

## Repair instructions WPE-I xx H 400 Premium

Version D0000086652-c 12.11.2021

The WPE-I 33, 44, 59, 87H 400 Premium ground source heat pump is an inverter-controlled heating heat pump. Heat pump settings are carried out via the standard touchscreen. To achieve higher outputs, appliances of different output levels can be cascaded. Parameters for pool operation, additional heating circuits with mixer, comprehensive DHW heating and cooling operation can be set using the EM3 auxiliary module. Max. 16 appliances can be used in one cascade.

Launch: April / 2019  
Destination countries: For target countries only



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#### 1. General information

Work on an open appliance and repair work may only be carried out by a person trained by STIEBEL ELTRON. Current safety instructions contained in the operating and installation instructions for the appliance must be observed.

#### 2. Further relevant information

| Document                                | Number      |
|-----------------------------------------|-------------|
| WPM G controller operating instructions | 339364      |
| Commissioning                           | 339365      |
| Heat pump operating instructions        | 339363      |
| Spare parts list                        | D0000085342 |
| ISG web operating instructions          | 292389      |
| Service bulletin: Faulty inverters      | D0000098535 |

#### 3. Relevant appliances

| Appliance             | Material no. | Version |
|-----------------------|--------------|---------|
| WPE-I 33H 400 Premium | 201412       | A       |
| WPE-I 44H 400 Premium | 201413       | B       |
| WPE-I 59H 400 Premium | 201414       | C       |
| WPE-I 87H 400 Premium | 201415       | D       |

#### 4. Special features of the appliance series

-none-

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## 5. Function description

### 5.1 Compressor speed control

The compressor speed is controlled in specified gears. Ten gears are stored with predefined speeds. The appropriate gear is selected subject to the heat demand. Appliances with a date of manufacture up to 2019 are started at 3000 rpm while appliances with a date of manufacture from May 2020 are started at 1800 rpm. The starting procedure takes ten seconds. Then the speed is regulated to the corresponding gear. Acceleration takes place by running up through the individual gears until the required speed is reached. The compressor is also stopped by running down through the individual gears, which can take a few minutes. Once the compressor reaches the lowest gear, the expansion valve is closed and the compressor is switched off after the pumpdown phase.

| Version B, C, D |             |           | Version A   |           |
|-----------------|-------------|-----------|-------------|-----------|
| Gear            | Rated speed | Range     | Rated speed | Range     |
| 1               | 1500        | 1500-1799 | 1500        | 1500-1649 |
| 2               | 2000        | 1810-2250 | 1655        | 1655-1799 |
| 3               | 2500        | 2251-2750 | 1850        | 1800-1999 |
| 4               | 3000        | 2751-3250 | 2100        | 2000-2299 |
| 5               | 3500        | 3251-3750 | 2400        | 2300-2599 |
| 6               | 4000        | 3751-4250 | 2700        | 2600-3000 |
| 7               | 4500        | 4251-4750 | 3300        | 3005-3299 |
| 8               | 5000        | 4751-5399 | 3500        | 3300-3799 |
| 9               | 5500        | 5410-5700 | 4000        | 3800-4199 |
| 10              | 6000        | 5701-6000 | 4500        | 4200-4500 |

### 5.2 Heating

The prerequisite for heating mode is that the outside temperatures correspond and a flow sensor (51, T33) has been connected. Based on the heating curve and the set room temperature (room temperature sensor, if required), a set temperature is calculated for the flow. This is used in the demand calculation to determine the required gear for the compressor and to display it on the control unit under "Heating demand" (Main menu – Process data – Graphs – Demand). If the value falls below "-4" (factory setting), as long as the compressor is not blocked by various restrictions (e.g. compressor idle time), the heat pump starts at the start speed. The compressor then runs through the gears until it reaches the speed that corresponds to the heating demand. The calculated demand and the switching delay determine how long it remains in each gear. It is also possible to run through multiple gears without a delay time. This is the case if the calculated demand after the compressor start is significantly below -4. When the "Demand" parameter moves into the positive range (+4), the compressor runs slowly back down through the gears. Here too, it is possible to run straight through the gears subject to the "Demand" parameter without remaining in the individual gears. This appliance series does not support immediate shutdown when a set temperature is reached.

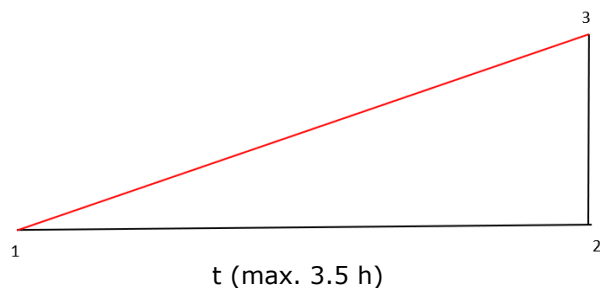
### 5.3 DHW

A prerequisite for DHW heating is at least one connected sensor T37/sensor in the DHW cylinder at the bottom. Generally, two sensors are connected and installed in the DHW cylinder at the top (T36) and at the bottom (T37). It is possible to select a weighting to balance the actual DHW temperature across the two sensors to ensure optimum DHW heating. The standard value is 0.65. This means that the lower sensor has a weighting of 65 % and the upper sensor has a weighting of 35 %. If only one sensor is installed, the weighted temperature corresponds to the sensor value.

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DHW heating starts when the (weighted) temperature in the DHW cylinder falls below the start temperature. If the temperature falls rapidly, DHW heating can also start before the start temperature is reached. For this, the diverter valve switches over to the DHW cylinder. For DHW heating, the compressor starts in the lowest gear. If there is additional demand, the calculated demand is added to this, so that the compressor immediately runs in a higher gear and the DHW demand is quickly met. Switching up through the gears is also quicker if the temperature at a DHW sensor drops by more than 1 K in a short time or the actual DHW temperature is below the calculated minimum set DHW temperature during DHW heating. The actual DHW temperature curve is expected to correspond at least to the curve shown in the diagram below. This means the diagonal line (red) between the DHW start temperature (1) and the set DHW temperature (3) indicates the expected DHW temperature curve during DHW heating. The maximum available time for this is 3.5 h. If the actual DHW temperature is lower than the expected temperature curve, switching up through the gears is carried out until the line is reached again. No provision has been made for switching down through the gears during DHW heating before the set DHW temperature is reached.

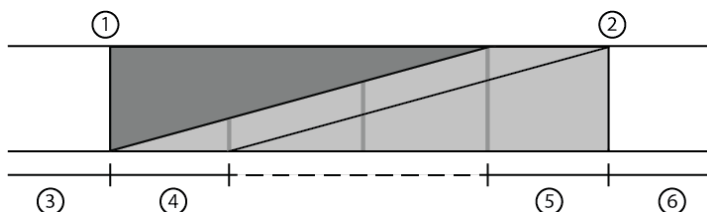


| Number | Designation           |
|--------|-----------------------|
| 1      | DHW start temperature |
| 2      | Time – max. 3.5 hours |
| 3      | Set DHW temperature   |

DHW heating is ended when the set DHW temperature is reached. Internal limits may also lead to shutdown. These include leaving the compressor curve, high pressure > 41.3 bar (absolute) or a hot gas temperature above 127 °C. DHW heating using hot gas extraction is described in the chapter "Hot gas extraction".

#### 5.4 Cooling

Active and passive cooling is only possible with an EM4 extension module (see EM4 connection diagrams, cooling function). The standard setting for start of cooling is an outside temperature of 25 °C. Depending on the outside temperature, the cooling function can be set to between -40 °C and +40 °C. For a cooling time start delay, an integral value of 150 Kelvin minutes is stored. The currently calculated value is displayed under the operating data. The control unit does not generally distinguish between active and passive cooling. If, during passive cooling, there is demand for DHW, for example, then the compressor switches on and carries out active cooling. The diagram below shows the correlation between passive and active cooling. The start temperature for passive cooling and the stop temperature for active cooling are calculated automatically depending on the start/stop temperature setting.



| Number | Designation               |
|--------|---------------------------|
| 1      | Stop temperature cooling  |
| 2      | Start temperature cooling |
| 3      | Stop passive cooling      |
| 4      | Stop active cooling       |
| 5      | Start passive cooling     |
| 6      | Start active cooling      |

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Setting example:

Cooling start temperature 18 °C

Cooling stop temperature 15 °C



| Number | Designation           |
|--------|-----------------------|
| 1      | Stop passive cooling  |
| 2      | Stop active cooling   |
| 3      | Start passive cooling |
| 4      | Start active cooling  |

Passive cooling can be activated independently of active cooling. During passive cooling, the brine circulates in the bore hole. If the compressor is already operating and there is passive cooling demand, active cooling is carried out. Active cooling can be activated independently of passive cooling. During active cooling, the compressor is used to cool the brine. The heat that is generated is used wherever possible for heating, DHW or swimming pool. Otherwise, it is routed to the source or an air cooler. The gears are calculated subject to the cooling parameter setting. The Kelvin deviation of each gear is determined by the range between the start/stop temperature and the range between the minimum and maximum gear.

#### 5.5 Hot gas extraction

An integral hot gas heat exchanger enables hot gas energy to be tapped during buffer charging or DHW heating.

Start hot gas extraction

- End temperature of the DHW cylinder not reached and...
- Compressor is running and...
- Hot gas temperature >65 °C factory setting (adjustable from 36 °C – 90 °C)

Stop hot gas extraction

- End temperature of the DHW cylinder reached or...
- Hot gas temperature >125 °C factory setting (adjustable from 50 °C – 125 °C) or...
- Hot gas temperature < 60 °C factory setting (adjustable from 35 °C – 84 °C) or...
- Compressor is not running

The hot gas heat exchanger always receives a flow when the compressor is running. When the circulation pump is switched on, a separate flow and return draw the energy from the heat exchanger. This circulation pump is used to control the extraction of heat from the hot gas.

#### 5.6 Refrigerant circuit control

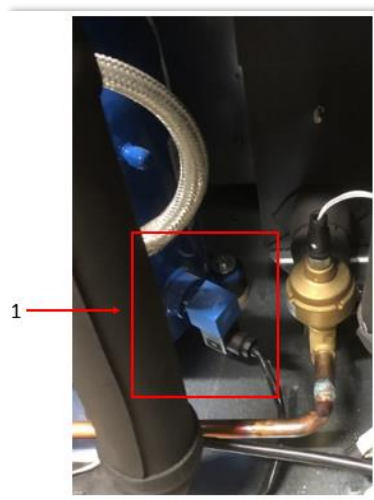
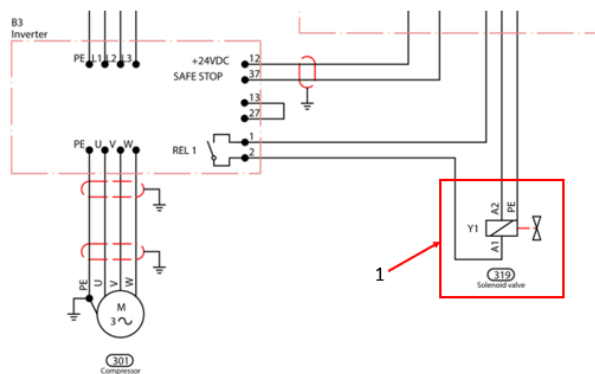
The refrigerant circuit comprises a compressor, evaporator, condenser, hot gas heat exchanger and expansion valve. No intermediate injection is provided. At the beginning, a set opening level is calculated for the expansion valve. When the expansion valve has reached this opening level, the compressor is started. The refrigerant circuit is controlled according to the PINCH principle and not according to a specific superheating process. The high pressure is controlled in relation to the source outlet temperature. A set HP value and a set opening level are calculated.

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#### 5.7 Oil injection control / oil boost function

The compressors are equipped with an oil injection system. This system ensures airtight compression chambers, increasing the isentropic efficiency of the compressor at all speeds. The oil circulation rate is controlled in a similar way. The inverter regulates the oil circulation rate via the oil injection valve on the compressor (1).



The oil injection valve is "closed at zero volt". At low speeds, the valve is not 'live' so that oil is injected into the scroll set suction connector. The control parameters are preset on the inverter and cannot be changed. However, they can be displayed. An insufficient oil level is an indication that oil has collected in the lines. To ensure oil return, time and speed functions are taken into consideration. The predominant function depends on which prerequisite occurs first. The following parameters are preset:

| Parameter                | Value      | Meaning                                                                                                                                   |
|--------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Compressor start speed   | 2700 rpm   | Selected compressor start speed                                                                                                           |
| Oil return management    | On         | Oil supply management is switched on                                                                                                      |
| Runtime, low speed       | 60 minutes | If the compressor speed for this time is consistently below 3000 rpm, it is increased to 4200 rpm (adjustable between 4205 and 4405 rpm). |
| Interval, speed increase | 24 hours   | Fixed time interval when the oil boost function switches on irrespective of the compressor speed.                                         |
| Duration, speed increase | 30 seconds | If the oil boost function is switched on, the compressor speed is increased for this duration.                                            |

#### 5.8 Pumpdown

Before each compressor stop, a pump down action is carried out.

Pump down is carried out in the lowest gear. The expansion valve closes. This causes residual refrigerant to be drawn out of the evaporator. This prevents liquid refrigerant from being drawn in an uncontrolled manner during the next starting procedure.

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#### 5.9 Cascade control

##### 5.9.1 Commissioning

One unit is configured as the primary unit (master). This unit manages the demand calculations and controls all secondary appliances (slaves) and all connected extension modules (EM). All other heat pumps are configured as secondary appliances.

In the Settings – System settings – Network settings parameter, the IP address of the appliance can be set to static or DHCP (factory setting).

On each appliance in the cascade, switch on the "Cascade control" parameter. The first appliance, which is to assume primary control, must be set as the master. Additional appliances must be programmed as slaves. On the master heat pump, the number of connected slave appliances and any externally controlled heat pumps is entered. For the slave appliances, their position in the cascade is entered. "ID 1" for the first slave, "ID 2" for the second slave, etc. The appliances must have the same port number (e.g. 5871).

From software version 2.01.000 onwards, the network settings are set automatically when the parameter "Assign IP" has been selected. With previous software versions, the data must be entered manually for each appliance.

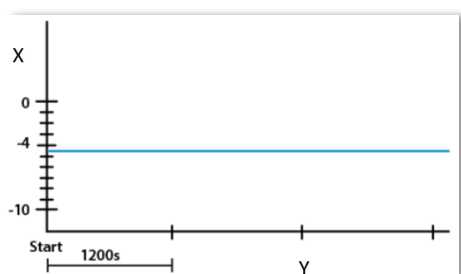
E.g. an IP address for the first (master) appliance of 192.168.178.1, and then successively for subsequent appliances 192.168.178.2, 192.168.178.3, etc.

The network mask is the same for all appliances: 255.255.255.0

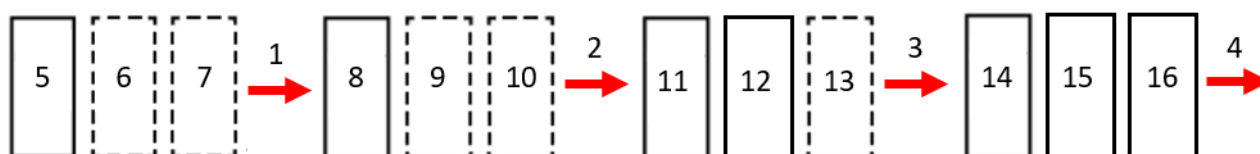
##### 5.9.2 Logic

The secondary appliances (slaves) communicate to the master what demand is being met. Each connected heat pump corresponds to a number of output stages (gears). These gears are added up and correspond to the total number of gears that the master heat pump can allocate to the requirements. The master heat pump calculates how many gears are required for each demand and distributes them among the units that can cover this heat demand. The primary heat pump (master) does not identify the heat pump type of the slave appliances. It is always assumed that all slave appliances are the same as the master heat pump.

Taking a cascade with three heat pumps as an example, assuming all heat pumps have the same runtime:



| Axis | Designation                                               |
|------|-----------------------------------------------------------|
| X    | Heat demand, constant -4.5, set/actual deviation constant |
| Y    | Time axis subdivided into 1200 sec. (20 minutes)          |



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| Number | Designation                          | Number | Designation                     |
|--------|--------------------------------------|--------|---------------------------------|
| 1      | 1200 seconds after start phase       | 9      | Slave heat pump (ID 1) OFF      |
| 2      | 2400 seconds after start phase       | 10     | Slave heat pump (ID 2) OFF      |
| 3      | 3600 seconds after start phase       | 11     | Master heat pump (ID 0) stage 5 |
| 4      | 4800 seconds after start phase, etc. | 12     | Slave heat pump (ID 1) stage 4  |
| 5      | Master heat pump (ID 0) stage 1      | 13     | Slave heat pump (ID 2) OFF      |
| 6      | Slave heat pump (ID 1) OFF           | 14     | Master heat pump (ID 0) stage 5 |
| 7      | Slave heat pump (ID 2) OFF           | 15     | Slave heat pump (ID 1) stage 4  |
| 8      | Master heat pump (ID 0) stage 5      | 16     | Slave heat pump (ID 2) stage 4  |

#### 5.9.3 Runtime compensation and stage control

Within a cascade, any appliance can be assigned the required function. Compressor runtime compensation only occurs once all functions have been equally distributed among all heat pumps. The maximum number of heat pumps is limited to six. EM cards can be used to control up to 15 existing heat pumps (Legacy On/Off).

The appliance with the lowest numbers of starts has switch-on priority. The start counter is reset when the primary heat pump (master) is activated or switched on again. If all heat pumps have the same number of starts, the primary unit is prioritised. Slave appliances with the lowest HP ID numbers are then switched on. Lastly, existing (legacy) appliances are activated based on the HP ID numbers.

