегрузки. Оно защищает компрессор от давления выше 32 бар.
- Не допускается размещать клапаны и съемные соединения в зонах, доступных для посторонних лиц, за исключением случаев, когда они соответствуют стандарту EN 16084.
- Трубопроводы хладагента необходимо оградить или закрыть во избежание повреждений.
- Во избежание коррозии медных/алюминиевых трубопроводов рекомендуется не прокладывать их в коррозионно-активных или солевых средах.
- Повышение температуры в ресивере при пожаре приводит к повышению давления. Поэтому очень важно установить предохранительный клапан.

## 9 - Заполнение системы

- Категорически запрещается запускать компрессор под вакуумом. Не включайте компрессор.
- Используйте только хладагент, предназначенный для данного изделия.
- Осуществите первоначальную заправку хладагента в жидкой фазе в конденсатор или ресивер жидкого хладагента. Обеспечьте медленное заполнение системы под давлением до 4-5 бар для R404A/R448A/R449A/R407A/R407F/R452A и приблизительно 2 бар для R134a, R513A.
- Остальная заправка осуществляется до достижения уровня стабильного номинального эксплуатационного режима.
- Категорически запрещается оставлять баллон с хладагентом, подсоединенным к контуру.
- Всасывающие, жидкостные и приемные клапаны Rotolock в качестве клапана Шредера для таких сервисных операций, как зарядка газом, измерение давления.

## 10 — Настройка электронного контроллера

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| ⚠ | При ретрофите реле контроля питания (SPPR) выберите для параметра контроллера o37 значение 1. В случае добавления опции реле контроля питания (SPPR) для защиты компрессора измените значение параметра o37 с 0 на 1. |
| | Модели версии P02 (OP-xxxxxxxxxP02E): если для параметра o30 в контроллере задано значение 19=R404A, 40=R448A или 41=R449A. |

- Изделие оснащено электронным контроллером, параметры которого запрограммированы на заводе-производителе под данное изделие. Подробную информацию см. в руководстве 118U3808.
- По умолчанию экран электронного контроллера показывает значение температуры для давления всасывания в °C. Для отображения значения температуры для давления конденсации нажмите нижнюю кнопку (рисунок 3).

ТВ зависимости от модели установленного компрессора и варианта применения электронный контроллер поставляется с завода-изготовителя отрегулированным для работы с R404A, R449A, R452A или R134a (см. Приложение в руководстве по установке контроллера Optyma). В случае использования другого хладагента необходимо выбрать другой хладагент в настройках. Предварительно необходимо установить параметр r12 на 0 (программируемый главный выключатель = ВЫКЛ).

- Нажмите верхнюю кнопку и удерживайте ее несколько секунд. Появится колонка с кодами параметров.
- Нажимая верхнюю или нижнюю кнопки, найдите код параметра o30.
- Нажимайте среднюю кнопку, пока не отобразится значение этого параметра.
- Нажимая верхнюю или нижнюю кнопки, установите новое значение: 2 = R22, 3 = R134a, 36 = R513A, 17 = R507, 19 = R404A, 20 = R407C, 21 = R407A, 37 = R407F, 40 = R448A, 41 = R449A, 42 = R452A.
- Нажмите среднюю кнопку, чтобы подтвердить выбранное значение.
- Нажимая верхнюю или нижнюю кнопку, найдите код параметра r84 (r84 = максимально допустимая температура нагнетания).
- Нажмите среднюю кнопку, максимальная температура нагнетания по умолчанию составляет 125 °C.
- Если клиент хочет увеличить значение, нажмите верхнюю кнопку, чтобы изменить его на новое: 130 °C. Нажмите среднюю кнопку, чтобы подтвердить выбранное значение.
- Максимально допустимая температура нагнетания (r84) не должна превышать 130 °C.

## 11 - Проверка перед вводом в эксплуатацию

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| ⚠ | Используйте защитные устройства, например, предохранительное реле давления и механический предохранительный клапан, в соответствии с применяемыми местными и общими нормами и стандартами по безопасности. Убедитесь в их эксплуатационной надежности и надлежащей регулировке. |
| | Убедитесь в том, что настройки выключателей высокого давления и предохранительных клапанов не превышают максимальное рабочее давление любого элемента системы. |

- Убедитесь, что все электрические соединения внутри блока конденсации надежно закреплены, так как они могли ослабнуть во время транспортировки.
- В случае необходимости подогревателя картера изделие должно находиться под током в течение как минимум 12 часов перед первым запуском и запуском после длительного останова при использовании ленточных подогревателей картера.
- Изделие оснащено главным выключателем с защитой от перегрузок. Защита от перегрузок устанавливается производителем, однако рекомендуется проверить установленное значение перед началом эксплуатации изделия. Значение защиты от перегрузок можно найти на электромонтажной схеме на передней створке изделия.
- Убедитесь, что датчик температуры нагнетания надежно закреплен и находится в непосредственном контакте с нагнетательным трубопроводом.
- Перепад давления в трубах жидкостных линий необходимо рассчитывать в зависимости от расположения испарителя и расстояния до него (используйте Coolselector2).

## 12 - Запуск

- Категорически запрещается запускать изделие, не заправленное хладагентом.
- Все рабочие клапаны должны находиться в открытом положении.
- Клапан Rotalock на ресивере необходимо повернуть 1 раз в направлении закрытия для получения требуемого давления конденсации для датчика давления.
- Проверьте соответствие между изделием и электропитанием.
- Проверьте работоспособность подогревателя картера.
- Убедитесь в свободном вращении вентилятора.
- Убедитесь в снятии защитной панели с задней части конденсатора.
- Отрегулируйте ВД/НД.
- Подайте питание на изделие. Оно должно тут же включиться. Если компрессор не включился, проверьте соответствие проводки и напряжения на клеммах.
- Обратноевращение3-фазногокомпрессораможно определить следующим образом: компрессор не создает давление, издает чрезмерный шум и потребляет крайне мало энергии. Модели P05 оснащены реле последовательности фаз, и в случае неправильной последовательности фаз компрессор не запускается или не создает давление. В таком случае немедленно выключите изделие и правильно подсоедините фазы к соответствующим клеммам.
- Если направление вращения правильное, индикатор низкого давления на контроллере (или манометр низкого давления) покажет снижение давления, а индикатор высокого давления (или манометр высокого давления) покажет увеличение давления.

## 13 - Проверка работающего изделия

- Проверьте направление вращения вентилятора. Подача воздуха должна осуществляться от конденсатора к вентилятору.
- Проверьте потребление тока и напряжение.
- Проверьте перегрев на всасывании для снижения риска попадания жидкости в компрессор.
- При наличии смотрового стекла контролируйте уровень масла при запуске и во время работы, проверяя видимость уровня масла.
- Соблюдайте эксплуатационные ограничения.
- Проверьте все трубопроводы на предмет чрезмерной вибрации. При вибрационных смещениях более 1.5 мм необходимы корректирующие меры, например, установка кронштейнов для крепления трубопроводов.
- При необходимости можно добавить дополнительный хладагент в жидкой фазе со стороны низкого давления как можно дальше от компрессора. Во время этой процедуры компрессор должен работать.
- Модели версии P02 (OP-xxxxxxxxxP02E):
- Через смотровое стекло убедитесь, что в жидкостной линии отсутствуют пузырьки, способные помешать точному впрыску жидкости.
- Если для параметра o30 в контроллере задано значение 19=R404A, 40=R448A или 41=R449A и значение параметра U26 > 125, убедитесь в том, что впрыск жидкости включен. Входной патрубок экономайзера должен быть холодным.
- Не перезаправляйте систему хладагентом.
- Следуйте местным инструкциям по восстановлению хладагента из агрегата.
- Категорически запрещается выпускать хладагент в атмосферу.
- Перед уходом с места установки, проведите общий осмотр на предмет чистоты, шума и обнаружения утечек.
- Зафиксируйте тип и количество заряженного хладагента, а также эксплуатационные условия для справки при проведении будущих проверок.

## 14 - Аварийная работа без контроллера

В случае отказа контроллера, компрессорно-конденсаторный агрегат можно использовать при условии изменения постоянного подключения проводки контроллера (рисунок 4) на временное


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подключение проводки (рисунок 5), как описано ниже.

⚠ Такое изменение может проводиться только квалифицированными электриками. Необходимо соблюдать законодательство страны.

⚠ Отсоедините компрессорно -конденсаторный агрегат от источника электропитания (установите главный выключатель изделия в положение ВЫКЛ).

- Коммутирующая способность контакта комнатного терморегулятора должна быть рассчитана на 250 В переменного тока.
- Отсоедините провод 22 (вход сигнала безопасности DI3) и провод 24 (комнатный терморегулятор DI1), соедините их изолированной перемычкой сечением 10 мм² на 250 В переменного тока.
- Отсоедините провод 25 (комнатный терморегулятор DI1) и провод 11 (питание компрессора) и соедините их изолированной перемычкой сечением 10 мм² на 250 В переменного тока.
- отсоедините провод 6 и подсоедините его к перемычке для проводов 11 и 25. Датчик давления вентилятора или регулятор скорости вращения вентилятора могут последовательно подключаться к проводу 6.
- Отсоедините провод 14 (подогреватель картера) и подсоедините его к клемме 22 контактора компрессора.
- Отсоедините провод 12 (питание подогревателя картера), удлините этот провод, используя перемычку сечением 10 мм² на 250 В переменного тока и кабель коричневого цвета сечением 1,0 мм², и подсоедините его к клемме 21 контактора компрессора.
- Отсоедините большую клеммную колодку от клемм 10-19 контроллера.
- Подсоедините компрессорно -конденсаторный агрегат к источнику электропитания (установите главный выключатель изделия в положение ВКЛ).

## 15 - Техническое обслуживание

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| ⚠ | Перед открытием створки (створок) вентилятора всегда выключайте изделие с помощью главного выключателя. |
| | Внутреннее давление и температура поверхности представляют опасность и могут послужить причиной тяжелой травмы. Лица, выполняющие обслуживание и установку, должны обладать соответствующими навыками и быть обеспечены необходимыми инструментами. Температура трубопроводов может превышать 100°C и может послужить причиной серъезных ожогов. |
| | Обеспечьте проведение периодических технических осмотров для обеспечения надежности системы в соответствии с требованиями местных норм. |

Для предотвращения неисправностей системы рекомендуется проведение следующего периодического технического обслуживания:

- Проверьте эксплуатационную надежность и надлежащую регулировку защитных устройств.
- Убедитесь в отсутствии течи в системе.
- Проверьте потребление тока компрессором.
- Убедитесь, что работа системы согласуется с предшествующими протоколами технического обслуживания и условиями окружающей среды.
- Проверьте надежность крепления всех электрических соединений.
- Обеспечьте чистоту изделия и убедитесь в отсутствии ржавчины и окисления на компонентах, трубопроводах и электрических соединениях изделия.

Конденсатор должен проходить проверку на засорение не реже одного раза в год, при необходимости следует осуществлять его очистку. Доступ к внутренней части конденсатора осуществляется через створку вентилятора. Пыль на микроканальных змеевиках собирается больше на поверхности, чем внутри, поэтому их легче чистить, чем ребристые змеевики.

- Перед открытием створки вентилятора выключайте изделие с помощью главного выключателя.
- Удалите с поверхности грязь, листья, волокна и т. п. с помощью пылесоса, оснащенного щеткой или другой мягкой насадкой. Также допускается продувка змеевика изнутри сжатым воздухом с последующей очисткой щеткой с мягкой щетиной. Запрещается использование щетки с металлической щетиной. Не допускайте касания или задевания змеевика трубой пылесоса или воздушной форсункой.
- Перед закрытием заслонки вентилятора поверните лопасть вентилятора в безопасное положение, чтобы не допустить удара заслонки по вентилятору.

В случае разгерметизации системы хладагента необходимо продуть ее сухим воздухом или азотом для удаления влаги и установить новый фильтр-осушитель. В случае необходимости удаления хладагента процедура удаления должна быть выполнена таким образом, чтобы хладагент не попал в окружающую среду.

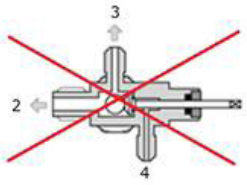



**Рис. A. Полностью открытое состояние, отверстия 2 и 3 полностью открыты, а отверстие 4 полностью закрыто.**

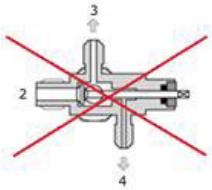



**Рис. B.** Полностью закрытое состояние, отверстия 3 и 4 частично открыты, а отверстие 2 полностью закрыто.

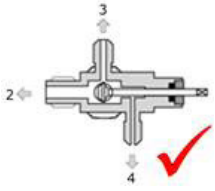



**Рис. C.** Частично открытое состояние (по часовой стрелке на 5,5 оборота из полностью открытого состояния. Отверстия 2, 3, 4 полностью открыты).

## 16 – Декларация соответствия

• **Директива по оборудованию, работаю- щему под давлением, 2014/68/EU EN 378-2:2016** – Системы холодильные и тепловые насосы. Требования безопасности и охраны окружающей среды. Часть 2: Проекти- рование, конструкция, испытание, маркиров- ка и документация

**Директива по низковольтному оборудованию 2014/35/EU** EN 60335-1:2012 + A11:2014 – Бытовые и аналогичные электроприборы. Безопасность. Часть 1: Общие требования для всех вышеупомянутых конденсаторных агре- гатов

**ДИРЕКТИВА по экодизайну 2009/125/ ЕС**, устанавливающая общие условия разработки требований экологического проектирования для изделий, связанных с энергетикой.

РЕГЛАМЕНТ (EU) 2015/1095, реализующий Директиву по экодизайну 2009/125/ЕС в от- ношении требований к экологическому проектированию для профессиональных холодильных шкафов, морозильных шкафов с интенсивным движением воздуха, компрес- сорно-конденсаторных агрегатов и чиллеров для технологического охлаждения.

• Измерения конденсаторного агрегата про- изводятся в соответствии со стандартом EN 13771-2:2017 – Компрессоры и конденсаторы для охлаждения. Проверка рабочих характе- ристик и методы испытаний. Часть 2. Агрегаты компрессорно-конденсаторные

## 17 - Гарантия

Всегда указывайте номер модели и серийный номер при подаче любой заявки, касающейся данного изделия.

Гарантия на изделие не действует в следующих случаях:

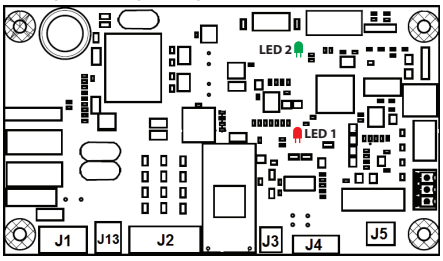
- Отсутствие заводской таблички.
- Внешние изменения, в частности, сверление, сварка, сломанные ножки и следы от ударов.
- Открытие компрессора или возврат со снятыми пломбами.
- Наличие ржавчины, воды или красителя для определения течи внутри компрессора.
- Использование хладагента или смазочного материала, не одобренного компанией Danfoss.
- Любое отклонение от рекомендованных инструкций, касающихся установки, применения или технического обслуживания.
- Мобильное применение.
- Использование во взрывоопасной атмосферной среде.
- Отсутствие номера модели или серийного номера в заявке на гарантийное обслуживание.

## 18 - Утилизация

Only for Norway

Компания Danfoss рекомендует проведение утилизации компрессорно-конденсаторных агрегатов и масла соответствующей компанией по месту ее нахождения.

Модуль B Plus — это электронная плата управления, используемая в моделях версии P02 для автоматического впрыска жидкости в спиральные компрессоры с помощью электронного расширительного клапана.




*Модуль B Plus*

Модуль B Plus закрыт защитной крышкой, как показано на рис. 6.

⚠ Не снимайте защитную крышку без необходимости. Перед снятием крышки устройство необходимо отключить.




*Рис. 6*

**Применение**

Модуль B Plus управляет впрыском жидкости, а также осуществляет мониторинг следующих параметров: Температура нагнетаемого газа, последовательность фаз и обрыв фаз.

**Описание функций**

• Впрыск жидкости

- Модуль B Plus способен управлять температурой нагнетаемого газа. Уставка по умолчанию — 125 °C, она необходима для эксплуатации компрессорно-конденсаторного блока в безопасном диапазоне температур.

⚠ Не изменяйте значение этой уставки.

- При останове компрессора клапан впрыска жидкости закроется в течение 6 секунд.

• Защита компрессора от высокой температуры нагнетаемого газа

- В модуле B Plus предусмотрен датчик температуры нагнетаемого газа, способный определять температуру газа в диапазоне от –50 до +180 °C с погрешностью ± 0,5 °C. Датчик температуры нагнетания установлен на расстоянии менее 150 мм от патрубка нагнетания компрессора.
- Если температура нагнетаемого газа превышает точку срабатывания защиты от перегрева (уставка + 10 K) в течение 1 секунды, реле аварийного сигнала (J5) будет разомкнуто. В таблице 1 это состояние обозначено как «Статичный перегрев нагнетаемого газа». Если температура нагнетаемого газа будет находиться ниже точки сброса (уставка –15 °C) непрерывно в течение 5 минут, реле аварийного сигнала (J5) будет замкнуто. Это 5-минутное состояние задержки обозначается как «Задержка сброса температуры нагнетаемого газа».
- Если перегрев нагнетаемого газа наблюдается более пяти раз в течение часа, реле аварийного сигнала (J5) блокируется в разомкнутом состоянии, после чего его можно сбросить только посредством ручного отключения модуля B Plus от сети питания (выключите устройство и включите его через некоторое время). Это состояние обозначается как «Блокировка по перегреву нагнетаемого газа», описание ошибок см. в таблице 1.
- Если датчик температуры нагнетаемого газа неисправен, то есть возникают ошибки «Датчик разомкнут», «Короткое замыкание датчика» или «Вне диапазона», реле аварийного сигнала (J5) также блокируется в разомкнутом положении, описание ошибок см. в таблице 1.

• Фазная защита

- Контроль последовательности фаз и отсутствия фазы выполняется только при запуске компрессора. При обнаружении состояний «Обрыв фазы» или «Нарушение порядка чередования фаз» в течение 4,5–5 секунд реле аварийного сигнала (J5) будет разомкнуто и заблокировано в этом состоянии. Блокировку в разомкнутом состоянии можно сбросить только посредством ручного отключения модуля B Plus от сети питания, описание ошибок см. в таблице 1.

• Интерфейс пользователя

- Когда модуль B Plus включается, индикатор питания LED 1 будет светиться красным. Когда модуль выключен, индикатор питания LED 1 погаснет. Когда модуль B Plus включен и ошибки не наблюдаются, индикатор состояния LED 2 будет светиться зеленым. Расположение индикаторов LED 1 и 2 на модуле B Plus показано на рис. 6.
- Если модуль B Plus обнаружит ошибку при включении, индикатор состояния LED 2 будет попеременно мигать желтым и красным с интервалом в 1 секунду. Подробные световые коды ошибок указаны в таблице 1.

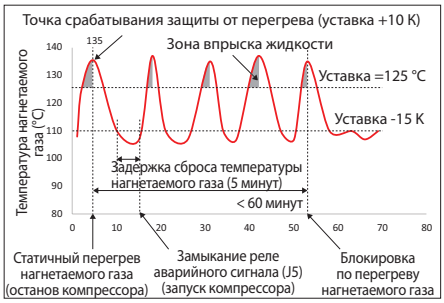
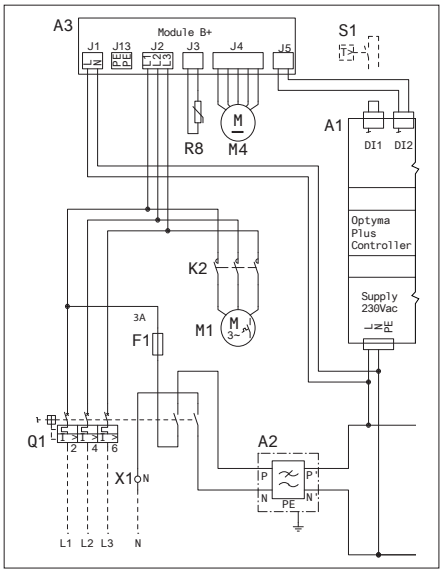



*Рис. 7*

• Связь модуля B Plus с контроллером Optyma Plus Controller.

- Когда реле аварийного сигнала (J5) разомкнуто, сигнал передается на цифровой вход 2 (DI2) контроллера Optyma, который активирует защитную аварию (A97) в контроллере Optyma Plus Controller, после чего подача питания к компрессору немедленно прекращается.




*Электрическая схема модели B Plus*

| Категория | Мигание желтым, раз | Мигание красным, раз | Ошибка | Описание | Действие |
|---|---|---|---|---|---|
| Температура нагнетаемого газа | 1 | 1 | Статичный перегрев нагнетаемого газа, задержка сброса температуры нагнетаемого газа | Температура нагнетаемого газа выше аварийной уставки останова компрессора | Проверьте, отображается ли защитная авария (A97) на контроллере Optyma. Если сигнал отображается, дождитесь автоматического устранения ошибки. Если ошибка возникает регулярно, убедитесь, что устройство работает в рекомендуемом диапазоне. |
| | | 2 | Блокировка по перегреву нагнетаемого газа | Статичный перегрев нагнетаемого газа наблюдается пять раз в течение часа | Выполните сброс питания модуля B Plus вручную (выключите устройство и включите его через некоторое время). |
| | | 3 | Температура нагнетаемого газа выходит за границы диапазона | Температура нагнетаемого газа выходит за пределы нормального диапазона (–50... +180 °C) | Убедитесь в надлежащей установке датчика температуры нагнетаемого газа на линии нагнетания. Проверьте температуру нагнетаемого газа в параметре U27 контроллера Optyma Plus Controller (значение должно находиться в диапазоне –50... +180 °C). |
| | | 4 | Датчик температуры нагнетаемого газа не подключен, короткое замыкание датчика температуры нагнетаемого газа | Нет подключения или короткое замыкание датчика температуры нагнетаемого газа | Проверьте датчик температуры нагнетания и его подключение. |
| Три фазы | 2 | 1 | Обрыв фазы | Потерян сигнал одной из фаз | Проверьте наличие всех фаз на 3-фазном источнике питания (J2) модуля B Plus. Если одна из фаз отсутствует, установите надлежащее подключение к источнику питания и выполните сброс модуля B Plus вручную (выключите устройство и включите его через некоторое время). |
| | | 2 | Нарушение порядка чередования фаз | Неправильное подключение фаз | Проверьте последовательность фаз на 3-фазном источнике питания (J2) модуля B Plus. Если она неверна, установите надлежащее подключение к источнику питания с учетом последовательности фаз и выполните сброс модуля B Plus вручную (выключите устройство и включите его через некоторое время). |

*Таблица 1. Световой код ошибки (мигание индикатора LED 2 желтым/красным)*


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# Annex - A

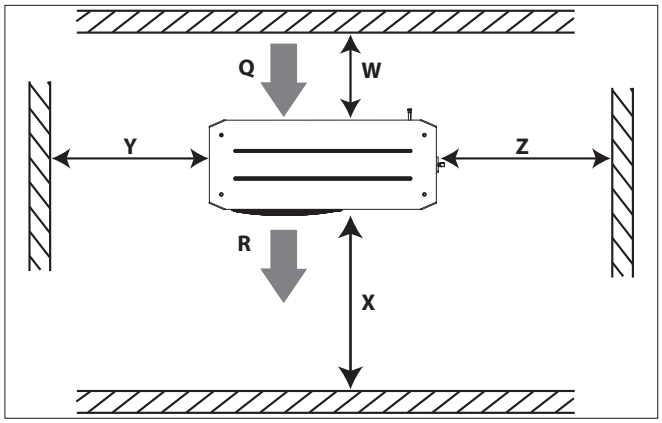
Technical data (English)

**Name plate**




** For exact values please refer name plate in unit*

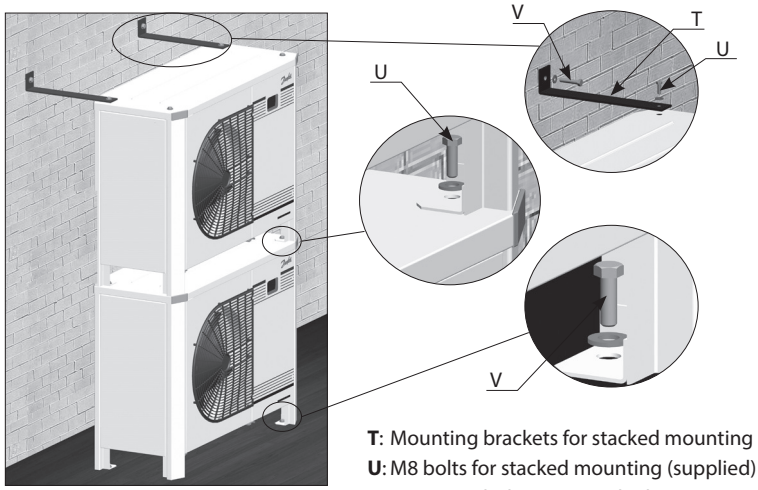
**A**: Model
**B**: Code number
**C**: Serial Number and bar code
**D**: EAN number
**E**: Refrigerant
**F**: PED Category
**G**: Application, Ingress Protection
**H**: Maximum Allowable Pressure (HP side)
**I**: Maximum Allowable Pressure (LP side)
**J**: Test Pressure
**K**: Maximum allowable Design Temperature




Picture 1 : Minimum mounting distances

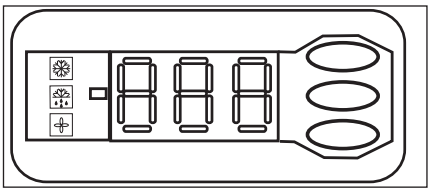
**Q**: Air in **R**: Air out

| Unit | W [mm] | X [mm] | Y [mm] | Z [mm] |
|---|---|---|---|---|
| Housing 1 (Code n° 114X31-- or 114X41--) | 250 | 550 | 456 | 456 |
| Housing 2 (Code n° 114X32-- or 114X42--) | 250 | 650 | 530 | 530 |
| Housing 3 (Code n° 114X33-- or 114X43--) | 250 | 760 | 581 | 581 |
| Housing 4 (Code n° 114X34-- or 114X44--) | 250 | 900 | 700 | 700 |




Picture 2 : Stacked mounting

**T**: Mounting brackets for stacked mounting (not supplied)
**U**: M8 bolts for stacked mounting (supplied)
**V**: Mounting bolts (not supplied)

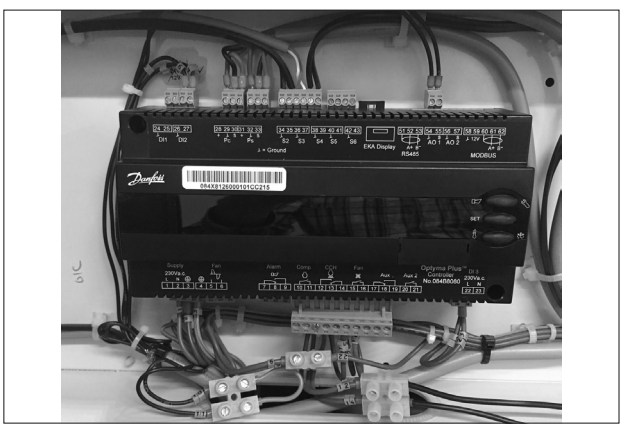


Picture 3 : Electronic controller display

- Compressor running
- Crankcase heater on
- Fan running
- Temperature value for suction pressure. Push lower button to switch to temperature value for condensing pressure



Picture 4 : Normal wiring



Picture 5 : Temporary wiring

**Designation system for the** Optyma™ **Plus range**

**OP - MPXM 034 ML P00 G**

**1 2 3 4 5 6 7 8**

| | |
|---|---|
| **1** | **Application**<br>M = MBP<br>L = LBP |
| **2** | **Package**<br>Condensing unit family: P = Optyma™ Plus |
| **3** | **Refrigerant**<br>H = R404A/R507<br>G = R134a, R513A<br>Q = R452A, R404A/R507<br>X = R404A/R507, R134a, R407A, R407F, R448A, R513A R449A,R452A<br>Y = R404A/R507, R449A<br>B = R448A/R449A/R404A/R452A (MBP)<br>P = R448A/R449A, R407A/F, R404A/R507<br>O = R448A/R449A/R404A/R452A (LBP) |
| **4** | **Condenser**<br>M = Microchannel heat condenser |
| **5** | **Swept volume**<br>Displacement in $cm^3$. Example 034 = 34 $cm^3$ |
| **6** | **Compressor platform**<br>ML= Fixed speed scroll MLZ |
| **7** | **Version**<br>P00: Optyma™ Plus<br>P02: Optyma™ Plus with Liquid Injection<br>P05: Optyma™ Plus with Supply monitoring relay |
| **8** | **Voltage code**<br>G = 230V/1-phase/50Hz compressor & fan<br>E = 400V/3-phase/50Hz compressor & 230V/1-phase fan |

## Version control

| Optyma™ **Plus** | **(P00)** | **(P02)** | **(P05)** |
|---|---|---|---|
| IP level | IP54 | IP54 | IP54 |
| Compressor technology | Scroll/ Reciprocating | Scroll | Scroll (3phase) |
| Control box (pre-wired E-panel) | yes | yes | yes |
| Microchannel condenser | yes | yes | yes |
| Fan speed controller* | yes | yes | yes |
| Main switch (circuit breaker) | yes | yes | yes |
| Supply monitoring relay | - | - | yes |
| Filter drier (flare connections) | yes | yes | yes |
| Sight glass | yes | yes | yes |
| Crankcase heater | yes | yes | yes |
| HP/LP adjustable pressostat | Electronic | Electronic | Electronic |
| Fail safe mini-pressostat | Mechanical | Mechanical | Mechanical |
| Access door(s) | yes | yes | yes |
| Acoustic insulation | yes | yes | yes |
| Condensing unit electronic controller | yes | yes | yes |
| Network connectivity | yes | yes | yes |
| Stack mounting | yes | yes | yes |
| Discharge gas thermostat | yes | yes | yes |
| HP/LP Alarm | yes | yes | yes |
| Liquid injection kit, phase loss/sequence protection | - | yes | - |
| Pressure Relief Valve** | - | - | - |

** Inbuilt function within Condensing unit electronic controller*
*** Accessory (Not factory mounted)*


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**Technical data**

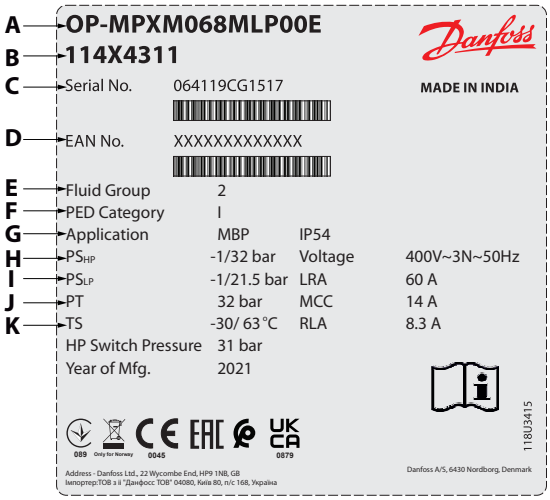
| Application | Code | Model | Compressor Model | Electrical Code | Refrigerant | Receiver (L) | PED category* | PS | Suction Valve | Liquid Valve | Housing | Unit Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | bar | Inch | Inch | | L | W | H |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | M | 6.2 | I | 32 | 7/8" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3301 | OP-LPOM067LLP05E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3302 | OP-LPOM084LLP05E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3303 | OP-LPOM098LLP05E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3401 | OP-LPOM120LLP05E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3402 | OP-LPOM168LLP05E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4261 | OP-MPXM034MLP00G | MLZ015T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4281 | OP-MPXM046MLP00G | MLZ021T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4290 | OP-MPXM057MLP00G | MLZ026T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4308 | OP-MPXM068MLP00G | MLZ030T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4321 | OP-MPXM080MLP00G | MLZ038T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4201 | OP-MPXM034MLP05E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4202 | OP-MPXM046MLP05E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4203 | OP-MPXM057MLP05E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4303 | OP-MPXM068MLP05E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4304 | OP-MPXM080MLP05E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4305 | OP-MPXM108MLP05E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4401 | OP-MPXM125MLP05E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4402 | OP-MPXM162MLP05E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |

**PED Category for Group 2 fluid*

# Anhang – A

Technische Daten (Deutsch)

### Typenschild




**Genaue Werte siehe Typenschild in der Einheit*

**A**: Typ
**B**: Bestellnummer
**C**: Seriennummer und Strichcode
**D**: EAN-Nummer
**E**: Kältemittel
**F**: PED-Kategorie
**G**: Anwendung, Schutzart
**H**: Maximal zulässiger Druck (HP-Seite)
**I**: Maximal zulässiger Druck (LP-Seite)
**J**: Prüfdruck
**K**: Maximal zulässige Auslegungs-temperatur

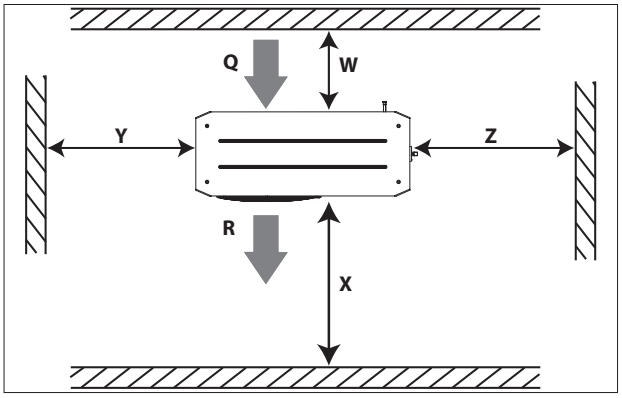



Bild 1: Mindestmontageabstände

**Q**: Lufteintritt **R**: Luftaustritt

| Einheit | B [mm] | X [mm] | Y [mm] | Z [mm] |
|---|---|---|---|---|
| Gehäuse 1 (Bestellnr.°114X31– bzw. 114X41–) | 250 | 550 | 456 | 456 |
| Gehäuse 2 (Bestellnr. 114X32– bzw. 114X42–) | 250 | 650 | 530 | 530 |
| Gehäuse 3 (Bestellnr. 114X33– bzw. 114X43–) | 250 | 760 | 581 | 581 |
| Gehäuse 4 (Bestellnr. 114X34– bzw. 114X44–) | 250 | 900 | 700 | 700 |

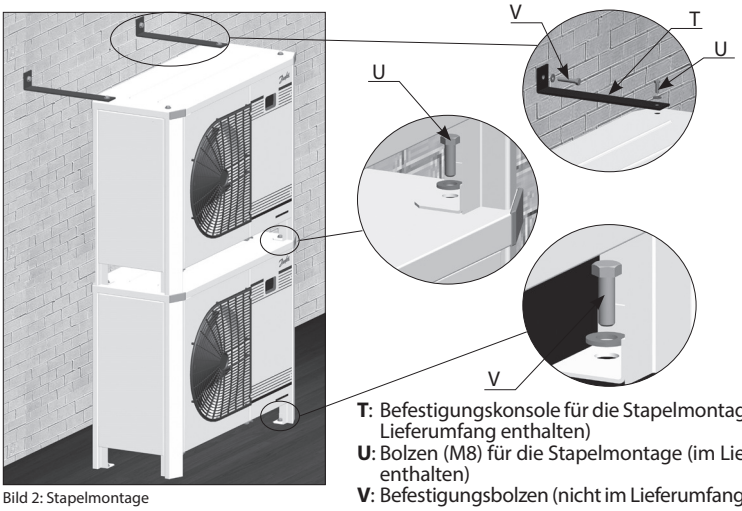



Bild 2: Stapelmontage

**T**: Befestigungskonsole für die Stapelmontage (nicht im Lieferumfang enthalten)
**U**: Bolzen (M8) für die Stapelmontage (im Lieferumfang enthalten)
**V**: Befestigungsbolzen (nicht im Lieferumfang enthalten)

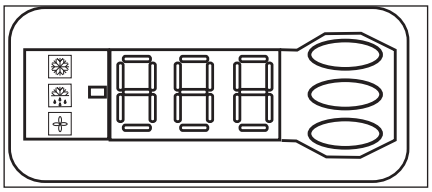


Bild 3: Display des elektronischen Reglers

Verdichter in Betrieb

Kurbelwannenheizung in Betrieb

Lüfter in Betrieb

Temperaturwert für den Saugdruck. Untere Taste drücken, um zum Temperaturwert für den Verflüssigungsdruck zu wechseln.



Bild 4: Normale Verdrahtung

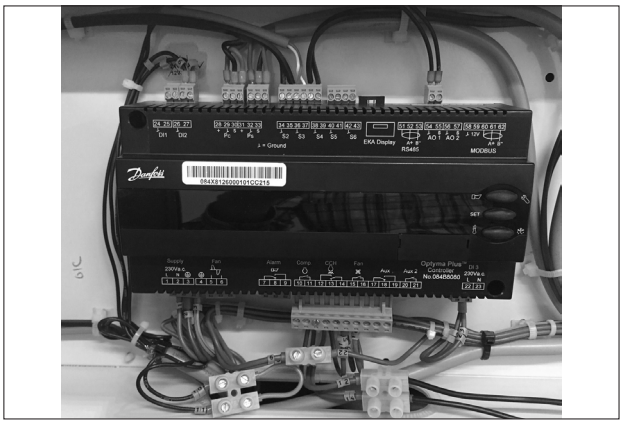


Bild 5: Vorläufige Verdrahtung für Notbetrieb


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**Bezeichnungssystem für das Produktprogramm Optyma™ Plus**

**OP - MPXM 034 ML P00 G**

**1 2 3 4 5 6 7 8**

| | |
|---|---|
| **1** | **Anwendung**<br>M = MBP<br>L = LBP |
| **2** | **Verbund**<br>Verflüssigungssatzbaureihe: P = Optyma™ Plus |
| **3** | **Kältemittel**<br>H = R404A/R507<br>G = R134a, R513A<br>Q = R452A, R404A/R507<br>X = R404A/R507, R134a, R407A, R407F, R448A, R513A R449A,R452A<br>Y = R404A/R507, R449A<br>B = R448A/R449A/R404A/R452A (MBP)<br>P = R448A/R449A, R407A/F, R404A/R507<br>O = R448A/R449A/R404A/R452A (LBP) |
| **4** | **Verflüssiger**<br>M = Microchannel-Verflüssiger |
| **5** | **Hubvolumen**<br>Hubvolumen in $cm^3$: Beispiel 034 = 34 $cm^3$ |
| **6** | **Verdichterplattform**<br>ML= Scrollverdichter mit fester Drehzahl MLZ |
| **7** | **Version**<br>P00: Optyma™ Plus<br>P02: Optyma™Plus mit Flüssigkeitseinspritzung<br>P05: Optyma™Plus mit Spannungsüberwachungsrelais |
| **8** | **Spannungscode**<br>G = 230V/1-phasiger/50 Hz Verdichter und Lüfter<br>E = 400V/3-phasig/50 Hz-Verdichter und 230 V/1-phasiger Lüfter |

## Ausstattungsunterschiede

| Optyma™ **Plus** | **(P00)** | **(P02)** | **(P05)** |
|---|---|---|---|
| IP-Schutzart | IP54 | IP54 | IP54 |
| Verdichtertechnologie | Scrollverdichter/ Hubkolbenverdichter | Scrollverdichter | Scrollverdichter (3-phasig) |
| Integrierter elektrischer Schaltkasten | Ja | Ja | Ja |
| Microchannel-Verflüssiger | Ja | Ja | Ja |
| Lüfterdrehzahlregler* | Ja | Ja | Ja |
| Hauptschalter (Leistungsschalter) | Ja | Ja | Ja |
| Spannungsüberwachungsrelais | - | - | Ja |
| Filtertrockner (Bördelanschlüsse) | Ja | Ja | Ja |
| Schauglas | Ja | Ja | Ja |
| Kurbelgehäuseheizung | Ja | Ja | Ja |
| Einstellbarer HD-/ ND-Druckschalter | Elektronisch | Elektronisch | Elektronisch |
| Patronendruckschalter | Mechanisch | Mechanisch | Mechanisch |
| Servicetür(en) | Ja | Ja | Ja |
| Schalldämmung | Ja | Ja | Ja |
| Verflüssigungssatz, elektronischer Regler | Ja | Ja | Ja |
| Netzwerkanbindungsoption | Ja | Ja | Ja |
| Stapelmontage | Ja | Ja | Ja |
| Heißgasthermostat | Ja | Ja | Ja |
| HD/ND-Alarm | Ja | Ja | Ja |
| Flüssigkeitseinspritzungssatz, Schutz vor Phasenverlust/ Phasenfolgeschutz | - | Ja | - |
| Sicherheitsventil** | - | - | - |

** Eingebaute Funktion im elektronischen Regler des Verflüssigungssatzes*
***Zubehör (nicht werkseitig installiert)*

**Technische Daten**

| Anwendung | Codes | Verflüssigungssätze | Verdichter | Spannungscode | Kältemittel | Sammler [L] | PED-Kategorie* | PS | Saugventil | Flüssigkeitsventil | Gehäuse | Abmessungen der Einheit (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | bar | Zoll | Zoll | | L | W | H |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | M | 6.2 | I | 32 | 7/8" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3301 | OP-LPOM067LLP05E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3302 | OP-LPOM084LLP05E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3303 | OP-LPOM098LLP05E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3401 | OP-LPOM120LLP05E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3402 | OP-LPOM168LLP05E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4261 | OP-MPXM034MLP00G | MLZ015T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4281 | OP-MPXM046MLP00G | MLZ021T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4290 | OP-MPXM057MLP00G | MLZ026T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4308 | OP-MPXM068MLP00G | MLZ030T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4321 | OP-MPXM080MLP00G | MLZ038T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4201 | OP-MPXM034MLP05E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4202 | OP-MPXM046MLP05E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4203 | OP-MPXM057MLP05E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4303 | OP-MPXM068MLP05E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4304 | OP-MPXM080MLP05E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4305 | OP-MPXM108MLP05E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4401 | OP-MPXM125MLP05E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4402 | OP-MPXM162MLP05E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |

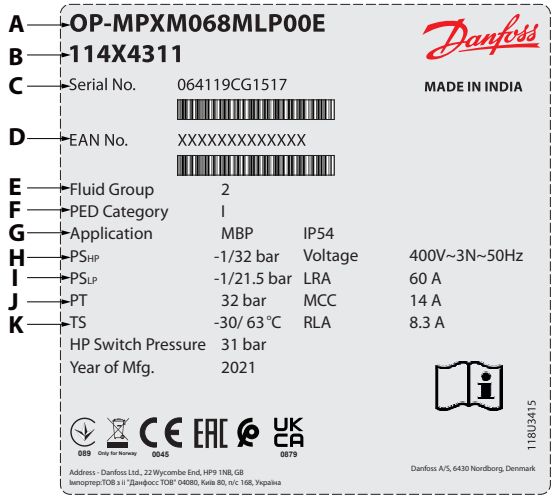
**PED-Kategorie für Fluide der Gruppe 2*


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# Annexe – A

Données techniques (Français)

**Plaque signalétique**




** Pour connaître les valeurs exactes, reportez-vous à la plaque signalétique du groupe*

**A**: Modèle
**B**: Nº de code
**C**: Nº de série et code-barres
**D**: numéro EAN
**E**: Réfrigérant
**F**: Catégorie PED
**G**: Application, Indice de protection
**H**: Pression maximale admissible (côté HP)
**I**: Pression maximale admissible (côté BP)
**J**: pression d'essai
**K**: Température de conception maximale autorisée

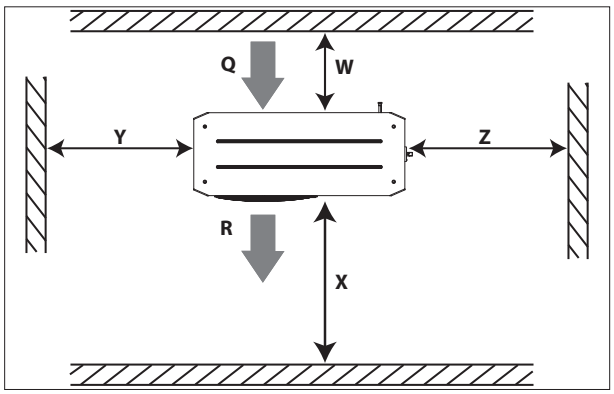



Illustration 1 : Distances de montage minimum

**Q** :Air entrant **R** : Air sortant

| Groupe | W [mm] | X [mm] | Y [mm] | Z [mm] |
|---|---|---|---|---|
| Logement 1 (Code n °114X31-- ou 114X41--) | 250 | 550 | 456 | 456 |
| Logement 2 (Code n ° 114X32-- ou 114X42--) | 250 | 650 | 530 | 530 |
| Logement 3 (Code n ° 114X33-- ou 114X43--) | 250 | 760 | 581 | 581 |
| Logement 4 (Code n ° 114X34-- ou 114X44--) | 250 | 900 | 700 | 700 |

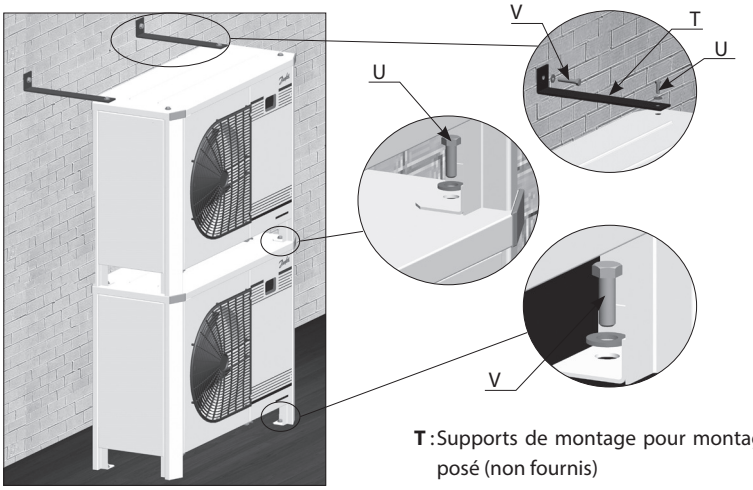



Illustration 2 : Montage superposé

**T** :Supports de montage pour montage superposé (non fournis)
**U** :Boulons M8 pour montage superposé (fournis)
**V** :Boulons de montage (non fournis)

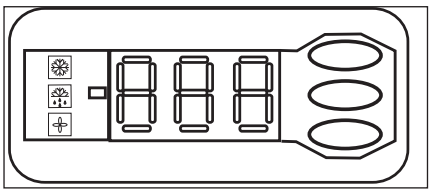


Illustration 3 : Affichage du régulateur électronique

Compresseur en fonctionnement

Résistance de carter activée

Ventilateur en fonctionnement

Valeur de la température pour la pression d'aspiration. Appuyez sur le bouton inférieur pour passer à la valeur de la température pour la pression de condensation.

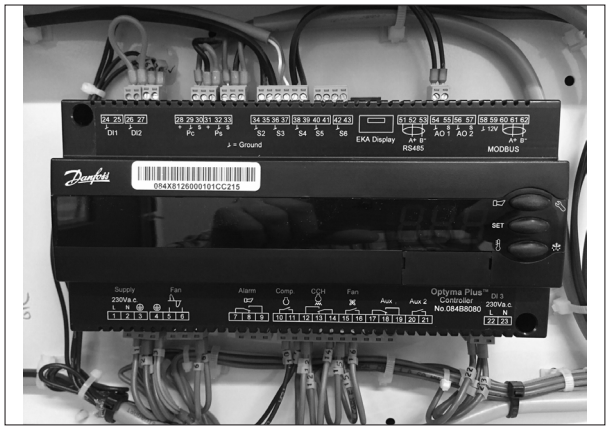


Illustration 4 : Câblage normal

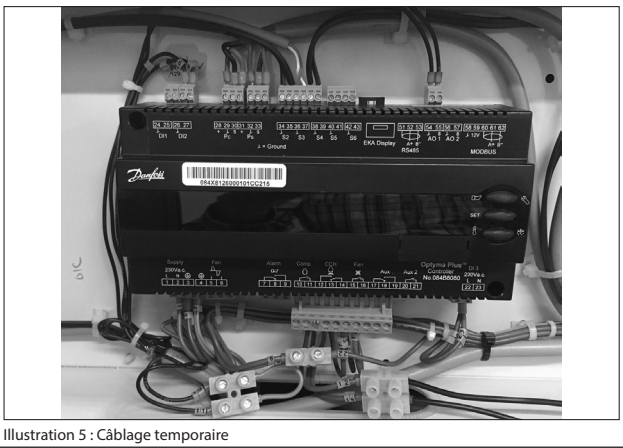


Illustration 5 : Câblage temporaire

**Système de désignation pour la gamme Optyma™ Plus**

**OP - MPXM 034 ML P00 G**

**1 2 3 4 5 6 7 8**

| | |
|---|---|
| **1** | **Application**<br>M = MBP<br>L = LBP |
| **2** | **Ensemble**<br>Gamme de groupe de condensation : P = Optyma™ Plus |
| **3** | **Réfrigérant**<br>H = R404A/R507<br>G = R134a, R513A<br>Q = R452A, R404A/R507<br>X = R404A/R507, R134a, R407A, R407F, R448A, R513A R449A,R452A<br>Y = R404A/R507, R449A<br>B = R448A/R449A/R404A/R452A (MBP)<br>P = R448A/R449A, R407A/F, R404A/R507<br>O = R448A/R449A/R404A/R452A (LBP) |
| **4** | **Condenseur**<br>M = Condenseur de chaleur à microcanaux |
| **5** | **Volume balayé**<br>Déplacement en $cm^3$ : Exemple 034 = 34 $cm^3$ |
| **6** | **Plateforme de compresseur**<br>ML= Scroll à vitesse fixe MLZ |
| **7** | **Version**<br>P00: Optyma™ Plus<br>P02: Optyma™ Plus avec injection de liquide<br>P05: Optyma™ Plus avec relais de surveillance de l'alimentation |
| **8** | **Code de tension**<br>G = Compresseur et ventilateur 230 V/monophasés/50 Hz<br>E = Compresseur 400 V/triphasé/50 Hz et ventilateur monophasé/230 V |

## Contrôle de version

| Optyma™ **Plus** | **(P00)** | **(P02)** | **(P05)** |
|---|---|---|---|
| Niveau IP | IP54 | IP54 | IP54 |
| Technologie du compresseur | Scroll/À piston | Scroll | Scroll (triphasé) |
| Boîtier de commande (panneau électrique précâblé) | oui | oui | oui |
| Condenseur à microcanaux | oui | oui | oui |
| Variateur de vitesse du ventilateur* | oui | oui | oui |
| Sectionneur principal (coupe-circuit) | oui | oui | oui |
| Relais de surveillance de l'alimentation | - | - | oui |
| Filtre déshydrateur (raccords flare) | oui | oui | oui |
| Voyant liquide | oui | oui | oui |
| Résistance de carter | oui | oui | oui |
| Pressostat ajustable HP/BP | Électronique | Électronique | Électronique |
| Mini-pressostat avec sécurité intégrée | Mécanique | Mécanique | Mécanique |
| Porte(s) d'accès | oui | oui | oui |
| Isolation acoustique | oui | oui | oui |
| Groupe de condensation avec régulateur électronique | oui | oui | oui |
| Connectivité réseau | oui | oui | oui |
| Superposable | oui | oui | oui |
| Thermostat du gaz de refoulement | oui | oui | oui |
| Alarme HP/BP | oui | oui | oui |
| Kit d'injection de liquide, protection contre les pertes/défauts d'ordre de phase | - | oui | - |
| Soupape de sécurité** | - | - | - |

** Fonction intégrée au groupe de condensation avec régulateur électronique*
*** Accessoire (non monté en usine)*


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**Données techniques**

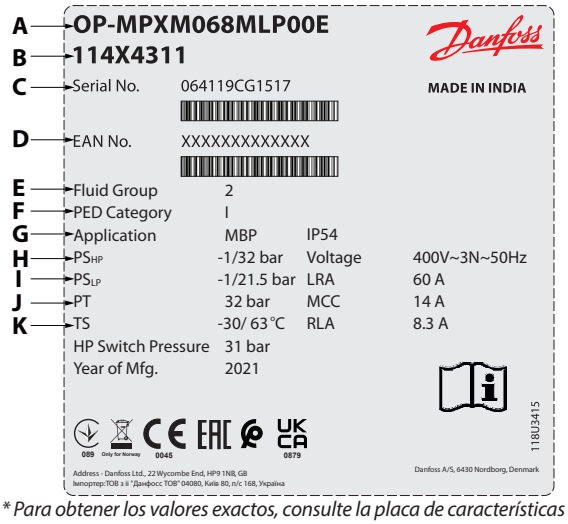
| Application | Codes | Modèle du groupe de condensation | Compresseur | Code électrique | Réfrigérant | Réservoir (l) | Catégorie PED* | PS | Vanne d'aspiration | Vanne de liquide | Boîtier | Dimensions de l'unité (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | bar | Pouce | Pouce | | L | W | H |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | M | 6.2 | I | 32 | 7/8" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3301 | OP-LPOM067LLP05E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3302 | OP-LPOM084LLP05E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3303 | OP-LPOM098LLP05E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3401 | OP-LPOM120LLP05E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3402 | OP-LPOM168LLP05E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4261 | OP-MPXM034MLP00G | MLZ015T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4281 | OP-MPXM046MLP00G | MLZ021T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4290 | OP-MPXM057MLP00G | MLZ026T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4308 | OP-MPXM068MLP00G | MLZ030T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4321 | OP-MPXM080MLP00G | MLZ038T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4201 | OP-MPXM034MLP05E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4202 | OP-MPXM046MLP05E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4203 | OP-MPXM057MLP05E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4303 | OP-MPXM068MLP05E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4304 | OP-MPXM080MLP05E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4305 | OP-MPXM108MLP05E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4401 | OP-MPXM125MLP05E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4402 | OP-MPXM162MLP05E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |

**Catégorie PED pour les fluides du groupe 2*

# Anexo A

Datos técnicos (Español)

**Placa de características**




** Para obtener los valores exactos, consulte la placa de características de la unidad*

- **A**: Modelo
- **B**: Código
- **C**: Número de serie y código de barras
- **D**: número EAN
- **E**: Refrigerante
- **F**: Categoría PED
- **G**: Aplicación, Grado de protección
- **H**: Presión máxima permitida (lado HP)
- **I**: Presión máxima permitida (lado LP)
- **J**: Presión de prueba
- **K**: Temperatura de diseño máxima permitida

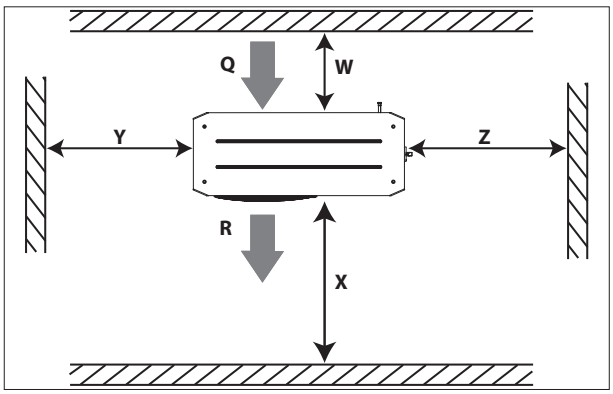



Ilustración 1: Distancias mínimas de montaje

**Q**: Entrada de aire **R**: Salida de aire

| Unidad | W [mm] | X [mm] | Y [mm] | Z [mm] |
|---|---|---|---|---|
| Carcasa 1 (N.° de código 114X31-- o 114X41--) | 250 | 550 | 456 | 456 |
| Carcasa 2 (N.° de código 114X32-- o 114X42--) | 250 | 650 | 530 | 530 |
| Carcasa 3 (N.° de código 114X33-- o 114X43--) | 250 | 760 | 581 | 581 |
| Carcasa 4 (N.° de código 114X34-- o 114X44--) | 250 | 900 | 700 | 700 |

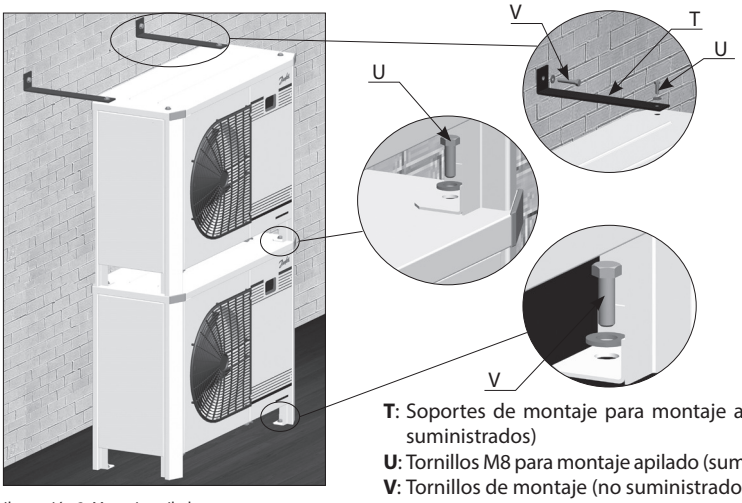



Ilustración 2: Montaje apilado

- **T**: Soportes de montaje para montaje apilado (no suministrados)
- **U**: Tornillos M8 para montaje apilado (suministrados)
- **V**: Tornillos de montaje (no suministrados)

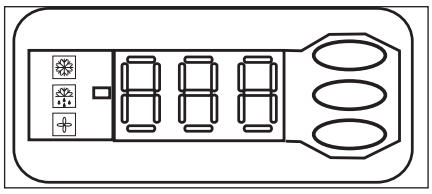


Ilustración 3: Pantalla del controlador electrónico

- Compresor en funcionamiento
- Resistencia del cárter activada
- Ventilador en funcionamiento
- Temperatura a la presión de aspiración. Pulse el botón inferior para consultar la temperatura a la presión de condensación.



Ilustración 4: Cableado normal

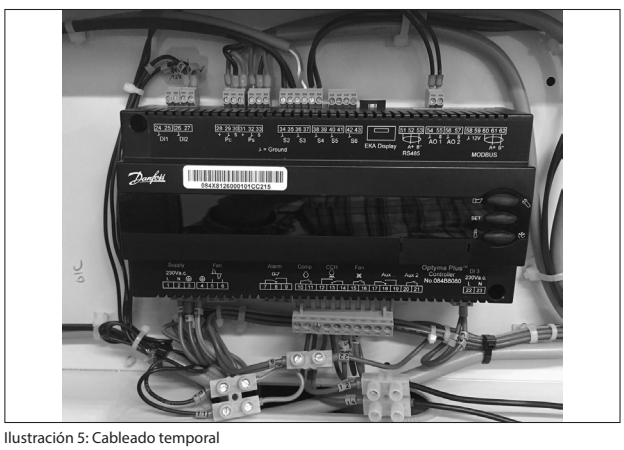


Ilustración 5: Cableado temporal


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**Nomenclatura de la gama Optyma™ Plus**

**OP - MPXM 034 ML P00 G**

1 2 3 4 5 6 7 8

| | |
|---|---|
| **1** | **Aplicación**<br>M = MBP<br>L = LBP |
| **2** | **Paquete**<br>Familia de unidades condensadoras: P = **Optyma™ Plus** |
| **3** | **Refrigerante**<br>H = R404A/R507<br>G = R134a, R513A<br>Q = R452A, R404A/R507<br>X = R404A/R507, R134a, R407A, R407F, R448A, R513A R449A,R452A<br>Y = R404A/R507, R449A<br>B = R448A/R449A/R404A/R452A (MBP)<br>P = R448A/R449A, R407A/F, R404A/R507<br>O = R448A/R449A/R404A/R452A (LBP) |
| **4** | **Condensador**<br>M = Condensador térmico de microcanales |
| **5** | **Volumen desplazado**<br>Desplazamiento en $cm^3$: Ejemplo 034 = 34 $cm^3$ |
| **6** | **Plataforma de compresores**<br>ML= Compresor scroll MLZ de velocidad fija |
| **7** | **Versión**<br>P00: Optyma™ Plus<br>P02: Optyma™ Plus con inyección de líquido<br>P05: Optyma™ Plus con relé de control de suministro |
| **8** | **Código de tensión**<br>G = 230V / monofásico / 50Hz compresor y ventilador<br>E = 400V / Trifásico / 50Hz compresor y 230V / monofásico fan |

## Control de versión

| Optyma™ **Plus** | **(P00)** | **(P02)** | **(P05)** |
|---|---|---|---|
| Nivel IP | IP54 | IP54 | IP54 |
| Tecnología del compresor | Scroll/ Alternativo | Scroll | Scroll (Trifásico) |
| Caja de control (panel eléctrico precableado) | sí | sí | sí |
| Condensador de microcanales | sí | sí | sí |
| Controlador de velocidad para ventilador* | sí | sí | sí |
| Interruptor principal (disyuntor) | sí | sí | sí |
| Relé de control de suministro | - | - | sí |
| Secador del filtro (conexiones roscadas) | sí | sí | sí |
| Visor de líquido | sí | sí | sí |
| Resistencia de cárter | sí | sí | sí |
| Presostato ajustable de AP/BP | Electrónico | Electrónico | Electrónico |
| Minipresostato a prueba de fallos | Mecánico | Mecánico | Mecánico |
| Puerta(s) de acceso | sí | sí | sí |
| Aislamiento acústico | sí | sí | sí |
| Controlador electrónico de la unidad condensadora | sí | sí | sí |
| Conectividad de red | sí | sí | sí |
| Montaje apilado | sí | sí | sí |
| Termostato de gas de descarga | sí | sí | sí |
| Alarma de AP/BP | sí | sí | sí |
| Kit de inyección de líquido, protección contra pérdidas/secuencia de fase | - | sí | - |
| Válvula de alivio de presión** | - | - | - |

** Función integrada en el controlador electrónico de la unidad condensadora*
*** Accesorio (no montado en fábrica)*

**Datos técnicos**

| Aplicación | Códigos | Modelo de unidad condensadora | Compresor | Código eléctrico | Refrigerante | Recipiente (L) | Categoría PED* | PS | Válvula de aspiración | Válvula de líquido | alojamiento | Dimensiones de la unidad (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | bar | Pulgada | Pulgada | | L | W | H |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | M | 6.2 | I | 32 | 7/8" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3301 | OP-LPOM067LLP05E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3302 | OP-LPOM084LLP05E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3303 | OP-LPOM098LLP05E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3401 | OP-LPOM120LLP05E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3402 | OP-LPOM168LLP05E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4261 | OP-MPXM-034MLP00G | MLZ015T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4281 | OP-MPXM-046MLP00G | MLZ021T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4290 | OP-MPXM-057MLP00G | MLZ026T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4308 | OP-MPXM-068MLP00G | MLZ030T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4321 | OP-MPXM-080MLP00G | MLZ038T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4201 | OP-MPXM034MLP05E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4202 | OP-MPXM046MLP05E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4203 | OP-MPXM057MLP05E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4303 | OP-MPXM068MLP05E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4304 | OP-MPXM080MLP05E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4305 | OP-MPXM108MLP05E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4401 | OP-MPXM125MLP05E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4402 | OP-MPXM162MLP05E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |

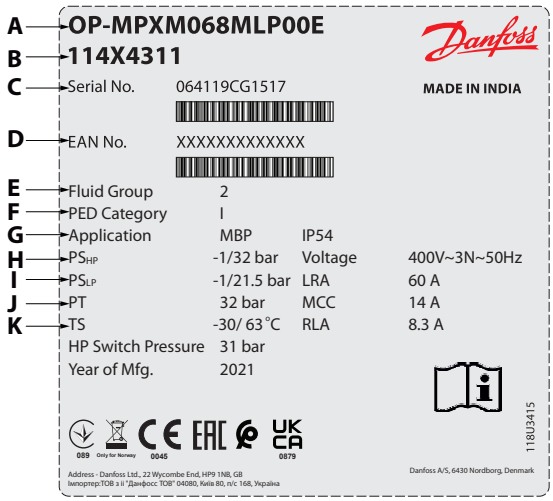
**Categoría PED para líquidos del Grupo 2*


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# Allegato A

Dati tecnici (Italiano)

**Targhetta**




** Per i valori esatti, fare riferimento alla targhetta affissa sull'unità*

**A**: Modello
**B**: Codice
**C**: Numero di serie e codice a barre
**D**: numero EAN
**E**: Refrigerante
**F**: Categoria PED
**G**: Applicazione, Grado di protezione
**H**: Pressione massima consentita (lato HP)
**I**: Pressione massima ammissibile (lato LP)
**J**: Pressione di prova
**K**: Temperatura di progetto massima consentita

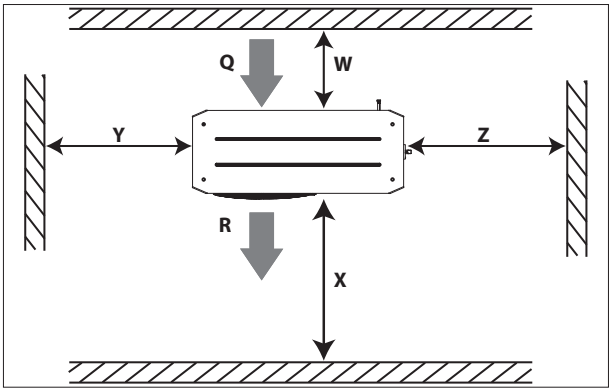



Figura 1: Distanze di montaggio minime

**Q**: Ingresso aria **R**: Uscita aria

| Unità | W [mm] | X [mm] | Y [mm] | Z [mm] |
|---|---|---|---|---|
| Alloggiamento 1 (Codice n° 114X31-- o 114X41--) | 250 | 550 | 456 | 456 |
| Alloggiamento 2 (Codice n° 114X32-- o 114X42--) | 250 | 650 | 530 | 530 |
| Alloggiamento 3 (Codice n° 114X33-- o 114X43--) | 250 | 760 | 581 | 581 |
| Alloggiamento 4 (Codice n° 114X34-- o 114X44--) | 250 | 900 | 700 | 700 |

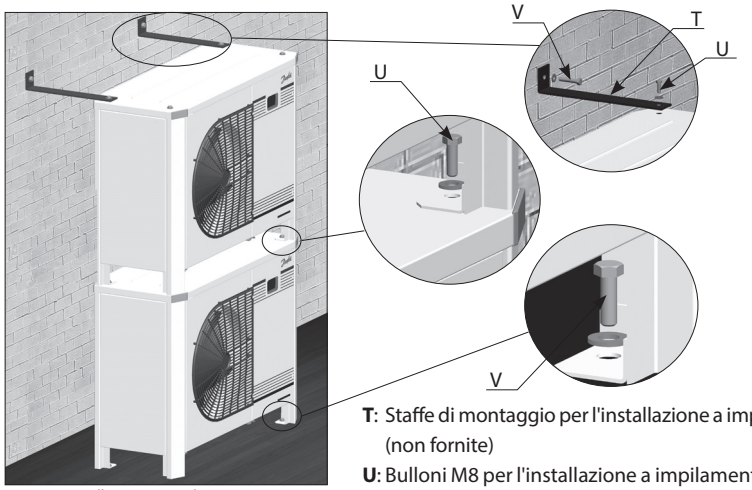



Figura 2: Installazione a impilamento

**T**: Staffe di montaggio per l'installazione a impilamento (non fornite)
**U**: Bulloni M8 per l'installazione a impilamento (forniti)
**V**: Bulloni di montaggio (non forniti)

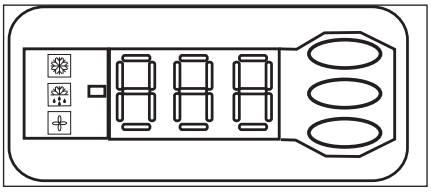


Figura 3: Display regolatore elettronico

Compressore in funzione

Resistenza del carter in funzione

Ventola in funzione

Valore temperatura per la pressione di aspirazione. Premere il pulsante inferiore per selezionare il valore della temperatura per la pressione di condensazione



Figura 4: Cablaggio normale



Figura 5: Cablaggio temporaneo

**Nomenclatura per la gamma Optyma™ Plus**

**OP - MPXM 034 ML P00 G**

1 2 3 4 5 6 7 8

| | |
|---|---|
| **1** | **Applicazione**<br>M = MBP<br>L = LBP |
| **2** | **Gruppo**<br>Famiglia di unità condensatrici: P = Optyma™ Plus |
| **3** | **Refrigerante**<br>H = R404A/R507<br>G = R134a, R513A<br>Q = R452A, R404A/R507<br>X = R404A/R507, R134a, R407A, R407F, R448A, R513A R449A,R452A<br>Y = R404A/R507, R449A<br>B = R448A/R449A/R404A/R452A (MBP)<br>P = R448A/R449A, R407A/F, R404A/R507<br>O = R448A/R449A/R404A/R452A (LBP) |
| **4** | **Condensatore**<br>M = Condensatore di calore a microcanali |
| **5** | **Volume di iniezione**<br>Cilindrata in $cm^3$: Esempio 034 = 34 $cm^3$ |
| **6** | **Tipo di compressore**<br>ML= Scroll velocità fissa MLZ |
| **7** | **Versione**<br>P00: Optyma™ Plus<br>P02: Optyma™ Plus con iniezione di liquido<br>P05: Optyma™ Plus con relè di monitoraggio alimentazione |
| **8** | **Codice di tensione**<br>G = 230V/monofase/ Compressore e ventilatore 50Hz<br>E = 400V/trifase/Compressore 50Hz e 230V/monofase ventilatore |

## Controllo versione

| Optyma™ **Plus** | **(P00)** | **(P02)** | **(P05)** |
|---|---|---|---|
| Protezione IP: | IP54 | IP54 | IP54 |
| Tecnologia compressore | Scroll/ Alternativo | Scroll | Scroll (trifase) |
| Centralina (pannello E pre-cablato) | sí | sí | sí |
| Condensatore a microcanali | sí | sí | sí |
| Regolatore velocità ventilatori* | sí | sí | sí |
| Interruttore principale (interruttore automatico) | sí | sí | sí |
| Relè di monitoraggio alimentazione | - | - | sí |
| Filtro essiccatore (connessioni a cartella) | sí | sí | sí |
| Spia del liquido | sí | sí | sí |
| Resistenza carter | sí | sí | sí |
| Pressostato regolabile AP/BP | Elettronico | Elettronico | Elettronico |
| Mini pressostato fail safe | Meccanico | Meccanico | Meccanico |
| Sportello/i di accesso | sí | sí | sí |
| Isolamento acustico | sí | sí | sí |
| Regolatore elettronico unità condensatrice | sí | sí | sí |
| Connettività di rete | sí | sí | sí |
| Montaggio a impilamento | sí | sí | sí |
| Termostato gas di mandata | sí | sí | sí |
| Allarme AP/BP | sí | sí | sí |
| Kit per iniezione di liquido, protezione contro perdita/sequenza di fase | - | sí | - |
| Valvola limitatrice di pressione** | - | - | - |

** Funzione integrata nel regolatore elettronico unità condensatrice*
*** Accessorio (non montato in fabbrica)*


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**Dati tecnici**

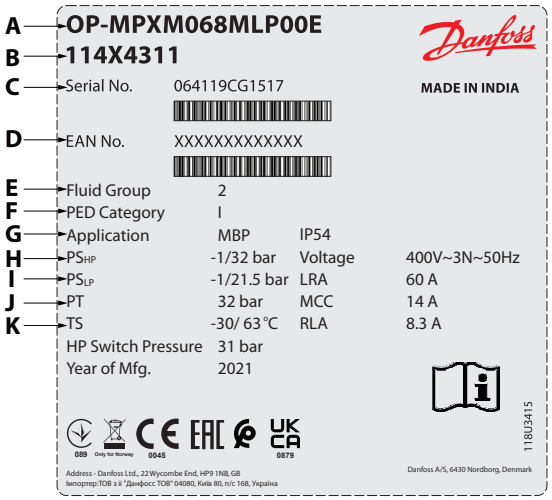
| Applicazione | Codici | Modello di unità condensatrice | Compressor Model | Codice elettrico | Refrigerante | Ricevitore (L) | Categoria PED* | PS | Valvola di aspirazione | Valvola liquido | alloggiamento | Dimensioni unità (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | bar | Pollici | Pollici | | L | W | H |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | M | 6.2 | I | 32 | 7/8" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3301 | OP-LPOM067LLP05E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3302 | OP-LPOM084LLP05E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3303 | OP-LPOM098LLP05E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3401 | OP-LPOM120LLP05E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3402 | OP-LPOM168LLP05E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4261 | OP-MPXM034MLP00G | MLZ015T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4281 | OP-MPXM046MLP00G | MLZ021T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4290 | OP-MPXM057MLP00G | MLZ026T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4308 | OP-MPXM068MLP00G | MLZ030T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4321 | OP-MPXM080MLP00G | MLZ038T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4201 | OP-MPXM034MLP05E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4202 | OP-MPXM046MLP05E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4203 | OP-MPXM057MLP05E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4303 | OP-MPXM068MLP05E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4304 | OP-MPXM080MLP05E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4305 | OP-MPXM108MLP05E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4401 | OP-MPXM125MLP05E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4402 | OP-MPXM162MLP05E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |

**Categoria PED per fluidi del gruppo 2*

# Anexo - A

Dados técnicos (Português)

**Placa de identificação**




** Para obter os valores exatos, consulte a placa de identificação na unidade*

**A**: Modelo
**B**: Número de código
**C**: número de série e código de barras
**D**: número EAN
**E**: Refrigerante
**F**: Categoria PED
**G**: Aplicação, Proteção de entrada
**H**: Pressão Máxima Permitida (lado HP)
**I**: Pressão Máxima Permitida (lado LP)
**J**: Pressão de Teste
**K**: Temperatura de projeto máxima permitida

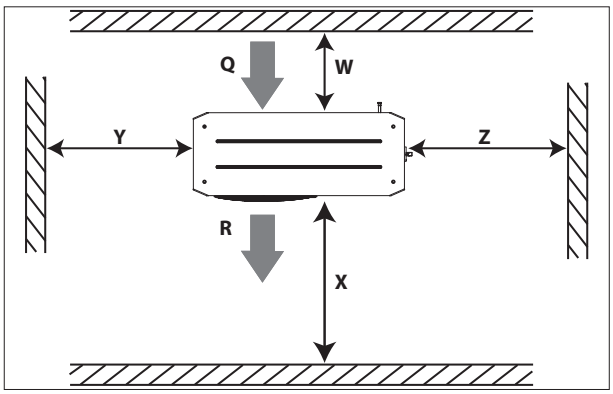



Imagem 1 : Distâncias de montagem mínimas

**Q**: Entrada de ar **R**: Saída de ar

| Unidade | W [mm] | X [mm] | Y [mm] | Z [mm] |
|---|---|---|---|---|
| Caixa 1 (Código n.º 114X31– ou 114X41–) | 250 | 550 | 456 | 456 |
| Caixa 2 (Código n.º 114X32– ou 114X42–) | 250 | 650 | 530 | 530 |
| Caixa 3 (Código n.º 114X33– ou 114X43–) | 250 | 760 | 581 | 581 |
| Caixa 4 (Código n.º 114X34– ou 114X44–) | 250 | 900 | 700 | 700 |

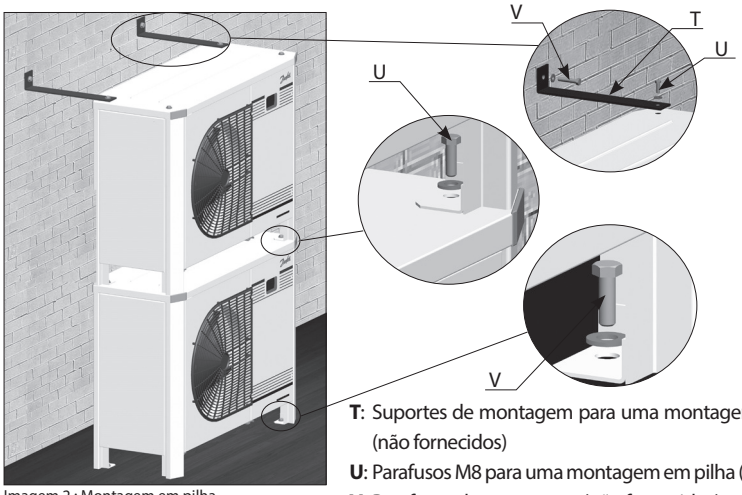



Imagem 2 : Montagem em pilha

**T**: Suportes de montagem para uma montagem em pilha (não fornecidos)
**U**: Parafusos M8 para uma montagem em pilha (fornecidos)
**V**: Parafusos de montagem (não fornecidos)

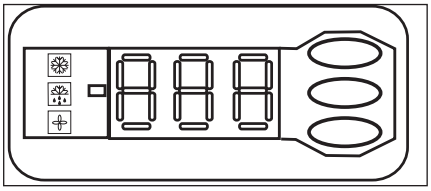


Imagem 3 : Visor do controlador electrónico

Compressor em funcionamento

Resistência do cárter ligada

Ventilador em funcionamento

Temperatura à pressão de aspiração. Prima o botão inferior para consultar a temperatura à pressão de condensação



Imagem 4 : Cablagem normal

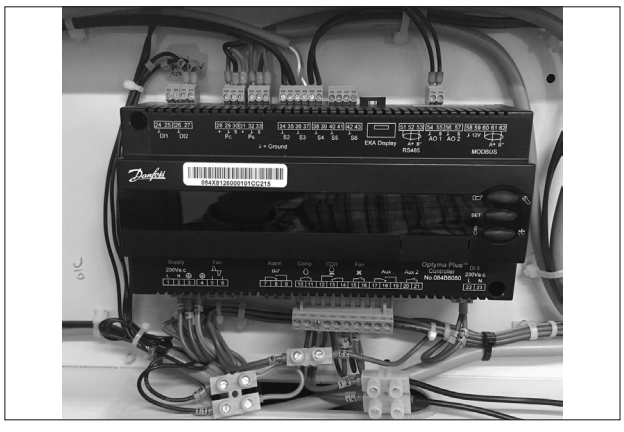


Imagem 5 : Cablagem temporária


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**Sistema de designação para a gama** Optyma™ **Plus**

**OP - MPXM 034 ML P00 G**

1 2 3 4 5 6 7 8

| | |
|---|---|
| **1** | **Aplicação**<br>M = MBP<br>L = LBP |
| **2** | **Embalagem**<br>Família da unidade de condensação: P = Optyma™ Plus |
| **3** | **Refrigerante**<br>H = R404A/R507<br>G = R134a, R513A<br>Q = R452A, R404A/R507<br>X = R404A/R507, R134a, R407A, R407F, R448A, R513A R449A,R452A<br>Y = R404A/R507, R449A<br>B = R448A/R449A/R404A/R452A (MBP)<br>P = R448A/R449A, R407A/F, R404A/R507<br>O = R448A/R449A/R404A/R452A (LBP) |
| **4** | **Condensador**<br>M = Condensador de calor por microcanais |
| **5** | **Cilindrada**<br>Deslocamento em $cm^3$: Exemplo 034 = 34 $cm^3$ |
| **6** | **Plataforma de compressor**<br>ML= Scroll de velocidade fixa MLZ |
| **7** | **Versão**<br>P00: Optyma™ Plus<br>P02: Optyma™Plus com injeção líquida<br>P05: Optyma™Plus com relé de monitorização de alimentação |
| **8** | **Código de tensão**<br>G = 230V/monofásico / 50 Hz compressor e ventilador<br>E = 400V/trifásico/50 Hz compressor e 230V/monofásico ventilador |

## Controlo da versão

| Optyma™ **Plus** | **(P00)** | **(P02)** | **(P05)** |
|---|---|---|---|
| Nível IP | IP54 | IP54 | IP54 |
| Tecnologia do compressor | Scroll/ Alternativo | Scroll | Scroll (Trifásico) |
| Caixa de controlo (painel E pré-ligado) | sim | sim | sim |
| Condensador por microcanais | sim | sim | sim |
| Controlador da velocidade do ventilador* | sim | sim | sim |
| Interruptor principal (disjuntor) | sim | sim | sim |
| Relé de monitorização de alimentação | - | - | sim |
| Secador de filtro (ligações de rosca) | sim | sim | sim |
| Janela de controlo | sim | sim | sim |
| Aquecedor de cárter | sim | sim | sim |
| Pressóstato regulável de AP/BP | Eletrónico | Eletrónico | Eletrónico |
| Mini pressóstato à prova de falhas | Mecânico | Mecânico | Mecânico |
| Porta(s) de acesso | sim | sim | sim |
| Isolamento acústico | sim | sim | sim |
| Controlador eletrónico da unidade de condensação | sim | sim | sim |
| Conectividade de rede | sim | sim | sim |
| Montagem em pilha | sim | sim | sim |
| Termóstato de gás de descarga | sim | sim | sim |
| Alarme AP/BP | sim | sim | sim |
| Kit de injeção de líquido, proteção contra a perda/sequência de fase | - | sim | - |
| Válvula de descarga de pressão** | - | - | - |

** Função incorporada no controlador eletrónico da unidade de condensação*
*** Akcesoria (niemontowane fabrycznie)*

**Dados técnicos**

| Aplicação | Códigos | Modelo da unidade de condensação | Compressor | Código elétrico | Refriger-ante | Recetor (L) | Categoria PED* | PS | Válvula de Sucção | Válvula de líqui-dos | Compart-imento | Dimensões da unidade (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | bar | Pol. | Pol. | | L | W | H |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | M | 6.2 | I | 32 | 7/8" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3301 | OP-LPOM067LLP05E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3302 | OP-LPOM084LLP05E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3303 | OP-LPOM098LLP05E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3401 | OP-LPOM120LLP05E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3402 | OP-LPOM168LLP05E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4261 | OP-MPXM034MLP00G | MLZ015T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4281 | OP-MPXM046MLP00G | MLZ021T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4290 | OP-MPXM057MLP00G | MLZ026T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4308 | OP-MPXM068MLP00G | MLZ030T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4321 | OP-MPXM080MLP00G | MLZ038T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4201 | OP-MPXM034MLP05E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4202 | OP-MPXM046MLP05E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4203 | OP-MPXM057MLP05E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4303 | OP-MPXM068MLP05E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4304 | OP-MPXM080MLP05E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4305 | OP-MPXM108MLP05E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4401 | OP-MPXM125MLP05E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4402 | OP-MPXM162MLP05E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |

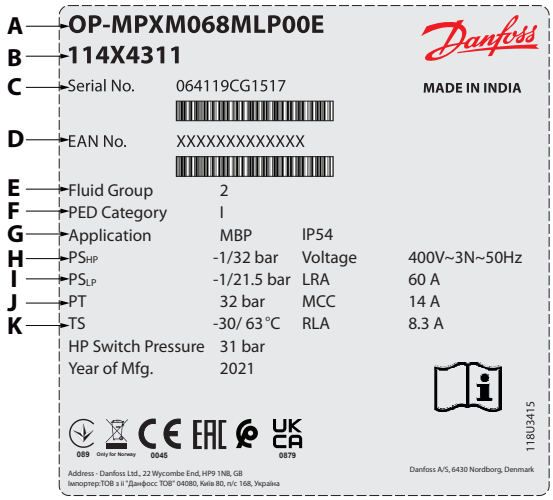
**Categoria PED para fluido do Grupo 2*


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# Bilaga – A

Teknisk data (Svenska)

**Typskylt**




** För exakta värden, se typskylten i enheten*

**A**: Model
**B**: Kodnummer
**C**: Serienummer och streckkod
**D**: EAN-nummer
**E**: Köldmedium
**F**: PED-kategori
**G**: Application, Ingress Protection
**H**: Maximalt tillåtet tryck (HP-sidan)
**I**: Maximalt tillåtet tryck (LP-sida)
**J**: Testtryck
**K**: Högsta tillåtna konstruktionstemperatur

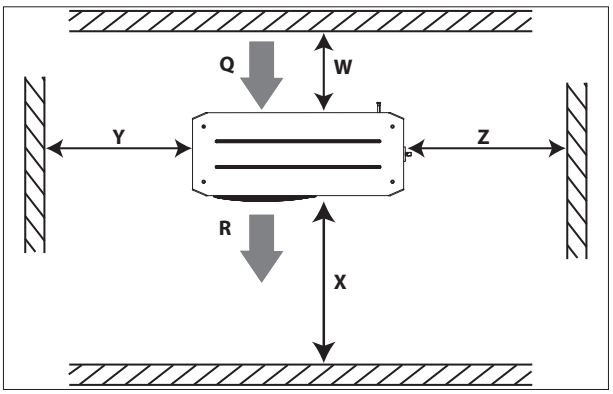



Bild 1: Minimum monteringsavstånd

**Q**: Luft in **R**: Luft ut

| Enhet | W [mm] | X [mm] | Y [mm] | Z [mm] |
|---|---|---|---|---|
| Hus 1 (Kodnr 114X31-- eller 114X41--) | 250 | 550 | 456 | 456 |
| Hus 2 (Kodnr 114X32-- eller 114X42--) | 250 | 650 | 530 | 530 |
| Hus 3 (Kodnr 114X33-- eller 114X43--) | 250 | 760 | 581 | 581 |
| Hus 4 (Kodnr 114X34-- eller 114X44--) | 250 | 900 | 700 | 700 |

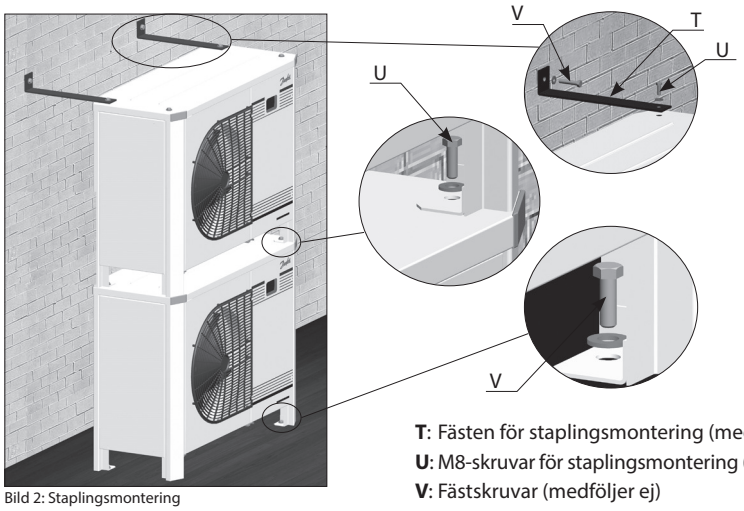



Bild 2: Staplingsmontering

**T**: Fästen för staplingsmontering (medföljer ej)
**U**: M8-skruvar för staplingsmontering (medföljer)
**V**: Fästskruvar (medföljer ej)

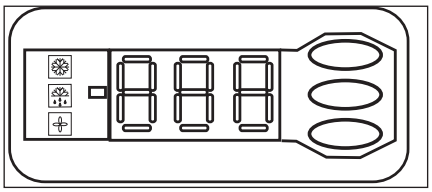


Bild 3: Elektronisk styrenhetsdisplay

Kompressor igång

Vevhusvärmare på

Fläkt igång

Temperaturvärde för sugtryck. Tryck på den nedre knappen för att växla till temperaturvärdet för kondenseringstryck



Bild 4: Normala anslutningar

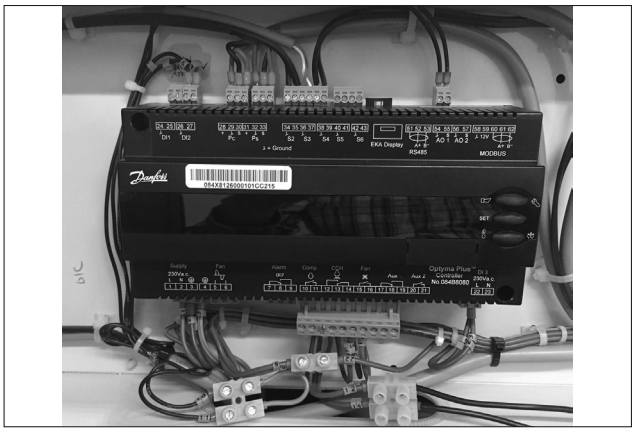


Bild 5: Tillfälliga anslutningar

**Beteckningssystem för Optyma™ Plus-serien**

**OP - MPXM 034 ML P00 G**

1 2 3 4 5 6 7 8

| | |
|---|---|
| **1** | **Tillämpning**<br>M = MBP<br>L = LBP |
| **2** | **Paket**<br>Typ av luftkylt aggregat: P = Optyma™ Plus |
| **3** | **Köldmedium**<br>H = R404A/R507<br>G = R134a, R513A<br>Q = R452A, R404A/R507<br>X = R404A/R507, R134a, R407A, R407F, R448A, R513A R449A,R452A<br>Y = R404A/R507, R449A<br>B = R448A/R449A/R404A/R452A (MBP)<br>P = R448A/R449A, R407A/F, R404A/R507<br>O = R448A/R449A/R404A/R452A (LBP) |
| **4** | **Kondensor**<br>M = värmekondensor med mikrokanaler |
| **5** | **Slagvolym**<br>Slagvolym i $cm^3$: Exempel, 034 = 34 $cm^3$ |
| **6** | **Kompressorplattform**<br>ML= MLZ-scrollkompressor med fast varvtal |
| **7** | **Version**<br>P00: Optyma™ Plus<br>P02: Optyma™ Plus med vätskeinsprutning<br>P05: Optyma™ Plus med relä för försörjningsövervakning |
| **8** | **Motorspänningskod**<br>G = 230V/1-fas/50 Hz kompressor och fläkt<br>E = 400V/3-fas/50 Hz kompressor och 230 V/1-fasfläkt |

## versionskontroll

| Optyma™ **Plus** | **(P00)** | **(P02)** | **(P05)** |
|---|---|---|---|
| IP-nivå | IP54 | IP54 | IP54 |
| Kompressorteknik | Scroll/Kolv | Scroll | Scroll (3-fas) |
| Regleringsbox (förkopplad E-panel) | ja | ja | ja |
| Mikrokanalkondensor | ja | ja | ja |
| Fläkthastighetsregulator* | ja | ja | ja |
| Huvudbrytare (kretsbrytare) | ja | ja | ja |
| Relä för försörjningsövervakning | - | - | ja |
| Torkfilter (koniska kopplingar) | ja | ja | ja |
| Synglas | ja | ja | ja |
| Vevhusvärmare | ja | ja | ja |
| Justerbar pressostat HP/LP | Elektronisk | Elektronisk | Elektronisk |
| Felsäker minipressostat | Mekanisk | Mekanisk | Mekanisk |
| Dörr(ar) | ja | ja | ja |
| Akustisk isolering | ja | ja | ja |
| Elektronisk regulator för luftkylt aggregat | ja | ja | ja |
| Nätverksanslutning | ja | ja | ja |
| Stapelmontering | ja | ja | ja |
| Hetgastermostat | ja | ja | ja |
| HP/LP-larm | ja | ja | ja |
| Vätskeinsprutningskit, skydd mot fasförlust/fel fasföljd | - | ja | - |
| Pressure Relief Valve** | - | - | - |

** Inbyggd funktion med elektronisk styrenhet för luftkylt aggregat*
*** Accessory (Not factory mounted)*


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**Tekniska data**

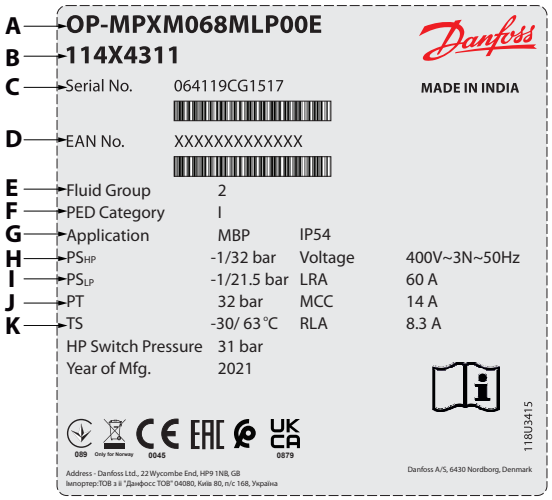
| Tillämpning | Koder | Luftkyld aggregatmodell | Kompressor | Elektrisk kod | Köldmedium | Köldmediebehållare (L) | PED-kategori* | PS | Sugventil | Vätskeventil | hölje | Enhetens mått (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | bar | Tum | Tum | | L | W | H |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | M | 6.2 | I | 32 | 7/8" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3301 | OP-LPOM067LLP05E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3302 | OP-LPOM084LLP05E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3303 | OP-LPOM098LLP05E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3401 | OP-LPOM120LLP05E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3402 | OP-LPOM168LLP05E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4261 | OP-MPXM034MLP00G | MLZ015T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4281 | OP-MPXM046MLP00G | MLZ021T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4290 | OP-MPXM057MLP00G | MLZ026T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4308 | OP-MPXM068MLP00G | MLZ030T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4321 | OP-MPXM080MLP00G | MLZ038T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4201 | OP-MPXM034MLP05E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4202 | OP-MPXM046MLP05E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4203 | OP-MPXM057MLP05E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4303 | OP-MPXM068MLP05E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4304 | OP-MPXM080MLP05E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4305 | OP-MPXM108MLP05E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4401 | OP-MPXM125MLP05E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4402 | OP-MPXM162MLP05E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |

**PED-kategori för grupp 2 – vätska*

# Załącznik A

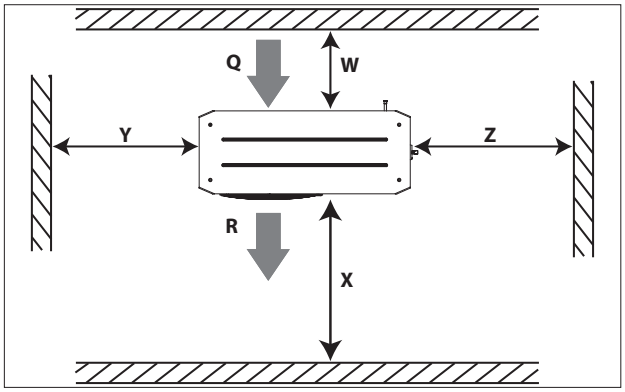
Dane techniczne (Polski)

**Tabliczka znamionowa**




** Dokładne wartości znajdują się na tabliczce znamionowej agregatu*

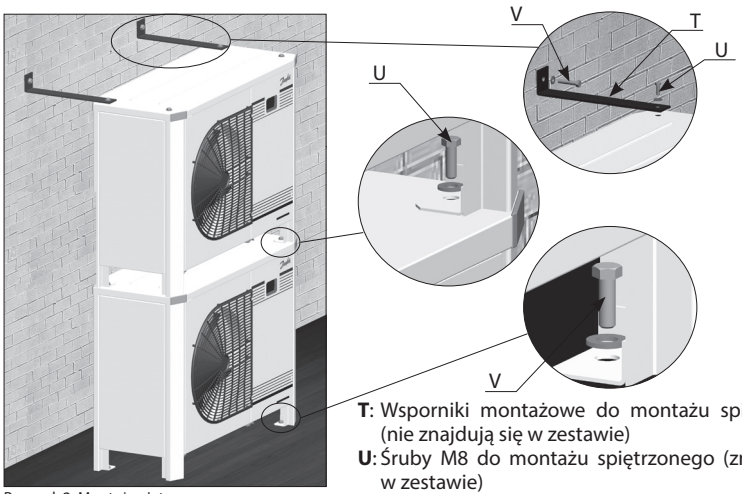
- **A**: Model
- **B**: Numer katalogowy
- **C**: Numer seryjny i kod kreskowy
- **D**: Numer EAN
- **E**: Czynnik chłodniczy
- **F**: Kategoria PED
- **G**: Zastosowanie, Stopień ochrony
- **H**: Maksymalne dopuszczalne ciśnienie (strona HP)
- **I**: Maksymalne dopuszczalne ciśnienie (strona LP)
- **J**: Ciśnienie próbne
- **K**: Maksymalna dopuszczalna temperatura projektowa




Rysunek 1: Minimalne prześwity

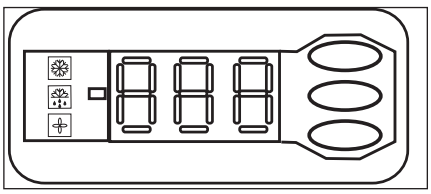
**Q**: Wlot powietrza **R**: Wylot powietrza

| Jednostka | W [mm] | X [mm] | Y [mm] | Z [mm] |
|---|---|---|---|---|
| Obudowa 1 (Nr kodowy 114X31-- lub 114X41--) | 250 | 550 | 456 | 456 |
| Obudowa 2 (Nr kodowy 114X32-- lub 114X42--) | 250 | 650 | 530 | 530 |
| Obudowa 3 (Nr kodowy 114X33-- lub 114X43--) | 250 | 760 | 581 | 581 |
| Obudowa 4 (Nr kodowy 114X34-- lub 114X44--) | 250 | 900 | 700 | 700 |




Rysunek 2: Montaż spiętrzony

- **T**: Wsporniki montażowe do montażu spiętrzonego (nie znajdują się w zestawie)
- **U**: Śruby M8 do montażu spiętrzonego (znajdują się w zestawie)
- **V**: Śruby montażowe (nie znajdują się w zestawie)



Rysunek 3: Wyświetlacz regulatora elektronicznego

Sprężarka pracuje

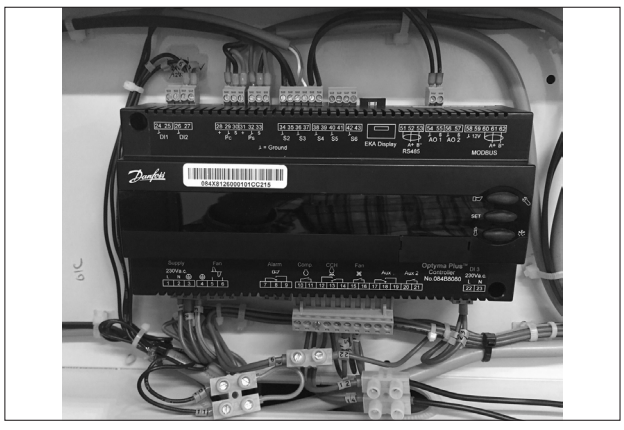
Grzałka karteru sprężarki włączona

Wentylator pracuje

Wartość temperatury dla ciśnienia ssania
Nacisnąć dolny przycisk, aby przełączyć na wartość temperatury dla ciśnienia skraplania



Rysunek 4: Okablowanie normalne



Rysunek 5: Okablowanie tymczasowe


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**System oznaczania gamy produktów Optyma™ Plus**

**OP - MPXM 034 ML P00 G**

**1 2 3 4 5 6 7 8**

| | |
|---|---|
| **1** | **Aplikacja**<br>M = MBP<br>L = LBP |
| **2** | **Pakiet**<br>Rodzina agregatów skraplających: P = **Optyma™ Plus** |
| **3** | **Rodzaj czynnika chłodniczego**<br>H = R404A/R507<br>G = R134a, R513A<br>Q = R452A, R404A/R507<br>X = R404A/R507, R134a, R407A, R407F, R448A, R513A R449A,R452A<br>Y = R404A/R507, R449A<br>B = R448A/R449A/R404A/R452A (MBP)<br>P = R448A/R449A, R407A/F, R404A/R507<br>O = R448A/R449A/R404A/R452A (LBP) |
| **4** | **Skraplacz**<br>M = Skraplacz mikrokanałowy |
| **5** | **Pojemność skokowa**<br>Pojemność skokowa w $cm^3$: Przykład 034 = 34 $cm^3$ |
| **6** | **Typ sprężarki**<br>ML= Sprężarka spiralna MLZ o stałej prędkości |
| **7** | **Wersja**<br>P00: Optyma™ Plus<br>P02: Optyma™ Plus z wtryskiem cieczy<br>P05: Optyma™ Plus z przekaźnikiem monitorowania zasilania |
| **8** | **Kod napięcia**<br>G = 230V/1-faza/50Hz sprężarka i wentylator<br>E = 400V/3-fazy/50Hz sprężarka i 230V/1 faza wentylator |

## Kontrola wersji

| Optyma™ **Plus** | **(P00)** | **(P02)** | **(P05)** |
|---|---|---|---|
| Stopień ochrony IP | IP54 | IP54 | IP54 |
| Technologia sprężarki | Spiralna/ Tłokowa | Spiralna | Spiralna (3 fazy) |
| Skrzynka sterownicza (z gotowym do podłączenia E-panelem) | tak | tak | tak |
| Skraplacz mikrokanałowy | tak | tak | tak |
| Regulator prędkości obrotowej wentylatora* | tak | tak | tak |
| Wyłącznik główny (bezpiecznik) | tak | tak | tak |
| Przekaźnik monitorowania zasilania | - | - | tak |
| Filtr odwadniacz (przyłącza śrubunkowe) | tak | tak | tak |
| Wziernik | tak | tak | tak |
| Grzałka karteru | tak | tak | tak |
| Presostat regulowany HP/LP | Elektroniczny | Elektroniczny | Elektroniczny |
| Presostat miniaturowy | Mechaniczny | Mechaniczny | Mechaniczny |
| Drzwiczki dostępowe | tak | tak | tak |
| Izolacja dźwiękochłonna | tak | tak | tak |
| Sterownik elektroniczny agregatu skraplającego | tak | tak | tak |
| Transmisja danych | tak | tak | tak |
| Montaż piętrowy | tak | tak | tak |
| Termostat gazu wylotowego | tak | tak | tak |
| Alarm HP/LP | tak | tak | tak |
| Zestaw wtrysku cieczy, ochrona utraty fazy / sekwencji | - | tak | - |
| Pressure Relief Valve** | - | - | - |

** Funkcja wbudowana w sterownik elektroniczny agregatu skraplającego*
*** Akcesoria (niemontowane fabrycznie)*

**Dane techniczne**

| Zastoso-wanie | Kod | Model agregatu skraplającego | Sprężarka | Kod zasilania | Czynnik chłodniczy | Zbiornik cieczy (L) | Kategoria PED* | PS | Zawór ssaw-ny | Zawór na linii cieczowej | obudowa | Wymiary agre-gatu (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | bar | cal | cal | | L | W | H |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | M | 6.2 | I | 32 | 7/8" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3301 | OP-LPOM067LLP05E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3302 | OP-LPOM084LLP05E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3303 | OP-LPOM098LLP05E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3401 | OP-LPOM120LLP05E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3402 | OP-LPOM168LLP05E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4261 | OP-MPXM034MLP00G | MLZ015T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4281 | OP-MPXM046MLP00G | MLZ021T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4290 | OP-MPXM057MLP00G | MLZ026T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4308 | OP-MPXM068MLP00G | MLZ030T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4321 | OP-MPXM080MLP00G | MLZ038T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4201 | OP-MPXM034MLP05E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4202 | OP-MPXM046MLP05E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4203 | OP-MPXM057MLP05E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4303 | OP-MPXM068MLP05E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4304 | OP-MPXM080MLP05E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4305 | OP-MPXM108MLP05E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4401 | OP-MPXM125MLP05E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4402 | OP-MPXM162MLP05E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |

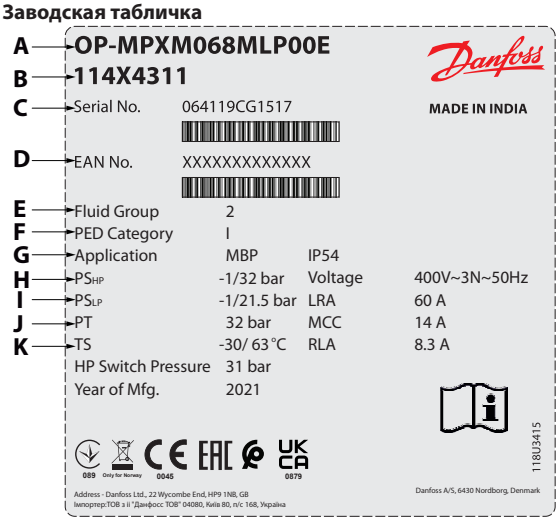
**Kategoria PED dla cieczy z grupy 2*


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# Приложение A

Технические характеристики (Русский)

**Заводская табличка**




** Точные значения см. на заводской табличке*

**A**: Модель
**B**: Кодовый номер
**C**: Заводской номер и штрихкод
**D**: Номер EAN
**E**: Хладагент
**F**: Категория согласно PED
**G**: Область применения, Класс защиты
**H**: Максимально допустимое давление (сторона высокого давления)
**I**: Максимально допустимое давление (сторона низкого давления)
**J**: Испытательное давление
**K**: Максимально допустимая расчетная температура

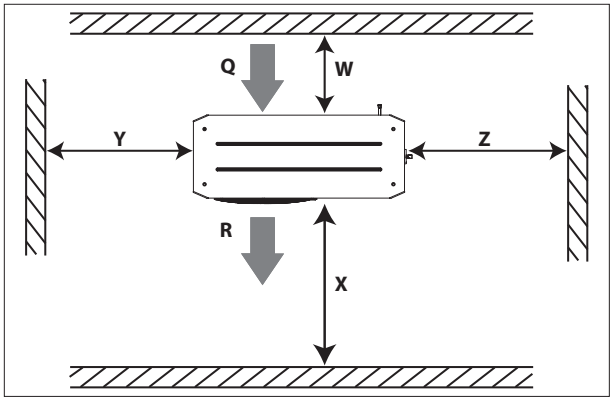



Рисунок 1: минимальные расстояния от стен при монтаже

**Q:** Приточный воздух **R:** Вытяжной воздух

| Устройство | W (мм) | X (мм) | Y (мм) | Z (мм) |
|---|---|---|---|---|
| Корпус 1 (Код 114X31-- или 114X41--) | 250 | 550 | 456 | 456 |
| Корпус 2 (Код 114X32-- или 114X42--) | 250 | 650 | 530 | 530 |
| Корпус 3 (Код 114X33-- или 114X43--) | 250 | 760 | 581 | 581 |
| Корпус 4 (Код 114X34-- или 114X44--) | 250 | 900 | 700 | 700 |

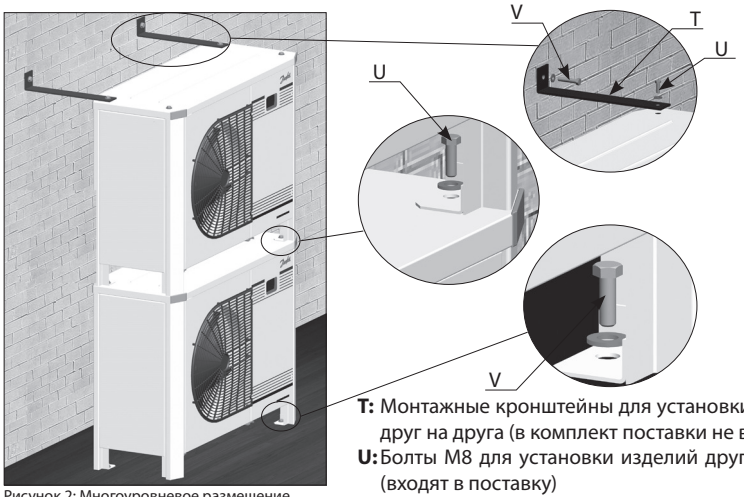



Рисунок 2: Многоуровневое размещение

**T:** Монтажные кронштейны для установки изделий друг на друга (в комплект поставки не входят)
**U:** Болты M8 для установки изделий друг на друга (входят в поставку)
**V:** Монтажные болты (не входят в поставку)

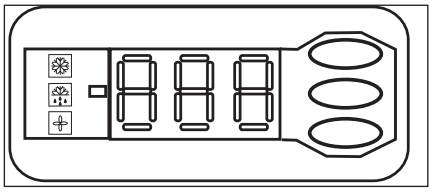


Рисунок 3: Дисплей электронного контроллера

Компрессор работает

Подогреватель картера ВКЛ.

Вентилятор работает

Значение температуры для давления всасывания. Нажмите нижнюю кнопку для переключения на значение температуры для давления конденсации.



Рисунок 4: Постоянное подключение

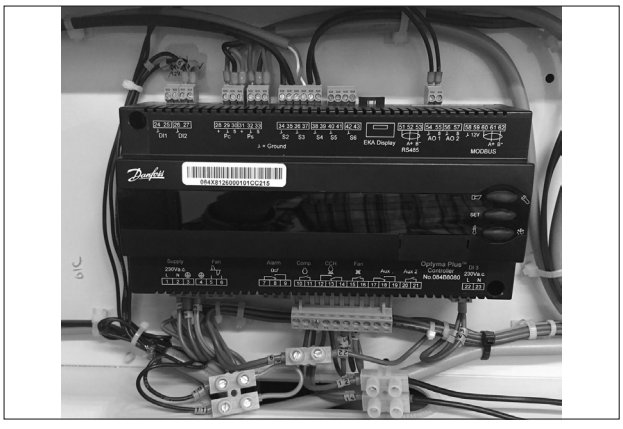


Рисунок 5: Временное подключение

**Условное обозначение устройств Optyma™ Plus**

**OP - MPXM 034 ML P00 G**

1 2 3 4 5 6 7 8

| | |
|---|---|
| 1 | **Область применения**<br>M = MBP<br>L = LBP |
| 2 | **Исполнение**<br>Семейство агрегатов: P = Optyma™ Plus |
| 3 | **Хладагент**<br>H = R404A/R507<br>G = R134a, R513A<br>Q = R452A, R404A/R507<br>X = R404A/R507, R134a, R407A, R407F, R448A, R513A R449A,R452A<br>Y = R404A/R507, R449A<br>B = R448A/R449A/R404A/R452A (MBP)<br>P = R448A/R449A, R407A/F, R404A/R507<br>O = R448A/R449A/R404A/R452A (LBP) |
| 4 | **Конденсатор**<br>M = микроканальный конденсатор |
| 5 | **Рабочий объем**<br>Вытесняемый объем в см$^3$, например 034 = 34 см$^3$ |
| 6 | **Тип компрессора**<br>ML= Спиральный компрессор с постоянной скоростью (MLZ) |
| 7 | **Версия**<br>P00: Optyma™ Plus<br>P02: Optyma™ Plus с впрыском жидкости<br>P05: Optyma™ Plus с реле контроля питания |
| 8 | **Код напряжения**<br>G = 230V/1-фазный/50Гц компрессор и вентилятор<br>E = 400V/3-фазы/50Гц компрессор и 230 В/1-фазный вентилятор |

## Комплектация версии

| Optyma™ **Plus** | **(P00)** | **(P02)** | **(P05)** |
|---|---|---|---|
| Класс защиты (IP) | IP54 | IP54 | IP54 |
| Тип компрессора | Спиральный/ Поршневой | Спиральный | Спиральный (3 фазы) |
| Блок управления (предварительно смонтированная электрическая панель) | да | да | да |
| Микроканальный конденсатор | да | да | да |
| Регулятор скорости вентилятора | да | да | да |
| Главный выключатель | да | да | да |
| Реле контроля питания | - | - | да |
| Фильтр-осушитель (штуцер под отбортовку) | да | да | да |
| Смотровое стекло | да | да | да |
| Подогреватель картера | да | да | да |
| Регулируемое реле давления ВД/НД | Электронные | Электронные | Электронные |
| Отказоустойчивый мини-прессостат | Механические | Механические | Механические |
| Двери люка(-ов) | да | да | да |
| Звукоизоляция | да | да | да |
| Электронный контроллер блока конденсации | да | да | да |
| Возможность сетевого подключения | да | да | да |
| Монтаж друг на друга | да | да | да |
| Термостат на линии нагнетания газа (в комплекте) | да | да | да |
| Сигнализатор ВД/НД (в комплекте) | да | да | да |
| Комплект впрыска жидкости, защита от потери/чередования фаз | - | да | - |
| Pressure Relief Valve** | - | - | - |

** Встроенная функция в электронном контроллере блока конденсации*
*** Дополнительное оборудование (не устанавливается на заводе)*


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**Технические характеристики**

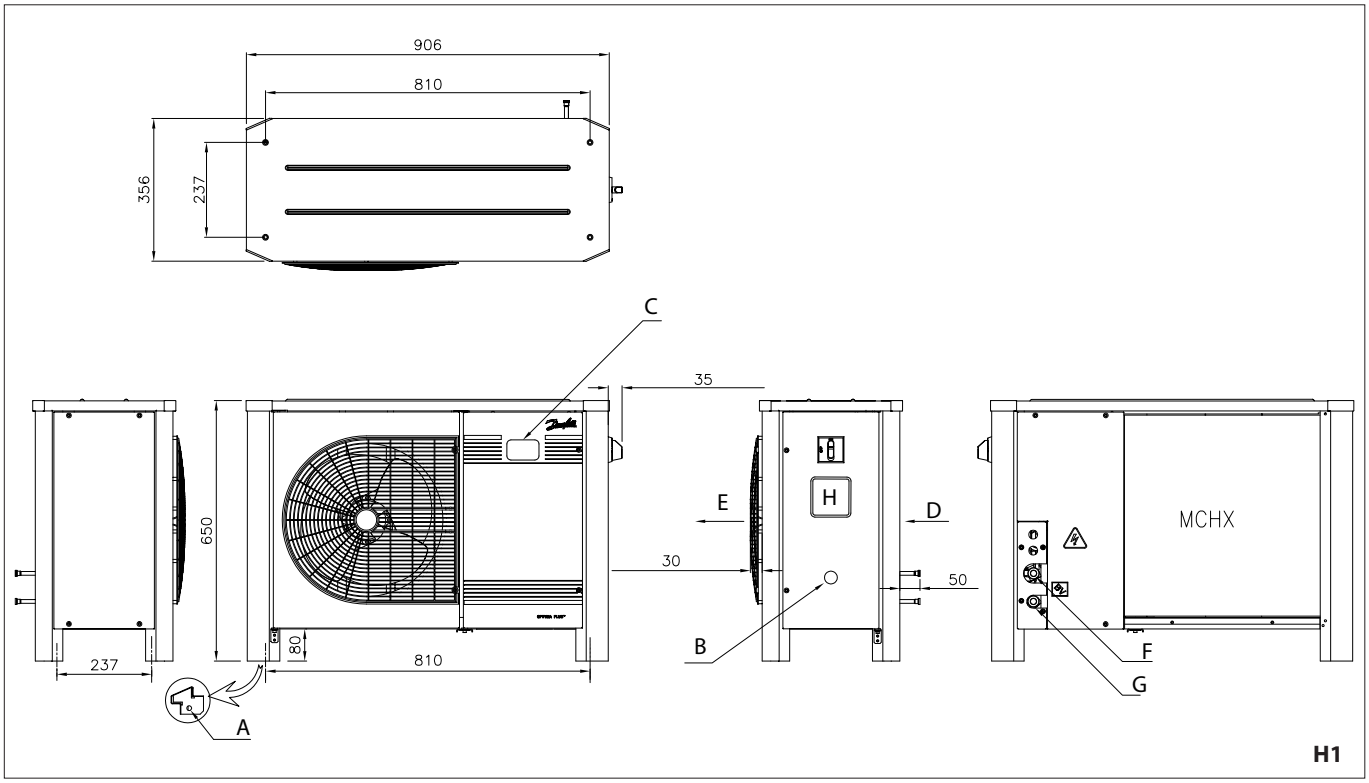
| Область применения | Код | Модель компрессорно-конденсаторного агрегата | Компрессор | Код напряжения | Хладагент | Ресивер, (л) | Категория PED* | PS | Всасывающий клапан | Клапан жидкости | Корпус | Размеры агрегата (мм) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | бар | дюймы | дюймы | | L | W | H |
| LBP | 114X3118 | OP-LPQM017DPP00G | DPT16LA | G | Q | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| LBP | 114X3225 | OP-LPQM048NTP00G | NTZ048-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3233 | OP-LPQM048NTP00E | NTZ048-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3241 | OP-LPQM068NTP00G | NTZ068-5 | G | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3249 | OP-LPQM068NTP00E | NTZ068-4 | E | Q | 3.4 | I | 32 | 5/8" | 3/8" | H2 | 813 | 1090 | 480 |
| LBP | 114X3357 | OP-LPQM096NTP00E | NTZ096-4 | E | M | 6.2 | I | 32 | 7/8" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3371 | OP-LPOM067LLP02E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3372 | OP-LPOM084LLP02E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3373 | OP-LPOM098LLP02E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3485 | OP-LPOM120LLP02E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3486 | OP-LPOM168LLP02E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3301 | OP-LPOM067LLP05E | LLZ013T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3302 | OP-LPOM084LLP05E | LLZ015T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3303 | OP-LPOM098LLP05E | LLZ018T4A | E | O | 6.2 | I | 32 | 3/4" | 1/2" | H3 | 965 | 1441 | 531 |
| LBP | 114X3401 | OP-LPOM120LLP05E | LLZ024T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| LBP | 114X3402 | OP-LPOM168LLP05E | LLZ034T4A | E | O | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4119 | OP-MPBM008DYP00G | DLY80RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4120 | OP-MPBM009DYP00G | DLY90RAb | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 1/4" | H1 | 650 | 941 | 406 |
| MBP | 114X4121 | OP-MPBM012DPP00G | DPT12RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4122 | OP-MPBM014DPP00G | DPT14RA | G | Y | 1.3 | Artical 4 Para. 3 | 32 | 3/8" | 3/8" | H1 | 650 | 941 | 406 |
| MBP | 114X4261 | OP-MPXM034MLP00G | MLZ015T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4264 | OP-MPXM034MLP00E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4281 | OP-MPXM046MLP00G | MLZ021T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4284 | OP-MPXM046MLP00E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4290 | OP-MPXM057MLP00G | MLZ026T5 | G | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4293 | OP-MPXM057MLP00E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4308 | OP-MPXM068MLP00G | MLZ030T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4311 | OP-MPXM068MLP00E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4321 | OP-MPXM080MLP00G | MLZ038T5 | G | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4324 | OP-MPXM080MLP00E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4344 | OP-MPXM108MLP00E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4414 | OP-MPXM125MLP00E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4434 | OP-MPXM162MLP00E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4201 | OP-MPXM034MLP05E | MLZ015T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4202 | OP-MPXM046MLP05E | MLZ021T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4203 | OP-MPXM057MLP05E | MLZ026T4 | E | X | 3.4 | I | 32 | 3/4" | 1/2" | H2 | 813 | 1090 | 480 |
| MBP | 114X4303 | OP-MPXM068MLP05E | MLZ030T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4304 | OP-MPXM080MLP05E | MLZ038T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4305 | OP-MPXM108MLP05E | MLZ048T4 | E | X | 6.2 | I | 32 | 7/8" | 5/8" | H3 | 965 | 1441 | 531 |
| MBP | 114X4401 | OP-MPXM125MLP05E | MLZ058T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |
| MBP | 114X4402 | OP-MPXM162MLP05E | MLZ076T4 | E | X | 10 | II | 32 | 1 1/8" | 3/4" | H4 | 966 | 1835 | 650 |

**Категория PED для жидкостей группы 2*

**Annex - B**

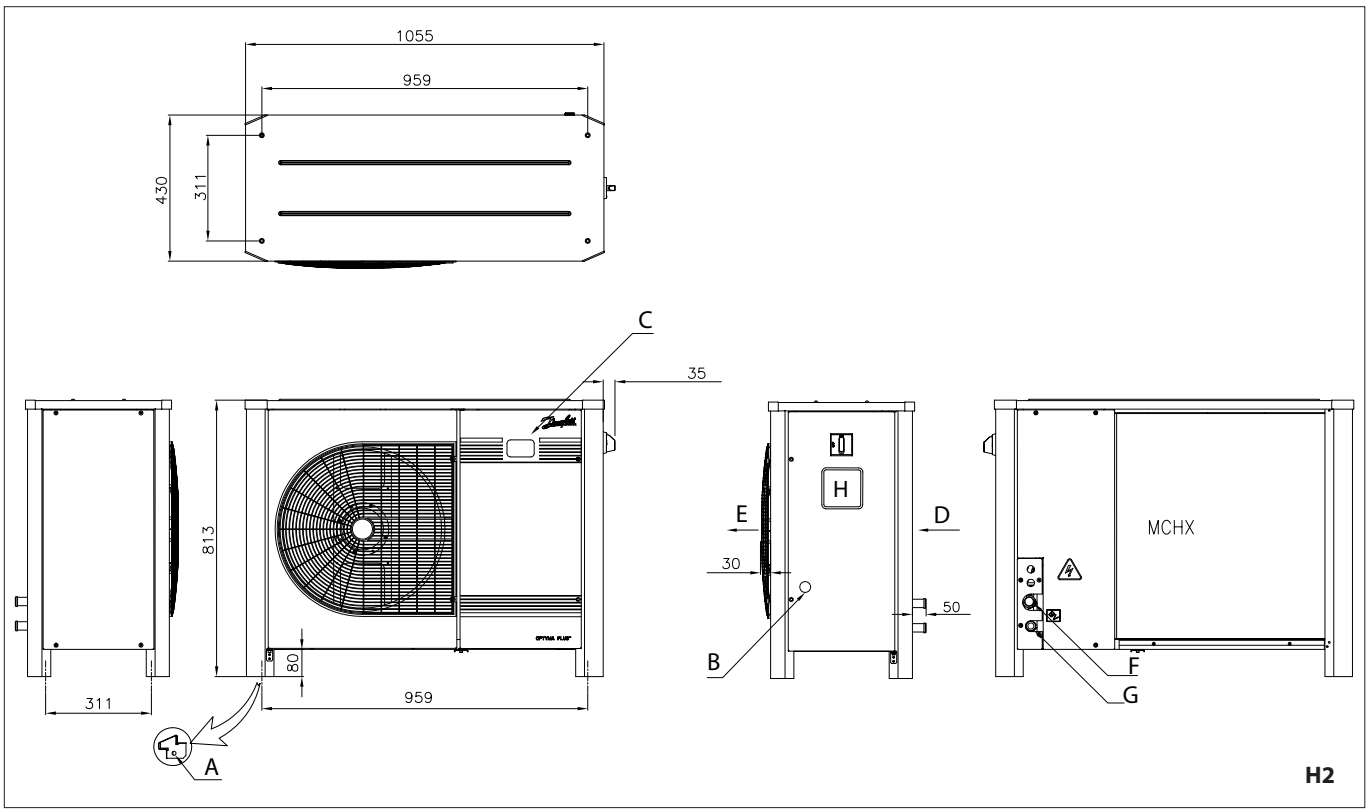
GA & PID Drawings / Maßzeichnungen und RI-Fließbild / Schéma GA et PID / GA y Plano PID /
Disegno GA e PID / Diagrama GA e PID / GA- och PID-ritning / schemat rozmieszczenia oraz orurowania i oprzyrządowania /
Компоновочный чертеж и схема трубной обвязки

**OP-LPHM018, OP-LPQM017, OP-MPBM008-009-012-014 & OP-MPHM007-010-012-015-018**




**H1**

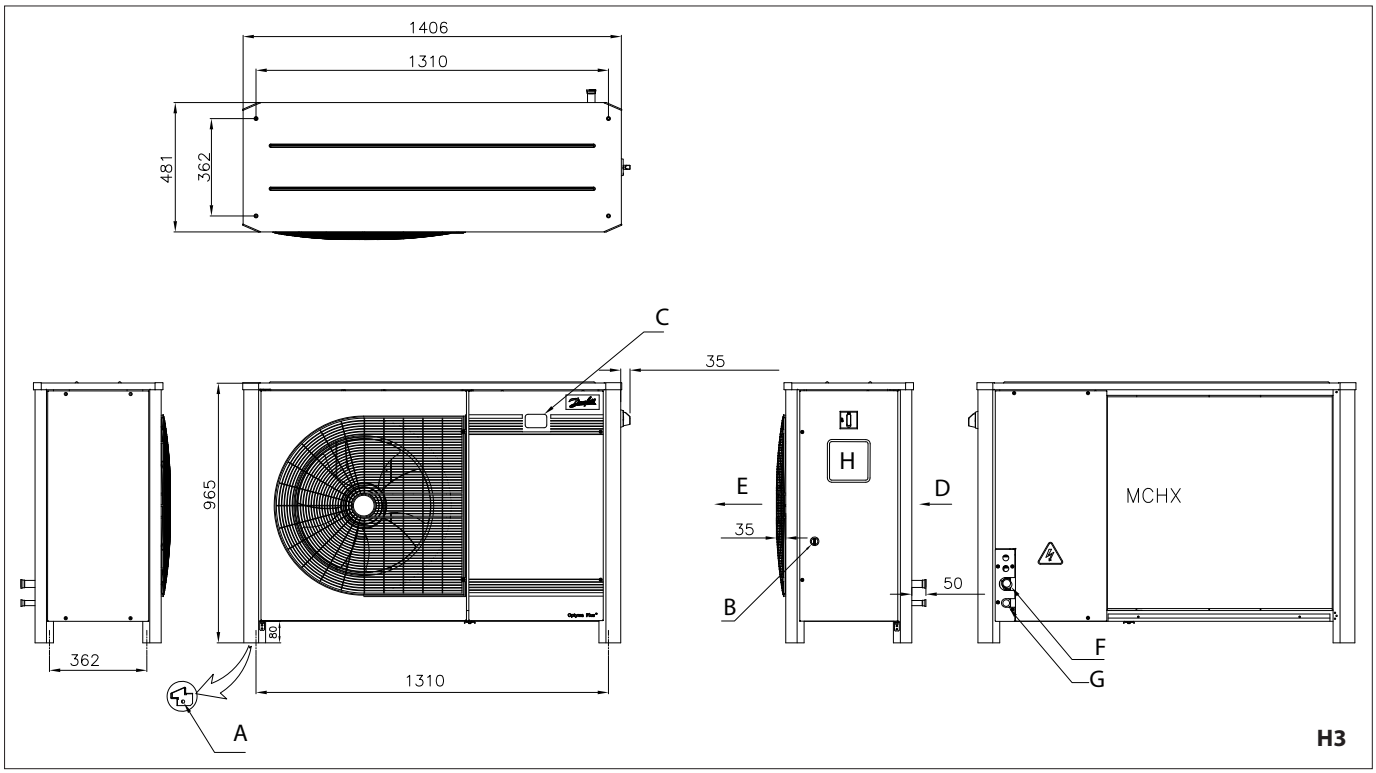
**OP-LPQM026-048-068-074 & OP-MPBM018-024-026-034 & OP-MPXM034-046-057 & OP-MPGM033 -34 & OP-MPHM026-034 & OP-LPHM026**



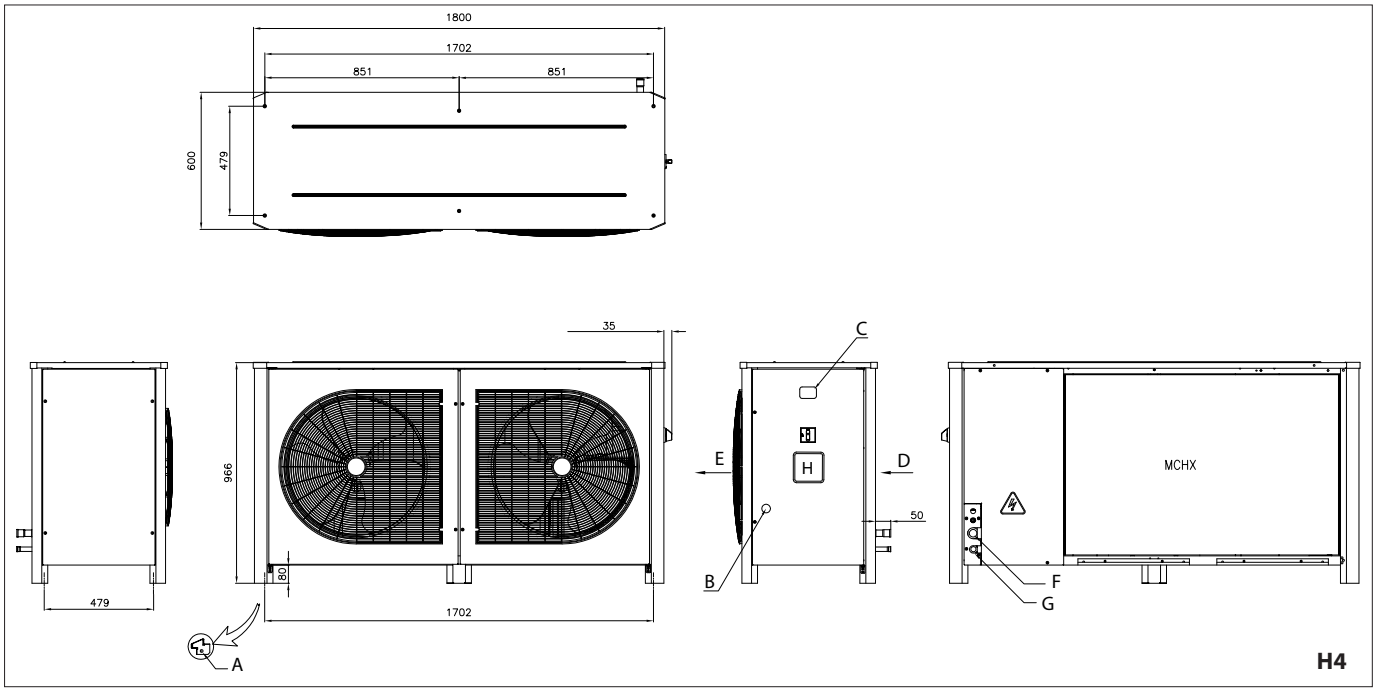

**H2**


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### OP-LPQM096-136 & OP-MPXM068-080-108




### OP-LPQM215-271 & OP-MPXM125-162




**English Legend**
A Ø12 Hole for Mounting
B Sight Glass
C Controller Display
D Air in
E Air out
F Suction Port
G Liquid Port
H Nameplate
⚠ Electrical Cables
Note: all dimension are in mm

**Deutsch Legende**
A Ø12 Befestigungsbohrung
B Schauglas
C Regler-Anzeige
D Lufteinlass
E Luftauslass
F Sauganschluss
G Flüssigkeitsanschluss
H Typenschild
⚠ Elektrokabel
*Hinweis: alle Maße in mm*

## Instructions

**Français Légende**
A Trou de montage ø 12
B Voyant
C Affichage du régulateur
D Entrée de l'air
E Sortie de l'air
F Port d'aspiration
G Port de liquide
H Plaque signalétique
⚠ Câbles électriques
*Remarque : toutes les dimensions sont exprimées en mm*

**Español leyenda**
A Ø12 Agujero para montaje
B Visor
C Display de Controlador
D Salida Aire
E Entrada Aire
F Puerto Succion
G Puerto Liquido
H Placa de identificación
⚠ Cables eléctricos
Nota: todas las dimensiones están en mm

**Italiano leggenda**
A Foro di montaggio Ø12
B Spia liquido
C Display del regolatore
D ngresso aria
E Uscita aria
F Porta di aspirazione
G Porta liquido
H Targhetta
⚠ Cavi elettrici
Nota: tutte le dimensioni sono espresse in mm

**Português Lenda**
A Orifício de Ø12 para montagem
B Visor de líquido
C Ecrã do controlador
D Entrada de ar
E Saída de ar
F Porta de aspiração
G Porta de líquidos
H Placa de identificação
⚠ Cabos elétricos
Nota: todas as dimensões são apresentadas em mm

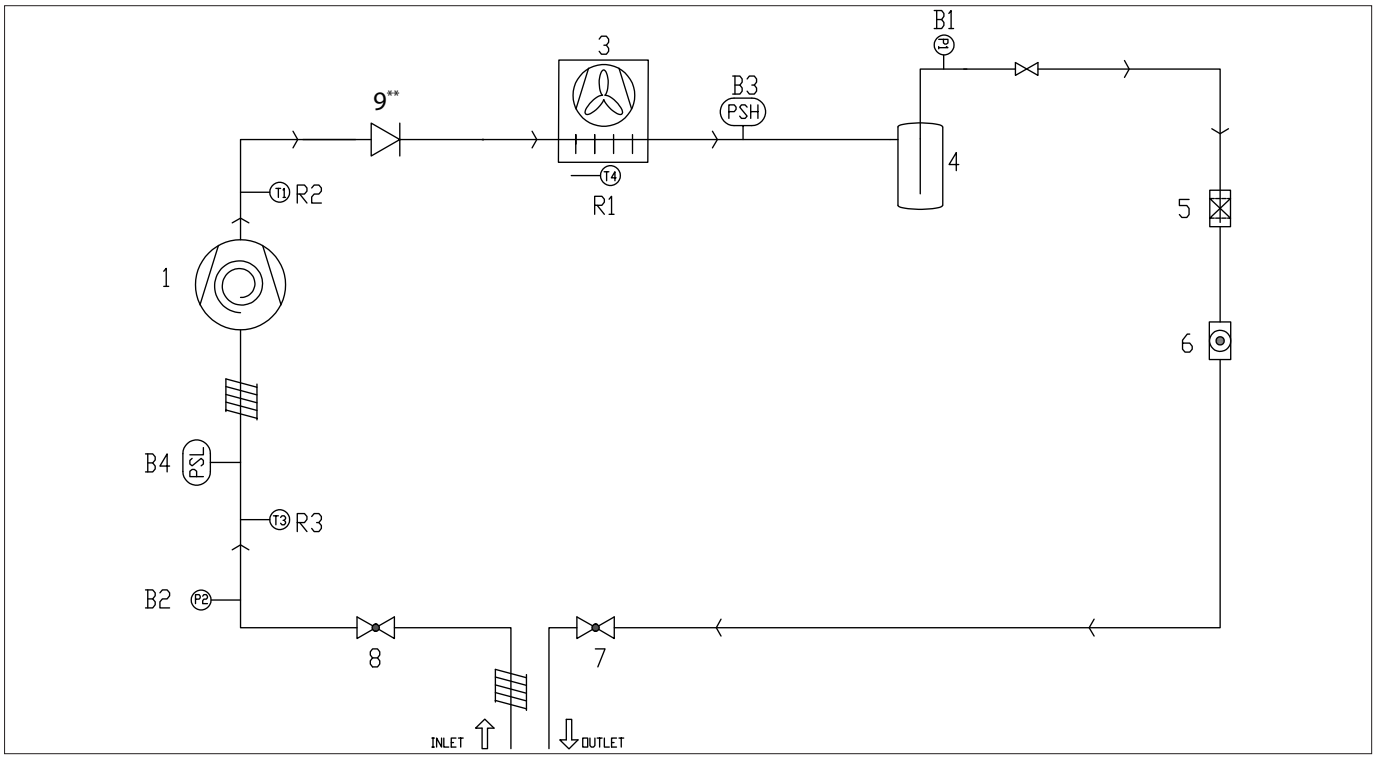
**Svenska Legend**
A Ø 12 Monteringshål
B Synglas
C Regleringsdisplay
D Luftinlopp
E Luftutlopp
F Sugport
G Vätskeport
H Typskylt
⚠ Elkablar
OBS! alla mått anges i mm

**Polski Legenda**
A Otwór Ø12 do montażu
B Wziernik
C Wyświetlacz sterownika
D Dopływ powietrza
E Wypływ powietrza
F Przyłącze ssawne
G Przyłącze cieczowe
H Tabliczka znamionowa
⚠ Kable elektryczne
Uwaga: wszystkie wymiary podano w mm

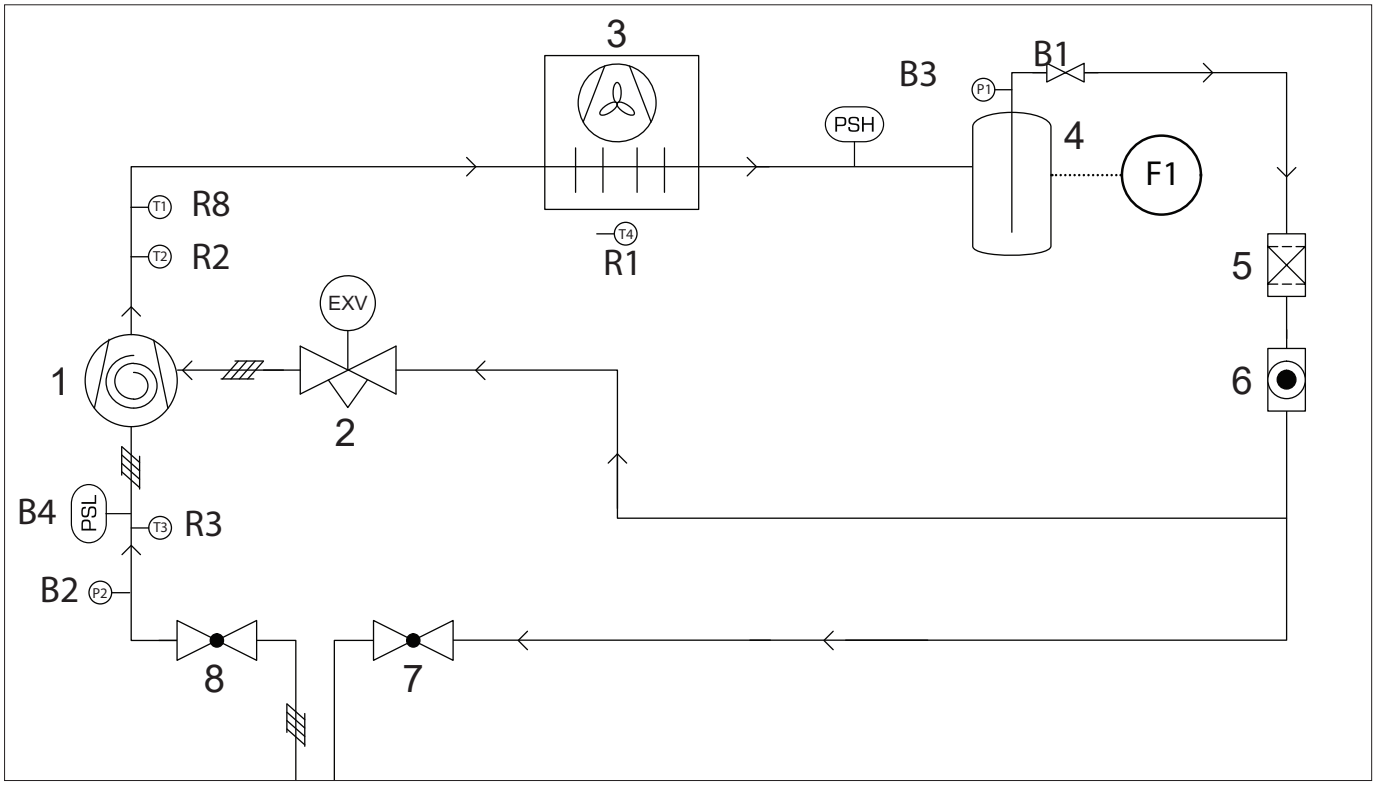
**Русский Легенда**
A Монтажное отверстие Ø12
B Смотровое стекло
C Дисплей контроллера
D Вход воздуха
E Выход воздуха
F Порт для подключения всасывающего трубопровода
G Порт для подключения жидкостного трубопровода
H Заводская табличка
⚠ Электрические кабели
Примечание. Все размеры приведены в мм


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**P00 & P05 Models: OP-LPQM017-026-048-068-074-096-136-215-271, OP-MPBM008-009-012-014, OP-MPBM018-024-026-034, OP-MPXM034-046-057-68-080-108-125-162 & OP-MPGM033**




**P02 & P05 Models: OP-LPOM067-084-098-120-168**




**English Legend**

**1** Compressor
**2** Electric Expansion Valve
**3** Micro Channel Heat Exchanger with axial fan
**4** Refrigerant receiver with rotalock valve
**5** Filter Drier
**6** Sight Glass
**7** Liquid Ball Valve
**8** Suction Ball Valve
**9** NRV (only for 114X44** models)
**B1** Condensing Pressure Transducer (P1)
**B2** Suction Pressure Transducer (P2)
**B3** High Pressure cartridge Switch (auto-reset) (PSH)
**B4** Low Pressure cartridge Switch (auto-reset) (PSL)
**F1** Pressure Relief Valve (PED category II models only)
**R1** Ambient Temperature sensor (T4)
**R2** Discharge Temperature Sensor (T2)
**R3** Suction Temperature Sensor (T3)
**R8** Discharge Temperature Sensor (T1)
▨ Insulation

**Deutsch Legende**
1 Verdichter
2 Elektrisch betriebenes Expansionsventil
3 Microchannel-Wärmeübertrager mit Axiallüfter
4 Kältemittelsammler mit Rotalockventil
5 Filtertrockner
6 Schauglas
7 Flüssigkeits-Kugelabsperrventil
8 Saugseitiges Kugelabsperrventil
9 NRV (alleen voor 114X44** modellen)
B1 Druckmessaufnehmer (Hochdruck) (P1)
B2 Druckmessaufnehmer (Niederdruck) (P2)
B3 Hochdruck-Patronendruckschalter (automatisches Zurücksetzen)(PSH)
B4 Niederdruck-Patronendruckschalter (automatisches Zurücksetzen)(PSL)
F1 Sicherheitsventil (nur Typen der Kategorie II der Druckgeräterichtlinie (Pressure Equipment Directive, PED))
R1 Umgebungstemperaturfühler (T4)
R2 Heißgastemp.- Fühler (T2)
R3 Saugstutzentemp.- Fühler (T3)
R8 Heißgastemp.- Fühler (T1)
▨ Isolation

**Français Légende**
1 compresseur
2 Détendeur électronique
3 Échangeur de chaleur à microcanaux avec ventilateur axial
4 Réservoir de fluide frigorigène avec vanne rotalock
5 Filtre déshydrateur
6 Voyant de liquide
7 Vanne liquide, à boule
8 Vanne d'aspiration, à boule
9 NRV (uniquement pour les modèles 114X44**)
B1 ransducteur de pression de condensation (P1)
B2 transducteur de pression d'aspiration (P2)
B3 Pressostat cartouche haute pression (auto-réarmement)(PSH)
B4 Pressostat cartouche basse pression (auto-réarmement)(PSL)
F1 Soupape de sécurité (modèles PED de catégorie II uniquement)
R1 Sonde de température ambiante (T4)
R2 sonde de température de refoulement (T2)
R3 sonde de température d'aspiration (T3)
R8 sonde de température de refoulement (T1)
▨ Isolation

**Español leyenda**
1 Compresor
2 Válvula de expansión electrónica
3 Intercambiador de calor de microcanales con ventilador axial
4 Recipiente de refrigerante con válvula rotalock
5 Filtro secador
6 Visor de líquido
7 Válvula de bola de líquido
8 Válvula de bola de aspiración
9 NRV (solo para modelos 114X44**))
B1 Transductor de presión de condensación (P1)
B2 Transductor de presión de aspiración (P2)
B3 Interruptor de cartucho de alta presión (restablecimiento automático) (PSH)
B4 Interruptor de cartucho de baja presión (restablecimiento automático) (PSL)
F1 Válvula de alivio de presión (solo modelos de categoría PED II)
R1 Sensor de temperatura ambiente (T4)
R2 Sensor de temperatura dedescarga (T2)
R3 Sensor de temperatura de aspiración (T3)
R8 Sensor de temperatura dedescarga (T1)
▨ Aislamiento

**Italiano leggenda**
1 Compressore
2 Valvola di espansione elettrica
3 Scambiatore di calore a microcanali con ventilatore assiale
4 Ricevitore refrigerante con valvola Rotalock
5. Essiccatore filtro
6 Spia di liquido
7 Valvola a sfera liquido
8 Valvola a sfera di aspirazione
9 NRV (solo per modelli 114X44**)
B1 Trasduttore pressione di condensazione (P1)
B2 Trasduttore pressione di aspirazione (P2)
B3 Pressostato cartuccia ad alta pressione (reset automatico)(PSH)
B4 Pressostato cartuccia a bassa pressione (reset automatico) (PSL)
F1 Valvola limitatrice di pressione (solo modelli di categoria PED II)
R1 Sensore temperatura ambiente (T4)
R2 Temp. scarico Sensore (T2)
R3 Temp. aspirazione Sensore (T3)
R8 Temp. scarico Sensore (T1)
▨ Isolamento

**Svenska Legend**
1 Kompressor
2 Elektrisk expansionsventil
3 Värmeväxlare med mikrokanaler med axialfläkt
4 Köldmediemottagare med Rotalock-ventil
5 Torkfilter
6 Synglas
7 Vätskekulventil
8 Sugkulventil
9 NRV (endast för 114X44** modeller)
B1 Kondensortrycksgivare (P1)
B2 Sugtrycksgivare (P2)
B3 Högtryckspatronbrytare(autoåterställning)(PSH)
B4 Lågtryckspatronbrytare(autoåterställning)(PSL)
F1 Överströmningsventil (endast modeller i PED-kategori II)
R1 Givare för omgivningstemperatur (T4)
R2 Tryckrörstemp. sensor (T2)
R3 Sugtemp. sensor (T3)
R8 Tryckrörstemp. sensor (T1)
▨ Isolering

**Português Lenda**
1 Compressor
2 Válvula de expansão elétrica
3 Permutador de calor com microcanais com ventilador axial
4 Recetor de refrigerante com válvula rotalock
5 Secador de filtro
6 Visor de líquido
7 Válvula de esfera de líquido
8 Válvula de esfera de sucção
9 NRV (somente para modelos 114X44**)
B1 Transdutor da pressão de condensação (P1)
B2 Transdutor da pressão de aspiração (P2)
B3 Interruptor de cartucho de alta pressão (reposição automática)(PSH)
B4 Interruptor de cartucho de baixa pressão (reposição automática)
F1 Válvula de descarga de pressão (apenas modelos PED de categoria II)
R1 Sensor de temperatura ambiente (T4)
R2 Sensor da temperatura de descarga (T2)
R3 Sensor da temperatura de aspiração (T3)
R8 Sensor da temperatura de descarga (T1)
▨ Isolamento

**Polski Legenda**
1 Sprężarka
2 Elektryczny zawór rozprężny
3 Mikrokanałowy wymiennik ciepła z wentylatorem osiowym
4 Zbiornik czynnika chłodniczego z zaworem Rotalock
5 Filtr odwadniacz
6 Wziernik
7 Zawór kulowy cieczy
8 Zawór kulowy ssawny
9 NRV (tylko dla modeli 114X44**)
B1 Przetwornik ciśnienia skraplania (P1)
B2 Przetwornik ciśnienia ssania (P2)
B3 Presostaty wysokiego ciśnienia z wkładem (automatyczny reset) (PSH)
B4 Presostaty niskiego ciśnienia z wkładem (automatyczny reset) (PSL)
F1 Zawór bezpieczeństwa PRV (tylko modele II kategorii PED)
R1 Czujnik temperatury otoczenia (T4)
R2 Czujnik temp. na wylocie (T2)
R3 Czujnik temp. na wlocie (T3)
R8 Czujnik temp. na wylocie (T1)
▨ Izolacja

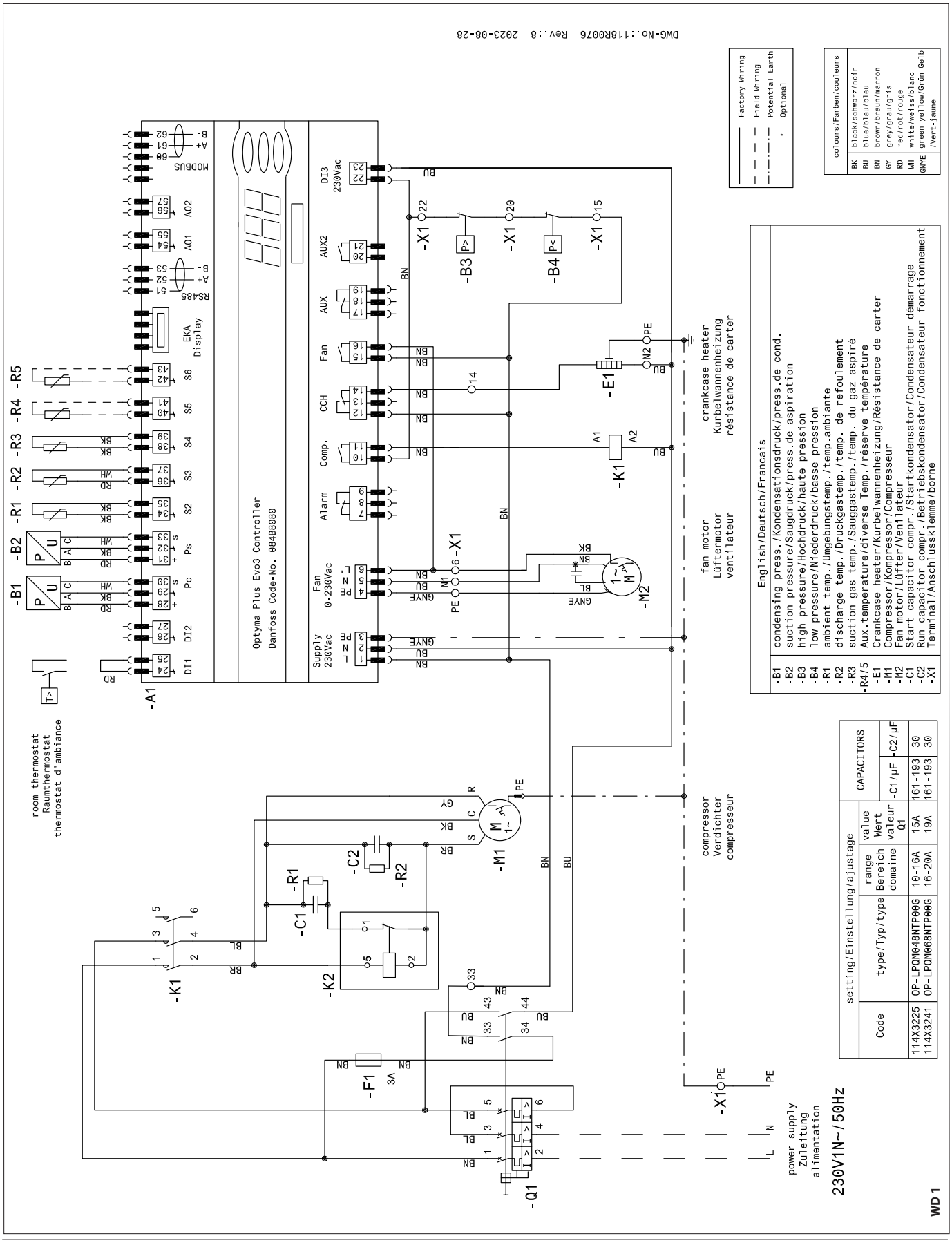
**Русский Легенда**
1 Компрессор
2 Электронный расширительный клапан
3 Микроканальный теплообменник с осевым вентилятором
4 Ресивер хладагента с клапаном Rotalock
5 Фильтр-осушитель
6 Смотровое стекло
7 Шаровой клапан на жидкостной линии
8 Шаровой клапан на линии всасывания
9 NRV (только для моделей 114X44**)
B1 Датчик давления конденсации (P1)
B2 Датчик давления всасывания (P2)
B3 Картриджное реле высокого давления (с автосбросом) (PSH)
B4 Картриджное реле низкого давления (с автосбросом) (PSL)
F1 Предохранительный клапан (только для моделей категории PED II)
R1 Датчик температуры окружающей среды(T4)
R2 Датчик темп. нагнетания (T2)
R3 Датчик темп. всасывания (T3)
R8 Датчик темп. нагнетания (T1)
▨ Изоляция


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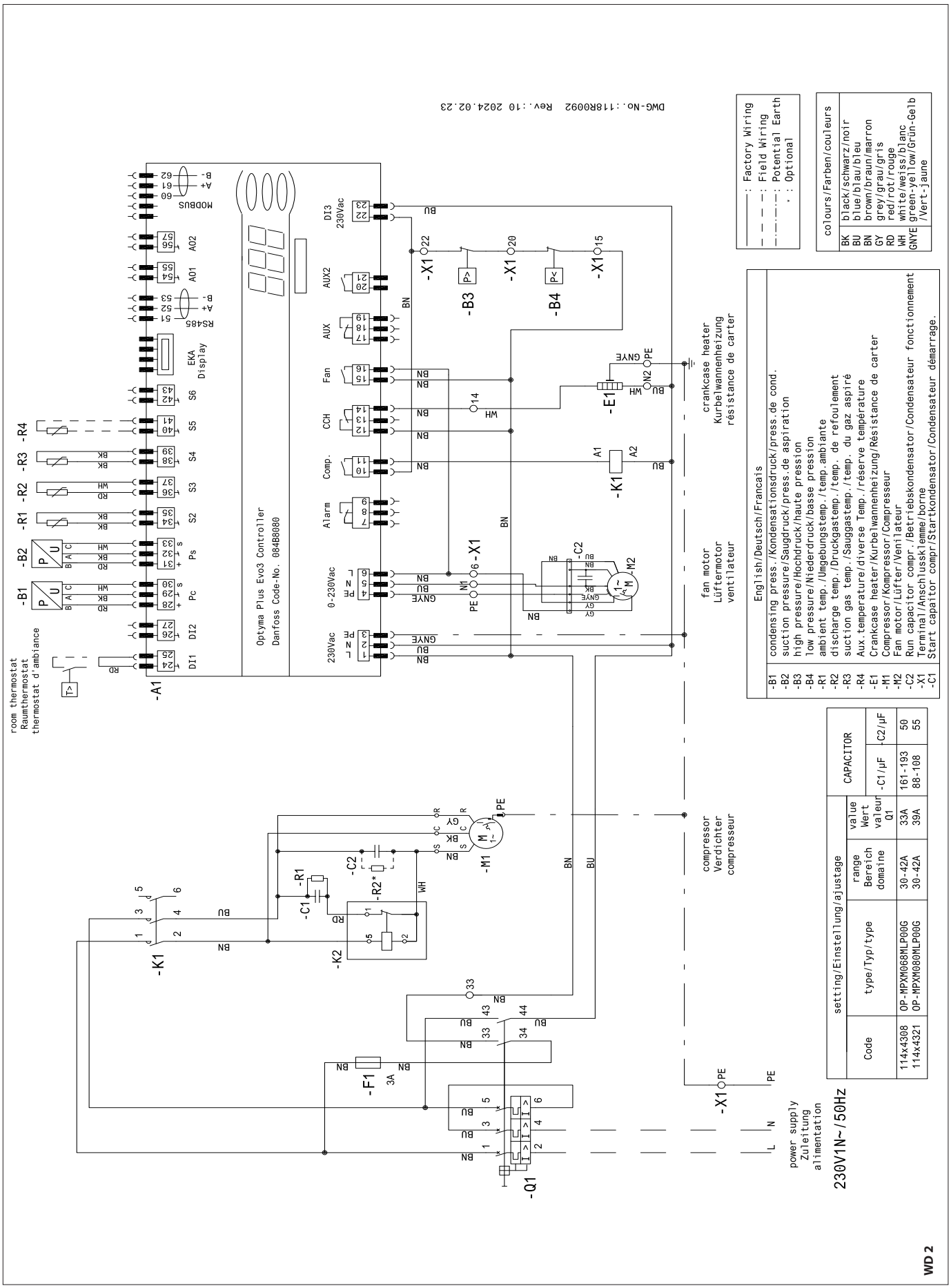
**Annex - C**

Wiring Diagram / Schaltplan / Schéma de câblage / Diagrama de cableado / Schema elettrico / Esquema elétrico / Kopplingsschema / schemat okablowania / Электрическая схема

**Code G : OP-LPQM048-068**



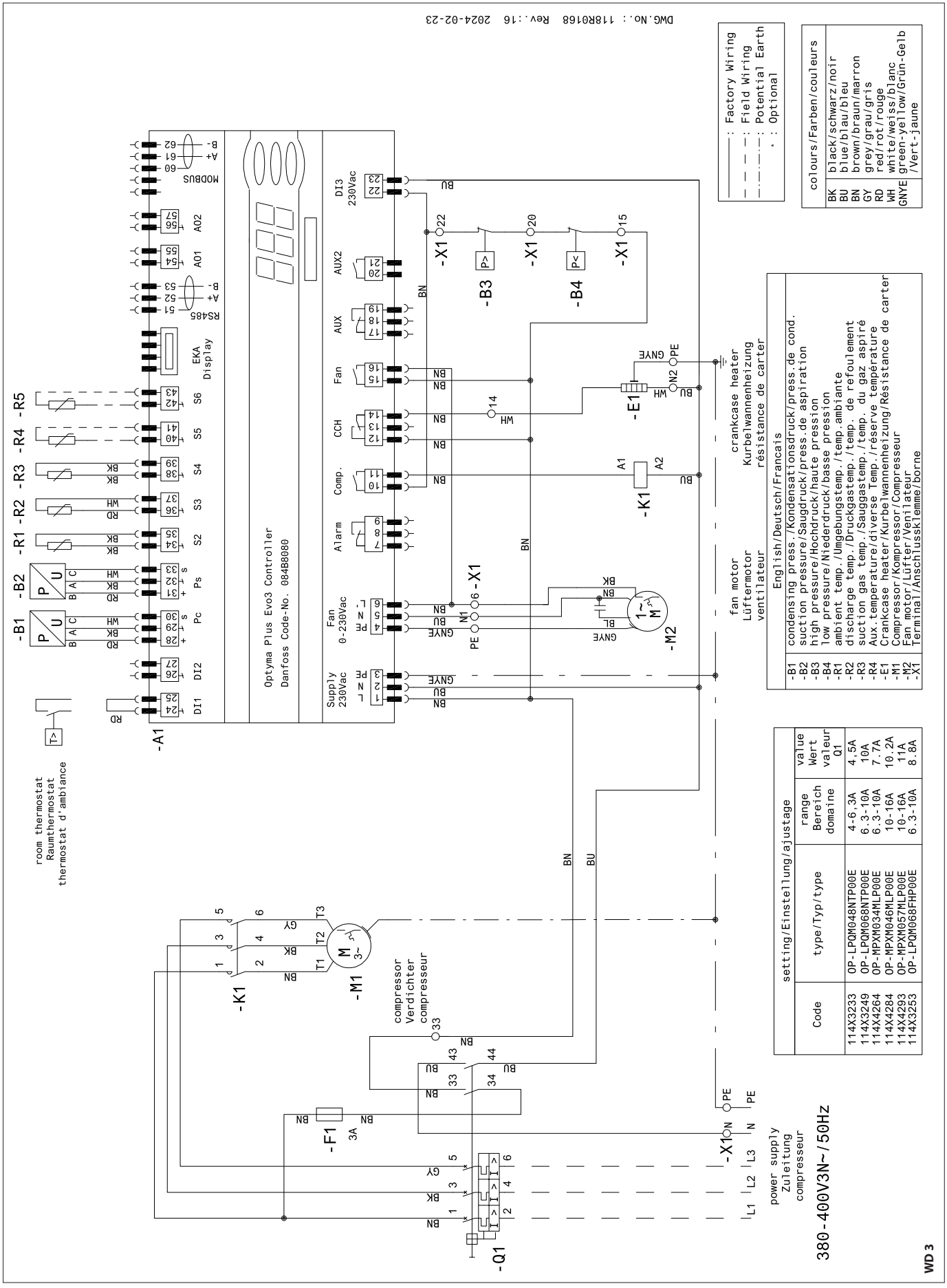
## Code G : OP-MPXM068-080



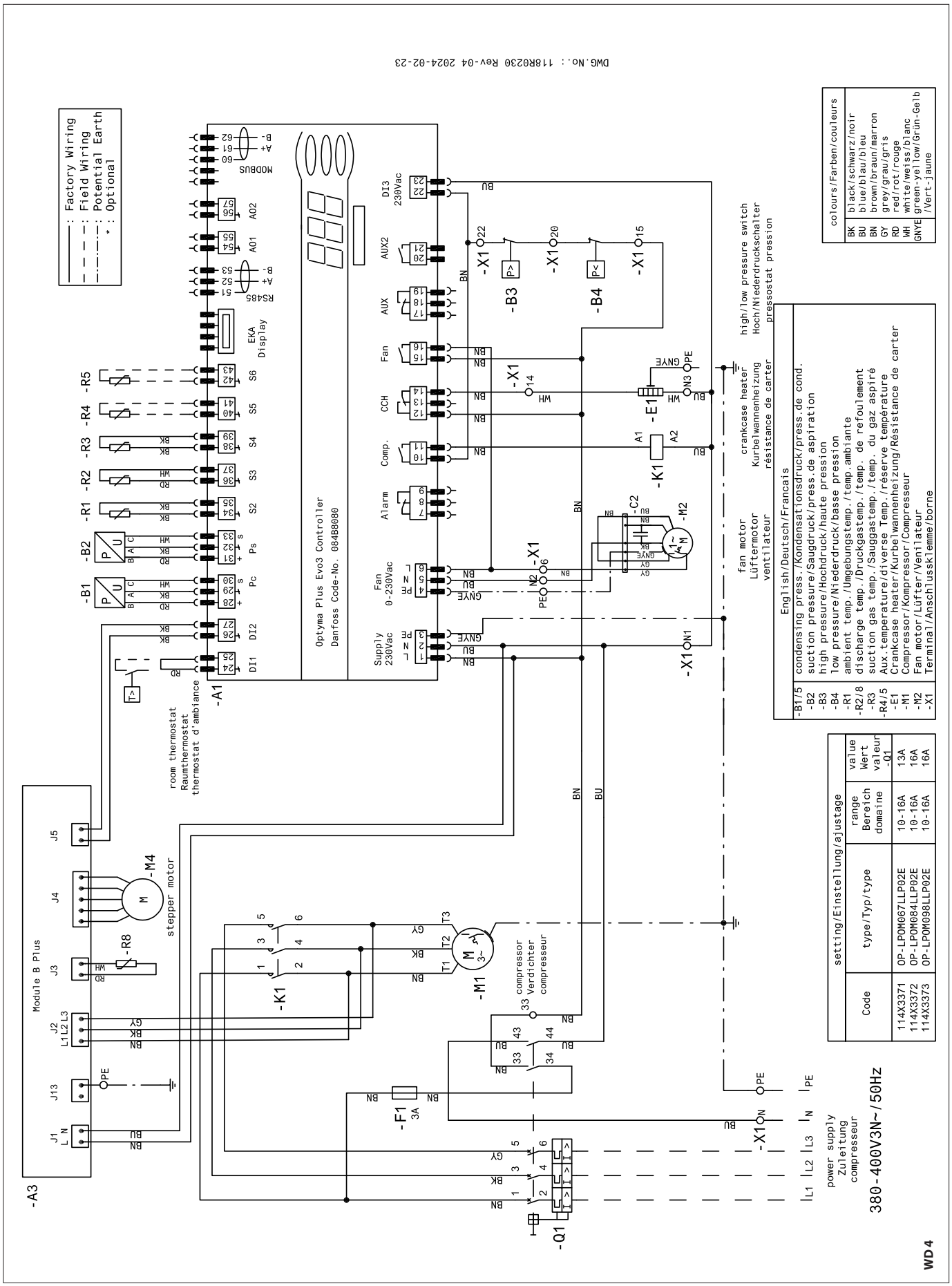


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## Code E: OP-LPQM048-068-074 & OP-MPXM034-046-057