The sequence in the event of output demand is in accordance with the table below. If stages are no longer required, switch-off occurs in reverse order according to priority.

| Start priority | Heat generator             | Calculated number of stages |
|----------------|----------------------------|-----------------------------|
| 1              | Heat pumps                 | 10                          |
| 2              | Existing legacy heat pumps | 4                           |
| 3              | Auxiliary heater           | 6                           |

Another heat pump is started if the heat pump already in operation can no longer accelerate or if demand requires four or more additional gears. A new unit is also started if an individual unit is running in gear 7 or higher and there is still heat demand. Appliances that have been activated for DHW heating are not requested to fulfil demand.

The master heat pump always attempts to balance the speed between the activated heat pumps. No speed compensation occurs for heat pumps that have been activated for DHW heating. No speed balancing occurs if a heat pump would need to run in a gear <4.

#### 5.9.4 Switch-off priority

Appliances working at stage four or higher are stepped down. Appliances showing the highest runtime are switched off first.

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#### 6. Appliance description

The ground source heat pump is an inverter-controlled heating heat pump. If this heat pump is used in conjunction with a DHW cylinder, DHW heating can also be carried out through the appliance. Hot gas extraction enables an additional heat exchanger with continuous flow to be used in the hot gas line. This ensures a high flow temperature subject to the refrigerant circuit data. Heat pump settings are carried out via the standard touchscreen. To achieve higher outputs, appliances of different output levels can be cascaded. Communication between multiple appliances occurs via a LAN connection.

The heat pump is housed in a steel casing painted in alpine white. The inverter is cooled with ambient air via a fan. All heat pump connections are made at the top.

##### 6.1 Casing

The casing is made of sheet steel painted in alpine white. In versions C and D, the left side panel has slots for inverter cooling. From May 2021, the air for inverter cooling is drawn in at the left side panel and discharged via the right side panel. In versions A and B, the slots are located in the back panel.

Ventilation slots for inverter cooling.

|   |            |
|---|------------|
| 1 | Air intake |
| 2 | Air outlet |

Version A, B  
Back view

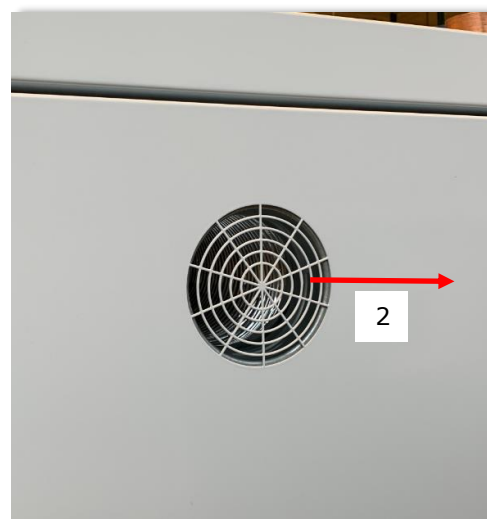


Version C, D up to  
May 2021  
Back view

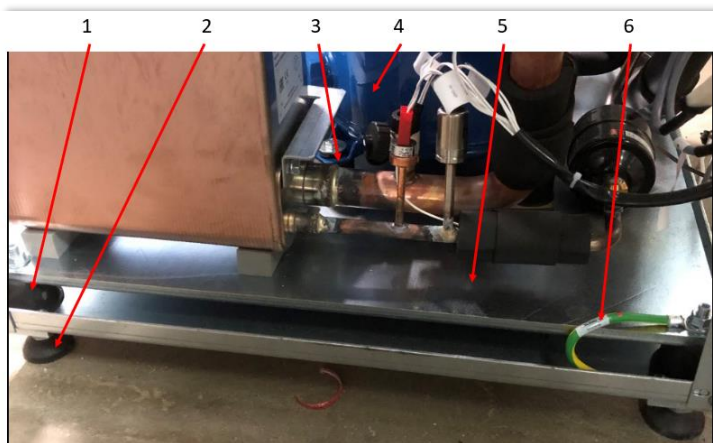


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Version C, D from  
June 2021



The hydraulic connections are routed through the top. The appliance is mounted on rubber anti-vibration mounts to reduce sound transmission. The compressor is fixed to a separate oscillation plate, which also rests with rubber anti-vibration mounts on the floor plate. The compressor is secured on rubber anti-vibration mounts on the separate oscillation plate.



| Number | Designation                                    |
|--------|------------------------------------------------|
| 1      | Rubber anti-vibration mount, oscillation plate |
| 2      | Rubber anti-vibration mount, appliance         |
| 3      | Rubber anti-vibration mount, compressor        |
| 4      | Compressor                                     |
| 5      | Oscillation plate                              |
| 6      | Earth cable                                    |

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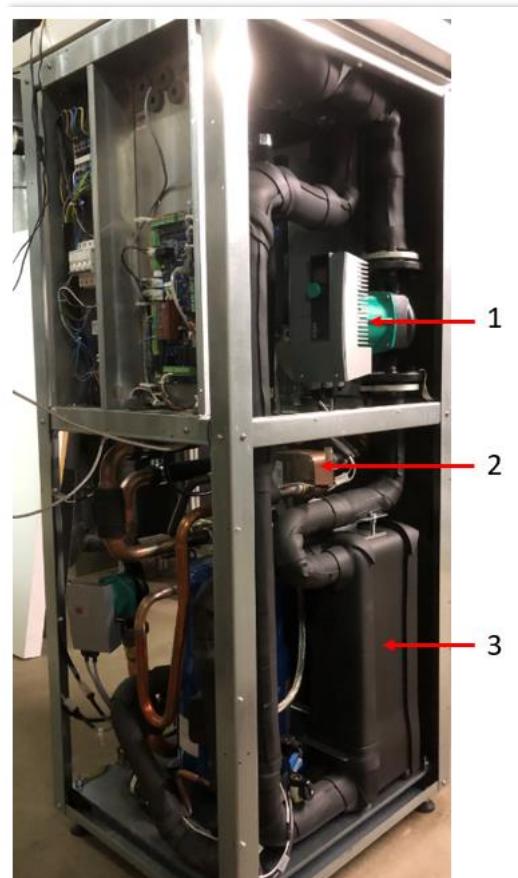
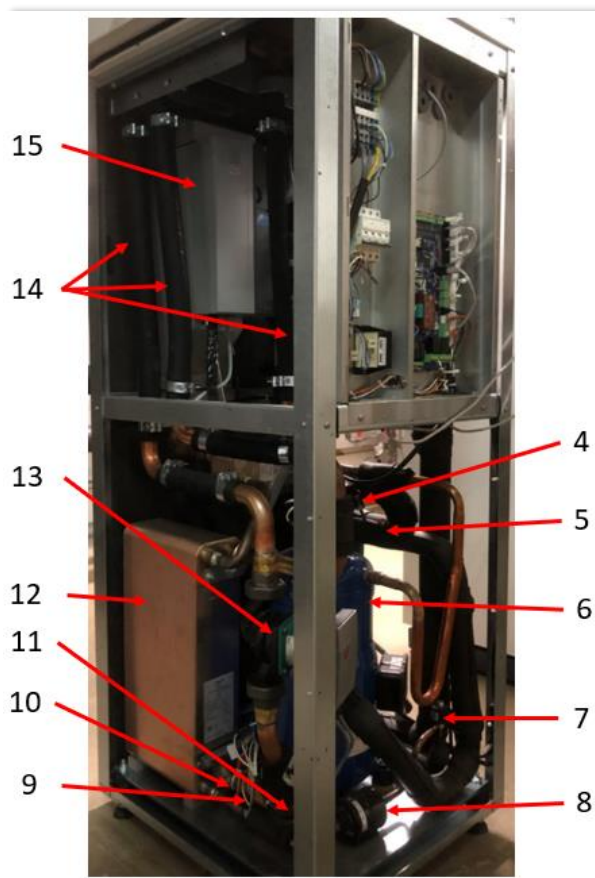
The sheet metal parts have insulating mats for sound-proofing. In versions C and D, the mounting plate is also enclosed by a frame.



The appliance dimensions can be found under "Specification".

### 6.2 Appliance overview

Version A, B:

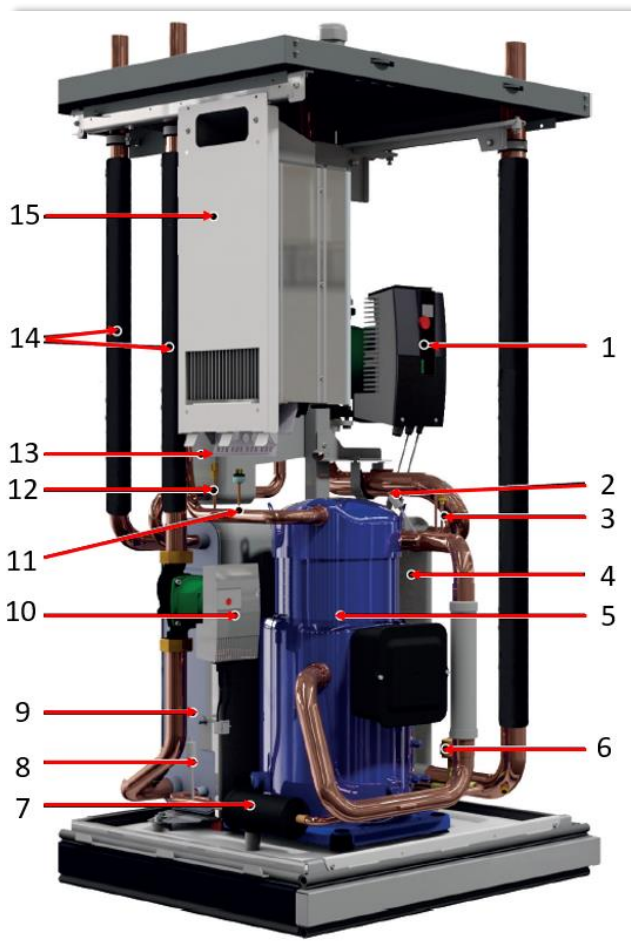


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| Number | Designation                     | Number | Designation                       |
|--------|---------------------------------|--------|-----------------------------------|
| 1      | Brine pump                      | 9      | High pressure sensor              |
| 2      | Hot gas heat exchanger          | 10     | High pressure switch              |
| 3      | Evaporator                      | 11     | Service connection, high pressure |
| 4      | Low pressure sensor             | 12     | Condenser                         |
| 5      | Low pressure service connection | 13     | Heating/DHW charging pump         |
| 6      | Compressor                      | 14     | Flexible hoses                    |
| 7      | Electronic expansion valve      | 15     | Inverter                          |
| 8      | Filter dryer                    |        |                                   |

Version C, D:



| Number | Designation                       |
|--------|-----------------------------------|
| 1      | Brine pump                        |
| 2      | Low pressure sensor               |
| 3      | Low pressure service connection   |
| 4      | Evaporator                        |
| 5      | Compressor                        |
| 6      | Electronic expansion valve        |
| 7      | Filter dryer                      |
| 8      | High pressure sensor              |
| 9      | Condenser                         |
| 10     | Heating/DHW charging pump         |
| 11     | High pressure switch              |
| 12     | Service connection, high pressure |
| 13     | Hot gas heat exchanger            |
| 14     | Flexible hoses                    |
| 15     | Inverter                          |

#### 6.3 Electronic assemblies

The appliance has various electronic components for controlling and entering parameters. The main controller in the programming unit (CM= control module) contains the entire control software. The control PCB in the appliance (BM= building module) controls the inputs and outputs, and includes refrigerant circuit control. For some auxiliary functions such as cooling, pool, heating circuits with mixer 2-5, hot gas extraction, DHW heating function or control of an older or competitor heat pump, an EM auxiliary module (EM = extension module) is required.

## Repair instructions

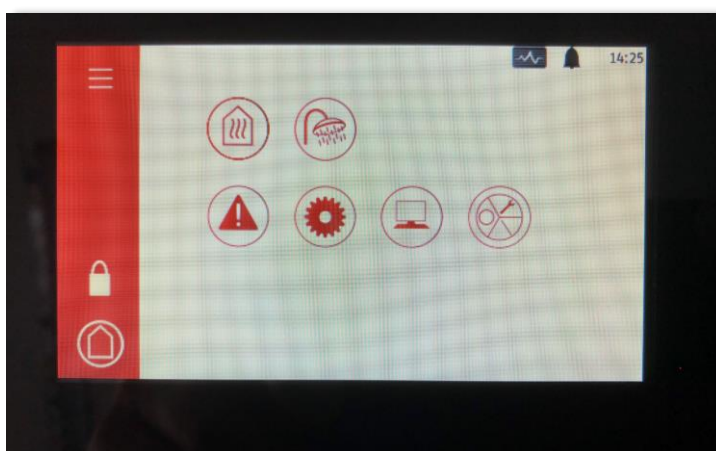
### WPE-I xx H 400 Premium

#### 6.3.1 Programming unit CM module (control module)

The spare parts number for the CM module programming unit is 338836.

The programming unit is used to carry out heat pump settings at various control levels. The PCB on the programming unit is the main control unit with heat pump software "Genesis". A detailed description of the individual parameters can be found in the operating instructions.

The 2 m long connecting cable from the CM module to the BM module is available as spare part no. 335104.



Symbols and their meaning:

| Symbol | Meaning                                                                             |
|--------|-------------------------------------------------------------------------------------|
|        | Open the menu from the start page.<br>Back to the menu from a submenu.              |
|        | Confirm a setting. Save an entry.                                                   |
|        | Reject a setting. Cancel an entry.                                                  |
|        | Scroll back through pages and submenus.                                             |
|        | Scroll forward through pages and submenus.                                          |
|        | Home button. Return to start page from any menu item.                               |
|        | Alarm symbol. Pressing this symbol changes the display to the alarm history window. |
|        | Active class A or B alarm.                                                          |

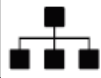
## Repair instructions

### WPE-I xx H 400 Premium

| Symbol | Meaning                                                                                                                                                                                                                                                                                                                                                      |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | Select operating mode. Pressing this symbol opens a new window to select the operating mode.                                                                                                                                                                                                                                                                 |
|        | Display menu. Scan of current temperatures, operating statuses, pressures, etc.                                                                                                                                                                                                                                                                              |
|        | Factory setting. Resets the values of the <u>current menu page</u> to the factory setting.                                                                                                                                                                                                                                                                   |
|        | Settings menu. Settings of required temperatures, functions, operating modes, etc.                                                                                                                                                                                                                                                                           |
|        | Back button. Go back to the next highest menu structure.                                                                                                                                                                                                                                                                                                     |
|        | Push-pull control. Displayed when raising or lowering parameters. Press and hold the button and slide it left or right to change the value.                                                                                                                                                                                                                  |
|        | Alternatively,  and  are also displayed and can be used to change a setting.                                                                                                                                                                                                                                                                                 |
|        | Activate/deactivate push-pull control and/or switch functions or parameters on and off. This symbol indicates a function or parameter that is switched on.                                                                                                                                                                                                   |
|        | Activate/deactivate push-pull control and/or switch functions or parameters on and off. This symbol indicates a function or parameter that is switched off.                                                                                                                                                                                                  |
|        | To avoid unauthorised access, some functions and parameters in the menu are locked. This symbol indicates locked functions. A code is required to unlock them. Customer service: 718293 Qualified contractor: 607080 Any other code returns the programming unit to user mode. Once the code has been entered, the control unit is unlocked for eight hours. |
|        | This symbol indicates unlocked functions. A code has been entered.                                                                                                                                                                                                                                                                                           |
|        | Legionella symbol. Indicates that the pasteurisation function is currently active.                                                                                                                                                                                                                                                                           |
|        | Compressor symbol. Displayed when the compressor is activated for heating or DHW heating.                                                                                                                                                                                                                                                                    |
|        | Cooling symbol. Displayed when the heat pump is in cooling mode.                                                                                                                                                                                                                                                                                             |
|        | Symbol for external heat generator 2. This symbol is displayed when the external heat generator (oil boiler, gas boiler, etc.) is being actuated                                                                                                                                                                                                             |
|        | Standby mode. If there is no heat demand, this symbol is displayed.                                                                                                                                                                                                                                                                                          |

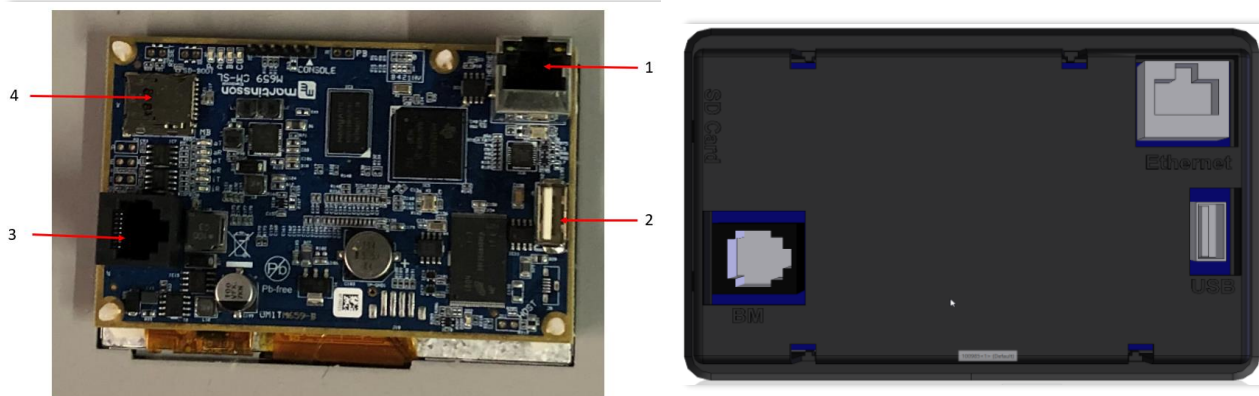
## Repair instructions

### WPE-I xx H 400 Premium

| Symbol                                                                              | Meaning                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Restart symbol. This symbol is displayed when the heat pump follows a restart command.                                                                                                                                             |
|    | Toggle buttons. Displayed when a function is assigned two switching options.                                                                                                                                                       |
|    | Internet symbol. This symbol is displayed when a network with internet access is connected and configured.                                                                                                                         |
|    | Network symbol. This symbol is displayed when a network is connected and configured.                                                                                                                                               |
|    | Swimming pool symbol. This symbol is displayed when a swimming pool is being heated.                                                                                                                                               |
|   | Heating symbol. This symbol is displayed when the heat pump is in heating mode.                                                                                                                                                    |
|  | Timer symbol. This symbol is displayed if the heat pump cannot start yet due to a function or a start condition. This may be a compressor idle time or a maximum temperature that must first be undershot.                         |
|  | DHW symbol. This symbol is displayed when the heat pump is in DHW mode.                                                                                                                                                            |
|  | Keyboard symbol. When this button is pressed, a virtual keyboard is shown.                                                                                                                                                         |
|  | Link symbol. This symbol is displayed to establish a connection between one heat pump and another downstream.                                                                                                                      |
|  | Programmed mode / automatic function active.                                                                                                                                                                                       |
|  | Service function. Can only be selected in cascade mode. The heat pump remains off. All external functions remain active.                                                                                                           |
|  | Activate the emergency/auxiliary heater. On activation, the heat pump is off and only the auxiliary heater remains active. Switching on this function on the master appliance results in heat pump shutdown in the entire cascade. |
|  | Operating mode "Off". If this function is switched on within a cascade on a slave appliance, the master heat pump is notified that this heat pump is no longer available.                                                          |
|  | Restart. A restart can only be selected if the operating mode is "Off". A service code must be entered. This function restarts the CM module.                                                                                      |