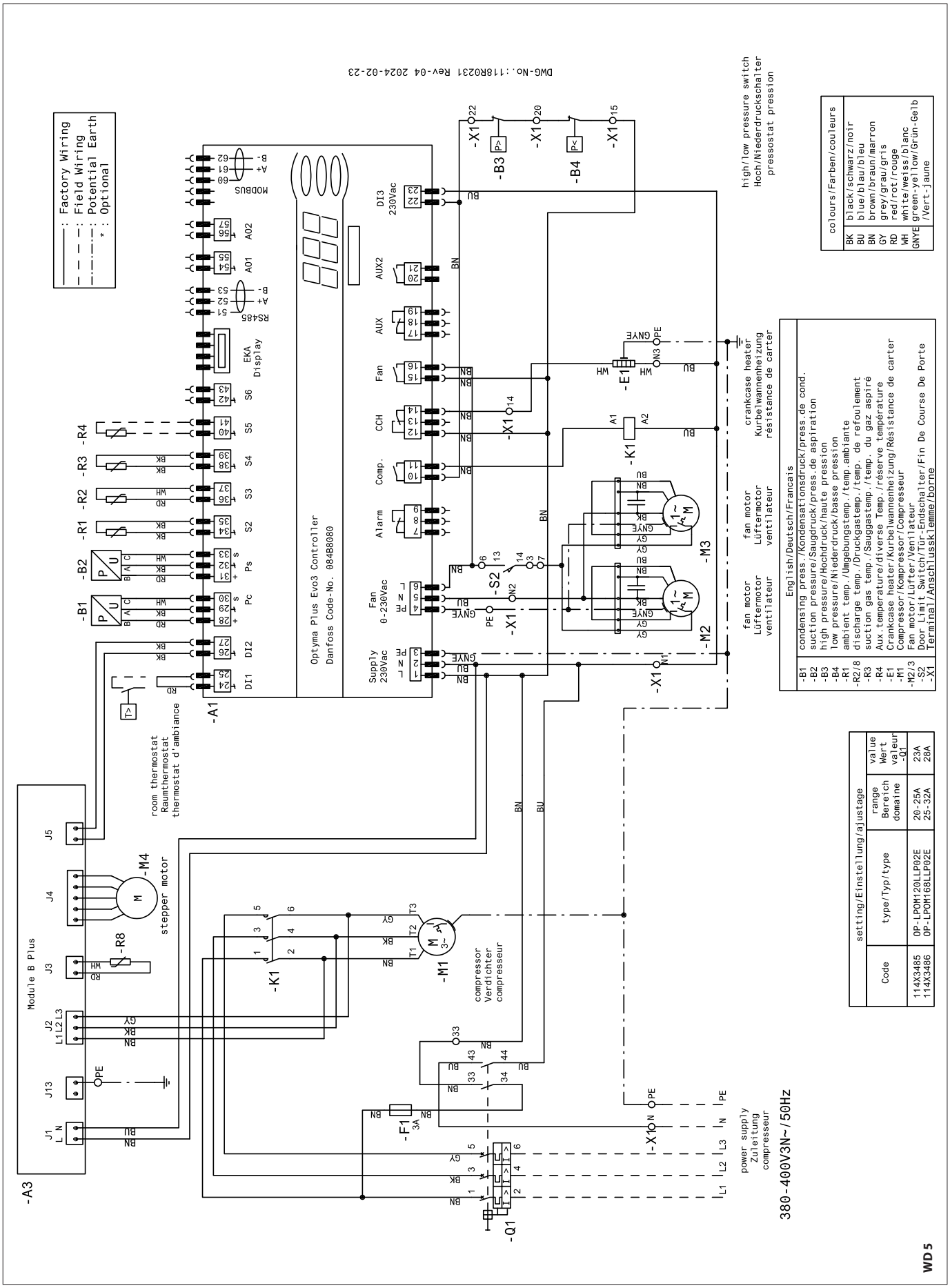
**Code E: OP-LPOM067-084-098**



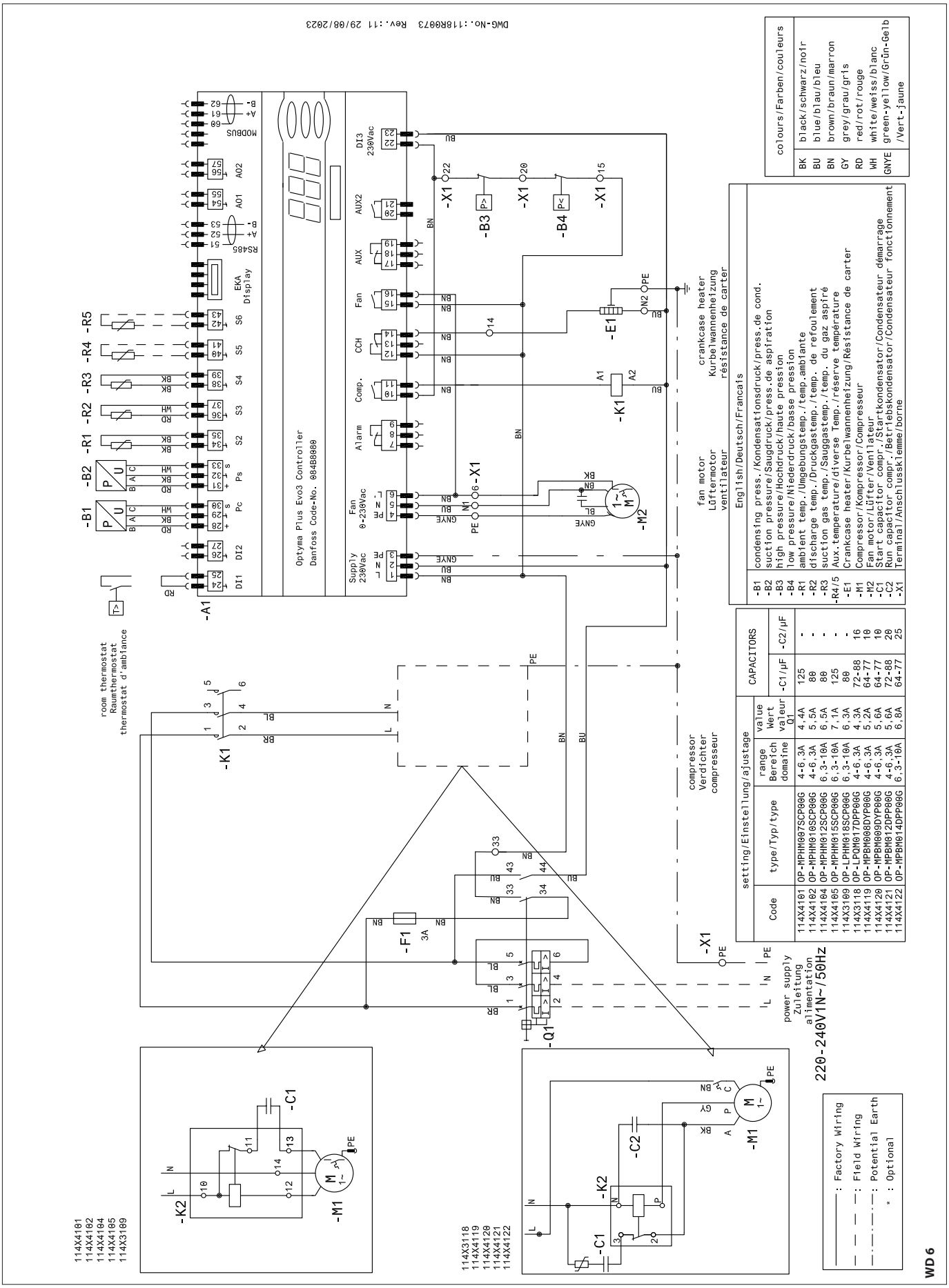


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## Code E: OP-LPOM120-168



## Code G : OP-LPQM017 & OP-MPBM008-009-012-014 & OP-MPHM007-010-012-015



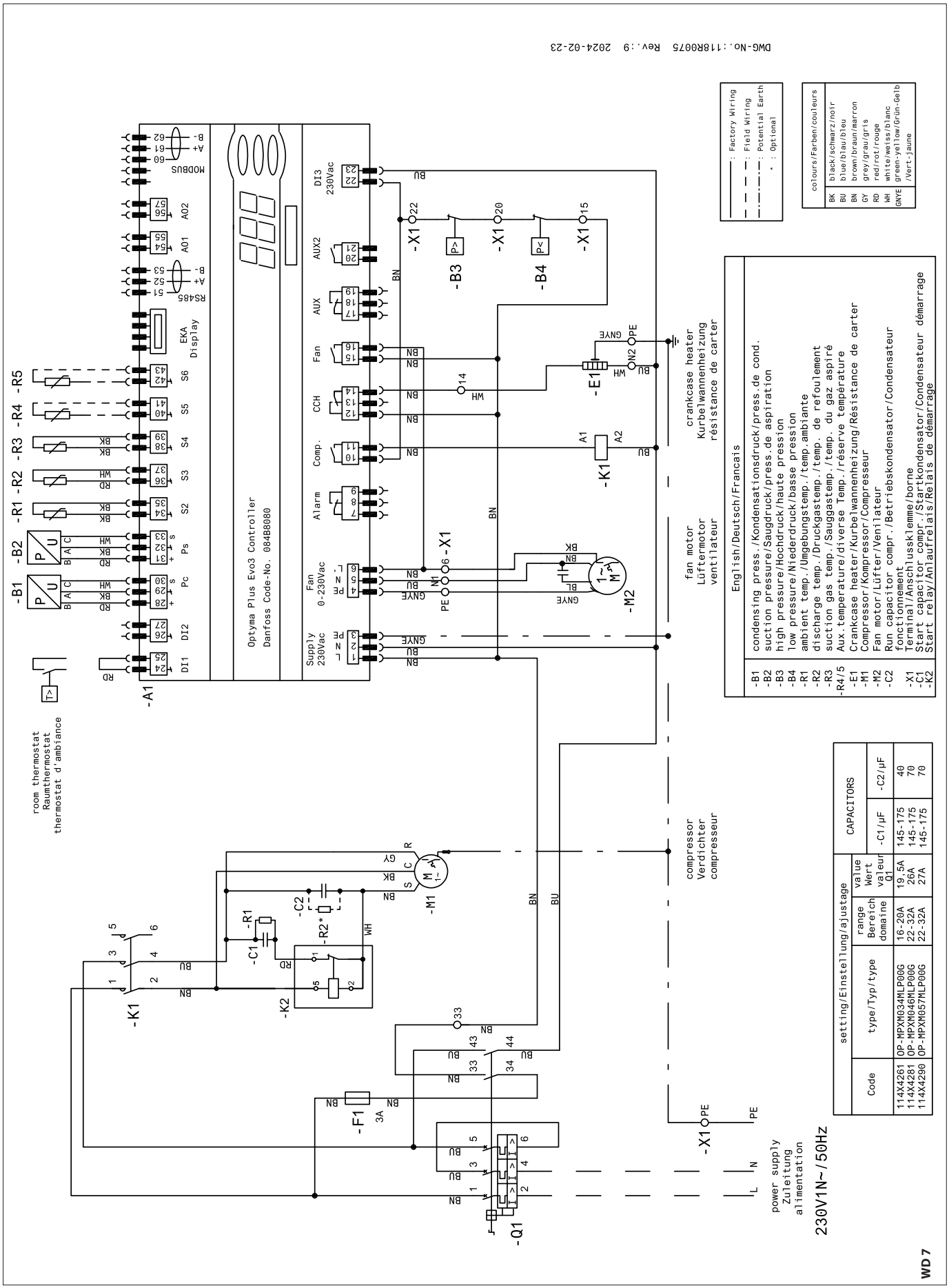

| setting/Einstellung/ajustage | | | | CAPACITORS | |
|---|---|---|---|---|---|
| Code | type/Typ/type | range Bereich domaine | value Wert valeur Q1 | -C1/µF | -C2/µF |
| 114X4101 | OP-MPHM007SCP00G | 4-6.3A | 4,4A | 125 | - |
| 114X4102 | OP-MPHM010SCP00G | 4-6.3A | 5.5A | 80 | - |
| 114X4104 | OP-MPHM012SCP00G | 6,3-10A | 6.5A | 80 | - |
| 114X4105 | OP-MPHM015SCP00G | 6,3-10A | 7,1A | 125 | - |
| 114X3109 | OP-LPHM018SCP00G | 6,3-10A | 6,3A | 80 | - |
| 114X3118 | OP-LPQM017DPP00G | 4-6.3A | 4,3A | 72-88 | 16 |
| 114X4119 | OP-MPBM008DYP00G | 4-6.3A | 5,2A | 64-77 | 10 |
| 114X4120 | OP-MPBM009DYP00G | 4-6.3A | 5.6A | 64-77 | 10 |
| 114X4121 | OP-MPBM012DPP00G | 4-6.3A | 5.6A | 72-88 | 20 |
| 114X4122 | OP-MPBM014DPP00G | 6,3-10A | 6.8A | 64-77 | 25 |

114X4101
114X4102
114X4104
114X4105
114X3109

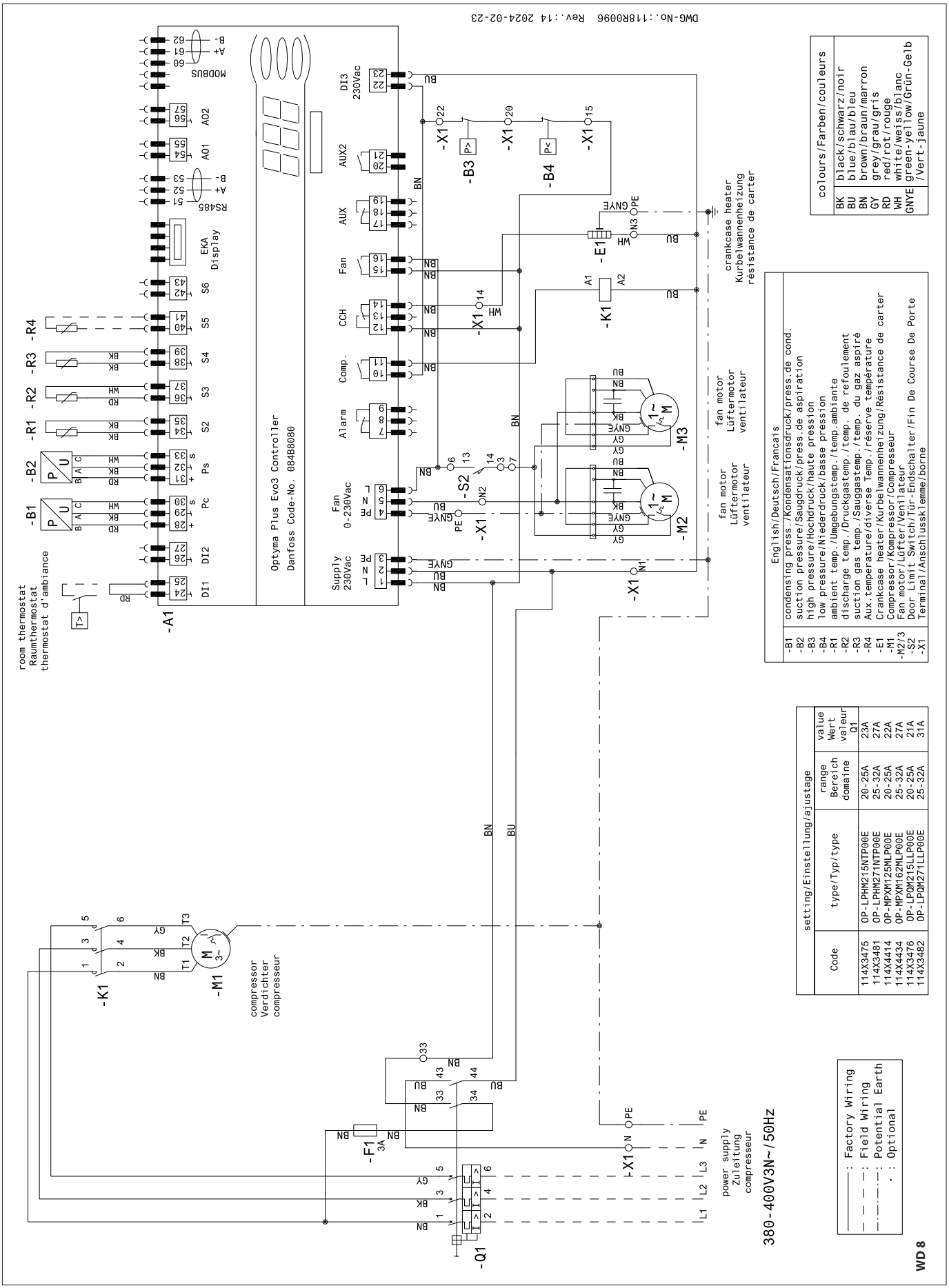
114X3118
114X4119
114X4120
114X4121
114X4122


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**Code G: OP-MPXM034-046-057**



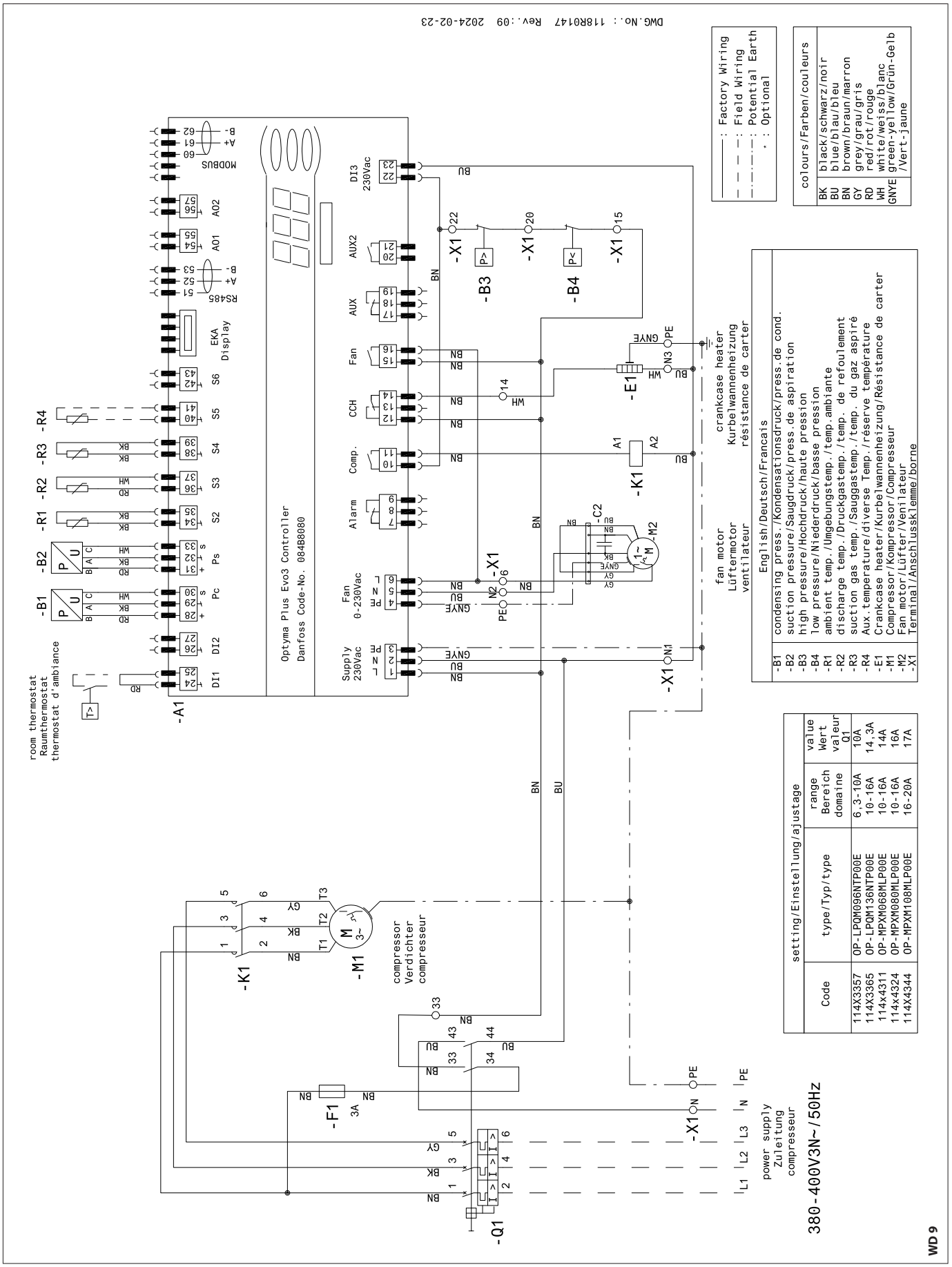
## Code E: OP-LPQM215-271 & OP-MPXM125-162



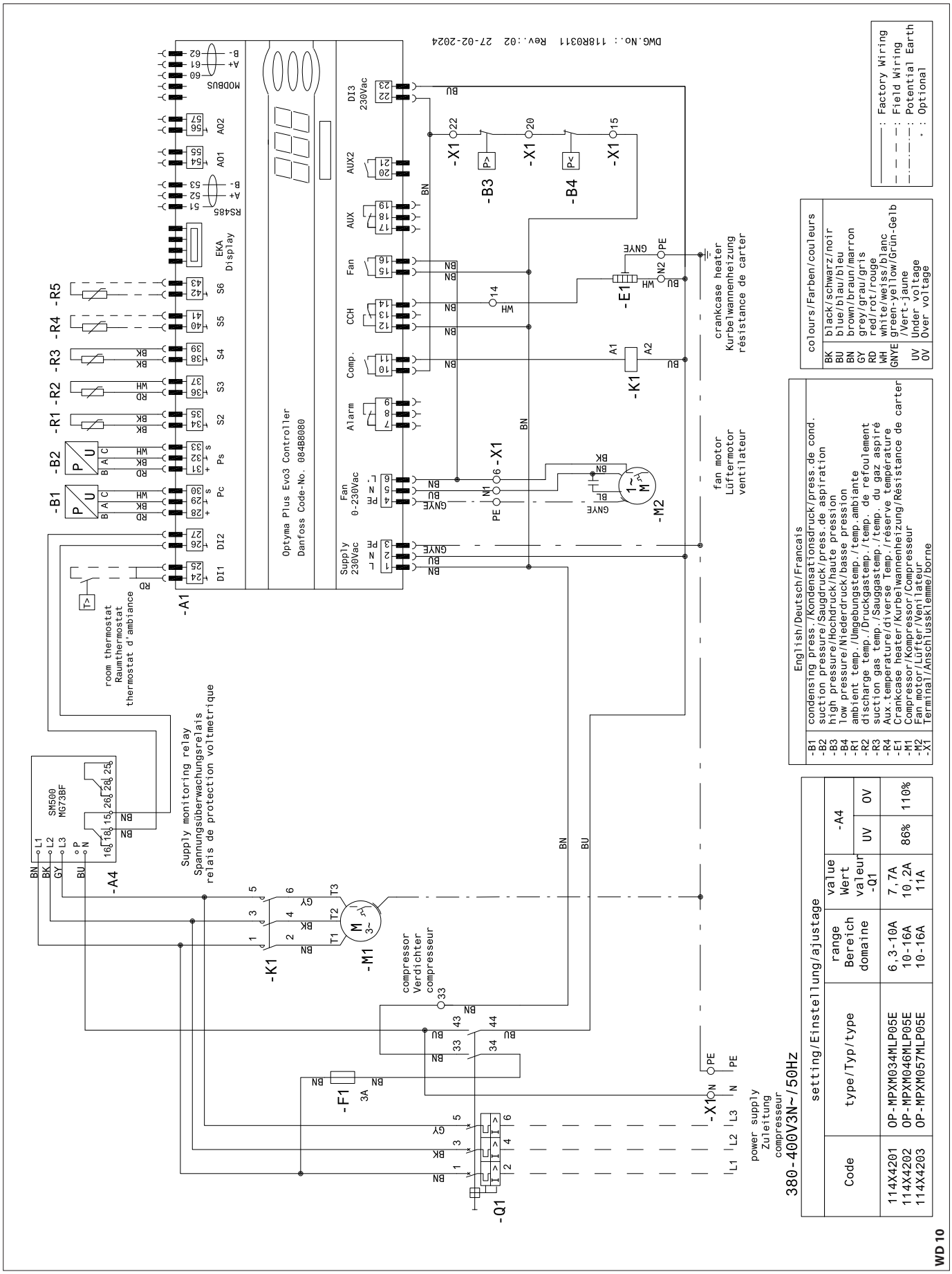


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## Code E: OP-LPQM096-136 & OP-MPXM068-080-108



## Code E (P05): OP-MPXM034-046-057

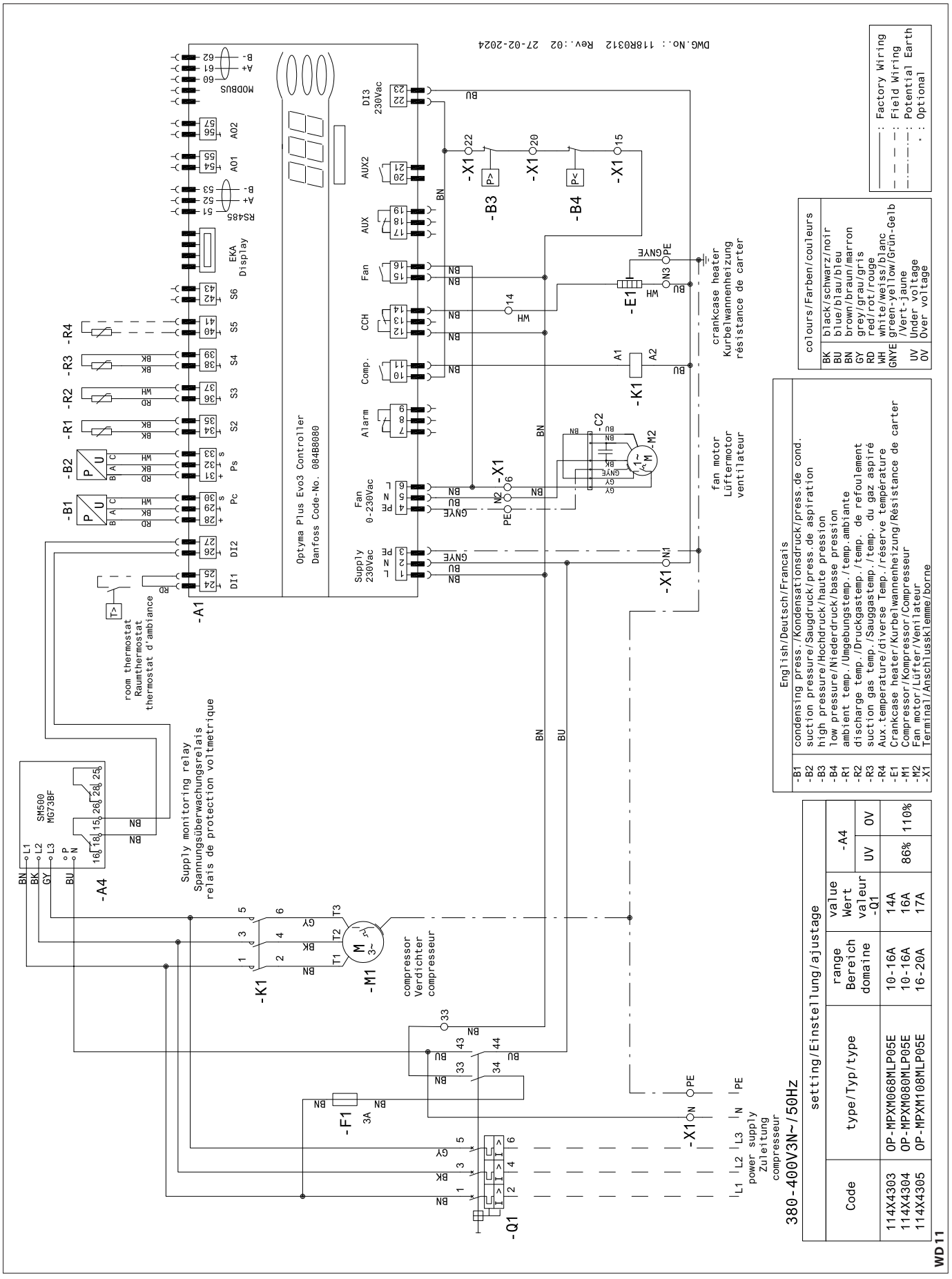



| setting/Einstellung/ajustage | | | | | | |
|---|---|---|---|---|---|---|
| Code | type/Typ/type | range Bereich domaine | value Wert valeur -Q1 | -A4 | | |
| | | | | UV | OV | |
| 114X4201 | OP-MPXM034MLP05E | 6,3-10A | 7,7A | 86% | 110% | |
| 114X4202 | OP-MPXM046MLP05E | 10-16A | 10,2A | | | |
| 114X4203 | OP-MPXM057MLP05E | 10-16A | 11A | | | |

WD 10


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## Code E (P05): OP-MPXM068-080-108




English/Deutsch/Francais

| | |
|---|---|
| -B1 | condensing press./Kondensationsdruck/press.de cond. |
| -B2 | suction pressure/Saugdruck/press.de aspiration |
| -B3 | high pressure/Hochdruck/haute pression |
| -B4 | low pressure/Niederdruck/basse pression |
| -R1 | ambient temp./Umgebungstemp./temp.ambiante |
| -R2 | discharge temp./Druckgastemp./temp. de refoulement |
| -R3 | suction gas temp./Sauggastemp./temp. du gaz aspiré |
| -R4 | Aux.temperature/diverse Temp./réserve température |
| -E1 | Crankcase heater/Kurbelwannenheizung/Résistance de carter |
| -M1 | Compressor/Kompressor/Compresseur |
| -M2 | Fan motor/Lüfter/Ventilateur |
| -X1 | Terminal/Anschlussklemme/borne |

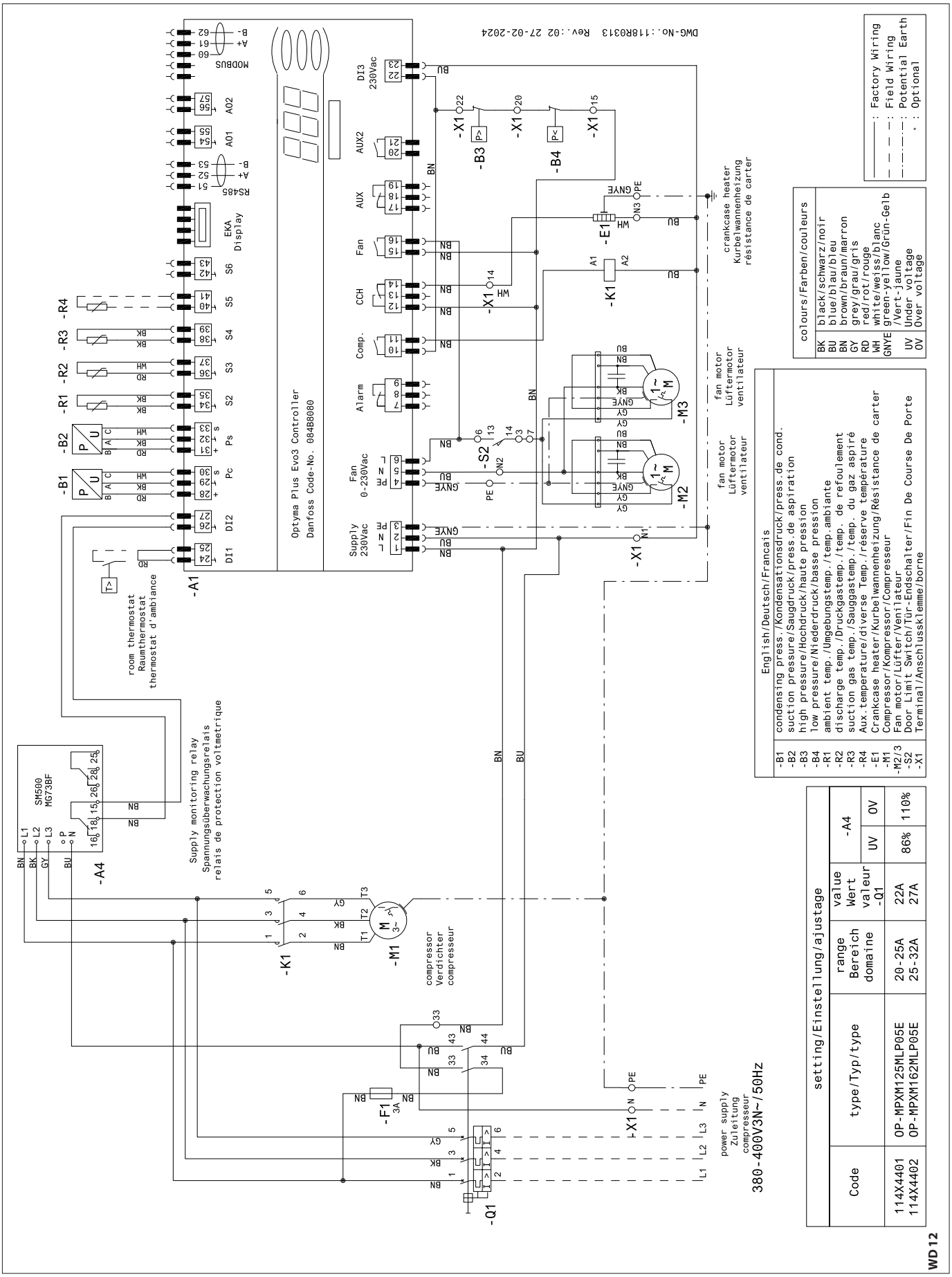
colours/Farben/couleurs

| | |
|---|---|
| BK | black/schwarz/noir |
| BU | blue/blau/bleu |
| BN | brown/braun/marron |
| GY | grey/grau/gris |
| RD | red/rot/rouge |
| WH | white/weiss/blanc |
| GNYE | green-yellow/Grün-Gelb |
| | /Vert-jaune |
| UV | Under voltage |
| OV | Over voltage |

setting/Einstellung/ajustage

| Code | type/Typ/type | range Bereich domaine | value Wert valeur -Q1 | -A4 UV | -A4 OV |
|---|---|---|---|---|---|
| 114X4303 | OP-MPXM068MLP05E | 10-16A | 14A | 86% | 110% |
| 114X4304 | OP-MPXM080MLP05E | 10-16A | 16A | | |
| 114X4305 | OP-MPXM108MLP05E | 16-20A | 17A | | |

## Code E (P05): OP-MPXM125-162





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## Instructions

**English Legend**
**A1 :** Optyma™ Plus Controller
**A2 :** EMI Filter
**A3 :** Liquid Injection Controller
**B1,B5 :** Condensing Pressure Transducer
**B2 :** Suction Pressure Transducer
**B3 :** High Pressure Switch (OFF = 31bar(g), ON = 24bar(g))
**B4 :** Low Pressure Switch (OFF = -0,3bar(g), ON = 0,5bar(g))
**C1 :** Start Capacitor (Compressor)
**C2 :** Run Capacitor (Compressor)
**C3 :** Run Capacitor (Fan 1)
**C4 :** Run Capacitor (Fan 2)
**F1 :** Fuse (Control Circuit)
**F2,F3 :** Motor protector
**K1 :** Contactor
**K2 :** Start Relay
**M1 :** Compressor
**M2 :** Fan Motor 1
**M3 :** Fan Motor 2
**M4 :** Electronic Expansion Valve
**Q1 :** Main Switch
**R1 :** Ambient Temp. Sensor
**R2,R8 :** Discharge Temp. Sensor
**R3 :** Suction Temp. Sensor
**R4,R5 :** Auxiliary Temp. Sensor (optional)
**R6 :** Crankcase Heater
**R7 :** NTC Resistor
**S1 :** Room Thermostat (optional)
**S2 :** Door Limit Switch
**X1 :** Terminal
**Supply :** Supply
**Fan :** Fan
**Alarm :** Alarm
**Comp. :** Compressor
**CCH :** Crankcase Heater
**Aux :** Auxiliary

---

**Deutsch Legende**
**A1:** OPTYMA™ PLUS Regler
**A2 :** EMI-Filter
**A3 :** Flüssigkeitsinjektionsregler
**B1,B5:** Druckmessaufnehmer (Hochdruck)
**B2:** Druckmessaufnehmer (Niederdruck)
**B3:** Hochdruckschalter (OFF = 31bar(g), ON = 24bar(g))
**B4:** Niederdruckschalter (OFF = -0,3bar(g), ON = 0,5bar(g))
**C1:** Anlaufkondensator (Verdichter)
**C2:** Betriebskondensator (Verdichter)
**C3:** Betriebskondensator (Lüfter 1)
**C4:** Betriebskondensator (Lüfter 2)
**F1:** Sicherung (Steuerkreis)
**F2,F3:** Motorschutz
**K1:** Schütz
**K2:** Anlaufrelais
**M1:** Verdichter
**M2:** Lüftermotor 1
**M3:** Lüftermotor 2
**M4 :** Elektronisches Expansionsventil
**Q1:** Hauptschalter
**R1:** Umgebungstemp.- Fühler
**R2,R8:** Heißgastemp.- Fühler
**R3:** Saugstutzentemp.- Fühler
**R4,R5:** Zusatztemp.- Fühler (optional)
**R6:** Kurbelwannenheizung
**R7 :** NTC-Widerstand
**S1:** Raumthermostat (optional)
**S2 :** Türendschalter
**X1:** Anschlussklemme
**Supply:** Spannungsversorgung
**Fan:** Lüfter
**Alarm:** Alarm
**Comp:** Verdichter
**CCH:** Kurbelwannenheizung
**Aux:** Zusatzgeräte

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**Français Légende**
**A1 :** contrôleur Optyma™ Plus
**A2 :** Filtre EMI
**A3 :** Régulateur d'injection de liquide
**B1,B5 :** transducteur de pression de condensation
**B2 :** transducteur de pression d'aspiration
**B3 :** pressostat haute pression (OFF = 31bar(g), ON = 24bar(g))
**B4 :** pressostat basse pression (OFF = -0,3bar(g), ON = 0,5bar(g))
**C1 :** Condensateur de démarrage (Compresseur)
**C2 :** Condensateur de marche (Compresseur)
**C3 :** Condensateur de marche (Ventilateur 1)
**C4 :** condensateur de marche (Ventilateur 2)
**F1 :** fusible (Circuit de commande)
**F2,F3 :** Protection du moteur
**K1 :** contacteur
**K2 :** relais de démarrage
**M1 :** compresseur
**M2 :** moteur de ventilateur 1
**M3 :** moteur de ventilateur 2
**M4 :** Détendeur électrique
**Q1 :** sectionneur principal
**R1 :** sonde de température ambiante
**R2,R8 :** sonde de température de refoulement
**R3 :** sonde de température d'aspiration
**R4,R5 :** sonde de température auxiliaire (en option)
**R6 :** résistance de carter
**R7 :** Résistance NTC
**S1 :** thermostat d'ambiance (en option)
**S2 :** Interrupteur de limite de porte
**X1 :** borne
**Supply :** alimentation
**Fan :** ventilateur
**Alarm :** alarme
**Comp. :** compresseur
**CCH :** résistance de carter
**Aux :** auxiliaire

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**Español leyenda**
**A1:** Controlador Optyma™ Plus
**A2 :** Filtro EMI
**A3 :** Controlador de inyección de líquido
**B1,B5:** Transductor de presión de condensación
**B2:** Transductor de presión de aspiración
**B3:** Presostato de alta presión (OFF = 31bar(g), ON = 24bar(g))
**B4:** Presostato de baja presión (OFF = -0,3bar(g), ON = 0,5bar(g))
**C1:** Condensador de arranque (compresor)
**C2:** Condensador de funcionamiento (compresor)
**C3:** Condensador de funcionamiento (ventilador 1)
**C4:** Condensador de funcionamiento (ventilador 2)
**F1:** Fusible (circuito de control)
**F2,F3:** Protector del motor
**K1:** Contactor
**K2:** Relé de arranque
**M1:** Compresor
**M2:** Motor del ventilador 1
**M3:** Motor del ventilador 2
**M4 :** Válvula de expansión electrónica
**Q1:** Interruptor principal
**R1:** Sensor de temperatura ambiente
**R2,R8:** Sensor de temperatura dedescarga
**R3:** Sensor de temperatura de aspiración
**R4,R5:** Sensor de temperatura auxiliar (opcional)
**R6:** Resistencia del cárter
**R7 :** Resistencia NTC
**S1:** Termostato ambiente (opcional)
**S2 :** Interruptor de límite de puerta
**X1:** Terminal
**Supply:** Alimentación
**Fan:** Ventilador
**Alarm:** Alarma
**Comp.:** Compresor
**CCH:** Resistencia del cárter
**Aux:** Auxiliar

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**Italiano leggenda**
**A1:** Regolatore Optyma™ Plus
**A2 :** Filtro EMI
**A3 :** Regolatore iniezione di liquido
**B1,B5:** Trasduttore pressione di condensazione
**B2:** Trasduttore pressione di aspirazione
**B3:** Pressostato alta pressione (OFF = 31bar(g), ON = 24bar(g))
**B4:** Pressostato bassa pressione (OFF = -0,3bar(g), ON = 0,5bar(g))
**C1:** Condensatore di avviamento (compressore)
**C2:** Condensatore di marcia (compressore)
**C3:** Condensatore di marcia (ventola 1)
**C4:** Condensatore di marcia (ventola 2)
**F1:** Fusibile (circuito di controllo)
**F2,F3:** Motoprotettore
**K1:** Contattore
**K2:** Relè avviamento
**M1:** Compressore
**M2:** Motore ventola 1
**M3:** Motore ventola 2
**M4 :** Valvola di espansione elettronica
**Q1:** Interruttore principale
**R1:** Temp. ambiente Sensore
**R2,R8:** Temp. scarico Sensore
**R3:** Temp. aspirazione Sensore
**R4,R5:** Temp. ausiliaria Sensore (opzionale)
**R6:** Resistenza carter
**R7 :** Resistore NTC
**S1:** Termostato ambiente (opzionale)
**S2 :** Finecorsa porta
**X1:** Terminale
**Supply :**Alimentazione
**Fan :** Ventola
**Alarm :** Allarme
**Comp. :** Compressore
**CCH :** Resistenza carter
**Aux :** Ausiliario

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**Svenska Legend**
**A1:** Optyma™ Plus regulator
**A2 :** EMI-filter
**A3 :** Vätskeinsprutningsregulator
**B1,B5:** Kondensortrycksgivare
**B2:** Sugtrycksgivare
**B3:** Högtrycksbrytare (OFF = 31bar(g), ON = 24bar(g))
**B4:** Lågtrycksbrytare (OFF = -0,3bar(g), ON = 0,5bar(g))
**C1:** Startkondensator (kompressor)
**C2:** Driftkondensator (kompressor)
**C3:** Driftkondensator (fläkt 1)
**C4:** Driftkondensator (fläkt 2)
**F1:** Säkring (styrkrets)
**F2,F3:** Motorskydd
**K1:** Kontaktor
**K2:** Startrelä
**M1:** Kompressor
**M2:** Fläktmotor 1
**M3:** Fläktmotor 2
**M4 :** Elektronisk expansionsventil
**Q1:** Huvudbrytare
**R1:** Omgivningstemp. sensor
**R2,R8:** Tryckrörstemp. sensor
**R3:** Sugtemp. sensor
**R4,R5:** Extra temp. sensor (tillval)
**R6:** Vevhusvärmare
**R7 :** NTC-resistor
**S1:** Rumstermostat (tillval)
**S2 :** Dörrgränsbrytare
**X1 :** Terminal
**Supply :** Matning
**Fan :** Fläkt
**Alarm :** Larm
**Comp. :** Kompressor
**CCH :** Vevhusvärmare
**Aux :** Extrautrustning

**Português Lenda**
**A1 :** Controlador Optyma™ Plus
**A2 :** Filtro EMI
**A3 :** Controlador de injeção de líquido
**B1,B5 :** Transdutor da pressão de condensação
**B2 :** Transdutor da pressão de aspiração
**B3 :** Pressóstato de alta pressão (OFF = 31bar(g), ON = 24bar(g))
**B4 :** Pressóstato de baixa pressão (OFF = -0,3bar(g), ON = 0,5bar(g))
**C1 :** Condensador de arranque (Compressor)
**C2 :** Condensador de trabalho (Compressor)
**C3 :** Condensador de trabalho (Ventilador 1)
**C4 :** Condensador de trabalho (Ventilador 2)
**F1 :** Fusível (Circuito de controlo)
**F2,F3 :** Protetor do motor
**K1 :** Contactor
**K2 :** Relé de arranque
**M1 :** Compressor
**M2 :** Motor do ventilador 1
**M3 :** Motor do ventilador 2
**M4 :** Válvula de expansão eletrónica
**Q1 :** Interruptor principal
**R1 :** Sensor da temperatura ambiente
**R2,R8 :** Sensor da temperatura de descarga
**R3 :** Sensor da temperatura de aspiração
**R4,R5 :** Sensor de temperature, auxiliar (opcional)
**R6 :** Resistência de cárter
**R7 :** Resistência NTC
**S1 :** Termóstato ambiente (opcional)
**S2 :** Interruptor de limite de porta
**X1 :** Terminal
**Supply :** Alimentação
**Fan :** Ventilador
**Alarm :** Alarme
**Comp. :** Compressor
**CCH :** Resistência de cárter
**Aux :** Auxiliar

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**Polski Legenda**
**A1 :** Regulator Optyma™ Plus
**A2 :** filtr EMI
**A3 :** Sterownik wtrysku cieczy
**B1 :** Przetwornik ciśnienia skraplania
**B2 :** Przetwornik ciśnienia ssania
**B3 :** Przełącznik wysokiego ciśnienia (OFF = 31bar(g), ON = 24bar(g))
**B4 :** Przełącznik niskiego ciśnienia (OFF = -0,3bar(g), ON = 0,5bar(g))
**C1 :** Kondensator rozruchowy (sprężarka)
**C2 :** Kondensator roboczy (sprężarka)
**C3 :** Kondensator roboczy (wentylator 1)
**C4:** Kondensator roboczy (wentylator 2)
**F1 :** Bezpiecznik (obwód sterowania)
**F2,F3 :** Zabezpieczenie silnika
**K1 :** Stycznik
**K2 :** Przekaźnik rozruchowy
**M1 :** Sprężarka
**M2 :** Silnik wentylatora 1
**M3 :** Silnik wentylatora 3
**M4 :** Elektroniczny zawór rozprężny
**Q1 :** Wyłącznik główny
**R1 :** Czujnik temp. otoczenia
**R2,R8 :** Czujnik temp. na wylocie
**R3 :** Czujnik temp. na wlocie
**R4,R5 :** Dodatkowy czujnik temperatury (opcjonalny)
**R6 :** Grzałka karteru sprężarki
**R7 :** Opornik NTC
**S1 :** Sterownik komorowy (opcjonalny)
**S2 :** Wyłącznik krańcowy drzwiczek
**X1 :** Zacisk
**Supply :** Zasilanie
**Fan :** Wentylator
**Alarm :** Alarm
**Comp. :** Sprężarka
**CCH :** Grzałka skrzyni korbowej
**Aux :** Element dodatkowy

---

**Русский Легенда**
**A1:** Контроллер Optyma™ Plus
**A2 :** EMI фильтр
**A3 :** Контроллер впрыска жидкости
**B1,B5:** Датчик давления конденсации
**B2:** Датчик давления всасывания
**B3:** Датчик высокого давления ( OFF = 31bar(g), ON = 24bar(g))
**B4:** Реле низкого давления (OFF = -0,3bar(g), ON = 0,5bar(g))
**C1:** Пусковой конденсатор (компрессор)
**C2:** Рабочий конденсатор (компрессор)
**C3:** Рабочий конденсатор (вентилятор 1)
**C4:** Рабочий конденсатор (вентилятор 2)
**F1:** Предохранитель (цепь управления)
**F2,F3:** Защита электродвигателя
**K1:** Контактор
**K2:** Пусковое реле
**M1:** Компрессор
**M2:** Мотор вентилятора 1
**M3:** Мотор вентилятора 2
**M4 :** Электронный расширительный клапан
**Q1:** Главный выключатель
**R1:** Датчик темп. окружающей среды
**R2,R8:** Датчик темп. нагнетания
**R3:** Датчик темп. всасывания
**R4,R5:** Дополнительный датчик температуры (опция)
**R6:** Подогреватель картера
**R7 :** Резистор NTC
**S1:** Комнатный терморегулятор (опция)
**S2 :** Дверной контакт
**X1:** Клемма
**Supply:** Поставка
**Fan:** Вентилятор
**Alarm:** Авария
**Comp.:** Компрессор
**CCH:** Подогреватель картера
**Aux.:** Вспомогательный

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Effektiva och konkurrenskraftiga lösningar för stormarknader, lager eller fryslager

Sidoskärmarna, droppträget och det invändiga droppträget är ledade och avtagbara

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www.kelvion.com

## Kelvions serie av blockluftkylare: KSC och MSC

# SUVERÄN KYLNING FÖR KOMMERSIELLA ÄNDAMÅL




## KAPACITETS-INTERVALL

**HFC** — **0.8 kW - 50 kW**
$t_{L1}$= 0°C | $t_0$= -8°C | DT1 = 8K | R404A [SC2]

**$CO_2$** — **0.8 kW - 58 kW**
$t_{L1}$= 0°C | $t_0$= -8°C | DT 1= 8K | R744 | 45/90 bar

**$H_2O$** — **1.2 kW - 88.2 kW**
$t_{L1}$= +16°C | $t_{S1}$= +4°C | $t_{S2}$= +8°C | Vatten [SC10]

**$NH_3$** — –

## FLÄKTAR

- **ESM-teknik** 0-10V | IP54
  KSC23: (2 varvtalslägen), IP55 | KSC30: (4 varvtalslägen), IP54
- **Diameter Ø:** 230, 300, 400, 500 mm
- **Antalet fläktar:** 1 - 4 st

## VÄRMEVÄXLARE

- **Rörsystem:** Förskjutet
- **Röravstånd:** 33 x 38 mm I Ø 12 mm
- **Lamellavstånd: [i mm]:** R = 4.0 I B = 7.0
- **Kombinerad injektion** via Venturi-fördelare
- **Leverans:** med ca 5 PSI övertryck

## TILLVAL

- Shut-Up®
- Adapter för luftslang och Shut Up® (KSC 30 & 40, MSC)
- Värmare med lamellrör KSHR/SHR Z & MSHR / SHR Z
- Isolerat droppträg med dubbel vägg
- Ledade lameller
- CAL®-fördelare
- $CO_2$ 45/90 bar och vatten / köldbärare
- 4 olika tillval för korrosionsskydd

## AVFROSTNING

| AVFROSTARE | SLINGA | DROPPTRÅG | FLÄKT |
|---|---|---|---|
| Elektrisk | ✓ | ✓ | |
| Het gas | | ✓ | |
| Kall gas | | | |
| Sekundär krets | | | |

## KELVION SELECT

Ditt verktyg för val av termodynamisk värmeväxlare
**NÄR SOM HELST.**
**VAR SOM HELST.**

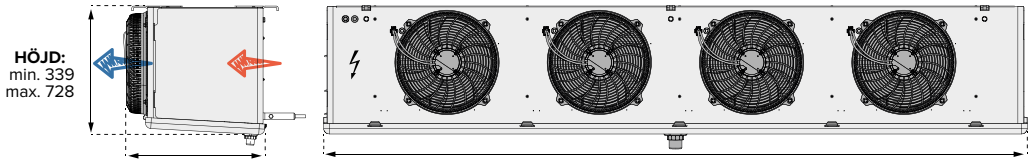
https://selectrt.kelvion.com

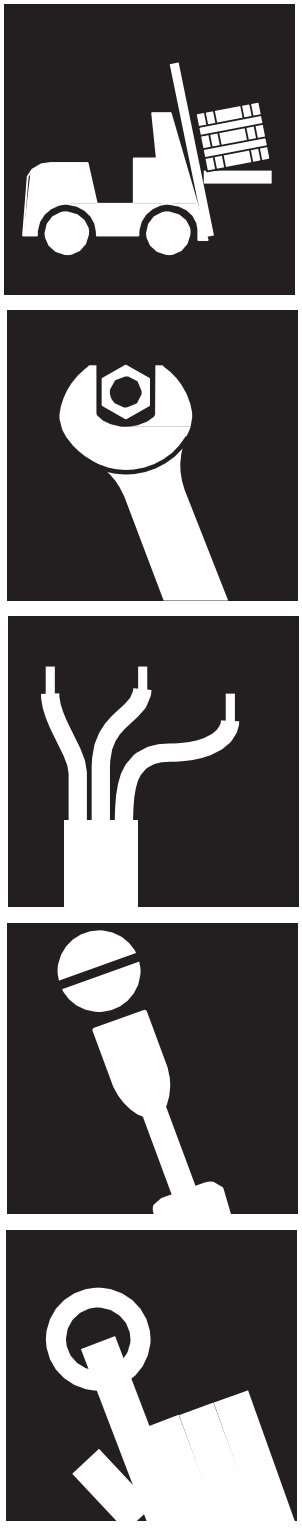
## MATERIAL

| MATERIAL | RÖR | LAMELLER | HÖLJE | ÄNDPLATTA |
|---|---|---|---|---|
| Aluminium | | ☑ | ☑ | ☑ |
| Koppar | ☑ | | | |
| Aluminium, epoxibelagt | | ✓ | | |
| Aluminium, skyddsbelagt | | | ✓ | ✓ |
| Rostfritt stål V2A (304) | ✓ | | ✓ | ✓ |

☑ Standardutförande I ✓ Finns tillgänglig som en version I
* på begäran I Höljet är pulverlackerat (RAL 9010)

## MÅTT i [mm]





# Bruksanvisning (BA)

# för

# Küba luftkylare

# enligt DIN EN 307

Kelvion Refrigeration GmbH
Kühler Weg 1 - D-82065 Baierbrunn, Tel. +49 (0) 89 / 744 73 – 0
Fax: Verkauf/Försäljning 0 89 744 73-222 • Einkauf/Inköp 0 89 744 73-220, www.kueba.com
Sitz/Registrerat kontor: Baierbrunn, Registergericht München: HRB 93184
Ust-Id. Nr. Momsregistreringsnummer. DE811154420
Geschäftsführer/VD: Reinhard Kindler, Ralph Mathis (Vorsitz/VD)
Deutsche Bank (BLZ 700 700 10), Konto 1 810 100, BIC DEUTDEMM
IBAN: DE84700700100181010000

## Hur man använder bruksanvisningen

Var noga med att läsa dessa instruktioner, monteringsanvisningarna och deklarationen från tillverkaren innan din luftkylare startas.

### Säkerhetssymboler för arbetsområden



**Inom dessa instruktioner (BA) finns denna symbol bredvid alla rekommendationer för arbetssäkerhet, det vill säga för situationer som antingen utgör en fara för människoliv eller risk för personskador. Följ dessa instruktioner och var försiktig i alla dessa situationer. Vänligen meddela alla arbetssäkerhetsinstruktioner till andra användare. Förutom dessa instruktioner (BA) är det nödvändigt att ta hänsyn till de universellt tillämpliga säkerhets- och olycksförebyggande reglerna.**

### Varningstecken



**Genom dessa instruktioner (BA) markerar VARNINGS-skylten alla avsnitt som kräver särskild uppmärksamhet så att reglerna, föreskrifterna, rekommendationerna och den korrekta arbetsförloppet följs och enheten och/eller delar av installationen skyddas från fara och förstörelse.**

### Återvinning



**När luftkylare, enhetsdelar eller reservdelar förnyas ska de utbytta delarna återvinnas på korrekt sätt. För mer information om det se avsnitt 10.1 till 10.6 i dessa instruktioner.**

Kelvion

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# 1 Inledande information

## 1.1 Grundläggande referenslitteratur

När det gäller tekniska data hänvisar vi till vår nuvarande litteratur om fläktluftkylare.
När det gäller fläktmotorer finns de enda väsentlig data de på etiketten.

## 1.2 Användningsområde

Fläktluftkylare kan användas:

- för köldmedium med direkt expansion med hjälp av vätskorna som visas på typskylten
- för köldmedium i pumpdrift med hjälp av vätskorna som visas på typskylten
- för köldmedier med hjälp av vätskorna som visas på typskylten

Kommentar:

| | |
|---|---|
| Vätskegrupp 1: | Köldmedium eller köldmedier med farokategori (köldmediegrupp L2 och L3 enligt DIN EN 378 - standarden (t.ex. ammoniak), värmeöverföringsolja) |
| Vätskegrupp 2: | Köldmedium eller köldmedier utan farokategori (köldmediegrupp L1 enligt DIN EN 378 -standarden (t.ex. Frigen), saltlösning, glykol eller vatten) |

## 1.3 Allmänna säkerhetsanvisningar

Installation, idrifttagning, service och underhåll får endast utföras av utbildade personer enligt föreskriften om förebyggande av olyckor BGV A1, ”Förebyggande principer”.

## 1.4 Äganderätt, upphovsrättslag

GEA KÜBA GmbH innehar alla rättigheter, inklusive fordringar av industriell äganderätt, såväl som försäljningsrätt samt rätten att kopiera och vidarebefordra KÜBA dokument.

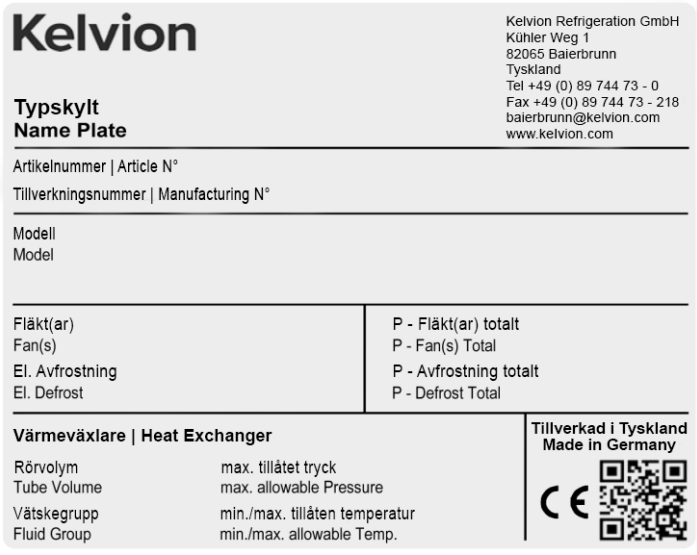
## 1.5 Ändringar

Beträffande beskrivningar och informativa detaljer som anges i denna bruksanvisning (BA) förbehålls alla tekniska ändringar som kan bli nödvändiga för att uppdatera och förbättra fläktluftkylare som tillverkas av GEA KÜBA.

# 2 Tekniska data

## 2.1 Karakteristiska data

Se modellbeteckning och etikettdata


Kelvion

Kelvion Refrigeration GmbH
Kühler Weg 1
82065 Baierbrunn
Tyskland
Tel +49 (0) 89 744 73 - 0
Fax +49 (0) 89 744 73 - 218
baierbrunn@kelvion.com
www.kelvion.com

**Typskylt**
**Name Plate**

Artikelnummer | Article N°
Tillverkningsnummer | Manufacturing N°

Modell
Model

| | |
|---|---|
| Fläkt(ar)<br>Fan(s) | P - Fläkt(ar) totalt<br>P - Fan(s) Total |
| El. Avfrostning<br>El. Defrost | P - Avfrostning totalt<br>P - Defrost Total |

**Värmeväxlare | Heat Exchanger**

| | |
|---|---|
| Rörvolym<br>Tube Volume | max. tillåtet tryck<br>max. allowable Pressure |
| Vätskegrupp<br>Fluid Group | min./max. tillåten temperatur<br>min./max. allowable Temp. |

**Tillverkad i Tyskland**
**Made in Germany**

CE

Följande information visas på typskylten:

- Typbeteckning (se beskrivning i 2.4)
- Serienummer, tillverkningsår
- Spänning
- Eleffekt (verklig)
- Maximalt tillåtet tryck PS
- Maximal tillåten temperatur $TS_{max}$
- Minimal tillåten temperatur $TS_{min}$
- Tillåten köldmediegrupp - se 1.2 Användningsområde
- Märkning av apparater typ ATEX i enlighet med EG-direktiv 94/9/EG
  (endast för apparater av typ ATEX)
- Märkning om ytterligare tester (t.ex. VDE) kan visas

## 2.2 Ändamål och användningsområde

Fläktluftkylare är endast lämplig för kylsystem anpassade enligt DIN EN 378. All annan användning anses ligga utanför fläktluftkylarens användningsområde. Tillverkaren tar inget ansvar för skador orsakade av felaktigt användande, detta ansvar ligger helt på kunden och dess driftspersonal. Kylarna är i standardutförande inte anpassade för installationer i korrosiv miljö.

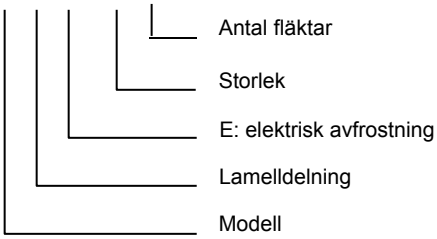
## 2.3 Material

- Rör av koppar (rostfritt stål), lameller av aluminium. Alternativ: Epoxilackerade eller koppar (svetsad).
- Rörsystem är lödda eller svetsade.
- Lämplig för alla köldmedier som anges på typskylten samt vatten och glykolvatten.
- Om sekundära köldmedier används, ska korrosionshämmare tillsättas, om lämpligt.
- Mer information finns i våra försäljningsbroschyrer

## 2.4 Modellbeteckning

För mer information vänligen se försäljningsbroschyrer

**Exempel: SG _ _ _ _ C**



# 3 Säkerhet

Den angivna informationen avser komponenten "luftkylare" men inte till det kompletta system den är en del av.

Värmeväxlaren för fläktluftkylaren avfuktas med torr luft och efter läcksökning och tryckprovning, förseglad utan övertryck.

## 3.1 Allmän information om säkerhet



Fläktluftkylaren är konstruerad enligt den senaste tekniska standarden och är därför säker att använda.
Luftkylaren får endast användas enligt beskrivningen i manualen.
En kylare som installerats felaktigt av okvalificerade personer för olämplig ändamål kan ändå utgöra en fara.
Informationen på typskylten, dvs. max. tillåtet tryck, tillåten temperatur och vätskegruppen måste säkerställas av tillverkaren. Inkoppling och skydd av luftkylaren måste utföras av tillverkaren i enlighet med sin riskanalys för anläggningen, med hänsyn taget till DIN EN 378-standarden och lokala bestämmelser.

**I explosiv miljö måste EG-direktiv 94/9EG (ATEX) och förordningen om säkerhet och hälsa inom industrin efterföljas. I denna miljö får endast fläktluftkylare typ ATEX installeras.**
**Informationen angiven på fläktluftkylaren av typ ATEX med referens till explosiv grupp gällande kategori och temperaturklass måste beaktas.**



Arbete med kylutrustning och elektronik i samband med installation av fläktluftkylare får endast utföras av certifierat företag med därför utbildad personal.

Samtlig, av brukaren anställd, personer som ska arbeta med denna kylare, måste ha läst och förstått instruktionerna om montering, demontering, igångsättning och drift och underhåll (kontroll, service och reparationsarbete) och speciellt säkerhetsanvisningarna enligt DIN EN 378 och nationella standarder.
Vid användning av ammoniak, R717 (endast med rostfria rör), måste berörda bestämmelser iakttas och personlig skyddsutrustning användas.

## 3.2 Montering

Installatören ansvarar för att materiel för upphängning (till exempel gängade stänger eller konsoler) har tillräcklig bärighet. Beträffande kylinstallationen måste denna utföras enligt bestämmelser för förebyggande av olyckor, speciellt DIN EN 378, samt enligt gällande nationella lagar och förordningar.

**Se till att alla skyddsanordningar, särskilt de som gäller montering av fläktskyddet, är fixerade innan du startar enheten.**

**Koppla bort all strömmatning vid montage, reparation och underhåll. Se till att du undviker kontakt med vassa kanter av lameller. Uppmärksamhet: Risk för personskada!**




**Konstruktionsändringar av luftkylaren, som inte skriftligen godkänts av tillverkaren, och som inverkar på säkerheten och kapaciteten är inte tillåtna. Se till att du undviker kontakt med köldmediet! Ingen lödning eller svetsning på uppfyllt köldmediesystem. Uppmärksamhet: Risk för förgiftning!**
**Uppsök läkare omgående om köldmediet kommit i ögonen!**

## 3.3 Elinstallation

Vid den elektriska installationen ska hänsyn tas till VDE 0100 och DIN EN 60204 del 1, lokal elleverantörs bestämmelser och alla övriga säkerhetsnormer, liksom informationen för fläktmotorer och avfrostningselement på typskyltar.

Den elektriska installationen får endast utföras av behörigt företag och i enlighet med lokala lagar och förordningar.

Inkoppling måste utföras enligt kopplingsschemat i monteringsanvisningen samt schemat i motorns kopplingsbox.

De enda bindande uppgifterna är de som finns på utrustningens typskyltar.
Apparat med elektrisk avfrostning måste förses med avsäkring.

En termisk skyddsbrytare för fläktmotorn finns antingen i motorns strömförsörjning eller ska ingå i kylinstallatörens styrutrustning (se fläktarnas kopplingsschema).

**En avdelare med minst 3 mm avstånd på varje stolpe måste byggas in i installationen (huvudbrytare eller servicebrytare).**

Efter utförd elektrisk inkoppling eller reparation, måste utrustningen kontrolleras enligt DIN EN 60204 del 1. Tätning och dragavlastning vid kabelgenomföringen måste utföras korrekt.

# 4 Transport

## 4.1 Emballage

### 4.1.1 Typ av emballage

Typ av transport och luftkylarens storlek är två viktiga aspekter för val av rätt emballage. Emballaget motsvarar riktlinjerna som nämns under 4.1.1.1 och 4.1.1.2 om inte annat överenskommits.

#### 4.1.1.1 Kartongemballage

Kartongförpackning är baserad på pappindustrins kvalitetsdefinition för wellpapp, VDM standard DIN 55 468.

#### 4.1.1.2 Lastpallar, häckar, exportförpackning

Dessa är i enlighet med reglerna för HPE förpackning som har fastställts av den tyska federala organisationen för användning av trä, lastpallar, exportförpackning och ”Corporation of German Engineering Institutes”.

### 4.1.2 GEA KÜBA AB transportemballage

Dessa är tillverkade av ekologiskt godkänd material som är lämpligt för återanvändning efter återvinning.

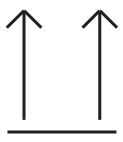
### 4.1.3 Regler för emballage

I enlighet med den tyska förordningen om förpackningar är vi beredda att ta tillbaka vårt förpackningsmaterial inom ramen för giltigheten, om de levereras fraktfritt till oss i Baierbrunn, Tyskland. All wellpappsemballage som vi använder är märkt med symbolen RESY för återvinning (retursystem).

Men för att undvika onödiga transporter föreslår vi att godsmottagaren på eget initiativ gör sig av med emballaget.

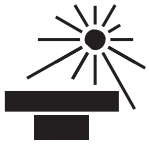
### 4.1.4 Bildsymboler

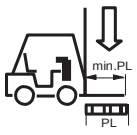
Symbolerna på förpackningarna måste följas, till exempel:


Uppåt


Ömtåligt


Förvaras torrt


Förvaras svalt



Minimal längd på gafflarna


Inga krokar!


Tyngdpunkt


Låsanordning



Maximal staplingshöjd


Inga lyftpunkter för gaffeltruck

## 4.2 Montering

Vi eftersträvar att leverera apparaterna så färdigmonterade som möjligt.
Skulle trots detta luftkylaren levereras i delar, måste monteringen ske i rätt ordning exakt enligt bifogad skiss.

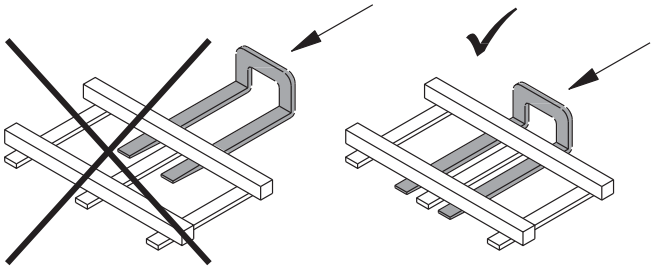
## 4.3 Transport

### 4.3.1 Hantering med tillräcklig omsorg under transport, lyft och lagring

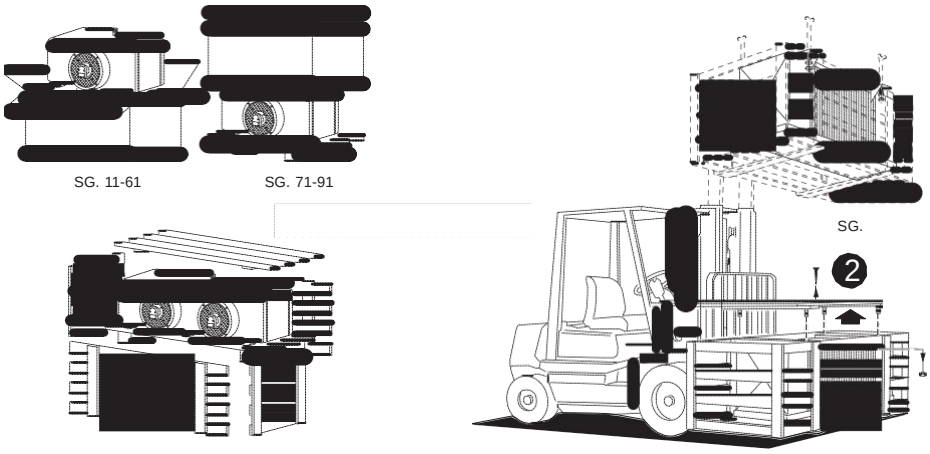
Under transport måste speciell hänsyn iakttas för att undvika skador som följd av våld eller oaktsam lastning och lossning.

**Undvik att ställa ner kylaren hårt. Dra inte i något rör eller anslutning och använd dem inte för fastsättning. Detta kan orsaka läckage.**

Lyftstroppar, kedjor, etc. får endast sättas fast vid lämpliga upphängningspunkter eller lyftkonsoler. Kontrollera vid lyft med gaffeltruck att gafflarna är tillräckligt långa för att nå helt fram under främre pallplankan.



Vanligtvis levereras kylarna packade med upphängningsprofilerna neråt (upp och ner).
Vissa modeller levereras packade i sitt monteringsläge. Lådans bottenplankor håller den packade enheten tillräckligt hög och lämnar utrymme för gaffeltrucken att nå under bottenplankorna för att lyfta föremålet.



### 4.3.2 Tyngdpunkt

**Kontrollera före lyft av enheten dess tyngdpunkt. Tyngdpunkten är alltid på sidan med fläktarna.**

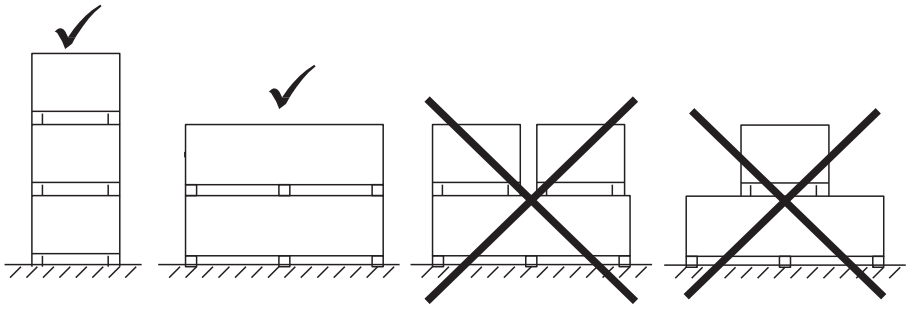
### 4.4 Lagring under transport

### 4.4.1 Lagringsplats

Fläktluftkylare skall lagras på plats skyddad från damm och fukt.

### 4.4.2 Stapling

Staplingshöjden är angiven på förpackningen. Det är viktigt att endast enheter av samma storlek staplas på varandra.



### 4.5 Leveransvolym

Att leveransen är komplett måste kontrolleras vid ankomsten av godset. Eventuella transportskador och/ eller saknade delar ska omedelbart anmälas skriftligen.

### 4.6 Säkra laster med säkerhetsanordningar

**Vi tillämpar standarden VDI 2700 ”Säkra last på vägfordon”. Ansvaret för bulkleverans vilar på fraktaren.**

### 4.7 Regler för förebyggande av olyckor:

Gällande nationella bestämmelser om förebyggande av olyckor ska följas, t.ex. för:

- lyftanordningar
- kranar
- gaffeltruckar
- mobila transportband

# 5 Montering

## 5.1 Allmänna anvisningar för montering

Allt monteringsarbete ska utföras av kvalificerad personal. Vi frånsäger oss uttryckligen allt ansvar för skador som är följd av oprofessionellt montagearbete.

Luftkylaren får endast fästas upp i därför angivna fastsättningspunkter

Bilderna i vår litteratur är förenklade.

**En kopia med den speciella montageanvisningen medföljer varje fläktluftkylare. Aktuell versioner kan laddas ner från vår webbplats www.kueba.com.**




## 5.2 Monteringsvillkor

### 5.2.1 Allmän instruktion för montering

Krav vid montering enligt DIN EN 378 eller relevanta nationella lagar och förordningar ska följas.
Det är mycket viktigt att tillräckligt med golvyta under fläktluftkylaren är reserverad för montering, drift, underhåll och reparationsarbeten.

Tak eller vägg ska förberedas i förväg, beroende på vikt och antal av fästpunkter för kylaren.

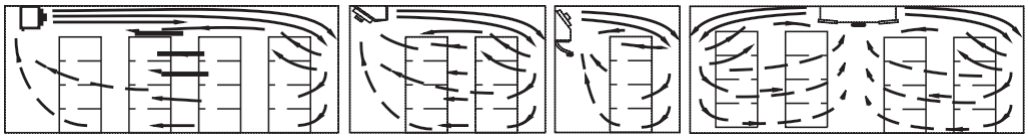
**Ansvaret för dimensionering av de bärande anordningarna (t.ex. gängstänger eller konsoler) och bultarnas styrka ligger med installatören.**

Kylarens upphängningspunkter är angivna på emballaget och återfinns även i montageanvisningarna.

### 5.2.2 Dimensioner, golvyta och vikt

**Dimensioner:**
Se i planeringsinformationen eller monteringsanvisningar.

**Nödvändig golvyta:**
Kontrollera att det finns utrymme vid anslutningssidan för byte av värmestavar (mått B). **Ge tillräckligt utrymme för luftintag och utlopp mellan kylare och tak och vägg, bjälklag, staplade produkter, hyllor mm., se i planeringsinformationen och monteringsanvisningar för nödvändiga utrymmen. För små utrymmen kan ge anläggningen driftsproblem.**



**Vikt:**
**Se i planeringsinformationen eller monteringsanvisningar.**

### 5.2.3 Lyftanordningar

**Upphängningsutrustningen måste beräknas för en vikt av minst 1% av kylarens vikt.**

## 5.3 Monteringsarbete

### 5.3.1 Allmän information om monteringsarbeten
Se avsnitt 3.2.2

### 5.3.2 Elinstallation
Se avsnitt 3.2.3

### 5.3.3 Montering av tillbehör

Se med tillbehöret bifogad montageinstruktion

### 5.3.4 Montering av kylutrustning

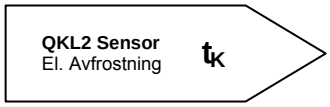
Montering av rör enligt DIN EN 378. Kontrollera att inga spänningar eller vibrationer överförs till kylaren.

Systemet ska vara rent och torr enligt standard DIN 8964.
Skydda kanalverket mot nersmutsning under installationsarbetet.

Följ tillverkarens instruktioner vid montage av magnetventil.

Speciell luftkylare med särskilda rörkretsar används vid drift med het gas. Vid avfrostning med het gas ska kylaren integreras med köldmediesystemet enligt medföljande skiss (beskrivningen finns i planeringsinformationen).

### 5.3.5 Placering av avfrostningsgivare




Positionen för avfrostningsgivare som föreslås av Küba för konventionella driftförhållanden markeras med ett klistermärke på kylarens gavel. Det finns ett dykrör för givaren i spolen.

### 5.3.6 Flänsat rörvärmeelement

Om fläktluftkylaren förses med extra värmeelement ska dessa förses med temperaturbegränsningsutrustning som är lämpligt för installationsrummet.
Värmarna får endast vara aktiva då fläktarna är i drift, tillsammans med luftriktare av standardtyp. De elkablarna till flänsat rörvärmeelement får inte överstiga 120°C. Fläktarna måste ha ett fördröjt stopp efter det att värmeelementen slagits ifrån och innan fläktarna stängs av.

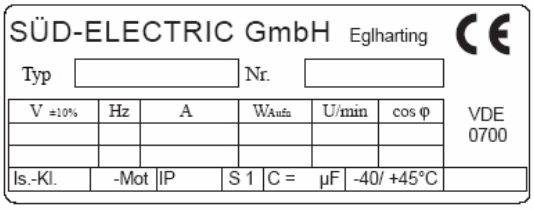
# 6 Igångsättning

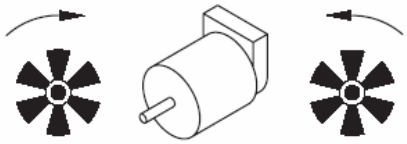
## 6.1 Instruktioner

**Första igångsättning får endast utföras av behörig personal, samt efter utförd tryck- och läckageprovning i enlighet med DIN EN 378.**

## 6.2 Provkörning

**Kontrollera fläktarnas rotationsriktning samt strömförbrukning mot typskyltens maxvärde.**



**Kontrollera att alla elanslutningar är rätt och ordentligt åtdragna.**

**Kontrollera säkerhetsutrustningens värden för till- och frånslag.**

## 6.3 Kontrollera före start

Vid förfrågan ska företaget kunna dokumentera att behörig tekniker testat fläktluftkylaren före första start i enlighet med förordningen gällande industriell säkerhet och hälsa. Nödvändig blankett för deklarationen finns för nerladdning på internet.

## 6.4 Avluftning av kyl-/ värmekretsar

Kontrollera vid uppfyllning av kyl-/värmekrets att det inte finns några luftfickor. Installera lämplig utrustning för avluftning av kyl-/värmesystem under drift.

# 7 Drift

## 7.1 Normalfunktion

### 7.1.1 Direkt expansion

Fläktluftkylaren blir uppfylld med köldmedium via expansionsventilen. Vätskan avdunstar i rörsystemet, ändrar det fysiska tillståndet och tar upp värme genom rörets vägg. Kylarens nedkylda metallväggar och lameller tar över värmen från den "varma" luften som finns i kylrummet. Värmen som överförs till kylrummet dras ut igen av fläktluftkylaren.

### 7.1.2 Drift med vatten och glykolvatten

Flytande köldmedium med låg tryck vidarebefordras av en pump eller av tyngdkraften in i luftkylarens rör. Det flytande köldmediet förångas i värmeväxlarens rör med hjälp av värme som förs in över lameller och in i rörväggen från atmosfären.

### 7.1.3 Sekundära köldmedier

Vid drift med vatten eller glykolblandat vatten krävs ett kylbatteri anpassat för detta och med en speciell kretsdelning.

Köldbäraren passerar genom batteriet och tar upp värme från den cirkulerande luften via lameller och rör.

## 7.2 Avstängning av fläktluftkylaren:

Den fläktluftkylaren är en del av kylanläggningen.
Start och stopp av fläkten beror på specifik utrustningsversion och utförs enligt installatörens anvisningar.



**Är kylrummet avstängt under längre period, rekommenderas motionsdrift av fläktarna 1-2 timmar 2 gånger varje månad**

## 7.3 Åtgärder vid eventuellt fel



**Använd personlig skyddsutrustning när köldmedier slipper ut!**

**Undvik alla kontakter med köldmediet!**

**Kontakta omedelbart läkare om ögonen kommit i kontakt med köldmediet!**

**Service- och reparationsarbeten får endast utföras av kvalificerad personal.**

## 7.4 Återkommande tester

Den auktoriserade personen ska utföra regelbundna tester på Küba fläktluftkylare i enlighet med driftsföretagets utvärderingar om faror (förordning om industrisäkerhet och hälsa). Läcksökning ska utföras enligt nationella bestämmelser. Beroende på installation, ska övrigt underhåll enligt bilagan, utföras med intervall som bestäms av driftsansvarig

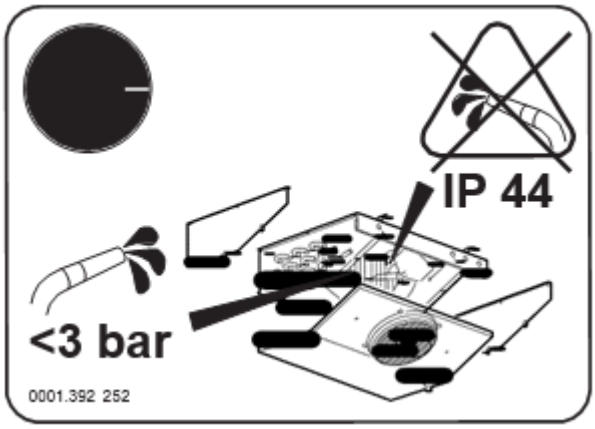
## 8 Underhåll

GEA KÜBA fläktluftkylare är i allmänhet underhållsfria. Trots detta måste, beroende på hygien, fläktluftkylaren rengöras med jämna mellanrum.

Smutsiga kylelement påverkar dessutom kyleffekten negativt. • Därför måste kylaren rengöras regelbundet med ett materialkompatibelt rengöringsmedel.
Endast rengöringsmedel som är lämpliga till fläktluftkylarens material får användas enligt tillverkarens instruktioner (dvs. blandningsförhållande, verkningstid, efterbehandling).

Elektriska delar får inte komma i kontakt med rengöring med ånga eller tryckluft.

**Strömmen till kylaren måste alltid vara bruten vid underhålls och rengöringsarbete på enheten.**
Var noga med att läsa säkerhetsinformationen på luftkylaren.




**Beroende på typ av köldmedium/köldbärare kan frätande, giftiga, brandfarliga eller explosiva ämnen uppstå vid lödning eller svetsning av värmeväxlaren Ta bort restgaser från värmeväxlaren och skölj rören med en inert gas, t.ex. kvävgas, före lödnings- eller svetsningsarbete.**

# 9 Kundtjänst

## 9.1 Lagerhållning av reservdelar

Lagring av reservdelar och kundservice är installatörens ansvar.
Se den aktuella reservdelslistan för reservdelar.

## 9.2 Korrosion

GEA KÜBA GmbH kan inte hållas ansvarig för begränsad hållbarhet för installationer i korrosiv miljö, inte ens om extra motståndskraftig version mot korrosion har valts.

# 10 Demontering och återvinning

## 10.1 Demontering

Vid demontering av kylanläggning ska olycksförebyggande regler enligt DIN EN 378 följas.

## 10.2 Luftkylarens material

Luftkylaren består av metaller såsom koppar, aluminium, stål och rostfritt stål. Inom avfallshanteringen återvinns dessa metaller, även om de är målade genom mekaniskt och/eller termiskt separation.

## 10.3 Syntetiska material

Fläktens beröringsskydd, hållare, luftriktare och luftkanal, fläktar och kopplingsdosan är gjorda av polyamider samt dels av glasfiber. Dessa material är helt återvinningsbara.

## 10.4 Material i motorer

Med undantag av några isolerande detaljer används stål, aluminium, koppar och polyamider. Återvinning enligt beskrivningen i punkterna 10.2 och 10.3.

## 10.5 Emballagematerial

Som emballage används obehandlat trä, kartong märkt med symbolen RESY (retursystem för återvinning), polystyren och polystyrenfolie. Dessa material är återvinningsbara.

För förpackningsföreskrifter, se avsnitt 4.1.3.

## 10.6 Koncept för återvinning

Punkterna 10.2 till 10.5 ger rekommendationer. Givetvis gäller i första hand nationella lagar och förordningar.

## 11 Bilagor

- Försäkran om överensstämmelse i enlighet med gällande EG-direktiv kan laddas ner på internet från GEA Küba GmbH www.kueba.com.

- Installationsmanual för denna serie kan laddas ner på internet från GEA Küba GmbH www.kueba.com.

- Sammanställning av förslag på periodiserade kontroller av fläktluftkylare (förslag) i enlighet med standarden DIN EN 307.

## Checklista för periodiserad kontroll av fläktluftkylare

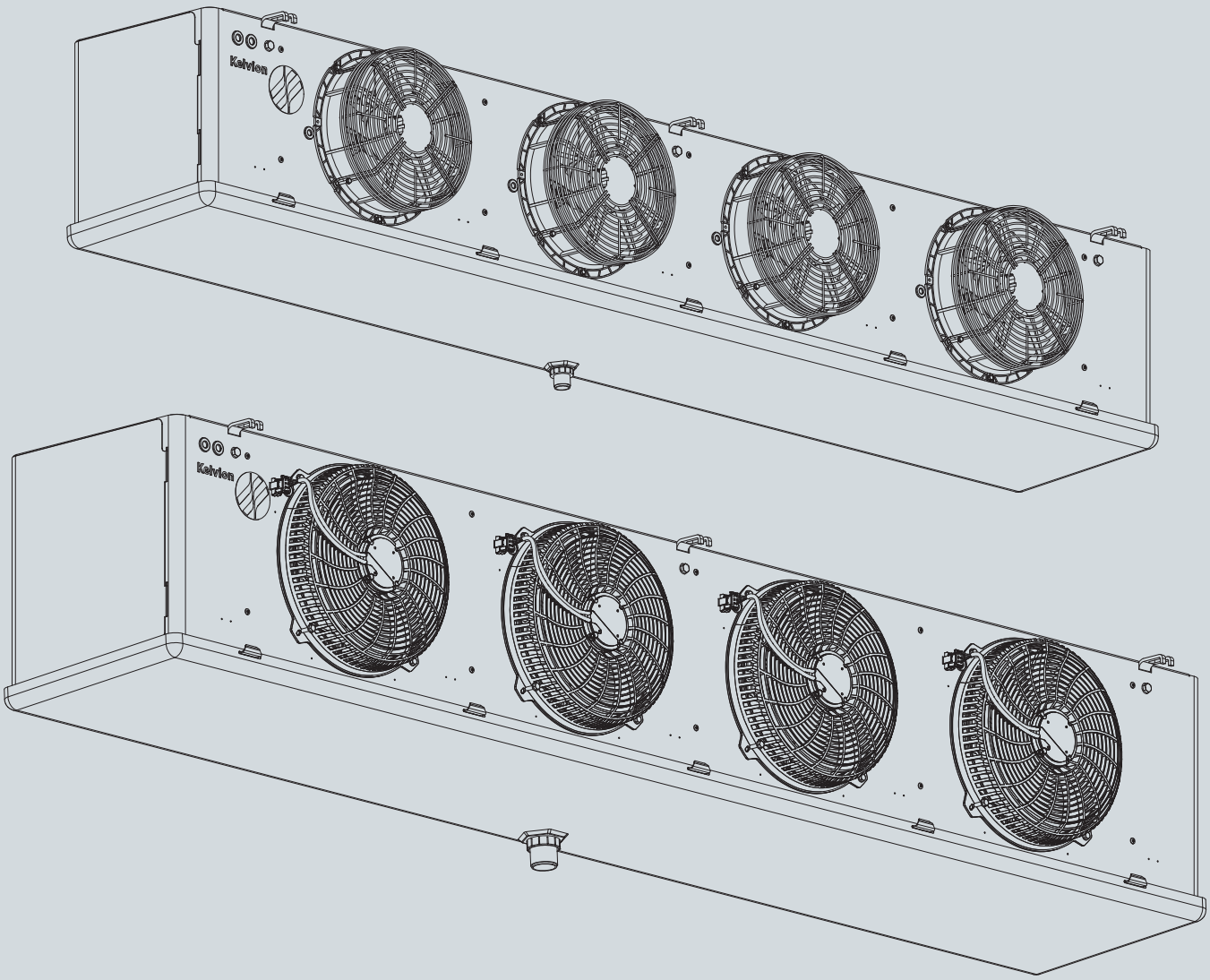
## (Förslag)

- Visuell inspektion av konsoler och fästanordningar.
- Kontroll för extrem nersmutsning, skador och korrosion
- Läcksökning
- Visuell inspektion av värmeväxlaren för isbildning
- Kontroll av köldmediefyllning och underkylning i synglas på fläktluftkylare med expansionsventil
  Kontroll av köldmedienivå i flödade fläktluftkylare
  Kontroll av kondition och uppfyllningsnivå i fläktluftkylare för köldbärare
- Kontroll av förångnings- och överhettningstemperaturer
  Kontroll av in- och utgående köldbärartemperatur av sekundära köldmediet
- Kontroll av in- och utgående lufttemperatur
- Kontroll av fläktarnas varvtal och strömförbrukning
- Rengöring av värmeväxlare
- Rengöring av droppskål
- Rengöring och kontroll av rör för kondensdräneringen
- Kontroll av avfrostningsfunktion (el eller het gas)
- Kontroll av säkerhetsutrustning (exklusive säkerhetsventiler)
- Kontroll av avstängningsventiler.
- Kontroll av köldbärarens procentuella glykolinblandning och inhibitor

Kontrollperioderna ska fastställas av driftsbolaget baserat på en utvärdering av faran och med hänsyn till driftförhållandena.

Kelvion

## Kelvion KSC / MSC

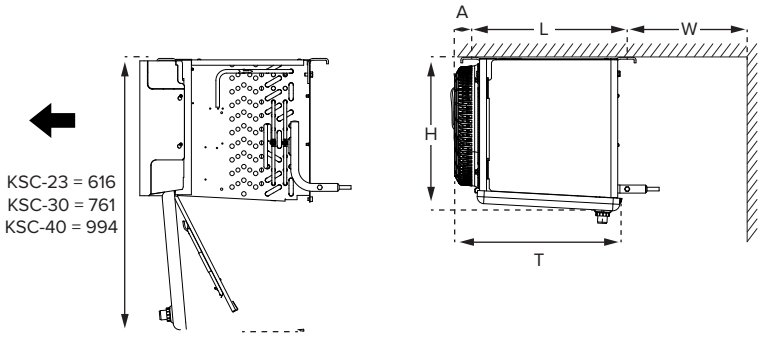


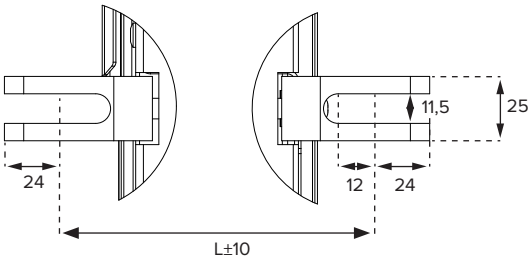

# MONTERINGSANVISNING

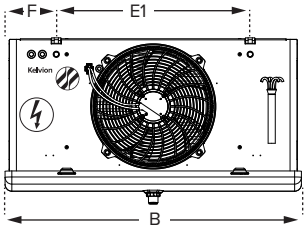
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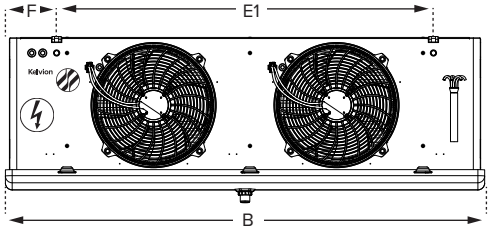
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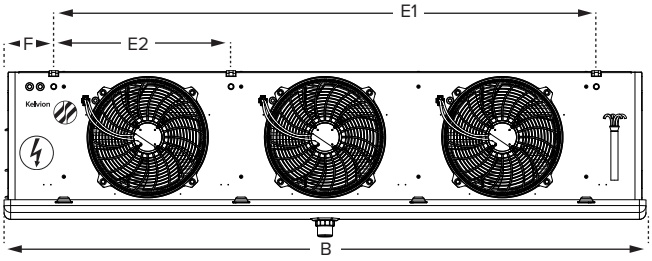
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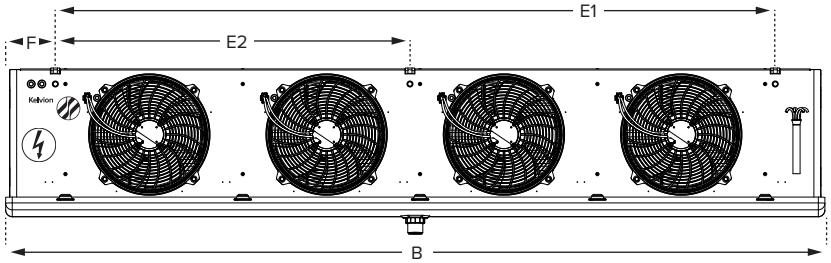


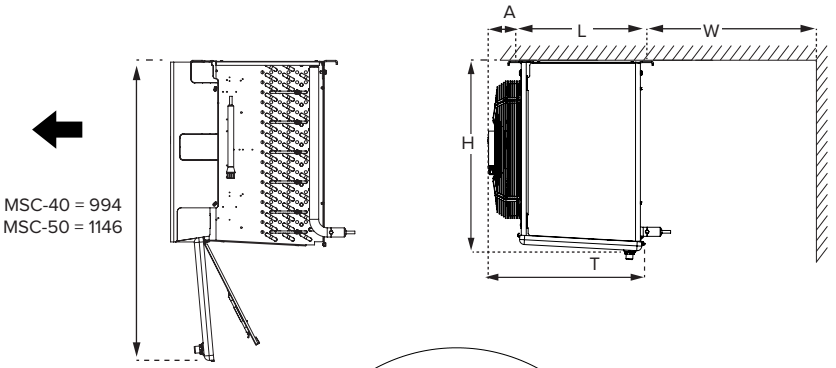



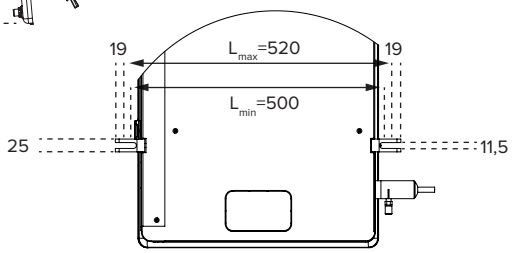



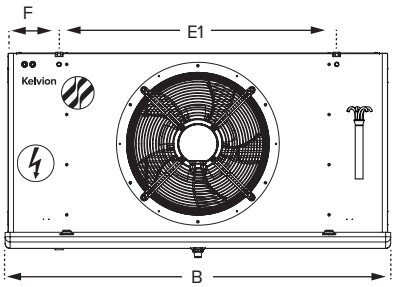



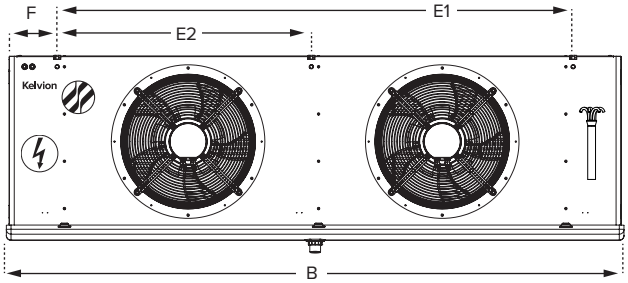

| Typ | H | B | T | L | $E1_{\pm5}$ | $E2_{\pm5}$ | $E3_{\pm5}$ | F | A | Avlopp | Vikt | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KSC | mm | mm | mm | mm | mm | mm | mm | mm | mm | G | utan förpackning [kg] | | med förpackning [kg] | |
| | | | | | | | | | | | utan avfrostare | med avfrostare | utan avfrostare | med avfrostare |
| **231-2** | 339 | 760 | 403 | 360 | 480 | - | - | 140 | 62 | G 3/4 | 9 | 11 | 13 | 15 |
| **231-3** | 339 | 760 | 403 | 360 | 480 | - | - | 140 | 62 | G 3/4 | 11 | 12 | 14 | 16 |
| **232-3** | 339 | 1 210 | 403 | 360 | 930 | - | - | 140 | 62 | G 3/4 | 17 | 20 | 22 | 24 |
| **233-3** | 339 | 1 660 | 403 | 360 | 1 380 | 450 | - | 140 | 62 | G 3/4 | 24 | 27 | 68 | 71 |
| **234-3** | 339 | 2 110 | 403 | 360 | 1 830 | 900 | - | 140 | 62 | G 3/4 | 31 | 35 | 83 | 87 |
| **301-3** | 418 | 810 | 453 | 430 | 530 | - | - | 140 | 42 | G 3/4 | 14 | 17 | 19 | 22 |
| **301-4** | 418 | 810 | 453 | 430 | 530 | - | - | 140 | 42 | G 3/4 | 16 | 18 | 21 | 23 |
| **301-6** | 418 | 810 | 453 | 430 | 530 | - | - | 140 | 42 | G 3/4 | 19 | 22 | 24 | 27 |
| **301-S** | 418 | 960 | 453 | 430 | 680 | - | - | 140 | 42 | G 3/4 | 23 | 25 | 29 | 31 |
| **302-3** | 418 | 1 310 | 453 | 430 | 1 030 | - | - | 140 | 42 | G 3/4 | 25 | 28 | 33 | 36 |
| **302-4** | 418 | 1 310 | 453 | 430 | 1 030 | - | - | 140 | 42 | G 3/4 | 28 | 31 | 36 | 39 |
| **302-6** | 418 | 1 310 | 453 | 430 | 1 030 | - | - | 140 | 42 | G 3/4 | 35 | 38 | 43 | 46 |
| **302-S** | 418 | 1 610 | 453 | 430 | 1 330 | - | - | 140 | 42 | G 3/4 | 40 | 44 | 78 | 82 |
| **303-4** | 418 | 1 810 | 453 | 430 | 1 530 | 500 | - | 140 | 42 | G 1 1/4 | 40 | 43 | 79 | 82 |
| **303-6** | 418 | 1 810 | 453 | 430 | 1 530 | 500 | - | 140 | 42 | G 1 1/4 | 50 | 54 | 89 | 93 |
| **303-S** | 418 | 2 260 | 453 | 430 | 1 980 | 650 | - | 140 | 42 | G 1 1/4 | 58 | 63 | 104 | 109 |
| **304-4** | 418 | 2 310 | 453 | 430 | 2 030 | 1 000 | - | 140 | 42 | G 1 1/4 | 51 | 55 | 97 | 101 |
| **304-6** | 418 | 2 310 | 453 | 430 | 2 030 | 1 000 | - | 140 | 42 | G 1 1/4 | 64 | 69 | 110 | 115 |
| **401-6** | 576 | 1 230 | 561 | 510 | 830 | - | - | 200 | 71 | G 3/4 " | 54 | 59 | 85 | 90 |
| **401-7** | 576 | 1 230 | 561 | 510 | 830 | - | - | 200 | 71 | G 3/4 " | 58 | 62 | 89 | 93 |
| **402-4** | 576 | 2 030 | 561 | 510 | 1 630 | - | - | 200 | 71 | G 1 1/4" | 80 | 85 | 124 | 129 |
| **402-5** | 576 | 2 030 | 561 | 510 | 1 630 | - | - | 200 | 71 | G 1 1/4" | 87 | 93 | 131 | 137 |
| **402-6** | 576 | 2 030 | 561 | 510 | 1 630 | - | - | 200 | 71 | G 1 1/4" | 94 | 102 | 138 | 146 |
| **402-7** | 576 | 2 030 | 561 | 510 | 1 630 | - | - | 200 | 71 | G 1 1/4" | 101 | 109 | 145 | 153 |
| **403-4** | 576 | 2 830 | 561 | 510 | 2 430 | 800 | - | 200 | 71 | G 1 1/4" | 113 | 120 | 196 | 203 |
| **403-5** | 576 | 2 830 | 561 | 510 | 2 430 | 800 | - | 200 | 71 | G 1 1/4" | 123 | 132 | 206 | 215 |
| **403-6** | 576 | 2 830 | 561 | 510 | 2 430 | 800 | - | 200 | 71 | G 1 1/4" | 134 | 145 | 217 | 228 |
| **404-5** | 576 | 3 630 | 561 | 510 | 3 230 | 1 600 | - | 200 | 71 | G 1 1/4" | 161 | 175 | 260 | 274 |
| **404-6** | 576 | 3 630 | 561 | 510 | 3 230 | 1 600 | - | 200 | 71 | G 1 1/4" | 177 | 192 | 276 | 291 |
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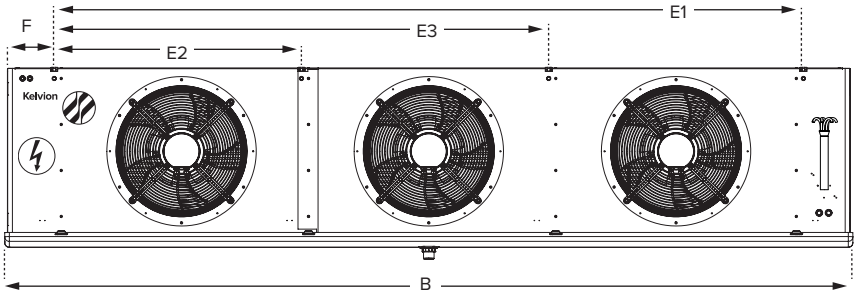
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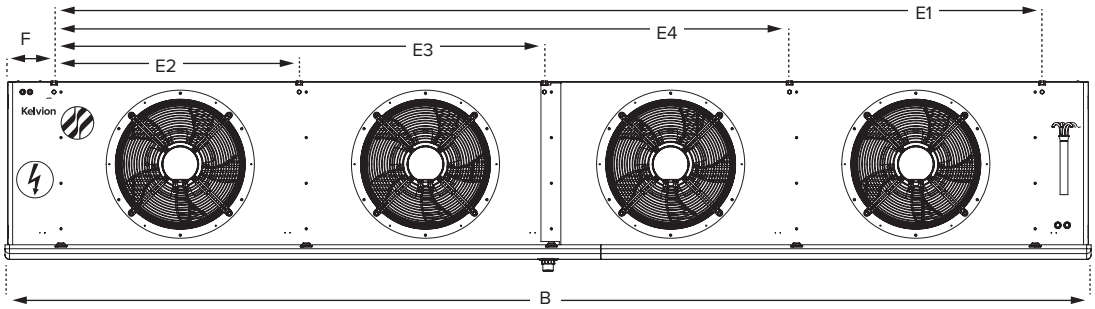


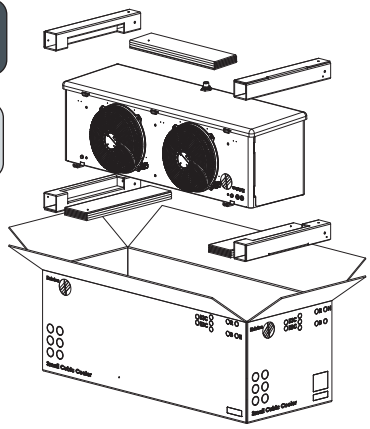

| Typ | H | B | T | L | $E1_{\pm5}$ | $E2_{\pm5}$ | $E3_{\pm5}$ | $E4_{\pm5}$ | F | A | Avlopp | Vikt | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MSC | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | G | utan förpackning [kg] | | med förpackning [kg] | |
| | | | | | | | | | | | | utan avfrostare | med avfrostare | utan avfrostare | med avfrostare |
| **401-5** | 576 | 1 330 | 590 | 510 | 930 | - | - | - | 200 | 99 | G 3/4 | 54 | 58 | 86 | 90 |
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| **501-4** | 728 | 1 430 | 590 | 510 | 1 030 | - | - | - | 200 | 99 | G 3/4 | 64 | 70 | 98 | 104 |
| **501-5** | 728 | 1 430 | 590 | 510 | 1 030 | - | - | - | 200 | 99 | G 3/4 | 70 | 76 | 104 | 110 |
| **501-6** | 728 | 1 430 | 590 | 510 | 1 030 | - | - | - | 200 | 99 | G 3/4 | 76 | 82 | 110 | 116 |
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| **504-4** | 728 | 4 430 | 590 | 510 | 4 030 | 1 000 | 2 000 | 3 000 | 200 | 99 | G 1 1/4 | 212 | 231 | 329 | 348 |
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# Kelvion

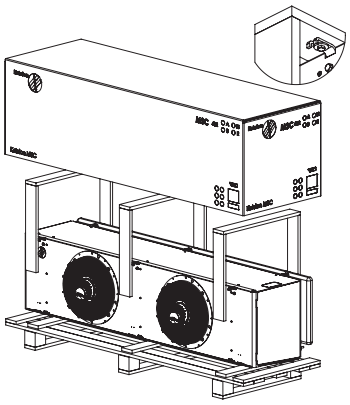
## MONTERING

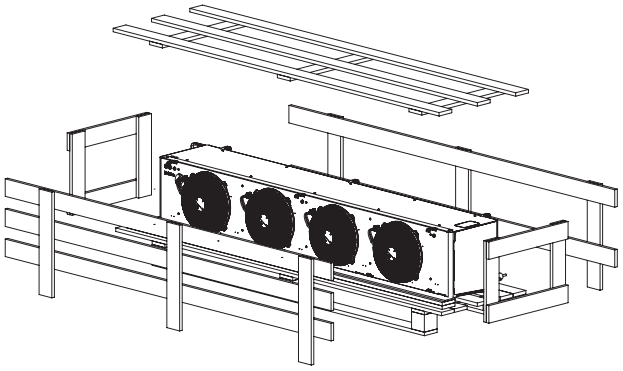
**1**

**1.1**

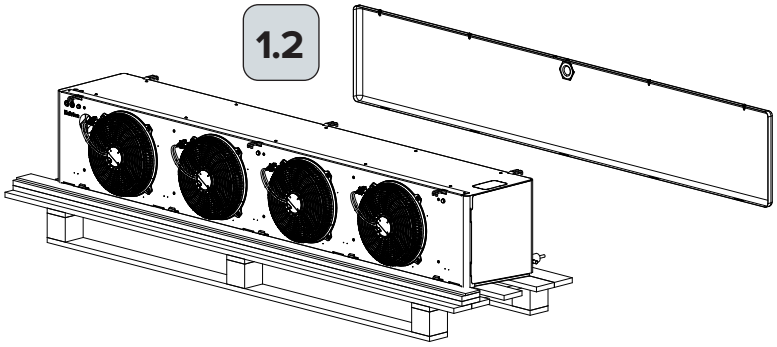


| | | | |
|---|---|---|---|
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| KSC/KBC 232 | KSC/KBC 303 | KSC/KBC 234 | MSC 503 |
| KSC/KBC 301 | KSC/KBC 303-S | KSC 403 | MSC 504 |
| KSC/KBC 301-S | KSC/KBC 304 | KSC 404 | |
| KSC/KBC 302 | KSC 401 | MSC 402 | |
| | KSC 402 | MSC 403 | |
| | MSC 401 | MSC 404 | |
| | MSC 501 | | |

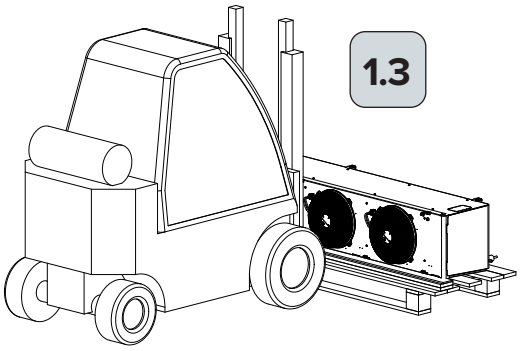




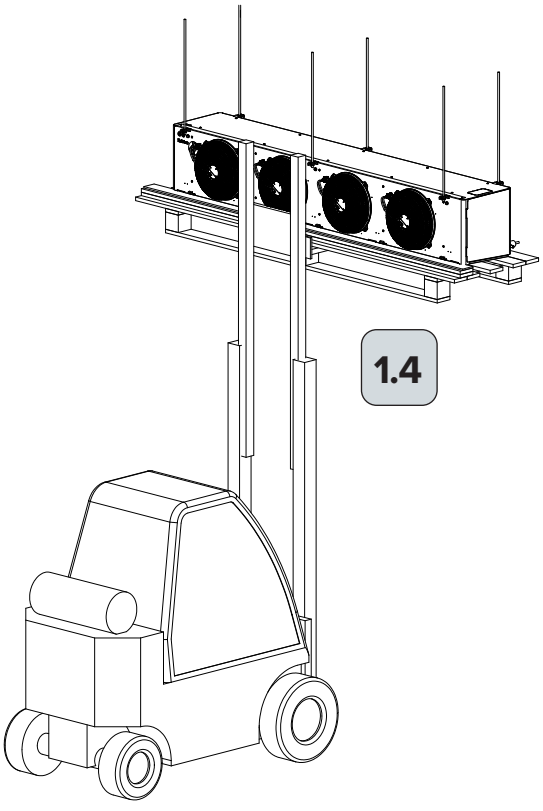
**1.2**



**1.3**

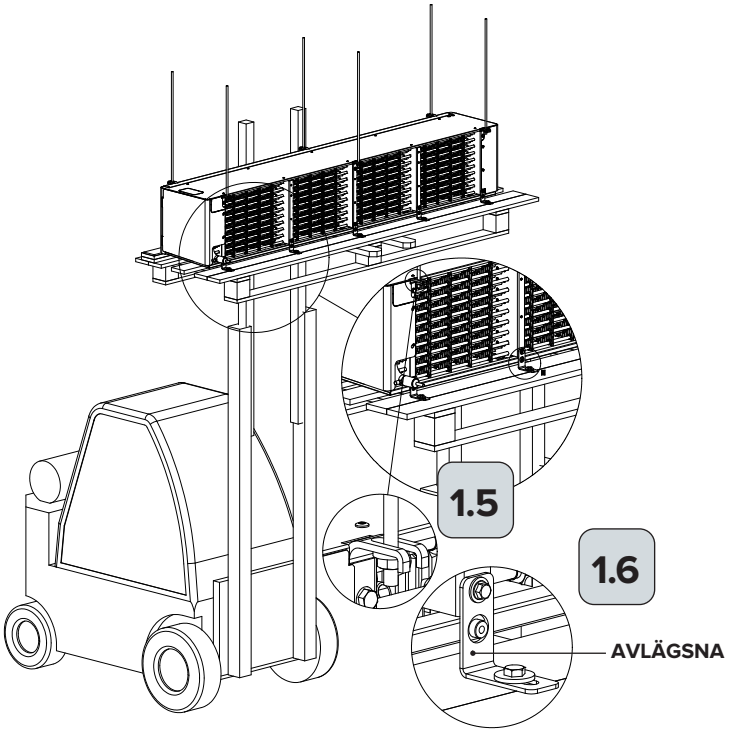


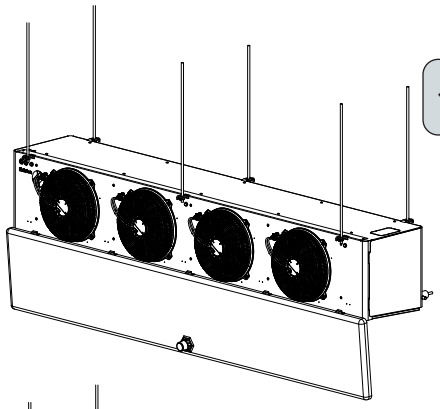
**1.4**

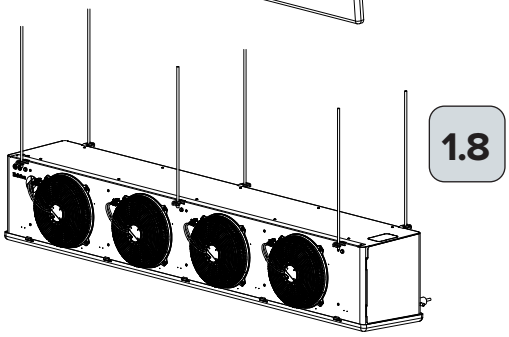


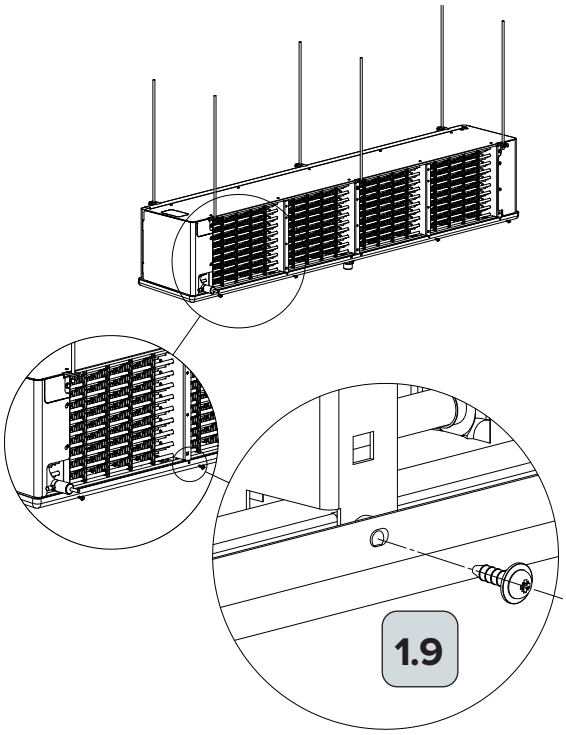
**1.5**

**1.6**

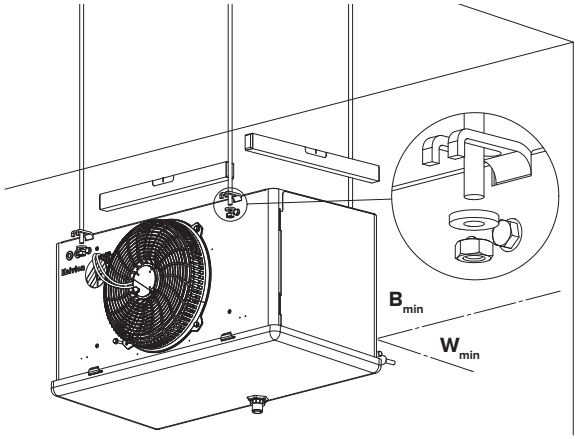




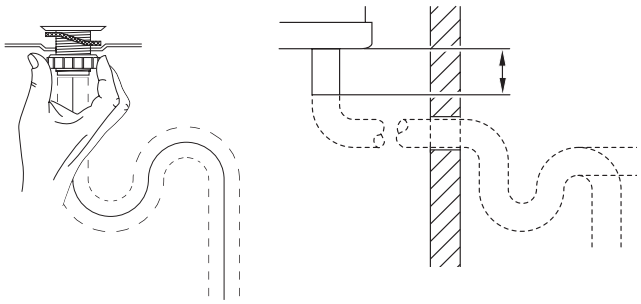




2




3

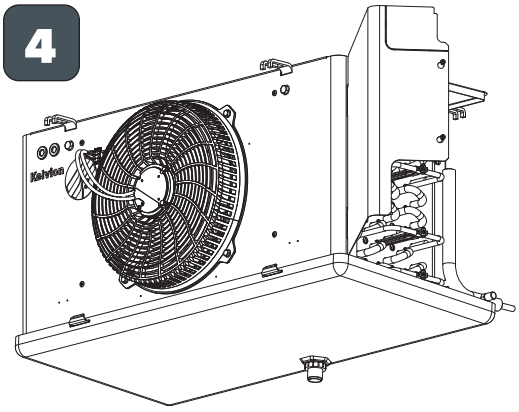


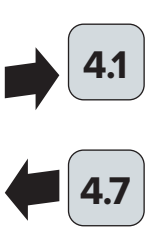
| Typ | $B_{min}$ utan el. avfrostare | $B_{min}$ med el. avfrostare | $W_{min}$ | W rekommenderad |
|---|---|---|---|---|
| KSC / MSC | mm | mm | mm | mm |
| **KSC 231** | 320 | 645 | 200 | 304 |
| **KSC 232** | 320 | 1 095 | 200 | 304 |
| **KSC 233** | 320 | 1 520 | 200 | 304 |
| **KSC 234** | 320 | 1 970 | 200 | 304 |
| **KSC 301** | 390 | 680 | 200 | 380 |
| **KSC 301-S** | 390 | 830 | 200 | 380 |
| **KSC 302** | 390 | 1180 | 200 | 380 |
| **KSC 302-S** | 390 | 1 480 | 200 | 380 |
| **KSC 303** | 390 | 1730 | 200 | 380 |
| **KSC 303-S** | 390 | 2 180 | 200 | 380 |
| **KSC 304** | 390 | 2 230 | 200 | 380 |
| **KSC 401** | 470 | 1 050 | 400 | 532 |
| **KSC 402** | 470 | 1 850 | 400 | 532 |
| **KSC 403** | 470 | 2 650 | 400 | 532 |
| **KSC 404** | 470 | 3 450 | 400 | 532 |
| **MSC 401** | 470 | 1150 | 400 | 532 |
| **MSC 402** | 470 | 2 050 | 400 | 532 |
| **MSC 403** | 470 | 2 950 | 400 | 532 |
| **MSC 404** | 470 | 3 850 | 400 | 532 |
| **MSC 501** | 470 | 1 250 | 500 | 684 |
| **MSC 502** | 470 | 2 250 | 500 | 684 |
| **MSC 503** | 470 | 3 250 | 500 | 684 |
| **MSC 504** | 470 | 4 250 | 500 | 684 |

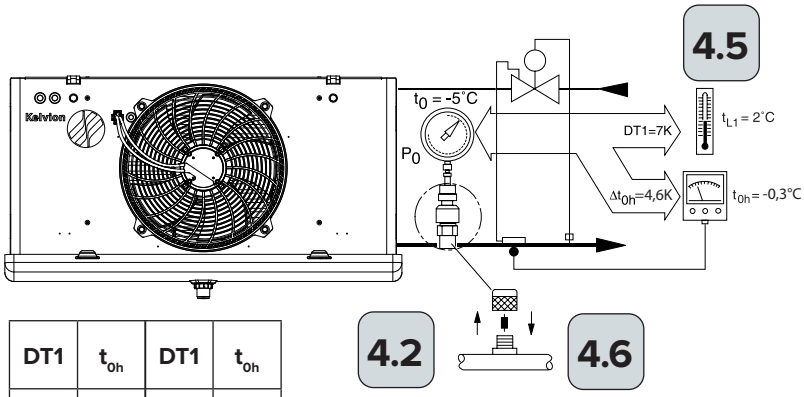
| Typ | Avlopp |
|---|---|
| KSC / MSC | G |
| **KSC 231** | G 3/4 |
| **KSC 232** | G 3/4 |
| **KSC 233** | G 3/4 |
| **KSC 234** | G 3/4 |
| **KSC 301** | G 3/4 |
| **KSC 301-S** | G 3/4 |
| **KSC 302** | G 3/4 |
| **KSC 302-S** | G 3/4 |
| **KSC 303** | G 1 1/4 |
| **KSC 303-S** | G 1 1/4 |
| **KSC 304** | G 1 1/4 |
| **KSC 401** | G 3/4 |
| **KSC 402** | G 1 1/4 |
| **KSC 403** | G 1 1/4 |
| **KSC 404** | G 1 1/4 |
| **MSC 401** | G 3/4 |
| **MSC 402** | G 1 1/4 |
| **MSC 403** | G 1 1/4 |
| **MSC 404** | G 1 1/4 |
| **MSC 501** | G 3/4 " |
| **MSC 502** | G 1 1/4" |
| **MSC 503** | G 1 1/4" |
| **MSC 504** | G 1 1/4" |

# Kelvion

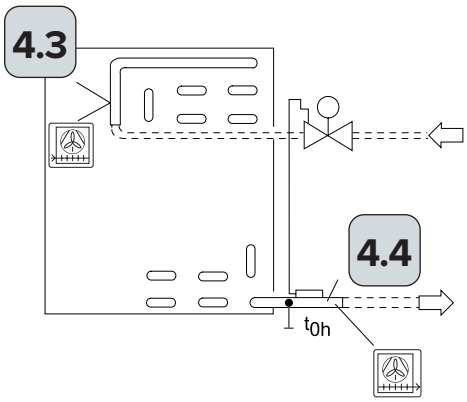
## MONTERING



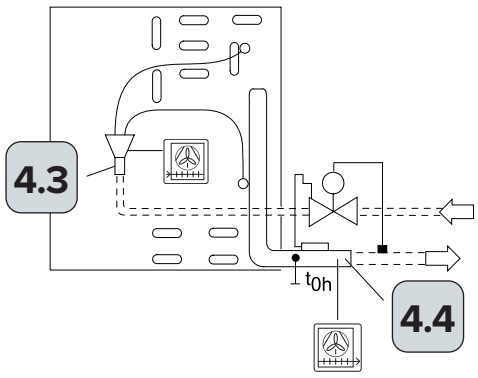




| DT1 | $t_{0h}$ | DT1 | $t_{0h}$ |
|---|---|---|---|
| [K] | [K] | [K] | [K] |
| 10 | 6,5 | 6 | 3,9 |
| 9 | 5,9 | 5 | 3,3 |
| 8 | 5,2 | 4 | 2,6 |
| 7 | 4,6 | | |



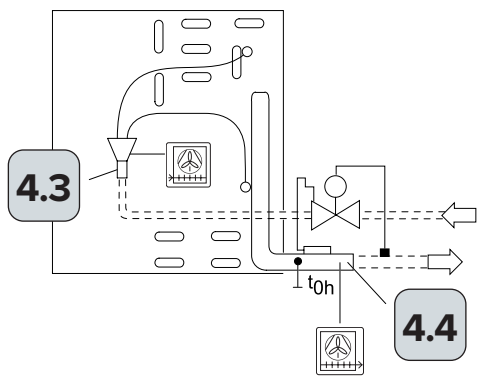

| Typ | | |
|---|---|---|
| KSC | ø mm | ø mm |
| **231-2** | 10 | 12 |
| **231-3** | 10 | 12 |
| **232-3** | 10 | 22 |
| **301-3R** | 10 | 22 |
| **301-3B** | 10 | 12 |
| **301-4** | 10 | 22 |




| Typ | | |
|---|---|---|
| KSC | ø mm | ø mm |
| **KSC-233-3R** | 15 | 28 |
| **KSC-233-3B** | 12 | 28 |
| **KSC-234-3** | 15 | 28 |
| **KSC-301-6** | 12 | 22 |
| **KSC-301-S** | 12 | 22 |
| **KSC-302-3** | 15 | 28 |
| **KSC-302-4** | 15 | 28 |
| **KSC-302-6** | 15 | 28 |
| **KSC-302-S** | 15 | 28 |

| Typ | | |
|---|---|---|
| KSC | ø mm | ø mm |
| **KSC-303-4** | 15 | 28 |
| **KSC-303-6** | 22 | 35 |
| **KSC-303-S** | 22 | 35 |
| **KSC-304-4** | 22 | 35 |
| **KSC-304-6** | 22 | 35 |
| **KSC-401-6** | 15 | 28 |
| **KSC-401-7** | 15 | 28 |
| KSC-402-4 | 22 | 35 |
| KSC-402-5 | 22 | 35 |

| Typ | | |
|---|---|---|
| KSC | ø mm | ø mm |
| KSC-402-6 | 22 | 35 |
| KSC-402-7 | 22 | 35 |
| KSC-403-4 | 22 | 42 |
| KSC-403-5 | 22 | 42 |
| KSC-403-6 | 22 | 42 |
| KSC-404-5 | 28 | 54 |
| KSC-404-6 | 28 | 54 |
| KSC-404-7 | 28 | 54 |

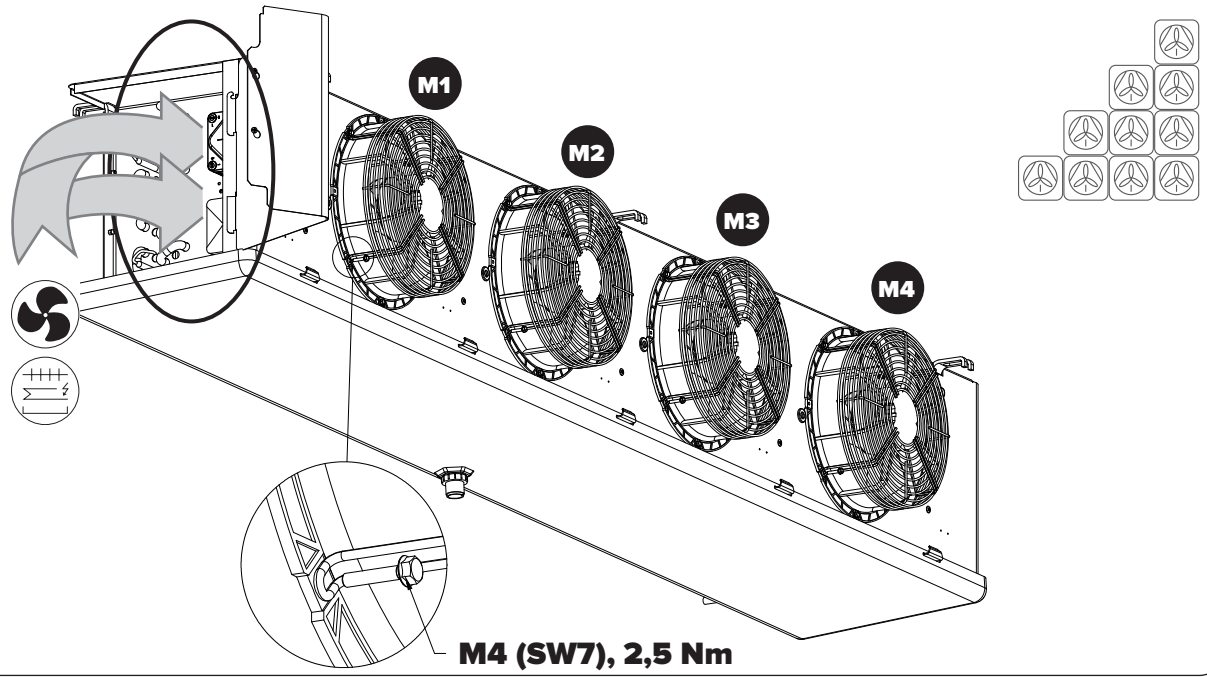



| Typ | | |
|---|---|---|
| MSC | ø mm | ø mm |
| **MSC-401-5** | 22 | 35 |
| **MSC-401-6** | 22 | 35 |
| **MSC-401-7** | 22 | 35 |
| **MSC-402-4** | 22 | 35 |
| **MSC-402-6** | 22 | 42 |
| **MSC-402-7** | 22 | 42 |
| **MSC-403-6** | 28 | 42 |
| **MSC-404-5** | 28 | 54 |
| **MSC-501-4** | 22 | 35 |

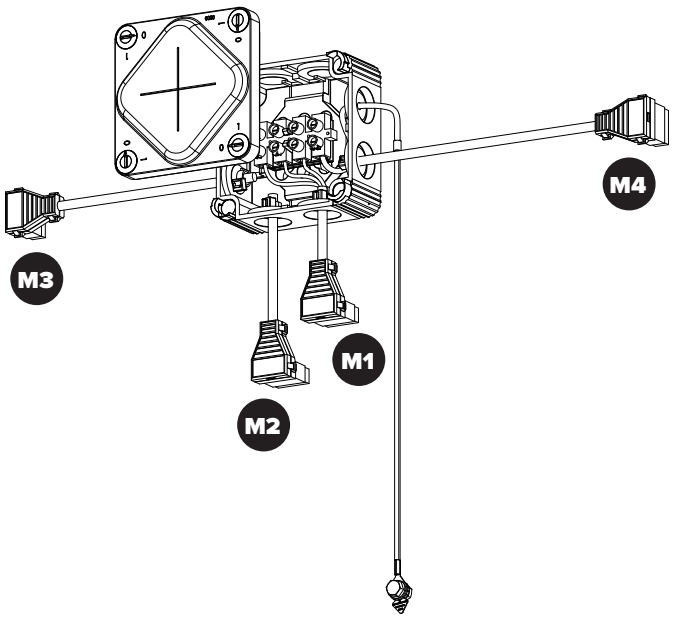
| Typ | | |
|---|---|---|
| MSC | ø mm | ø mm |
| **MSC-501-5** | 22 | 35 |
| **MSC-501-6** | 22 | 35 |
| **MSC-502-4** | 22 | 42 |
| **MSC-502-6** | 28 | 54 |
| **MSC-503-4** | 28 | 54 |
| **MSC-503-5** | 28 | 54 |
| **MSC-503-6** | 28 | 54 |
| MSC-504-4 | 2x22 | 2x42 |
| MSC-504-5 | 2x22 | 2x42 |

# ELSYSTEM

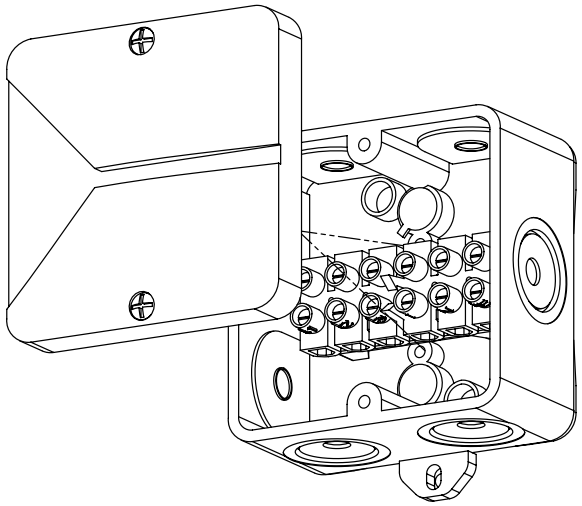
## KSC 23




## MOTOR



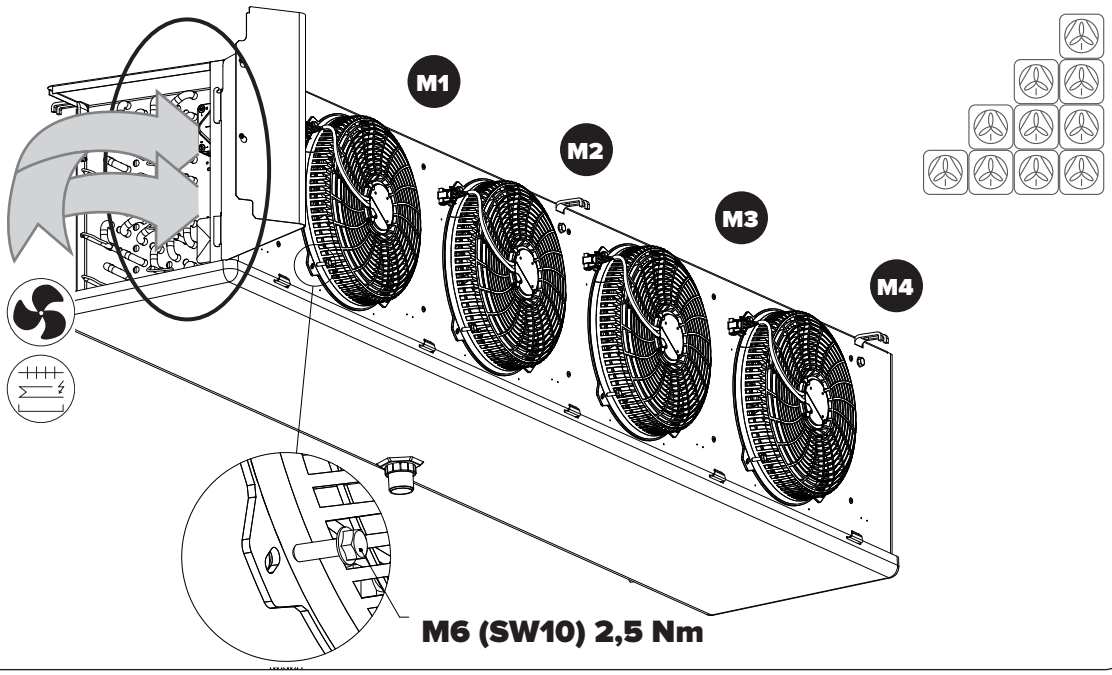

## ELEKTRISK AVFROSTARE



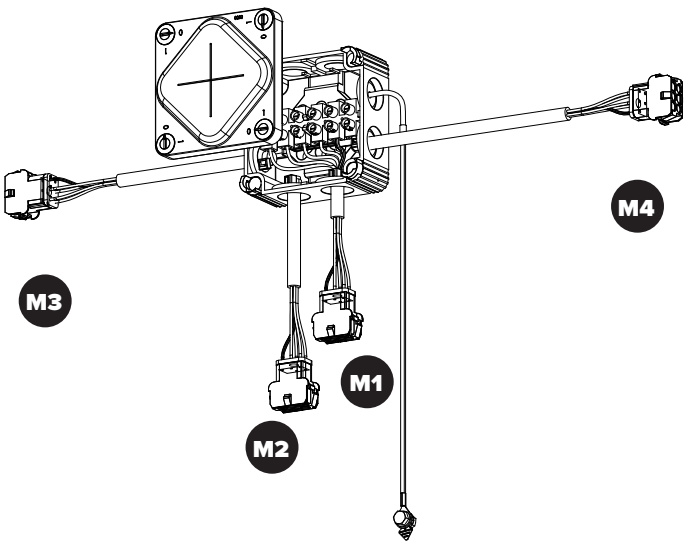
# Kelvion

## ELSYSTEM

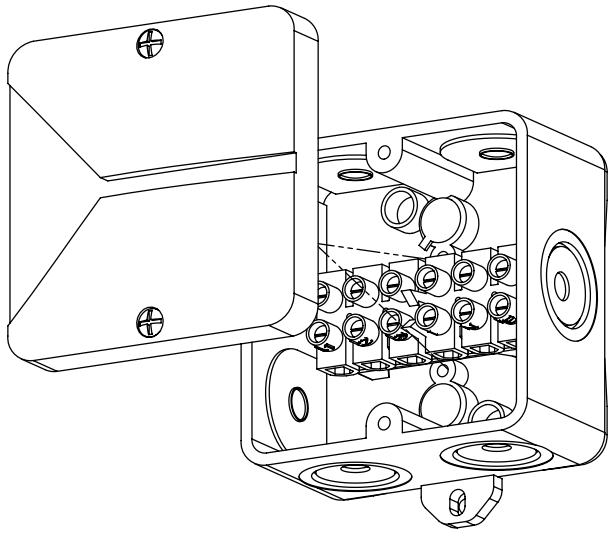
### KSC 30




## MOTOR

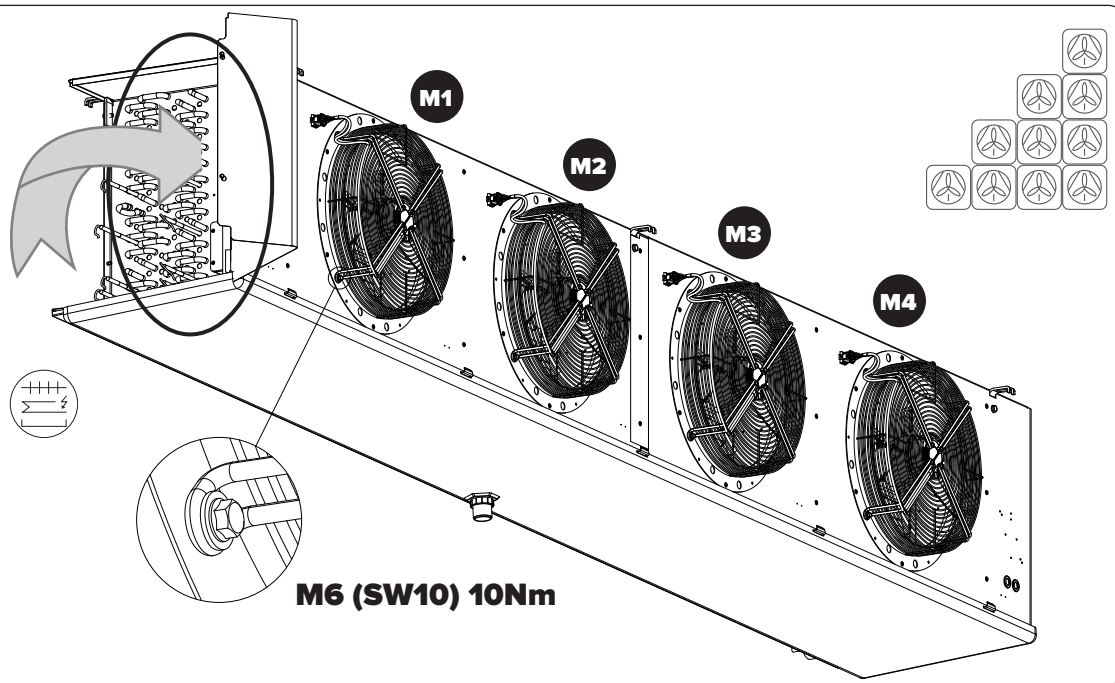



## ELEKTRISK AVFROSTARE

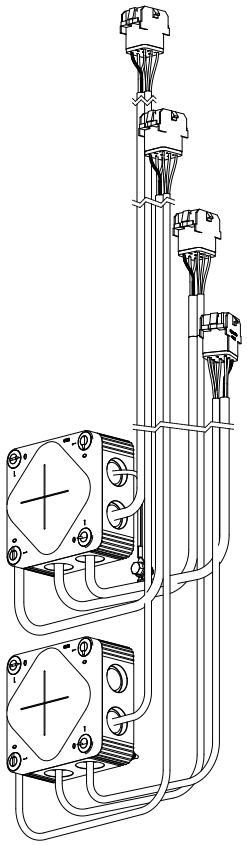


# ELSYSTEM

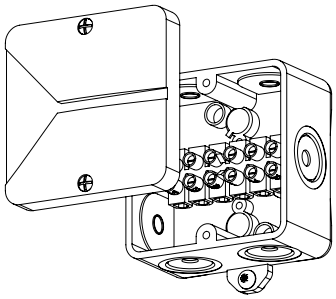
## KSC 40



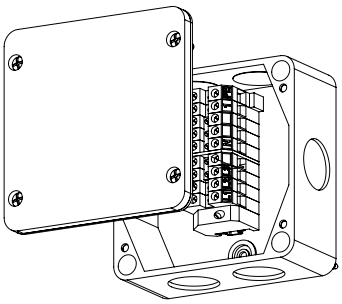

## MOTOR



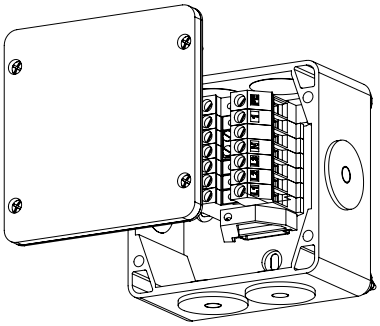
## ELEKTRISK AVFROSTARE



ABOX025



WK060

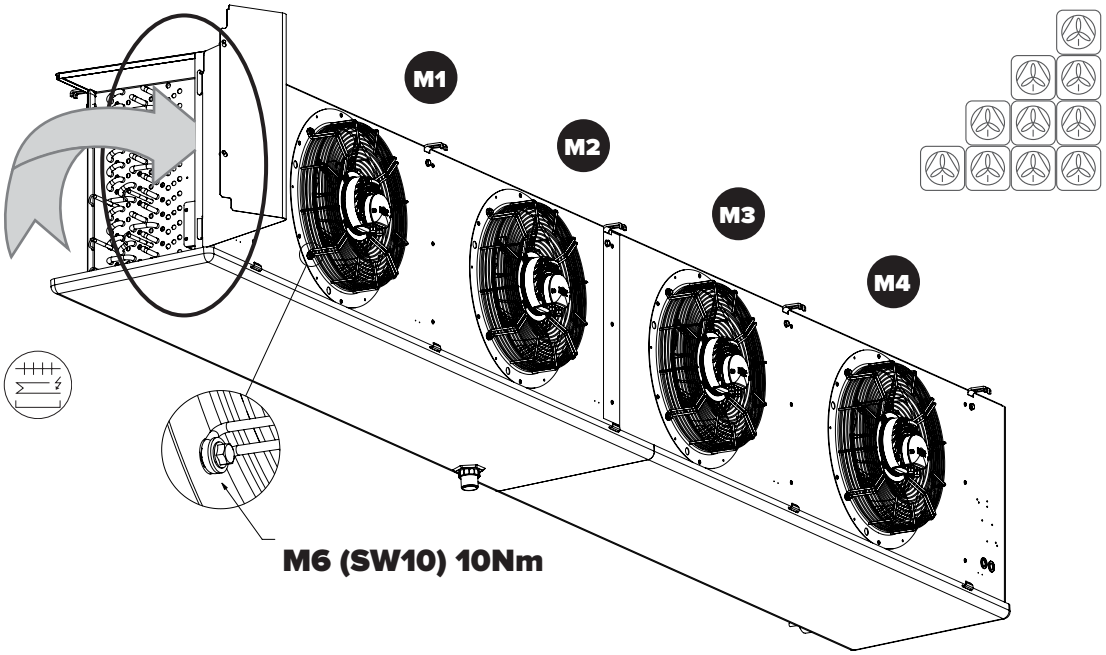


WK100

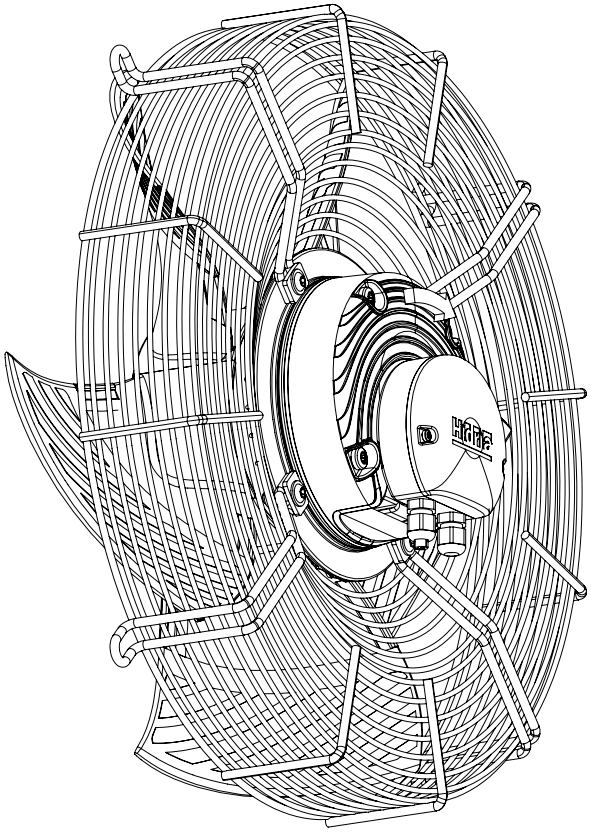
# Kelvion

## ELSYSTEM

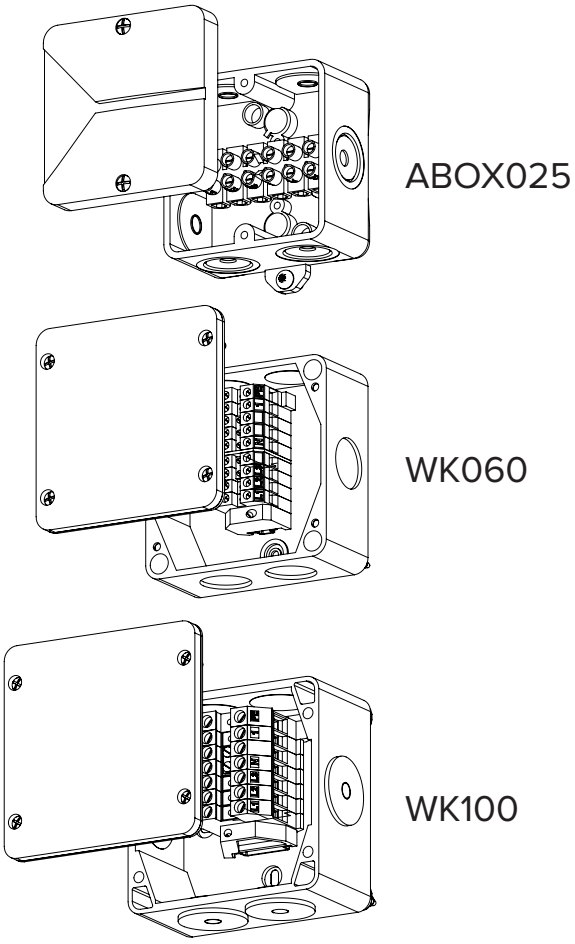
### MSC 40




## MOTOR

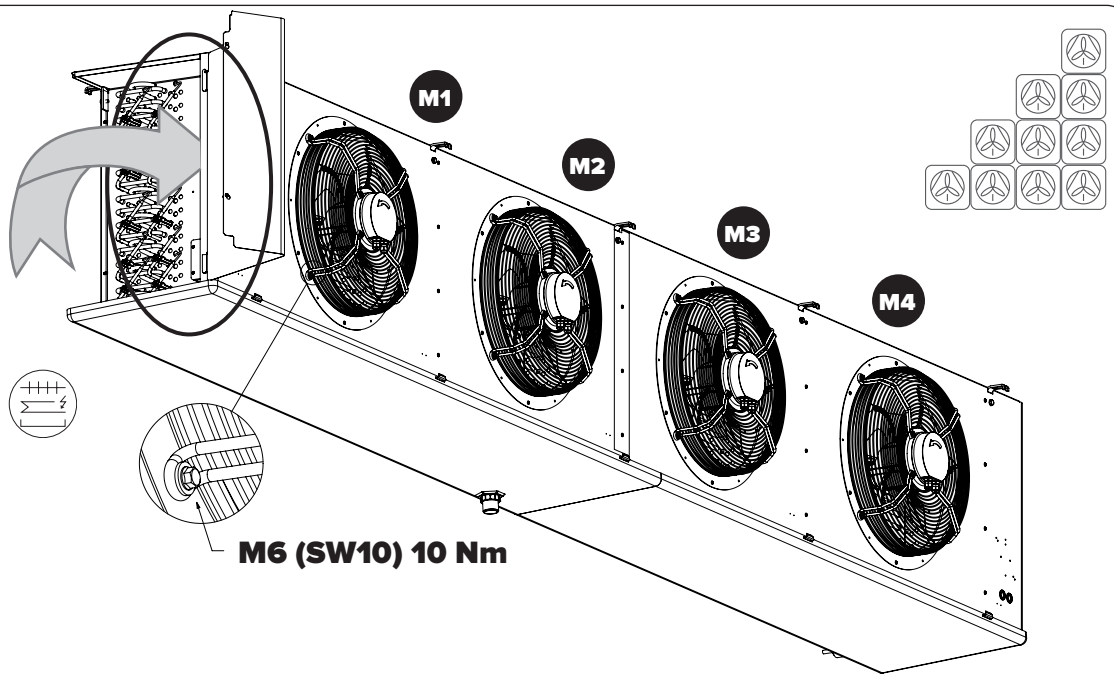


## ELEKTRISK AVFROSTARE

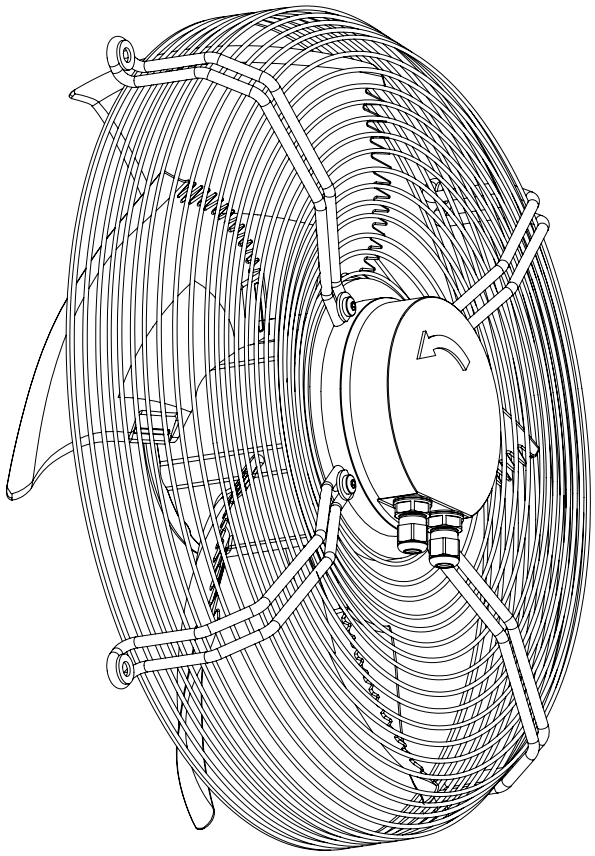


# ELSYSTEM

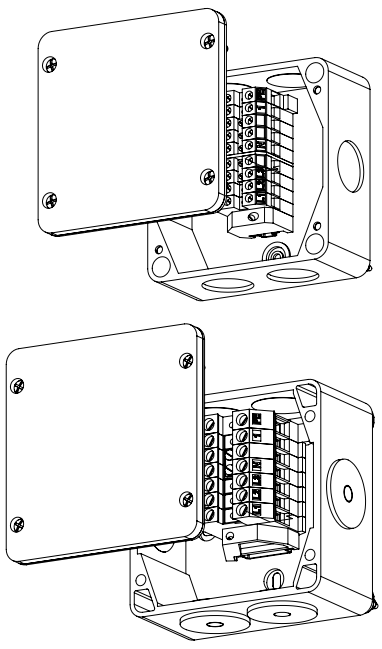
## MSC 50

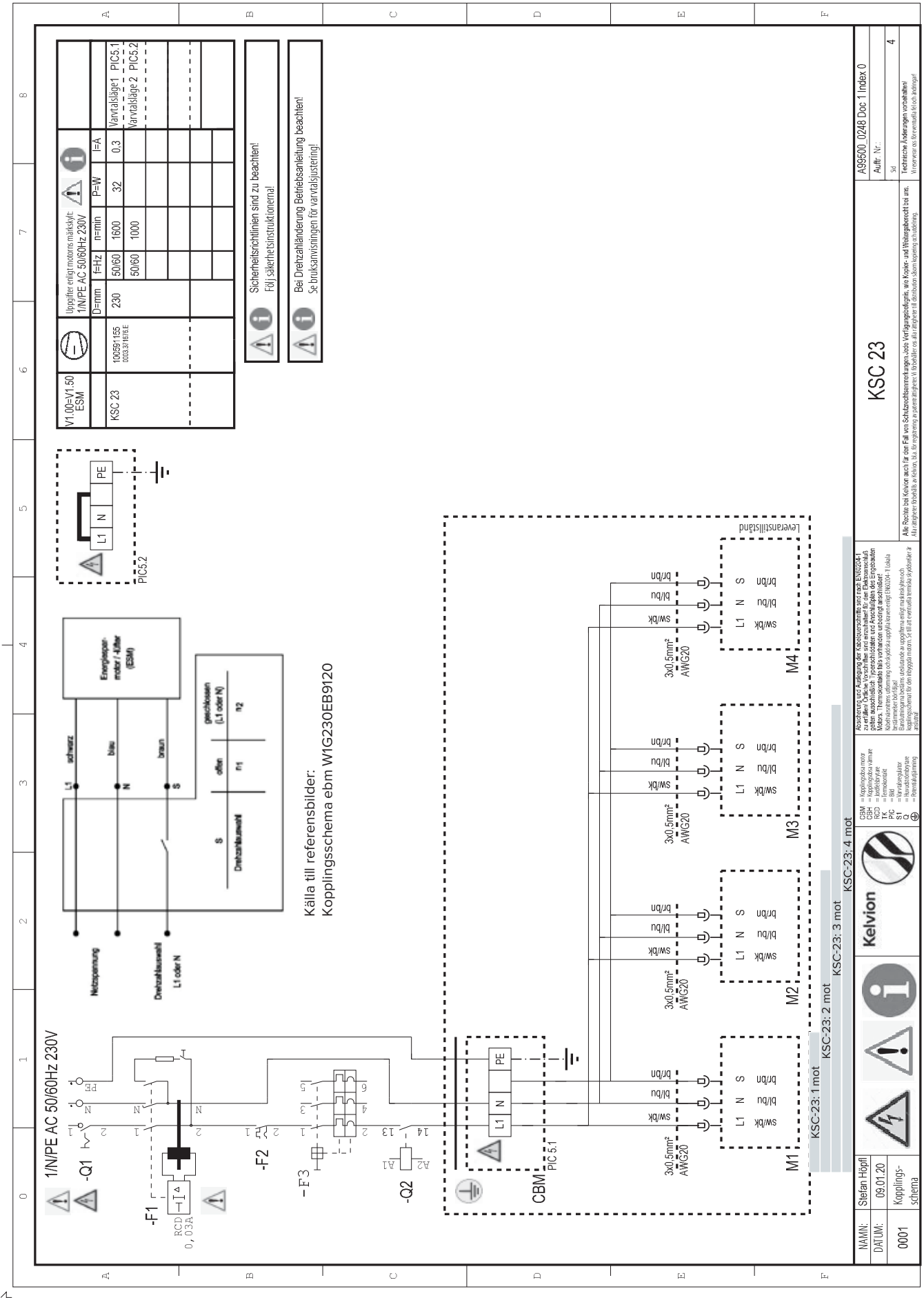



## MOTOR



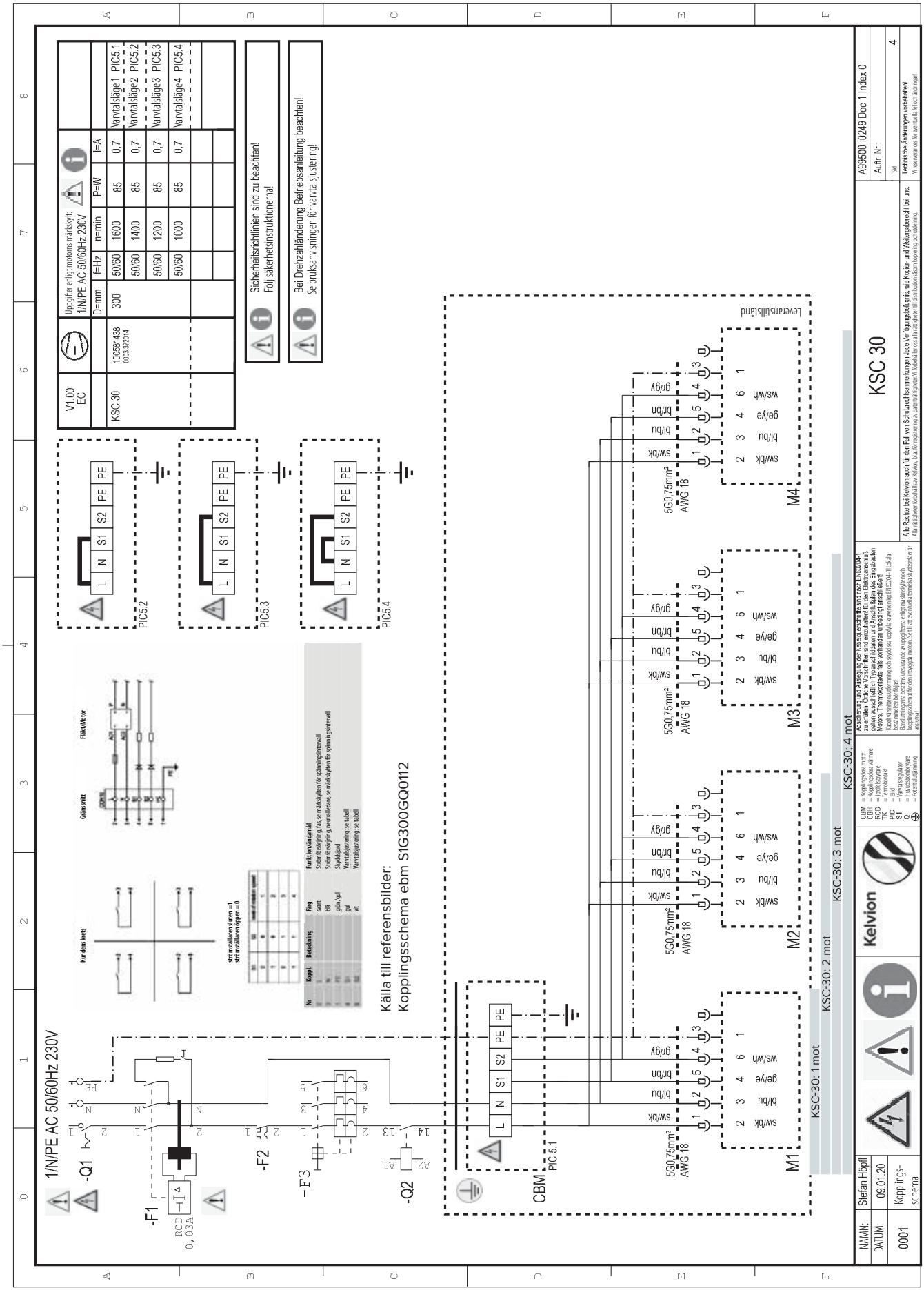
## ELEKTRISK AVFROSTARE

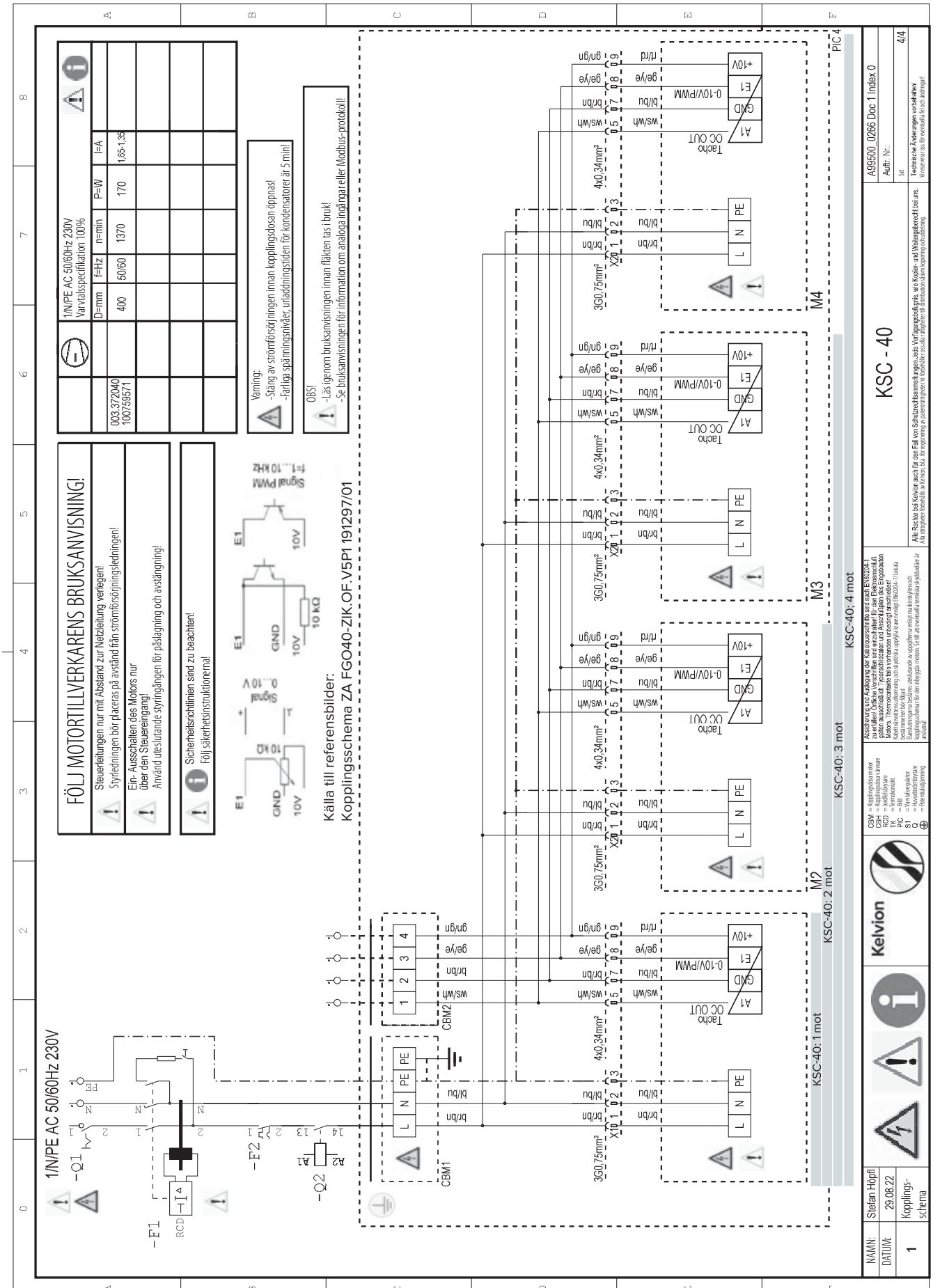


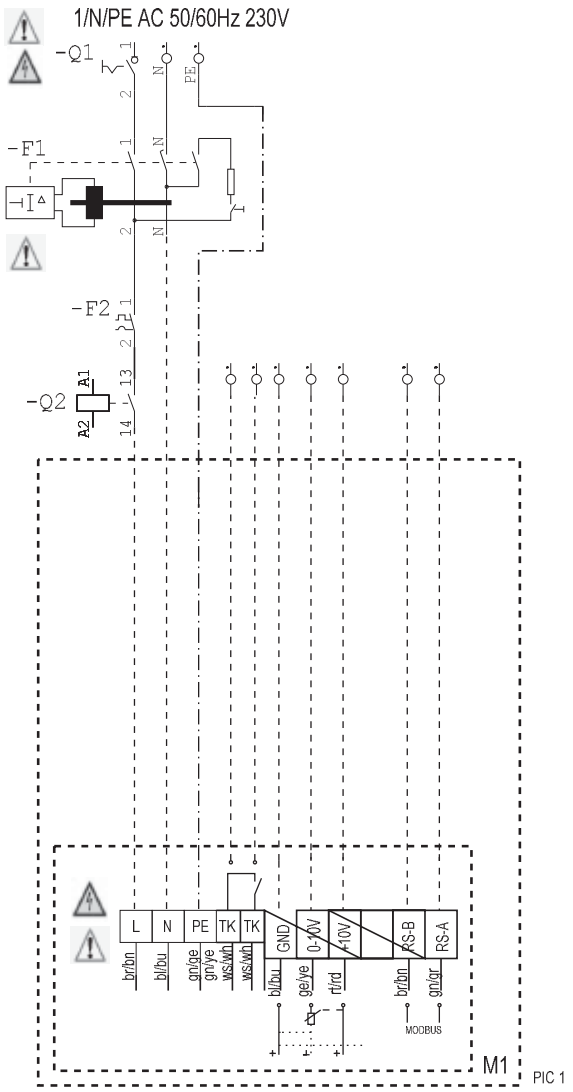

1/N/PE AC 50/60Hz 230V
-Q1
-F1
RCD 0,03A
-F2
-F3
-Q2
CBM
PIC 5.1
PIC5.2
L1 N PE
Nätspänning
Drehzahlauswahl
L1 oder N
Energiespar-motor (-lüfter (ESM)
schwarz
blau
braun
offen
geschlossen (L1 oder N)
Drehzahlauswahl
n1
n2
Källa till referensbilder:
Kopplingsschema ebm W1G230EB9120
M1
M2
M3
M4
3x0,5mm² AWG20
sw/bk
bl/bu
br/bn
KSC-23: 1 mot
KSC-23: 2 mot
KSC-23: 3 mot
KSC-23: 4 mot
Leveranstillstånd
V1.00=V1.50 ESM
KSC 23
100591155
D=mm
f=Hz
n=min
P=W
I=A
230
50/60
1600
32
0,3
Varvtalsläge1 PIC5.1
Varvtalsläge 2 PIC5.2
Uppgifter enligt motorns märkskylt: 1/N/PE AC 50/60Hz 230V
Sicherheitsrichtlinien sind zu beachten!
Följ säkerhetsinstruktionerna!
Bei Drehzahländerung Betriebsanleitung Beachten!
Se bruksanvisningen för varvtalsjustering!
KSC 23
A99500_0248 Doc 1 Index 0
Auftr. Nr.:
Std
4
Technische Änderungen vorbehalten!
Vi reserverar oss för tekniska ändringar!
Alle Rechte bei Kelvion auch für den Fall von Schutzrechtsanmeldungen. Jedes Verfügungsbefugnis, wie Kopier- und Weitergaberecht bei uns.
Alla rättigheter tillhörande av oss, t.ex. för kopiering av patent anmälningar. Vi förbehåller oss all rätt gäller vid tillämpning av tillhörande skydd.
NAMN: Stefan Höpfl
DATUM: 09.01.20
0001
Kopplings-schema
Kelvion
CBM = Kopplingsdosa motor
CBH = Kopplingsdosa värmare
RCD = Jordfelsbrytare
TK = Termokontakt
PIC = Rätt
S1 = Varvtalsregulator
Q = Värmeskyddsbrytare
= Skyddsledare
Anordnande av kabelanslutning enligt EN50274 Anordnande av kabelanslutning enligt EN50274 Anordnande av kabelanslutning enligt EN50274 

MOTOR

# KSC 30


1/N/PE AC 50/60Hz 230V
-Q1
-F1
-F2
-F3
-Q2
CBM
PIC 5.1
Källa till referensbilder:
Kopplingsschema ebm S1G300GQ0112
Kundens krets
Grönsnitt
Fläkt/Motor
strömställaren sluten = 1
strömställaren öppen = 0
Nr
Koppl.
Beteckning
Färg
Funktion/ändamål
svart
blå
grön/gul
gul
vit
Stömförsörjning fas, se märkskylten för spänningsintervall
Stömförsörjning neutralledare, se märkskylten för spänningsintervall
Skyddsjord
Varvtalsjustering: se tabell
Varvtalsjustering: se tabell
L
N
S1
S2
PE
PIC5.2
PIC5.3
PIC5.4
V1.00
EC
KSC 30
190581438
0003.372014
Uppgifter enligt motorns märkskylt:
1/N/PE AC 50/60Hz 230V
D=mm
f=Hz
n=min
P=W
I=A
300
50/60
1600
85
0,7
Varvtalsläge1 PIC5.1
50/60
1400
85
0,7
Varvtalsläge2 PIC5.2
50/60
1200
85
0,7
Varvtalsläge3 PIC5.3
50/60
1000
85
0,7
Varvtalsläge4 PIC5.4
Sicherheitsrichtlinien sind zu beachten!
Följ säkerhetsinstruktionerna!
Bei Drehzahländerung Betriebsanleitung beachten!
Se bruksanvisningen för varvtalsjustering!
5G0,75mm²
AWG 18
sw/bk
bl/bu
ge/ye
br/bn
ws/wh
gr/gy
M1
M2
M3
M4
KSC-30: 1 mot
KSC-30: 2 mot
KSC-30: 3 mot
KSC-30: 4 mot
Leveranstillstånd
KSC 30
Kelvion
A99500_0249 Doc 1 Index 0
Auftr. Nr.:
Stk
4
Alle Rechte bei Kelvion arch für den Fall von Schutzrechtsanmeldungen. Jede Verfügungsbefugnis, wie Kopier- und Weitergaberecht bei uns.
Alla rättigheter tillhör Kelvion. Vid ev. registrering av patenträttigheter vi förbehåller oss alla rättigheter till förfogande och kopiering och utlämning.
Technische Änderungen vorbehalten!
Tekniska ändringar förbehålles!
NAMN:
Stefan Höpfl
DATUM:
09.01.20
0001
Kopplings-
schema


1/N/PE AC 50/60Hz 230V
Varvtalsspecifikation 100%
D=mm
f=Hz
n=min
P=W
I=A
003.3720/40
100759571
400
50/60
1370
170
1.65-1.35
FÖLJ MOTORTILLVERKARENS BRUKSANVISNING!
Steuerleitungen nur mit Abstand zur Netzleitung verlegen!
Styrledningen bör placeras på avstånd från strömförsörjningsledningen!
Ein- Ausschalten des Motors nur über den Steuereingang!
Använd uteslutande styringången för påslagning och avstängning!
Sicherheitsrichtlinien sind zu beachten!
Följ säkerhetsinstruktionerna!
Varning:
-Stäng av strömförsörjningen innan kopplingsdosan öppnas!
-Farliga spänningsnivåer, urladdningstiden för kondensatorer är 5 min!
OBS!
-Läs igenom bruksanvisningen innan fläkten tas i bruk!
-Se bruksanvisningen för information om analoga ingångar eller Modbus-protokoll!
Källa till referensbilder:
Kopplingsschema ZA FGO40-ZIK.OF.V5P1 191297/01
1/N/PE AC 50/60Hz 230V
-Q1
-F1
RCD
-F2
-Q2
CBM1
CBM2
KSC-40: 1 mot
KSC-40: 2 mot
KSC-40: 3 mot
KSC-40: 4 mot
M2
M3
M4
KSC - 40
Kelvion
A99500_0266 Doc 1 Index 0
Auftr. Nr.:
Sd
4/4
NAMN:
Stefan Höpfl
DATUM:
29.08.22
1
Kopplings-schema




PIC 1

## FÖLJ MOTORTILLVERKARENS BRUKSANVISNING!

Steuerleitungen nur mit Abstand zur Netzleitung verlegen!
Styrledningen bör placeras på avstånd från strömförsörjningsledningen!

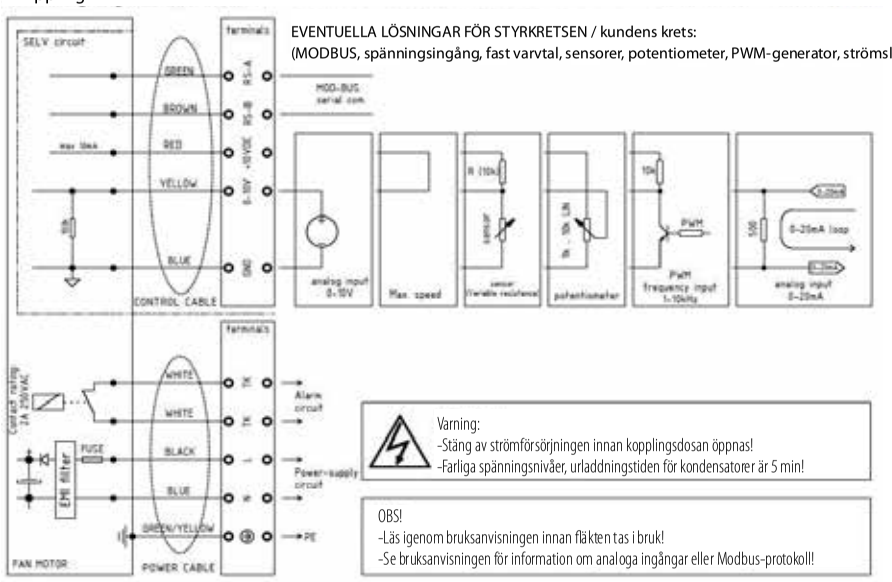
Ein- Ausschalten des Motors nur über den Steuereingang!
Använd uteslutande styringången för påslagning och avstängning!

Sicherheitsrichtlinien sind zu beachten!
Följ säkerhetsinstruktionerna!

| | | 1/N/PE AC 50/60Hz 230V Varvtalsspecifikation 100% | | | | | |
|---|---|---|---|---|---|---|---|
| | | D=mm | f=Hz | n=min | P=W | I=A | |
| 0003.3720411 100759572 | | 400 | 50 60 | 1520 | 320 | 2,15 | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Kopplingsschema 0302-0-0006

KONFIDENTIELL




EVENTUELLA LÖSNINGAR FÖR STYRKRETSEN / kundens krets:
(MODBUS, spänningsingång, fast varvtal, sensorer, potentiometer, PWM-generator, strömslinga...)

Varning:
-Stäng av strömförsörjningen innan kopplingsdosan öppnas!
-Farliga spänningsnivåer, urladdningstiden för kondensatorer är 5 min!

OBS!
-Läs igenom bruksanvisningen innan fläkten tas i bruk!
-Se bruksanvisningen för information om analoga ingångar eller Modbus-protokoll!

VIKTIGT:
Enheten är endast avsedd för inbyggnad som komponent och får inte användas i några andra sammanhang.
Använd aldrig på-/urkoppling av strömmatningen för att ändra enhetens driftläge – använd endast styrsignalen!
På-/urkoppling av strömmatningen kan medföra överström!