## Repair instructions WPE-I xx H 400 Premium

Back of programming unit

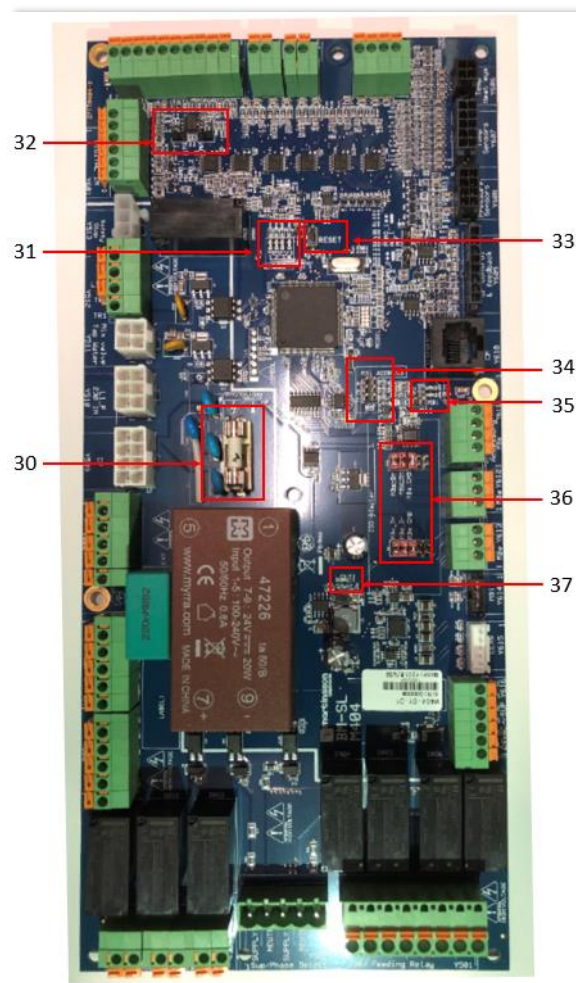
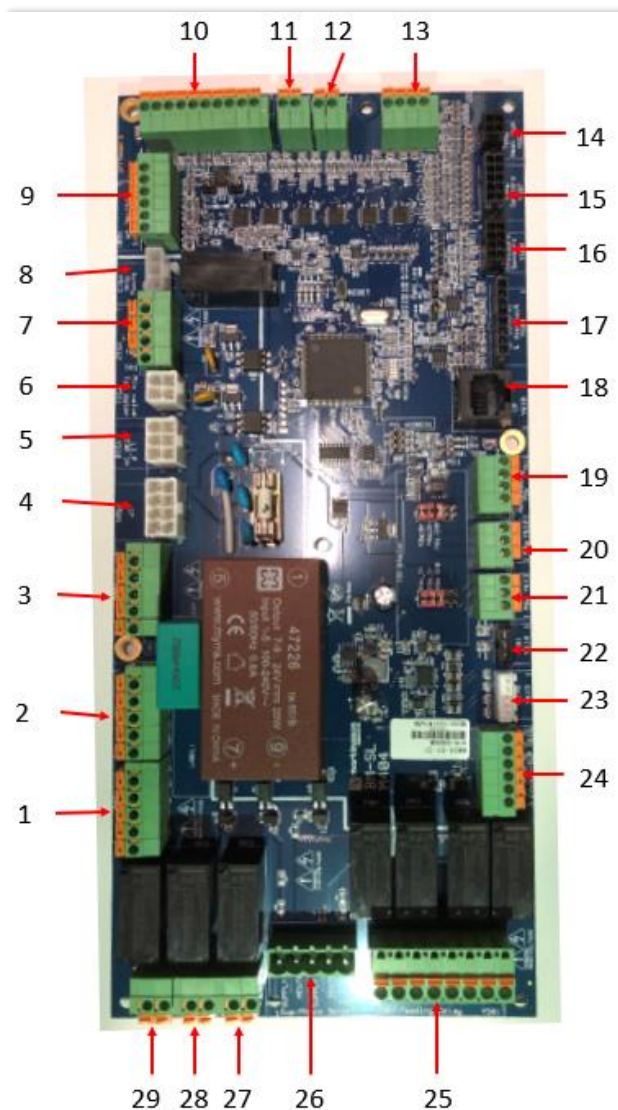


| Position | Designation                                                                                                                                                                                                                                                                                                                                                                         |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | RJ45 connection. Connection of another heat pump. With more than two heat pumps or a connection to an ISG, a network switch is connected. This connection remains free if it is a heat pump without any other network subscribers.                                                                                                                                                  |
| 2        | <ul style="list-style-type: none"> <li>• USB slot – if a USB stick is inserted here, after activation of "Logging", all parameters are automatically recorded at one second intervals.</li> <li>• If a USB stick with a software update is inserted, the display switches automatically to the update menu. When the update is confirmed, the update process is started.</li> </ul> |
| 3        | RJ45 connection for connecting the programming unit to the BM card.                                                                                                                                                                                                                                                                                                                 |
| 4        | Micro SD slot – no function at present.                                                                                                                                                                                                                                                                                                                                             |

## Repair instructions WPE-I xx H 400 Premium

### 6.3.2 BM card (building module)

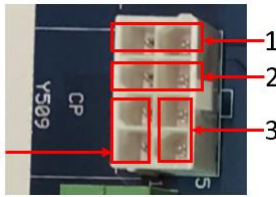
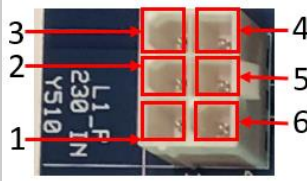
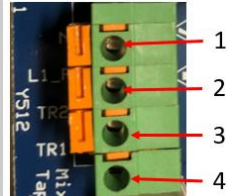
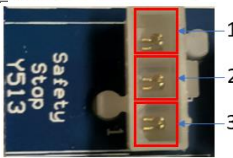
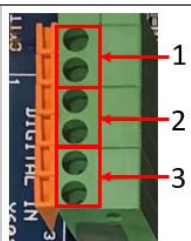
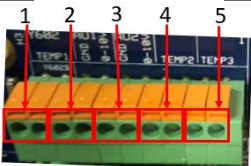
The spare parts number for the BM card is 338837.



| Number | Designation          | Image | Function                           |
|--------|----------------------|-------|------------------------------------|
| 1      | X13/Y506 L - 230 V~  |       | 5-pole mains terminal              |
| 2      | X14/Y507 N - neutral |       | 5-pole terminal, neutral conductor |

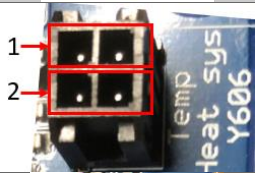
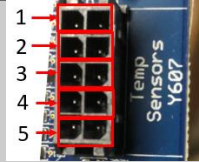
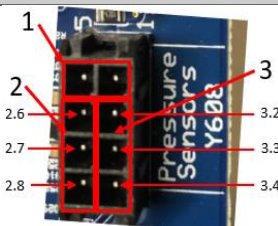
## Repair instructions

### WPE-I xx H 400 Premium

| Number | Designation                                                                                                                                                                            | Image                                                                               | Function                                                                                                                                               |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3      | X15/Y508 Pe – earth                                                                                                                                                                    |    | 5-pole earth terminal                                                                                                                                  |
| 4      | CP / Y509 network output<br>1 = Pe<br>2 = not assigned<br>3 = L, 230 V output<br>4 = N, neutral output                                                                                 |   | 8-pole plug-in strip for the supply voltage to the brine circulation pump and buffer/DHW charging pump.                                                |
| 5      | L1P / Y510 network input<br>1 = 230 V input from F2<br>2 = not assigned<br>3 = Pe input<br>4 = 230 V input from EMC<br>5 = 230 V output to T1<br>6 = N input                           |  | 6-pole plug-in strip<br>Supply voltage input for circulation pumps and isolating transformer T1.                                                       |
| 6      | Mix valve / Y511                                                                                                                                                                       |  | Not assigned.                                                                                                                                          |
| 7      | Tap water / Y512<br>1 = N<br>2 = L<br>3 = TR2 (L') (triac switching circuit)<br>4 = TR1 (L') (triac switching circuit)                                                                 |  | 4-pole terminal for the diverter valve from heating mode to DHW charging via condenser.                                                                |
| 8      | Safety stop / Y513<br>1 = 24 V DC from inverter terminal 12<br>2 = not assigned<br>3 = return to inverter terminal 37                                                                  |  | 3-pole plug-in strip<br>Safety stop function                                                                                                           |
| 9      | Y601 / Digital In<br>1 = DI1 for connecting a power supply utility circuit or smart grid 1<br>2 = DI2 for external alarm contact<br>3 = external N/O contact                           |  | 6-pole terminal for 3 external actuators. Floating.<br>Optional assignment of all contacts. The functions are not assigned in the delivered condition. |
| 10     | Y602 / Temperature sensor and analogue outputs.<br>1 = buffer cylinder sensor<br>2 = GND + 0-10 V flow, heating circuit with mixer 1<br>3 = GND + 0-10 V flow, external heat generator |  | 10-pole terminal for 3 temperature sensors and 2 x 0 – 10 V outputs.                                                                                   |

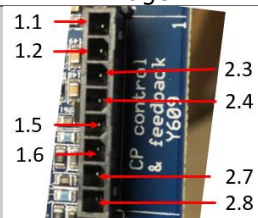
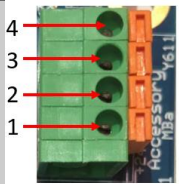
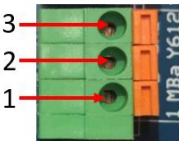
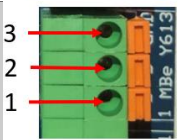
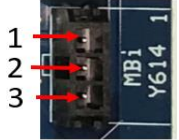
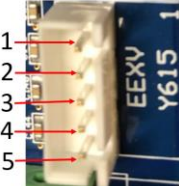
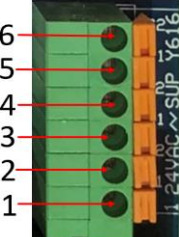
## Repair instructions

### WPE-I xx H 400 Premium

| Number | Designation                                                                                                                                                                                        | Image                                                                                | Function                                                                                                                                             |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | 4 = flow sensor, heating circuit with mixer 1<br>5 = flow sensor, HP. This sensor is always required for the heat pump function.                                                                   |                                                                                      |                                                                                                                                                      |
| 11     | Y603 / HGW<br>1 = from software version 2.00.000, return sensor T34 can be connected here.                                                                                                         |     | 2-pole terminal for future functions.                                                                                                                |
| 12     | Y604 / Outdoor<br>1 = outside temperature sensor                                                                                                                                                   |    | 2-pole terminal for the outside temperature sensor. Not pole-sensitive. If no sensor is connected, the system regulates to 0 °C outside temperature. |
| 13     | Y605 / Tap water<br>1 = DHW temperature sensor, cylinder top<br>2 = DHW temperature Sensor, cylinder centre                                                                                        |   | 4-pole terminal for DHW temperature sensor.                                                                                                          |
| 14     | Y606 / Temp heat sys<br>1 = flow sensor<br>2 = return sensor                                                                                                                                       |   | 4-pole plug-in strip for temperature sensor of heating system.                                                                                       |
| 15     | Y607 / Temp sensors<br>1 = sensor, source inlet<br>2 = sensor, source outlet<br>3 = sensor, compressor inlet<br>4 = sensor, condenser<br>5 = sensor, hot gas                                       |   | 10-pole plug-in strip for source and heat pump sensor                                                                                                |
| 16     | Y608 / pressure sensors<br>1 = high pressure switch<br>2 = high pressure transducer<br>2.6=earth, 2.7=0-5 V,<br>2.8=5 V out<br>2 = low pressure transducer<br>3.2=0-5 V, 3.3=5 V out,<br>3.4=earth |  | 8-pole plug-in strip for high pressure switch and refrigerant circuit pressure transducer.                                                           |

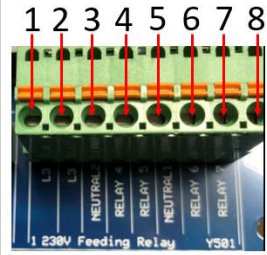
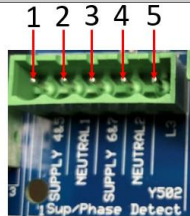
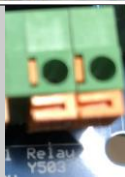
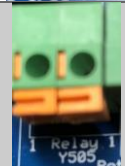
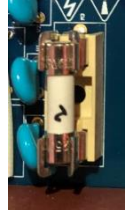
## Repair instructions

### WPE-I xx H 400 Premium

| Number       | Designation                                                                                                                                                                                                                                                                                 | Image                                                                               | Function                                                                                                         |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------|-------|-------|---------|----------|---------|---------|---------|--------|---------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 17           | Y609 / CP control & feedback<br>1.x = control, brine pump<br>1.1=0-10 V, 1.2=earth,<br>1.5=feedback, 1.6=earth<br>2.x = control, DHW/buffer<br>charging pump<br>2.3=0-10 V, 2.4=earth,<br>2.7=feedback, 2.8=earth                                                                           |    | 8-pole plug-in strip for<br>controlling the source pump<br>and the DHW/buffer charging<br>pump.<br>0-10 V signal |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 18           | Y610 / CM                                                                                                                                                                                                                                                                                   |    | RJ45 socket<br>Connection to the<br>programming unit "bottom<br>left"                                            |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 19           | Y611 / MBa<br>1 = +24 V out<br>2 = D+<br>3 = D-<br>4 = earth                                                                                                                                                                                                                                |   | 4-pole terminal for a room<br>temperature sensor –<br>optional.                                                  |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 20           | Y612 / MBa2<br>1 = D+<br>2 = D-<br>3 = earth                                                                                                                                                                                                                                                |  | 3-pole terminal for bus<br>connection to EM3.                                                                    |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 21           | Y613 / MBc<br>1 = D+<br>2 = D-<br>3 = earth                                                                                                                                                                                                                                                 |  | 3-pole terminal for a building<br>management system (BMS).<br>Not assigned.                                      |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 22           | Y614 / MBi<br>1 = MBi D+<br>2 = MBi D-<br>3 = unassigned                                                                                                                                                                                                                                    |  | 3-pole plug-in strip.<br>Communication cable to the<br>inverter at connection 68/69                              |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 23           | Y615 / EEXV<br><table><tr><th>Version A, B</th><th>Version C, D</th></tr><tr><td>1=orange</td><td>1=red</td></tr><tr><td>2=red</td><td>2=green</td></tr><tr><td>3=yellow</td><td>3=white</td></tr><tr><td>4=black</td><td>4=black</td></tr><tr><td>5=grey</td><td>5=empty</td></tr></table> | Version A, B                                                                        | Version C, D                                                                                                     | 1=orange | 1=red | 2=red | 2=green | 3=yellow | 3=white | 4=black | 4=black | 5=grey | 5=empty |  | 5-pole plug-in strip.<br>Connection, electronic<br>expansion valve. |
| Version A, B | Version C, D                                                                                                                                                                                                                                                                                |                                                                                     |                                                                                                                  |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 1=orange     | 1=red                                                                                                                                                                                                                                                                                       |                                                                                     |                                                                                                                  |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 2=red        | 2=green                                                                                                                                                                                                                                                                                     |                                                                                     |                                                                                                                  |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 3=yellow     | 3=white                                                                                                                                                                                                                                                                                     |                                                                                     |                                                                                                                  |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 4=black      | 4=black                                                                                                                                                                                                                                                                                     |                                                                                     |                                                                                                                  |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 5=grey       | 5=empty                                                                                                                                                                                                                                                                                     |                                                                                     |                                                                                                                  |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |
| 24           | Y616 / 24 V AC -SUP<br>1 = 24 VAC1 from transformer<br>T1<br>2 = 24 VAC2 from transformer<br>T1<br>3 = 24 VAC1 output<br>4 = 24 VAC2 output<br>5 = 24 VAC1 output<br>6 = 24 VAC2 output                                                                                                     |  | 6-pole terminal.<br>24 V AC power supply.<br>2 x outputs 24 V AC.<br>Together max. 1 A load<br>capacity.         |          |       |       |         |          |         |         |         |        |         |                                                                                     |                                                                     |