Källa till referensbilder:
Kopplingsschema Hidria 0310-4-0071_0302-0-0006

| | |
|---|---|
| NAMN: | Stefan Höpfl |
| DATUM: | 11.05.22 |
| | Kopplings-schema |

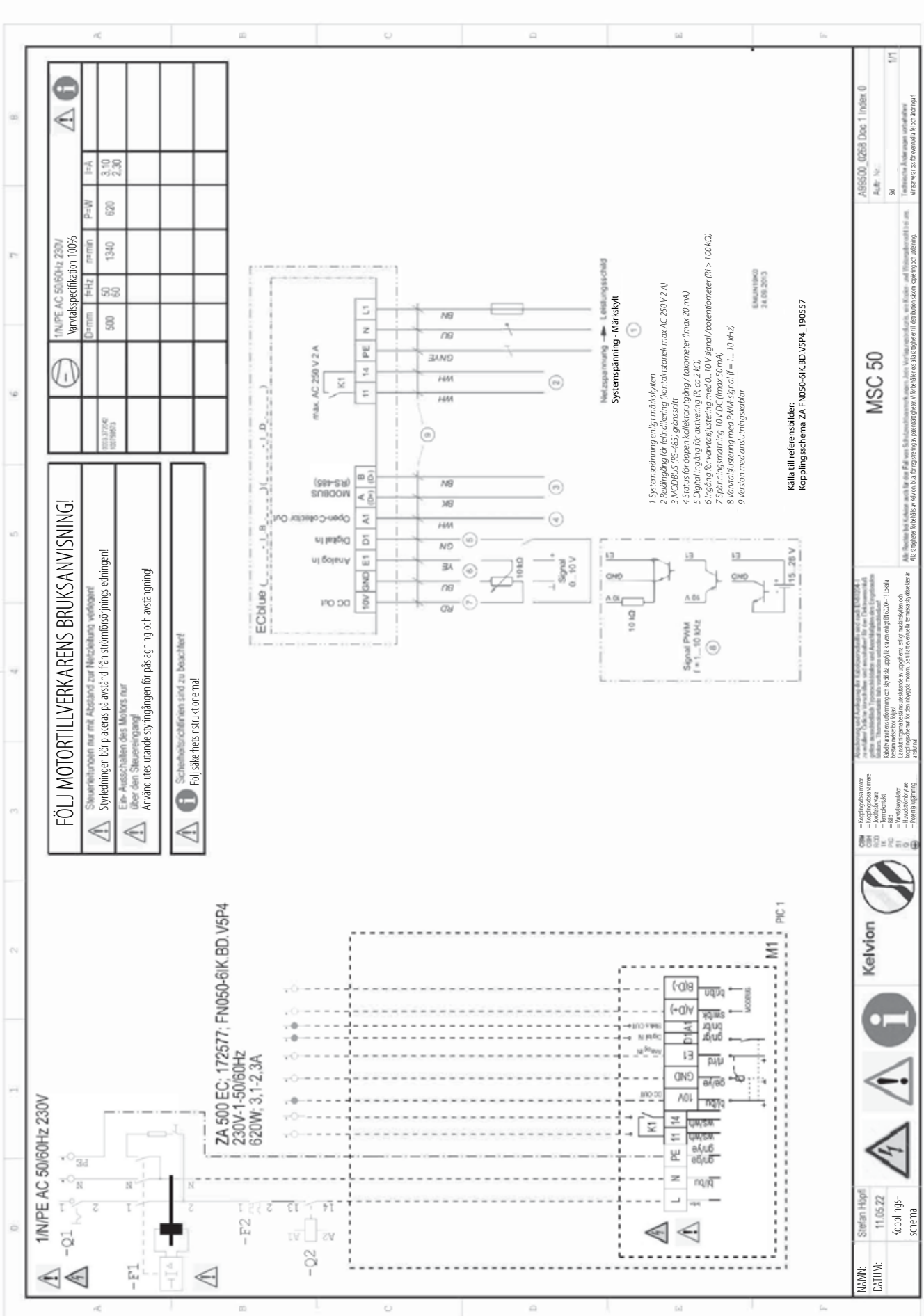
CBM Kopplingsdosa motor
CBH Kopplingsdosa värmare
RCB Jordfelsbrytare
TK = Termokontakt
PIC = Bild
S1 = Varvtalsregulator
Q = Huvudströmbrytare
= Potentialutjämning

Absicherung und Auslegung der Kabelquerschnitte sind nach EN60204-1 zu erfüllen! Örtliche Vorschriften sind einzuhalten! für den Elektroanschluß gelten ausschließlich Typenschilddaten und Anschlußplan des eingebauten Motors. Thermokontakte falls vorhanden unbedingt anschließen!
Kabeltvärsnitters utformning och skyddsåtgärder ska uppfylla kraven enligt EN60204-1 Lokala bestämmelser bör följas!
Dimensioneringarna bestäms uteslutande av uppgifterna enligt maskinskylten och kopplingsschemat för den inbyggda motorn. Se till att eventuella termiska skyddsenheter är anslutna!

MSC 40

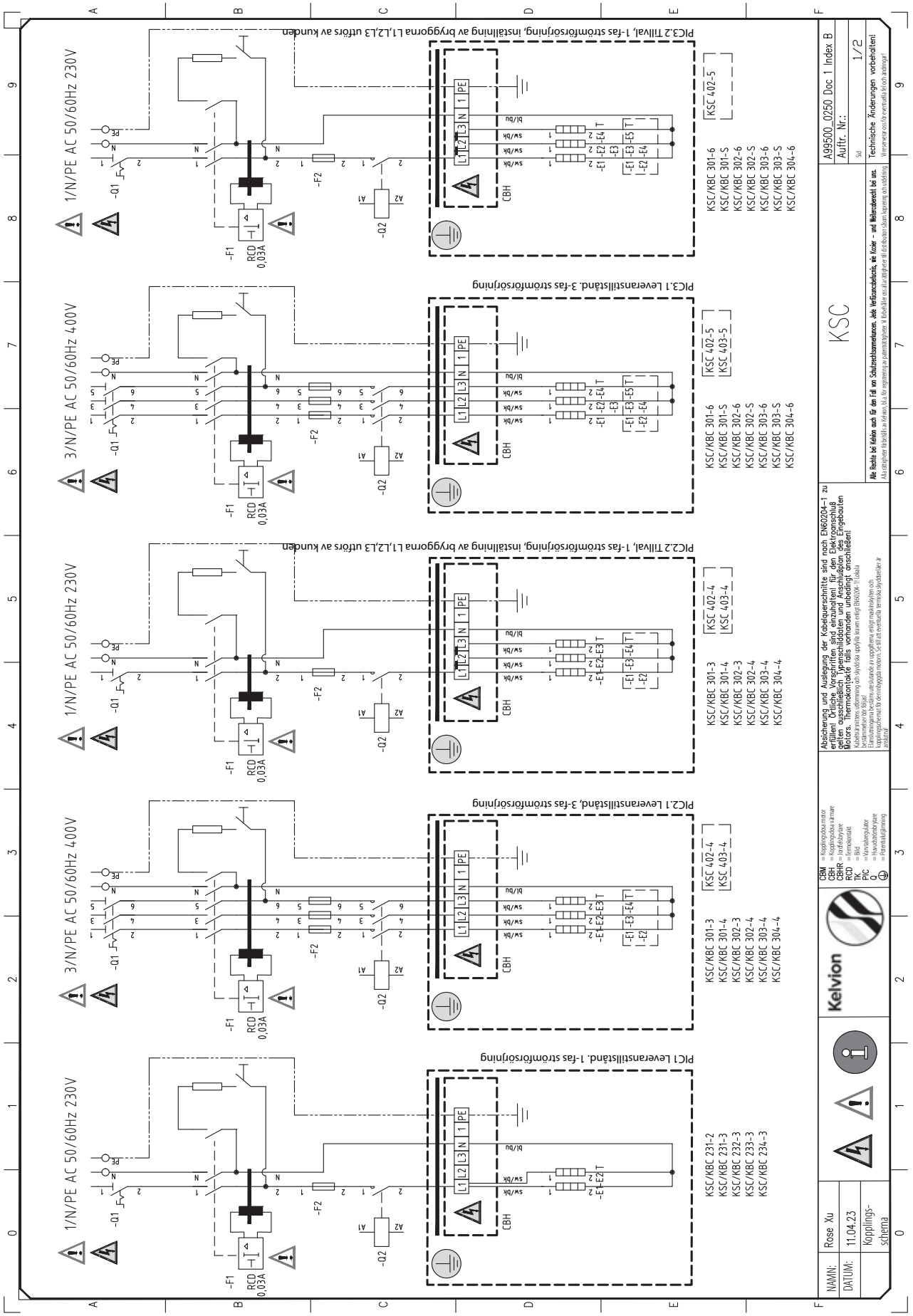
Alle Rechte bei Kelvion auch für den Fall von Schutzrechtsanmerkungen. Jede Verfügungsbefugnis, wie Kopier- und Weitergaberecht bei uns. Alla rättigheter förbehålls av Kelvion, bl.a. för registrering av patenträttigheter. Vi förbehåller oss alla rättigheter till distributionssätt som kopiering och utdelning.

A99500_0267 Doc 1 Index 0
Auftr. Nr.:
Sid 1/1
Technische Änderungen vorbehalten!
Vi reserverar oss för eventuella fel och ändringar!


1/N/PE AC 50/60Hz 230V
ZA 500 EC; 172577; FN050-6IK.BD.V5P4
230V-1-50/60Hz
620W; 3,1-2,3A
FÖLJ MOTORTILLVERKARENS BRUKSANVISNING!
Stelan Höpf
11.05.22
Kopplings-schema
MSC 50
Kelvion
Källa till referensbilder:
Kopplingsschema ZA FN050-6IK.BD.V5P4_190557
Systemspänning - Märkskylt
Netzspannung - Leistungsschild
1 Systemspänning enligt märkskylten
2 Reläingång för felindikering (kontaktstorlek max AC 250 V 2 A)
3 MODBUS (RS-485) gränssnitt
4 Status för öppen kollektorutgång / takometer (Imax 20 mA)
5 Digital ingång för aktivering (Ri ca 2 kΩ)
6 Ingång för varvtalsjustering med 0...10 V signal / potentiometer (Ri > 100 kΩ)
7 Spänningsmatning 10 V DC (Imax 50 mA)
8 Varvtalsjustering med PWM-signal (f = 1... 10 kHz)
9 Version med anslutningskablar
M1
PIC 1

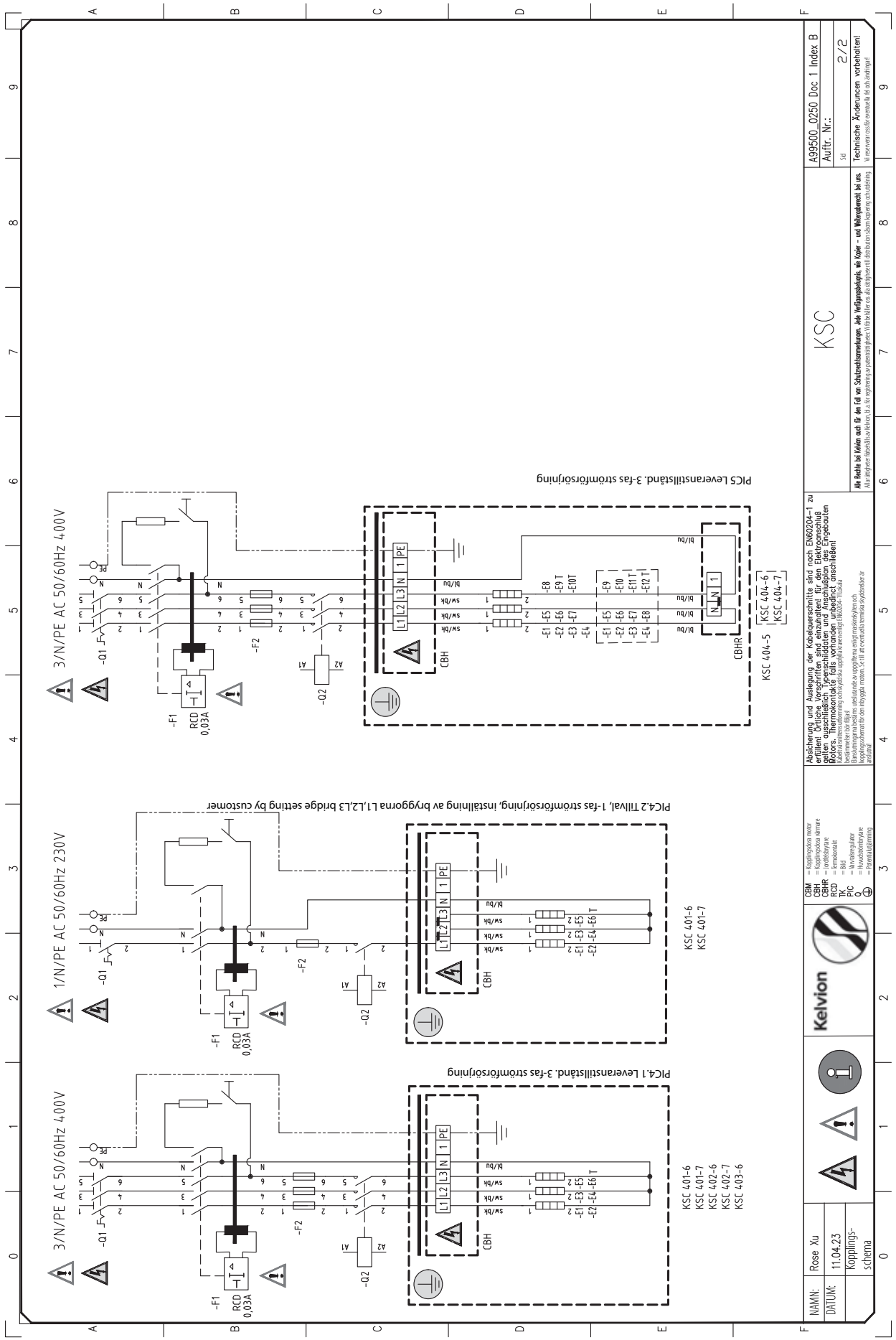
# ELEKTRISK AVFROSTARE

KSC



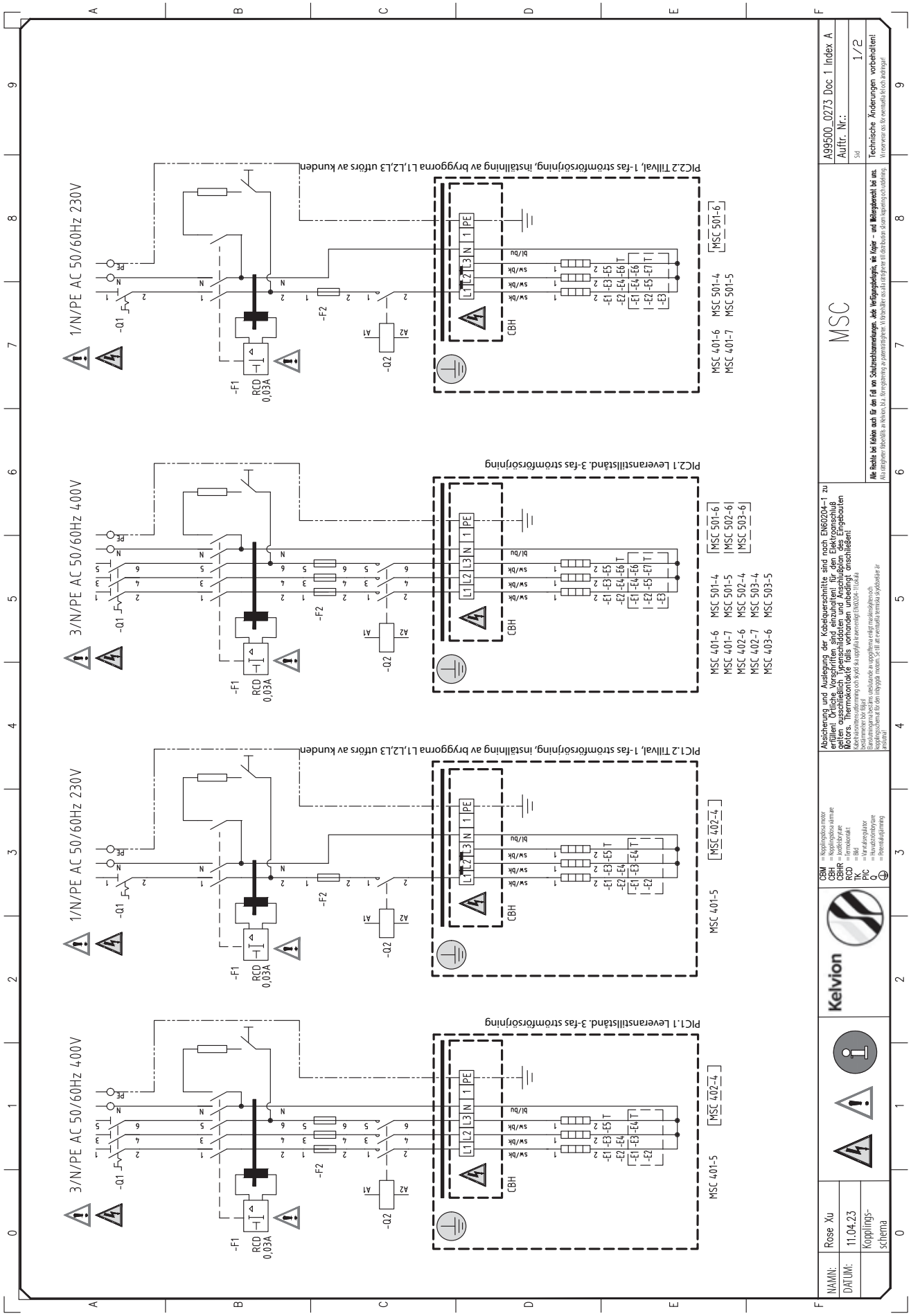
# ELEKTRISK AVFROSTARE

KSC



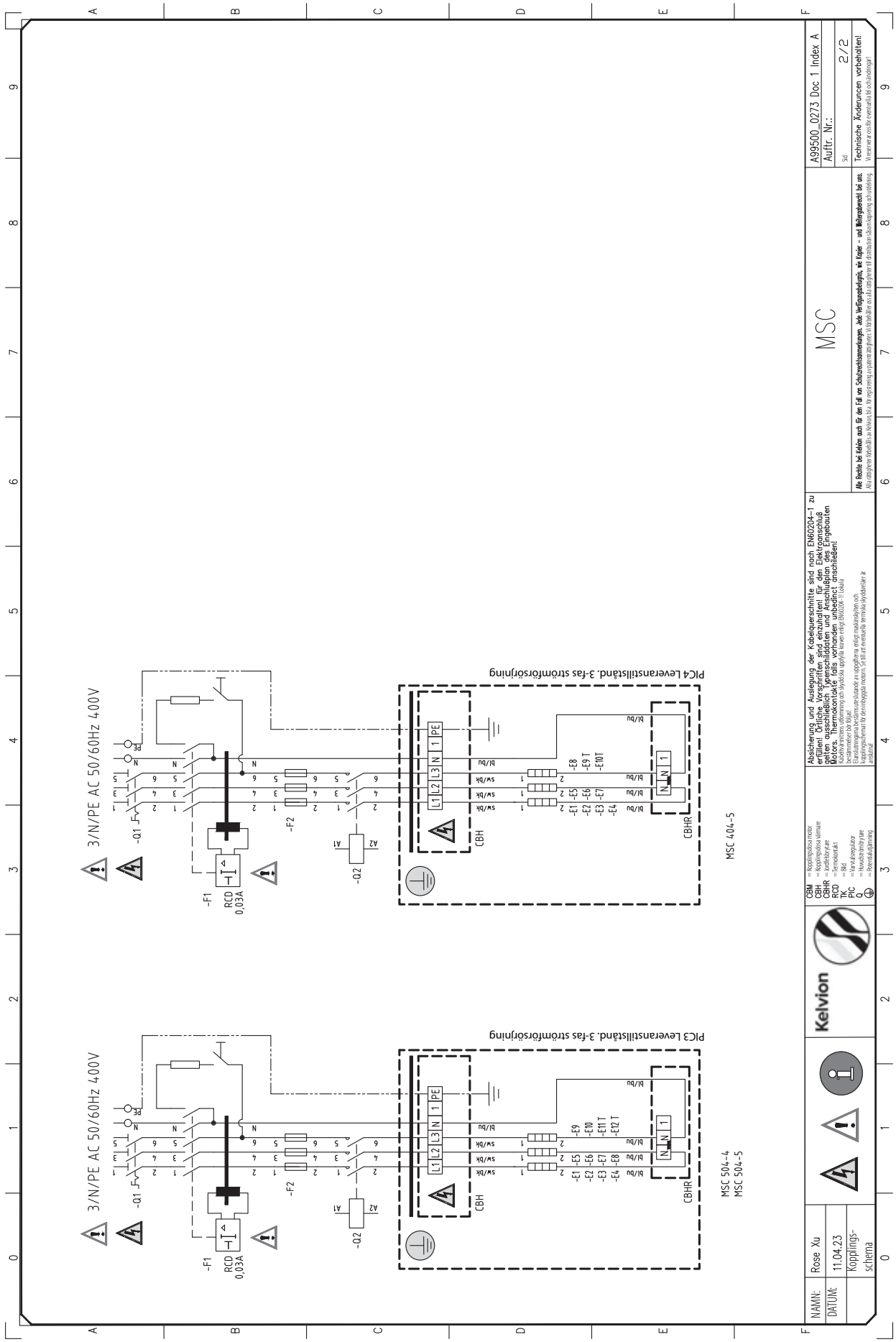
# ELEKTRISK AVFROSTARE

MSC



# ELEKTRISK AVFROSTARE

MSC



# Kelvion

## KABELSYSTEM

## KSC 23, 30, 40

**Standard/serie**

**Kopplingsschema nr: A99500_0250** (Doc 2; Index B)

| Typ | | Värmeslinga | | | | Droppträg värmare | | | | | | | | L1 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KSC | Slingans Längd | Antal | Längd | Effekt | Form | Antal | Längd | Effekt | Form | Antalet värme-kretsar | Värme-kretsar Nb | PIC Bild på kopplings-schemat | PIC Bild på kopplings-schemat | Värmes-linga | Droppträg värmare T | Droppträg värmare T ( R ) | Värmes-linga | Drop vär |
| Typ | L [ mm ] | Slinga | L [ mm ] | P [ W ] | | Droppträg | L [ mm ] | P [ W ] | | | [ Nb ] | | | Slinga [st] | T [st] | T(R) [st] | Slinga [st] | T |
| KSC | Slingans Längd | | | | | | | | | | | | | | | | | |
| 231-2 | 450 | 1 | 1350 | 480 | U152 | 1 | 1350 | 480 | U150 | 1 | CBH1 | 1 | | 1 | 1 T | | | |
| 231-3 | 450 | 1 | 1350 | 480 | U152 | 1 | 1350 | 480 | U150 | 1 | CBH1 | 1 | | 1 | 1 T | | | |
| 232-3 | 900 | 1 | 2250 | 860 | U152 | 1 | 2250 | 860 | U150 | 1 | CBH1 | 1 | | 1 | 1 T | | | |
| 233-3 | 1350 | 1 | 3100 | 1145 | U152 | 1 | 3100 | 1145 | U150 | 1 | CBH1 | 1 | | 1 | 1 T | | | |
| 234-3 | 1800 | 1 | 4000 | 1490 | U152 | 1 | 4000 | 1490 | U150 | 1 | CBH1 | 1 | | 1 | 1 T | | | |
| 301-3 | 500 | 2 | 1500 | 535 | U228 | 1 | 1500 | 535 | U200 | 1 | CBH1 | 2.1 | 2.2 | 1 | | | 1 | |
| 301-4 | 500 | 2 | 1500 | 535 | U190 | 1 | 1500 | 535 | U200 | 1 | CBH1 | 2.1 | 2.2 | 1 | | | 1 | |
| 301-6 | 500 | 3 | 1500 | 535 | U132 | 1 | 1500 | 535 | U200 | 1 | CBH1 | 3.1 | 3.2 | 1 | | | 2 | |
| 301-S | 650 | 3 | 1700 | 615 | U99 | 1 | 1700 | 615 | U200 | 1 | CBH1 | 3.1 | 3.2 | 1 | | | 2 | |
| 302-3 | 1000 | 2 | 2500 | 920 | U228 | 1 | 2500 | 920 | U200 | 1 | CBH1 | 2.1 | 2.2 | 1 | | | 1 | |
| 302-4 | 1000 | 2 | 2500 | 920 | U190 | 1 | 2500 | 920 | U200 | 1 | CBH1 | 2.1 | 2.2 | 1 | | | 1 | |
| 302-6 | 1000 | 3 | 2500 | 920 | U132 | 1 | 2500 | 920 | U200 | 1 | CBH1 | 3.1 | 3.2 | 1 | | | 2 | |
| 302-S | 1300 | 3 | 3100 | 1145 | U132 | 1 | 3100 | 1145 | U200 | 1 | CBH1 | 3.1 | 3.2 | 1 | | | 2 | |
| 303-4 | 1500 | 2 | 3500 | 1300 | U190 | 1 | 3500 | 1300 | U200 | 1 | CBH1 | 2.1 | 2.2 | 1 | | | 1 | |
| 303-6 | 1500 | 3 | 3500 | 1300 | U132 | 1 | 3500 | 1300 | U200 | 1 | CBH1 | 3.1 | 3.2 | 1 | | | 2 | |
| 303-S | 1950 | 3 | 4250 | 1590 | U99 | 1 | 4250 | 1590 | U200 | 1 | CBH1 | 3.1 | 3.2 | 1 | | | 2 | |
| 304-4 | 2000 | 2 | 4500 | 1685 | U190 | 1 | 4500 | 1685 | U200 | 1 | CBH1 | 2.1 | 2.2 | 1 | | | 1 | |
| 304-6 | 2000 | 3 | 4500 | 1685 | U132 | 1 | 4500 | 1685 | U200 | 1 | CBH1 | 3.1 | 3.2 | 1 | | | 2 | |
| 401-6 | 800 | 5 | 2100 | 765 | U132 | 1 | 2250 | 860 | U150 | 1 | CBH1 | 4.1 | 4.2 | 2 | | | 2 | |
| 401-7 | 800 | 5 | 2100 | 765 | U165 | 1 | 2250 | 860 | U150 | 1 | CBH1 | 4.1 | 4.2 | 2 | | | 2 | |
| 402-4 | 1600 | 3 | 3650 | 1360 | U66 | 1 | 3850 | 1435 | U150 | 1 | CBH1 | 2.1 | 2.2 | 2 | | | 1 | |
| 402-5 | 1600 | 4 | 3650 | 1360 | U99 | 1 | 3850 | 1435 | U150 | 1 | CBH1 | 3.1 | 3.2 | 2 | | | 2 | |
| 402-6 | 1600 | 5 | 3650 | 1360 | U132 | 1 | 3850 | 1435 | U150 | 1 | CBH1 | 4.1 | | 2 | | | 2 | |
| 402-7 | 1600 | 5 | 3850 | 1435 | U165 | 1 | 3850 | 1435 | U150 | 1 | CBH1 | 4.1 | | 2 | | | 2 | |
| 403-4 | 2400 | 3 | 5200 | 1950 | U66 | 1 | 5500 | 2000 | U150 | 1 | CBH1 | 2.1 | 2.2 | 2 | | | 1 | |
| 403-5 | 2400 | 4 | 5200 | 1950 | U99 | 1 | 5500 | 2000 | U150 | 1 | CBH1 | 3.1 | | 2 | | | 2 | |
| 403-6 | 2400 | 5 | 5500 | 2000 | U132 | 1 | 5500 | 2000 | U150 | 1 | CBH1 | 4.1 | | 2 | | | 2 | |
| 404-5 | 3200 | 8 | 3500 | 1300 | L100 | 2 | 3500 | 1300 | L100 | 1 | CBH1 | 5 | | 4 | | | 3 | |
| 404-6 | 3200 | 10 | 3500 | 1300 | L100 | 2 | 3500 | 1300 | L100 | 1 | CBH1 | 5 | | 4 | | | 4 | |
| 404-7 | 3200 | 10 | 3500 | 1300 | L100 | 2 | 3500 | 1300 | L100 | 1 | CBH1 | 5 | | 4 | | | 4 | |

Driftspänning för värmaren | Betriebsspannung der Heizung: 230V 50/60Hz

| **Kopplingsdosa CBH**<br>Värmare<br>Heizkreis | | | | | | | | | | | | | **Kopplingsdosa CBHR**<br>Värmare retur<br>Heizkreis Rückführung | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L2** | | **L3** | | | | | | 1/N/PE 50/60 Hz | 3 / N / PE \| 50/60 Hz | | | | | | | |
| Droppträg värmare | Droppträg värmare | Värmes-linga | Droppträg värmare | Droppträg värmare | Total-effekt | Effekt slinga | Effekt dropp-träg | Total-ström | Ström | Ström | Ström | SKS | Anslutnings-dosa Kopplingsdo-sa med jordledare | Värme-krets nb | Anslut-ningsdo-sa, kopplings-dosa | Kabeltvär-snitt för returkabel BOM | Kabel-längd för returkabel BOM |
| T | T ( R ) | | T | T ( R ) | | | | L1 | L1 | L2 | L3 | | | | | | |
| [st] | T(R) [st] | Slinga [st] | T [st] | T(R) [st] | P [ KW ] | P [ KW ] | P [ KW ] | P [KW] | I [A] | I [A] | I [A] | [Storlek] | CBH | [Nb] | CBHR | min [mm²] | [m] |
| | | | | | 1,0 | 0,5 | 0,5 | 4,2 | 4,2 | 0,0 | 0,0 | 3 | ABOX025 | | | | |
| | | | | | 1,0 | 0,5 | 0,5 | 4,2 | 4,2 | 0,0 | 0,0 | 3 | ABOX025 | | | | |
| | | | | | 1,7 | 0,9 | 0,9 | 7,5 | 7,5 | 0,0 | 0,0 | 3 | ABOX025 | | | | |
| | | | | | 2,3 | 1,1 | 1,1 | 10,0 | 10,0 | 0,0 | 0,0 | 2 | ABOX025 | | | | |
| | | | | | 3,0 | 1,5 | 1,5 | 13,0 | 13,0 | 0,0 | 0,0 | 2 | ABOX025 | | | | |
| | | | 1 T | | 1,6 | 1,1 | 0,5 | 7,0 | 2,3 | 2,3 | 2,3 | 3 | ABOX025 | | | | |
| | | | 1 T | | 1,6 | 1,1 | 0,5 | 7,0 | 2,3 | 2,3 | 2,3 | 3 | ABOX025 | | | | |
| | | | 1 T | | 2,1 | 1,6 | 0,5 | 9,3 | 2,3 | 4,7 | 2,3 | 4 | ABOX025 | | | | |
| | | | 1 T | | 2,5 | 1,8 | 0,6 | 10,7 | 2,7 | 5,3 | 2,7 | 3 | ABOX025 | | | | |
| | | | 1 T | | 2,8 | 1,8 | 0,9 | 12,0 | 4,0 | 4,0 | 4,0 | 3 | ABOX025 | | | | |
| | | | 1 T | | 2,8 | 1,8 | 0,9 | 12,0 | 4,0 | 4,0 | 4,0 | 3 | ABOX025 | | | | |
| | | | 1 T | | 3,7 | 2,8 | 0,9 | 16,0 | 4,0 | 8,0 | 4,0 | 4 | ABOX025 | | | | |
| | | | 1 T | | 4,6 | 3,4 | 1,1 | 19,9 | 5,0 | 10,0 | 5,0 | 4 | ABOX025 | | | | |
| | | | 1 T | | 3,9 | 2,6 | 1,3 | 17,0 | 5,7 | 5,7 | 5,7 | 3 | ABOX025 | | | | |
| | | | 1 T | | 5,2 | 3,9 | 1,3 | 22,6 | 5,7 | 11,3 | 5,7 | 4 | ABOX025 | | | | |
| | | | 1 T | | 6,4 | 4,8 | 1,6 | 27,7 | 6,9 | 13,8 | 6,9 | 2 | ABOX025 | | | | |
| | | | 1 T | | 5,1 | 3,4 | 1,7 | 22,0 | 7,3 | 7,3 | 7,3 | 3 | ABOX025 | | | | |
| | | | 1 T | | 6,7 | 5,1 | 1,7 | 29,3 | 7,3 | 14,7 | 7,3 | 4 | ABOX025 | | | | |
| | | 1 | 1 T | | 4,7 | 3,8 | 0,9 | 20,4 | 6,7 | 6,7 | 7,1 | 4 | WK 060 | | | | |
| | | 1 | 1 T | | 4,7 | 3,8 | 0,9 | 20,4 | 6,7 | 6,7 | 7,1 | 3 | WK 060 | | | | |
| | | | 1 T | | 5,5 | 4,1 | 1,4 | 24,0 | 11,8 | 5,9 | 6,2 | 3 | ABOX 025 | | | | |
| | | | 1 T | | 6,9 | 5,4 | 1,4 | 29,9 | 11,8 | 11,8 | 6,2 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 8,2 | 6,8 | 1,4 | - | 11,8 | 11,8 | 12,2 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 8,6 | 7,2 | 1,4 | - | 12,5 | 12,5 | 12,5 | 4 | WK 060 | | | | |
| | | | 1 T | | 7,9 | 5,9 | 2,0 | 34,1 | 17,0 | 8,5 | 8,7 | 3 | ABOX 025 | | | | |
| | | | 1 T | | 9,8 | 7,8 | 2,0 | - | 17,0 | 17,0 | 8,7 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 12,0 | 10,0 | 2,0 | - | 17,4 | 17,4 | 17,4 | 5 | WK 060 | | | | |
| | | 1 | 2 T | | 13,0 | 10,4 | 2,6 | - | 22,6 | 17,0 | 17,0 | 3 | WK 100 | CBHR1 | WK 100 | 2,5 | 4,35 |
| | | 2 | 2 T | | 15,6 | 13,0 | 2,6 | - | 22,6 | 22,6 | 22,6 | 3 | WK 100 | CBHR1 | WK 100 | 2,5 | 4,35 |
| | | 2 | 2 T | | 15,6 | 13,0 | 2,6 | - | 22,6 | 22,6 | 22,6 | 3 (9x)<br>4 (1x) | WK 100 | CBHR1 | WK 100 | 2,5 | 4,35 |

# Kelvion

## KABELSYSTEM

## MSC 40, 50

**Standard/serie**

**Kopplingsschema nr: A99500_0273** (Doc 2; Index A)

| Typ | | Värmeslinga | | | | Droppträg värmare | | | | | | PIC | PIC | L1 | | | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MSC | Slingans längd | Antal | Längd | Effekt | Form | Antal | Längd | Effekt | Form | Antalet värme-kretsar | Värme-kretsar Nb | Bild på kopplings-schemat | Bild på kopplings-schemat | Värmes-linga | Droppträg värmare T | Droppträg värmare T ( R ) | Värmes-linga |
| Typ | L [ mm ] | Slinga | L [ mm ] | P [ W ] | | Droppträg | L [ mm ] | P [ W ] | | | [ Nb ] | | | Slinga [st] | T [st] | T(R) [st] | Slinga [st] |
| MSC | Slingans längd |  |  | | |  |  | | |  | | | |  |  |  |  |
| 401-5 | 900 | 4 | 2250 | 860 | U99 | 1 | 2500 | 920 | U150 | 1 | CBH1 | 1.1 | 1.2 | 2 | | | 2 |
| 401-6 | 900 | 5 | 2250 | 860 | U132 | 1 | 2500 | 920 | U150 | 1 | CBH1 | 2.1 | 2.2 | 2 | | | 2 |
| 401-7 | 900 | 5 | 2400 | 880 | U165 | 1 | 2500 | 920 | U150 | 1 | CBH1 | 2.1 | 2.2 | 2 | | | 2 |
| 402-4 | 1800 | 3 | 4000 | 1490 | U66 | 1 | 4250 | 1590 | U150 | 1 | CBH1 | 1.1 | 1.2 | 2 | | | 1 |
| 402-6 | 1800 | 5 | 4250 | 1590 | U132 | 1 | 4250 | 1590 | U150 | 1 | CBH1 | 2.1 | | 2 | | | 2 |
| 402-7 | 1800 | 5 | 4250 | 1590 | U165 | 1 | 4250 | 1590 | U150 | 1 | CBH1 | 2.1 | | 2 | | | 2 |
| 403-6 | 2700 | 5 | 5820 | 2165 | U132 | 1 | 6000 | 2178 | U150 | 1 | CBH1 | 2.1 | | 2 | | | 2 |
| 404-5 | 3600 | 8 | 3850 | 1435 | L100 | 2 | 3850 | 1435 | L100 | 1 | CBH1 | 4 | | 4 | | | 3 |
| 501-4 | 1000 | 5 | 2400 | 880 | U66 | 1 | 2700 | 995 | U150 | 1 | CBH1 | 2.1 | 2.2 | 2 | | | 2 |
| 501-5 | 1000 | 5 | 2400 | 880 | U99 | 1 | 2700 | 995 | U150 | 1 | CBH1 | 2.1 | 2.2 | 2 | | | 2 |
| 501-6 | 1000 | 6 | 2400 | 880 | U132 | 1 | 2700 | 995 | U150 | 1 | CBH1 | 2.1 | 2.2 | 3 | | | 2 |
| 502-4 | 2000 | 5 | 4500 | 1685 | U66 | 1 | 4600 | 1720 | U150 | 1 | CBH1 | 2.1 | | 2 | | | 2 |
| 502-6 | 2000 | 6 | 4500 | 1685 | U132 | 1 | 4600 | 1720 | U150 | 1 | CBH1 | 2.1 | | 3 | | | 2 |
| 503-4 | 3000 | 5 | 6400 | 2300 | U66 | 1 | 6700 | 2530 | U150 | 1 | CBH1 | 2.1 | | 2 | | | 2 |
| 503-5 | 3000 | 5 | 6400 | 2300 | U99 | 1 | 6700 | 2530 | U150 | 1 | CBH1 | 2.1 | | 2 | | | 2 |
| 503-6 | 3000 | 6 | 6400 | 2300 | U132 | 1 | 6700 | 2530 | U150 | 1 | CBH1 | 2.1 | | 3 | | | 2 |
| 504-4 | 4000 | 10 | 4250 | 1590 | L100 | 2 | 4250 | 1590 | L100 | 1 | CBH1 | 3 | | 4 | | | 4 |
| 504-5 | 4000 | 10 | 4250 | 1590 | L100 | 2 | 4250 | 1590 | L100 | 1 | CBH1 | 3 | | 4 | | | 4 |

Driftspänning för värmaren | Betriebsspannung der Heizung: 230V 50/60Hz

| **Kopplingsdosa CBH**<br>Värmare<br>Heizkreis | | | | | | | | | | | | | **Kopplingsdosa CBHR**<br>Värmare retur<br>Heizkreis Rückführung | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L2** | | **L3** | | | | | 1/N/PE 50/60 Hz | 3 / N / PE \| 50/60 Hz | | | | | | | | |
| Droppträg värmare T | Droppträg värmare T ( R ) | Värmes-linga | Droppträg värmare T | Droppträg värmare T ( R ) | Total-effekt | Effekt slinga | Effekt dropp-träg | Total-ström L1 | Ström L1 | Ström L2 | Ström L3 | SKS | Anslutnings-dosa Kopplingsdo-sa med jordledare | Värme-krets nb | Anslut-ningsdo-sa, kopplings-dosa | Kabeltvär-snitt för returkabel BOM | Kabel-längd för returkabel BOM |
| [st] | T(R) [st] | Slinga [st] | T [st] | T(R) [st] | P [ KW ] | P [ KW ] | P [ KW ] | P [KW] | I [A] | I [A] | I [A] | [Storlek] | CBH | [Nb] | CBHR | min [mm²] | [m] |
| | | | 1 T | | 4,4 | 3,4 | 0,9 | 19,0 | 7,5 | 7,5 | 4,0 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 5,2 | 4,3 | 0,9 | 22,7 | 7,5 | 7,5 | 7,7 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 5,3 | 4,4 | 0,9 | 23,1 | 7,7 | 7,7 | 7,8 | 3 | WK 060 | | | | |
| | | | 1 T | | 6,1 | 4,5 | 1,6 | 26,3 | 13,0 | 6,5 | 6,9 | 3 | ABOX 025 | | | | |
| | | 1 | 1 T | | 9,5 | 8,0 | 1,6 | - | 13,8 | 13,8 | 13,8 | 5 | WK 060 | | | | |
| | | 1 | 1 T | | 9,5 | 8,0 | 1,6 | - | 13,8 | 13,8 | 13,8 | 5 | WK 060 | | | | |
| | | 1 | 1 T | | 13,0 | 10,8 | 2,2 | - | 18,8 | 18,8 | 18,9 | 3 | WK 060 | | | | |
| | | 1 | 2 T | | 14,4 | 11,5 | 2,9 | - | 25,0 | 18,7 | 18,7 | 3 | WK 100 | CBHR1 | WK 100 | 2,5 | 4,75 |
| | | 1 | 1 T | | 5,4 | 4,4 | 1,0 | 23,5 | 7,7 | 7,7 | 8,2 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 5,4 | 4,4 | 1,0 | 23,5 | 7,7 | 7,7 | 8,2 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 6,3 | 5,3 | 1,0 | 27,3 | 11,5 | 7,7 | 8,2 | 2 | WK 100 | | | | |
| | | 1 | 1 T | | 10,1 | 8,4 | 1,7 | - | 14,7 | 14,7 | 14,8 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 11,8 | 10,1 | 1,7 | - | 22,0 | 14,7 | 14,8 | 3 | WK 100 | | | | |
| | | 1 | 1 T | | 14,0 | 11,5 | 2,5 | - | 20,0 | 20,0 | 21,0 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 14,0 | 11,5 | 2,5 | - | 20,0 | 20,0 | 21,0 | 3 | WK 060 | | | | |
| | | 1 | 1 T | | 16,3 | 13,8 | 2,5 | - | 30,0 | 20,0 | 21,0 | 2 | WK 100 | | | | |
| | | 2 | 2 T | | 15,9 | 12,7 | 3,2 | - | 27,7 | 20,7 | 20,7 | 3 | WK 100 | CBHR1 | WK 100 | 4,0 | 5,15 |
| | | 2 | 2 T | | 15,9 | 12,7 | 3,2 | - | 27,7 | 20,7 | 20,7 | 3 | WK 100 | CBHR1 | WK 100 | 4,0 | 5,15 |

Kelvion

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# Coolselector2

## Projektinformation

| | |
|---|---|
| Projektnamn: | |
| Kommentarer: | |
| Skapad av: | |
| Coolselector2 version: | 5.4.9. Databas: 114 |
| Utskriven: | den 21 Augusti 2024 |
| Använda inställningar: | Alla tillämpningar |

## Luftkylt aggregat 1

### Driftsförhållanden

| | | | | | |
|---|---|---|---|---|---|
| Köldmedium: | R449A | | | | |
| Daggpunktstemperatur för förångning: | -10,0 | °C | Omgivningstemperatur: | 32,0 | °C |
| Förångningstryck: | 3,613 | bar | Underkylning: | 0 | K |
| Förångar medeltemperatur: | -11,9 | °C | Ytterligare underkylning: | 0 | K |
| Användbar överhettning: | 8,0 | K | Höjd över havet: | 0 | m |
| Ytterligare överhettning: | 0 | K | | | |
| Returgastemperatur: | -2,0 | °C | | | |
| **Klassificeringsvillkor:** | *Anpassad* | | | | |
| **Erforderlig kylningskapacitet:** | *3,300 kW* | | | | |

### Urval: OP-MPXM034MLP00E, R449A

| | |
|---|---|
| Modell | OP-MPXM034MLP00E |
| Artikelnummer | 114X4264 |
| Kompressormodell | MLZ015T4 |
| Produktområde | Optyma™ Plus |
| Produktversion | P00 |
| Köldmedium | R449A |
| Kylning [kW] | 3,344 |
| COP kylning [W/W] | 2,04 |
| Total effekt [kW] | 1,637 |
| Total ström [A] | 3,650 |
| Frekvens [Hz] | 50 |
| Strömtillförsel | 380 - 400 V 3 ph |
| Tc [°C] | 40,9 |

### Valt artikelnummer och valda reservdelar

**Artikelnummer:** *114X4264. OP-MPXM034MLP00E*

## Ecodesign

| **Modell: OP-MPXM034MLP00E. Uppfyller Ecodesign 2018** | | |
|---|---|---|
| Refrigerant: R449A | | |
| Objekt | Värde | Enhet |
| **Förångningsmedeltemperatur** | -10,0 | °C |
| Returgastemperatur | 20,0 | °C |
| **Parametrar vid fullbelastning och omgivningstemperatur 32,0 °C** | | |
| Nominell kylningskapacitet | 3,679 | kW |
| Nominell ineffekt | 1,660 | kW |
| Nominell COP | 2,22 | |
| **Parametrar vid fullbelastning och omgivningstemperatur 25,0 °C** | | |
| Kylningskapacitet | 4,042 | kW |
| Strömförsörjning | 1,450 | kW |
| COP | 2,79 | |
| **Parametrar vid fullbelastning och omgivningstemperatur 43,0 °C** | | |
| Kylningskapacitet | 3,061 | kW |
| Strömförsörjning | 2,113 | kW |
| COP | 1,45 | |

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DATASHEET
Kelvion Select RT

# AIR COOLER DIRECT EXPANSION | KSC-301-4BE-HX32

**Item no.:** 100685109

## BASIC DATA

| | | | | | |
|---|---|---|---|---|---|
| **Capacity [kW]** | 3,60 | **Sensible heat ratio (SHR) [-]** | 0,69 | **Refrigerant** | R449A (Dupont XP40) |
| **Air inlet temp. [°C]** | 2,0 | **Air outlet temp. [°C]** | -2,1 | **Operation mode** | EC |
| **Rel. humidity [%]** | 85,0 | **Evaporation temp. [°C] (Dew point)** | -8,0 | | |

## AIR DATA

| | |
|---|---|
| **Air volume flow** | 1.665 m³/h |
| **Ext. static pressure** | 0 Pa |
| **Air throw** | 10 m |
| **Altitude** | 0 m |
| **Air outlet rel. humidity** | 94,4 % |

## HEAT EXCHANGER

| | |
|---|---|
| **Surface** | 7,7 m² |
| **Fin spacing** | 7 mm |
| **Internal volume** | 2,5 dm³ |
| **Liquid temp.** | 23,5 °C |
| **Superheating temp.** | -1,5 °C |
| **Max. operating pressure** | 32 bar |

## MATERIALS

| | |
|---|---|
| **Tubes** | Copper |
| **Fins** | Alu |
| **End plates** | Alu |
| **Casing** | Alu |
| **Finish** | powder coated, white (RAL 9010) |

# FAN(S)

## 1 PIECE(S): 230V/1PH/50-60HZ; IP54

| | |
|---|---|
| **Fan diameter** | 300 mm |
| **Range of temp.** | -40,0 to 40,0 °C |
| **Sound power LwA** | 68 dB(A) |
| **Sound pressure LpA (5m)** (2) | 43 dB(A) |
| **Optional controller, on site** (5) | - |
| **ErP** | 2015 |

## SELECTED SPEED DATA (PER FAN) (3)

| | |
|---|---|
| **Operation mode** | EC - S1 |
| **Speed** | 1600 rpm |
| **Power input** | 95 W |
| **Operating current** | 0,6 A |
| **Energy efficiency class EEC** | C |

## FAN SET SERIAL PLATE DATA (PER FAN)

| | |
|---|---|
| **Operation mode** | EC |
| **Speed** | 1600 rpm |
| **Power nominal** | 85 W |
| **Current draw** | 0,7 A |
| **Protector** | Built in protector, connected internal |

## CONNECTIONS (7)

| | |
|---|---|
| **Inlet** | Cu 10 mm |
| **Outlet** | Cu 22 mm |

**Refrigerant distribution**
No distributor

## WEIGHT (4)

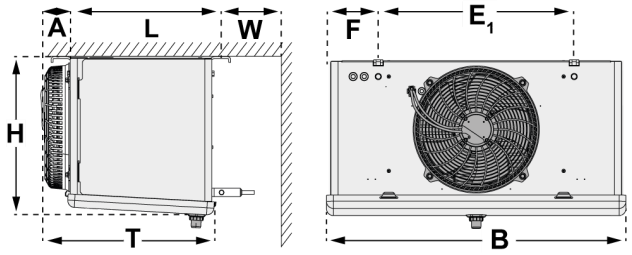
| | |
|---|---|
| **Dry weight** | 18 kg |
| **Weight incl. packing** | 23 kg |

## DEFROST

**Electric defrost**

| | |
|---|---|
| **Coil** | 1,07 kW |
| **Drip tray** | 0,54 kW |
| **Total** | 1,61 kW |

## DIMENSIONS (4)




B 810 mm
L 430 mm
Drain G 3/4"

H 418 mm
$E_1$ 530 mm

W 200 mm
F 140 mm

T 453 mm
A 42 mm

Packing dimensions (height x length x width): 530 x 910 x 600 mm

## OPTIONS AND ACCESSORIES (EXCL. VAT)

| CATEGORY | | OPTION GROUP | ITEM | ITEM NO. |
|---|---|---|---|---|
| Coil | 010.9 | Tube type | Tubes copper, max. operating pressure 32 bar | |
| Coil | 011.1 | Fin type | Fins alu | |
| Fan(s) | 070.4 | EC fans | EC-ESM, four fixed speeds wired on terminal box, 230 V - 1 Ph - 50/60 Hz | |
| Defrost | 031.6 | Electric defrost | Electric defrost in coil and drip tray (heavy) | |

Subject to modifications.
Any data or other information in this selection software shall be deemed to be a general description of product properties and shall not be binding upon Kelvion. Binding product specifications may be agreed by Kelvion in bids, proposals, tenders or other offers issued in response to inquiries or calls for tenders or other invitations to bid.

Notes
(1) Classification acc. to Pressure Equipment Directive (PED): Category "0" for fluid group "2" at max. allowable pressure of PS = 32 bar.
(2) Sound pressure LpA is based on the complete unit and based on EN13487 ± 2 dB(A).
(3) The current consumption can vary depending on air density and mains voltage.
(4) Weights and dimensions do not apply to all possible variants.
(5) If frequency converters are used for speed control, please follow the guidelines of the fan-set manufacturers.
(6) Kelvion will define the production site depending e.g. on type series, execution and location.
(7) The connection sizes are subject to potential change due to production requirements.

Version: 24.0816.1011 (1.1.4.9)

**KELVION CODE: KSC-301-4BE-HX32-AE7E2691-59D6**

You can return to your current configuration with the following link:

https://selectrt.kelvion.com/code/ksc-301-4be-hx32-ae7e2691-59d6

Creation date: Aug 20, 2024

ENGINEERING
TOMORROW

Användarhandbok

# Temperaturregulator för kylrum och frysrum Typ **AK-RC 204B, 205C**



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## 1. Versioner och referenser

| Modell | Beskrivning | Strömtillförsel | Elektrisk avsäkring |
|---|---|---|---|
| AK-RC 204B | Temperaturregulator med fyra reläer | 230 V~ ± 10%, 50 Hz ± 5% | Nej |
| AK-RC 205C | Temperaturregulator med fem reläer | 230 V~ ± 10%, 50 Hz ± 5% | Ja (Brytare) |

## 2. Varningar ⚠

- Användning av enheten utan att tillverkarens anvisningar följs kan påverka enhetens säkerhetsstandard. För att enheten ska fungera korrekt ska endast NTC-givare från Danfoss användas.
- Om NTC-givarens givarkabel vid ett temperaturomfång på -40 till +20°C förlängs till upp till 1 000 m med en kabel på minst 0,5 mm² kommer den maximala avvikelsen att vara 0,25 °C.
- Enheten ska installeras på en plats som är skyddad mot vibrationer, vatten och korrosiva gaser och där omgivningstemperaturen inte överstiger det värde som anges i det tekniska databladet.
- För att avläsningen ska bli korrekt ska givaren användas på en plats utan värmepåverkan, bortsett från den temperatur som ska mätas eller regleras.
- IP65-kapslingsklassen gäller endast när skyddskåpan är stängd.
- IP65-kapslingsklassen gäller endast om kablarna ansluts till enheten med hjälp av genomföringar som har IP65 eller högre. Kabelgenomföringens storlek ska vara lämplig för diametern på den kabel som används.
- Spruta inte med högtrycksslang direkt på enheten eftersom den då kan skadas.

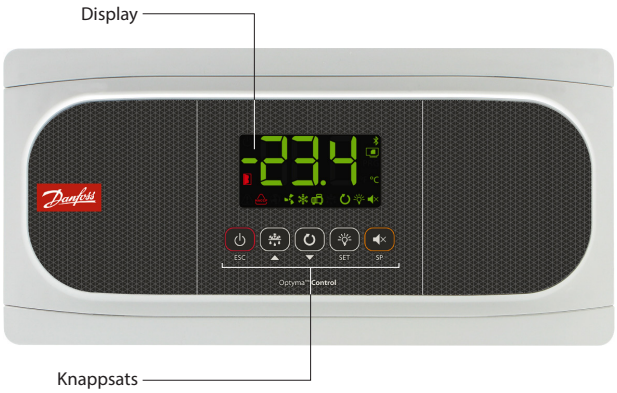
**Viktigt:**

- **Innan installationen påbörjas måste råden i gällande lokala bestämmelser beaktas.**
- AUX-RELÄERNA är programmerbara, deras drift varierar således beroende på konfiguration.
- De digitala ingångarnas funktion varierar, beroende på konfiguration.
- Rekommenderade strömmar och effekter är maximala driftströmmar och drifteffekter.

## 3. Underhåll

- Rengör enhetens yta med en mjuk trasa, vatten och diskmedel.
- Använd inte slipande rengöringsmedel, bensin, alkohol eller lösningsmedel eftersom enheten då kan skadas.

## 4. Beskrivning




**Fast:** Standbyläge aktiverat. Reglering är pausad.
**Blinkar:** Kontrollerad process för avstängning av regleringen pågår.

**Fast:** Kylrumsdörr öppen.
**Blinkar:** Dörren har varit öppen längre än vad som har definierats i parameter **A12**.

Det finns ett aktivt larm (men inget aktivt HACCP-larm).

**Fast:** HACCP-larm aktivt.
**Blinkar:** HACCP-larm registrerat och obekräftat.
Tryck på knappen för att bekräfta HACCP-larmet.

**Fast:** Förångarens fläktar aktiverade.
**Blinkar:** Förångarens fläktar ska vara aktiverade, men en fördröjning förhindrar detta.

**Fast:** Magnetventilen för kyla är aktiverad.
**Blinkar:** Magnetventilen ska vara aktiverad, men en fördröjning förhindrar detta.

**Fast:** Kompressorn är aktiverad.
**Blinkar:** Kompressorn ska vara aktiverad men en fördröjning eller ett skydd förhindrar detta.

Avfrostningsrelä aktiverat.

Kontinuerligt cykelläge aktiverat.

Kylrumsbelysning aktiverad.

Pågående larm tystat.

°F °C Temperatur visas i ° Fahrenheit/° Celsius.

PRG Programmeringsläge aktiverat.

### 4.1 Knappsats

ESC

Om du trycker på denna knapp i tre sekunder aktiveras/avaktiveras standbyläget. I detta läge pausas regleringen och power-ikonen ⏻ visas.
I programmeringsmenyn gör detta läge att parametern lämnas utan att ändringar sparas och enheten återgår till föregående nivå eller så avslutas programmeringen.

Om du trycker på denna knapp en gång visas temperaturen för givare S2 i tio sekunder (om den är aktiverad).
Om du trycker på knappen i tre sekunder startas/stoppas avfrostningen.
I programmeringsmenyn gör detta att du kan bläddra mellan olika nivåer eller ändra ett parametervärde vid inställning av en parameter.

Om du trycker på knappen i tre sekunder aktiveras/avaktiveras kontinuerligt cykelläge.
I programmeringsmenyn gör detta att du kan bläddra mellan olika nivåer eller ändra ett parametervärde vid inställning av en parameter.

SET

Tryck en gång på denna knapp för att aktivera/avaktivera kylrummets belysning.
Tryck på knappen i tre sekunder för att komma till den förenklade programmeringsmenyn.
Tryck i sex sekunder för att komma till den utökade programmeringsmenyn.
I programmeringsmenyn gör detta att du kommer till den nivå som visas på displayen eller att ett nytt värde accepteras vid inställning av en parameter.

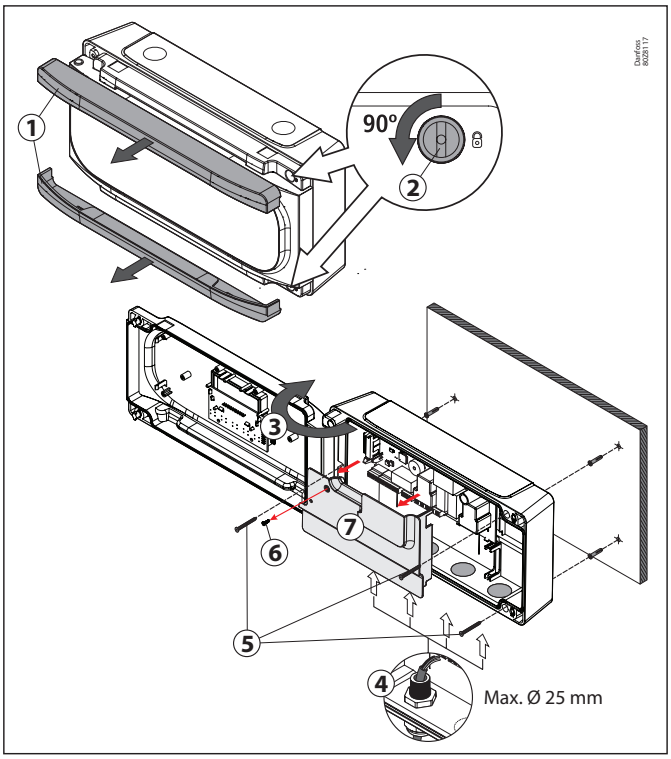
SP

Om du trycker en gång på denna knapp visas aktuellt effektivt börvärde, inklusive tillfälliga ändringar av andra parametrar (**C10** eller **C12**).
Om ett larm har aktiverats tystar du det genom att trycka en gång på denna knapp. Om du trycker på knappen i tre sekunder kommer du till inställningen för börvärde.

**STANDBY**
Om temperaturregleringen inte kan stoppas omedelbart på grund av aktuell konfiguration startar en kontrollerad stopprocess och ikonen ⏻ blinkar. Om du vill avbryta stopprocessen och tvinga läget till Standby, trycker du på Standbyknappen igen i tre sekunder.

## 5. Installation

- Ta bort infattningarna (1) genom att dra i den ena sidan först och sedan den andra.
- Vrid skruvarna (2) 1/4 varv moturs och öppna dörren (3).
- Installera nödvändiga kabelgenomföringar (4) genom att ta bort skydden.
- Markera och gör hål i väggen med hjälp av den medföljande mallen.
- Fäst enheten på väggen. För tegelväggar använder du de medföljande skruvarna och förankringarna. För plåtväggar (kylrum), använder du de medföljande skruvarna utan förankringar (5).
- Ta bort plastkåpan (7) genom att lossa skruven (6) och dra kablarna enligt rekommendationerna på s. 7.
- När kabeldragningen är klar, sätt tillbaka plastkåpan (7), stäng kåpan (3), dra åt skruvarna (2) och sätt tillbaka infattningarna (1).





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## 6. Kabeldragning

Koppla alltid från strömförsörjningen innan kabeldragnin utförs. Givare och tillhörande kablar får **ALDRIG** installeras i en kanal tillsammans med ström- eller styrkablar.

För frånkoppling måste strömförsörjningskretsen vara utrustad med en brytare på minst 2 A, 230 V som är placerad i närheten av enheten. Välj en strömförsörjningskabel av typen H05VV-F eller NYM 1x16/3. Aktuell tvärsnittsarea beror på gällande lokal standard, men får aldrig vara mindre än 2,5 $mm^2$.

Kablar för relä- eller kontaktorutgångar ska ha en tvärsnittsarea på 2,5$mm^2$, tåla arbetstemperaturer på minst 70°C och installeras med så få böjar som möjligt.

Kablaget för 230 V~ måste hållas på avstånd från andra externa element.

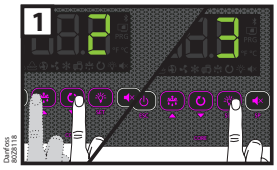
- **Vilken typ av kabeldragning som ska utföras beror på vilket alternativ som valts i wizarden vid den inledande konfigurationen.**
- **Använd lämpligt kopplingsschema baserat på valt alternativ.**
- **Kontrollera tillgängliga alternativ i kopplingsschemat som medföljer enheten.**

**Viktigt:**

- **Innan installationen påbörjas måste råden i gällande lokala bestämmelser beaktas.**
- AUX-RELÄERNA är programmerbara, deras drift varierar således beroende på konfiguration.
- De digitala ingångarnas funktion varierar, beroende på konfiguration.
- Rekommenderade strömmar och effekter är maximala driftströmmar och drifteffekter.

## 7. Inledande konfiguration

Första gången enheten startas går den in i Wizardläget. På displayen visas meddelandet *Ini*, där **0** blinkar.



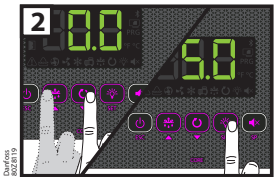

**Steg 1:**
Välj det lämpligaste Inl-alternativet baserat på den typ av installation som ska utföras och tryck på **SET**.
Tillgängliga alternativ visas i följande tabell:

| Inl | Typ av installation | | | | Parametrar | | | | | | | | | | Kopplings-schema som ska användas |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Kylreglering | Pump-down | Avfrostning | Förång-arfläktar | Pd | o00 | I00 | I10 | I11 | I20 | I21 | d1 | d7 | F3 | |
| 0 | Demoläge: visar temp. men används inte för reglering eller aktivering av reläer | | | | | | | | | | | | | | |
| 1 | Magnetventil | Nej | Elektrisk | Ja | 0 | * | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | A |
| 2 | Magnetventil + kompressor | Ja | Elektrisk | Ja | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 20 | 0 | 0 | B |
| 3 | Magnetventil + kompressor | Nej | Elektrisk | Ja | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | B |
| 4 | Magnetventil | Nej | Luft | Ja | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | A |
| 5 | Magnetventil + kompressor | Ja | Luft | Ja | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | 1 | B |
| 6 | Magnetventil + kompressor | Nej | Luft | Ja | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | 1 | B |
| 7 | Magnetventil + kompressor | Ja | Hetgas | Ja | 1 | 1 | 2 | 7 | 1 | 9 | 1 | 5 | 2 | 0 | C |
| 8 | Magnetventil + kompressor | Nej | Hetgas | Ja | 0 | 1 | 2 | 0 | 0 | 9 | 1 | 5 | 2 | 0 | C |
| 9 | Magnetventil + kompressor | Ja | Omvänd cykel | Ja | 1 | 1 | 2 | 7 | 1 | 0 | 0 | 5 | 3 | 0 | D |
| 10 | Magnetventil + kompressor | Nej | Omvänd cykel | Ja | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | D |
| 11 | Magnetventil | Nej | Statisk | Nej | 0 | * | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | A |
| 12 | Magnetventil + kompressor | Ja | Statisk | Nej | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 20 | 1 | - | B |
| 13 | Magnetventil + kompressor | Nej | Statisk | Nej | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 20 | 1 | - | B |

*** o00=2** i AK-RC 204B, **o00=0** i AK-RC 205C

**Obs!** Om du har valt alternativ 2, 5, 7, 9 eller 12 ska du kontrollera konfigurationen av parameter I11 enligt typ av pressostat som används. (Se kopplingsschemat som medföljer enheten).

**Steg 2:**
Ange önskat temperaturbörvärde med hjälp av knapparna ▲ och ▼ och tryck på **SET**.
Wizarden har avslutats. Enheten börjar reglera temperaturen.




Om detta inte är första gången wizarden körs visas meddelandet **dFp** (standardparametrar) på displayen när det sista steget har slutförts. Du kan välja mellan två alternativ:
**0**: Ändra endast de parametrar som ingår i wizarden. Övriga parametrar förblir oförändrade.
**1**: Alla parametrar återställs till fabriksinställningarna förutom de som har ändrats av wizarden.

**Viktigt:** Wizarden startar inte automatiskt när enheten har aktiverats minst en gång. Du kan när som helst starta wizarden genom att stänga av regulatorn. Detta gör du genom att trycka på strömknappen i tre sekunder och vänta tills strömsymbolen lyser. Tryck på följande knappar i denna ordning, ▲ ▼ , och **SET**.
Om pumpdownfunktionen har aktiverats kan det dröja ett tag från det att standbyfunktionen aktiveras tills regulatorn stoppas (se sida 8).

### Parameterlista för wizarden

| | | | | |
|---|---|---|---|---|
| **Pd** | Pumpdown aktiv? | **0**=Nej | **1**=Ja | |
| **o00** | Konfiguration av AUX1-reläet | **0**=Avaktiverad<br>**2**=Belysning | **1**=Kompressor/Vevhusvärmare<br>**3**=Virtuell styrning | **4**=Larm (endast i AK-RC 204B) |
| **I00** | Anslutna givare | **1**=Givare 1 (kylrum) | **2**=Givare 1 (kylrum) + Givare 2 (förångare) | |
| **I10** | Konfiguration av digital utgång 1 | **0**=Avaktiverad<br>**3**=Allvarligt externt larm<br>**6**=Avfrostningsblockering | **1**=Dörrkontakt<br>**4**=Ändring av börvärde<br>**7**=Lågtrycksbrytare | **2**=Externt larm<br>**5**=Fjärrstyrd avfrostning<br>**8**=Fjärrstyrd standby |
| **I11** | Polaritet för digital ingång 1 | **0**=Aktiveras vid slutande kontakt | **1**=Aktiveras vid brytande kontakt | |
| **I20** | Konfiguration av digital utgång 2 | **0**=Avaktiverad<br>**3**=Allvarligt externt larm<br>**6**=Avfrostningsblockering<br>**9**=Högtrycksbrytare for hetgas | **1**=Dörrkontakt<br>**4**=Ändring av börvärde<br>**7**=Registrering av givare<br>**10**=Fjärrstyrd standby | **2**=Externt larm<br>**5**=Fjärrstyrd avfrostning<br>**8**=Givare 2:a förångare |
| **I21** | Polaritet för digital ingång 2 | **0**=Aktiveras vid slutande kontakt | **1**=Aktiveras vid brytande kontakt | |
| **d1** | Maximal varaktighet för avfrostning (0=avfrostning inaktiverad) | | | |
| **d7** | Typ av avfrostning | **0**=Värmestavar | **1**=Luft/fläktar | **2**=Hetgas**3**=Omvänd cykel |
| **F3** | Status för fläktarna under avfrostning | **0**=Avstängda | **1**=Igång | |

## 8. Drift

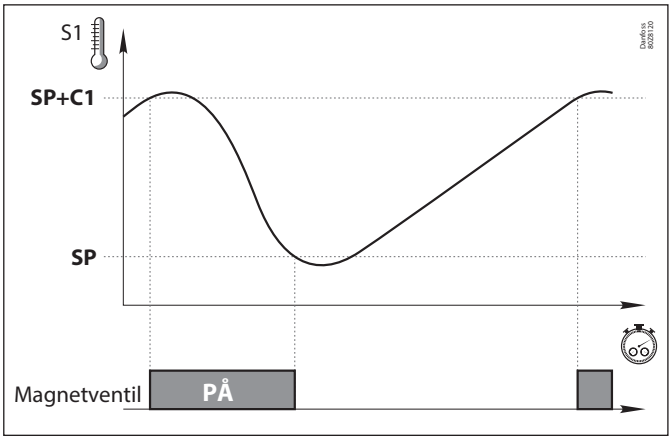
| **Displaymeddelanden** | |
|---|---|
|  | Fel vid pumpdown (stopp), tiden som konfigurerats i parameter C20 har överskridits (se sida 8).<br>Visas endast på skärmen. |
|  | Fel vid pumpdown (uppstart), tiden som konfigurerats i parameter C19 har överskridits (se sida 8).<br>Visas endast på skärmen. |
|  | Fel på givare 1/2/3 (öppen eller kortsluten krets eller temperatur utanför givargränserna)<br>Endast E2 och E3: Fuktig förångargivare (se sida 12).<br>Aktiverar larmreläet och det akustiska larmet. |
|  | Larm för öppen dörr.<br>Endast om dörren förblir öppen under längre tid än vad som definierats i parameter **A12** (se sida 12).<br>Aktiverar larmreläet och det akustiska larmet. |
|  | Larm för maxtemperatur från regleringsgivare.<br>Det programmerade temperaturvärdet i **A1** har uppnåtts (se sida 12).<br>Aktiverar larmreläet och det akustiska larmet. |
|  | Larm för minimitemperatur från regleringsgivare.<br>Det programmerade temperaturvärdet i **A2** har uppnåtts (se sida 12).<br>Aktiverar larmreläet och det akustiska larmet. |
|  | Externt larm aktiverat (av digital ingång) (se sida 12).<br>Aktiverar larmreläet och det akustiska larmet. |
|  | Allvarligt externt larm aktiverat (av digital ingång) (se sida 12).<br>Aktiverar larmreläet och det akustiska larmet. |
|  | Larm för avfrostning avslutad på grund av timeout.<br>Den inställda tiden i **d1** har överskridits (se sida 13).<br>Aktiverar larmreläet och det akustiska larmet. |
|  | HACCP-larm.<br>Temperaturen har nått parametervärdet **h1** under längre tid än vad som fastställts i **h2** (se sida 12).<br>Aktiverar larmreläet och det akustiska larmet. |
|  | HACCP-larm på grund av ett strömförsörjningsfel.<br>Temperaturen som fastställts i **h1** har uppnåtts efter ett strömförsörjningsfel (se sida 12).<br>Aktiverar larmreläet och det akustiska larmet. |


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| | |
|---|---|
|  | Indikerar att avfrostning pågår (se sida 10).<br>Visas endast på skärmen. |
|  | Lösenord krävs. Se parametrarna **b10** och **PAS** (se sida 13).<br>Visas endast på skärmen. |
|  | **Visas sekventiellt med temperaturen**: Regulatorn är i demoläge, konfigurationen har inte utförts. |

## 8.1 Kylreglering

**Reglering via magnetventil (KYL-relä)**
Kylprocessen regleras genom att magnetventilen öppnas/stängs. När temperaturen i givare S1 når börvärdet (**SP**) plus givarens differens (**C1**) öppnas magnetventilen och gör att temperaturen sjunker. När börvärdet (**SP**) har nåtts stängs magnetventilen.



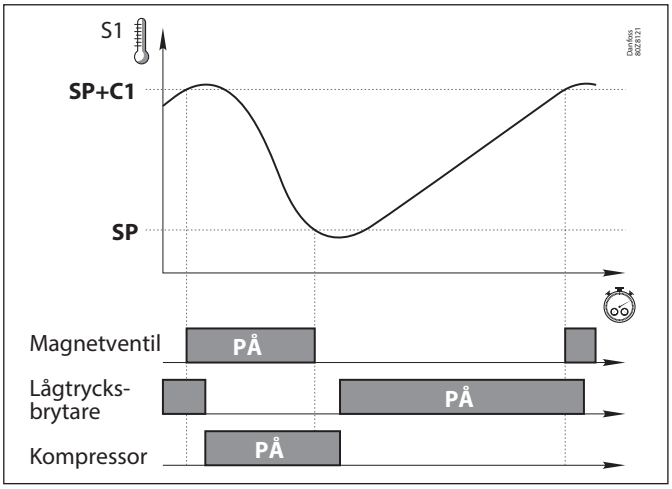

**Reglering av kompressor (AUX 1-relä)**

*Med pumpdown (**InI**: 2, 5, 7, 9, 12)*

**Kräver anslutning av en lågtrycksbrytare i digital ingång 1.**
När temperaturen i givare S1 når börvärdet (**SP**) plus givarens differens (**C1**) öppnas magnetventilen, vilket gör att trycket i förångaren ökar varpå lågtryckspressostaten avaktiveras och kompressorn startar.

När börvärdet (**SP**) har nåtts stängs magnetventilen, vilket gör att trycket i förångaren sjunker varpå lågtrycksbrytaren aktiveras och kompressorn stoppas.

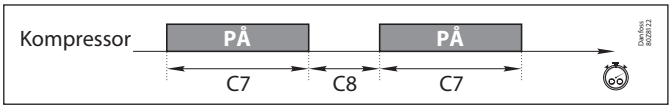
Fler detaljer om processen finns på sidan 8.




*Utan Pumpdown (**InI**: 3, 6, 8, 10, 13)*
Kompressorn drivs samtidigt som magnetventilen, den startar när magnetventilen öppnas och stoppar när magnetventilen stängs.

**Driftläge i händelse av fel på givare S1**
Om givare S1 slutar att fungera (fel, frånkoppling osv.), styrs kompressorns drift av parameter **C6** enligt ett av tre tillgängliga alternativ:

**C6=0**: Kompressorn stoppas tills givare S1 börjar fungera igen.
**C6=1**: Kompressorn startas tills givare S1 börjar fungera igen
**C6=2**: Kompressorn körs i enlighet med genomsnittlig drift under de 24 timmarna innan felet inträffade, hänsyn tas till antalet starter och stopp samt genomsnittlig tid i varje läge (stopp-start). Om det inte har förflutit 24 timmar sedan ett givarfel inträffande ställs enheten in i **C6=3** läge.
**C6=3**: Kompressorn körs enligt de tider som programmerats i **C7** (PÅ) och **C8** (AV).



**Pumpdownfunktion**
Denna funktion möjliggör direkt reglering av magnetventilen och kompressorn och kräver anslutning av en lågtrycksbrytare till digital ingång 1. Funktionen förhindrar tryckproblem i systemet genom att säkerställa att kompressorn endast körs när trycket ligger inom rätt intervall. Används endast vid reglering av både magnetventil och kompressor. Om endast magnetventilen regleras, ANVÄND INTE DENNA INSTÄLLNING utan använd något annat alternativ. I annat fall avges ett fellarm om lågtrycksbrytaren inte är ansluten.

Denna funktion är endast tillgänglig för Inl-alternativ 2, 5, 7, 9 och 12.

**STOPP**
När temperaturen i givare S1 når inställt börvärde (**SP**) avaktiveras KYL-reläet och vätskemagnetventilen stängs. Eftersom kompressorn fortsätter att arbeta sjunker trycket snabbt i förångaren. När ett inställt värde uppnås aktiveras lågtrycksbrytaren, vilket gör att status för digital ingång 1 ändras varpå kompressorn stoppas (AUX 1-relä).

Detta gör att köldmediet i högtryckskledningen isoleras från kompressorns vevhus, vilket förhindrar allvarliga fel vid start.

Om lågtrycksbrytaren slutar fungera stoppar regulatorn kompressorn när säkerhetsintervallet som definierats i **C20** har förflutit och meddelandet "**Pd**" visas (ett informationsmeddelande som inte påverkar enhetens drift).

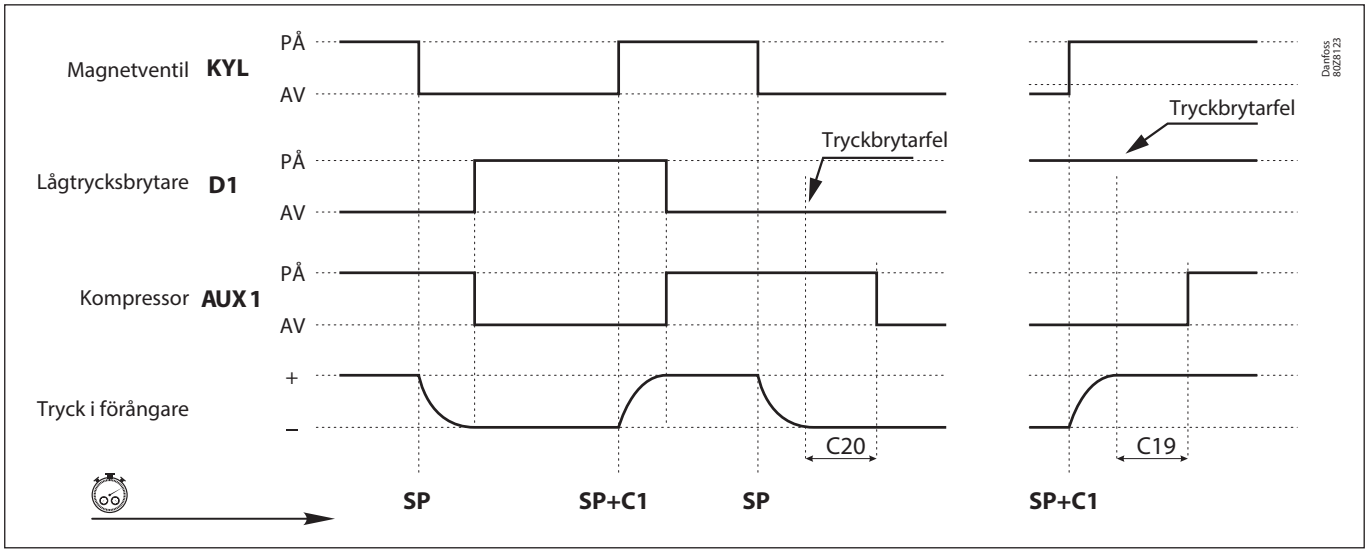
Om tiden för **C20** är 0 (standardvärde) kommer kompressorn inte att stoppas förrän lågtrycksbrytaren aktiveras, och meddelandet "**Pd**" visas efter 15 minuter.

**START**
När temperaturen i givare S1 når börvärdet plus differensen (**SP+C1**) aktiveras KYL-reläet och vätskemagnetventilen öppnas. Detta gör att trycket i förångaren ökar vilket i sin tur gör att lågtrycksbrytaren avaktiveras varpå kompressorn startar.

Om lågtrycksbrytaren inte avaktiveras en stund efter att vätskemagnetventilen har öppnats (fastställs av **C19**) stänger regulatorn magnetventilen igen (KYL-reläet ställs in på PÅ) och meddelandet "LP" visas. Denna åtgärd upprepas oavbrutet varannan minut tills pressostaten avaktiveras och anläggningen återgår till normal drift.

Om tiden för **C19** är 0 (standardvärde) förblir magnetventilen öppen tills lågtrycksbrytaren avaktiveras, meddelandet "LP" visas efter fem minuter.

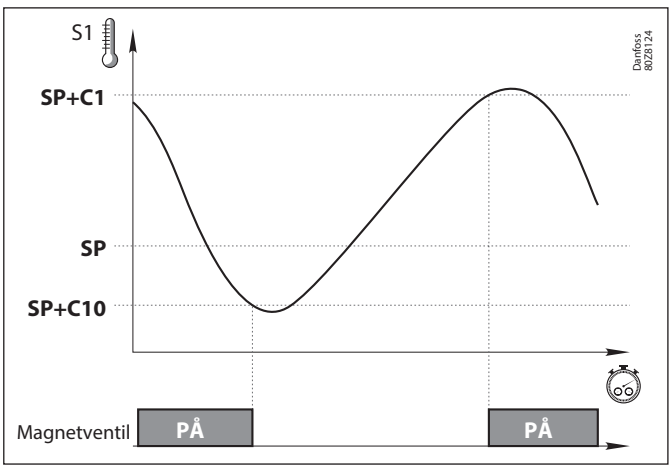
**STANDBY**
Om pumpdownfunktionen har aktiverats kan det dröja ett tag från det att standbyfunktionen aktiveras tills regulatorn stoppas. Detta sker på grund av att vissa installationskontrollfaser inte kan avbrytas.
För att tvångsstoppa regulatorn trycker du på Standbyknappen igen i tre sekunder.




**Läge för kontinuerlig cykel**
Detta läge används för snabbkylning av kylrummen innan produkter lastas och aktiveras genom att man trycker på knappen ↻ i tre sekunder.

När detta läge aktiveras börjar kompressorn arbeta tills temperaturen i givare S1 når börvärdet, minus den differens som anges i parameter **C10**. Värdet för **C10** är alltid negativt, såvida det inte är 0.

Enheten återgår omedelbart till normal drift. Om börvärdet inte kan nås återgår enheten till normal drift när den tid som konfigurerats i **C9** har förflutit, eller genom att man trycker på knappen ↻ igen i fem sekunder.





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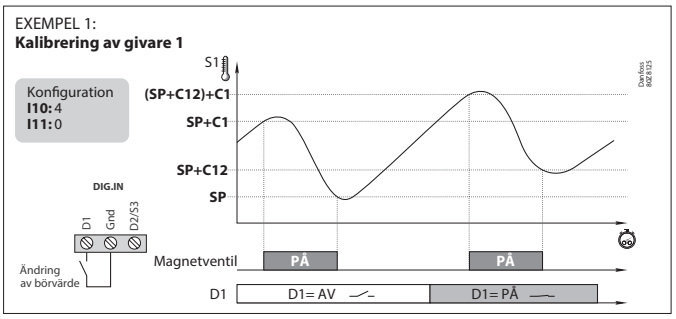
### Läge för ändring av börvärde

Detta läge möjliggör snabb växling mellan två arbetstemperaturer i kylrummet, börvärdet ändras i enlighet med värdet som angetts i parameter **C12**. Detta värde kan vara negativt eller positivt, beroende på om börvärdet ska minskas eller ökas. Om värdet är inställt på 0 är läget avaktiverat.

Läget kan aktiveras på följande sätt:

- Med hjälp av en extern brytare som ansluts till en av de digitala ingångarna. Den digitala ingången ska konfigureras som "Ändring av börvärde (**I10** eller **I20**= 4)". Aktivering med denna metod avbryter alla andra aktiveringar och kan endast avaktiveras med samma metod.

Parameter **C0** möjliggör korrigering av den temperatur som detekteras av givare 1. Detta är särskilt användbart när givaren inte kan placeras på optimal plats.



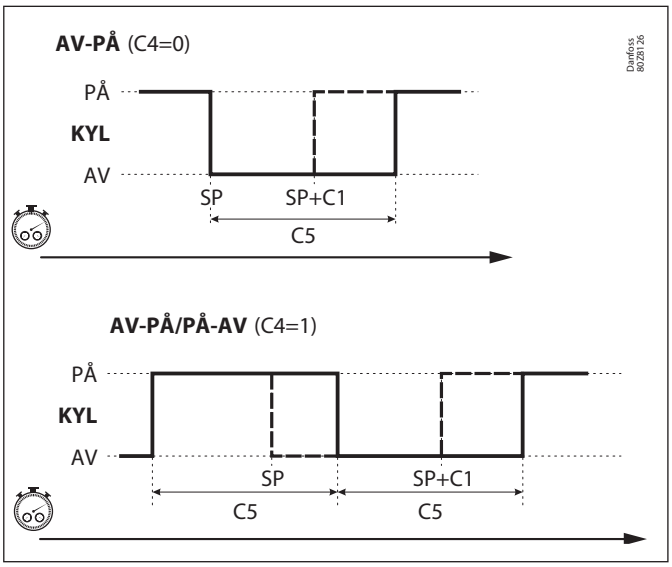

### Låsning av börvärde

Med parametrarna **C2** och **C3** kan en övre och nedre gräns fastställas för börvärdet (**SP**). Detta för att produkten eller installationen ska skyddas mot oavsiktlig ändring av börvärdet.

### Tidsinställningar för kompressorskydd

Parameter **C4** gör det möjligt att välja vilken typ av tidsinställning som ska användas för skydd av kompressorn. Dessa tidsfördröjningar förhindrar för täta start och stopp av kompressorn.

Dessa tidsinställningar påverkar reläerna KYLA och AUX 1 (om o00=1)
**AV-PÅ** (C4=0): Minsta tid i AV-läge före varje start.
**AV-PÅ/PÅ-AV** (C4=1): Minsta tid i läge PÅ och AV för varje cykel. Fördröjningstiden definieras med hjälp av parameter **C5**.
Om **C5**=0, tidsinställning är avaktiverad.

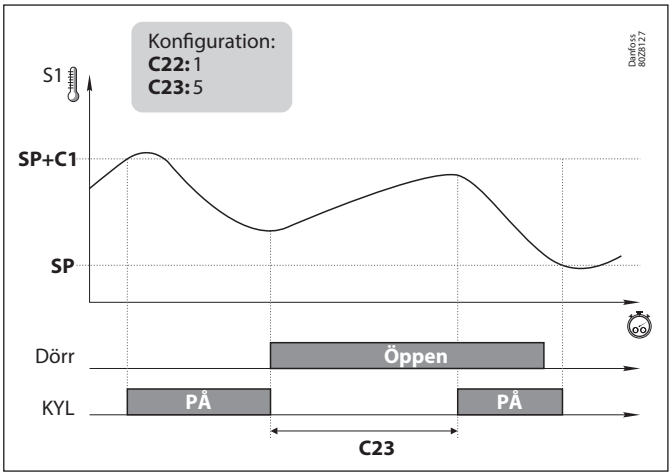



## 8.2 Dörrhantering

Dörrhantering möjliggör reglering av installationens beteende om kylrumsdörren öppnas via parametrarna **C22** och **C23**.

Parameter **C22** definierar huruvida kylningen ska stoppas om dörren öppnas. Om **C22**=1 när dörren öppnas stoppas fläktarna och 15 sekunder senare stängs magnetventilen (KYL-relä).

Parameter **C23** definierar maxtid i minuter som kylan får vara avstängd medan dörren är öppen. Om **C23**=0 sker ingen kylning när dörren är öppen.




### Hantering av dörrvärme

Om börvärdet är lika med eller lägre än -4°C och AUX 2-reläet har konfigurerats som "dörrvärme" (**o10**=4), aktiveras värmetråden (relä PÅ) när kylrummets temperatur sjunker under -3°C och avaktiveras (relä AV) när 0°C nås.