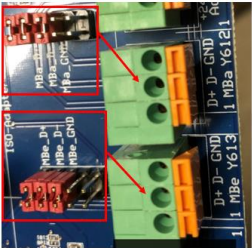
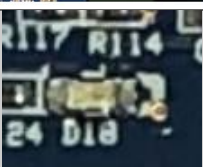
## Repair instructions

### WPE-I xx H 400 Premium

| Number  | Designation                                                                                                                                                                                                                                                                                                           | Image                                                                               | Function                                                                              |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------|--|---|--------------------|---------|------------------------|---------|-------------|--|-----------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 25      | Y501 / Feeding Relay<br>1 = 230 V AC output<br>2 = 230 V AC output<br>3 = N<br>4 = relay 4 L1/ brine circulation pump (optional)<br>5 = relay 5 L1/heating circuit 1<br>6 = N<br>7 = relay 6 L2/ system circulation pump<br>8 = relay 7 L2/ circulation pump, hot gas extraction                                      |   | 8-pole terminal.<br>Connection of the power supply for circulation pumps.             |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| 26      | Y502 / Sup/Phase Detect<br>1 = L1, power cable<br>2 = N1, not assigned<br>3 = L2, power cable<br>4 = N2, not assigned<br>5 = L3, power cable                                                                                                                                                                          |   | 5-pole plug-in strip.<br>Voltage inputs for relay outputs.                            |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| 27      | Y503 / Relay 3<br>Floating contact for switching on external 2nd heat generator.                                                                                                                                                                                                                                      |  | 2-pole terminal.<br>Floating contact. N/O contact. External 2nd heat generator.       |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| 28      | Y504 / Relay 2<br>Floating contact for signal transmission when the compressor is switched on.                                                                                                                                                                                                                        |  | 2-pole terminal.<br>Floating contact. N/O contact. Signal for compressor switched on. |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| 29      | Y505 / Relay 1<br>Floating contact for transmission of a heat pump fault. Programmable.                                                                                                                                                                                                                               |  | 2-pole terminal.<br>Floating contact. N/O contact. Alarm contact.                     |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| 30      | M3<br>Fine-wire fuse<br>T2 A, 250 V                                                                                                                                                                                                                                                                                   |  |                                                                                       |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| 31      | LED status display<br><table><tr><th>LED</th><th>Meaning</th></tr><tr><td>1 2 3 4</td><td></td></tr><tr><td>X</td><td>Standard condition</td></tr><tr><td>X O O O</td><td>High limit safety Stop</td></tr><tr><td>x x x x</td><td>Update mode</td></tr><tr><td></td><td>Frost protection (not used)</td></tr></table> | LED                                                                                 | Meaning                                                                               | 1 2 3 4 |  | X | Standard condition | X O O O | High limit safety Stop | x x x x | Update mode |  | Frost protection (not used) |  | Function description<br><br>X = flashing<br>O = steady light |
| LED     | Meaning                                                                                                                                                                                                                                                                                                               |                                                                                     |                                                                                       |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| 1 2 3 4 |                                                                                                                                                                                                                                                                                                                       |                                                                                     |                                                                                       |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| X       | Standard condition                                                                                                                                                                                                                                                                                                    |                                                                                     |                                                                                       |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| X O O O | High limit safety Stop                                                                                                                                                                                                                                                                                                |                                                                                     |                                                                                       |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
| x x x x | Update mode                                                                                                                                                                                                                                                                                                           |                                                                                     |                                                                                       |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |
|         | Frost protection (not used)                                                                                                                                                                                                                                                                                           |                                                                                     |                                                                                       |         |  |   |                    |         |                        |         |             |  |                             |                                                                                     |                                                              |

## Repair instructions

### WPE-I xx H 400 Premium

| Number | Designation                                                 | Image                                                                               | Function                                                                                                                                                                    |
|--------|-------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 32     | Jumper M1 + M2                                              |    | Use for 0 – 10 V functions of terminals AO 24 and AO 25 / Y602. Jumper set = 0-10 V<br>Open contact = PWM                                                                   |
| 33     | Reset button                                                |    | Pressing the reset button restarts the BM card. No parameters are changed.                                                                                                  |
| 34     | Jumper M5 / MBi address<br>Jumper 1<br>Jumper 2<br>Jumper 3 |    |                                                                                                                                                                             |
| 35     | Jumper M11                                                  |   | Setting a jumper terminates the MBi bus. This jumper always remains open. Termination of the MBi connection (connection to the inverter) is not carried out on the BM card. |
| 36     | Jumper MBa / MBe<br>Jumper MBa.<br>Jumper MBe.              |  | Also see section "Modbus amplifier PCB". The ISO-SL adaptor PCB is plugged in at the factory.                                                                               |
| 37     | LED status display<br>D18                                   |  | Indicates by flashing that there is communication with the CM card.                                                                                                         |

## Repair instructions WPE-I xx H 400 Premium

### 6.3.3 Modbus amplifier PCB (ISO adaptor)

The Modbus amplifier PCB is always required and is preinstalled in the delivered condition.

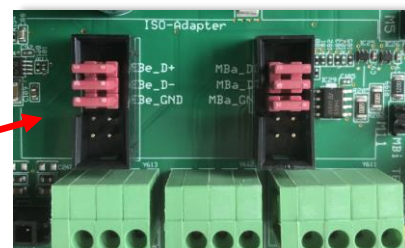
The Modbus amplifier PCB is plugged into the ISO adaptor slot (position 36 on the BM card).

The Modbus amplifier PCB is available from the spare parts store if required. Material number is 352024.

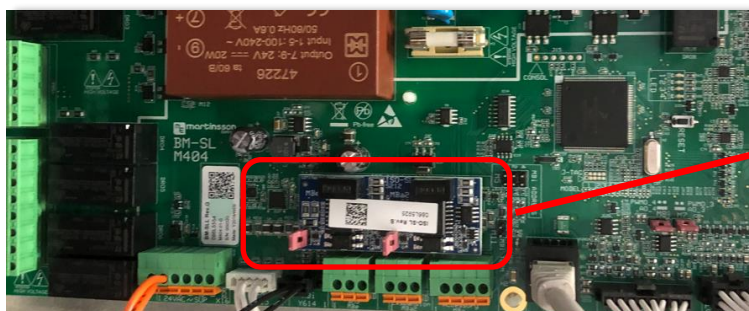


If, when a BM card is replaced, this Modbus amplifier PCB is not plugged into the new BM card, this Modbus amplifier PCB should be taken from the old BM card and plugged into the new BM card. The six preinstalled jumpers on the BM card must be removed for replacement and the Modbus amplifier PCB is pushed with the bi-pin bases, as shown in the figure, on to the plug-in contacts.

Bi-pin base on the BM card with the six jumpers to be removed.



Modbus amplifier PCB plugged in the BM card.

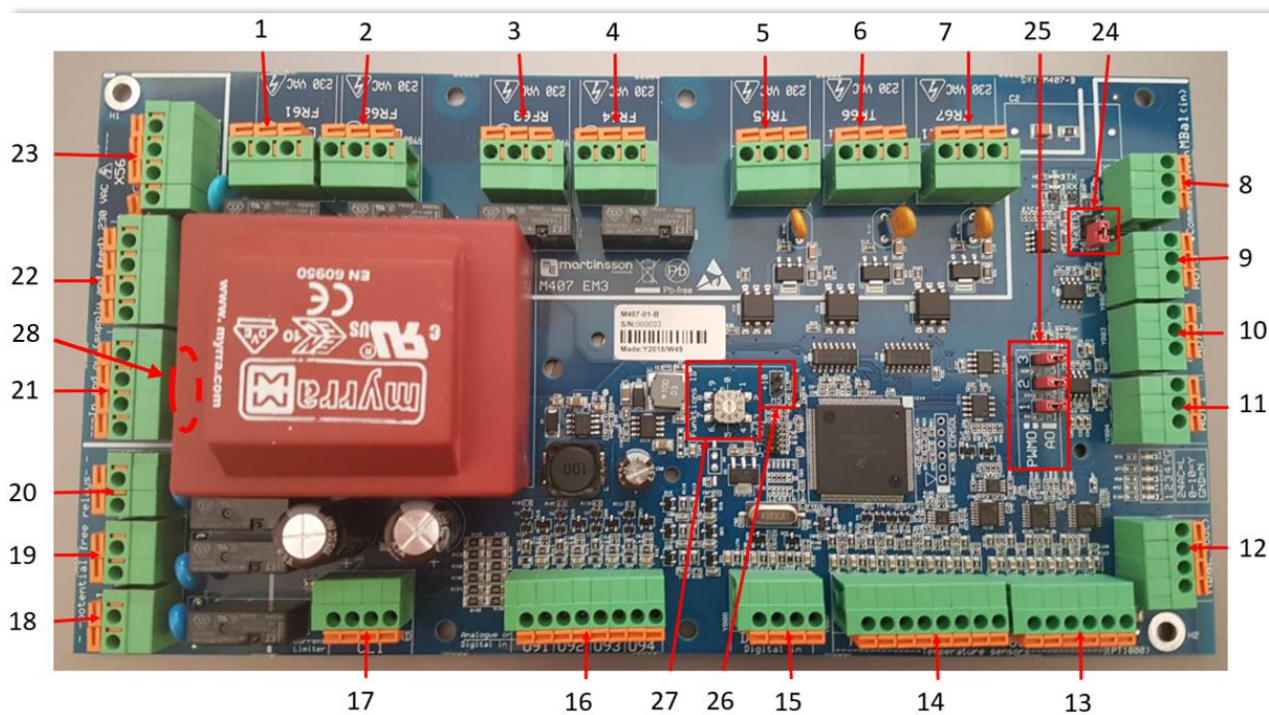


## Repair instructions

### WPE-I xx H 400 Premium

#### 6.3.4 Auxiliary module – EM (extension module)

The EM auxiliary module must be used if a DHW function, pool function, cooling function, additional mixer functions or additional heat pumps are also required for standard heat pump function. Irrespective of the relevant selected function of the EM card, the inputs and outputs are switched individually. The part numbers are listed in the section "Accessories".



| Number | Designation                            | Image | Function                                                     |
|--------|----------------------------------------|-------|--------------------------------------------------------------|
| 1      | FR61<br>Function relay 230 V<br>Output |       | Connection, circulation pump<br>1 = 230 V<br>2 = N<br>3 = Pe |
| 2      | FR62<br>Function relay 230 V<br>Output |       | Connection, circulation pump<br>1 = 230 V<br>2 = N<br>3 = Pe |
| 3      | FR63<br>Function relay 230 V<br>Output |       | Connection, circulation pump<br>1 = 230 V<br>2 = N<br>3 = Pe |

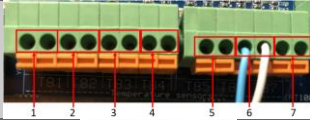
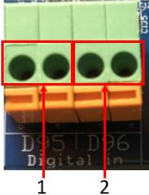
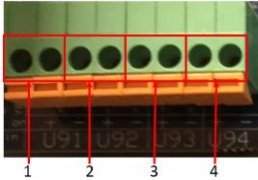
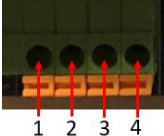
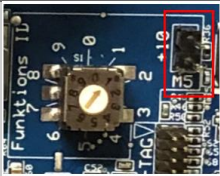
## Repair instructions

### WPE-I xx H 400 Premium

| Number | Designation                                                                               | Image | Function                                                                                                                                  |
|--------|-------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 4      | FR64<br>Function relay 230 V<br>Output                                                    |       | Connection, circulation pump<br>1 = 230 V<br>2 = N<br>3 = Pe                                                                              |
| 5      | TR65<br>Continuous voltage and<br>triac output for switching<br>mixers or diverter valves |       | Diverter valve L1, N, Y<br>1 = Y switched via triac, 230 V<br>2 = N<br>3 = 230 V continuous voltage                                       |
| 6      | TR66<br>Continuous voltage and<br>triac output for switching<br>mixers or diverter valves |       | Diverter valve L1, N, Y<br>1 = Y switched via triac, 230 V<br>2 = N<br>3 = 230 V                                                          |
| 7      | TR67<br>Continuous voltage and<br>triac output for switching<br>mixers or diverter valves |       | Diverter valve L1, N, Y<br>1 = Y switched via triac, 230 V<br>2 = N<br>3 = 230 V                                                          |
| 8      | MBa1<br>Input/connection with<br>MBa2 – BM card for data<br>transfer                      |       | MBa function (input). Jumper M4<br>set if no additional EM3 card is<br>connected to the bus.<br>1 = GND 2 = D- 3 = D+                     |
| 9      | A073<br>Analogue outputs                                                                  |       | Connection, mixer, control unit<br>1 = GND/earth<br>2 = 0-10 V closed-loop control<br>voltage<br>3 = 24 V AC open-loop control<br>voltage |
| 10     | A072<br>Analogue outputs                                                                  |       | Connection, mixer, control unit<br>1 = GND/earth<br>2 = 0-10 V closed-loop control<br>voltage<br>3 = 24 V AC open-loop control<br>voltage |
| 11     | A071<br>Analogue outputs                                                                  |       | Connection, mixer, control unit<br>1 = GND/earth<br>2 = 0-10 V closed-loop control<br>voltage<br>3 = 24 V AC open-loop control<br>voltage |
| 12     | MBa2<br>Output / connection with<br>MBa1 – additional EM card                             |       | MBa2 function (output). Control<br>connection to accessory.<br>1 = GND/earth<br>2 = D- 3 = D+<br>4 = 24 V AC                              |

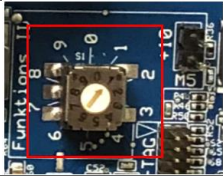
## Repair instructions

### WPE-I xx H 400 Premium

| Number   | Designation                                                                               | Image                                                                               | Function                                                                                                                                     |
|----------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 13 / 14  | T81, T82, T83, T84, T85, T86, T87                                                         |    | Temperature sensor PT 1000<br>1 = T81 2 = T82 3 = T83<br>4 = T84 5 = T85 6 = T86<br>7 = T87                                                  |
| 15       | D95, D96<br>Digital input for transmission of operating status. SG, pressure switch, etc. |    | Digital input. Contact closed, contact open<br>1 = D95<br>2 = D96                                                                            |
| 16       | U91, U92, U93, U94                                                                        |    | Analogue and digital input. Contact closed, contact open +/- wired.<br>1 = U91 +/- 2 = U92 +/-<br>3 = U93 +/- 4 = U94 +/-                    |
| 17       | CL1                                                                                       |   | Current limiter. L1, L2, L3 to earth.<br>1 = L1, 2 = L2, 3 = L3, 4 = earth                                                                   |
| 18/19/20 | R51 / R52 / R53<br>Connection of external consumers.                                      |  | Floating relay                                                                                                                               |
| 21       | X54<br>L = 230 V~                                                                         |  | 4-pole mains terminal.                                                                                                                       |
| 22       | X55<br>N = neutral                                                                        |  | 4-pole terminal, neutral conductor.                                                                                                          |
| 23       | X56<br>Pe = earth                                                                         |  | 4-pole earth terminal.                                                                                                                       |
| 24       | Jumper M4                                                                                 |  | The jumper must be set if the EM card is placed at the end of the Modbus network.                                                            |
| 25       | Jumper for AO71, AO72, AO73                                                               |  | Must be used for functions AO71, AO72, AO73<br>Jumper set = 0-10 V<br>Open contact = PWM                                                     |
| 26       | Jumper M5 for changeover of Modbus addresses                                              |  | Depending on the required function of the EM3 card, the jumper must be set or removed. The position is shown in the relevant wiring diagram. |

## Repair instructions

### WPE-I xx H 400 Premium

| Number | Designation                          | Image                                                                             | Function                                                                                                                                                                              |
|--------|--------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 27     | Rotary selector for function setting |  | By adjusting the rotary selector and setting the M5 jumper, various functions of the EM are activated. Settings are specified in the wiring diagrams for the relevant functions used. |
| 28     | Fine-wire fuse 2 A (slow), 250 V     |  |                                                                                                                                                                                       |

Functions of the EM card:

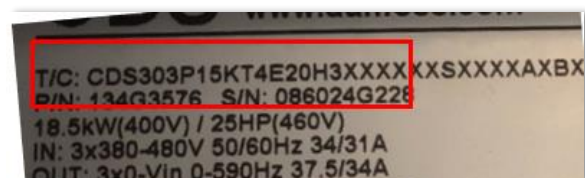
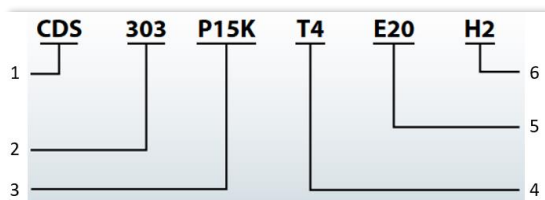
| ID | Function                                  | ID | Function                                 |
|----|-------------------------------------------|----|------------------------------------------|
| 0  | Factory delivery / M5 closed              | 11 | Existing HPs 3+4 / position 1 / M5 set   |
| 1  | DHW functions / M5 open                   | 12 | Existing HPs 5+6 / position 0 / M5 set   |
| 2  | Heating circuits with mixer 2+3 / M5 open | 13 | Existing HPs 7+8 / position 0 / M5 set   |
| 3  | Heating circuits with mixer 4+5 / M5 open | 14 | Existing HPs 9+10 / position 0 / M5 set  |
| 4  | Cooling function / M5 open                | 15 | Existing HPs 11+12 / position 0 / M5 set |
| 5  | Pool function / M5 open                   | 16 | Existing HPs 13+14 / position 0 / M5 set |
| 10 | Existing HPs 1+2 / position 0 / M5 set    | 17 | Existing HPs 15+16 / position 0 / M5 set |

#### 6.3.5 Inverter

If the inverter is replaced, it is important to ensure that the correct inverter is used with regard to date of manufacture.