## 8.3 Avfrostning

### Avfrostningstyper

Det finns fem avfrostningstyper, beroende på vilket alternativ som valts i wizarden (Inl):

**Elektrisk** (**Inl**=1, 2 och 3) (**d7**=0)

Avfrostning sker med hjälp av elektriska värmestavar som levererar värme till förångaren. I detta läge styrs fläktarnas drift av parameter **F3**, kompressorn och magnetventilen stoppas.

**Med hjälp av luft** (**Inl**=4, 5 och 6) (**d7**=1)

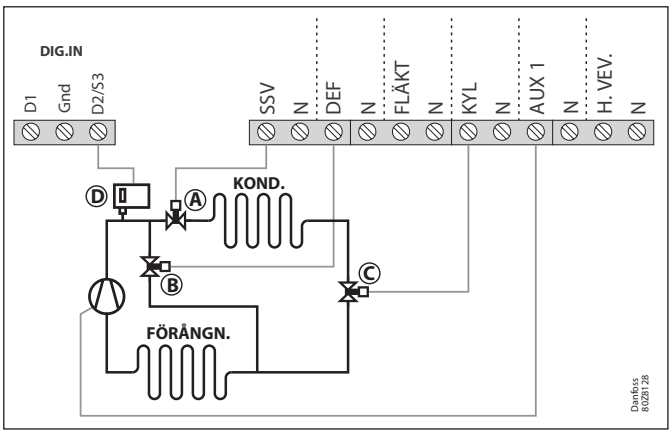
Används vanligtvis i kylrum med något högre temperaturbörvärde (>4°C), eftersom kylrummets inre temperatur är tillräcklig för att is från förångaren ska smälta. Fläktarna aktiveras som standard så att luft kan cirkulera genom förångaren. För att stoppa dem ändrar du parameter F3 till 0. Kompressorn och magnetventilen stoppas.

**Statisk** (**Inl**=11, 12 och 13)

I denna typ av installation finns inga förångarfläktar och avfrostning utförs genom att kylningen stoppas.

**Med hjälp av hetgas** (**Inl**=7 och 8) (**d7**=2)

Hetgas från kompressorns utlopp används för att smälta is från förångaren, för detta krävs två ventiler: en vid kondensorns ingång (A) (SSV-relä) och en annan mellan kompressorns utgång och förångarens ingång (B) (DEF-relä).




Under processen stängs vätskemagnetventilen (C) och kondensoringångens magnetventil, och förångarinloppets magnetventil öppnas, vilket gör att hetgas tvingas passera genom förångarinloppets ventil så att isen smälter.

Som tillval kan en högtrycksbrytare (D) installeras för reglering av magnetventilen (digital ingång D2, **I20**=9) under avfrostning med hetgas. Om trycket sjunker öppnas magnetventilen så att vätska släpps in i tanken. När trycket stiger igen stängs magnetventilen.

---

**Omvänd cykel** (**Inl**=9 och 10) (**d7**=3)

En fyrvägsventil används för invertering av kylningscykeln så att förångaren används som kondensor för smältning av isen. Processen startar genom att kylprocessen stoppas (om den är aktiv). Om pumpdown är aktiv startar avfrostningen när åtgärden har slutförts.

Sedan aktiveras fyrvägsventilen (DEF-relä PÅ), magnetventilen (KYL-relä PÅ) och kompressorn (AUX 1 PÅ) och avfrostning startar. Räkning av tiden för D1 börjar när KYL-reläet har aktiverats.

När avfrostningen är klar kan åtgärden stoppas på två sätt:

- Pumpdown aktiv (Inl=9): Magnetventilen stängs (KYL-relä AV) och fyrvägsventilen återgår till sitt utgångsläge (DEF-relä AV) medan kompressorn fortsätter att arbeta (AUX 1-relä PÅ) tills lågtrycksbrytaren aktiveras, varpå kompressorn stoppas (AUX 1-relä AV) och avdroppningstiden startar.
- Utan pumpdown (Inl=10): Magnetventilen stängs (KYL-relä AV) och fyrvägsventilen återgår till sitt utgångsläge (DEF-relä AV) varpå kompressorn stoppas (AUX 1-relä AV) och avdroppnings-tiden startar.

---

## 8.4 Reglering av avfrostning

### Avfrostningsstart

Avfrostning startar om:

- Den tid som programmerats i parameter **d0** har förflutit sedan den senaste avfrostningen startades.
- Tryck på knappen i tre sekunder.
- Med hjälp av en extern tryckknapp (**I10** / **I11**=5).

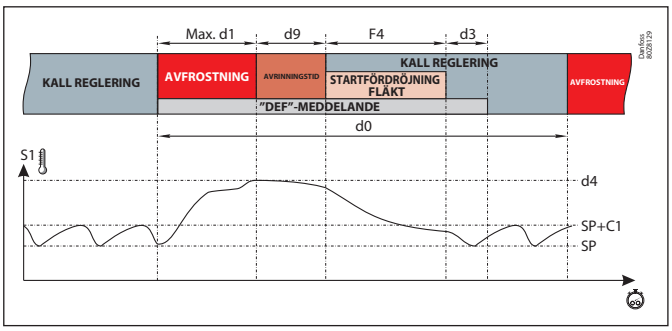
### Avbryta avfrostning

Avfrostning avbryts om:

- Temperaturen som programmerats i parameter **d4** har uppnåtts i givare 2. För detta krävs att en andra givare (**I00**=2) finns tillgänglig i förångaren.
- Tiden som har konfigurerats i parameter **d1** har förflutit (max. varaktighet för avfrostning).
- Knappen trycks in i fem sekunder.
- Med hjälp av en extern tryckknapp (**I10** / **I11**=5).

### Avrinningstid

Avrinningstiden fastställs av parameter **d9** och innebär inställning av tiden som läggs till i slutet av avfrostningen för att överskottsvatten ska avlägsnas från smält förångaris. Under denna tid sker ingen kylning.





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**Fördröjning av fläktstart**
Fördröjningen fastställs av parameter **F4** och gör att eventuella droppar som finns kvar i förångaren kan frysa till innan fläktarna aktiveras, vilket förhindrar att de hamnar i kylrummet. Detta förhindrar även att värme överförs till kylrummet till följd av avfrostning i förångaren.

**Obs!** Om avfrostningen avbryts innan 1 minut har löpt ut tillämpas inte avdroppningstiden (**d9**) och fläktarna aktiveras utan att hänsyn tas till startfördröjningen (**F4**). Om avfrostning sker med hjälp av luft eller statiskt avaktiveras avrinningstiden (**d9**) och startfördröjning av fläkten (**F4**).

**Meddelande som visas under avfrostning**
Detta fastställs med parameter **d2** och du kan välja mellan att visa den faktiska temperaturen som registrerats av givare 1 (**d2**=0), den temperatur som registrerats av givare 1 vid start av avfrostningen (**d2**=1) eller visa meddelandet dEF (**d2**=2). Parameter **d3** definierar den tid under vilken ovanstående meddelande visas när avdroppningstiden (**d9**) och fläktens stopptid (**F4**) har löpt ut.

**Fjärrstyrd avfrostning**
Med den här funktionen kan avfrostning av enheten aktiveras med en extern knapp som ansluts till en av de digitala ingångarna som ska konfigureras som fjärrstyrd avfrostning (**I10** eller **I20**=5).

**Blockering av avfrostning**
Detta förhindrar att avfrostning startar vid olämpliga tidpunkter med hjälp av en extern brytare. Detta kan vara praktiskt om man vill säkerställa att belastningen på installationen inte ökar för mycket så att tillåtna gränser överskrids.

Den externa brytaren måste anslutas till en av de digitala ingångarna, som ska konfigureras som ”Blockering av avfrostning” (**I10** eller **I20**=6).

**Avfrostning av en andra förångare**
Denna funktion möjliggör reglering av avfrostning i en andra förångare, förutsatt att avfrostning sker med hjälp av elvärme, luft eller statiskt. Samma typ av avfrostning ska användas för den första och andra förångaren.

För detta krävs att ingång 2 konfigureras som andra förångargivare (**I20**=8). Vid fel på den andra förångargivaren avslutas avfrostningen när den tid som definierats i **d1** har löpt ut.

*Elektrisk avfrostning*
För detta krävs konfiguration av relä AUX 2 som avfrostning av en andra förångare (**o10**=5).

Avfrostning startar samtidigt i båda förångarna. När förångargivare 1 når den temperatur som definierats i **d4** avaktiveras DEF-reläet och avfrostning av förångare 1 avslutas. Avfrostning av förångare 2 avslutas när förångargivare 2 når den temperatur som definierats i **d4**. Avrinningstiden startar när båda avfrostningarna har avslutats.

*Avfrostning med hjälp av luft*
Fläktarna för båda förångarna är parallellkopplade till FLÄKT-reläet. Avfrostning startar samtidigt i båda förångarna och avslutas inte förrän båda givarna når den temperatur som definierats i **d4**. Därefter startar avrinningstiden.

*Statisk avfrostning*
Avfrostning startar samtidigt i båda förångarna och avslutas inte förrän båda givarna når den temperatur som definierats i **d4**. Därefter startar avrinningstiden.

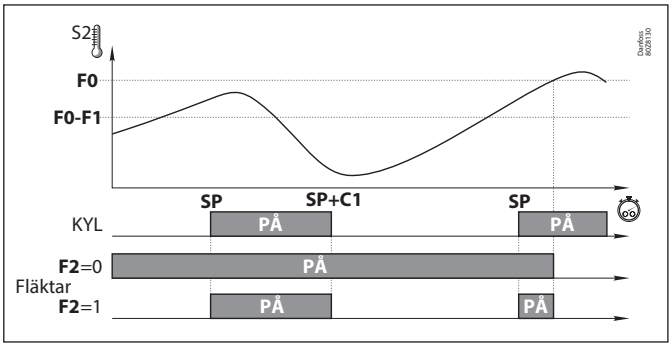
**Övriga parametrar**
Med parameter **d5** kan du konfigurera huruvida enheten ska utföra en avfrostning (**d5**=1) eller inte (**d5**=0) vid strömtillförsel (första uppstart eller efter ett strömförsörjningsfel). Om du väljer alternativet JA (**d5**=1) startar avfrostningen när fördröjningstiden som definierats i **d6** har löpt ut.

Med hjälp av parameter **d8** definierar du den tid som fastställts i **d0** och väljer mellan total förfluten tid (**d8**=0) eller summan av kompressorns drifttid (**d8**=1).

**Anmärkning:** Om parameter **d1** är inställd på 0 utförs ingen avfrostning.

## 8.5 Fläktreglering

Reglering av fläktarna sker via givare 2 (förångare) och parametrarna **F0** (stopptemperatur) och **F1** (givardifferens). Om givare 2 inte är ansluten eller om ett fel detekteras i givaren (**E2**) körs fläktarna kontinuerligt utan att hänsyn tas till parametrarna **F0** och **F1**. Hänsyn tas dock till de övriga parametrarna (**F2** till **F4**). Med parameter **F2** definieras status för fläktarna när kompressorn stoppas. Med parameter **F3** definieras fläktarnas status under avfrostning.
Med parameter **F4** definieras fläktens startfördröjningstid efter avfrostning. Med parameter **C22** definieras huruvida fläktarna ska stoppas när dörren öppnas.



## 8.6 Larm

Enheten avger en varning genom ett meddelande på skärmen, aktivering av ett relä (endast enheter med fem reläer om o10=1 eller enheter med fyra reläer om **o00**=4) och ett ljudlarm när kriterierna som programmerats i parametrarna har uppfyllts.

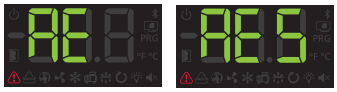
**Larm för högsta/lägsta temperatur**
Meddelandet "**AH**" eller "**AL**" visas när temperaturen i givare 1 når det värde som konfigurerats i parametrarna **A1** (max. temperatur) och **A2** (min. temperatur).

Detta värde kan vara:
- Absolut (**A0**=1): Temperaturen vid vilken larmet ska aktiveras måste anges i **A1/A2**.
- I förhållande till börvärdet (SP) (**A0**=0): Ökning eller minskning av antalet grader som krävs för att larmet ska aktiveras i förhållande till börvärdet ska anges i **A1/A2**. Det här alternativet gör att man kan ändra börvärdet utan att behöva återställa max.- och min.-larmen.

Med parameter **A10** fastställs differensen mellan de båda parametrarna (hysteres).

**Obs!** I en regulator konfigureras följande parametrar:
**SP**=2, **A1**=10, **A10**=2
- Om **A0**=0 (i förhållande till börvärdet ((SP) aktiveras larmet för maxtemperatur när 12 grader nås i givare 1 och avaktiveras när 10 grader nås.
- Om **A0**=1 (absolut) aktiveras larmet för maxtemperatur när 10 grader nås i givare 1 och avaktiveras när 8 grader nås.

**Externt larm/allvarligt externt larm**




Meddelandet **AE** (externt larm) eller **AES** (allvarligt externt larm) visas när den digitala ingången som har konfigurerats som externt larm eller allvarligt externt larm aktiveras.

Det allvarliga externa larmet gör att alla laster avaktiveras och därmed stoppas temperaturregleringen. När larmet försvinner återgår enheten till normal drift.

Minst en av de digitala ingångarna måste konfigureras som ett externt larm (**I10** eller **I20**=2) eller som ett allvarligt externt larm (**I10** eller **I20**=3).

**Larm för givarfel**




Om en av de aktiverade givarna kortsluts, får avbrott eller hamnar utanför intervallet, visas meddelandet E1, E2 eller E3 visas beroende på om det gäller givare S1, S2 eller S3.

**Larm om fel på förångargivare till följd av fuktinträngning**




Om temperaturen i givare S2 är 20°C högre än temperaturen i givare S1 när avfrostningen startar ignorerar regulatorn givare S2 och avfrostningen avslutas istället baserat på avfrostningstiden.

Displayen visar meddelandet **E2**, larmreläet aktiveras och ett larm ljuder.

Det går att tysta larmet men larmikonen **B** försvinner inte förrän:
- Regulatorn slås från och slås sedan på igen.
- Avfrostning utan fel startas i givare **S2**.

Om den andra förångargivaren (**I20**=8) har aktiverats kommer den att bete sig på liknande sätt, men istället kommer meddelandet **E3** att visas.

**Larm för öppen dörr**




Dörren har varit öppen under längre tid än vad som definierats i parameter **A12** och larmet för öppen dörr aktiveras.

För detektering av öppen dörr krävs att en av de digitala ingångarna konfigureras som "dörrkontakt" (**I10** eller **I20**=1).

Larmrelä och ljudlarm aktiveras.

**HACCP-larm**




Larmet aktiveras i situationer som kan äventyra produktsäkerheten hos de produkter som förvaras i kylrummet.

Om kylrummets temperatur är högre än den som definierats i parameter **h1** under en längre tid än den som definierats i parameter **h2**, aktiveras larmet och meddelandet HCP visas på skärmen.

När du trycker på mute-knappen stängs ljudet av, men larmet kvarstår.

Larmet försvinner när temperaturen sjunker under parametern **h1**, om mute-knappen har tryckts in. Om mute-knappen inte har tryckts in avaktiveras det akustiska larmet men HACCP-indikatorn fortsätter att blinka, vilket innebär att ett obekräftat HACCP-larm har avgetts.

Tryck på mute-knappen för att bekräfta HACCP-larmet.

Om ett HACCP-larm avges under ett strömavbrott, avges HACCP-larmet igen när strömmen kommer tillbaka och displayen visar meddelandena HCP och PF (strömavbrott) växelvis.

**Larmfördröjning**
Larmfördröjning förhindrar att vissa larm visas så att anläggningen kan återgå till normal drift efter vissa händelser.
- Fördröjning vid start (A3): Detta fördröjer aktivering av temperaturlarm vid strömtillförsel (vid start eller efter strömavbrott) eller när standbyläget lämnas. På så sätt kan installationen startas utan larm.
- Fördröjning efter avfrostning (A4): Detta fördröjer aktivering av temperaturlarm när en avfrostning avslutas.
- Fördröjning till min- och maxtemperaturlarm (A5): Detta fördröjer aktivering av max-(A1) och min.temperaturlarmen (A2) från det att temperaturen i givare 1 når det programmerade värdet.
- Fördröjning till aktivering av externt larm (A6): Detta fördröjer aktivering av det externa larmet från det att den digitala ingången aktiveras.
- Fördröjning till avaktivering av externt larm (A7): Detta fördröjer avaktivering av det externa larmet från det att den digitala ingången aktiveras.
- Fördröjning till larm för öppen dörr (A12): Detta fördröjer aktivering av larmet när en öppen dörr detekteras.


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**Konfiguration av larmrelä**
Om ett relä har konfigurerats som larmrelä kan du med hjälp av parameter **A9** definiera reläets status när ett larm utlöses:

- **A9**=0 Relä aktiverat (PÅ) vid larm (AV utan larm)
- **A9**=1 Relä avaktiverat (AV) vid larm (PÅ utan larm)

## 8.7 Aviseringar

Enheten avger en varning genom ett meddelande på skärmen vid händelser som kräver användarens uppmärksamhet. Det akustiska larmet eller larmreläet (om det är aktivt) aktiveras dock inte.

**Larm max avfrostningstid**




Meddelandet **Adt** visas när en avfrostning har slutförts på grund av timeout, om parameter **A8**=1.

**Pumpdownfel (stopp)**




Meddelandet **Pd** visas om ett fel upptäcks när kylsystemet stoppas med hjälp av pumpdownfunktionen. (Se sidan 8).

**Pumpdownfel (uppstart)**




Meddelandet **LP** visas om ett fel upptäcks när kylningscykeln startas med hjälp av pumpdownfunktionen. (Se sidan 8).

## 8.8 Belysningsreglering

Relä AUX 1 eller AUX 2 måste konfigureras som ”Belysning” (**o00** eller **o10**=2).

Reglering av belysningen sker via:

Tryckknappen : En tryckning gör att belysningen tänds eller släcks.

Kylrumsdörren: När dörren öppnas förblir belysningen tänd under den tid som definieras av parameter **b01**. Om värdet är 0 släcks belysningen när dörren stängs. (En av de digitala ingångarna måste konfigureras som dörrkontakt (**I10** eller **I20**=1).

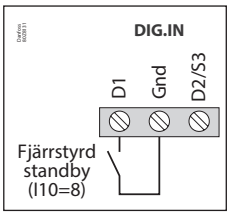
Reglering sker även när utrustningen är i standbyläge.

## 8.9 Lösenord




Enhetens konfiguration skyddas med en 2-siffrig kod (från 01 till 99). Om läget är aktivt efterfrågas en kod när du försöker komma åt programmeringsmenyn. Denna meny går inte att komma åt om fel kod anges. Koden ställs in via parametern **PAS**. Med parameter **b10** definieras funktionen för denna kod.

## 8.10 Fjärrstyrt standbyläge




Detta gör det möjligt att aktivera standbyläget med en brytare som ansluts till en av de digitala ingångarna. Denna digitala ingång måste ställas in på Fjärraktivering av standby (**I10**=8 eller **I20**=12).

## 8.11 Användning av AUX-reläerna

Regulatorn kan vara utrustad med en eller två AUX-reläer beroende på modell. Funktionen för dessa reläer konfigureras via menyn Parametrar.

**AUX 1-relä**

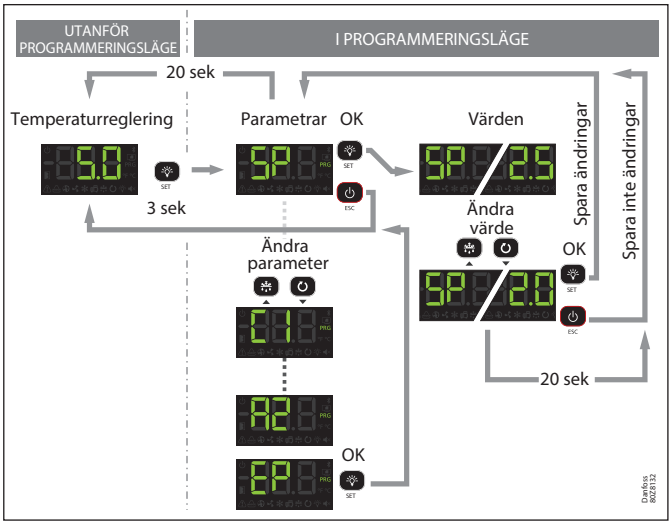
- **Avaktiverad** (**o00**=0): Reläet utför ingen funktion.
- **Kompressorer/vevhusvärmare** (**o00**=1): Reglerar kompressorns drift. När kompressorn inte är påslagen driver reläet vevhusvärmaren. Denna funktion kan endast väljas via wizarden (Inl).
- **Belysning** (**o00**=2): Denna funktion reglerar kylrummets belysning.

**AUX 2-relä**

- **Avaktiverat** (**o10**=0): Reläet utför ingen funktion.
- **Larm** (**o10**=1): Detta aktiverar reläet varje gång ett larm avges.
- **Belysning** (**o10**=2): Denna funktion reglerar kylrummets belysning.
- **Dörrvärme** (**o10**=4): Denna funktion reglerar rummets dörrvärme.
- **Avfrostning 2:a förångare** (**o10**=5): Reglering av värmestavar för avfrostning av en andra förångare.
- **Samma status som magnetventil** (**o10**=6): Indikerar magnetventilens status: aktiverad om magnetventilen är i läget PÅ, avaktiverad om magnetventilen är i läget AV.
- **Samma status som enheten** (**o10**=7): Indikerar enhetens status: aktiverad om enheten är i läget PÅ, avaktiverad om enheten är i läget Standby.

## 9. Konfiguration

**Komprimerad programmeringsmeny**
Denna funktion möjliggör snabb konfigurering av de vanligaste parametrarna. Tryck på knappen **SET** i tre sekunder för att komma åt menyn.




**Parametrar**

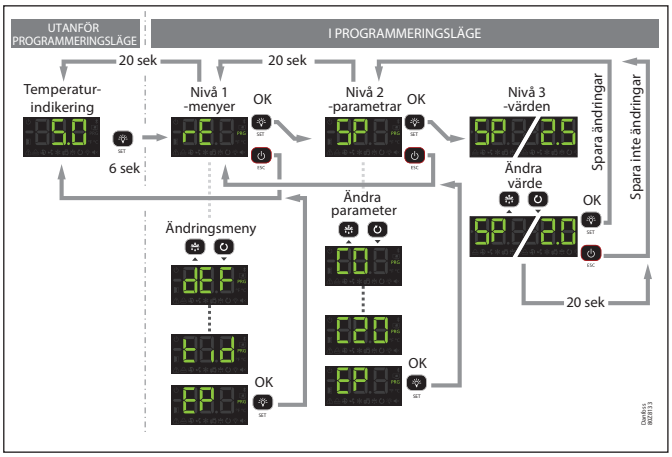
| Nivå 2 | Beskrivning | Värden | Min. | Def. | Max. |
|---|---|---|---|---|---|
| SP | Temperaturinställning (börvärde) | °C/°F | -50 | 0,0 | 99 |
| C1 | Differens för givare 1 (hysteres) | °C/°F | 0,1 | 2,0 | 20,0 |
| d0 | Avfrostningsintervall (tiden mellan två avfrostingsstarter) | H. | 0 | 6 | 96 |
| d1 | Max. avfrostningstid **(0**=Avfrostning avaktiverad) | Min. | 0 | ☒ | 255 |
| d4 | Avfrostningens stopptemperatur (från givare) (Om I00 ≠1) | °C/°F | -50 | 8,0 | 50 |
| F3 | Status för fläktarna under avfrostning **0**=Avstängda, **1**=Igång | | 0 | 0 | 1 |
| A1 | Larm för maxnivå i givare 1 (den ska vara högre än börvärdet ((SP) | °C/°F | A2 | 99 | 99 |
| A2 | Larm för miniminivå i givare 1 (den ska vara lägre än börvärdet ((SP) | °C/°F | -50 | -50 | A1 |

**Utökad programmeringsmeny**

Använd den utökade programmeringsmenyn för att konfigurera enhetens parametrar så att den anpassas till dina installationskrav. Tryck på knappen **SET** i sex sekunder för att komma åt menyn.

**Viktigt:**

- Om lösenordsfunktionen har konfigurerats som knappsatslåsning (**b10**=2) eller som åtkomst till parameterblockering (**b10**=1) blir du ombedd att ange lösenordet som programmerats i **PAS** när du försöker komma åt någon av de båda funktionerna. Om det angivna lösenordet är felaktigt går enheten tillbaka till visning av temperaturen.
- Vissa parametrar och menyer kanske inte visas beroende på hur de övriga parametrarna har konfigurerats.





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## Reglering

| Nivå 1 | Nivå 2 | Beskrivning | Värden | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| rE | SP | Temperaturinställning (börvärde) | °C/°F | -50 | 0,0 | 99 |
| | C0 | Kalibrering av givare 1 (offset) | °C/°F | -20,0 | 0,0 | 20,0 |
| | C1 | Differens för givare 1 (hysteres) | °C/°F | 0,1 | 2,0 | 20,0 |
| | C2 | Börvärde, övre låsning (kan inte ställas in över detta värde) | °C/°F | C3 | 99 | 99 |
| | C3 | Börvärde nedre låsning (kan inte ställas in under detta värde) | °C/°F | -50 | -50 | C2 |
| | C4 | Typ av fördröjning för kompressorskydd:<br>**0**=Minimitid för kompressor i AV-läge<br>**1**=Minimitid för kompressor i AV- och PÅ-läge i varje cykel | | 0 | 0 | 1 |
| | C5 | Fördröjningstid för skydd (värde för alternativet som valts i parameter C4) | Min. | 0 | 0 | 120 |
| | C6 | Status för KYL-relä med fel i givare 1:<br>**0**=AV, **1**=PÅ, **2**=Genomsnitt baserat på de senaste 24 timmarna före givarfel<br>**3**=PÅ-AV enligt prog. C7 och C8 | | 0 | 2 | 3 |
| | C7 | Relätid i PÅ-läge vid fel på givare 1<br>(Om C7=0 och C8≠0 kommer reläet alltid att kopplas från i läget AV) | Min. | 0 | 10 | 120 |
| | C8 | Relätid i AV-läget vid fel på givare 1<br>(Om C8=0 och C7≠0 kommer reläet alltid att anslutas i läget PÅ) | Min. | 0 | 5 | 120 |
| | C9 | Maxtid i läget för kontinuerlig cykel. (**0**=Avaktiverat) | H. | 0 | 0 | 48 |
| | C10 | Variation av börvärdet (SP) i läget för kontinuerlig cykel. När detta värde nås (SP+C10) återgår driften till normalt läge. (SP+C10 ≥ C3).<br>Värdet för denna parameter är alltid negativt, såvida det inte är 0. (**0**=AV) | °C/°F | 0 | -50 | C3-SP |
| | C12 | Alternering av börvärdet (SP) när funktionen Ändra börvärde är aktiv.<br>(SP+C12 ≤ C2) (**0**=Avaktiverad) | °C/°F | C3-SP | 0,0 | C2-SP |
| | C19 | Max. starttid från pumpdown<br>(Värden mellan 1 och 9 sekunder accepteras inte) (**0**=avaktiverad) | Sek. | 0 | 0 | 120 |
| | C20 | Maxtid för pumpdown (**0**=Avaktiverad) | Min. | 0 | 0 | 15 |
| | C21 | Givare som ska visas **0**=Alla givare (sekventiell)<br>**1**=Givare 1 (rumsgivare), **2**=Givare 2 (förångare), **3**=Givare 3 (enligt I20) | | 0 | 1 | 3 |
| | C22 | Stoppa fläktar och kompressor när dörren öppnas **0**=Nej **1**=Ja | | 0 | 0 | 1 |
| | C23 | Startfördröjning för fläktar och kompressor när dörren är öppen | Min. | 0 | 0 | 999 |
| | C27 | Kalibrering av givare 3 (offset) | °C/°F | -20,0 | 0,0 | 20,0 |
| | EP | Gå tillbaka till nivå 1 | | | | |

## Avfrostning

| Nivå 1 | Nivå 2 | Beskrivning | Värden | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| dEF | d0 | Avfrostningsintervall (tiden mellan två avfrostingsstarter) | H. | 0 | 6 | 96 |
| | d1 | Max. avfrostningstid **(0**=Avfrostning avaktiverad) | Min. | 0 | * | 255 |
| | d2 | Typ av meddelande under avfrostning:<br>**0**=Visar den faktiska temperaturen, **1**=Visar temperaturen när avfrostningen startade, **2**=Visar dEF-meddelandet | | 0 | 2 | 2 |
| | d3 | Maxtid för meddelandet<br>(Tid som läggs till i slutet av avfrostningen) | Min. | 0 | 5 | 255 |
| | d4 | Uppnådd avfrostningstemperatur (från givare) (Om I00 ≠ 1) | °C/°F | -50 | 8,0 | 50 |
| | d5 | Avfrostning vid spänningssättning av enheten:<br>**0**=NEJ Första avfrostning enligt d0, **1**=JA, Första avfrostning enligt d6 | | 0 | 0 | 1 |
| | d6 | Fördröjning av avfrostningsstart vid spänningssättning av enheten | Min. | 0 | 0 | 255 |
| | d7** | Typ av avfrostning:<br>**0**=Värmestavar, **1**=Luft/fläktar, **2**=Hetgas, **3**=Reverserad cykel | | 0 | * | 3 |
| | d8 | Tidsräkning mellan avfrostningar:<br>**0**=Total realtid, **1**=Summa av tiden som kompressorn har varit aktiv | | 0 | 0 | 1 |
| | d9 | Avrinningstid när avfrostning avslutas (kompressor och fläktar stängs av) | Min. | 0 | 1 | 255 |
| | EP | Gå tillbaka till nivå 1 | | | | |

* Enligt wizard.
** Kan endast modifieras med hjälp av wizard (InI).

### Förångarfläktar

| Nivå 1 | Nivå 2 | Beskrivning | Värden | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| Fläkt | F0 | Avstängningstemperatur för fläktarna | °C/°F | -50 | 45 | 122 |
| | F1 | Differens för givare 2 om fläktarna är avstängda | °C/°F | 0,1 | 2,0 | 36 |
| | F2 | Slå från fläktarna när kompressorn stängs av **0**=Nej, **1**=Ja | | 0 | 0 | 1 |
| | F3 | Status för fläktarna under avfrostning **0**=Avstängda, **1**=Igång | | 0 | 0 | 1 |
| | F4 | Fördröjning av start efter avfrostning (om F3=0)<br>Aktiveras endast om högre än **d9** | Min. | 0 | 2 | 99 |
| | EP | Gå tillbaka till nivå 1 | | | | |

### Larm

| Nivå 1 | Nivå 2 | Beskrivning | Värden | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| AL | A0 | Konfiguration av temperaturlarm<br>**0**=I förhållande till börvärdet ((SP) **1**=Absolut | | 0 | 1 | 1 |
| | A1 | Larm för maxnivå i givare 1 (den ska vara högre än börvärdet ((SP) | °C/°F | A2 | 99 | 99 |
| | A2 | Larm för miniminivå i givare 1 (den ska vara lägre än börvärdet ((SP) | °C/°F | -50 | -50 | A1 |
| | A3 | Fördröjning av temperaturlarm vid uppstart | Min. | 0 | 0 | 120 |
| | A4 | Fördröjning av temperaturlarm från det att avfrostningen avslutas | Min. | 0 | 0 | 99 |
| | A5 | Fördröjning av temperaturlarm från det att värdet **A1** eller **A2** har nåtts | | 0 | 30 | 99 |
| | A6 | Fördröjning av externt larm/allvarligt externt larm vid mottagning av en signal i digital ingång (**I10** eller **I20**=2 eller 3) | Min. | 0 | 0 | 120 |
| | A7 | Fördröjning av avaktivering av externt larm/allvarligt externt larm när signalen i den digitala ingången försvinner (**I10** eller **I20**=2 eller 3) | Min. | 0 | 0 | 120 |
| | A8 | Visa varning om avfrostningen avslutas p.g.a. maxtid, **0**=Nej, **1**=Ja | | 0 | 0 | 1 |
| | A9 | Relälarm, polaritet<br>**0**=Relä PÅ vid larm (AV utan larm), **1**=Relä AV vid larm (PÅ utan larm) | | 0 | 0 | 1 |
| | A10 | Differens för temperaturlarm (**A1** och **A2**) | °C/°F | 0,1 | 1,0 | 20,0 |
| | A12 | Fördröjning av larm för öppen dörr (om **I10** eller **I20**=1) | Min. | 0 | 10 | 120 |
| | EP | Gå tillbaka till nivå 1 | | | | |

### Grundläggande konfiguration

| Nivå 1 | Nivå 2 | Beskrivning | Värden | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| bcn | b00 | Fördröjning av alla funktioner vid strömtillförsel | Min. | 0 | 0 | 255 |
| | b01 | Tidsinställning för kylrumsbelysning | Min. | 0 | 0 | 999 |
| | b10 | Lösenordsfunktion<br>**0**=Avaktiverad, **1**=Blockera åtkomst till parametrar, **2**=Blockera knappsats | | 0 | 0 | 2 |
| | PAS | Åtkomstkod (lösenord) | | 0 | 0 | 99 |
| | b20 | MODbus-adress | | 0 | 0 | 247 |
| | b21 | Baudrate:<br>**0**=9600 bps, **1**=19200 bps, **2**=38400 bps, **3**=57600 bps | bps | 0 | 2 | 3 |
| | b22 | Akustiskt larm aktiverat: **0**=Nej, **1**=Ja | | 0 | 1 | 1 |
| | Unt | Temperaturenhet: **0**=°C, **1**=°F | | 0 | 1 | 1 |
| | EP | Gå tillbaka till nivå 1 | | | | |


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### In- och utgångar

| Nivå 1 | Nivå 2 | Beskrivning | Värden | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| In0 | I00 | Anslutna givare<br>**1**=Givare 1 (kylrum), **2**=Givare 1 (kylrum) + Givare 2 (förångare) | | 1 | 2 | 2 |
| | I10** | Konfiguration av digital utgång 1<br>**0**=Avaktiverad, **1**=Dörrkontakt, **2**=Externt larm, **3**=Allvarligt externt larm, **4**=Ändring av börvärde (SP), **5**=Fjärrstyrd avfrostning, **6**=Avfrostningsblockering, **7**=Lågtrycksbrytare, **8**=Fjärrstyrd standby | | 0 | * | 8 |
| | I11 | Polaritet för digital ingång 1<br>**0**=Aktiveras vid sluten kontakt **1**=Aktiveras vid öppen kontakt | | 0 | * | 1 |
| | I20 | Konfiguration av digital utgång 2<br>**0**=Avaktiverad, **1**=Dörrkontakt, **2**=Externt larm, **3**=Allvarligt externt larm, **4**=Ändring av börvärde (SP), **5**=Fjärrstyrd avfrostning, **6**=Avfrostningsblockering, **7**=Registrering av givare, **8**=Givare 2:a förångare, **9**=Högtrycksbrytare för hetgas, **10**=Fjärrstyrd standby | | 0 | 0 | 10 |
| | I21 | Polaritet för digital ingång 2<br>**0**=Aktiveras vid sluten kontakt **1**=Aktiveras vid öppen kontakt | | 0 | 0 | 1 |
| | O00** | Konfiguration av AUX1-reläet<br>**0**=Avaktiverad, **1**=Kompressor/Resistorsump, **2**=Belysning, **3**=Virtuell reglering, **4**=Larm (endast AK-RC 204B) | | 0 | * | 4 |
| | O10 | Konfiguration av AUX2-relä<br>**0**=Avaktiverad, **1**=Larm, **2**=Belysning, **3**=Virtuell reglering, **4**=Dörrvärme, **5**=Avfrostning 2:a förångare, **6**=Samma status som magnetventil **7**=Samma status som enhet | | 0 | 2 | 7 |
| | EP | Gå tillbaka till nivå 1 | | | | |

* Enligt wizard.
** Kan endast modifieras med hjälp av wizard (Inl).

### HACCP-larm

| Nivå 1 | Nivå 2 | Beskrivning | Värden | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| HCP | h1 | Maxtemperatur för HACCP-larm | °C/°F | -50 | 99 | 99 |
| | h2 | Maximal tillåten tid för aktivering av HACCP-larmet(**0**=Avaktiverad) | H. | 0 | 0 | 255 |
| | EP | Gå tillbaka till nivå 1 | | | | |

### Information (skrivskyddad)

| Nivå 1 | Nivå 2 | Beskrivning | Värden | Min. | Def. | Max. |
|---|---|---|---|---|---|---|
| tid | Inl | Valt alternativ i wizard | | | | |
| | Pd** | Pumpdown aktiv? **0**=Nej, **1**=Ja | | | | |
| | PU | Programversion | | | | |
| | Pr | Programrevidering | | | | |
| | bU | Bootloader-version | | | | |
| | br | Bootloader-revidering | | | | |
| | PAr | Revidering av parameterkarta | | | | |
| | EP | Gå tillbaka till nivå 1 | | | | |

** Kan endast modifieras med hjälp av wizard (Inl).

## Meddelanden

| Meddelanden | | A | R |
|---|---|---|---|
| Pd | Fel vid pumpdown (avstängning) | | |
| LP | Fel vid pumpdown (uppstart) | | |
| E1/E2/E3 | Fel på givare 1/2/3 (öppen eller korsad krets eller temperatur utanför givarens gränser) | • | • |
| Ad0 | Larm för öppen dörr. Endast om dörren förblir öppen längre än vad som anges i parameter **A12** | • | • |
| AH | Larm för maxtemperatur i regleringsgivare. Det programmerade temperaturvärdet i **A1** har uppnåtts | • | • |
| AL | Larm för min.temperatur i regleringsgivare. Det programmerade temperaturvärdet i **A2** har uppnåtts | • | • |
| AE | Externt larm aktiverat (via digital ingång) | • | • |
| AES | Allvarligt externt larm aktiverat (via digital ingång) | • | • |
| Adt | Avfrostningslarm p.g.a. timeout. Inställd tid i **d1** har överskridits | | |
| HCP | HACCP-larm. Temperaturen har nått värdet för parameter **h1** under längre tid än vad som är inställt i **h2** | • | • |
| hCP + PF | HACCP-larm på grund av strömförsörjningsfel. Temperaturen som fastställts i **h1** har uppnåtts efter ett strömförsörjningsfel | • | • |
| dEF | Indikerar att avfrostning pågår | | |
| PAS | Begäran om åtkomstkod (lösenord). Se parametrarna **b10** och **PAS** | | |
| S1 - S2 | **Visas sekventiellt med temperaturen:** Regulatorn är i demoläge, konfiguration har inte utförts. | | |

**A:** Aktiverar akustiskt larm
**R:** Aktiverar larmreläet


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## 10. Tekniska specifikationer

| Egenskaper | | Specifikationer |
|---|---|---|
| Strömtillförsel | | 230 V~ ± 10%, 50 Hz ± 5% |
| Max. ingångseffekt vid drift | | 6,3 VA |
| Max. märkström | | 15 A |
| Relä AVFROSTNING– SPDT– 20 A | NO (Normalt öppen) | EN60730-1: 15 (15) A 250 V~ |
| | NC (normalt stängd) | EN60730-1: 15 (13) A 250 V~ |
| Relä FLÄKT– SPST– 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relä KYL– SPST– 16 A | | EN60730-1: 12 (9) A 250 V~ |
| Relä AUX 1 – SPDT – 20 A | NO (Normalt öppen) | EN60730-1: 15 (15) A 250 V~ |
| | NC (normalt stängd) | EN60730-1: 15 (13) A 250 V~ |
| Relä AUX 2– SPDT– 16 A | NO (Normalt öppen) | EN60730-1: 12 (9) A 250 V~ |
| | NC (normalt stängd) | EN60730-1: 10 (8) A 250 V~ |
| Antal reläcykler | | EN60730-1: 100 000 cykler |
| Givarens temperaturområde | | -58 – +99,9 °C |
| Upplösning, inställning och differens | | 0,1 °C |
| Noggrannhet | | ±1 °C |
| Belastningstolerans för NTC-givaren vid 25 °C | | ±0,4 °C |
| Omgivningstemperatur vid drift | AK-RC 204B | -10 – +50 °C |
| | AK-RC 205C | -10 – +45 °C |
| Omgivningstemperatur vid förvaring | | -30 – +60 °C |
| Kapslingsklass | | IP65 |
| Föroreningsgrad | | II s/SS-EN 60730-1 |
| Klassificering av regleringsenhet | | Inbyggd enhet, med automatisk driftfunktion typ 1.B, för användning under rena förhållanden, logiskt stöd (programvara) klass A och kontinuerlig drift.<br><br>Dubbel isolering mellan strömtillförsel, sekundärkrets och reläutgång. |
| Temperatur vid tryckprovning | | Åtkomliga delar: 75 °C<br>Delar som placerar aktiva element: 125 °C |
| Ström för test av dämpning av radiostörningar | | 270 mA |
| Spänning och ström enligt EMC-tester | | 207 V, 17 mA |
| Typ av montering | | Fast invändig |
| MODbus-adress | | Visas på etiketten |
| Mått | | 290 mm (B) x 141 mm (H) x 84,4 mm (D) |
| Intern summer | | Ja |

## 11. Beställning

**Regulator**

| Modell | Beskrivning | Kommentarer | Artikelnummer |
|---|---|---|---|
| AK-RC 204B | AK-RC 204B gen. 2,5 O/P, enfas | Omfattar:<br>• 1 x 1,5 m, NTC 10K-givare<br>• 1 x 3 m, NTC 10K-givare | 080Z5001 |
| AK-RC 205C | AK-RC 205C gen. 2,5 O/P, enfas | | 080Z5002 |

**Tillbehör** (för reservdels- och utbytesändamål):

| Namn | Egenskaper | Antal | Artikelnummer |
|---|---|---|---|
| 3,5 m, NTC 10K-givare | Givare i termoplastiskt gummi | 1 | 084N3210 |
| 8,5 m, NTC 10K-givare | Givare i termoplastiskt gummi | 50 | 084N3208 |
| 1,5 m, NTC 10K-givare | Givare i rostfritt stål | 150 | 084N3200 |

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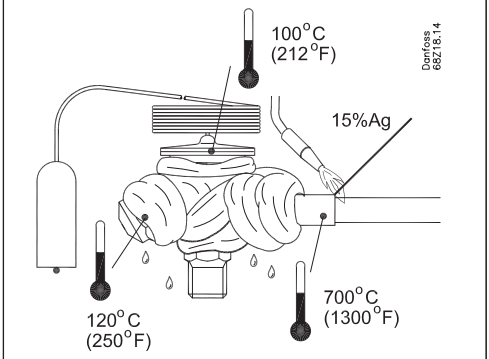
**Installation guide**

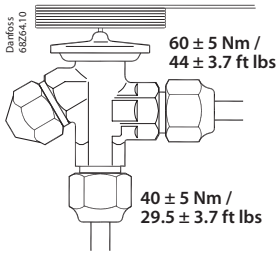
# Thermostatic expansion valve

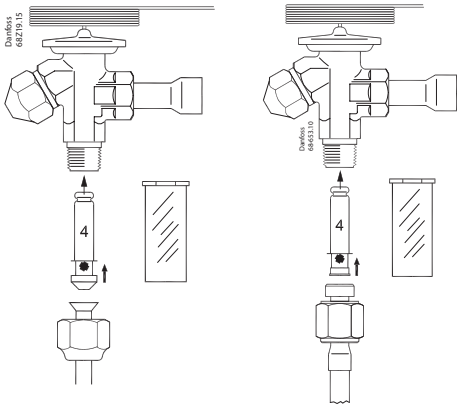
## Type T 2 / TE 2

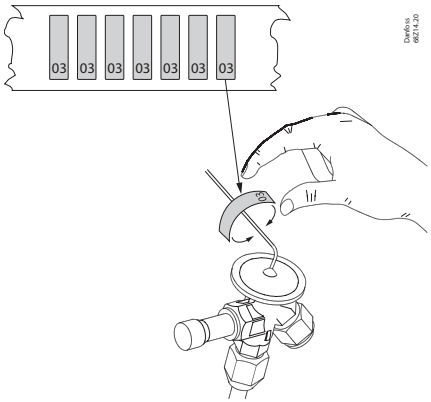
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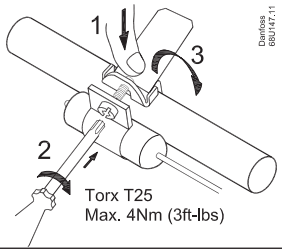
| **Refrigerant:** See product label | **Max. working pressure:** PS / MWP: 34 bar / 500 psig | **Max. test pressure** $P_{test}$ = 37.5 bar / 544 psig |
|---|---|---|

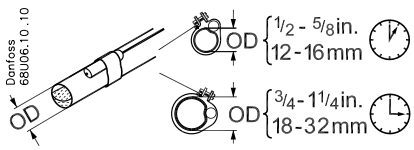


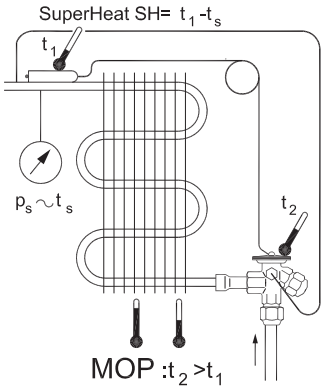



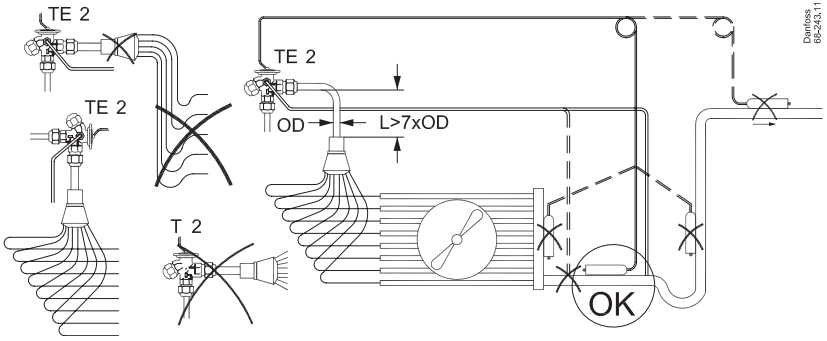



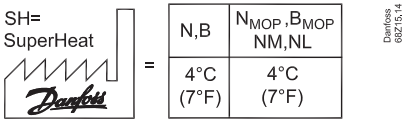



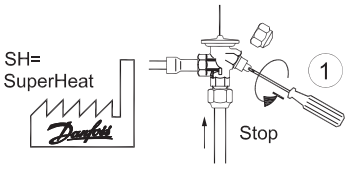



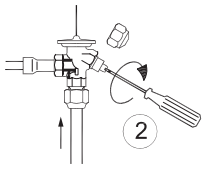





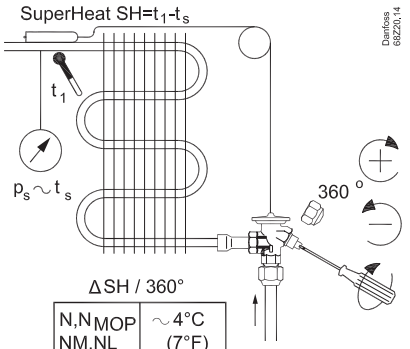




| N,B | $N_{MOP}$, $B_{MOP}$ NM,NL |
|---|---|
| ~2-3 x 360° | ~1,5 - 2 x 360° |




| N,$N_{MOP}$ NM,NL | ~4°C (7°F) |
|---|---|
| B,$B_{MOP}$ | ~ 8°C (14°F) |

**Temperature ranges:**

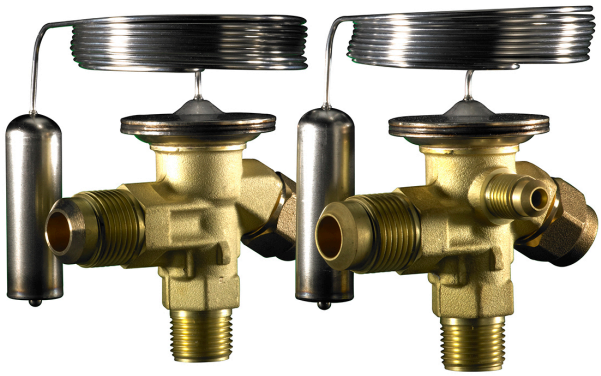
N = -40 – 10 °C / -40 – 60 °F
NM = -40 – -5 °C / -40 – 25 °F
NL = -40 – -15 °C / -40 – 5 °F
B = -60 – -25 °C / -75 – -15 °F

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Data Sheet

# Thermostatic expansion valve Type **T 2** and **TE 2**

Thermostatic expansion valves maintain a constant superheat level at the evaporator outlet



Thermostatic expansion valves regulate the injection of refrigerant liquid into evaporators.

Injection is controlled by the refrigerant superheat.

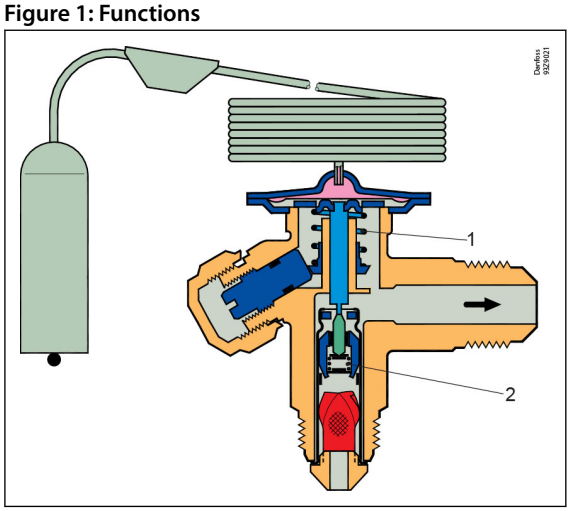
Therefore the valves are especially suitable for liquid injection in "dry" evaporators where the superheat at the evaporator outlet is proportional to the evaporator load.

## Features

- Large temperature range
  - Equally applicable to freezing, refrigeration and air conditioning applications.
- Interchangeable orifice assembly
  - easy storage
  - easy capacity matching
  - better service.
  - easy cleaning and replacement of filter
- Rated capacities from 1 to 20.5 kW / 0.3 to 5.8 TR for R407C
- Can be supplied with MOP (Max. Operating Pressure).
  - Protects the compressor motor against excessive evaporating pressure during normal operation
- Stainless steel bulb and Danfoss patented bulb strap
  - Fast and easy to install
  - Good temperature transfer from pipe to bulb
- Valves for special temperature ranges can be supplied
- Design protected

## Functions

**Figure 1: Functions**




| | |
|---|---|
| 1 | Element Spring |
| 2 | Orifice spring |

T2 and TE2 valves have an interchangeable orifice assembly.

The orifice assembly is suitable for all versions of valve body and refrigerants and in all evaporating temperature ranges.

The charge in the thermostatic element depends on the refrigerant and evaporating temperature range.

The valves are available with internal (T2) or external (TE2) pressure equalization.

External pressure equalization should always be used on systems with liquid distributors. The bulb gives fast and precise reaction to temperature changes in the evaporator. The bulb is fixed with a Danfoss patented bulb strap for quick, easy and reliable connection. The valves are able to withstand the effects that normally occur with hot gas defrosting.

To ensure long operating life, the valve cone and seat are made of a special alloy with particularly good wear qualities.

## Product specification

# Technical data

**Max. temperature**
Bulb, when valve is installed: 100 °C
Bulb, element not mounted: 60 °C

**Min. temperature**
T2 – TE2: -60 °C

**Max. test pressure**
PT = 38 bar

**Max. working pressure**
PS/MWP = 34 bar

**Table 1: Technical data**

| Refrigerant | Range N<br>-40 °C – 10 °C | Range NM<br>-40 °C – -5 °C | Range NL<br>-40 °C – -15 °C | Range B<br>-60 °C – -25 °C |
|---|---|---|---|---|
| | MOP-point in evaporating temperature $t_e$ and evaporating pressure $p_e$ [1] | | | |
| | 15 °C / 60 °F | 0 °C / 32 °F | -10 °C / 15 °F | -20 °C / -4 °F |
| R22 | 100 psig / 6.9 bar (abs) | 60 psig / 4.0 bar (abs) | 35 psig / 2.4 bar (abs) | 20 psig / 1.4 bar (abs) |
| R407C | 95 psig / 6.6 bar (abs) | – | – | – |
| R134a | 55 psig / 3.8 bar (abs) | 30 psig / 2.0 bar (abs) | 15 psig / 1.0 bar (abs) | – |
| R404A/R507 | 120 psig / 8.3 bar (abs) | 75 psig / 5.2 bar (abs) | 50 psig / 3.4 bar (abs) | 30 psig / 2.1 bar (abs) |

[1] Pe in bar gauge

**Superheat**
SS = static superheat
OS = opening superheat
SH = SS + OS = total superheat
$Q_{nom}$ = rated capacity
$Q_{max}$ = maximum capacity
Static superheat SS can be adjusted with setting spindle.
Standard superheat setting SS is 4K for all standard valves.
The opening superheat OS is 6 K from when opening begins to where the valve gives its rated capacity $Q_{nom}$.

**Example**
Static superheat SS = 5 K
Opening superheat OS = 6 K
Total superheat SH = 5 + 6 = 11 K

**Table 2: Range N: -40 to 50 °F**

| Orifice no. | Rated capacity in tons (TR) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R22 | R407C | R134a | R513A | R404A<br>R507 | R407A | R407F | R448A | R449A | R454C | R455A | R1234yf |
| 0X | 0.25 | 0.26 | 0.19 | 0.16 | 0.18 | 0.25 | 0.28 | 0.26 | 0.25 | 0.22 | 0.24 | 0.14 |
| 0 | 0.51 | 0.51 | 0.34 | 0.29 | 0.37 | 0.49 | 0.56 | 0.51 | 0.49 | 0.42 | 0.47 | 0.25 |
| 1 | 1 | 1 | 0.59 | 0.51 | 0.75 | 1 | 1.1 | 1 | 0.97 | 0.79 | 0.93 | 0.43 |
| 2 | 1.3 | 1.4 | 0.73 | 0.62 | 1 | 1.3 | 1.5 | 1.4 | 1.3 | 1 | 1.3 | 0.53 |
| 3 | 2.3 | 2.3 | 1.2 | 1 | 1.8 | 2.3 | 2.6 | 2.3 | 2.3 | 1.8 | 2.2 | 0.88 |
| 4 | 3.4 | 3.5 | 1.8 | 1.5 | 2.8 | 3.5 | 4.1 | 3.6 | 3.5 | 2.6 | 3.3 | 1.3 |
| 5 | 4.8 | 4.7 | 2.4 | 2 | 3.7 | 4.6 | 5.4 | 4.6 | 4.5 | 3.4 | 4.2 | 1.7 |
| 6 | 5.6 | 5.6 | 2.9 | 2.5 | 4.4 | 5.6 | 6.5 | 5.7 | 5.5 | 4.2 | 5.2 | 2.1 |

The rated capacity is based on:
Evaporating temperature te = 40 °F
Condensing temperature tc = 100 °F
Refrigerant temperature ahead of valve tl = 98 °F

**Table 3: Range N: -40 to 10 °C**

| Orifice no. | Rated capacity in kW | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R22 | R407C | R134a | R513A | R404A R507 | R407A | R407F | R448A | R449A | R454C | R455A | R1234yf |
| 0X | 0.9 | 0.92 | 0.68 | 0.58 | 0.64 | 0.88 | 1 | 0.9 | 0.88 | 0.77 | 0.86 | 0.49 |
| 0 | 1.8 | 1.8 | 1.2 | 1 | 1.3 | 1.7 | 2 | 1.8 | 1.7 | 1.5 | 1.7 | 0.87 |
| 1 | 3.5 | 3.5 | 2.1 | 1.8 | 2.6 | 3.4 | 3.9 | 3.5 | 3.4 | 2.8 | 3.3 | 1.5 |
| 2 | 4.7 | 4.8 | 2.6 | 2.2 | 3.7 | 4.7 | 5.4 | 4.8 | 4.6 | 3.6 | 4.4 | 1.8 |
| 3 | 8 | 8.1 | 4.3 | 3.7 | 6.3 | 8 | 9.2 | 8.1 | 7.9 | 6.2 | 7.6 | 3.1 |
| 4 | 12.1 | 12.4 | 6.4 | 5.4 | 9.9 | 12.4 | 14.3 | 12.6 | 12.1 | 9.3 | 11.5 | 4.6 |
| 5 | 16.7 | 16.5 | 8.4 | 6.9 | 13 | 16.3 | 19 | 16.3 | 15.7 | 11.8 | 14.7 | 5.9 |
| 6 | 19.7 | 19.7 | 10.1 | 8.6 | 15.5 | 19.6 | 22.9 | 19.8 | 19.1 | 14.8 | 18.3 | 7.3 |

The rated capacity is based on:
Evaporating temperature te = 4.4 °C
Condensing temperature tc = 38 °C
Refrigerant temperature ahead of valve tl = 37 °C

## Valve selection based on capacity calculation

As for extended capacity calculations and valve selection based on capacities and refrigerants, please refer to Coolselector®2. Rated and extended capacities are calculated with the Coolselector®2 calculation engine to ARI standards with the ASEREP equations based on laboratory measurements of selected valves.

## How to select a valve

Example:
Refrigerant = R407C
Q (capacity) = 1.1kW
Tcond (condensing temperature) = 25 °C
Tevap (evaporator temperature) = -30 °C
Tsub (subcooling temperature) = 2 K
Dpd (distributer pressure drop) = 1 bar
Q (capacity) = 1.1kW
fsub (subcooling correction factor) = 0.98
fp (distribution correction factor) = 0.96

$$\frac{Q}{fsub \times fp} = \text{selected capacity}$$

$$\frac{1.1}{0.98 \times 0.96} = 1.17 \text{ kW}$$

The selection will be: TE2 orifice 00 (1.21 kW > 1.17 kW)

**Table 4: Capacity in kW, range N -40 °C to 10 °C. Opening superheat sh= 6 K**

| Valve type | Orifice no. | Cond. temp. [°C] | Evaporating [°C] | | | |
|---|---|---|---|---|---|---|
| | | | -40 | -30 | -20 | -10 |
| T2 / TE2 | 0X | | 0.76 | 0.83 | 0.88 | 0.9 |
| T2 / TE2 | **00** | **25** | 0.99 | **1.21** | 1.42 | 1.6 |
| T2 / TE2 | 1 | | 1.41 | 1.8 | 2.27 | 2.77 |

**Table 5: Subcooling correction factor 'fsub'**

| Subcooling [K] | 2 | 4 | 10 | 15 |
|---|---|---|---|---|
| Correction factor | **0.98** | 1 | 1.07 | 1.12 |

**Table 6: Distributer correction factor 'fp' ***

| Pressure drop [bar] | | Evaporating [°C] | | | |
|---|---|---|---|---|---|
| | | -40 | -35 | -30 | -25 |
| "Pressure drop [bar]" | 0 | 1 | 1 | 1 | 1 |
| | 1 | 0.96 | 0.96 | 0.96 | 0.96 |
| | 1.5 | 0.94 | 0.94 | 0.94 | 0.94 |
| | 2 | 0.92 | 0.92 | 0.92 | 0.92 |

* Calculated at 32 °C condensing temperature

## Dimensions and weights

**Figure 2: Flare × flare (All dimentions are in mm)**

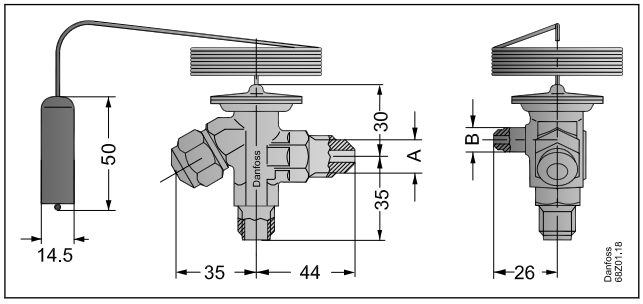



**Figure 3: Flare × solder (All dimentions are in mm)**

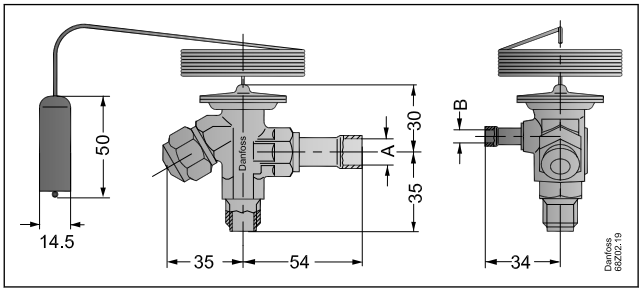



**Table 7: Dimensions and weights**

| | Outlet | Equalization | Weight |
|---|---|---|---|
| | A | B | [kg / lb] |
| Flare × flare | 1/2 " flare | 1/4 " flare | 0.3 / 0.7 |
| Flare × solder | 1/2 " solder<br>12 mm solder | 1/4 " solder<br>6 mm solder | 0.3 / 0.7 |

**Figure 4: Solder adaptor**

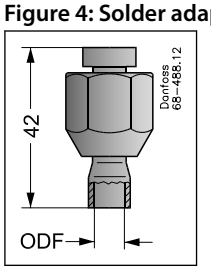
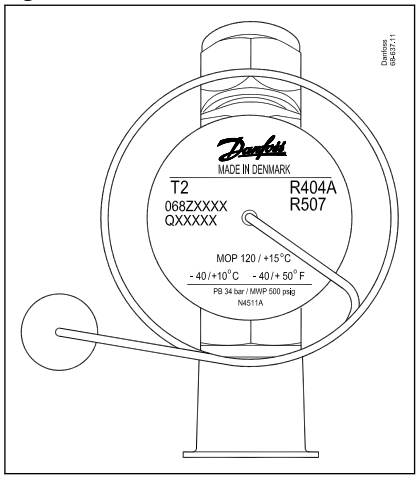



**Table 8: Solder adaptor**

| Solder ODF | | Weight |
|---|---|---|
| [in] | [mm] | [kg / lb] |
| 1/4 | 6 | 0.05 / 0.11 |
| 3/8 | 10 | 0.05 / 0.11 |

## Identification

**Figure 5: Identification**

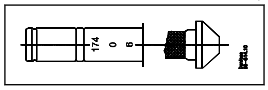



| | |
|---|---|
| **T2** | internal equalization |
| **TE2** | external equalization |
| **N** | Nordborg, Denmark (BE = Wuqing, China) |
| **45** | week |
| **11** | 2011 |
| **A** | Monday |

**Production place and date N4511A**

The thermostatic element has laser engraved data on top of the diaphragm. This engraving gives valve type (with code number), evaporating temperature range, MOP point, refrigerant, and max. working pressure. PS/MWP.

**Figure 6: Orifice assembly and filter for flare x flare version for T2 and TE2**




**Orifice assembly for T2 and TE2**

The orifice assembly is marked with the orifice size (e.g. 06) and week stamp + last number in the year (e.g. 174). The orifice assembly number is also given on the lid of its plastic container.

**Figure 7: Capillary tube label for T2 and TE2**




**Capillary tube label for T2 and TE2**

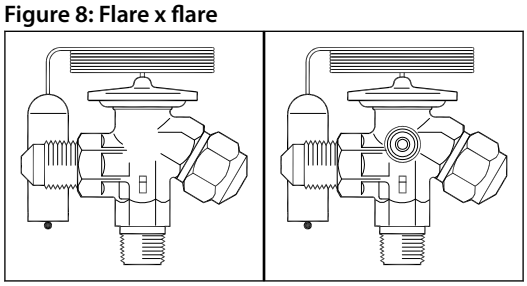
The label gives the orifice size (04) and consists of the lid of the orifice assembly plastic container. It can easily be fastened around the expansion valve capillary tube to clearly identify the valve size.

## Ordering

### T2/TE2 Thermostatic element with bulb strap

#### Flare x flare

**Figure 8: Flare x flare**



Capillary tube: 1.5 m
Range N = -40 – 10 °C
Range B = -60 – -25 °C
Range NM = -40 – -5 °C MOP 0 °C
Range NL = -40 – -15 °C MOP -10 °C

**Table 9: Flare x flare**

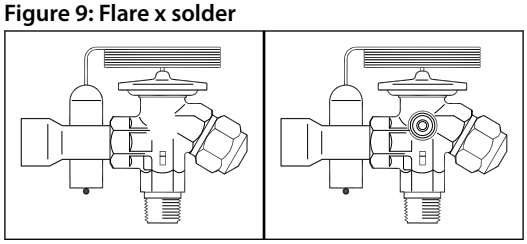
| Refrigerant | Type | Range | MOP | Pressure equliza-tion Flare | Connection flare inlet × outlet | | Code no. Multi pack |
|---|---|---|---|---|---|---|---|
| | | [°C] | [°C] | | [in] | [mm] | |
| R22/R407C [1] | T2 | -40 – 10 | – | – | 3/8 × 1/2 | 10×12 | 068Z3206 |
| | T2 | -40 – 10 | 15 | – | 3/8 × 1/2 | 10×12 | 068Z3208 |
| | T2 | -40 – -5 | 0 | – | 3/8 × 1/2 | 10×12 | 068Z3224 |
| | T2 | -40 – -15 | -10 | – | 3/8 × 1/2 | 10×12 | 068Z3226 |
| | T2 | -60 – -25 | – | – | 3/8 × 1/2 | 10×12 | 068Z3207 |
| | T2 | -60 – -25 | -20 | – | 3/8 × 1/2 | 10×12 | 068Z3228 |
| | TE2 | -40 – 10 | – | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3209 |
| | TE2 | -40 – 10 | 15 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3211 |
| | TE2 | -40 – -5 | 0 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3225 |
| | TE2 | -40 – -15 | -10 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3227 |
| | TE2 | -60 – -25 | – | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3210 |
| | TE2 | -60 – -25 | -20 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3229 |
| R407C | T2 | -40 – 10 | – | – | 3/8 × 1/2 | 10×12 | 068Z3496 |
| | T2 | -40 – 10 | 15 | – | 3/8 × 1/2 | 10×12 | 068Z3516 |
| | TE2 | -40 – 10 | – | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3501 |
| | TE2 | -40 – 10 | 15 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3517 |
| R134a/R513A | T2 | -40 – 10 | – | – | 3/8 × 1/2 | 10×12 | 068Z3346 |
| | T2 | -40 – 10 | 15 | – | 3/8 × 1/2 | 10×12 | 068Z3347 |
| | T2 | -40 – -5 | 0 | – | 3/8 × 1/2 | 10×12 | 068Z3393 |
| | T2 | -40 – -15 | -10 | – | 3/8 × 1/2 | 10×12 | 068Z3369 |
| | TE2 | -40 – 10 | – | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3348 |
| | TE2 | -40 – 10 | 15 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3349 |
| | TE2 | -40 – -5 | 0 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3392 |
| | TE2 | -40 – -15 | -10 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3370 |

| Refrigerant | Type | Range | MOP | Pressure equliza-tion Flare | Connection flare inlet × outlet | | Code no. Multi pack |
|---|---|---|---|---|---|---|---|
| | | [°C] | [°C] | | [in] | [mm] | |
| R404A/R507 | T2 | -40 – 10 | – | – | 3/8 × 1/2 | 10×12 | 068Z3400 |
| | T2 | -40 – 10 | 15 | – | 3/8 × 1/2 | 10×12 | 068Z3402 |
| | T2 | -40 – -5 | 0 | – | 3/8 × 1/2 | 10×12 | 068Z3406 |
| | T2 | -40 – -15 | -10 | – | 3/8 × 1/2 | 10×12 | 068Z3408 |
| | T2 | -60 – -25 | – | – | 3/8 × 1/2 | 10×12 | 068Z3401 |
| | T2 | -60 – -25 | -20 | – | 3/8 × 1/2 | 10×12 | 068Z3410 |
| | TE2 | -40 – 10 | – | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3403 |
| | TE2 | -40 – 10 | 15 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3405 |
| | TE2 | -40 – -5 | 0 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3407 |
| | TE2 | -40 – -15 | -10 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3409 |
| | TE2 | -60 – -25 | – | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3404 |
| | TE2 | -60 – -25 | -20 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3411 |
| R407F/R407A | T2 | -40 – 10 | – | – | 3/8 × 1/2 | 10×12 | 068Z3715 |
| | TE2 | -40 – 10 | – | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3714 |
| R448A/R449A | T2 | -40 – 10 | – | – | 3/8 × 1/2 | 10×12 | 068Z3727 |
| | TE2 | -40 – 10 | – | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3728 |
| | T2 | -40 – -15 | -10 | – | 3/8 × 1/2 | 10×12 | 068Z3673 |
| | T2 | -60 – -25 | -20 | – | 3/8 × 1/2 | 10×12 | 068Z3735 |
| | TE2 | -60 – -25 | -20 | ¼ in / 6 mm | 3/8 × 1/2 | 10×12 | 068Z3736 |
| R454C | T2 | -40 – 10 | - | – | 3/8 × 1/2 | 10x12 | 068Z7483 |
| | TE2 | -40 – 10 | - | ¼ in / 6 mm | 3/8 × 1/2 | 10x12 | 068Z7485 |
| R455A | T2 | -40 – 10 | - | – | 3/8 × 1/2 | 10x12 | 068Z7496 |
| | TE2 | -40 – 10 | - | ¼ in / 6 mm | 3/8 × 1/2 | 10x12 | 068Z7499 |
| R1234yf | T2 | -40 – 10 | - | – | 3/8 × 1/2 | 10x12 | 068Z7487 |
| | TE2 | -40 – 10 | - | ¼ in / 6 mm | 3/8 × 1/2 | 10x12 | 068Z7489 |

(1) For R407C plants. Please select valves from the dedicated R407C program

## Flare x solder

**Figure 9: Flare x solder**



Capillary tube:1.5 m
Range N=-40 – 10 °C
Range NL = -40 – -15 °C
Range B= -60 – -25 °C

**Table 10: Flare x solder**

| Refrigerant | Type | Range | MOP | Pressure equliza-tion Flare | Connection flare inlet x solder outlet | | Code no. Multi pack |
|---|---|---|---|---|---|---|---|
| | | [°C] | [°C] | | [in] | [mm] | |
| R22/R407C[1] | T2 | -40 – 10 | – | – | 3/8 × 1/2 | – | 068Z3281 |
| | T2 | -40 – 10 | – | – | – | 10×12 | 068Z3302 |
| | T2 | -40 – 10 | 15 | – | 3/8 × 1/2 | – | 068Z3287 |
| | T2 | -40 – 10 | 15 | – | – | 10×12 | 068Z3308 |
| | T2 | -40 – -15 | -10 | – | – | 10×12 | 068Z3366 |
| | T2 | -60 – -25 | – | – | 3/8 × 1/2 | – | 068Z3357 |
| | T2 | -60 – -25 | – | – | – | 10×12 | 068Z3361 |
| | T2 | -60 – -25 | -20 | – | 3/8 × 1/2 | – | 068Z3319 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z3284 |
| | TE2 | -40 – 10 | – | 6 mm | – | 10×12 | 068Z3305 |
| | TE2 | -40 – 10 | 15 | ¼ in | 3/8 × 1/2 | – | 068Z3290 |
| | TE2 | -40 – 10 | 15 | 6 mm | – | 10×12 | 068Z3311 |
| | TE2 | -40 – -15 | -10 | 6 mm | – | 10×12 | 068Z3367 |
| | TE2 | -60 – -25 | – | ¼ in | 3/8 × 1/2 | – | 068Z3359 |
| | TE2 | -60 – -25 | – | 6 mm | – | 10×12 | 068Z3363 |
| | TE2 | -60 – -25 | -20 | ¼ in | 3/8 × 1/2 | – | 068Z3320 |
| R407C | T2 | -40 – 10 | – | – | – | 10×12 | 068Z3502 |
| | T2 | -40 – 10 | 15 | – | 3/8 × 1/2 | – | 068Z3329 |
| | T2 | -40 – 10 | 15 | – | – | 10×12 | 068Z3514 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z3446 |
| | TE2 | -40 – 10 | – | 6 mm | – | 10×12 | 068Z3503 |
| | TE2 | -40 – 10 | 15 | ¼ in | 3/8 × 1/2 | – | 068Z3447 |
| | TE2 | -40 – 10 | 15 | 6 mm | – | 10×12 | 068Z3515 |
| R134a/R513A | T2 | -40 – 10 | – | – | 3/8 × 1/2 | – | 068Z3383 |
| | T2 | -40 – 10 | – | – | – | 10×12 | 068Z3384 |
| | T2 | -40 – 10 | 15 | – | 3/8 × 1/2 | – | 068Z3387 |
| | T2 | -40 – 10 | 15 | – | – | 10×12 | 068Z3388 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z3385 |
| | TE2 | -40 – 10 | – | 6 mm | – | 10×12 | 068Z3386 |
| | TE2 | -40 – 10 | 15 | ¼ in | 3/8 × 1/2 | – | 068Z3389 |
| | TE2 | -40 – 10 | 15 | 6 mm | – | 10×12 | 068Z3390 |
| R404A/R507 | T2 | -40 – 10 | – | – | 3/8 × 1/2 | – | 068Z3414 |
| | T2 | -40 – 10 | – | – | – | 10×12 | 068Z3435 |
| | T2 | -40 – 10 | 15 | – | 3/8 × 1/2 | – | 068Z3416 |
| | T2 | -40 – 10 | 15 | – | – | 10×12 | 068Z3423 |
| | T2 | -40 – -15 | -10 | – | 3/8 × 1/2 | – | 068Z3429 |
| | T2 | -40 – -15 | -10 | – | – | 10×12 | 068Z3436 |
| | T2 | -60 – -25 | – | – | 3/8 × 1/2 | – | 068Z3418 |
| | T2 | -60 – -25 | – | – | – | 10×12 | 068Z3425 |
| | T2 | -60 – -25 | -20 | – | 3/8 × 1/2 | – | 068Z3420 |
| | T2 | -60 – -25 | -20 | – | – | 10×12 | 068Z3427 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z3415 |
| | TE2 | -40 – 10 | – | 6 mm | – | 10×12 | 068Z3422 |
| | TE2 | -40 – 10 | 15 | 6 mm | – | 10×12 | 068Z3424 |
| | TE2 | -40 – 10 | 15 | ¼ in | 3/8 × 1/2 | – | 068Z3417 |
| | TE2 | -40 – -15 | -10 | ¼ in | 3/8 × 1/2 | – | 068Z3430 |
| | TE2 | -40 – -15 | -10 | 6 mm | – | 10×12 | 068Z3437 |
| | TE2 | -60 – -25 | – | ¼ in | 3/8 × 1/2 | – | 068Z3419 |
| | TE2 | -60 – -25 | – | 6 mm | – | 10×12 | 068Z3426 |
| | TE2 | -60 – -25 | -20 | ¼ in | 3/8 × 1/2 | – | 068Z3421 |
| | TE2 | -60 – -25 | -20 | 6 mm | – | 10×12 | 068Z3428 |
| R407F/R407A | T2 | -40 – 10 | – | – | 3/8 × 1/2 | – | 068Z3716 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z3713 |

| Refrigerant | Type | Range | MOP | Pressure equliza-tion Flare | Connection flare inlet x solder outlet | | Code no. Multi pack |
|---|---|---|---|---|---|---|---|
| | | [°C] | [°C] | | [in] | [mm] | |
| R448A/R449A | T2 | -40 – 10 | – | – | 3/8 × 1/2 | – | 068Z3729 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z3730 |
| | T2 | -40 – -15 | -10 | – | 3/8 × 1/2 | – | 068Z3664 |
| | T2 | -60 – -25 | -20 | – | 3/8 × 1/2 | – | 068Z3737 |
| | TE2 | -40 – -15 | -10 | ¼ in | 3/8 × 1/2 | – | 068Z3665 |
| | TE2 | -60 – -25 | -20 | ¼ in | 3/8 × 1/2 | – | 068Z3738 |
| | T2 | -40 – -15 | -10 | – | – | 10×12 | 068Z3674 |
| | TE2 | -60 – -25 | -20 | 6 mm | – | 10×12 | 068Z3672 |
| R452A | T2 | -40 – 10 | – | – | 3/8 × 1/2 | – | 068Z3806 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z3807 |
| | T2 | -40 – 10 | – | – | – | 10×12 | 068Z3808 |
| | TE2 | -40 – 10 | – | 6 mm | – | 10×12 | 068Z3809 |
| R454C | T2 | -40 – 10 | – | – | 3/8 × 1/2 | – | 068Z7490 |
| | T2 | -40 – 10 | – | – | – | 10x12 | 068Z7484 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z7492 |
| | TE2 | -40 – 10 | – | 6 mm | – | 10x12 | 068Z7486 |
| R455A | T2 | -40 – 10 | – | – | 3/8 × 1/2 | – | 068Z7494 |
| | T2 | -40 – 10 | – | – | – | 10x12 | 068Z7498 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z7501 |
| | TE2 | -40 – 10 | – | 6 mm | – | 10x12 | 068Z7500 |
| R1234yf | T2 | -40 – 10 | – | – | 3/8 × 1/2 | – | 068Z7491 |
| | T2 | -40 – 10 | – | – | – | 10x12 | 068Z7488 |
| | TE2 | -40 – 10 | – | ¼ in | 3/8 × 1/2 | – | 068Z7493 |
| | TE2 | -40 – 10 | – | 6 mm | - | 10x12 | 068Z7495 |

(1) For R407C plants, please select valves from the dedicated R407C program

## Flare connections

**Figure 10: Flare connections**

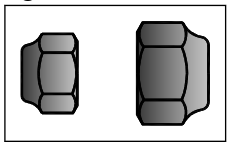


**Table 11: Flare connections**

| Connection for copper tubing with outside diameter | | Reducer for copper tubing with outside diameter | | Code no. |
|---|---|---|---|---|
| [in] | [mm] | [in] | [mm] | |
| 1/4 | 6 | – | – | 011L1101 |
| 3/8 | 10 | – | – | 011L1135 |
| 1/2 | 12 | – | – | 011L1103 |
| – | – | 1/4 | 6 | 011L1107 |

Example :
A TE2 thermostatic expansion valve consists of two parts + flare nuts if required:
- 1 thermostatic element
- 1 orifice assembly and flare nuts

When ordering one thermostatic expansion valve, TE2 with orifice 01, five code numbers are required:
- 1-off thermostatic element - 068Z3209
- 1-off orifice assembly 01 - 068-2010
- 1-off 3⁄8 in flare nut - 011L1135
- 1-off 1⁄2 in flare nut - 011L1103
- 1-off 1⁄4 in flare nut - 011L1101

## Orifice assembly with filter

**Figure 11: Orifice assembly with filter**

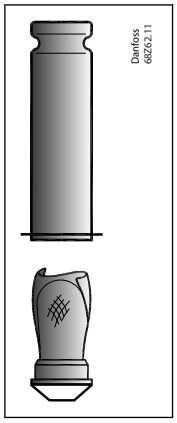



**Table 12: Orifice assembly with filter**

| Orifice no. | Code no. |
|---|---|
| 0X | 068-2002 |
| 00 | 068-2003 |
| 01 | 068-2010 |
| 02 | 068-2015 |
| 03 | 068-2006 |
| 04 | 068-2007 |
| 05 | 068-2008 |
| 06 | 068-2009 |

## Orifice assembly with filter for solder adaptor

**Figure 12: Orifice assembly with filter for solder adaptor**

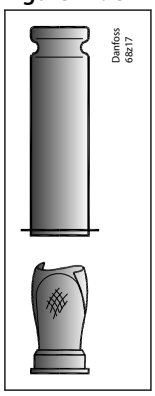



**Table 13: Orifice assembly with filter for solder adaptor**

| Orifice no. | Code no. |
|---|---|
| 0X | 068-2089 |
| 00 | 068-2090 |
| 01 | 068-2091 |
| 02 | 068-2092 |
| 03 | 068-2093 |
| 04 | 068-2094 |
| 05 | 068-2095 |
| 06 | 068-2096 |

## Filter

**Figure 13: Filter**

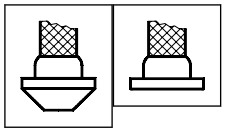
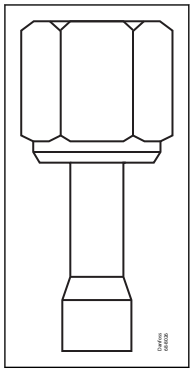


**Table 14: Filter**

| Filter type | Code no. Multi pack |
|---|---|
| For flare connection | 068-0003 |
| For solder adaptor | 068-0015 |

## Solder adaptor

**Figure 14: Solder adaptor**



The adaptor is for use with thermostatic expansion valves T2 and TE2 with flare × solder connections. When the adaptor is fitted correctly it meets the sealing requirements of DIN 8964.

The adaptor offers the following advantages:
- The orifice assembly can be replaced.
- The filter can be cleaned or replaced.

When using the solder adapter, a special orifice assembly is required. Please use the following tables to select both the appropriate adapter and orifice asembly.

Only in this way can the sealing requirements of DIN 8964 be fulfilled.

Solder adaptor for filter drier (FSA) must not be used in the T2 inlet.

**Table 15: Solder adaptor without orifice assembly and filter**

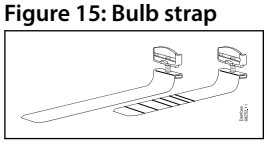
| Connection ODF solder | Code no. |
|---|---|
| 1⁄4 in | 068-2062 |
| 6 mm | 068-2063 |
| 3⁄8 in | 068-2060 |
| 10 mm | 068-2061 |

**Table 16: Filter for solder adaptor**

| Description | Code no. |
|---|---|
| Filter excl. orifice assembly | 068-0015 |

## Bulb strap (Danfoss patented)

**Figure 15: Bulb strap**



Each valve is delivered with a Danfoss patented bulb strap. Spares can be ordered.

**Table 17: Bulb strap (Danfoss patented)**

| Description | Pack mode | Quantity / pack | Code no. |
|---|---|---|---|
| Accessory bag with short bulb strap I/45 | I | 45 | 068U3525 |
| Accessory bag with long bulb strap I/45 | I | 45 | 068U3527 |
| Accessory bag with short Bulb strap M/25 | M | 25 | 068U3520 |
| Accessory bag with long Bulb strap M/45 | M | 45 | 068U3528 |

## Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for the product. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

**Table 18: Certificates, declarations, and approvals**

| File name | Document type | Document topic | Approval_authority |
|---|---|---|---|
| EAC RU Д-DK.БЛ08.B.00191_18 | EAC Declaration | Machinery & Equipment | EAC |
| Danfoss 068U9615.06 | Manufacturers Declaration | PED/RoHS | Danfoss |
| Danfoss 068Z9620.00 | Manufacturers Declaration | - | Danfoss |
| Danfoss 068-9601.00 | Manufacturers Declaration | - | Danfoss |
| UA.089.D.00188-17 | UA Declaration | PED | LLC CDC EURO TYSK |
| UA.TR-089.0993-17 | Pressure - Safety Certificate | PED | LLC CDC EURO TYSK |
| Danfoss 068U9616.01 | Manufacturers Declaration | China RoHS | Danfoss |

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Coolselector®2 makes it easy for engineers, consultants, and designers to find and order the best components for refrigeration and air conditioning systems. Run calculations based on your operating conditions and then choose the best setup for your system design.

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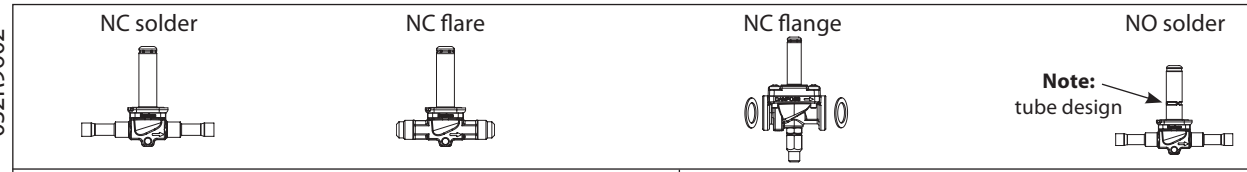
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**Installation guide**

# Solenoid valve

## Types EVR 2 – EVR 22 (Version 2)

032R9602




032R9602

**Refrigerants**
R1234yf, R1234ze(E), R125, R134a, R152a, R22, R290, R32, R404A, R407C, R407F, R407H, R410A, R413A, R417A, R422A, R422B, R422D, R438A, R422A, R422B, R422D, R438A, R442A, R444B, R447A, R447B, R448A, R449A, R449B, R450A, R452A, R452B, R454A, R454B, R454C, R455A, R463A, R507A, R512A, R513A, R513B, R515A, R515B, R516A, R600, R600a.
For complete list of approved refrigerants, visit *https://store.danfoss.com* and search for individual code numbers, where refrigerants are listed as part of technical data.