| Appliance               | Type                                 | Spare part no. |
|-------------------------|--------------------------------------|----------------|
| Version A, B up to 9542 | Danfoss CDS303 P15K casing type B3   | 338832         |
| Version A, B from 95443 |                                      | 203259         |
| Version C up to 9542    | Danfoss CDS303 P18.5K casing type B4 | 339631         |
| Version C from 9543     |                                      | 203260         |
| Version D up to 9542    | Danfoss CDS303 P22K casing type B4   | 202177         |
| Version D from 9543     |                                      | 203261         |

Type designation code for this inverter series:

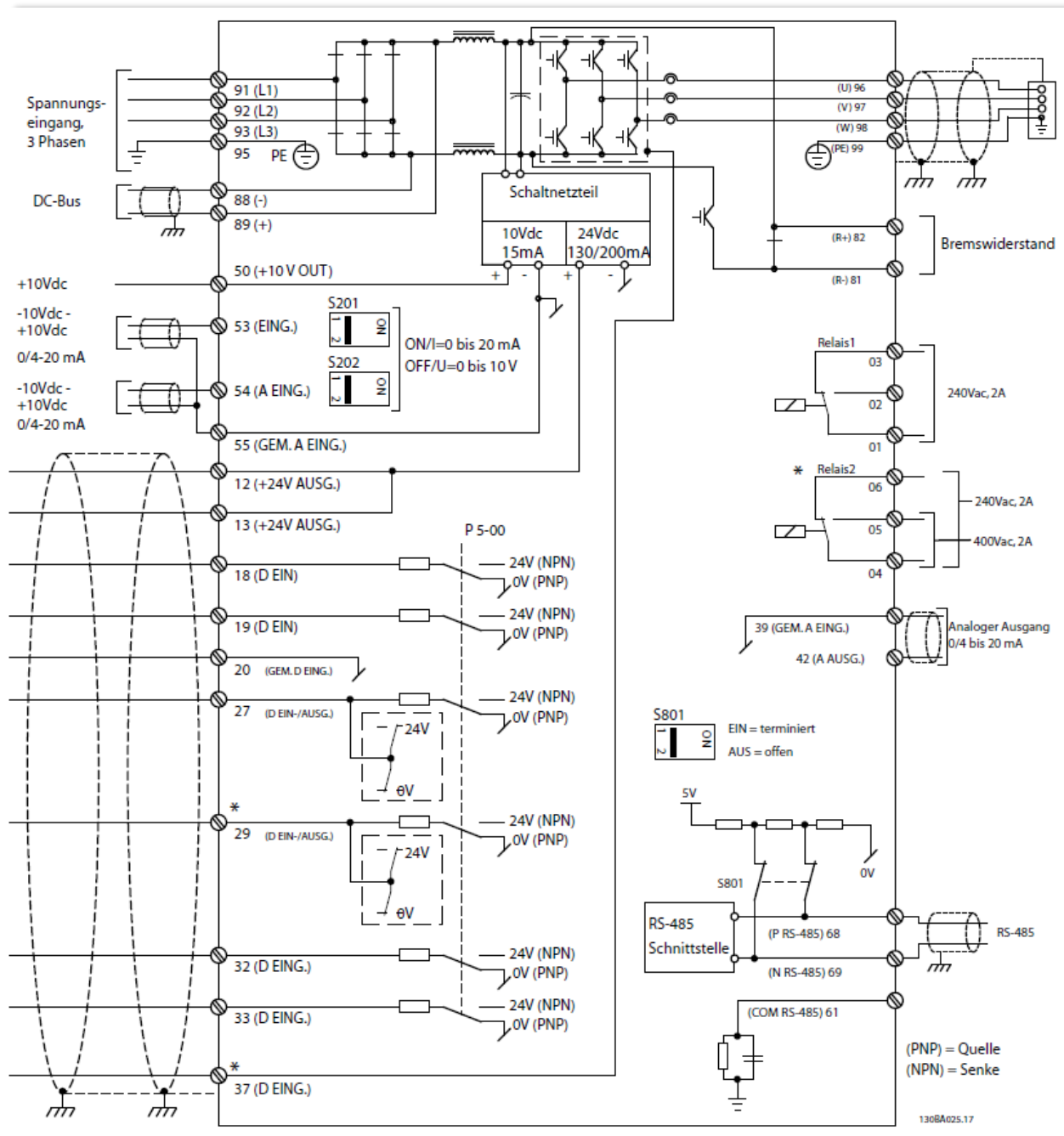


| Position | Description                                           | Position | Description                                                                                                 |
|----------|-------------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------|
| 1        | Special inverter series for the VZH scroll compressor | 6        | RFI class                                                                                                   |
| 2        | Series 303                                            | 5        | IP rating                                                                                                   |
| 3        | Output at high overload in KW                         | 4        | Mains supply voltage<br>T2= 200-240 V/3~/50&60 Hz<br>T4= 380-480 V/3~/50&60 Hz<br>T6= 525-600 V/3~/50&60 Hz |

## Repair instructions

### WPE-I xx H 400 Premium

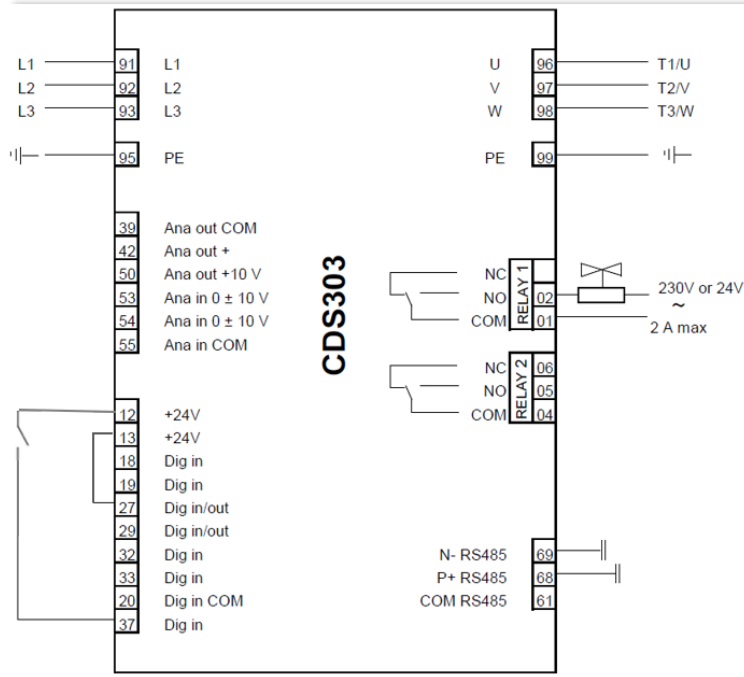
Internal wiring diagram for inverter:



## Repair instructions

### WPE-I xx H 400 Premium

Wiring diagram:

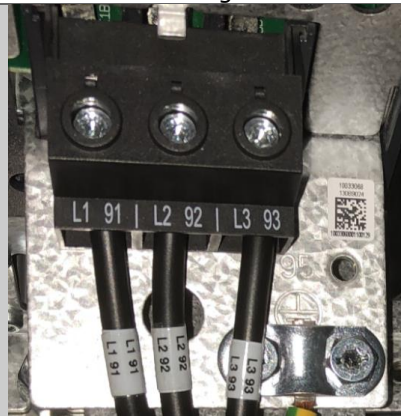


| Abbreviation | Meaning                 |
|--------------|-------------------------|
| L1, L2, L3   | Power supply            |
| U, V, W      | Supply line, compressor |
| Ana          | Analogue                |
| Dig          | Digital                 |
| In           | Input                   |
| Out          | Output                  |
| NC           | Normal close            |
| NO           | Normal open             |
| Com          | Common                  |

#### Connection

91, 92, 93, 95

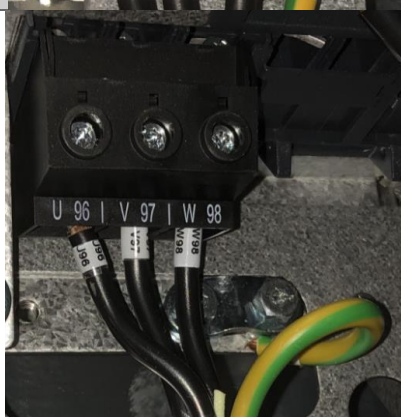
#### Image



#### Function

Power supply at inverter from the mains terminal. The figure shows inverter 339631.

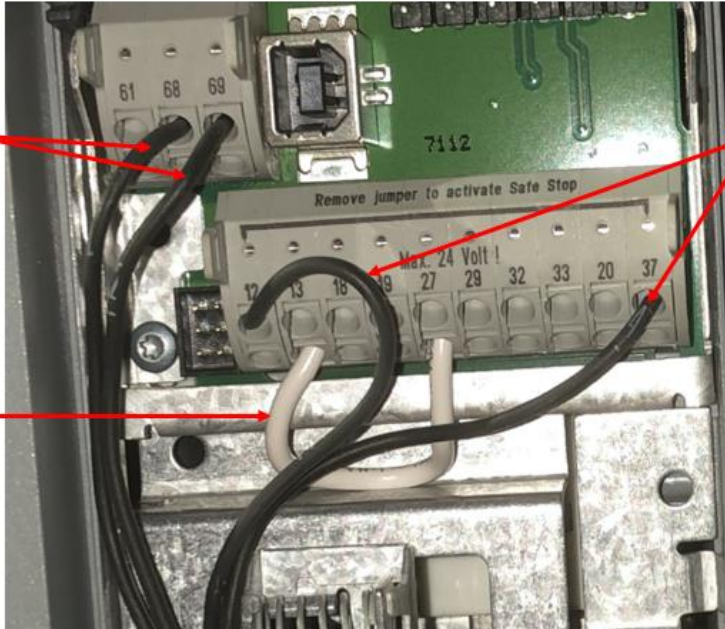
96, 97, 98, 99



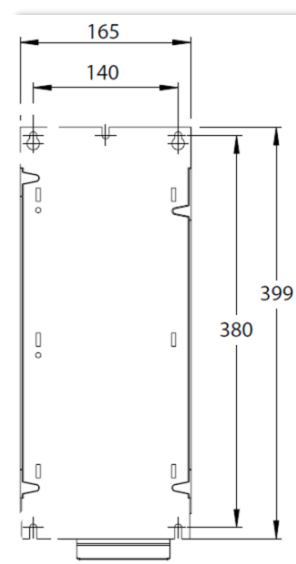
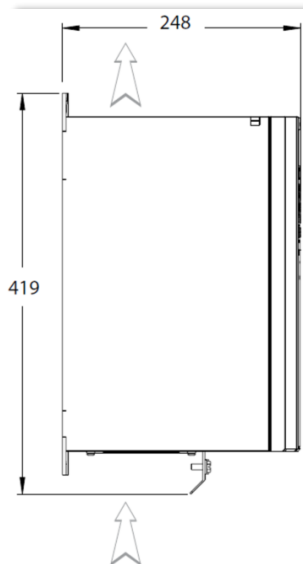
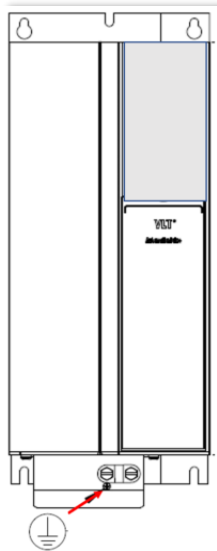
Power supply to the compressor. The figure shows inverter 339631.

## Repair instructions

### WPE-I xx H 400 Premium

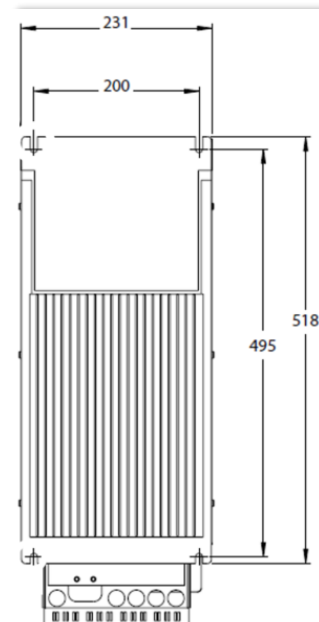
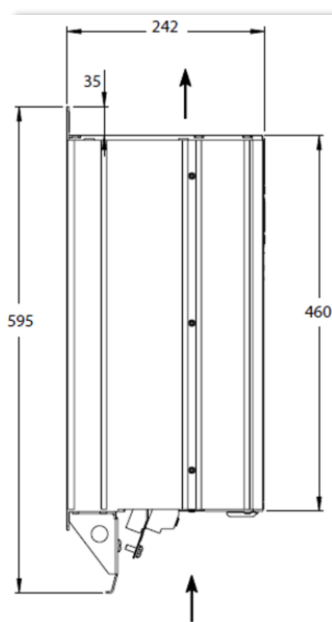
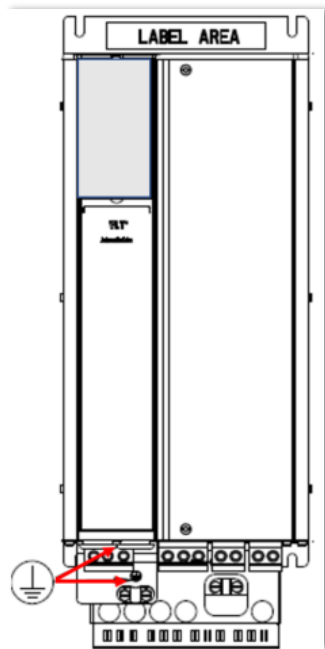
| Connection                                                                                                                                                                                                                                                                                                                                                                | Image                                                                               | Function                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Relay 1, terminal 01 / 02                                                                                                                                                                                                                                                                                                                                                 |    | Connection to solenoid valve at compressor for oil lubrication.<br>Figure shows inverter 339631. |
| <p>1 = terminal 68, 69.<br/>Connecting cable for Modbus connection with BM card at connection Y614.</p> <p>2 = terminal 12, 37.<br/>Connecting cable for safety stop function to BM card at connection Y513.</p> <p>3 = terminal 13, 27.<br/>This heat pump ON/OFF function is not used and is therefore disabled with a jumper.</p> <p>Figures show inverter 338832.</p> |  |                                                                                                  |

Casing B3, weight 13 kg



## Repair instructions WPE-I xx H 400 Premium

Casing B4, weight 24 kg



## Repair instructions

### WPE-I xx H 400 Premium

#### 6.4 Electrical assemblies

##### 6.4.1 Compressor

From May 2020, a new compressor has been fitted in the appliance series. Compressors for appliances from date of manufacture 9543 can also be used in appliances up to date of manufacture 9542 if required. In the event of repairs, however, compressors for appliances up to date of manufacture 9542 may not be used in appliances with a date of manufacture after 9543.

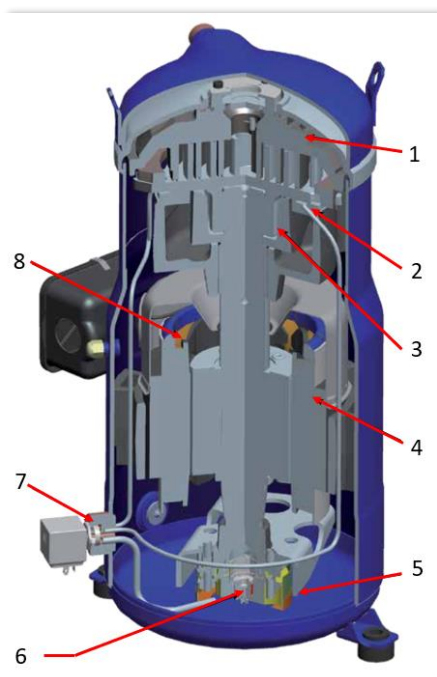
If an older inverter is replaced with a new one, the compressor must always be replaced too, as inverter control is programmed to the new series compressor characteristics.

Compressors from serial number 9543 have the following features:

- Improved oil pump for better compressor lubrication.
- Higher oil fill level for even better lubrication.
- Wider SOA range.
- Maximum flow temperature of 65 °C is achieved from a source temperature of just 0 °C (previously only from 5 °C source temperature).

| Appliance               | Type                  | Spare part no. |
|-------------------------|-----------------------|----------------|
| Version A, B up to 9542 | VZH 088 AGANA Danfoss | 201536         |
| Version A, B from 9543  | VZH 088 CGANA Danfoss | 341967         |
| Version C up to 9542    | VZH 117 AGANA Danfoss | 201537         |
| Version C from 9543     | VZH 170 CGANA Danfoss | 344155         |
| Version D up to 9542    | VZH 170 AGANA Danfoss | 201538         |
| Version D from 9543     | VZH 170 CGANA Danfoss | 342685         |

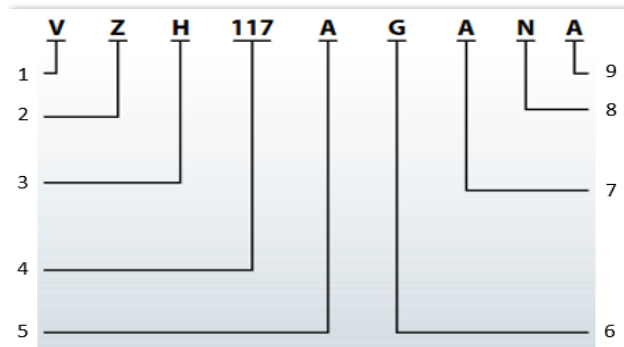
Schematic layout of Danfoss scroll compressors:



| Position | Description                                                                                       |
|----------|---------------------------------------------------------------------------------------------------|
| 1        | Scroll set made of reinforced cast iron.                                                          |
| 2        | Patented oil injection system for better scroll set sealing and optimum efficiency at low speeds. |
| 3        | Lead-free polymer bearings.                                                                       |
| 4        | Permanent magnet motor                                                                            |
| 5        | Oil filter                                                                                        |
| 6        | Gear oil pump                                                                                     |
| 7        | Oil injection control for optimum oil circulation.                                                |
| 8        | Oil and gas flows are routed through an oil return line to the oil sump.                          |

## Repair instructions WPE-I xx H 400 Premium

Type code for the compressor:



| Position | Description                                                            | Position | Description                                                                                                                                                               |
|----------|------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | Variable speed                                                         | 9        | Generation code                                                                                                                                                           |
| 2        | Product series                                                         | 8        | Type of motor protection.<br>N= no internal motor protection (motor protection via inverter).                                                                             |
| 3        | Lubricant POE-oil, refrigerant R410A                                   | 7        | Equipment<br>A= solder connections, oil sight glass with thread, without oil level switch<br>B= solder connections, without oil sight glass, oil level switch with thread |
| 4        | Displaced volume in cm <sup>3</sup> /rev                               | 6        | Motor voltage code for the mains supply voltage for the inverter.<br>G= 380-480 V/3~/50&60 Hz<br>H= 525-600 V/3~/50&60 Hz<br>J= 200-240 V/3~/50&60 Hz                     |
| 5        | Design pressure ratio<br>A=high pressure ratio<br>B=low pressure ratio |          |                                                                                                                                                                           |

Version A, B up to 9542



## Repair instructions

### WPE-I xx H 400 Premium

| Parameter        | Specification        | Parameter                         | Specification        |
|------------------|----------------------|-----------------------------------|----------------------|
| Weight           | 59.75 kg             | Oil quantity                      | 3.3 l                |
| Technology       | Scroll compressor    | LRA                               | 37.5 A               |
| Supply voltage   | 380-480/3/50-60      | No. of starts per hour            | 12 (maximum)         |
| Speed at 50 Hz   | 3000 [rpm]           | Winding resistance                | 0.10 Ohm             |
| Speed at 60 Hz   | 3600 [rpm]           | Voltage range                     | 342 V – 528 V        |
| Frequency        | 25 – 100 Hz          | Rated voltage                     | 380 V – 480 V        |
| Refrigerant      | R410A                | Displacement volume               | 88.4 cm <sup>3</sup> |
| Oil type         | Polyolester          | Nominal cooling capacity          | 96.59                |
| Motor protection | Via inverter control | Nominal cooling capacity at 50 Hz | 21.1                 |

Version C up to 9542



| Parameter        | Specification        | Parameter                         | Specification         |
|------------------|----------------------|-----------------------------------|-----------------------|
| Weight           | 65.17 kg             | Oil quantity                      | 3.6 l                 |
| Technology       | Scroll compressor    | LRA                               | 44 A                  |
| Supply voltage   | 380-480/3/50-60      | No. of starts per hour            | 12 (maximum)          |
| Speed at 50 Hz   | 3000 [rpm]           | Winding resistance                | 0.08 Ohm              |
| Speed at 60 Hz   | 3600 [rpm]           | Voltage range                     | 342 V – 528 V         |
| Frequency        | 25 – 100 Hz          | Rated voltage                     | 380 V – 480 V         |
| Refrigerant      | R410A                | Displacement volume               | 116.9 cm <sup>3</sup> |
| Oil type         | Polyolester          | Nominal cooling capacity          | 129.35 KBTU/H         |
| Motor protection | Via inverter control | Nominal cooling capacity at 50 Hz | 28.3 KBTU/H           |

## Repair instructions WPE-I xx H 400 Premium

Version D up to 9542

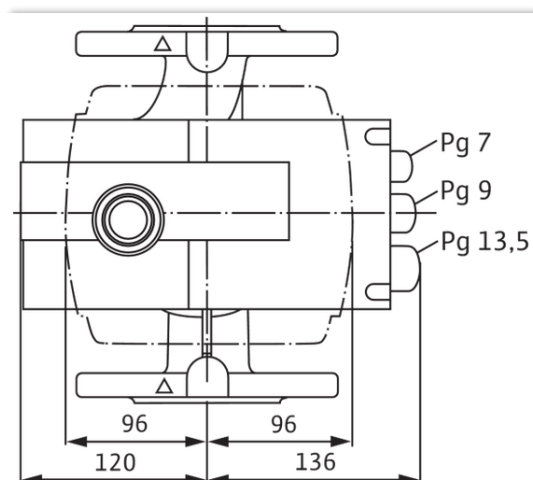


| Parameter        | Specification        | Parameter                         | Specification         |
|------------------|----------------------|-----------------------------------|-----------------------|
| Weight           | 113.5 kg             | Oil quantity                      | 6.7 l                 |
| Technology       | Scroll compressor    | LRA                               | 61 A                  |
| Supply voltage   | 380-480/3/50-60      | No. of starts per hour            | 12 (maximum)          |
| Speed at 50 Hz   | 3000 [rpm]           | Winding resistance                | 0.05 Ohm              |
| Speed at 60 Hz   | 3600 [rpm]           | Voltage range                     | 342 V – 528 V         |
| Frequency        | 25 – 100 Hz          | Rated voltage                     | 380 V – 480 V         |
| Refrigerant      | R410A                | Displacement volume               | 170.2 cm <sup>3</sup> |
| Oil type         | Polyolester          | Nominal cooling capacity          | 189.08 KBTU/H         |
| Motor protection | Via inverter control | Nominal cooling capacity at 50 Hz | 40.8 KBTU/H           |

### 6.4.2 Brine circulation pump

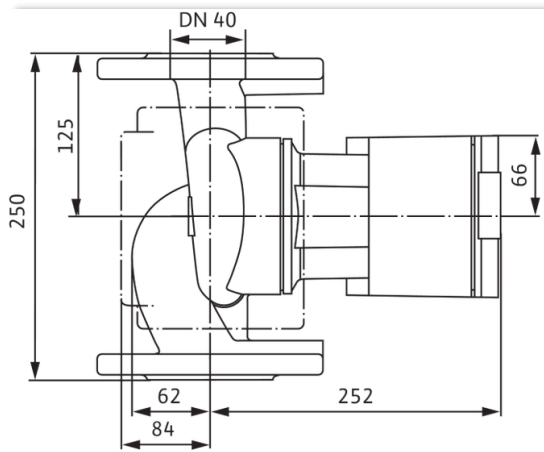
| Appliance    | Type                    | Spare part no. |
|--------------|-------------------------|----------------|
| Version A, B | Wilo Stratos 40/1-12 DA | 334437         |
| Version C, D | Wilo Stratos 40/1-16 DA | 334471         |

Version A, B

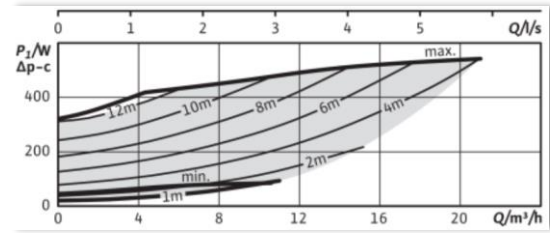
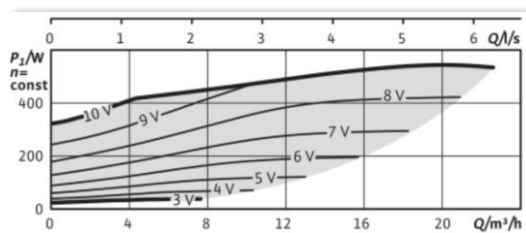
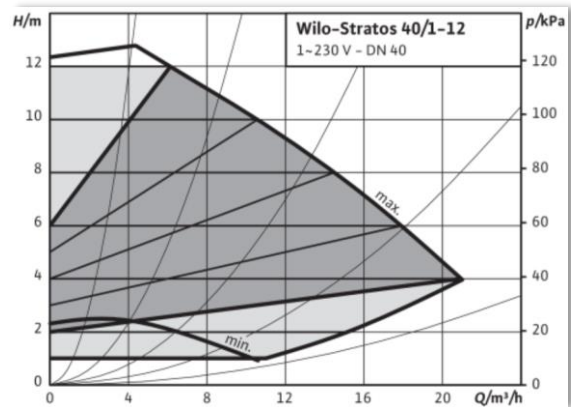
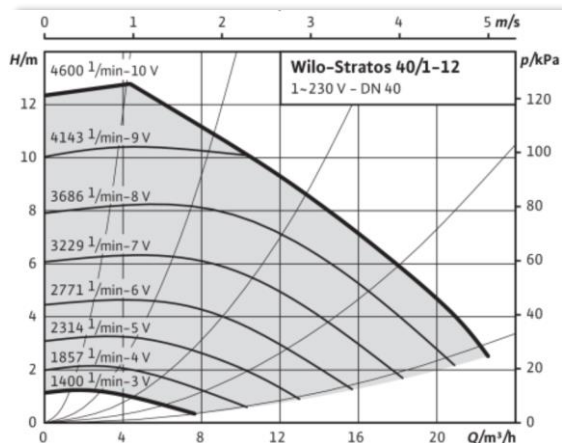


## Repair instructions

### WPE-I xx H 400 Premium



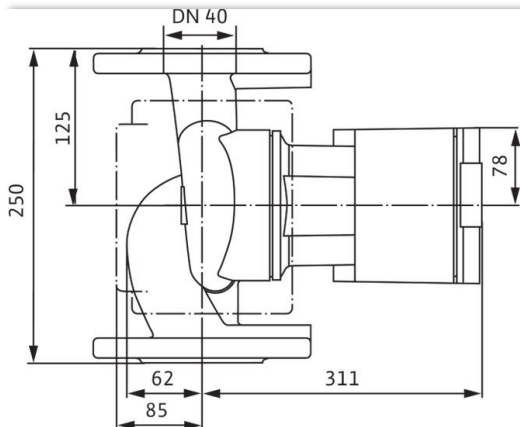
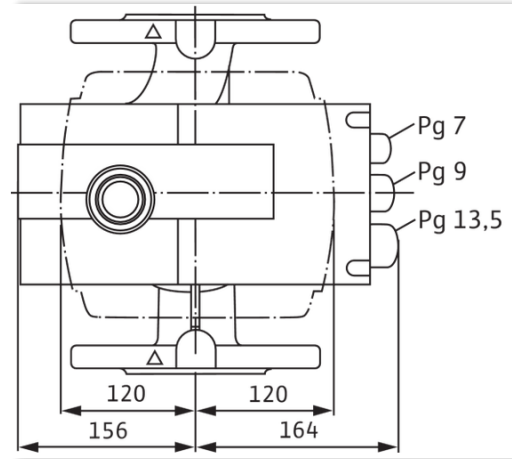
| Parameter               | Specification          |
|-------------------------|------------------------|
| Max. pump rate          | 22.6 m <sup>3</sup> /h |
| Max. head               | 12 m                   |
| Energy efficiency index | 0.2                    |
| Max. operating pressure | 16 bar                 |
| Ambient temperature     | -10 °C to +40 °C       |
| Media temperature       | -10 °C to +110 °C      |
| Power consumption       | 25 W – 550 W           |
| Power consumption       | 0.2 A – 2.4 A          |
| Speed                   | 1400 – 4600 rpm        |
| Weight                  | 14 kg                  |



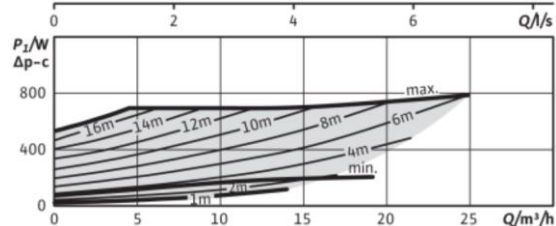
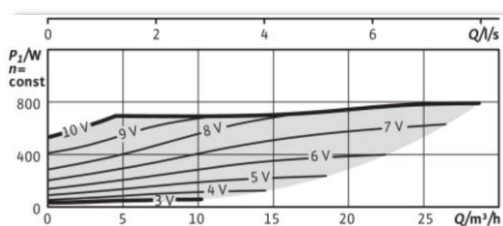
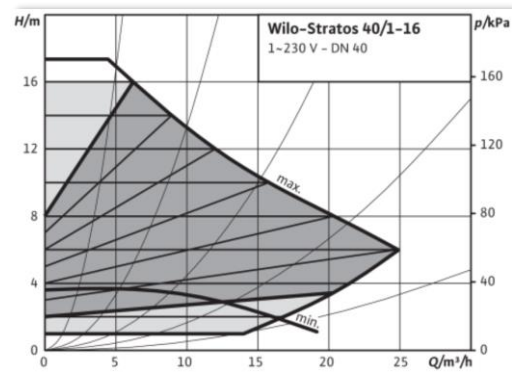
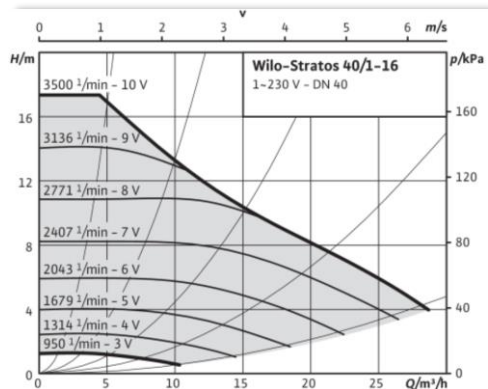
## Repair instructions

### WPE-I xx H 400 Premium

Version C, D



| Parameter               | Specification          |
|-------------------------|------------------------|
| Max. pump rate          | 28.7 m <sup>3</sup> /h |
| Max. head               | 16 m                   |
| Energy efficiency index | 0.2                    |
| Max. operating pressure | 10 bar                 |
| Ambient temperature     | -10 °C to +40 °C       |
| Media temperature       | -10 °C to +110 °C      |
| Power consumption       | 35 W – 800 W           |
| Power consumption       | 0.3 A – 3.5 A          |
| Speed                   | 950 – 3500 rpm         |
| Weight                  | 24 kg                  |



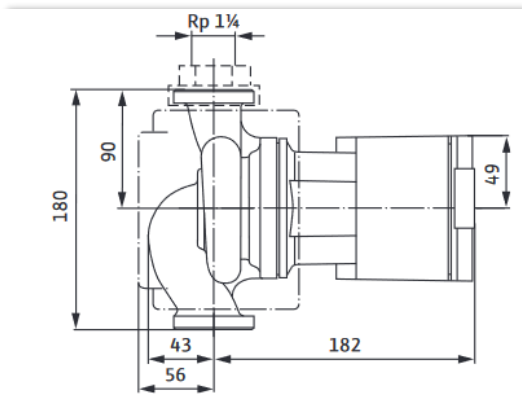
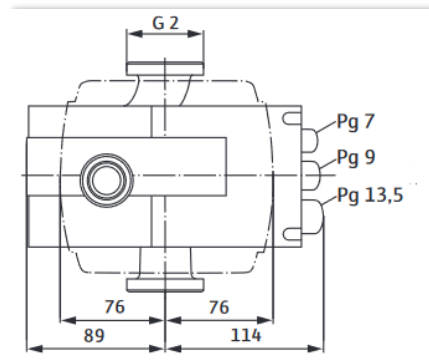
## Repair instructions

### WPE-I xx H 400 Premium

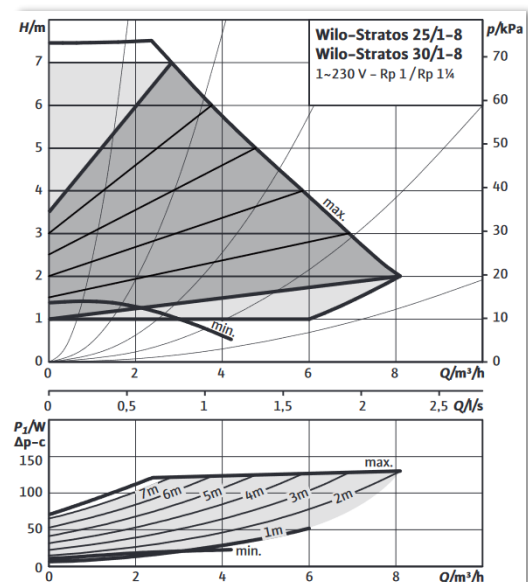
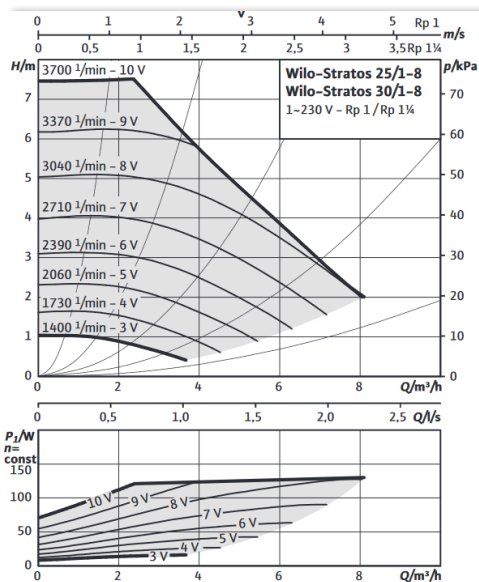
#### 6.4.3 Buffer/DHW charging pump

| Appliance    | Type                  | Spare part no. |
|--------------|-----------------------|----------------|
| Version A, B | Wilo Para 30/1 - 8 T1 | 334436         |
| Version C, D | Wilo Para 30/1 -12 T1 | 334435         |