**Note**
Pick up valves carefully from package.

**Filter**
Filter drier is always recommended in customer system.

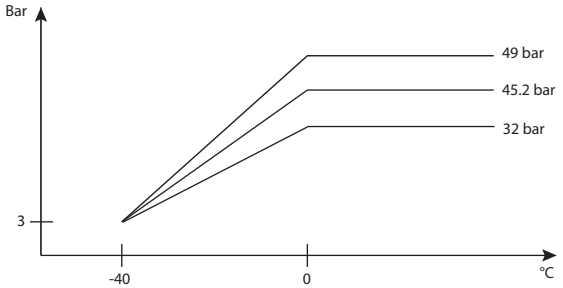
**Special note for R1234yf, R1234ze, R152A, R290, R32, R444B, R452B, R454A, R454B, R454C, R455A, R516A, R600 and R600a:**
The EVR 2 – EVR 22 with solder connections and without manual stem is validated in accordance to ATEX, ISO 5149, IEC 60335-2-24, IEC 60335-2-40, and UL. Ignition risk is evaluated in accordance to ISO 5149, and IEC 60335.

NOTE 1: EVR 2-15 flare connections are only approved for A1 and A2L refrigerants.

NOTE 2: Excluded from this EVR 22 with connections 1 3/8 inch / 35 mm related to PED requirements.

**Max. working pressure**
EVR solder and flare connections: 45.2 bar.
EVR flange connections: 32 bar.
EVR PED version: 49 bar.
(Approved max. working pressure is marked on the armature tube)

**Note**
Avoid reverse flow in EVR (except EVRC) to avoid unstable function or long term damage of valve.

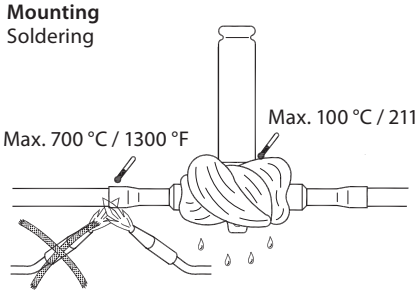



Max. working pressure in bar in relation to media temperature in °C.

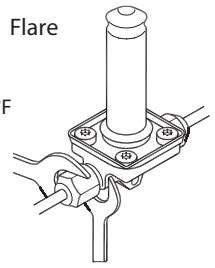
**Media temperature:** -40 °C / -40 °F – 105 °C / 221 °F

**Max. opening diff. pressure (MOPD):** Coil dependent

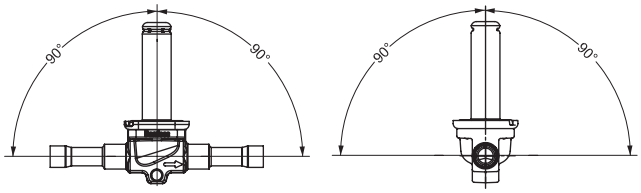
**Mounting**
Soldering



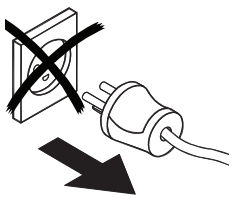

Flare



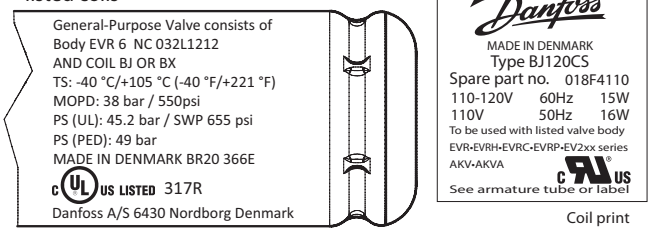
**Mounting angle**



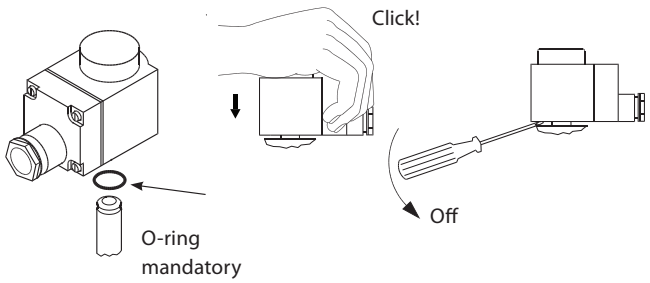

Always disconnect power from the coil when dismounted from the valve. The coil may be damaged and there is risk of injuries and burns.

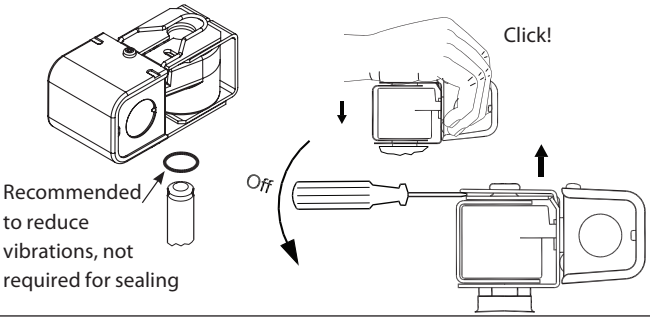


**ID Marking - example**
Valve identification and reference to UL listed coils




Coil print



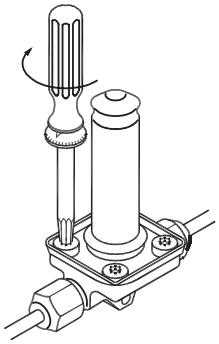



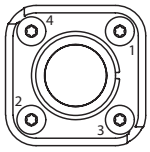

The EVR 2 – EVR 22 with solder connections and without manual stem can be applied on systems with R1234yf, R1234ze, R152A, R290, R32, R444B, R452B, R454A, R454B, R454C, R455A, R516A, R600 and R600a as the working fluid. EVR 2-15 flare connections are only approved for A1 and A2L refrigerants. . For countries where safety standards are not an indispensable part of the safety system Danfoss recommend the installer to get a third party approval of the system containing flammable refrigerant. Note, please follow specific selection criteria stated in the datasheet for these particular refrigerants.

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## Disassembly and assembly of EVR version 2

### Mounting / dismounting of top part
EVR 2 – EVR 8

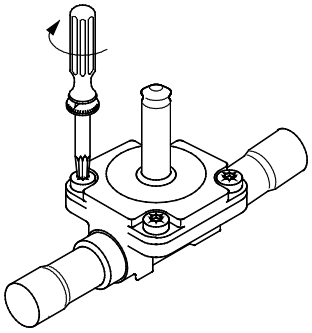


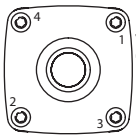



**Note!**
Always use cross-tightening

| Type | [Nm] | [kpm] | [ft-lbs] | Torx size |
|---|---|---|---|---|
| EVR 2, EVR 3, EVR 4, EVR 6, EVR 8 | 3.0 | 0.3 | 2.2 | T15 |

### Mounting / dismounting of top part
EVR 10 – EVR 22

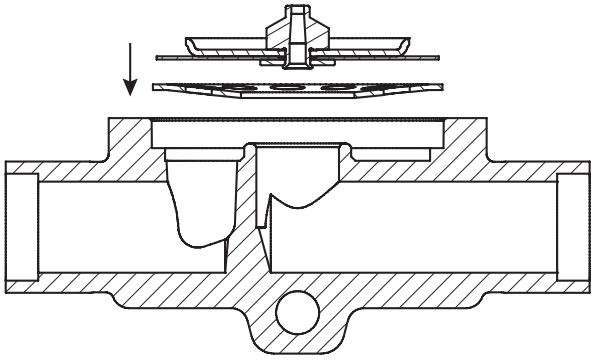




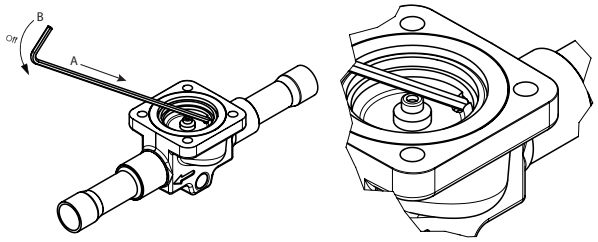

**Note!**
Always use cross-tightening

| Type | [Nm] | [kpm] | [ft-lbs] | Torx size |
|---|---|---|---|---|
| EVR 10, EVR 15, EVR 18 | 10 | 1 | 7.4 | T30 |
| EVR 20, EVR 22 | 30 | 3 | 22.1 | T45 |

### Mounting of support washer

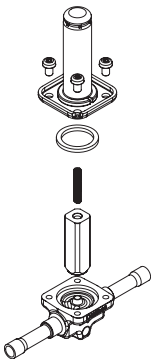


### Special for EVR 4 – EVR 8:
### Dismounting gasket and supporting ring




**Caution!**
For EVR 2 – EVR 3, and EVR 10 – EVR 22, a screwdriver might be needed for removal of the gasket. Be careful not to scratch the gasket surface.

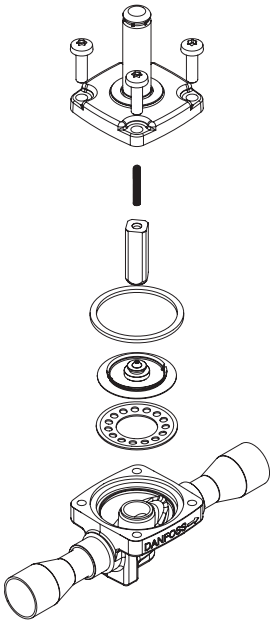
**EVR 2 – EVR 3 (NC)**



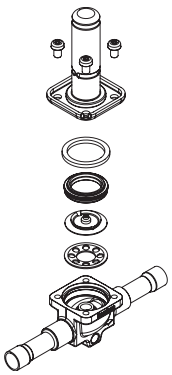
**EVR 4 – EVR 8 (NC)**



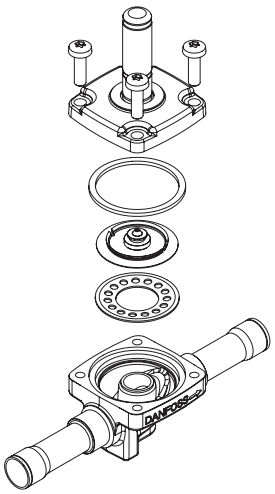
**EVR 10 – EVR 22 (NC)**



**EVR 4 – EVR 8 (NO)**



**EVR 10 – EVR 20 (NO)**



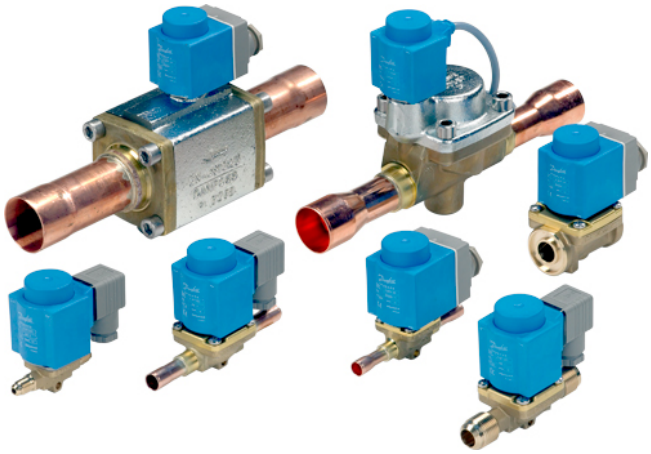
**Manual operation for pressure testing and service related operation:**
Only use the manual stem operation of the EVR NC valve during initial pressure testing of the refrigeration system or during service related manual operation. Remove the protective cap and rotate the manual stem clockwise approx. 6 cycles from fully closed to fully open position. After the manual operation is completed, ensure to rotate the manual stem counter-clockwise back to fully closed position and re-mount the protective cap before connecting the valve to automatic operation. MOPD for the manual operation function is 5 bar. Alternatively, all EVR NC and NO valves can be manually operated by removing the coil and force the valve open or closed by using a solenoid valve tester (permanent magnet).

ENGINEERING TOMORROW

Data Sheet

# Solenoid valve
# Type **EVR 2 - EVR 40**

Version 2



EVR is a direct or servo operated solenoid valve suitable for liquid, suction, and hot gas lines with most refrigerants, including flammable refrigerants.

EVR valves and coils are sold separately.

**Features**

- Complete range of solenoid valves for refrigeration, freezing and air conditioning plant
- Supplied in versions normally closed (NC) and normally open (NO) with de-energized coil
- Wide choice of coils for AC and DC
- Suitable for most refrigerants, including flammable refrigerants
- Designed for media temperatures up to 105 °C
- Flare connections up to ⅝ in
- Solder connections up to 2 ⅛ in
- Extended ends on solder versions make the installation easy, eliminating the need to dismantle the valve when soldering in
- Available in flare, solder and flange connection versions

# Functions

## Function

EVR solenoid valves are designed on two different principles:
1. Direct operation
2. Servo operation

**1. Direct operation (NC)**
EVR 2 – EVR 3 are direct operated. The valves open directly for full flow when the armature (3) moves up into the magnetic field of the coil.

This means that the valves operate with a minimum differential pressure of 0 bar. The seat plate is fitted directly on the armature (3) see Design and material.

Inlet pressure acts from above on the armature and the valve plate. Thus, the inlet pressure and spring force act to close the valve when there is no current in the coil.

**2. Servo operation (NC)**
EVR 4 – EVR 22 are servo operated with a "floating" diaphragm (4) see Design and material. The pilot orifice of stainless steel is placed in the center of the diaphragm. The seat plate is fitted directly to the armature (3) see Design and material. When there is no current in the coil, the main orifice and pilot orifice are closed. The pilot orifice and main orifice are held closed by the armature spring force and the differential pressure between inlet and outlet sides.

When current is applied to the coil, the armature is drawn up into the magnetic field and opens the pilot orifice. This relieves the pressure above the diaphragm, i.e. the space above the diaphragm becomes connected to the outlet side of the valve.

The differential pressure between inlet and outlet sides then presses the diaphragm away from the main orifice and opens it for full flow. Therefore a certain minimum differential pressure is necessary to open the valve and keep it open. For EVR 4 – EVR 22 valves the minimum differential pressure for safe operation is 0.03 bar.

When the current is switched off, the pilot orifice is closed. Via the equalization holes in the diaphragm, the pressure above the diaphragm rises to the same value as the inlet pressure and the diaphragm closes the main orifice.

EVR 25, EVR 32 and EVR 40 are servo operated piston valves. The servo piston (16) see Design and material with sealing face closes against the valve seat by means of the differential pressure between inlet and outlet side of the valve and the force of the compression spring. When the coil is switched on, the pilot orifice opens. This relieves the pressure on the piston spring side of the valve. The differential pressure will then open the valve. The minimum differential pressure for safe operation is 0.2 bar.

EVR (NO) has the opposite function to EVR (NC), i.e. it is open with de-energized coil. EVR (NO) is available with servo operation only.

**2.1. Bi-flow operation**
Bi-flow operation with EVRC EVRC is a servo operated solenoid valve with a special diaphragm with built-in non-return valve. The valve is for use in liquid lines in refrigeration plants.

EVRC allows flow in both directions and can be used in liquid lines in refrigeration plants with hot gas or gas defrost.

During the refrigeration period EVRC works as a normal solenoid valve, while during defrost it allows the condensed liquid to return to the liquid manifold.

During the defrosting period the coil for EVRC must be energized.

**2.2. Manual stem operation for EVR 6 - EVR 25 NC**
EVR 6 - EVR 25 NC are available with optional manual stem operation to manually force the NC valve open when the coil is de-energized.

The protective cap should be removed and the manual stem (12) Design and material should be rotated until the valve is fully open. It takes approx. 6 cycles from fully closed, to reach the fully open position.

After manual operation is completed, the valve should manually be closed again and the protective cap mounted.

**NOTE:**
Alternatively, all EVR NC and NO valves can be manually operated by removing the coil and force the valve open or closed by using a solenoid valve tester (permanent magnet) code no. 018F0091.

## Media

**Refrigerants**
R1234yf, R1234ze(E), R125, R134a, R152a, R22, R290, R32, R404A, R407C, R407F, R407H, R410A, R413A, R417A, R422A, R422B, R422D, R438A, R422A, R422B, R422D, R438A, R442A, R444B, R447A, R447B, R448A, R449A, R449B, R450A, R452A, R452B, R454A, R454B, R454C, R455A, R463A, R507A, R512A, R513A, R513B, R515A, R515B, R516A, R600, R600a.

For a complete list of approved refrigerants, visit store.danfoss.com and search for individual code numbers, where refrigerants are listed as part of technical data.

**NOTE:**
Special note for R1234yf, R1234ze, R152A, R290, R32, R444B, R452B, R454A, R454B, R454C, R455A, R516A, R600 and R600a: This product is validated in accordance to ATEX, ISO 5149, IEC 60335-2-24, IEC 60335-2-40 and UL. Ignition risk is evaluated in accordance to ISO 5149 and IEC 60335.

The EVR 2 – EVR 22 with solder connections and without manual stem can be applied on systems with R1234yf, R1234ze, R152A, R290, R32, R444B, R452B, R454A, R454B, R454C, R455A, R516A, R600 and R600a as the working fluid.

EVR 2-15 flare connections are only approved for A1 and A2L refrigerants

**NOTE:**
Excluded from this EVR 22 with connections 1 ⅜ inch / 35mm related to PED requirements.

The EVR 2-EVR 40 versions with solder and flare connection and without manual stem can be applied to oil-free systems : R1234ze(E)

EVR 2 - EVR 22 versions with solder and flare connections and without manual stem can be applied to oil-free systems R513A, R515B, R516A

**NOTE:**
EVR 2-22 (R516A) and EVR 2-40, R1234ze:
- Excluded from this EVR 22 - EVR 40 with connections 1 ⅜ inch / 35mm and larger connections related to higher PED requirements.

For countries where safety standards are not an indispensable part of the safety system Danfoss recommends the installer gets a third party approval of any system containing flammable refrigerant.

**NOTE:**
Please follow specific selection criteria stated in the datasheet for these particular refrigerants.

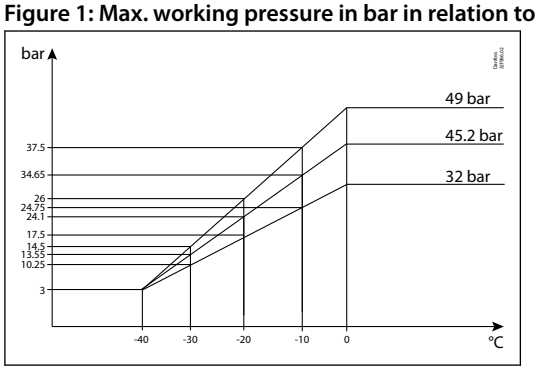
**Media temperature**
-40 – 105 °C, Max. 130 °C during defrosting
For R1234ze Media temperature: - 20 - 90 °C (105 °C for transient condition).

# Product specification

## Technical data

### Ambient temperature and enclosure for coil
See separate data sheet for solenoid and ATEX coils.

### Max. working pressure
**Figure 1: Max. working pressure in bar in relation to media temperature in °C.**




**WARNING:**
Special note for EVR PED version: The EVR 2 - EVR 22 versions with solder connections and without manual stem can be applied to 49 bar MWP.

**NOTE:**
Excluded from this EVR 22 with connections 1 ⅜ inch / 35 mm related to higher PED requirements.

### Capacity
For $K_v$ values refer to the tables in Ordering.
The $K_v$ value of the water flow in [$m^3/h$] at a pressure drop across valve of 1 bar, ρ = 1000 $kg/m^3$.

See extended capacity tables on Coolselector®2.

**Table 1: MOPD**

| Type | Opening differential pressure with standard coil Δp [bar] | | |
|---|---|---|---|
| | Min. | Max. (= MOPD) liquid | |
| | | AC coil [10 W] | DC coil [20 W] |
| EVR 2 NC | 0.00 | 38 | 33 |
| EVR 3 NC | 0.00 | 38 | 18 |
| EVR 4 NC | 0.03 | 38 | 28 |
| EVR 6 NC | 0.03 | 38 | 28 |
| EVR 6 NO | 0.03 | 21 | 21 |
| EVR 8 NC | 0.03 | 38 | 28 |
| EVR 10 NC | 0.03 | 38 | 20 |
| EVR 10 NO | 0.03 | 21 | 21 |
| EVR 15 NC | 0.03 | 38 | 20 |
| EVR 15 NO | 0.03 | 21 | 21 |
| EVR 18 NC | 0.03 | 38 | 20 |
| EVR 20 NC | 0.03 | 38 | 20 |
| EVR 20 NO | 0.03 | 19 | 19 |
| EVR 22 NC | 0.03 | 38 | 20 |
| EVR 22 NO | 0.03 | 19 | 19 |
| EVR 25 NC | 0.2 | 38 | 17 |
| EVR 32 NC | 0.2 | 38 | 17 |
| EVR 40 NC | 0.2 | 38 | 17 |

**NOTE:**
For higher MODP 12 W and 20 W AC coils are available on request

## Valve selection based on capacity calculation

As for extended capacity calculations and valve selection based on capacities and refrigerants, please refer to Coolselector®2. Rated and extended capacities are calculated with the Coolselector®2 calculation engine to ARI standards with the ASEREP equations based on laboratory measurements of selected valves.

## Rated capacity [kW]

**Table 2: Rated capacity [kW]**

| Type | R22/R407C | R134a | R404A/R507 | R410A | R32 | R290 | R600a |
|---|---|---|---|---|---|---|---|
| **Liquid** | | | | | | | |
| EVR 2 | 3.02 | 2.79 | 2.04 | 2.96 | 4.23 | 3.36 | 3.38 |
| EVR 3 | 5.43 | 5.02 | 3.68 | 5.32 | 7.61 | 6.05 | 6.09 |
| EVR 4 | 13.68 | 12.66 | 9.26 | 13.41 | 19.17 | 15.23 | 15.33 |
| EVR 6 | 17.90 | 16.56 | 12.12 | 17.55 | 25.09 | 19.93 | 20.07 |
| EVR 8 | 21.32 | 19.73 | 14.44 | 20.90 | 29.88 | 23.74 | 23.90 |
| EVR 10 | 37.62 | 34.80 | 25.47 | 36.88 | 52.71 | 41.88 | 42.17 |
| EVR 15 | 57.93 | 53.60 | 39.23 | 56.79 | 81.18 | 64.49 | 64.94 |
| EVR 18 | 75.84 | 70.16 | 51.36 | 74.35 | 106.26 | 84.43 | 85.01 |
| EVR 20 | 120.29 | 111.29 | 81.46 | 117.93 | 168.56 | 133.92 | 134.85 |
| EVR 22 | 137.19 | 126.92 | 92.90 | 134.49 | 192.23 | 152.73 | 153.79 |
| EVR 25 | 149.23 | 138.06 | 101.06 | 146.30 | – | – | – |
| EVR 32 | 254.97 | 235.89 | 172.66 | 249.96 | – | – | – |
| EVR 40 | 368.74 | 341.15 | 249.71 | 361.49 | – | – | – |
| **Suction vapour** | | | | | | | |
| EVR 2 | 0.33 | 0.24 | 0.29 | 0.42 | 0.54 | 0.41 | 0.23 |
| EVR 3 | 0.60 | 0.44 | 0.52 | 0.75 | 0.96 | 0.73 | 0.41 |
| EVR 4 | 1.51 | 1.10 | 1.32 | 1.90 | 2.43 | 1.85 | 1.03 |
| EVR 6 | 1.98 | 1.44 | 1.72 | 2.48 | 3.18 | 2.42 | 1.35 |
| EVR 8 | 2.35 | 1.71 | 2.05 | 2.96 | 3.78 | 2.88 | 1.60 |
| EVR 10 | 4.15 | 3.02 | 3.62 | 5.22 | 6.67 | 5.09 | 2.83 |
| EVR 15 | 6.40 | 4.65 | 5.57 | 8.03 | 10.28 | 7.83 | 4.36 |
| EVR 18 | 8.37 | 6.09 | 7.30 | 10.52 | 13.45 | 10.26 | 5.70 |
| EVR 20 | 13.28 | 9.66 | 11.57 | 16.68 | 21.34 | 16.27 | 9.04 |
| EVR 22 | 15.15 | 11.02 | 13.20 | 19.02 | 24.34 | 18.55 | 10.31 |
| EVR 25 | 16.33 | 11.79 | 14.25 | 20.58 | – | – | – |
| EVR 32 | 27.90 | 20.14 | 24.35 | 35.16 | – | – | – |
| EVR 40 | 40.35 | 29.12 | 35.21 | 50.85 | – | – | – |
| **Hot gas** | | | | | | | |
| EVR 2 | 1.35 | 1.04 | 1.10 | 1.65 | 2.18 | 1.54 | 0.94 |
| EVR 3 | 2.42 | 1.87 | 1.99 | 2.98 | 3.92 | 2.76 | 1.70 |
| EVR 4 | 6.10 | 4.70 | 5.01 | 7.50 | 9.86 | 6.96 | 4.28 |
| EVR 6 | 7.99 | 6.16 | 6.56 | 9.81 | 12.91 | 9.11 | 5.61 |
| EVR 8 | 9.51 | 7.33 | 7.81 | 11.68 | 15.37 | 10.85 | 6.68 |
| EVR 10 | 16.78 | 12.94 | 13.78 | 20.61 | 27.12 | 19.14 | 11.78 |
| EVR 15 | 25.85 | 19.93 | 21.22 | 31.74 | 41.77 | 29.48 | 18.14 |
| EVR 18 | 33.84 | 26.08 | 27.77 | 41.55 | 54.67 | 38.59 | 23.75 |
| EVR 20 | 53.68 | 41.37 | 44.05 | 65.91 | 86.72 | 61.21 | 37.67 |
| EVR 22 | 61.22 | 47.18 | 50.24 | 75.17 | 98.91 | 69.81 | 42.96 |
| EVR 25 | 87.87 | 67.73 | 72.12 | 107.91 | – | – | – |
| EVR 32 | 150.17 | 115.75 | 123.24 | 184.40 | – | – | – |
| EVR 40 | 217.22 | 167.43 | 178.27 | 266.74 | – | – | – |

Rated liquid and suction vapor capacity is based on:

- vaporating temperature $t_e$ = -10 °C
- liquid temperature ahead of valve $t_l$ = 25 °C
- pressure drop in valve Δp = 0.15 bar

Rated hot gas capacity is based on:

- condensing temperature tc = 40 °C
- pressure drop across valve Δp = 0.8 bar
- hot gas temperature th = 65 °C
- subcooling of refrigerant Δtsub = 4 K

For other refrigerants, please refer to Coolselector®2

## Design and material

**Figure 2: EVR 2 - EVR 3 Solder and flare connection**

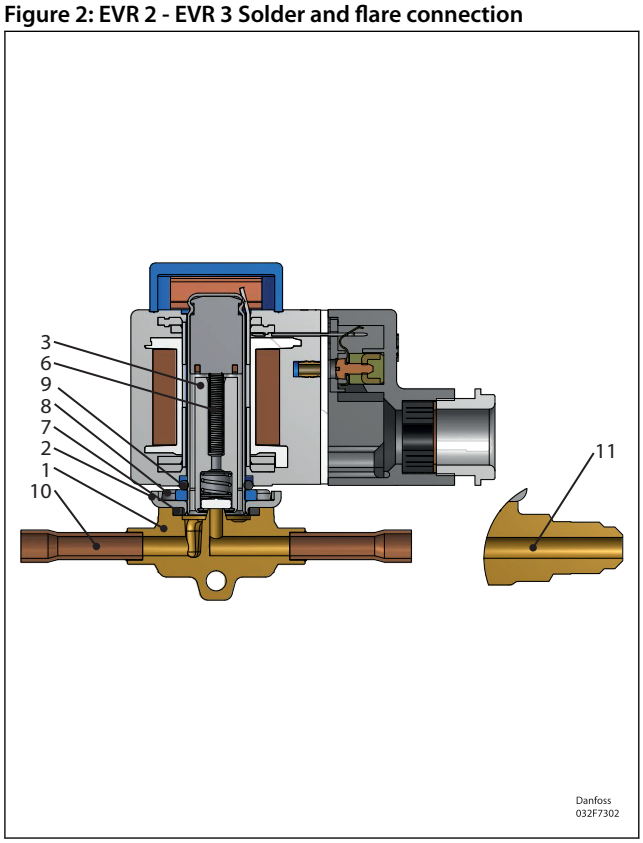



**Figure 3: EVR 4 - EVR 6 - EVR 8 Solder and flare connection**

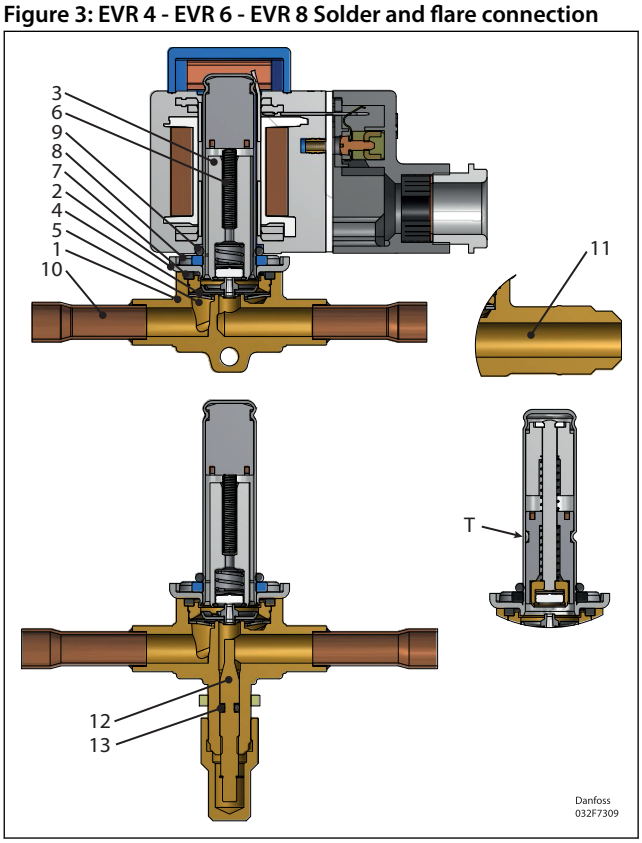



**Table 3: Design and material for EVR 2, EVR 3, EVR 4, EVR 6, EVR 8**

| Pos. no. | Description | Material |
|---|---|---|
| 1 | Valve housing assembly | Brass |
| 2 | Cover | Stainless steel |
| 3 | Armature assembly | Stainless steel/PTFE |
| 4 | Diaphragm assembly | Stainless steel/PTFE |
| 5 | Support washer | Stainless steel |
| 6 | Armature spring | Stainless steel |
| 7 | Seal | Chloroprene rubber |
| 8 | Screws | Stainless steel |
| 9 | O-ring | EPDM rubber |
| 10 | Solder connection | Copper |
| 11 | Flare connection | Brass |
| 12 | Manual stem [1] | Brass |
| 13 | O-ring | Chloroprene rubber |
| T | Normally Open (NO) tube design | |

[1] Manual stem is not available for EVR 4

**Figure 4: EVR 10 Solder and flare connection**

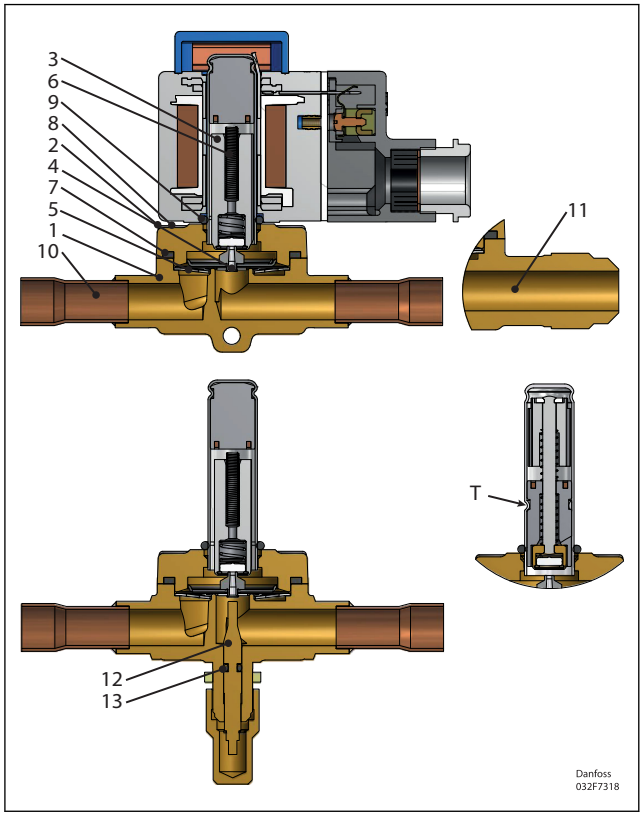



**Figure 5: EVR 15 - EVR 18 Solder, flare, and flange**

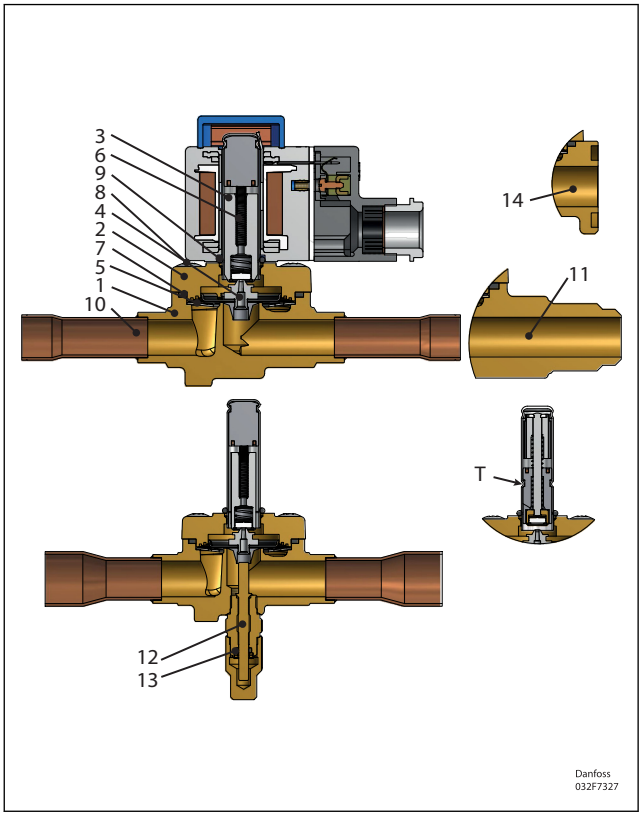



**Table 4: Design and material for EVR 10, EVR 15, EVR 18**

| Pos. no. | Description | Material |
|---|---|---|
| 1 | Valve housing assembly | Brass |
| 2 | Cover | Stainless steel |
| 3 | Armature assembly | Stainless steel/PTFE |
| 4 | Diaphragm assembly | Stainless steel/PTFE |
| 5 | Support washer | Stainless steel |
| 6 | Armature spring | Stainless steel |
| 7 | Seal | Chloroprene rubber |
| 8 | Screws | Stainless steel |
| 9 | O-ring | EPDM rubber |
| 10 | Solder connection | Copper |
| 11 | Flare connection | Brass |
| 12 | Manual stem | Brass |
| 13 | O-ring | Chloroprene rubber |
| 14 | Flange connection | Brass |
| T | Normally Open (NO) tube design | |

**Figure 6: EVR 20 - EVR 22 Solder and flange connection**

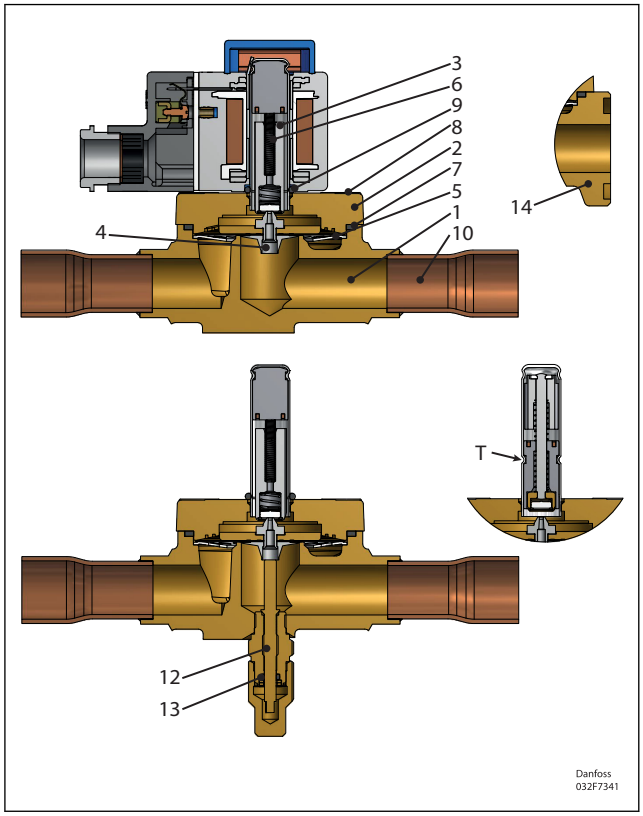



**Figure 7: EVR 25 Solder connection**

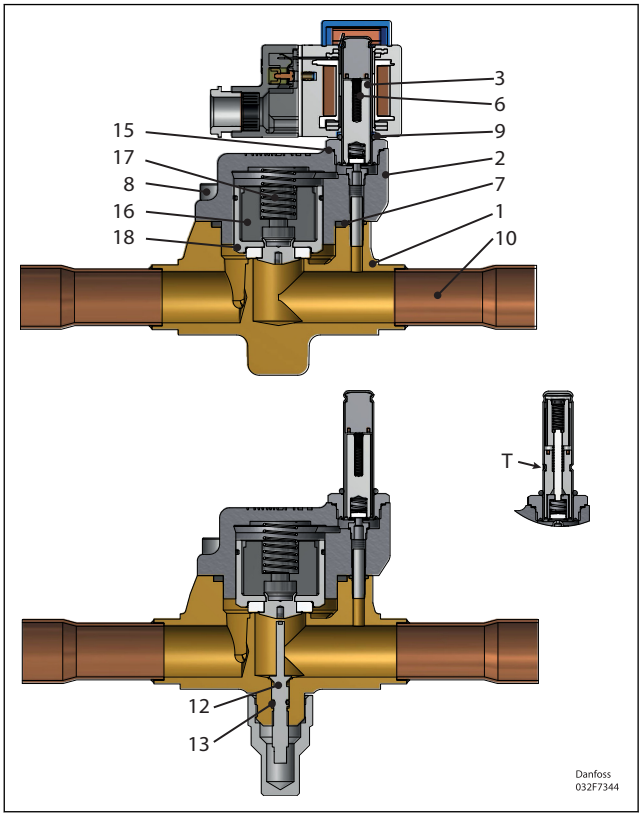



**Table 5: Design and material for EVR 20, EVR 22, EVR 25**

| Pos. no. | Description | Material |
|---|---|---|
| 1 | Valve housing assembly | Brass |
| 2 | Cover | Stainless steel |
| 3 | Armature assembly | Stainless steel/PTFE |
| 4 | Diaphragm assembly | Stainless steel/PTFE |
| 5 | Support washer | Stainless steel |
| 6 | Armature spring | Stainless steel |
| 7 | Seal | Chloroprene rubber |
| 8 | Screws | Stainless steel |
| 9 | O-ring | EPDM rubber |
| 10 | Solder connection | Copper |
| 11 | Flare connection | Brass |
| 12 | Manual stem | Brass |
| 13 | O-ring | Chloroprene rubber |
| 14 | Flange connection | Brass |
| 15 | Gasket | Aluminum |
| 16 | Insert | Nylon |
| 17 | Piston spring | Stainless steel |
| 18 | Piston | Stainless steel |
| T | Normally Open (NO) tube design | |

**Figure 8: EVR 32 - EVR 40 Solder connection**

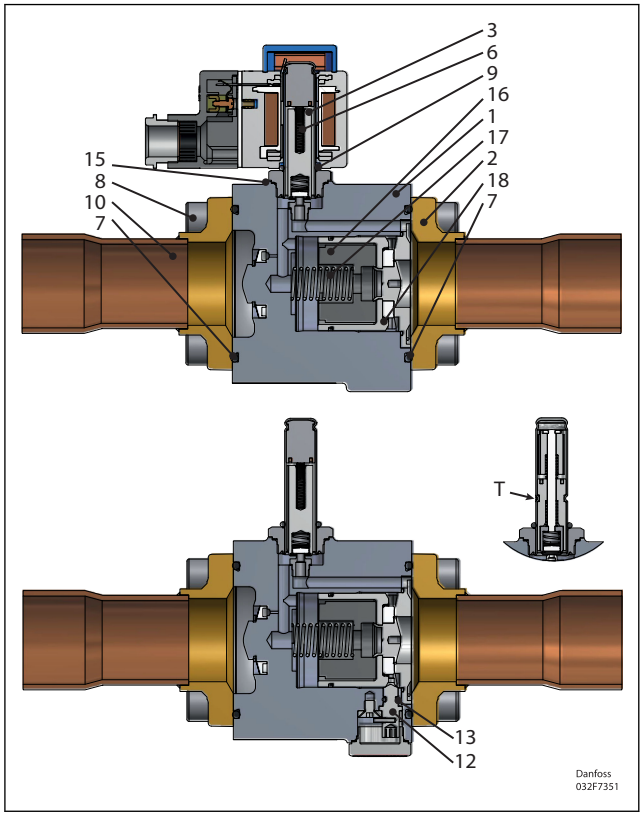



**Figure 9: EVRC Solder connection**

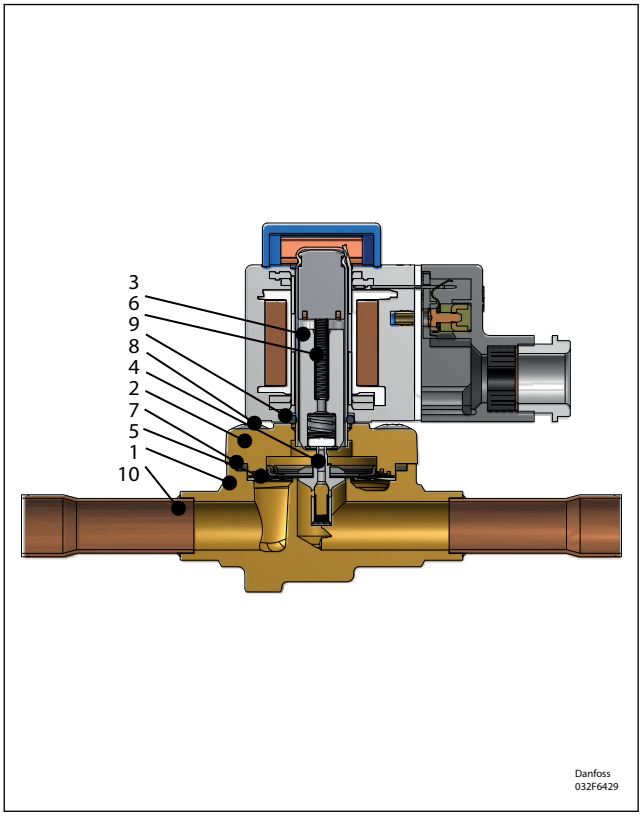



**Table 6: Design and material for EVR 32, EVR 40, EVR Solder connection**

| Pos. no. | Description | Material |
|---|---|---|
| 1 | Valve housing assembly | Brass |
| 2 | Cover | Stainless steel |
| 3 | Armature assembly | Stainless steel/PTFE |
| 4 | Diaphragm assembly | Stainless steel/PTFE |
| 5 | Support washer | Stainless steel |
| 6 | Armature spring | Stainless steel |
| 7 | Seal | Chloroprene rubber |
| 8 | Screws | Stainless steel |
| 9 | O-ring | EPDM rubber |
| 10 | Solder connection | Copper |
| 12 | Manual stem | Brass |
| 13 | O-ring | Chloroprene rubber |
| 15 | Gasket | Aluminum |
| 16 | Insert | Nylon |
| 17 | Piston spring | Stainless steel |
| 18 | Piston | Stainless steel |
| T | Normally Open (NO) tube design | |

## Dimensions and weights for EVR 2 - EVR 3 Solder connection

Figure 10: EVR and Cable coil

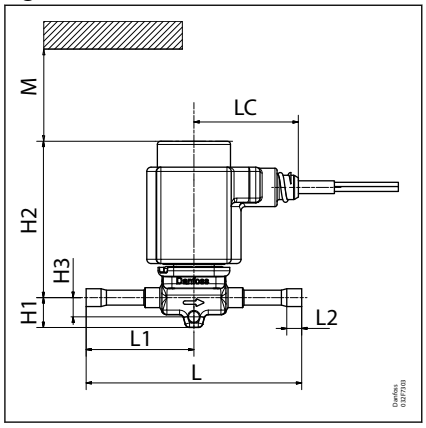



Figure 11: EVR and DIN plug coil

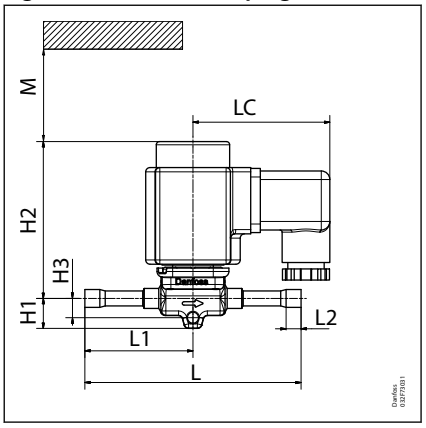



Figure 12: EVR and Terminal box coil

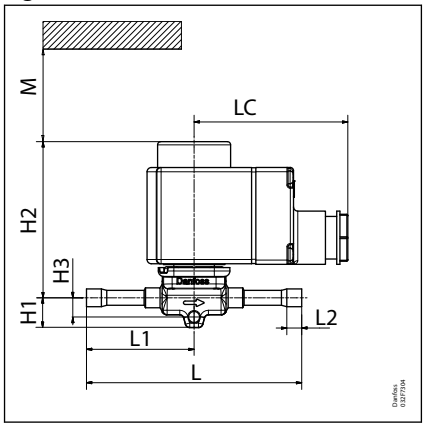



Figure 13: End view

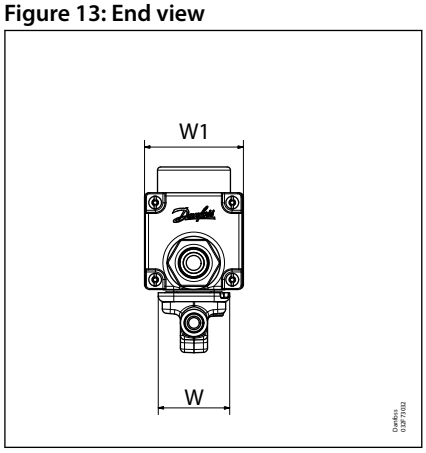



Table 7: Dimensions and weights for EVR 2 - EVR 3 Solder connection

| Type | Connection size | | H1 | H2 | H3 | M min. | L | L1 | L2 | LC | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | |
| EVR 2 | ¼ | 6 | 14 | 73 | 9 | 65 | 101 | 50.5 | 7 | – | 34 | – | 0.16 |
| EVR 3 | ¼ | 6 | 14 | 73 | 9 | 65 | 101 | 50.5 | 7 | – | 34 | – | 0.16 |
| | ⅜ | 10 | 14 | 73 | 9 | 65 | 117 | 58.5 | 8 | – | 34 | – | 0.17 |
| **Coil** | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 4 - EVR 6 - EVR 8 Solder connection

Figure 14: EVR and Cable coil

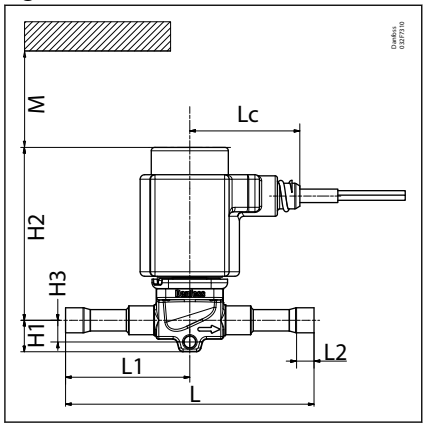



Figure 15: EVR and DIN plug coil

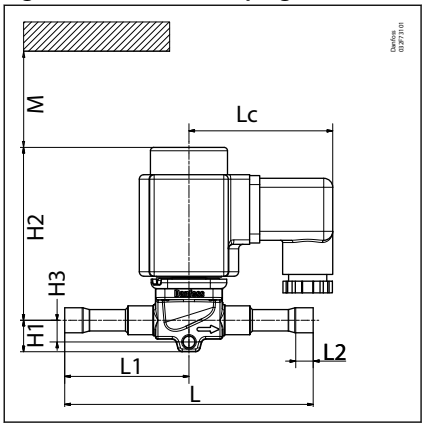



Figure 16: EVR and Terminal box coil

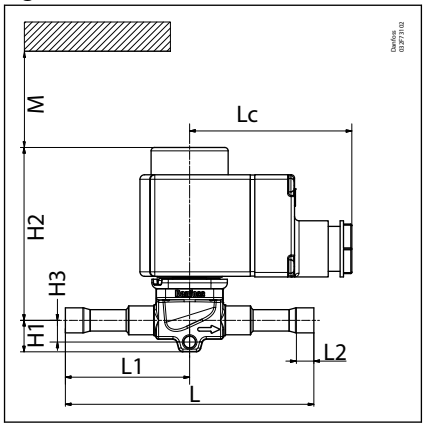



Figure 17: Manual stem

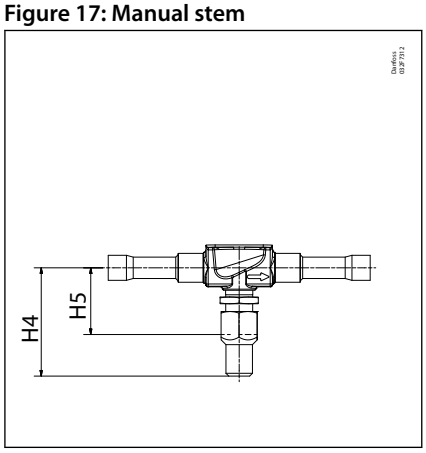



Figure 18: End view

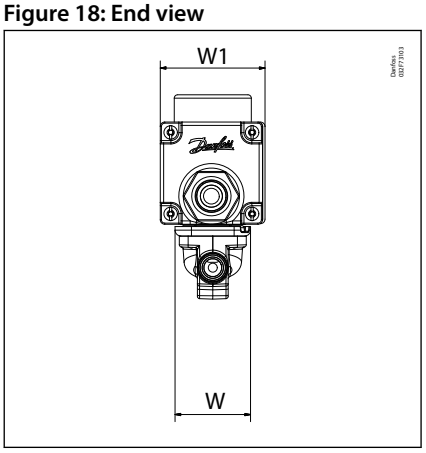



Table 8: Dimensions and weights for EVR 4 - EVR 6 - EVR 8 Solder connection

| Type | Connection size | | Manual operation | H1 | H2 | H3 | H4 | H5 | M min. | L | L1 | L2 | LC | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | | | | |
| EVR 4 | 3/8 | 10 | No | 14 | 78 | 10 | – | – | 65 | 117 | 58.5 | 8 | – | 34 | – | 0.19 |
| EVR 6 | 3/8 | 10 | Yes | 14 | 78 | 10 | 48 | 30 | 65 | 117 | 58.5 | 8 | – | 34 | – | 0.19 |
| | 3/8 | 10 | No | 14 | 78 | 10 | – | – | 65 | 111 | 55.5 | 8 | – | 34 | – | 0.19 |
| | 1/2 | 12 | Yes | 14 | 78 | 10 | 48 | 30 | 65 | 127 | 63.5 | 10 | – | 34 | – | 0.2 |
| | 1/2 | 12 | No | 14 | 78 | 10 | – | – | 65 | 127 | 63.5 | 10 | – | 34 | – | 0.2 |
| EVR 8 | 1/2 | 12 | Yes | 14 | 78 | 10 | 48 | 30 | 65 | 127 | 63.5 | 10 | – | 34 | – | 0.2 |
| | 1/2 | 12 | No | 14 | 78 | 10 | – | – | 65 | 127 | 63.5 | 10 | – | 34 | – | 0.2 |
| | 5/8 | 16 | No | 14 | 78 | 10 | – | – | 65 | 163 | 81.5 | 12 | – | 34 | – | 0.2 |
| **Coil** | | | | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 10 Solder connection

**Figure 19: EVR and Cable coil**

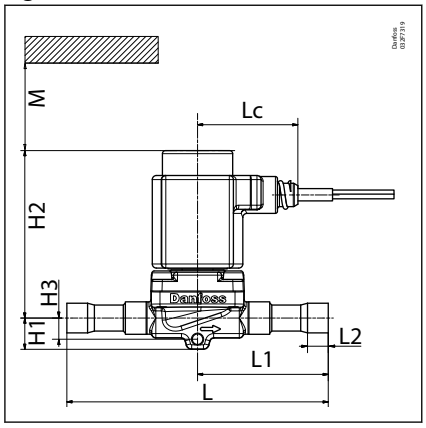



**Figure 20: EVR and DIN plug coil**

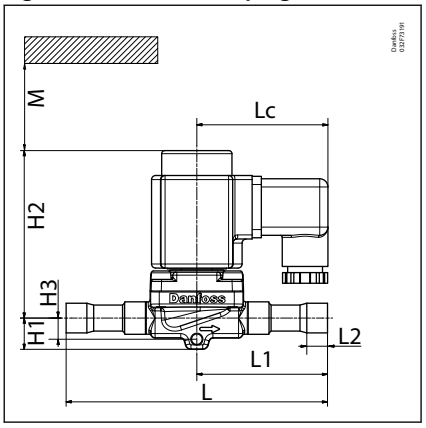



**Figure 21: EVR and Terminal box coil**

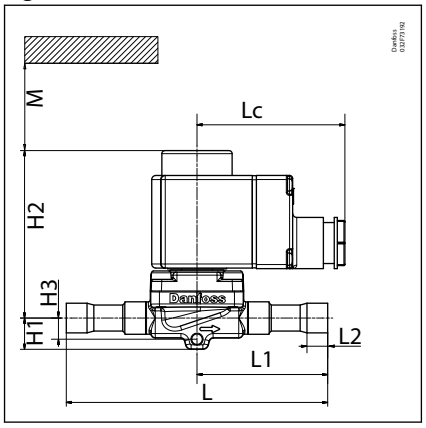



**Figure 22: Manual stem**

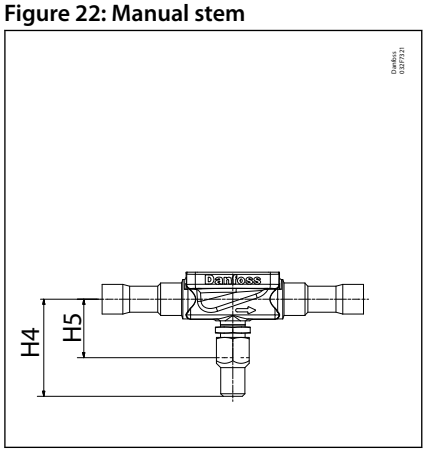



**Figure 23: End view**

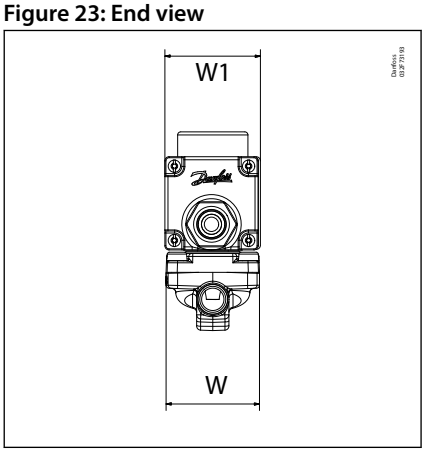



**Table 9: Dimensions and weights for EVR 10 Solder connection**

| Type | Connection size | | Manual operation | H1 | H2 | H3 | H4 | H5 | M min. | L | L1 | L2 | LC | W | W1 max. | Net weight without coil [1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | | | | |
| EVR 10 | ½ | 12 | Yes | 15 | 82 | 10 | 48 | 29 | 65 | 128 | 64 | 10 | – | 46 | – | 0.39 |
| | ⅜ | 10 | No | 15 | 82 | 10 | – | – | 65 | 118 | 59 | – | – | 46 | – | 0.34 |
| | ⅝ | 16 | No | 15 | 82 | 10 | – | – | 65 | 163 | 81.5 | 12 | – | 46 | – | 0.38 |
| | ⅝ | 16 | Yes | 15 | 82 | 10 | 48 | 29 | 65 | 163 | 81.5 | 12 | – | 46 | – | 0.4 |
| **Coil** | | | | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 15 - EVR 18 Solder connection

Figure 24: EVR and Cable coil

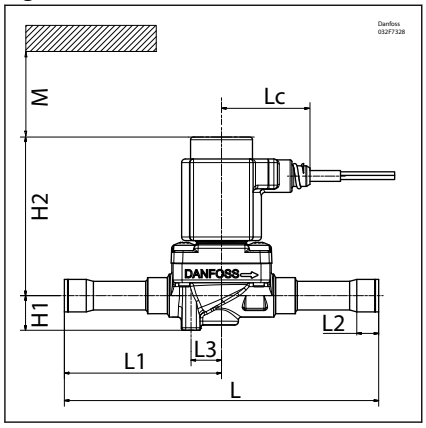



Figure 25: EVR and DIN plug coil

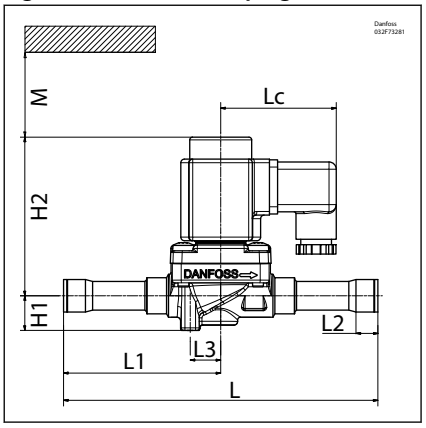



Figure 26: EVR and Terminal box coil

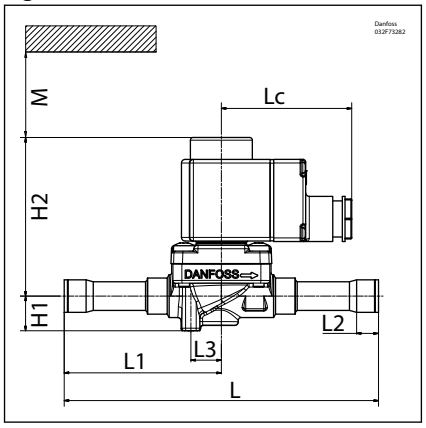



Figure 27: Manual stem

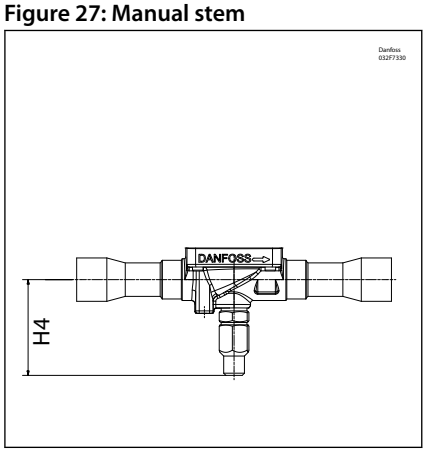



Figure 28: End view

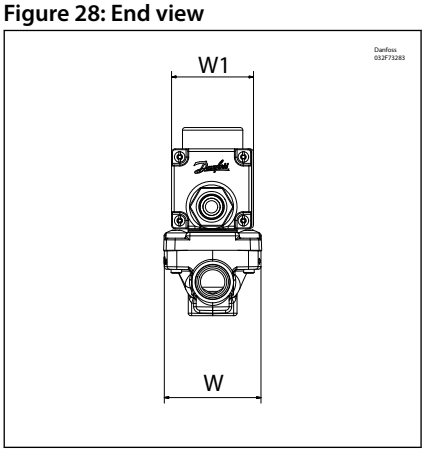



Table 10: Dimensions and weights for EVR 15 - EVR 18 Solder connection

| Type | Connection | | Manual operation | H1 | H2 | H4 | M min. | L | L1 | L2 | L3 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | | | |
| | 5/8 | 16 | Yes | 19 | 89 | 54 | 65 | 174 | 87 | 12 | 17 | – | 56 | – | 0.7 |
| EVR 15 | 5/8 | 16 | No | 19 | 89 | – | 65 | 174 | 87 | 12 | 17 | – | 56 | – | 0.7 |
| | 7/8 | 22 | No | 19 | 89 | – | 65 | 174 | 87 | 17 | 17 | – | 56 | – | 0.7 |
| EVR 18 | 7/8 | 22 | Yes | 19 | 89 | 54 | 65 | 179 | 89.5 | 17 | 17 | – | 56 | – | 0.7 |
| **Coil** | | | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 20 - EVR 22 Solder connection

**Figure 29: EVR and Cable coil**

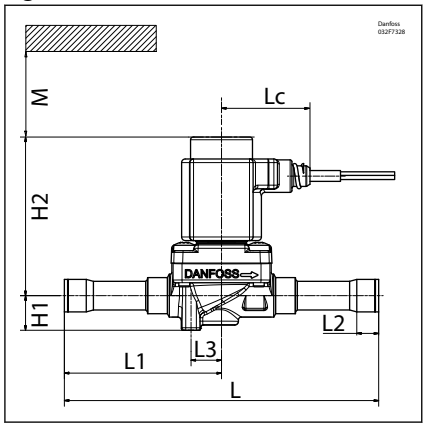



**Figure 30: EVR and DIN plug coil**

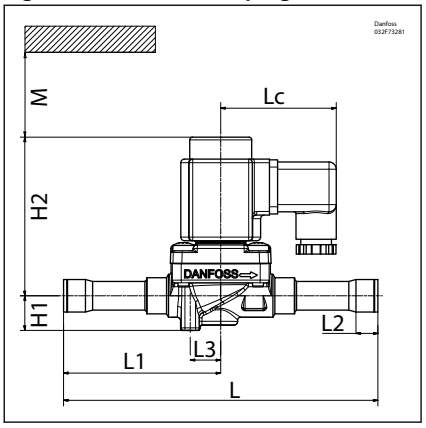



**Figure 31: EVR and Terminal box coil**

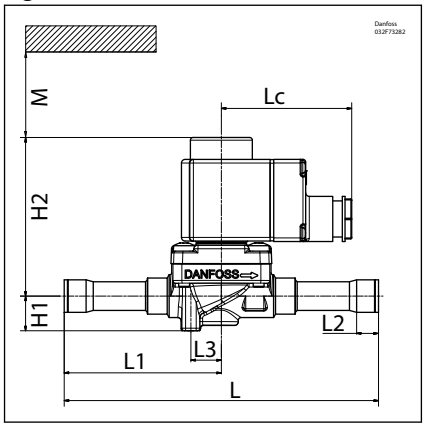



**Figure 32: Manual stem**

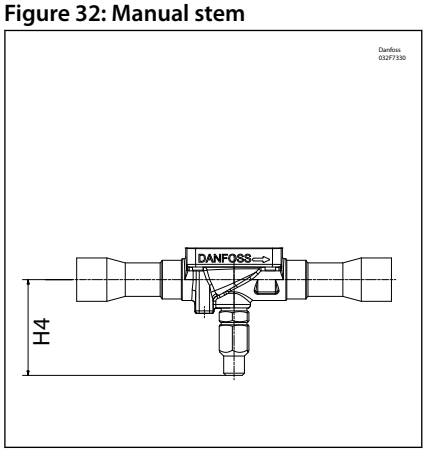



**Figure 33: End view**

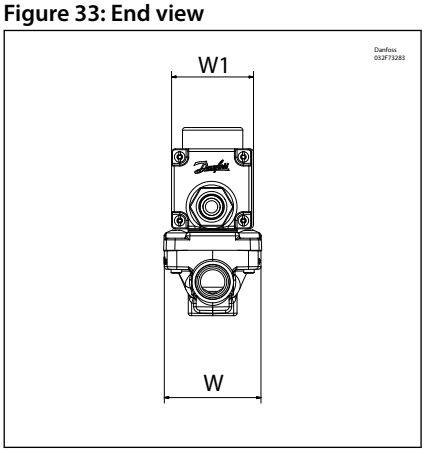



**Table 11: Dimensions and weights for EVR 20 - EVR 22 Solder connection**

| Type | Connection | | Manual operation | H1 | H2 | H4 | M min. | L | L1 | L2 | L3 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | | | |
| | 7/8 | 22 | Yes | 19 | 93 | 56 | 65 | 190 | 95 | 17 | 20 | – | 72 | – | 1.26 |
| EVR 20 | 7/8 | 22 | No | 19 | 93 | – | 65 | 190 | 95 | 17 | 20 | – | 72 | – | 1.26 |
| | 1 1/8 | 28 | No | 19 | 93 | – | 65 | 217 | 108.5 | 20 | 20 | – | 72 | – | 1.31 |
| | 1 1/8 | 28 | Yes | 19 | 93 | 56 | 65 | 222 | 111 | 20 | 20 | – | 72 | – | 1.31 |
| EVR 22 | 1 1/8 | 28 | No | 19 | 93 | – | 65 | 267 | 133.5 | 20 | 20 | – | 72 | – | 1.47 |
| | 1 3/8 | 35 | No | 19 | 93 | – | 65 | 292 | 146 | 25 | 20 | – | 72 | – | 1.47 |
| **Coil** | | | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 25 Solder connection

**Figure 34: EVR and Cable coil**

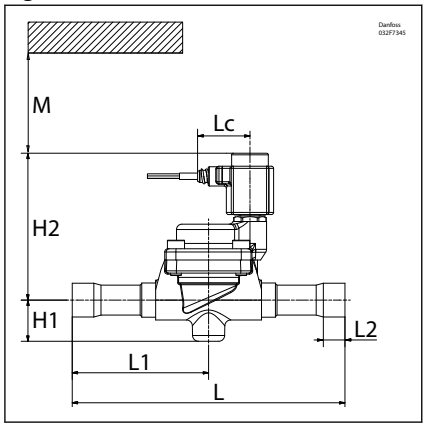



**Figure 35: EVR and DIN plug coil**

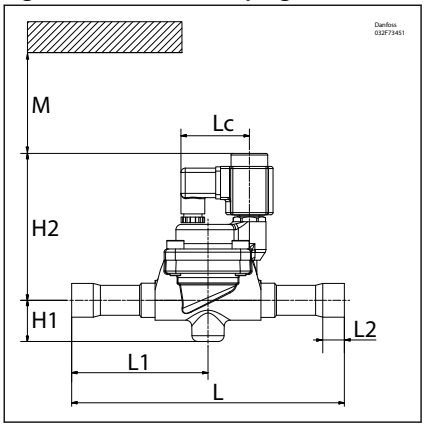



**Figure 36: EVR and Terminal box coil**

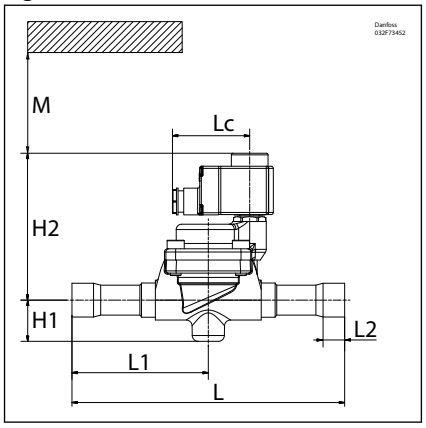



**Figure 37: Manual stem**

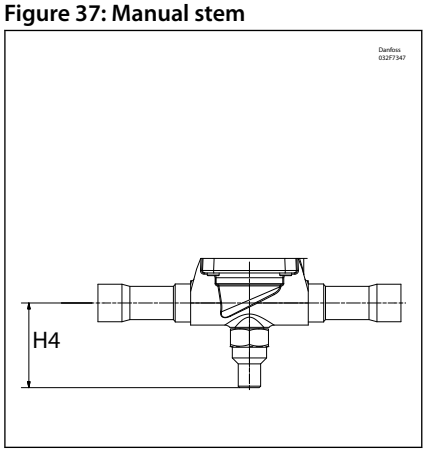



**Figure 38: End view**

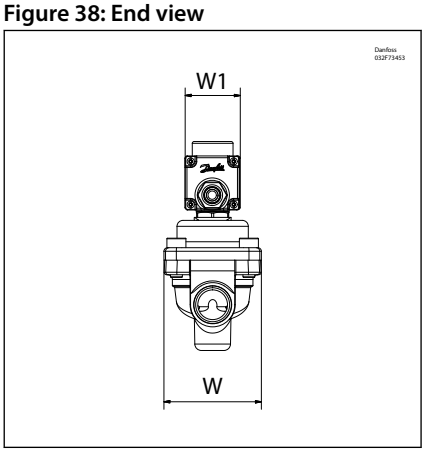



**Table 12: Dimensions and weights for EVR 25 Solder connection**

| Type | Connection | | Manual operation | H1 | H2 | H4 | M min. | L | L1 | L2 | Lc | W | W1 max. | Net weight without coil[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | | |
| EVR 25 | 1 1/8 | 28 | Yes | 39 | 138 | 71 | 65 | 255 | 127.5 | 20 | – | 82 | – | 2.67[1] |
| | 1 1/8 | 28 | No | 39 | 138 | – | 65 | 255 | 127.5 | 20 | – | 82 | – | 2.67[1] |
| | 1 3/8 | 35 | Yes | 39 | 138 | 71 | 65 | 281 | 140.5 | 25 | – | 82 | – | 2.80[1] |
| | 1 3/8 | 35 | No | 39 | 138 | – | 65 | 281 | 140.5 | 25 | – | 82 | – | 2.80[1] |
| **Coil** | | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | | 80 | – | 68 | – |

[1] Manual stem: +0.060 kg
[2] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 32 - EVR 40 Solder connection

**Figure 39: EVR and Cable coil**

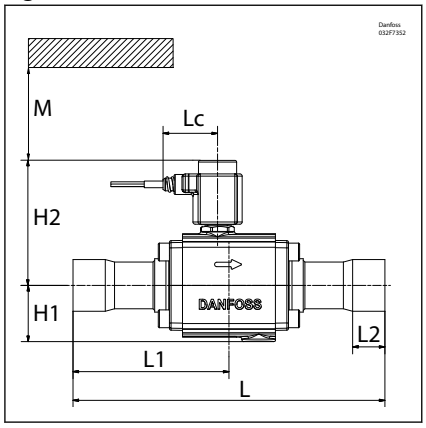



**Figure 40: EVR and DIN plug coil**

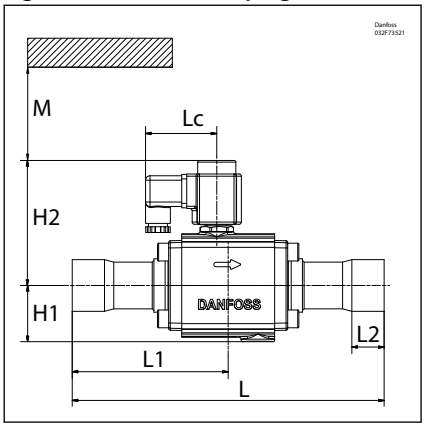



**Figure 41: EVR and Terminal box coil**

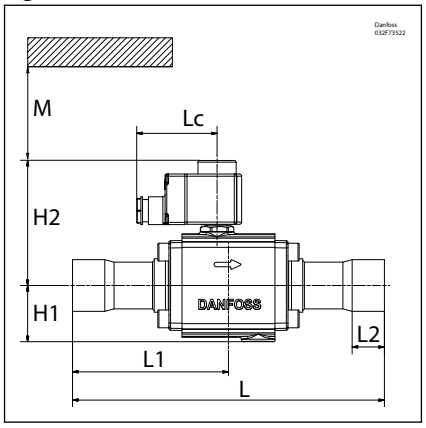



**Figure 42: Manual stem**

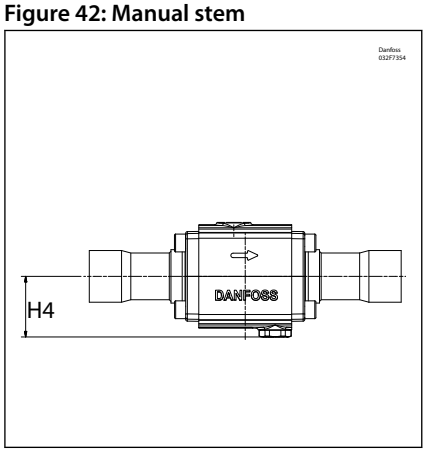



**Figure 43: End view**

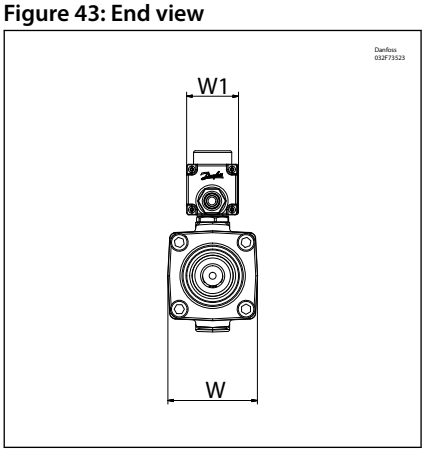



**Table 13: Dimensions and weights for EVR 32 - EVR 40 Solder connection**

| Type | Connection | | Manual operation | H1 | H2 | H4 | M min. | L | L1 | L2 | Lc | W | W1 max. | Net weight without coil[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | | |
| EVR 32 | 1 3/8 | 35 | Yes | – | 111 | 55 | 65 | 280 | 140 | 25 | – | 81 | – | 4.3 |
| | 1 3/8 | 35 | No | 51 | 111 | – | 65 | 280 | 140 | 25 | – | 81 | – | 4.3 |
| | 1 5/8 | 42 | Yes | – | 111 | 55 | 65 | 280 | 140 | 29 | – | 81 | – | 4.4 |
| | 1 5/8 | 42 | No | 51 | 111 | – | 65 | 280 | 140 | 29 | – | 81 | – | 4.4 |
| | 2 1/8 | – | Yes | – | 111 | 55 | 65 | 280 | 140 | 34 | – | 80 | – | 4.57 |
| | 2 1/8 | – | No | 51 | 111 | – | 65 | 280 | 140 | 34 | – | 80 | – | 4.57 |
| EVR 40 | 1 5/8 | 42 | Yes | – | 111 | 55 | 65 | 280 | 140 | 29 | – | 81 | – | 4.4 |
| | 1 5/8 | 42 | No | 51 | 111 | – | 65 | 280 | 140 | 29 | – | 81 | – | 4.4 |
| | 2 1/8 | – | Yes | – | 111 | 55 | 65 | 280 | 140 | 34 | – | 80 | – | 4.57 |
| | 2 1/8 | – | No | 51 | 111 | – | 65 | 280 | 140 | 34 | – | 80 | – | 4.57 |
| **Coil** | | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | | 80 | – | 68 | – |

[2] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVRC 15 Solder connection

**Figure 44: EVRC and Cable coil**

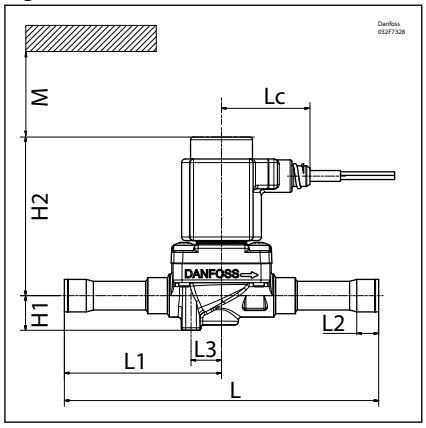



**Figure 45: EVRC and DIN plug coil**

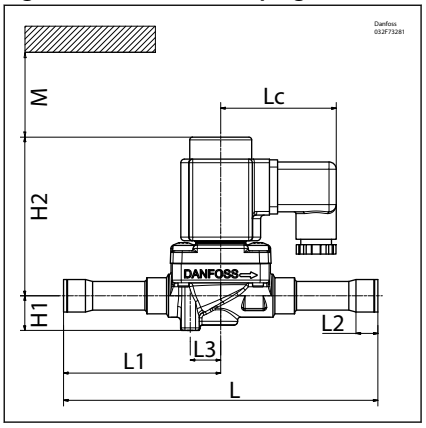



**Figure 46: EVRC and Terminal box coil**

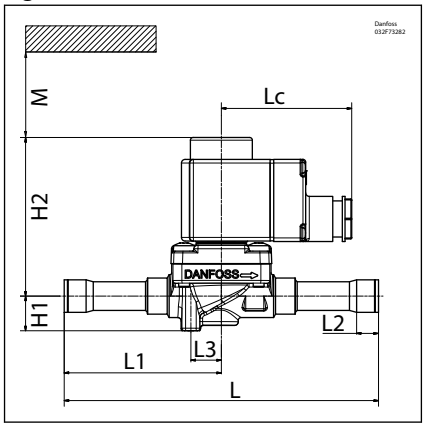



**Figure 47: End view**

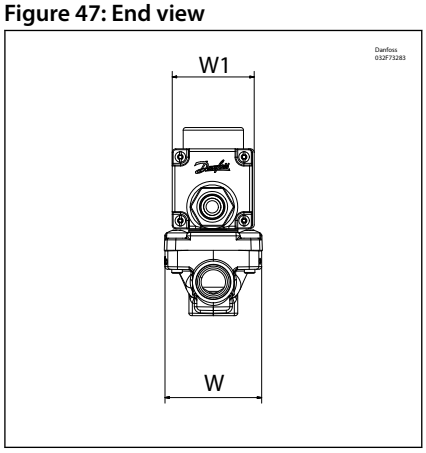



**Table 14: Dimensions and weights for EVRC 15 Solder connection**

| Type | Connection | | Manual operation | H1 | H2 | M min. | M min. | L | L1 | L2 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | | |
| EVRC 15 | 5/8 | 16 | No | 19 | 89 | 65 | 174 | 87 | 12 | 17 | – | 56 | – | 0.7 |
| **Coil** | | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVRC 20 Solder connection

**Figure 48: EVRC and Cable coil**

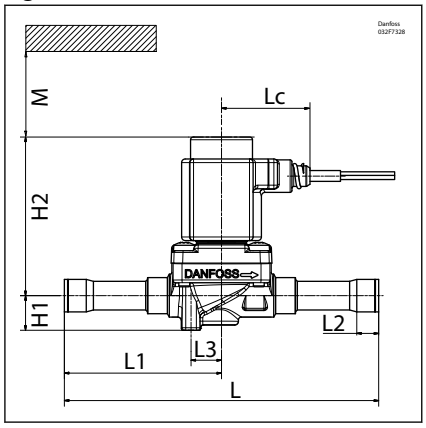



**Figure 49: EVRC and DIN plug coil**

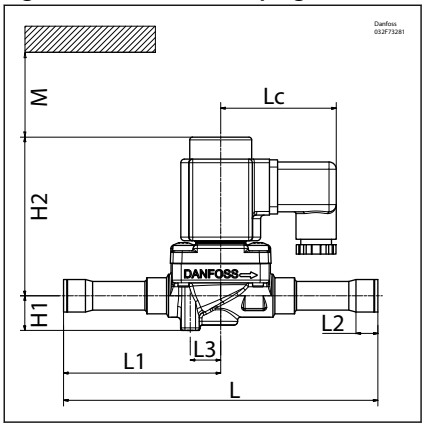



**Figure 50: EVRC and Terminal box coil**

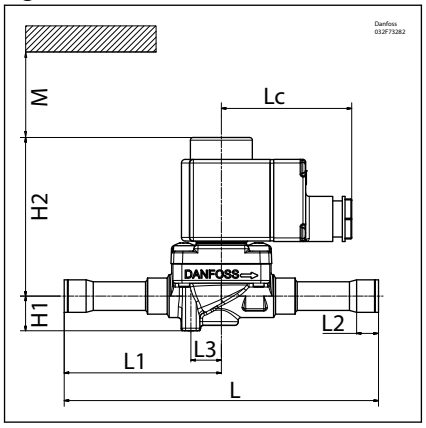



**Figure 51: End view**

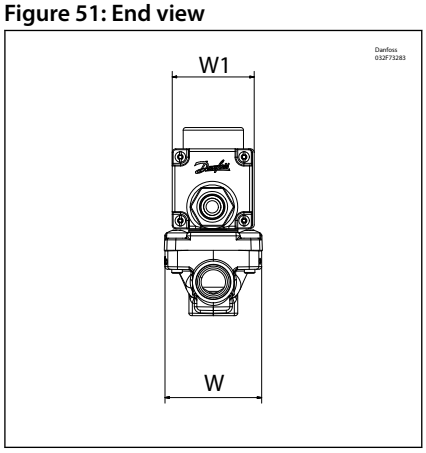



**Table 15: Dimensions and weights for EVRC 20 Solder connection**

| Type | Connection | | Manual operation | H1 | H2 | M min. | M min. | L | L1 | L2 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | | |
| EVRC 20 | 7/8 | 22 | No | 19 | 93 | 65 | 190 | 95 | 17 | 20 | – | 72 | – | 1.26 |
| **Coil** | | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 2 - EVR 3 Flare connection

**Figure 52: EVR and Cable coil**

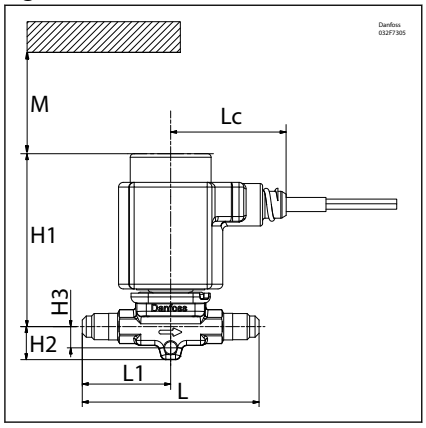



**Figure 53: EVR and DIN plug coil**

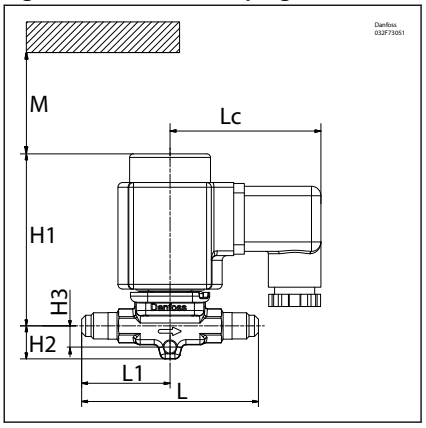



**Figure 54: EVR and Terminal box coil**

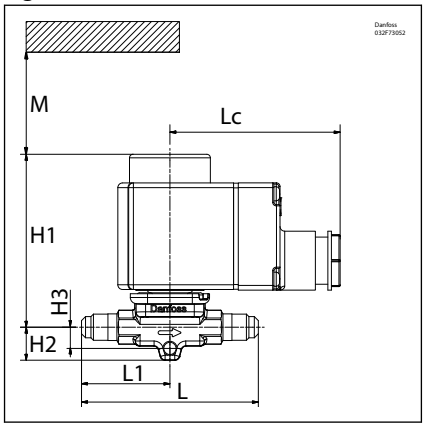
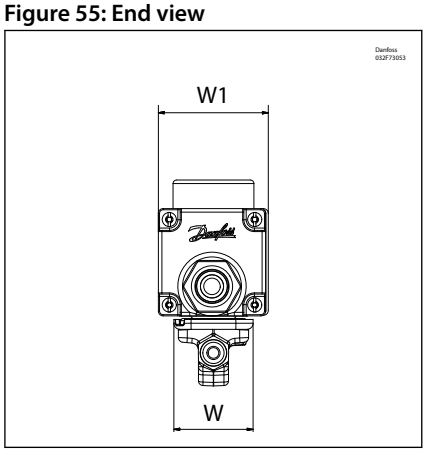



**Figure 55: End view**




| Type | Connection | | H1 | H2 | H3 | M min. | L | L1 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | |
| EVR 2 | 1/4 | 6 | 14 | 73 | 9 | 65 | 75 | 37.5 | – | 34 | – | 0.18 |
| EVR 3 | 1/4 | 6 | 14 | 73 | 9 | 65 | 75 | 37.5 | – | 34 | – | 0.18 |
| | 3/8 | 10 | 14 | 73 | 9 | 65 | 75 | 37.5 | – | 34 | – | 0.18 |
| **Coil** | | | | | | | | | | | | |
| Cable coil | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 6 Flare connection

**Figure 56: EVR and Cable coil**

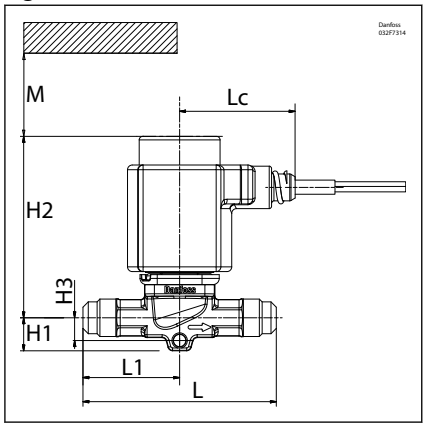



**Figure 57: EVR and DIN plug coil**

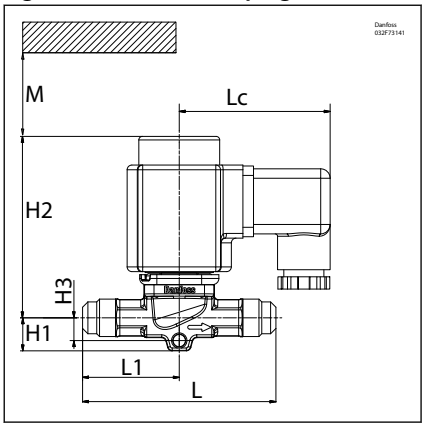



**Figure 58: EVR and Terminal box coil**

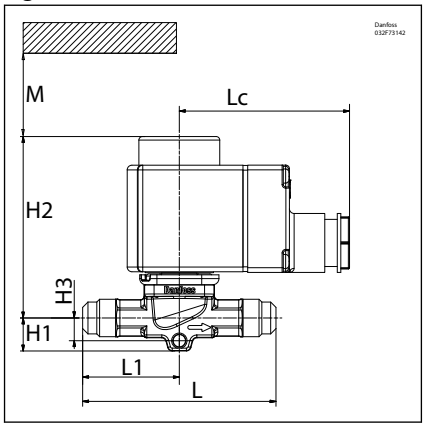



**Figure 59: End view**

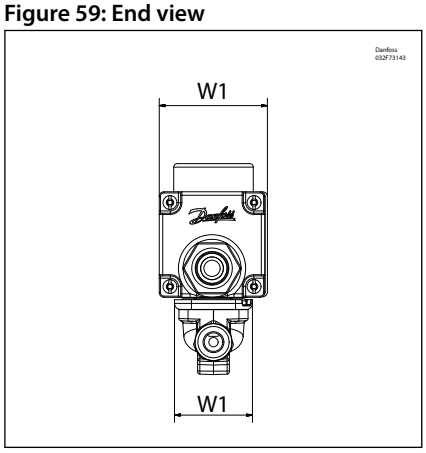



**Table 16: Dimensions and weights for EVR 6 Flare connection**

| Type | Connection | | H1 | H2 | H3 | M min. | L | L1 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | |
| EVR 6 | 3/8 | 10 | 14 | 77 | 10 | 65 | 82 | 41 | – | 34 | – | 0.21 |
| | 1/2 | 12 | 14 | 77 | 10 | 65 | 88 | 44 | – | 34 | – | 0.22 |
| **Coil** | | | | | | | | | | | | |
| Cable coil | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 10 Flare connection

**Figure 60: EVR and Cable coil**

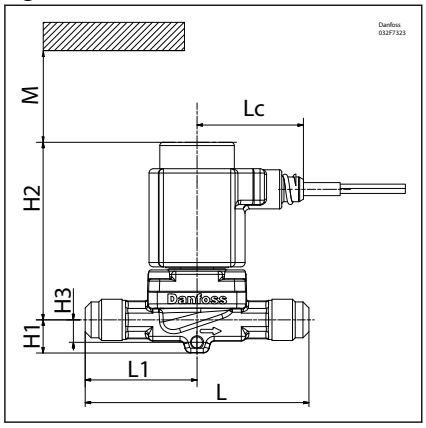



**Figure 61: EVR and DIN plug coil**

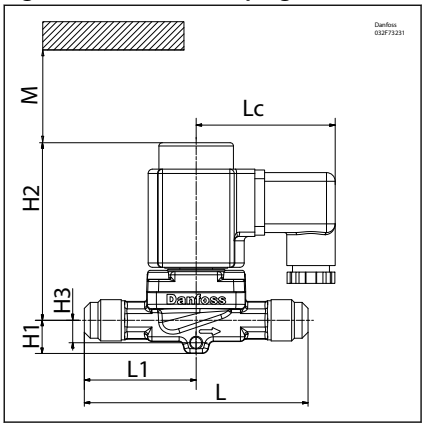



**Figure 62: EVR and Terminal box coil**

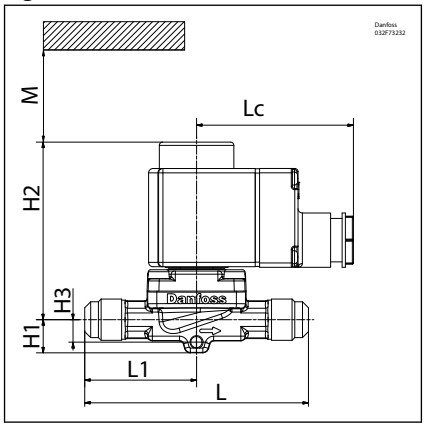



**Figure 63: End view**

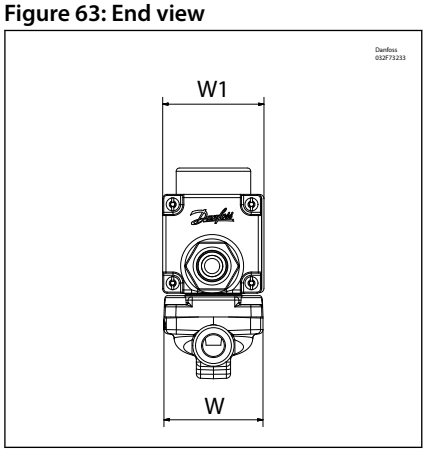



**Table 17: Dimensions and weights for EVR 10 Flare connection**

| Type | Connection | | H1 | H2 | H3 | M min. | L | L1 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | |
| EVR 10 | ½ | 12 | 15 | 82 | 10 | 65 | 103 | 51.5 | – | 46 | – | 0.44 |
| | ⅝ | 16 | 15 | 82 | 10 | 65 | 110 | 55 | – | 46 | – | 0.45 |
| **Coil** | | | | | | | | | | | | |
| Cable coil | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 15 Flare connection

**Figure 64: EVR and Cable coil**

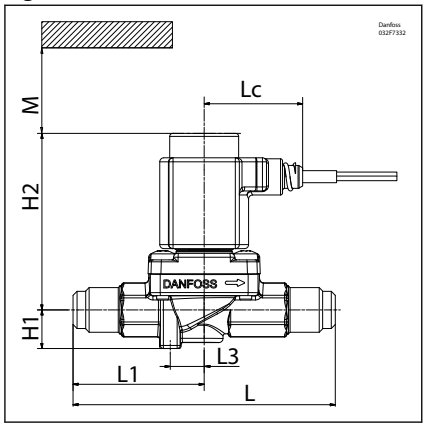



**Figure 65: EVR and DIN plug coil**

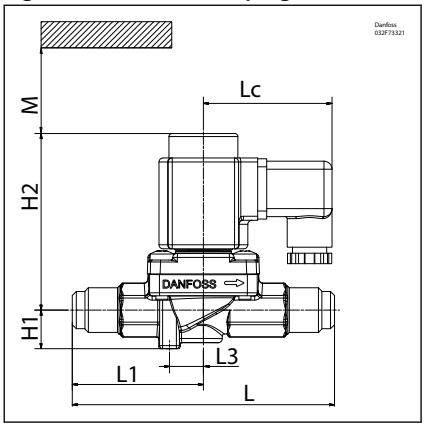



**Figure 66: EVR and Terminal box coil**

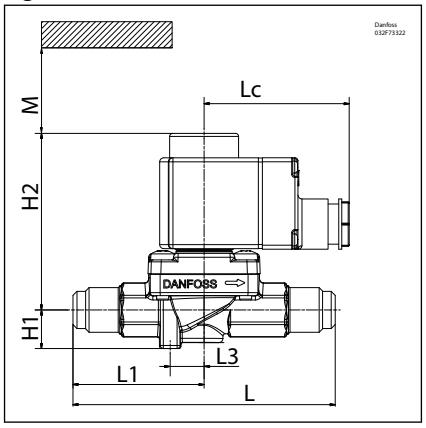



**Figure 67: Manual stem**

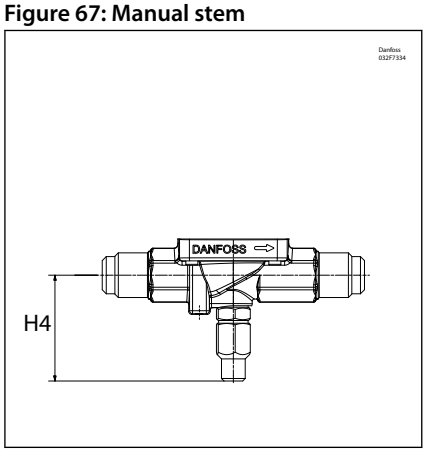



**Figure 68: End view**

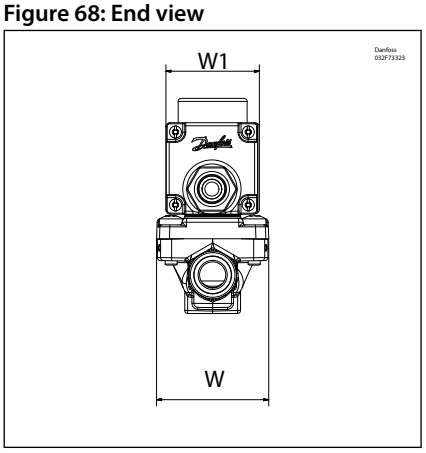



**Table 18: Dimensions and weights for EVR 15 Flare connection**

| Type | Connection | | Manual operation | H1 | H2 | H3 | M min. | L | L1 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [in] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | | |
| EVR 15 | 5⁄8 | 16 | Yes | 19 | 89 | 53 | 65 | 131 | 65.5 | 17 | – | 56 | – |
| | 5⁄8 | 16 | No | 19 | 89 | – | 65 | 131 | 65.5 | 17 | – | 56 | – |
| **Coil** | | | | | | | | | | | | | |
| Cable coil | | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg

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## Dimensions and weights for EVR 15 Flange connection

**Figure 69: EVR and Cable coil**

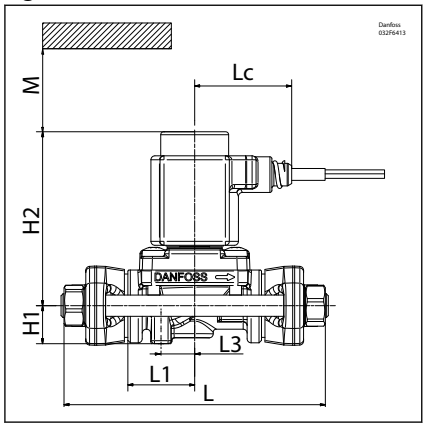



**Figure 70: EVR and DIN plug coil**

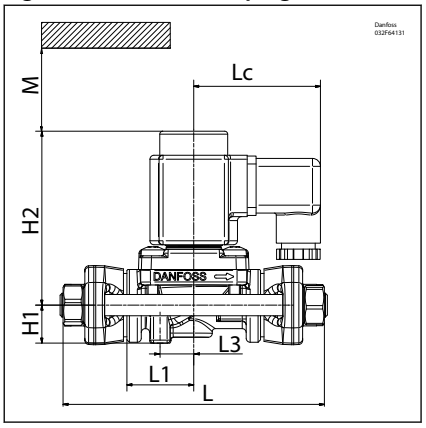



**Figure 71: EVR and Terminal box coil**

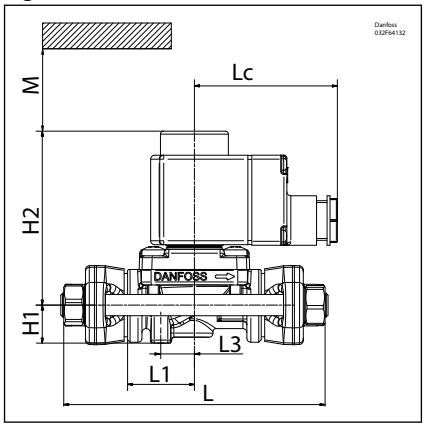



**Figure 72: Manual stem**

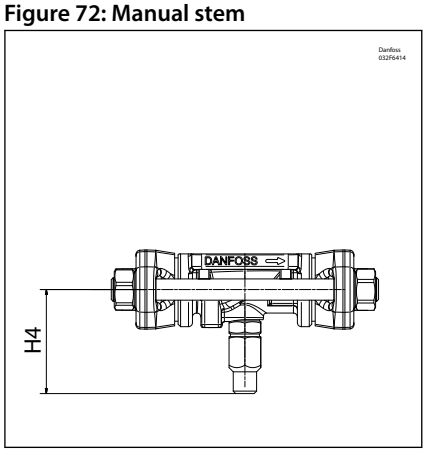



**Figure 73: End view**

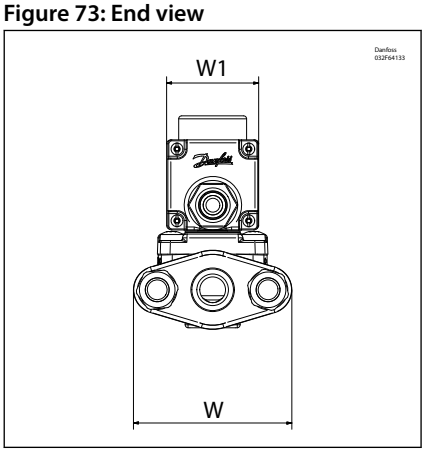



**Table 19: Dimensions and weights for EVR 15 Flange connection**

| Type | Manual operation | H1 | H2 | H4 | M min. | L | L1 | L3 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | |
| EVR 15 | Yes | 19 | 89 | 53 | 65 | 126 | 33.8 | 17 | – | 80 | – | 0.64 |
| | No | 19 | 89 | – | 65 | 126 | 33.8 | 17 | – | 80 | – | 0.64 |
| **Coil** | | | | | | | | | | | | |
| Cable coil | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg. The Weight of flange set is 0.6 kg

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## Dimensions and weights for EVR 20 Flange connection

**Figure 74: EVR and Cable coil**

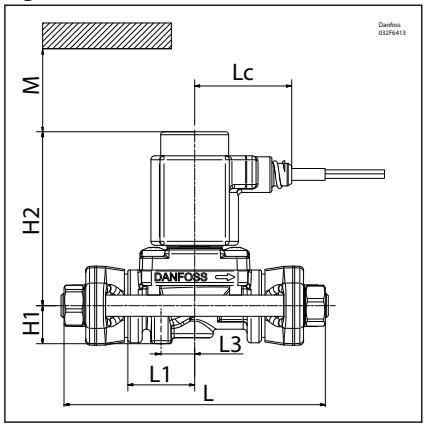



**Figure 75: EVR and DIN plug coil**

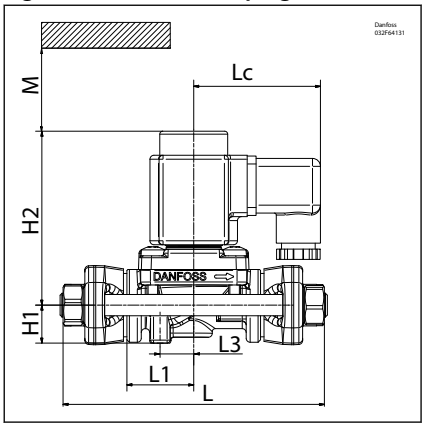



**Figure 76: EVR and Terminal box coil**

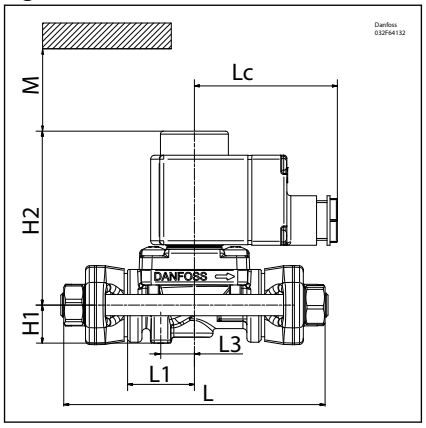



**Figure 77: Manual stem**

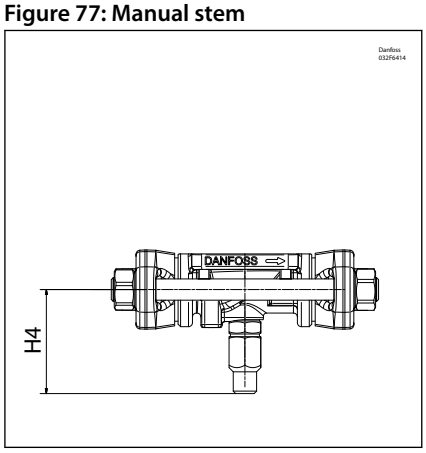



**Figure 78: End view**

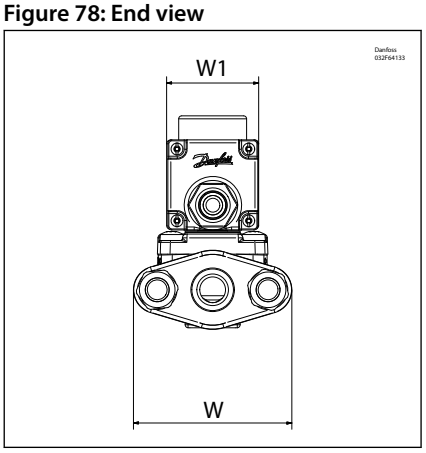



**Table 20: Dimensions and weights for EVR 20 Flange connection**

| Type | Manual operation | H1 | H2 | H4 | M min. | L | L1 | L3 | Lc | W | W1 max. | Net weight without coil[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg] |
| **Valve body** | | | | | | | | | | | | |
| EVR 20 | Yes | 19 | 93 | 56 | 65 | 156 | 42.5 | 20 | – | 96 | – | 1.20 |
| | No | 19 | 93 | – | 65 | 156 | 42.5 | 20 | – | 96 | – | 1.20 |
| **Coil** | | | | | | | | | | | | |
| Cable coil | | | | | | | | | 49 | – | 46 | – |
| DIN plug coil | | | | | | | | | 64 | – | 47 | – |
| Terminal box coil 10 W | | | | | | | | | 72 | – | 47 | – |
| Terminal box coil 12 / 20 W | | | | | | | | | 80 | – | 68 | – |

[1] Net weight of coil for 10 W is approx. 0.3 kg and for 12 and 20 W is approx. 0.5 kg. The Weight of flange set is 0.6 kg

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# Ordering

## Ordering EVR solder connection, Normally Closed (NC) - separate valve bodies

Figure 79: EVR 2 / EVR 3

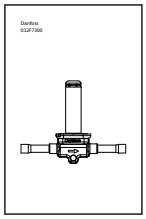


Figure 80: EVR 4 / EVR 6 / EVR 8

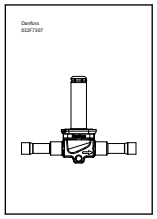


Figure 81: EVR 10

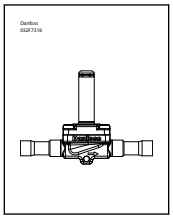


Figure 82: EVR 15 / EVR 18 / EVR 20 / EVR 22

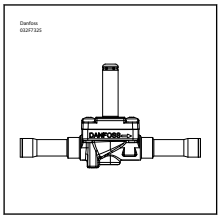


Figure 83: EVR 25

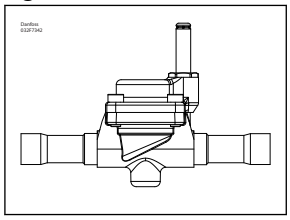


Figure 84: EVR 32 / EVR 40

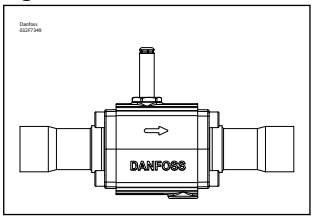



Table 21: Ordering EVR solder connection, Normally Closed (NC) - separate valve bodies

| Type | Coil voltage | Connection size | | Manual operation | $K_v$ value | Code no. |
|---|---|---|---|---|---|---|
| | | [in] | [mm] | | [$m^3/h$] | |
| EVR 2 | AC / DC | 1/4 | – | No | 0.15 | 032F1201 |
| | AC / DC | 1/4 | – | No | 0.15 | 032F7100 |
| | AC / DC | – | 6 | No | 0.15 | 032F1202 |
| EVR 3 | AC / DC | 1/4 | – | No | 0.26 | 032F1206 |
| | AC / DC | 3/8 | – | No | 0.26 | 032F1204 |
| | AC / DC | – | 6 | No | 0.26 | 032F1207 |
| | AC / DC | – | 10 | No | 0.26 | 032F1208 |
| EVR 4 | AC / DC | 3/8 | – | No | 0.7 | 032L7110 |
| EVR 6 | AC / DC | 3/8 | – | No | 1.0 | 032L1212 |
| | AC / DC | 3/8 | – | Yes | 0.87 | 032L7116 |
| | AC / DC | – | 10 | No | 1.0 | 032L1213 |
| | AC / DC | – | 12 | No | 1.0 | 032L1236 |
| | AC / DC | 1/2 | – | No | 1.0 | 032L1209 |
| | AC / DC | 1/2 | – | Yes | 0.87 | 032L7144 |
| | AC / DC | 5/8 | – | No | 1.0 | 032L7117 |
| EVR 8 | AC /DC | 1/2 | – | No | 1.15 | 032L7121 |
| | AC / DC | 1/2 | – | Yes | 1.09 | 032L7148 |
| | AC / DC | 5/8 | – | No | 1.15 | 032L7122 |
| EVR 10 | AC / DC | 3/8 | – | No | 1.56 | 032L7125 |
| | AC / DC | – | 12 | No | 2.2 | 032L1218 |
| | AC / DC | 1/2 | – | No | 2.2 | 032L1217 |
| | AC / DC | 1/2 | – | Yes | 2.2 | 032L1188 |
| | AC / DC | 5/8 | 16 | No | 2.2 | 032L1214 |
| | AC / DC | 5/8 | – | Yes | 2.2 | 032L7149 |
| EVR 15 | AC / DC | 5/8 | 16 | No | 3.3 | 032L1228 |
| | AC / DC | 5/8 | 16 | Yes | 3.3 | 032L1227 |
| | AC / DC | 7/8 | 22 | No | 3.3 | 032L1225 |
| EVR 18 | AC / DC | 7/8 | – | Yes | 3.9 | 032L1004 |
| EVR 20 | AC / DC | 7/8 | – | No | 6.0 | 032L1240 |
| | AC / DC | 7/8 | – | Yes | 6.0 | 032L1254 |
| | AC / DC | 1 1/8 | – | No | 6.0 | 032L1244 |
| | AC / DC | – | 28 | No | 6.0 | 032L1245 |

| Type | Coil voltage | Connection size | | Manual operation | $K_v$ value | Code no. |
|---|---|---|---|---|---|---|
| | | [in] | [mm] | | [m³/h] | |
| EVR 22 | AC / DC | 1 1⁄8 | – | No | 6.2 | 032L7145 |
| | AC / DC | 1 1⁄8 | – | Yes | 6.2 | 032L7137 |
| | AC / DC | 1 3⁄8 | – | No | 6.2 | 032L3267 |
| EVR 25 | AC / DC | 1 1⁄8 | – | Yes | 9.8 | 032L2200 |
| | AC / DC | 1 1⁄8 | – | No | 9.8 | 032L2201 |
| | AC / DC | – | 28 | Yes | 9.8 | 032L2205 |
| | AC / DC | – | 28 | No | 9.8 | 032L2206 |
| | AC / DC | 1 3⁄8 | – | Yes | 9.8 | 032L2207 |
| | AC / DC | 1 3⁄8 | – | No | 9.8 | 032L2208 |
| EVR 32 | AC / DC | 1 3⁄8 | 35 | Yes | 16.7 | 032L1105 |
| | AC / DC | 1 3⁄8 | 35 | No | 16.7 | 032L1106 |
| | AC / DC | 1 5⁄8 | – | Yes | 16.7 | 032L1103 |
| | AC / DC | 1 5⁄8 | – | No | 16.7 | 032L1104 |
| | AC / DC | – | 42 | Yes | 16.7 | 032L1107 |
| | AC / DC | – | 42 | No | 16.7 | 032L1108 |
| | AC / DC | 2 1⁄8 | – | No | 16.7 | 032L1180 |
| | AC / DC | 2 1⁄8 | – | Yes | 16.7 | 032L1181 |
| EVR 40 | AC / DC | 1 5⁄8 | – | Yes | 24.2 | 032L1109 |
| | AC / DC | 1 5⁄8 | – | No | 24.2 | 032L1110 |
| | AC / DC | – | 42 | Yes | 24.2 | 032L1113 |
| | AC / DC | – | 42 | No | 24.2 | 032L1114 |
| | AC / DC | 2 1⁄8 | – | Yes | 24.2 | 032L1111 |
| | AC / DC | 2 1⁄8 | – | No | 24.2 | 032L1112 |

## Ordering EVR solder connection, Normally Open (NO) - separate valve bodies

**Figure 85: EVR 6 solder connection (NO)**

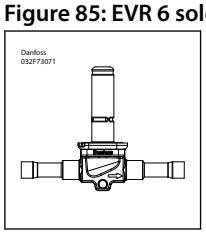



**Table 22: Ordering EVR solder connection, Normally Open (NO) - separate valve bodies**

| Type | Coil voltage | Connection size | | Manual operation | $K_v$ value | Code no. |
|---|---|---|---|---|---|---|
| | | [in] | [mm] | | [m³/h] | |
| EVR 6 | AC / DC | 3⁄8 | – | No | 1.0 | 032L1290 |
| | AC / DC | – | 10 | No | 1.0 | 032L1295 |
| EVR 10 | AC / DC | 1⁄2 | – | No | 2.2 | 032L1291 |
| | AC / DC | – | 12 | No | 2.2 | 032L1296 |
| EVR 15 | AC / DC | 5⁄8 | 16 | No | 3.3 | 032L1299 |
| | AC / DC | 7⁄8 | – | No | 3.3 | 032L3270 |
| EVR 20 | AC / DC | 7⁄8 | – | No | 6.0 | 032L1260 |
| | AC / DC | 1 1⁄8 | – | No | 6.0 | 032L1269 |
| | AC / DC | – | 28 | No | 6.0 | 032L1279 |
| EVR 22 | AC | 1 3⁄8 | – | No | 6.0 | 032L3268 |

## Ordering EVR flare connection, Normally Closed (NC) - separate valve bodies

**Figure 86: EVR 6 flare connection (NC)**

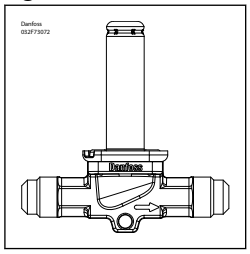


**Table 23: Ordering EVR flare connection, Normally Open (NO) - separate valve bodies**

| Type | Coil voltage | Connection size | | Manual operation | $K_v$ value | Code no. |
|---|---|---|---|---|---|---|
| | | [in] | [mm] | | [$m^3/h$] | |
| EVR 2 | AC / DC | 1/4 | 6 | No | 0.15 | 032F8056 |
| EVR 3 | AC / DC | 1/4 | 6 | No | 0.26 | 032F8107 |
| | AC / DC | 3/8 | 10 | No | 0.26 | 032F8116 |
| EVR 6 | AC / DC | 3/8 | 10 | No | 1.0 | 032L8072 |
| | AC / DC | 1/2 | 12 | No | 1.0 | 032L8079 |
| EVR 10 | AC / DC | 1/2 | 12 | No | 2.2 | 032L8095 |
| | AC / DC | 5/8 | 16 | No | 2.2 | 032L8098 |
| EVR 15 | AC / DC | 5/8 | 16 | Yes | 3.3 | 032L8100 |
| | AC / DC | 5/8 | 16 | No | 3.3 | 032L8101 |

## Ordering EVR flare connection, Normally Open (NO) - separate valve bodies

**Figure 87: EVR 6 flare connection (NO)**

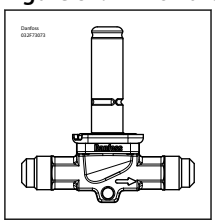


**Table 24: Ordering EVR flare connection, Normally Open (NO) - separate valve bodies**

| Type | Coil voltage | Connection size | | Manual operation | $K_v$ value | Code no. |
|---|---|---|---|---|---|---|
| | | [in] | [mm] | | [$m^3/h$] | |
| EVR 6 | AC / DC | 3/8 | 10 | No | 1.0 | 032L8085 |
| EVR 10 | AC / DC | 1/2 | 12 | No | 2.2 | 032L8090 |

## Ordering EVR flange connection, Normally Closed (NC) - separate valve bodies

**Figure 88: EVR 15 flmage connection**

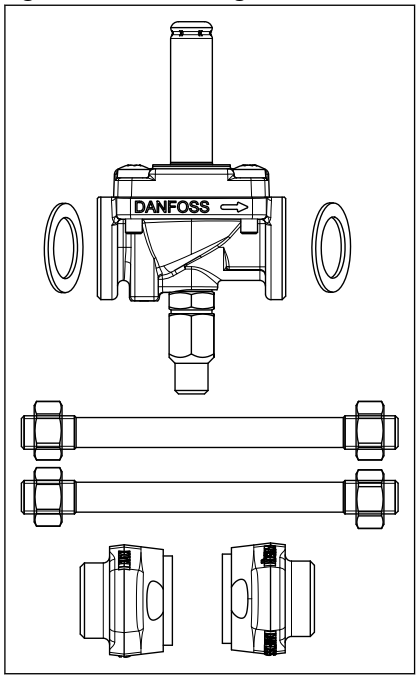



**Table 25: EVR flange connection, Normally Closed (NC) - separate valve bodies**

| Type | Coil voltage | Connection | Manual operation | Code no. |
|---|---|---|---|---|
| EVR 15 | AC / DC | Flanges | No | 032L1224 |
| | AC / DC | Flanges | Yes | 032L1234 |
| EVR 20 | AC / DC | Flanges | No | 032L1243 |
| | AC / DC | Flanges | Yes | 032L1253 |

**Table 26: Flange sets**

| Type | Connection size | | Connection type | | | Code no. |
|---|---|---|---|---|---|---|
| | [in] | [mm] | Solder [in] | Solder [mm] | Weld [in] | |
| EVR 15 | ½ | – | – | – | Yes | 027N1115 |
| | ⅝ | – | Yes | – | – | 027L1117 |
| | – | 16 | – | Yes | – | 027L1116 |
| | ¾ | – | – | – | Yes | 027N1120 |
| | ⅞ | – | Yes | – | – | 027L1123 |
| | – | 22 | – | Yes | – | 027L1122 |
| EVR 20 | ¾ | – | – | – | Yes | 027N1220 |
| | ⅞ | – | Yes | – | – | 027L1223 |
| | – | 22 | – | Yes | – | 027L1222 |
| | 1 | – | – | – | Yes | 027N1225 |
| | 1⅛ | – | Yes | – | – | 027L1229 |
| | – | 28 | – | Yes | – | 027L1228 |

**Example**
EVR 15 without manual operation,
code no. **032L1224**
½ in weld flange set,
code no. **027N1115**
+ coil with terminal box, 220 V, 50 Hz,
code no. **018F6701**

## Ordering EVRC solder connection, Normally Closed (NC) - separate valve bodies

**Figure 89: EVRC solder connection (NC)**

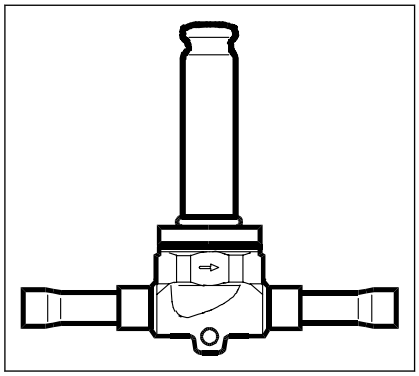


**Table 27: EVRC solder connection, Normally Closed (NC)**

| Type | Coil voltage | Connection size [in] | Connection size [mm] | Manual operation | Kv value [m³/h] | | Code no. |
|---|---|---|---|---|---|---|---|
| | | | | | Flow in arrow direction | Flow against arrow direction | |
| EVRC 15 | AC / DC | 5/8 | 16 | No | 2.7 | 2.5 | 032L1255 |
| EVRC 20 | AC / DC | 7/8 | 22 | No | 3.6 | 5 | 032L1258 |

## Ordering Flare nuts

Valve bodies for flare connection (NC) and (NO) are supplied without flare nuts.

**Table 28: ordering Flare nuts**

| Connection size | | Code no. |
|---|---|---|
| [in] | [mm] | |
| 1/4 | 6 | 011L1101 |
| 3/8 | 10 | 011L1135 |
| 1/2 | 12 | 011L1103 |
| 5/8 | 16 | 011L1167 |

## Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

**Table 29: Certificates, declarations, and approvals**

| Document name | Document type | Document topic | Approval authority |
|---|---|---|---|
| MH7648 | Electrical - Safety Certificate | | UL |
| TAA0000085 Rev. 2 | Marine - Safety Certificate | | DNV GL |
| RMRS 18.10006.262 | Marine - Safety Certificate | | RMRS |

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# EU DECLARATION OF CONFORMITY

## Danfoss A/S

Refrigaration and Air Conditioning Controls

declares under our sole responsibility that the

**Product category:** Solenoid coils

**Type designation(s):**

Coils: 018Fxxxx(+), 018Zxxxx(+), 042Nxxxx used for valves type: EV, EVR, EVRH, EVRP, EVRC, EVU, EVUL, EVUB, EVUF, EVO, AKV, AKVH, AKVO, EVRA, EVRAT, AKVA, EVM, EVRB, EVRF, EVRS, EVRST, ICLX, GPLX, ICS, CTM, AKV 10P, AKV 10PS, VDHT, VDH, VPH, EVT

Note (+) *the following coils are excluded: 018F47xx, 018Z85xx, 018Z659x (Ex certified)*

Covered by this declaration is in conformity with the following directive(s), regulation(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

**Low Voltage Directive 2014/35/EU**

- EN60730-1: 2011 - Automatic electrical controls for household and similar use – Part 1: General requirements.

**Electromagnetic Compatibility – Directive 2014/30/EU**

- EN60730-1: 2011 - Automatic electrical controls for household and similar use – Part 1: General requirements.

| | | | |
|---|---|---|---|
| Date: 2022.12.12<br>**Place of issue:**<br>DK6430 Nordborg | **Issued by**<br>DocuSigned by: Per Brüggert 29ACD799A36647F...<br>**Signature:**<br>**Name:** Per Brüggert<br>**Title:** Senior Design Engineer | Date: 2022.12.12<br>**Place of issue:**<br>DK6430 Nordborg | **Approved by**<br>DocuSigned by: Jesper Kirkegaard 02CE1A82330744A...<br>**Signature:**<br>**Name:** Jesper Kirkegaard<br>**Title:** Engineering Director |

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**Product category:** Solenoid coils

**Type designation(s):**

Coils: 018Fxxxx(+), 018Zxxxx(+), 042Nxxxx used for valves type: EV, EVR, EVRH, EVRP, EVRC, EVU, EVUL, EVUB, EVUF, EVO, AKV, AKVH, AKVO, EVRA, EVRAT, AKVA, EVM, EVRB, EVRF, EVRS, EVRST, ICLX, GPLX, ICS, CTM, AKV 10P, AKV 10PS, VDHT, VDH, VPH, EVT

Note (+) *the following coils are excluded: 018F47xx, 018Z85xx, 018Z659x (Ex certified)*

Covered by this declaration is in conformity with the following directive(s), regulation(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

**Electrical Equipment (Safety) Regulations 2016**

- BS EN60730-1:2011 – Automatic electrical controls for household and similar use. General requirements.

**Electromagnetic Compatibility Regulations 2016**

- BS EN60730-1:2011 – Automatic electrical controls for household and similar use. General requirements.

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|---|---|---|---|
| Date: 2022.12.12<br>**Place of issue:**<br>DK6430 Nordborg | **Issued by**<br>DocuSigned by: Per Brüggert 29ACD799A36647F...<br>**Signature:**<br>**Name:** Per Brüggert<br>**Title:** Senior Design Engineer | Date: 2022.12.12<br>**Place of issue:**<br>DK6430 Nordborg | **Approved by**<br>DocuSigned by: Jesper Kirkegaard 02CE1A82330744A...<br>**Signature:**<br>**Name:** Jesper Kirkegaard<br>**Title:** Engineering Director |

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# EU DECLARATION OF CONFORMITY

## Danfoss A/S

### Danfoss Cooling Segment

declares under our sole responsibility that the

**Product category:** Elelctronics Controls for Cold Rooms

**Type designation(s):** AK-RC 204B, AK-RC 205C, AK-RC 305W-SD and AK-RC 306W-EV

Covered by this declaration is in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

**Low Voltage Directive (LVD – 2014/35/EU)**

EN 60730-1:2011 – Automatic Electrical controls for household and similar appliance.
Part 1: General requirements

**Electro Magnetic Compatibility Directive (EMC – 2014/30/EU)**

EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

**RoHS Directive 2011/65/EU including amendment 2015/863**

EN IEC 63000:2018. Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

| | | | |
|---|---|---|---|
| Date: 2022.02.10<br>**Place of Issue:** IN – Chennai, 602105 | **Issued by**<br><br>**Signature:**<br>**Name:** Saravanan Arumugam<br>**Title:** Lead Compliance - Engineer | Date: 2022.02.10<br>**Place of Issue:** Italy – 31015, Conegliano | **Approved by**<br><br>**Signature:**<br>**Name:** Alberto Candaten<br>**Title:** Director R&D and Engineering ECS-RH |

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## Danfoss A/S

### Danfoss Cooling Segment

declares under our sole responsibility that the

**Product category:** Elelctronics Controls for Cold Rooms

**Type designation(s):** AK-RC 204B, AK-RC 205C, AK-RC 305W-SD and AK-RC 306W-EV

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**Electrical Equipment (Safety) Regulations 2016**

BS EN 60730-1:2011 – Automatic Electrical controls for household and similar appliance. Part 1: General requirements

**Electromagnetic Compatibility Regulations 2016**

BS EN 61326-1 :2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

**Restriction to Use Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (as amended)**

BS EN IEC 63000 :2018. Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

| | | | |
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| Date: 2022.02.10<br>**Place of Issue:** IN – Chennai, 602105 | **Issued by**<br><br>**Signature:**<br>**Name:** Saravanan Arumugam<br>**Title:** Lead Compliance - Engineer | Date: 2022.02.10<br>**Place of Issue:** Italy – 31015, Conegliano | **Approved by**<br><br>**Signature:**<br>**Name:** Alberto Candaten<br>**Title:** Director R&D and Engineering ECS-RH |

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# EU DECLARATION OF CONFORMITY

## Danfoss A/S

### Danfoss Climate Solutions

declares under our sole responsibility that the

**Product category:** Condensing Unit Controller

**Type designation(s):** Optyma Plus™ Controller

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**Electro Magnetic Compatibility Directive (EMC – 2014/30/EU)**

EN 61000-6-2: 2005 – Electromagnetic compatibility [EMC], Generic standard – Immunity for Industrial Environments.

EN 61000-6-3: 2007 + A1: 2011 - Electromagnetic compatibility [EMC], Generic standard – Emission standard for residential, commercial and Light-Industrial Environment.

**Low Voltage Directive (LVD – 2014/35/EU)**

EN 60730-1:2011 – Automatic Electrical controls for household and similar appliance.
Part 1: General requirements

EN 60730-2-9: 2010 – Automatic Electrical controls for household and similar appliance.
Part 2-9: Particular requirement of temperature sensing controls

| | | | |
|---|---|---|---|
| Date: 2022.10.19<br>**Place of issue:** IN – Chennai, 602105 | **Issued by**<br>  <br>**Signature:**<br>**Name:** Saravanan Arumugam<br>**Title:** Lead Compliance - Engineer | Date: 2022.10.19<br>**Place of issue:** Italy – 31015, Conegliano | **Approved by**<br>  <br>**Signature:**<br>**Name:** Alberto Candaten<br>**Title:** Director R&D and Engineering ECS-RH |

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# UK DECLARATION OF CONFORMITY

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**Danfoss Climate Solutions**

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**Product category:** Condensing Unit Controller

**Type designation(s):** Optyma Plus™ Controller

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**Electromagnetic Compatibility Regulations 2016**

BS EN 61000-6-2: 2005 – Electromagnetic compatibility [EMC], Generic standard – Immunity for Industrial Environments.

BS EN 61000-6-3: 2007 + A1: 2011 - Electromagnetic compatibility [EMC], Generic standard – Emission standard for residential, commercial and Light-Industrial Environment.

**Electrical Equipment (Safety) Regulations 2016**

BS EN 60730-1:2011 – Automatic Electrical controls for household and similar appliance.
Part 1: General requirements

BS EN 60730-2-9: 2010 – Automatic Electrical controls for household and similar appliance.
Part 2-9: Particular requirement of temperature sensing controls

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|---|---|---|---|
| Date: 2022.10.19<br>**Place of issue:** IN - Chennai, 602105 | **Issued by**<br><br>**Signature:**<br>**Name:** Saravanan Arumugam<br>**Title:** Lead Compliance - Engineer | Date: 2022.10.19<br>**Place of issue:** Italy – 31015, Conegliano | **Approved by**<br><br>**Signature:**<br>**Name:** Alberto Candaten<br>**Title:** Director R&D and Engineering ECS-RH |

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# EU DECLARATION OF CONFORMITY

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System Solutions and New Business

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**Product category:** Condensing units

**Type designation(s):**

| Product Range | Type Description | Product Version | PED Cat. (Group 1) | PED Cat. (Group 2) |
|---|---|---|---|---|
| Optyma™ Slim Pack | OP-LSVM048NT*; OP-LSVM068NT*; OP-LSVM026DS*; OP-LSVM034DS*; OP-MSTM021DX*; OP-MSTM022DS*; OP-MSTM026DS*; OP-MSTM034DS*; OP-MSTM038DS*; OP-MSIM034ML*; OP-MSIM044ML*; OP-MSIM046ML*; OP-MSIM057ML*; OP-MSIM068ML*; OP-MSIM080ML*; OP-MSIM099ML*; OP-MSIM108ML* | W05 & W09 | II | I |
| | OP-MSTM008DY*; OP-MSTM009DY*; OP-MSTM012DP*; OP-MSTM014DP*; OP-MSSM026CS*; OP-MSSM030CS; OP-MSTM018DX*; OP-MSSM012SC*; OP-MSSM015SC*; OP-MSSM018SC*; OP-MSSM021SC* | | I | I |

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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| Product Range | Type Description | Product Version | PED Cat. (Group 1) | PED Cat. (Group 2) |
|---|---|---|---|---|
| Optyma™ Plus | OP-LPVM048NT*; OP-LPVM068NT*; OP-LPVM026DS*; OP-LPVM034DS*; OP-MPTM021DX*; OP-MPTM022DS*; OP-MPTM026DS*; OP-MPTM034DS*; OP-MPTM038DS*; OP-MPIM034ML*; OP-MPIM044ML*; OP-MPIM046ML*; OP-MPIM057ML*; OP-MPIM068ML*; OP-MPIM080ML*; OP-MPIM099ML*; OP-MPIM108ML*; OP-MPIM125ML*; OP-MPIM162ML* | P00 | II | I |
| | OP-LPKM067LL*; OP-LPKM084LL*; OP-LPKM098LL*; OP-LPKM120LL*; OP-LPKM168LL* | P02 | | |
| | OP-MPTM008DY*; OP-MPTM009DY*; OP-MPTM012DP*; OP-MPTM014DP*; OP-MPTM018DX*; OP-MPSM026CS*; OP-MPSM030CS* | P00 | I | I |

| Product Range | Type Description | Product Version | PED Cat (Group 2) |
|---|---|---|---|
| Optyma™ Slim Pack | OP-LSQM048NT*; OP-LSQM068NT*; OP-LSQM067LL*; OP-LSQM084LL*; OP-LSQM098LL*; OP-MSGM012SC*; OP-MSGM015SC*; OP-MSGM018SC*; OP-MSGM021SC*; OP-MSXM034ML*; OP-MSXM044ML*; OP-MSXM046ML*; OP-MSXM057ML*; OP-MSXM068ML*; OP-MSXM080ML*; OP-MSXM099ML*; OP-MSXM108ML* | W05 & W09 | I |

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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| Product Range | Type Description | Product Version | PED Cat (Group 2) |
|---|---|---|---|
| Optyma™ Plus | OP-LPQM048NT*; OP-LPQM068NT*; OP-MPGM012SC*; OP-MPGM015SC*; OP-MPGM018SC*; OP-MPGM021SC*; OP-MPXM044ML*; OP-MPXM099ML* | P00 | I |
| | OP-LPOM067LL*; OP-LPOM084LL*; OP-LPQM098LL* | P02 | |
| | OP-MPXM034ML*; OP-MPXM046ML*; OP-MPXM057ML*; OP-MPXM068ML*; OP-MPXM080ML*; OP-MPXM108ML* | P00 & P05 | |
| | OP-MPPM028VVL*; OP-MPPM035VVL*; OP-MPPM044VVL* | P01 | |
| | OP-MPPM065VVL*; | P01 | II |
| | OP-MPXM125ML*; OP-MPXM162ML* | P00, P05 & P07 | |
| | OP-LPOM120LL*; OP-LPOM168LL* | P02 | |

*Followed by 4 characters

Covered by this declaration is in conformity with the following directive(s), regulation(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

**Eco-design Directive 2009/125/EC**

Establishing a framework for the setting of Eco-design requirements for energy-related products.

**Regulation (EU) 2015/1095**

Implementing Eco-design Directive 2009/125/EC with regards to Eco-design 2018 requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers. Product information required in tables 4 and 5 of the regulations at annex V are available for individual products with approved refrigerant fluids in Coolselector®2 Software, which can be freely downloaded at website https://www.danfoss.com.

Condensing unit measurements are made according to standard EN 13771-2:2017 – Compressor and condensing units for refrigeration-performance testing and test methods – Part 2: Condensing units.

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|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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**Pressure Equipment Directive 2014/68/EU**

EN378-2:2016 Refrigerating system and heat pumps – safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation (As applicable clauses)

EN14276-2:2007 + A1:2011 Pressure equipment for refrigerating system and heat pumps. Conformity assessment module A2 (TÜV NORD Systems GmbH & Co. KG, Große Bahnstraße 31, 22525 Hamburg, Germany)

Conformity assessment is according to PED module A2.

**Name and Address of the Notified Body carried out the PED Inspection according to Module A2**

**TÜV NORD Systems GmbH & Co. KG**
**Notified body no: 0045**
Große Bahnstraße 31,
22525 Hamburg, Germany.

CE 0045

**Certificate No of Module A2:**
**0045/202/9070/Z/00506/21/D/001(04) issued on 16/04/2024**

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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# UK DECLARATION OF CONFORMITY

## Danfoss A/S

System Solutions and New Business

declares under our sole responsibility that the

**Product category:** Condensing units

**Type designation(s):**

| Product Range | Type Description | Product Version | PED Cat. (Group 1) | PED Cat. (Group 2) |
|---|---|---|---|---|
| Optyma™ Slim Pack | OP-LSVM048NT*; OP-LSVM068NT*; OP-LSVM026DS*; OP-LSVM034DS*; OP-MSTM021DX*; OP-MSTM022DS*; OP-MSTM026DS*; OP-MSTM034DS*; OP-MSTM038DS*; OP-MSIM034ML*; OP-MSIM044ML*; OP-MSIM046ML*; OP-MSIM057ML*; OP-MSIM068ML*; OP-MSIM080ML*; OP-MSIM099ML*; OP-MSIM108ML* | W05 & W09 | II | I |
| | OP-MSTM008DY*; OP-MSTM009DY*; OP-MSTM012DP*; OP-MSTM014DP*; OP-MSSM026CS*; OP-MSSM030CS; OP-MSTM018DX*; OP-MSSM012SC*; OP-MSSM015SC*; OP-MSSM018SC*; OP-MSSM021SC* | | I | I |

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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| Product Range | Type Description | Product Version | PED Cat. (Group 1) | PED Cat. (Group 2) |
|---|---|---|---|---|
| Optyma™ Plus | OP-LPVM048NT*; OP-LPVM068NT*; OP-LPVM026DS*; OP-LPVM034DS*; OP-MPTM021DX*; OP-MPTM022DS*; OP-MPTM026DS*; OP-MPTM034DS*; OP-MPTM038DS*; OP-MPIM034ML*; OP-MPIM044ML*; OP-MPIM046ML*; OP-MPIM057ML*; OP-MPIM068ML*; OP-MPIM080ML*; OP-MPIM099ML*; OP-MPIM108ML*; OP-MPIM125ML*; OP-MPIM162ML* | P00 | II | I |
| | OP-LPKM067LL*; OP-LPKM084LL*; OP-LPKM098LL*; OP-LPKM120LL*; OP-LPKM168LL* | P02 | | |
| | OP-MPTM008DY*; OP-MPTM009DY*; OP-MPTM012DP*; OP-MPTM014DP*; OP-MPTM018DX*; OP-MPSM026CS*; OP-MPSM030CS* | P00 | I | I |

| Product Range | Type Description | Product Version | PED Cat (Group 2) |
|---|---|---|---|
| Optyma™ Slim Pack | OP-LSQM048NT*; OP-LSQM068NT*; OP-LSQM067LL*; OP-LSQM084LL*; OP-LSQM098LL*; OP-MSGM012SC*; OP-MSGM015SC*; OP-MSGM018SC*; OP-MSGM021SC*; OP-MSXM034ML*; OP-MSXM044ML*; OP-MSXM046ML*; OP-MSXM057ML*; OP-MSXM068ML*; OP-MSXM080ML*; OP-MSXM099ML*; OP-MSXM108ML* | W05 & W09 | I |

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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| Product Range | Type Description | Product Version | PED Cat (Group 2) |
|---|---|---|---|
| Optyma™ Plus | OP-LPQM048NT*; OP-LPQM068NT*; OP-MPGM012SC*; OP-MPGM015SC*; OP-MPGM018SC*; OP-MPGM021SC*; OP-MPXM044ML*; OP-MPXM099ML* | P00 | I |
| | OP-LPOM067LL*; OP-LPOM084LL*; OP-LPQM098LL* | P02 | |
| | OP-MPXM034ML*; OP-MPXM046ML*; OP-MPXM057ML*; OP-MPXM068ML*; OP-MPXM080ML*; OP-MPXM108ML* | P00 & P05 | |
| | OP-MPPM028VVL*; OP-MPPM035VVL*; OP-MPPM044VVL* | P01 | |
| | OP-MPPM065VVL*; | P01 | II |
| | OP-MPXM125ML*; OP-MPXM162ML* | P00, P05 & P07 | |
| | OP-LPOM120LL*; OP-LPOM168LL* | P02 | |

*Followed by 4 characters

Covered by this declaration is in conformity with the following directive(s), regulation(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

**Energy Information (Amendment) (EU Exit) Regulations 2019**
Establishing a framework for the setting of Ecodesign requirements for energy-related products.

implementing Energy Information (Amendment) (EU Exit) Regulations 2019 requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers. Product information required in tables 4 and 5 of the regulations at annex V are available for individual products with approved refrigerant fluids in Coolselector®2 Software, which can be freely downloaded at website https://www.danfoss.com

Condensing unit measurements are made according to standard "BS EN 13771-2:2017" – Compressor and condensing units for refrigeration-performance testing and test methods – Part 2: Condensing units.

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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**Pressure Equipment (Safety) Regulations 2016**

BS EN 378-2:2016 Refrigerating system and heat pumps – safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation (As applicable clauses)

BS EN14276-2:2007 + A1:2011 Pressure equipment for refrigerating system and heat pumps.

Conformity assessment module A2 (TÜV NORD Systems GmbH & Co. KG, Große Bahnstraße 31, 22525 Hamburg, Germany)

Conformity assessment is according to PED module A2.

**Name and Address of the Notified Body carried out the PED Inspection according to Module A2**

**TÜV NORD Systems GmbH & Co. KG**
**Notified body no: 0045**
Große Bahnstraße 31,
22525 Hamburg, Germany.

CE 0045

**Certificate No of Module A2:**
**0045/202/9070/Z/00506/21/D/001(04) issued on 16/04/2024**

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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# EU DECLARATION OF INCORPORATION

## Danfoss A/S

System Solutions and New Business

declares under our sole responsibility, that the following partly completed machinery is in conformity with the following parts of the Machinery Directive and that relevant technical documentation is compiled.

**Product category:** Condensing units

**Type designation(s):**

| Product Range | Type Description | Product Version | PED Cat. (Group 1) | PED Cat. (Group 2) |
|---|---|---|---|---|
| Optyma™ Slim Pack | OP-LSVM048NT*; OP-LSVM068NT*; OP-LSVM026DS*; OP-LSVM034DS*; OP-MSTM021DX*; OP-MSTM022DS*; OP-MSTM026DS*; OP-MSTM034DS*; OP-MSTM038DS*; OP-MSIM034ML*; OP-MSIM044ML*; OP-MSIM046ML*; OP-MSIM057ML*; OP-MSIM068ML*; OP-MSIM080ML*; OP-MSIM099ML*; OP-MSIM108ML* | W05 & W09 | II | I |
| | OP-MSTM008DY*; OP-MSTM009DY*; OP-MSTM012DP*; OP-MSTM014DP*; OP-MSSM026CS*; OP-MSSM030CS; OP-MSTM018DX*; OP-MSSM012SC*; OP-MSSM015SC*; OP-MSSM018SC*; OP-MSSM021SC* | | I | I |

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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| Product Range | Type Description | Product Version | PED Cat. (Group 1) | PED Cat. (Group 2) |
|---|---|---|---|---|
| Optyma™ Plus | OP-LPVM048NT*; OP-LPVM068NT*; OP-LPVM026DS*; OP-LPVM034DS*; OP-MPTM021DX*; OP-MPTM022DS*; OP-MPTM026DS*; OP-MPTM034DS*; OP-MPTM038DS*; OP-MPIM034ML*; OP-MPIM044ML*; OP-MPIM046ML*; OP-MPIM057ML*; OP-MPIM068ML*; OP-MPIM080ML*; OP-MPIM099ML*; OP-MPIM108ML*; OP-MPIM125ML*; OP-MPIM162ML* | P00 | II | I |
| | OP-LPKM067LL*; OP-LPKM084LL*; OP-LPKM098LL*; OP-LPKM120LL*; OP-LPKM168LL* | P02 | | |
| | OP-MPTM008DY*; OP-MPTM009DY*; OP-MPTM012DP*; OP-MPTM014DP*; OP-MPTM018DX*; OP-MPSM026CS*; OP-MPSM030CS* | P00 | I | I |

| Product Range | Type Description | Product Version | PED Cat (Group 2) |
|---|---|---|---|
| Optyma™ Slim Pack | OP-LSQM048NT*; OP-LSQM068NT*; OP-LSQM067LL*; OP-LSQM084LL*; OP-LSQM098LL*; OP-MSGM012SC*; OP-MSGM015SC*; OP-MSGM018SC*; OP-MSGM021SC*; OP-MSXM034ML*; OP-MSXM044ML*; OP-MSXM046ML*; OP-MSXM057ML*; OP-MSXM068ML*; OP-MSXM080ML*; OP-MSXM099ML*; OP-MSXM108ML* | W05 & W09 | I |

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| Product Range | Type Description | Product Version | PED Cat (Group 2) |
|---|---|---|---|
| Optyma™ Plus | OP-LPQM048NT*; OP-LPQM068NT*; OP-MPGM012SC*; OP-MPGM015SC*; OP-MPGM018SC*; OP-MPGM021SC*; OP-MPXM044ML*; OP-MPXM099ML* | P00 | I |
| | OP-LPOM067LL*; OP-LPOM084LL*; OP-LPQM098LL* | P02 | |
| | OP-MPXM034ML*; OP-MPXM046ML*; OP-MPXM057ML*; OP-MPXM068ML*; OP-MPXM080ML*; OP-MPXM108ML* | P00 & P05 | |
| | OP-MPPM028VVL*; OP-MPPM035VVL*; OP-MPPM044VVL* | P01 | |
| | OP-MPPM065VVL*; | P01 | II |
| | OP-MPXM125ML*; OP-MPXM162ML* | P00, P05 & P07 | |
| | OP-LPOM120LL*; OP-LPOM168LL* | P02 | |

*Followed by 4 characters

**Machinery Directive, 2006/42/EC**

Following essential health and safety requirements have been applied and fulfilled (Annex I)

EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A2:2019 + A14:2019 – Household and similar electrical appliances – Safety-Part 1: General requirements.

EN 60335-2-40:2003+A11:2004+A12:2005+A1:2006+A2:2009+A13:2012[LVD] - Household and similar electrical appliances - Safety - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers.

EN 60335-1:2012+A11:2014+A13:2017 [LVD] Household and similar electrical appliances - Safety - Part 1: General requirements.

EN 60335-2-89: 2010+A2:2017 [MD,LVD] Household and similar electrical appliances - Safety - Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor.

The partly completed machinery is in conformity with the following other directive(s), regulation(s), harmonized standard(s) or other normative document(s), provided it/they are used in accordance with our instructions.

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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**Eco-design Directive 2009/125/EC**

Establishing a framework for the setting of Eco-design requirements for energy-related products.

**Regulation (EU) 2015/1095**

Implementing Eco-design Directive 2009/125/EC with regards to Eco-design 2018 requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers. Product information required in tables 4 and 5 of the regulations at annex V are available for individual products with approved refrigerant fluids in Coolselector®2 Software, which can be freely downloaded at website https://www.danfoss.com.

Condensing unit measurements are made according to standard EN 13771-2:2017 – Compressor and condensing units for refrigeration-performance testing and test methods – Part 2: Condensing units.

**Pressure Equipment Directive 2014/68/EU**

EN378-2:2016 Refrigerating system and heat pumps – safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation (As applicable clauses)

EN14276-2:2007 + A1:2011 Pressure equipment for refrigerating system and heat pumps. Conformity assessment module A2 (TÜV NORD Systems GmbH & Co. KG, Große Bahnstraße 31, 22525 Hamburg, Germany)

Conformity assessment is according to PED module A2.

**Name and Address of the Notified Body carried out the PED Inspection according to Module A2**

**TÜV NORD Systems GmbH & Co. KG**
**Notified body no: 0045**
Große Bahnstraße 31,
22525 Hamburg, Germany.

CE 0045

**Certificate No of Module A2:**
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| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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This partly completed machinery must not be used before the final machinery into which it is to be incorporated has been declared in conformity with the Machinery Directive and other relevant directives.

By reasoned request by national authorities, we undertake to transmit relevant information about the partly completed machinery. The issuer of this declaration is also the person who is authorized to compile relevant technical documentation in accordance with part B of Annex VII.

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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# UK DECLARATION OF INCORPORATION

## Danfoss A/S

System Solutions and New Business

declares under our sole responsibility, that the following partly completed machinery is in conformity with the following parts of the Supply of Machinery (Safety) Regulations and that relevant technical documentation is compiled.

**Product category:** Condensing units

**Type designation(s):**

| Product Range | Type Description | Product Version | PED Cat. (Group 1) | PED Cat. (Group 2) |
|---|---|---|---|---|
| Optyma™ Slim Pack | OP-LSVM048NT*; OP-LSVM068NT*; OP-LSVM026DS*; OP-LSVM034DS*; OP-MSTM021DX*; OP-MSTM022DS*; OP-MSTM026DS*; OP-MSTM034DS*; OP-MSTM038DS*; OP-MSIM034ML*; OP-MSIM044ML*; OP-MSIM046ML*; OP-MSIM057ML*; OP-MSIM068ML*; OP-MSIM080ML*; OP-MSIM099ML*; OP-MSIM108ML* | W05 & W09 | II | I |
| | OP-MSTM008DY*; OP-MSTM009DY*; OP-MSTM012DP*; OP-MSTM014DP*; OP-MSSM026CS*; OP-MSSM030CS; OP-MSTM018DX*; OP-MSSM012SC*; OP-MSSM015SC*; OP-MSSM018SC*; OP-MSSM021SC* | | I | I |

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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| Product Range | Type Description | Product Version | PED Cat. (Group 1) | PED Cat. (Group 2) |
|---|---|---|---|---|
| Optyma™ Plus | OP-LPVM048NT*; OP-LPVM068NT*; OP-LPVM026DS*; OP-LPVM034DS*; OP-MPTM021DX*; OP-MPTM022DS*; OP-MPTM026DS*; OP-MPTM034DS*; OP-MPTM038DS*; OP-MPIM034ML*; OP-MPIM044ML*; OP-MPIM046ML*; OP-MPIM057ML*; OP-MPIM068ML*; OP-MPIM080ML*; OP-MPIM099ML*; OP-MPIM108ML*; OP-MPIM125ML*; OP-MPIM162ML* | P00 | II | I |
| | OP-LPKM067LL*; OP-LPKM084LL*; OP-LPKM098LL*; OP-LPKM120LL*; OP-LPKM168LL* | P02 | | |
| | OP-MPTM008DY*; OP-MPTM009DY*; OP-MPTM012DP*; OP-MPTM014DP*; OP-MPTM018DX*; OP-MPSM026CS*; OP-MPSM030CS* | P00 | I | I |

| Product Range | Type Description | Product Version | PED Cat (Group 2) |
|---|---|---|---|
| Optyma™ Slim Pack | OP-LSQM048NT*; OP-LSQM068NT*; OP-LSQM067LL*; OP-LSQM084LL*; OP-LSQM098LL*; OP-MSGM012SC*; OP-MSGM015SC*; OP-MSGM018SC*; OP-MSGM021SC*; OP-MSXM034ML*; OP-MSXM044ML*; OP-MSXM046ML*; OP-MSXM057ML*; OP-MSXM068ML*; OP-MSXM080ML*; OP-MSXM099ML*; OP-MSXM108ML* | W05 & W09 | I |

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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| Product Range | Type Description | Product Version | PED Cat. (Group 1) | PED Cat. (Group 2) |
|---|---|---|---|---|
| Optyma™ Plus | OP-LPVM048NT*; OP-LPVM068NT*; OP-LPVM026DS*; OP-LPVM034DS*; OP-MPTM021DX*; OP-MPTM022DS*; OP-MPTM026DS*; OP-MPTM034DS*; OP-MPTM038DS*; OP-MPIM034ML*; OP-MPIM044ML*; OP-MPIM046ML*; OP-MPIM057ML*; OP-MPIM068ML*; OP-MPIM080ML*; OP-MPIM099ML*; OP-MPIM108ML*; OP-MPIM125ML*; OP-MPIM162ML* | P00 | II | I |
| | OP-LPKM067LL*; OP-LPKM084LL*; OP-LPKM098LL*; OP-LPKM120LL*; OP-LPKM168LL* | P02 | | |
| | OP-MPTM008DY*; OP-MPTM009DY*; OP-MPTM012DP*; OP-MPTM014DP*; OP-MPTM018DX*; OP-MPSM026CS*; OP-MPSM030CS* | P00 | I | I |

*Followed by 4 characters

**Supply of Machinery (Safety) Regulations 2008**

Following essential health and safety requirements have been applied and fulfilled Schedule 2 part 1 Annex I

BS EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A2:2019 + A14:2019 – Household and similar electrical appliances – Safety-Part 1: General requirements.

BS EN 60335-2-40:2003+A11:2004+A12:2005+A1:2006+A2:2009+A13:2012[LVD] - Household and similar electrical appliances - Safety - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers.

BS EN 60335-1:2012+A11:2014+A13:2017 [LVD] Household and similar electrical appliances - Safety - Part 1: General requirements.

BS EN 60335-2-89: 2010+A2:2017 [MD,LVD] Household and similar electrical appliances - Safety - Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor.

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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The partly completed machinery is in conformity with the following other directive(s), regulation(s), harmonized standard(s) or other normative document(s), provided it/they are used in accordance with our instructions.

**Energy Information (Amendment) (EU Exit) Regulations 2019**

Establishing a framework for the setting of Ecodesign requirements for energy-related products.

implementing Energy Information (Amendment) (EU Exit) Regulations 2019 requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers. Product information required in tables 4 and 5 of the regulations at annex V are available for individual products with approved refrigerant fluids in Coolselector®2 Software, which can be freely downloaded at website https://www.danfoss.com

Condensing unit measurements are made according to standard "BS EN 13771-2:2017" – Compressor and condensing units for refrigeration-performance testing and test methods – Part 2: Condensing units.

**Pressure Equipment (Safety) Regulations 2016**

BS EN 378-2:2016 Refrigerating system and heat pumps – safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation (As applicable clauses)

BS EN14276-2:2007 + A1:2011 Pressure equipment for refrigerating system and heat pumps. Conformity assessment module A2 (TÜV NORD Systems GmbH & Co. KG, Große Bahnstraße 31, 22525 Hamburg, Germany)

Conformity assessment is according to PED module A2.

**Name and Address of the Notified Body carried out the PED Inspection according to Module A2**

**TÜV NORD Systems GmbH & Co. KG**
**Notified body no: 0045**
Große Bahnstraße 31,
22525 Hamburg, Germany.

CE 0045

**Certificate No of Module A2:**
**0045/202/9070/Z/00506/21/D/001(04) issued on 16/04/2024.**

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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This partly completed machinery must not be used before the final machinery into which it is to be incorporated has been declared in conformity with the Machinery Regulations and other relevant regulations.

By reasoned request by national authorities, we undertake to transmit relevant information about the partly completed machinery. The issuer of this declaration is also the person who is authorized to compile relevant technical documentation in accordance with part B of Schedule 2 part 7 Annex VII

| | | | |
|---|---|---|---|
| Date: 2024.08.13<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.08.13<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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**Danfoss A/S**
6430 Nordborg
Denmark
CVR nr.: 20 16 57 15

Telephone: +45 7488 2222
Fax: +45 7449 0949

# MANUFACTURER'S DECLARATION

## Danfoss A/S

System Solutions and New Business

declares under our sole responsibility that the

**Product category:** Condensing units

**Type designation(s):**

| Product Range | Type Designation | Product Version |
|---|---|---|
| Optyma™ Slim Pack | OP-LSVM048NT*; OP-LSVM068NT*; OP-LSVM026DS*; OP-LSVM034DS*;OP-MSTM021DX*; OP-MSTM022DS*; OP-MSTM026DS*; OP-MSTM034DS*; OP-MSTM038DS*; OP-MSIM034ML*; OP-MSIM044ML*; OP-MSIM046ML*; OP-MSIM057ML*; OP-MSIM068ML*; OP-MSIM080ML*; OP-MSIM099ML*; OP-MSIM108ML*; OP-MSTM008DY*; OP-MSTM009DY*; OP-MSTM012DP*; OP-MSTM014DP*; OP-MSSM026CS*; OP-MSSM030CS; OP-MSTM018DX*; OP-MSSM012SC*; OP-MSSM015SC*; OP-MSSM018SC*; OP-MSSM021SC* ; OP-LSQM048NT*; OP-LSQM068NT*; OP-LSQM067LL*; OP-LSQM084LL*; OP-LSQM098LL*; OP-MSGM012SC*;OP-MSGM015SC*; OP-MSGM018SC*; OP-MSGM021SC*; OP-MSXM034ML*;OP-MSXM044ML*; OP-MSXM046ML*;OP-MSXM057ML*; OP-MSXM068ML*; OP-MSXM080ML*; OP-MSXM099ML*;OP-MSXM108ML* | W05 & W09 |
| Optyma™ Slim Pack | OP-LPQE048NT*; OP-LPQE068NT*; OP-LPQE067LL*; OP-LPQE083LL*; OP-LPQE097LL*; OP-MPVE034ML*; OP-MPVE046ML*; OP-MPVE057ML*; OP-MPVE068ML*; OP-MPVE080ML*; OP-MPVE099ML*; OP-MPVE108ML* | W10 |

| | | | |
|---|---|---|---|
| Date: 2024.07.31<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.07.31<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

Danfoss only vouches for the correctness of the English version of this document. In the event of the document being translated into any other language, the translator concerned must be liable for the correctness of the translation.

| | | |
|---|---|---|
| Optyma™ Plus | OP-LPVM048NT*; OP-LPVM068NT*; OP-LPVM026DS*; OP-LPVM034DS*;OP-MPTM021DX*; OP-MPTM022DS*; OP-MPTM026DS*; OP-MPTM034DS*; OP-MPTM038DS*; OP-MPIM034ML*; OP-MPIM044ML*; OP-MPIM046ML*; OP-MPIM057ML*; OP-MPIM068ML*; OP-MPIM080ML*; OP-MPIM099ML*; OP-MPIM108ML*; OP-MPIM125ML*; OP-MPIM162ML*; OP-LPKM067LL*; OP-LPKM084LL*; OP-LPKM098LL*; OP-LPKM120LL*; OP-LPKM168LL*; OP-MPTM008DY*; OP-MPTM009DY*; OP-MPTM012DP*; OP-MPTM014DP*; OP-MPTM018DX*; OP-MPSM026CS*; OP-MPSM030CS*; OP-LPQM048NT*; OP-LPQM068NT*; OP-MPGM012SC*; OP-MPGM015SC*;OP-MPGM018SC*; OP-MPGM021SC*;OP-MPXM044ML*; OP-MPXM099ML*; OP-LPOM067LL*; OP-LPOM084LL*;OP-LPQM098LL*; OP-MPXM034ML*; OP-MPXM046ML*; OP-MPXM057ML*; OP-MPXM068ML*; OP-MPXM080ML*; OP-MPXM108ML*; OP-MPXM125ML*; OP-MPXM162ML*; OP-LPOM120LL*; OP-LPOM168LL* | P00, P02, P05, P06 & P07 |
| Optyma™ Plus INVERTER | OP-MPPM028VVL*; OP-MPPM035VVL*; OP-MPPM044VVL*; OP-MPPM065VVL* | P01 |
| Optyma™ | OP-SC**; OP-NL**; OP-TL**; NL**; SC**; TL**; FR**; FF**; PL**; OP-DL** | N0, N1, N2, T0, T1& T2 |
| | OP-LCQ*; OP-LGQ*; OP-MCR*; OP-MGR* | A02, C25, A14 |
| | OP-LCH*; OP-LCQ*; OP-MCH*; OP-MCQ*; OP-MCG*; OP-LCN*; OP-MCN* | A00, A01, 04, A09, A10, A11 |

*: followed by 4 characters can be found in Product name plate/Instructions /Catalogue

**: followed by 6 characters can be found in Product name plate/Instructions

Covered by this declaration is in conformity with the following directive(s), regulations(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

| | | | |
|---|---|---|---|
| Date: 2024.07.31<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.07.31<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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**UK RoHS Regulation: The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (as amended)**

Though Condensing units are not in the scope of UK RoHS regulations, Danfoss declares that the listed products and spare parts/accessories are compliant with the requirements of this regulations. Assessment done according to standard BS EN IEC 63000:2018. Also, Technical documentation done for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

**RoHS Directive 2011/65/EU including amendment 2015/863**

Though Condensing units are not in the scope of RoHS 2011/65/EU, Danfoss declares that the listed products and spare parts/accessories are compliant with the requirements of the Directive 2011/65/EU. Assessment done according to standard EN IEC 63000:2018. Also, Technical documentation done for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

**Waste of Electrical and Electronic Equipment (WEEE) and Battery Directives (only for Norway)**

Danfoss supports the objective of the WEEE Directive (2012/19/EU) and the Battery Directive (2006/66/EC) to further improve the environment management of WEEE and to contribute to a circular economy and enhance resource efficiency by improving the collection, treatment and recycling of electronics and waste batteries and accumulators at the end of their life.

**Law 7/2022, of 8 April, on waste and contaminated soil for a circular economy (BOE-A-2022-5809) (Spain)**

Danfoss supports the objective of Circular economy and declares that the listed products and spare parts/accessories are contains less than or equal to 0.005% kg net weight of non-recycled plastic included in packaging.

| | | | |
|---|---|---|---|
| Date: 2024.07.31<br>**Place of issue:**<br><br>Z.I de Reyrieux<br>01600 Trévoux,<br>France | **Issued by**<br><br>**Signature:**<br>**Name:** Renevier Gaël<br>**Title:** Head of R&D – SY | Date: 2024.07.31<br>**Place of issue:**<br><br>Carr. Miguel Alemán<br>No. 162. El Milagro<br>Apodaca, NL<br>66634 Mexico | **Approved by**<br><br>**Signature:**<br>**Name:** Xavier Casas Valdez<br>**Title:** Head of System Solutions |

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ENGINEERING TOMORROW

**Danfoss A/S**
6430 Nordborg
Denmark
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Telephone: +45 7488 2222
Fax: +45 7449 0949

# EU DECLARATION OF CONFORMITY

## Danfoss A/S

### Refrigeration and Air Conditioning Controls

declares under our sole responsibility that the

**Product category:** Thermostatic Expansion Valves
**Type designation(s):** T/TE 2 and orifices, Solder adaptors for T/TE 2, TXI

Covered by this declaration is in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

**RoHS Directive 2011/65/EU including amendment 2015/863**
EN IEC 63000:2018. Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

| | | | |
|---|---|---|---|
| Date: 2019.06.21<br>**Place of issue:**<br>Nordborg, Denmark | **Issued by**<br>**Signature:**<br>**Name: Bent Nielsen**<br>**Title: Lead Design Engineer** | Date: 2019.06.21<br>**Place of issue:**<br>Nordborg, Denmark | **Approved by**<br>**Signature:**<br>**Name: Jesper Kirkegaard**<br>**Title: Engineering Director** |

Danfoss only vouches for the correctness of the English version of this declaration. In the event of the declaration being translated into any other language, the translator concerned shall be liable for the correctness of the translation



Classified as Business

Kelvion Machine Cooling Sp. z o.o.
ul. Sikorskiego 38
58-160 Świebodzice
www.kelvion.com
+48 748500800

# EC-Declaration of incorporation for partly completed machineries

According to
Machinery Directive 2006/42/EC

# EC-Declaration of Conformity

According to
Directive 2006/42/EC (Machinery Directive)
Directive 2014/35/EU (Low Voltage Directive)
Directive 2014/30/EU (Electromagnetic compatibility)
Directive 2014/68/EU (Pressure Equipment Directive)

This declaration of conformity is issued under the sole responsibility of the manufacturer.
The manufacturer **Kelvion Machine Cooling Sp. z o.o.** herewith declares that following Heat Exchangers of types:
**KSC-231-2RN; KSC-231-3RN; KSC-301-3RN; KSC-301-4RN; KSC-301-6RN; KSC-232-3RN; KSC-302-3RN; KSC-302-4RN KSC-302-6RN; KSC-233-3RN; KSC-303-4RN; KSC-303-6RN; KSC-234-3RN; KSC-304-4RN; KSC-304-6RN; KSC-231-2RE KSC-231-3RE; KSC-301-3RE; KSC-301-4RE; KSC-301-6RE; KSC-232-3RE; KSC-302-3RE; KSC-302-4RE; KSC-302-6RE KSC-233-3RE; KSC-303-4RE; KSC-303-6RE; KSC-234-3RE; KSC-304-4RE; KSC-304-6RE; KSC-231-2BN; KSC-231-3BN KSC-301-3BN; KSC-301-4BN; KSC-301-6BN; KSC-232-3BN; KSC-302-3BN; KSC-302-4BN; KSC-302-6BN; KSC-233-3BN KSC-303-4BN; KSC-303-6BN; KSC-234-3BN; KSC-304-4BN; KSC-304-6BN; KSC-231-2BE; KSC-231-3BE; KSC-301-3BE KSC-301-4BE; KSC-301-6BE; KSC-232-3BE; KSC-302-3BE; KSC-302-4BE; KSC-302-6BE; KSC-233-3BE; KSC-303-4BE KSC-303-6BE;KSC-234-3BE; KSC-304-4BE; KSC-304-6BE**

are in compliance with the following directive:

| | |
|---|---|
| Machinery Directive 2006/42/EC<br>Low Voltage Directive 2014/35/EU<br>Electromagnetic compatibility 2014/30/EU | All named above “partly completed machineries” according 4.3 (SEP) |
| Pressure Equipment Directive 2014/68/EU | Heat Exchangers according article 4 paragraph 3 for fluid group 2 |

Above mentioned products are manufactured and tested according to the follow standards if applicable:

Test pressure (PT) = 1,43 x max. permitted pressure (=PS), in accordance with Directive 2014/68/EU, appendix 1-point 7.4
EN 378-2 Refrigerating systems and heat pumps, Safety and environmental requirements
ASME Boiler and Pressure Vessel Code Section IX
EN 13134 Brazing – Technology Approval

The “partly completed machineries” respectively heat exchanger in the supplied version are intended for installation in a machine or assembly. It’s operating is forbidden before it has been ascertained that the machine or assembly, in which the above mentioned products have been installed, complies if applicable with the Machinery Directive 2006/42/EC, Low Voltage Directive 2014/35/EU, Safety of machinery – Electrical equipment of machines IEC 60204-1 and Pressure Equipment Directive 2014/68/EU and applicable national legislation.

Świebodzice, 20/03/2020

L. Zając
Quality Manager

# Igångkörningsprotokoll Kyl- och Frysaggregat

Vid igångkörning av aggregat skall Igångkörningsprotokoll fyllas i och alla data ska finnas i alla fält som är relevanta för den aktuella installationen. För att i ett senare tillfälle ha möjlighet att åberopa garanti eller reklamation, ska detta dokument senast två veckor efter installationen ha skickats till det företag från vilken utrustningen inköpts ifrån.

- ☐ Igångkörningsprotokollet
- ☐ Protokoll över utförd tätprovning
- ☐ Protokoll över vakuumpumpning

Protokollen över utförd tätprovning och vakuumpumpning finns för kopiering i aggregatets Underhållsjournal/register. En korrekt ifylld Underhållsjournal/register är en förutsättning för att vid behov kunna åberopa leverantörens ansvar vid fel.

| | | | |
|---|---|---|---|
| Kund nr: | | Enhetsnr: | |
| Anläggning: | | Installatör: | |
| Aggregattyp: | | Storlek: | |
| Köldmedium: | | Kylmedel: | |
| Ordernr: | | Konc. kylmedel: | |

**Dessa värden ska mätas:**
Vid fler än 4 kompressorer eller pumpar, får fler exemplar av detta dokument användas så att data kan redovisas för kompressorer/pumpar.

**Kompressorer**

| | Ström L1 | Ström L2 | Ström L3 | Spänning L1 | Spänning L2 | Spänning L3 |
|---|---|---|---|---|---|---|
| Kompressor 1 | A | A | A | V | V | V |
| Kompressor 2 | A | A | A | V | V | V |
| Kompressor 3 | A | A | A | V | V | V |
| Kompressor 4 | A | A | A | V | V | V |
| Kompressor 5 | A | A | A | V | V | V |
| Kompressor 6 | A | A | A | V | V | V |

| | Tryckrörstemp | Sugrörs-temperatur | Oljetryck | Kondenserings-tryck | Förångnings-tryck |
|---|---|---|---|---|---|
| Kompressor 1 | °C | °C | Bar | Bar | Bar |
| Kompressor 2 | °C | °C | Bar | Bar | Bar |
| Kompressor 3 | °C | °C | Bar | Bar | Bar |
| Kompressor 4 | °C | °C | Bar | Bar | Bar |
| Kompressor 5 | °C | °C | Bar | Bar | Bar |
| Kompressor 6 | °C | °C | Bar | Bar | Bar |

## Vid luftkyld kondensor

| Lufttemp In | Lufttemp Ut | Kondenserings-tryck | Vätsketemp ut ur kond. | Underkylning |
|---|---|---|---|---|
| °C | °C | Bar | °C | K |

| | Ström L1 | Ström L2 | Ström L3 | Spänning L1 | Spänning L2 | Spänning L3 |
|---|---|---|---|---|---|---|
| Fläkt 1 | A | A | A | V | V | V |
| Fläkt 2 | A | A | A | V | V | V |
| Fläkt 3 | A | A | A | V | V | V |
| Fläkt 4 | A | A | A | V | V | V |
| Fläkt 5 | A | A | A | V | V | V |
| Fläkt 6 | A | A | A | V | V | V |

## Vid vattenkyld kondensor

| Kylmedeltemp In | Kylmedeltemp Ut | Kylmedelflöde | Kondenserings-tryck | Vätsketemp ut ur kondensor | Underkylning |
|---|---|---|---|---|---|
| °C | °C | l/s | Bar | °C | K |

## Pumpar till kondensor

| | Ström L1 | Ström L2 | Ström L3 | Spänning L1 | Spänning L2 | Spänning L3 |
|---|---|---|---|---|---|---|
| Pump 1 | A | A | A | V | V | V |
| Pump 2 | A | A | A | V | V | V |

Tryckuppsättning: Pump 1 _____ kPa Pump 2 _____ kPa

## Förångare

| | Rumstemperatur | Förångnings-tryck | Vätsketemp in till exp. vent. | Överhettning |
|---|---|---|---|---|
| Förångare 1 | °C | Bar | °C | K |
| Förångare 2 | °C | Bar | °C | K |
| Förångare 3 | °C | Bar | °C | K |
| Förångare 4 | °C | Bar | °C | K |
| Förångare 5 | °C | Bar | °C | K |
| Förångare 6 | °C | Bar | °C | K |

## Täthetsprovning och vakuumsugning:

Tätprovning (vid ej fabriksfyllt aggregat) utförd med $N_2$ till _____ bars tryck _____minuter utan att trycket

sjunker. Datum för provet_____

Protokoll finns upprättat och sitter i anläggningens register. ☐ JA ☐ Nej

Vakuumsugning utfört till sluttryck_____mbar (med avstängd pump) i_____minuter, utan att trycket stiger.

Datum för provet_____

Protokoll finns upprättat och sitter i anläggningens register. ☐ JA ☐ Nej

## Oljeprov:

Avses att ta ett oljeprov efter 100–300 driftstimmar? ☐ JA ☐ Nej
Oljeprovet ska i så fall finnas tillgängligt i de fall reklamation eller garanti åberopas.

**Nedanstående skall kontrolleras och noteringar anges:**

| | Funktion/Värde/OK | Inställt värde/Påfyllt/avtappad mängd |
|---|---|---|
| Är anläggningen utrustad enligt beställningen | | |
| Fasföljden för matningen av kompressorerna är korrekt | | |
| Förångar/luftkylarfläktar rotationsriktning | | |
| Kondensor/KMK fläktar rotationsriktning | | |
| Kondensortrycksreglering funktion/inställning | | |
| Vattensparventil inställning/funktion | | |
| Oljenivå i kompressor | | |
| Vevhusvärme funktion | | |
| Vevhusvärmare aktiverad i x antal timmar innan 1:a start | | |
| HP funktion/bryttryck | | |
| LP funktion/bryttryck | | |
| Drifttermostat funktion/inställt värde | | |
| Oljevakt funktion | | |
| Motorskydd funktion/inställt värde | | |
| Synglas i vätskeledningen inspekterad. Iakttagelse? | | |
| Läcksökning efter påfyllt köldmedium | | |
| Driftindikering funktion | | |
| Larmindikering funktion | | |
| Avfrostning funktion | | |

Ort: Datum:

Namnteckning Namnförtydligande