Version A, B



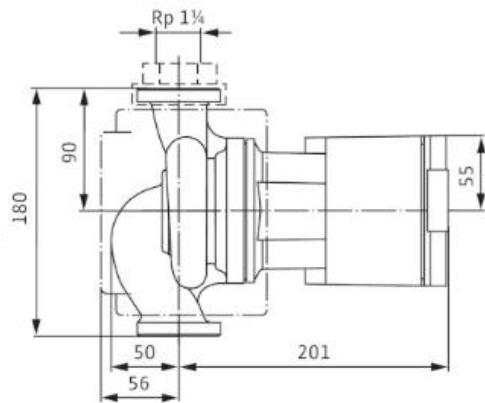
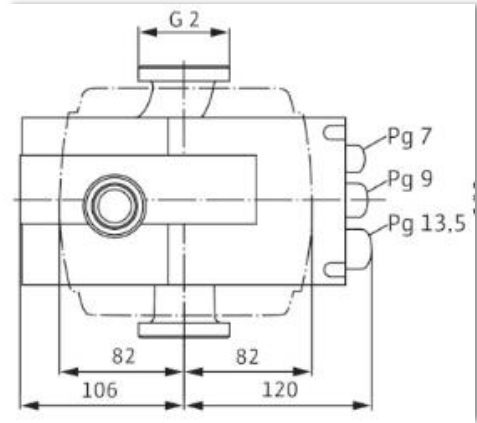
| Parameter               | Specification     |
|-------------------------|-------------------|
| Max. pump rate          | 8 m³/h            |
| Max. head               | 7 m               |
| Energy efficiency index | ≤0.23             |
| Max. operating pressure | 16 bar            |
| Ambient temperature     | -10 °C to +40 °C  |
| Media temperature       | -10 °C to +110 °C |
| Power consumption       | 9 W – 130 W       |
| Power consumption       | 0.13 A – 1.2 A    |
| Speed                   | 1400 – 3700 rpm   |
| Weight                  | 4 kg              |



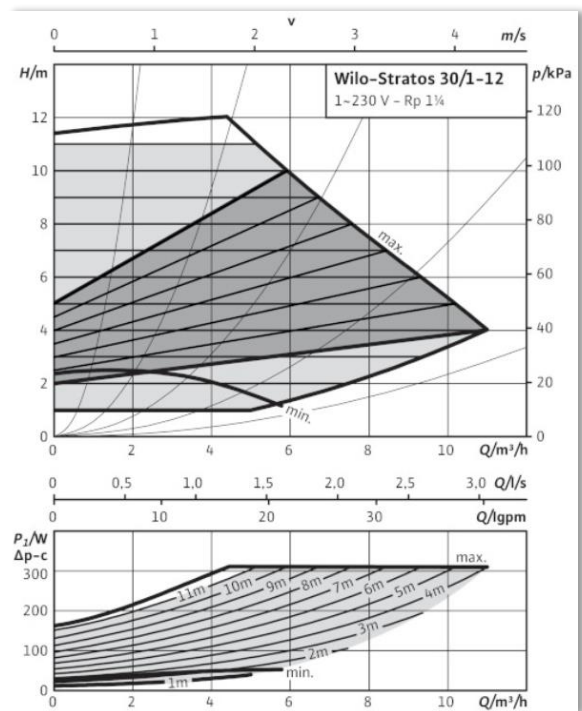
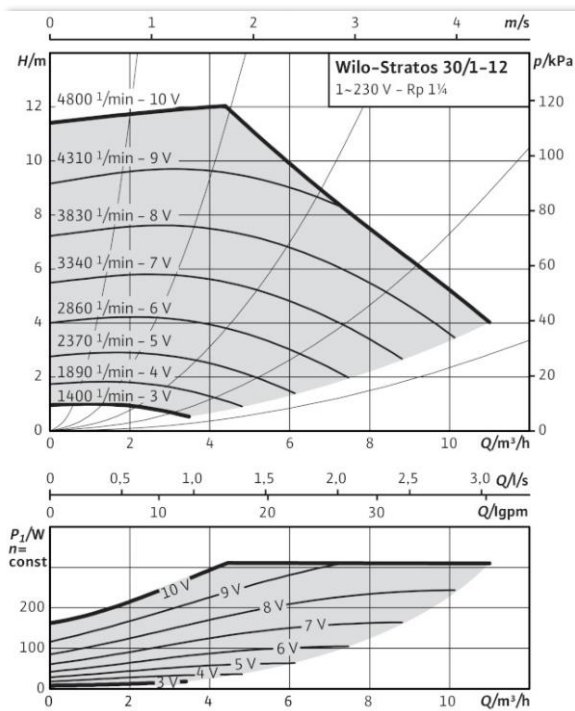
## Repair instructions

### WPE-I xx H 400 Premium

Version C, D



| Parameter               | Specification     |
|-------------------------|-------------------|
| Max. pump rate          | 8 m³/h            |
| Max. head               | 7 m               |
| Energy efficiency index | ≤0.23             |
| Max. operating pressure | 10 bar            |
| Ambient temperature     | -10 °C to +40 °C  |
| Media temperature       | -10 °C to +110 °C |
| Power consumption       | 12 W – 310 W      |
| Power consumption       | 0.22 A – 1.37 A   |
| Speed                   | 1400 – 4800 rpm   |
| Weight                  | 5.5 kg            |



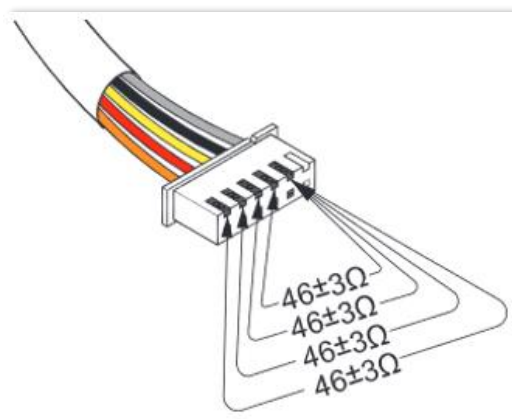
## Repair instructions

### WPE-I xx H 400 Premium

#### 6.4.4 Expansion valve

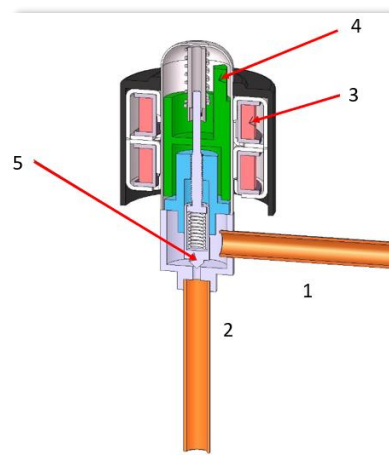
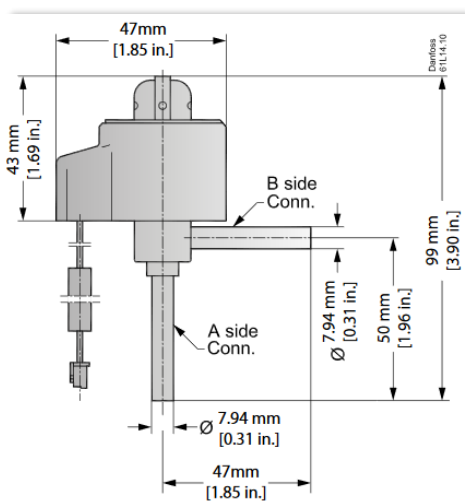
| Appliance    | Type                               | Spare part no. |
|--------------|------------------------------------|----------------|
| Version A, B | Danfoss ETS 6-32                   | 201484         |
|              | Drive for ETS 6                    | 201504         |
| Version C, D | Danfoss ETS 12.5                   | 201481         |
|              | Molex connector (connecting cable) | 339627         |

Version A, B



| Designation                | Data     |
|----------------------------|----------|
| Expansion valve ETS 6-32   | 034G5055 |
| Solder terminals           | 5/16"    |
| Maximum operating pressure | 47 bar   |

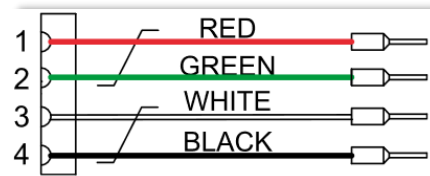
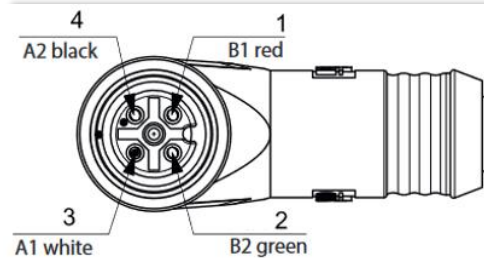
| Designation           | Data     |
|-----------------------|----------|
| Expansion valve drive | 034G5140 |
| Voltage               | 12 V DC  |
| Output                | 3 W      |
| Service magnet        | 034G5199 |
| Service drive         | 034G0013 |



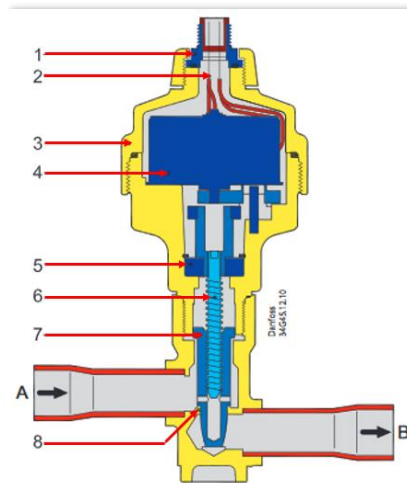
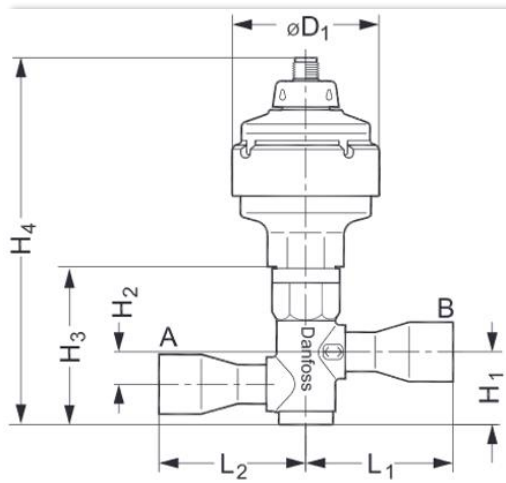
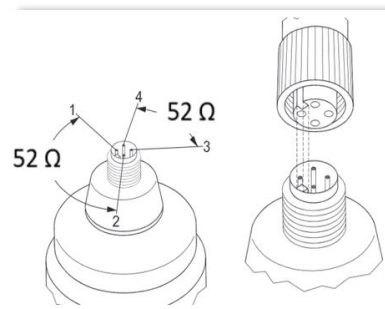
| Position | Designation | Position | Designation      |
|----------|-------------|----------|------------------|
| 1        | Inlet       | 4        | Permanent magnet |
| 2        | Outlet      | 5        | Valve needle     |
| 3        | Winding     |          |                  |

## Repair instructions WPE-I xx H 400 Premium

Version C, D



| Designation                | Data     |
|----------------------------|----------|
| Expansion valve ETS 12.5   | 034G4210 |
| Solder terminals           | 12 mm    |
| Maximum operating pressure | 45.5 bar |



| Position | Data   | Position | Data   |
|----------|--------|----------|--------|
| H1       | 30 mm  | L1       | 60 mm  |
| H2       | 13 mm  | L2       | 60 mm  |
| H3       | 64 mm  | ØD1      | 60 mm  |
| H4       | 150 mm | Weight   | 0.7 kg |

| Position | Data           | Position | Data                  |
|----------|----------------|----------|-----------------------|
| 1        | M12 connection | 6        | Spindle               |
| 2        | Glass gasket   | 7        | Tapered and guide nut |
| 3        | Drive casing   | 8        | Valve seat            |
| 4        | Stepper motor  | A        | Inlet                 |
| 5        | Storage area   | B        | Outlet                |

## Repair instructions

### WPE-I xx H 400 Premium

#### 6.4.5 Pressure sensors

| Appliance                           | Type                            | Spare part no. |
|-------------------------------------|---------------------------------|----------------|
| Version A, B, C, D<br>High pressure | Huba Control<br>520.933S075LONW | 338833         |
| Version A, B, C, D<br>Low pressure  | Huba Control<br>520.931S075LONW | 338835         |

High pressure transducer



10 – 46 bar

Low pressure transducer



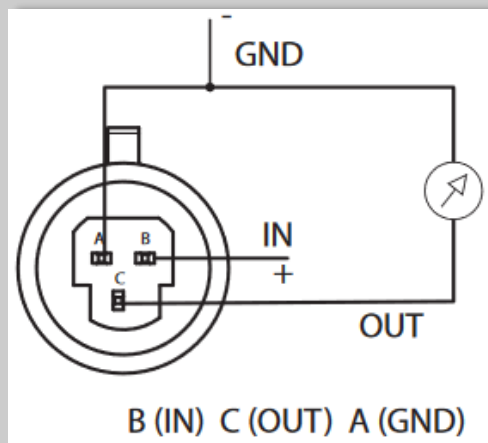
1.5 – 14 bar

Overpressure

Supply voltage 5 V DC  $\pm 10\%$  (In)

Output 0 – 5 V (10 – 90 % ratio / 0.5 V – 4.5 V)

Electrical connection Metri Pack 150 P2S Series



## Repair instructions

### WPE-I xx H 400 Premium

#### 6.4.6 Temperature sensors

All sensors used by the BM module or EM module are PT 1000 sensors.

| Temperature in °C | PT 1000 sensor resistance in $\Omega$ |
|-------------------|---------------------------------------|
| -30               | 843                                   |
| -20               | 922                                   |
| -10               | 961                                   |
| 0                 | 1000                                  |
| 10                | 1039                                  |
| 20                | 1078                                  |
| 25                | 1097                                  |
| 30                | 1117                                  |
| 40                | 1155                                  |
| 50                | 1194                                  |
| 60                | 1232                                  |
| 70                | 1271                                  |
| 80                | 1309                                  |
| 90                | 1347                                  |
| 100               | 1385                                  |
| 110               | 1423                                  |
| 120               | 1461                                  |

| Name and number                                                        | Function                                                                                                                                                                                                                             |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System supply line<br>Flow sensor in the hydraulics<br>Y602   T33   51 | Calculation of heat demand.<br>Alarm if system temperatures too low or too high.                                                                                                                                                     |
| Condenser out<br>Condenser outlet in heat pump<br>Y607   4 9   431     | Calculation of heat demand.<br>Calculation of the expansion valve control.<br>Alarm if system temperatures too low or too high.<br>Calculation of the supercooling.                                                                  |
| Condenser in<br>Condenser inlet in heat pump                           | Calculation of heat demand.<br>Calculation of the expansion valve control.<br>Switch-on of hot gas extraction system under certain operating conditions.<br>Alarm if system return temperatures are too high.                        |
| Brine in<br>Source inlet<br>Y607   1 6   413                           | Calculation of the expansion valve control.<br>Source temperature monitoring. Source protection function.<br>Alarm if source temperature differential is too high.<br>Reference temperature in active cooling for source changeover. |
| Brine out<br>Source outlet<br>Y607   2 7   412                         | Calculation of the expansion valve control.<br>Source temperature monitoring. Source protection function.<br>Alarm if source temperature differential is too high.<br>Compressor speed calculation in active cooling mode.           |
| Suction gas line<br>Evaporator outlet<br>Y607   3 8   421              | Calculation of superheating.<br>Calculation of the expansion valve control.                                                                                                                                                          |
| Discharge pipe<br>Hot gas sensor<br>Y607   5 10   416                  | Hot gas extraction start, stop and control.<br>Alarm if the hot gas temperature is too high.<br>Calculation of the expansion valve control.<br>If the hot gas temperature is too high, superheating is reduced.                      |
| Outdoor sensor<br>Outside temperature sensor<br>Y604   T35   50        | Set temperature calculation in heating mode.<br>Changeover summer (cooling mode)/winter operation (heating mode).<br>If there is no sensor, a substitute value of 0 °C is used.                                                      |
| Buffer tank                                                            | Calculation of heat demand in the buffer cylinder.                                                                                                                                                                                   |

## Repair instructions

### WPE-I xx H 400 Premium

| Name and number                                                            | Function                                                                                                                                                          |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Buffer sensor<br>Y602   T31   136                                          |                                                                                                                                                                   |
| Distribution circuit 1<br>Heating circuit with mixer 1<br>Y602   T32   108 | Control of heating circuit with mixer 1.                                                                                                                          |
| Hot water<br>DHW sensor (bottom)<br>Y605   T37   53                        | If only this DHW sensor is connected, heating is carried out without calculation of the DHW according to this sensor.                                             |
| Hot water<br>DHW sensor (top)<br>Y605   T36   55                           | If this sensor is used in addition to the bottom DHW sensor, the two sensors are used for interpolation. The weighting between these two sensors can be adjusted. |

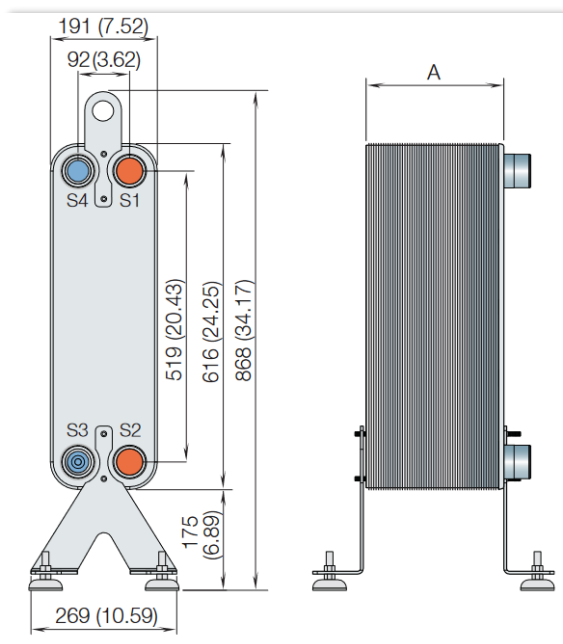
## 6.5 Mechanical and hydraulic assemblies

### 6.5.1 Evaporator

Evaporators are available on request from the spare parts store. Low demand means that evaporators are only requested once an order has been received.

| Version | Spare part no. |
|---------|----------------|
| A       | 204430         |
| B       | 204433         |
| C       | 204436         |
| D       | 204439         |

#### Evaporator



mm (inches)

| Designation         | Data                |
|---------------------|---------------------|
| Plates, connections | Stainless steel     |
| Solder              | Copper              |
| Number of plates    | n                   |
| Dimension A in mm   | $16 + (2.07 * n)$   |
| Weight in kg        | $4.82 + (0.35 * n)$ |
| Max. particle size  | 1 mm                |

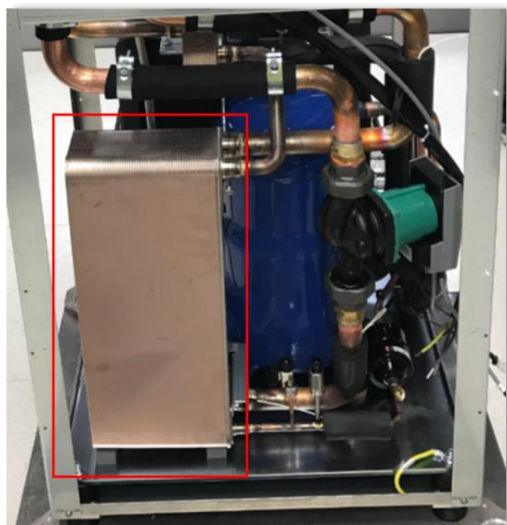
Version C uses an Alfa Laval heat exchanger with the designation AC112-70 AMDS-G with a number of plates of  $n=70$ . The connections for evaporators of all versions are the same. They only differ based on the number of plates.

## Repair instructions

### WPE-I xx H 400 Premium

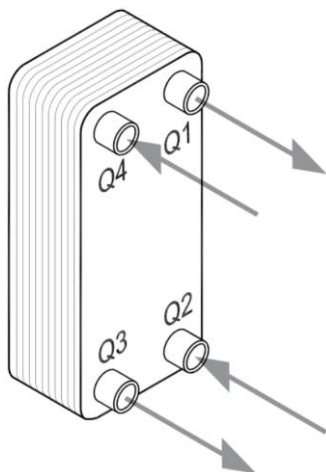
#### 6.5.2 Condenser

| Version | Type                | Spare part no. |
|---------|---------------------|----------------|
| A       |                     | 204428         |
| B       | Danfoss H62L cx 140 | 204431         |
| C       | Danfoss H116L c 104 | 204434         |
| D       |                     | 204437         |



##### Danfoss H62L cx 140

| Designation             | Specification            |
|-------------------------|--------------------------|
| Weight                  | 19.5 Kg                  |
| Solder material         | Copper                   |
| Danfoss designation     | 021H0200                 |
| Temperature min./max.   | -196 °C/+200 °C          |
| Max. operating pressure | 48 bar                   |
| Number of plates        | 120                      |
| Connections             |                          |
| Q1                      | 1 3/8" solder connection |
| Q2                      | 1 3/8" solder connection |
| Q3                      | 1/2" solder connection   |
| Q4                      | 5/8" solder connection   |



##### Danfoss H116L c 104

| Designation             | Specification            |
|-------------------------|--------------------------|
| Weight                  | 26.38 Kg                 |
| Solder material         | Copper                   |
| Danfoss designation     | 021H9266                 |
| Temperature min./max.   | -196 °C/+200 °C          |
| Max. operating pressure | 48 bar                   |
| Number of plates        | 140                      |
| Connections             |                          |
| Q1                      | 1 3/8" solder connection |
| Q2                      | 1 3/8" solder connection |
| Q3                      | 1/2" solder connection   |
| Q4                      | 5/8" solder connection   |

## Repair instructions

### WPE-I xx H 400 Premium

#### 6.5.3 Hot gas heat exchanger

| Version | Type             | Spare part no. |
|---------|------------------|----------------|
| A       |                  | 204429         |
| B       | Danfoss H30L-c46 | 204432         |
| C       | Danfoss H30L-c56 | 204435         |
| D       |                  | 204438         |

|                   |                           |                                     |                        |
|-------------------|---------------------------|-------------------------------------|------------------------|
| H30L-c46          |                           |                                     |                        |
| Temperature range | -196 °C to +200 °C        | Max. permissible operating pressure | 48 bar                 |
| Plate material    | Stainless steel AISI 316L | Weight                              | 5.6 kg                 |
| Solder material   | Copper                    | Number of plates                    | 46                     |
| H1                | R1 ½"                     | Q1                                  | 7/8" solder connection |
| H3                | 28.2 mm solder connection | Q2                                  | 7/8" solder connection |
| H4                | 28.2 mm solder connection | Danfoss designation                 | 021H4102               |

|                   |                           |                                     |                        |
|-------------------|---------------------------|-------------------------------------|------------------------|
| H30L-c56          |                           |                                     |                        |
| Temperature range | -196 °C to +200 °C        | Max. permissible operating pressure | 45 bar                 |
| Plate material    | Stainless steel AISI 316L | Weight                              | 4.98 kg                |
| Solder material   | Copper                    | Number of plates                    | 56                     |
| H1                | R1 ½"                     | Q1                                  | 7/8" solder connection |
| H3                | 28.2 mm solder connection | Q2                                  | 7/8" solder connection |
| H4                | 28.2 mm solder connection | Danfoss designation                 |                        |

#### 6.5.4 Filter dryer

| Version | Type                      | Spare part no. |
|---------|---------------------------|----------------|
| A, B    | Danfoss DML 164S 023Z4830 | 201476         |
| C, D    | Danfoss DML 305S 023Z4833 | 201477         |



|                   |                            |                                     |         |
|-------------------|----------------------------|-------------------------------------|---------|
| DML 164S          |                            |                                     |         |
| Temperature range | -40 °C to +70 °C           | Max. permissible operating pressure | 46 bar  |
| Casing material   | Steel                      | Weight                              | 0.94 kg |
| Connection        | ½"/12 mm solder connection | Casing volume                       | 0.35 l  |

|                   |                              |                                     |         |
|-------------------|------------------------------|-------------------------------------|---------|
| DML 305S          |                              |                                     |         |
| Temperature range | -40 °C to +70 °C             | Max. permissible operating pressure | 46 bar  |
| Casing material   | Steel                        | Weight                              | 1.48 kg |
| Connection        | 5/8"/16 mm solder connection | Casing volume                       | 0.72 l  |

#### 6.5.5 Pipe assemblies

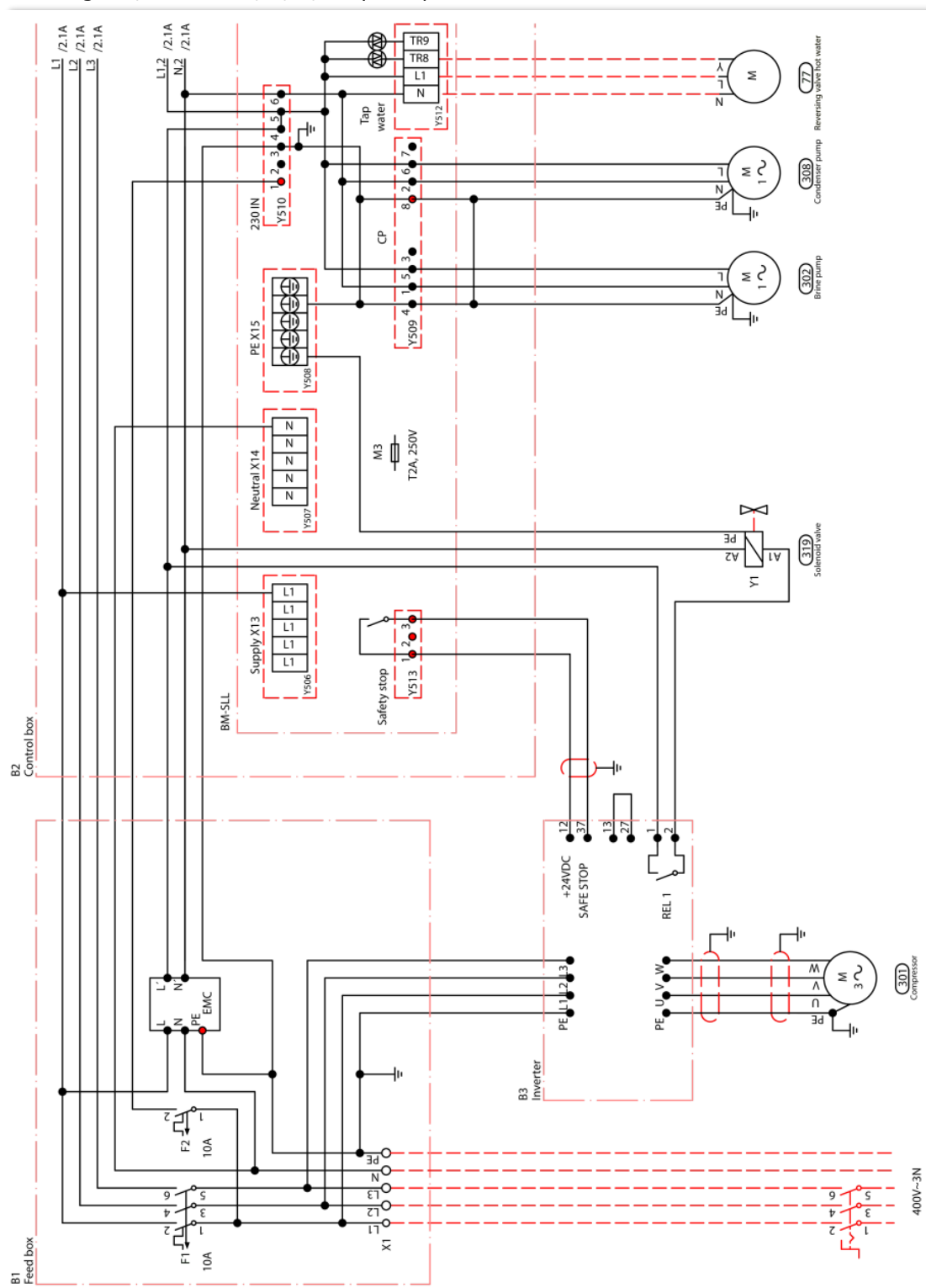
Pipe assemblies are not installed for these appliances.

## Repair instructions

### WPE-I xx H 400 Premium

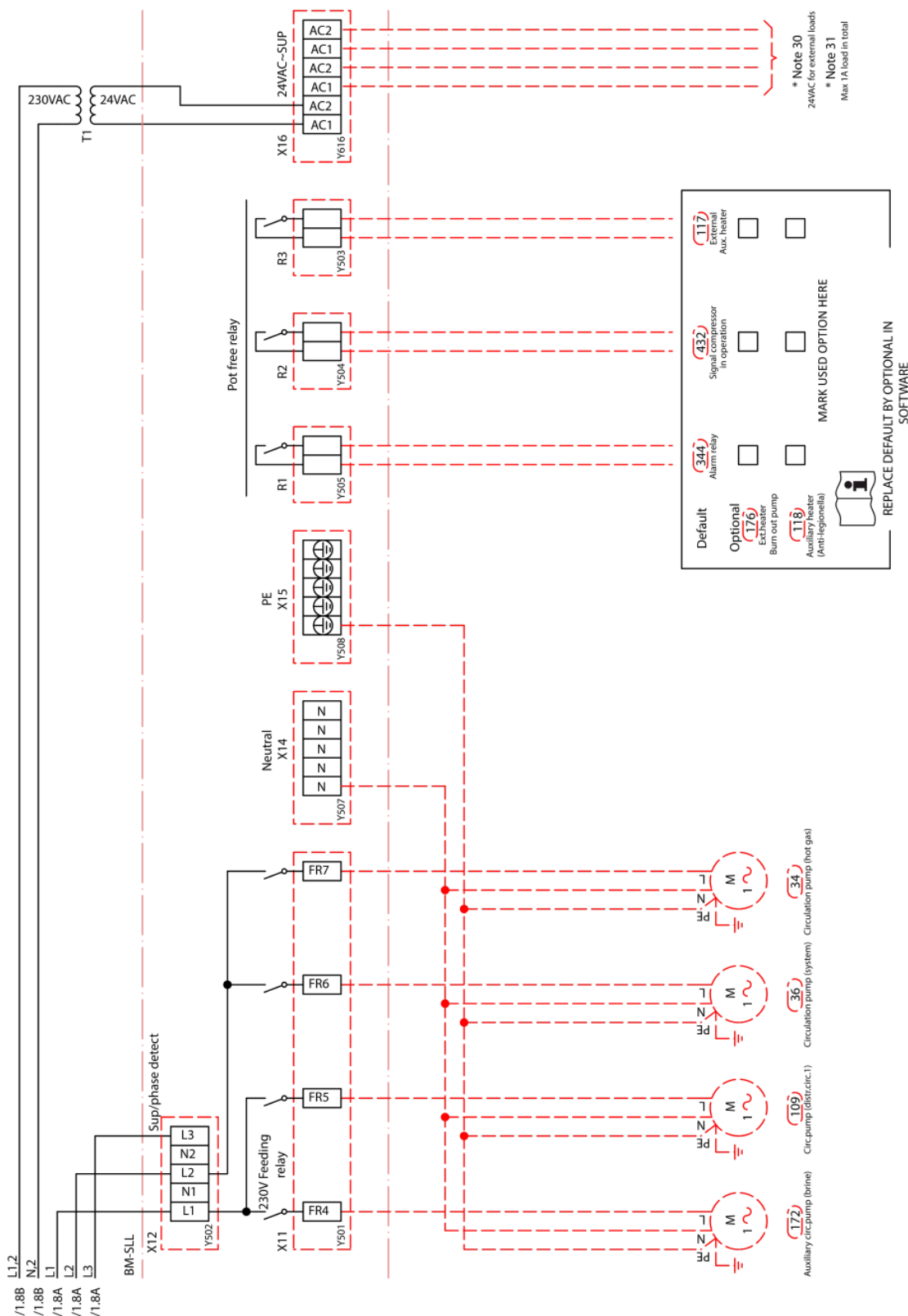
#### 6.6 Wiring diagram

Connection diagram, versions A, B, C, D up to April 2019



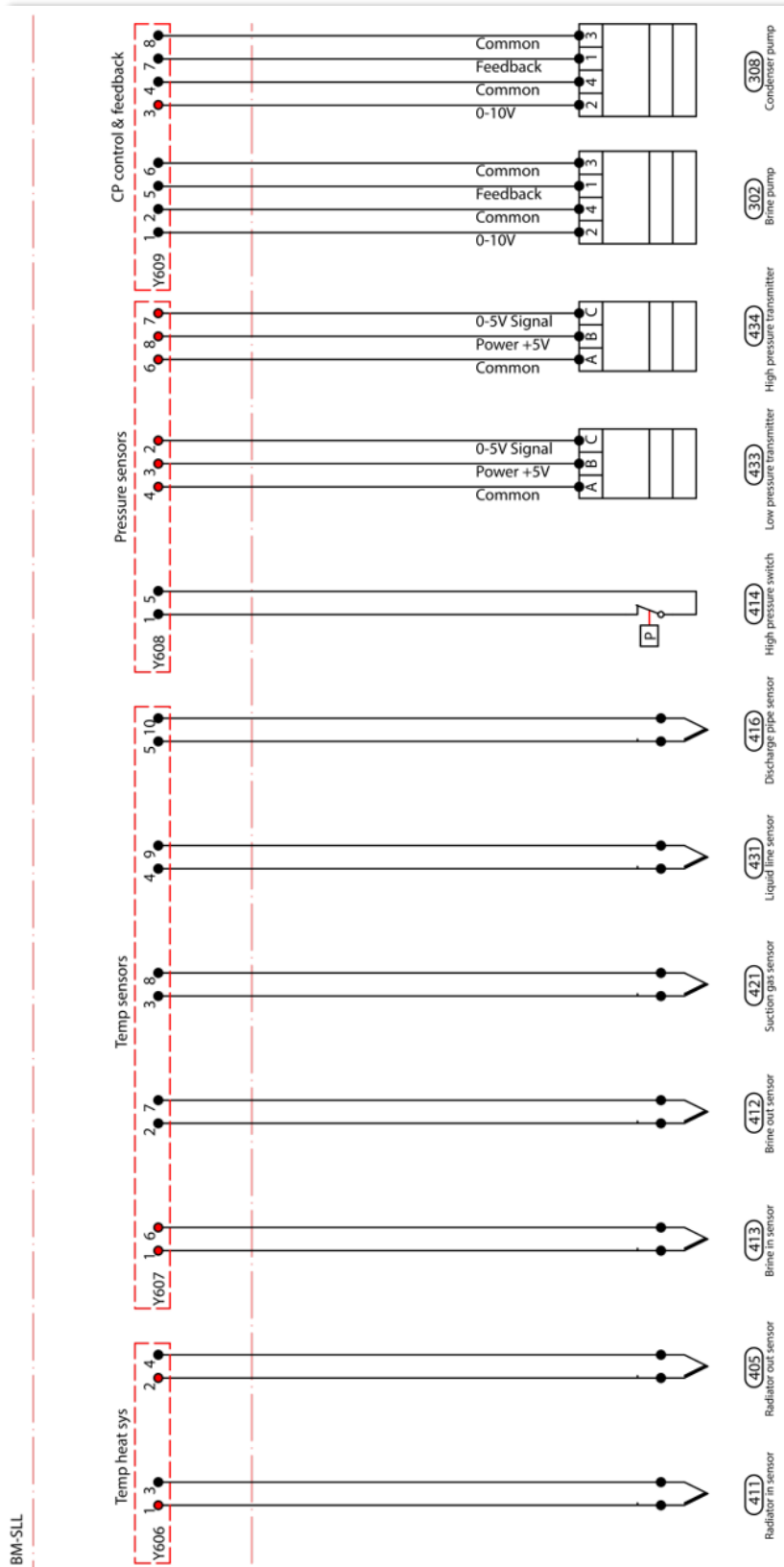
# Repair instructions

## WPE-I xx H 400 Premium



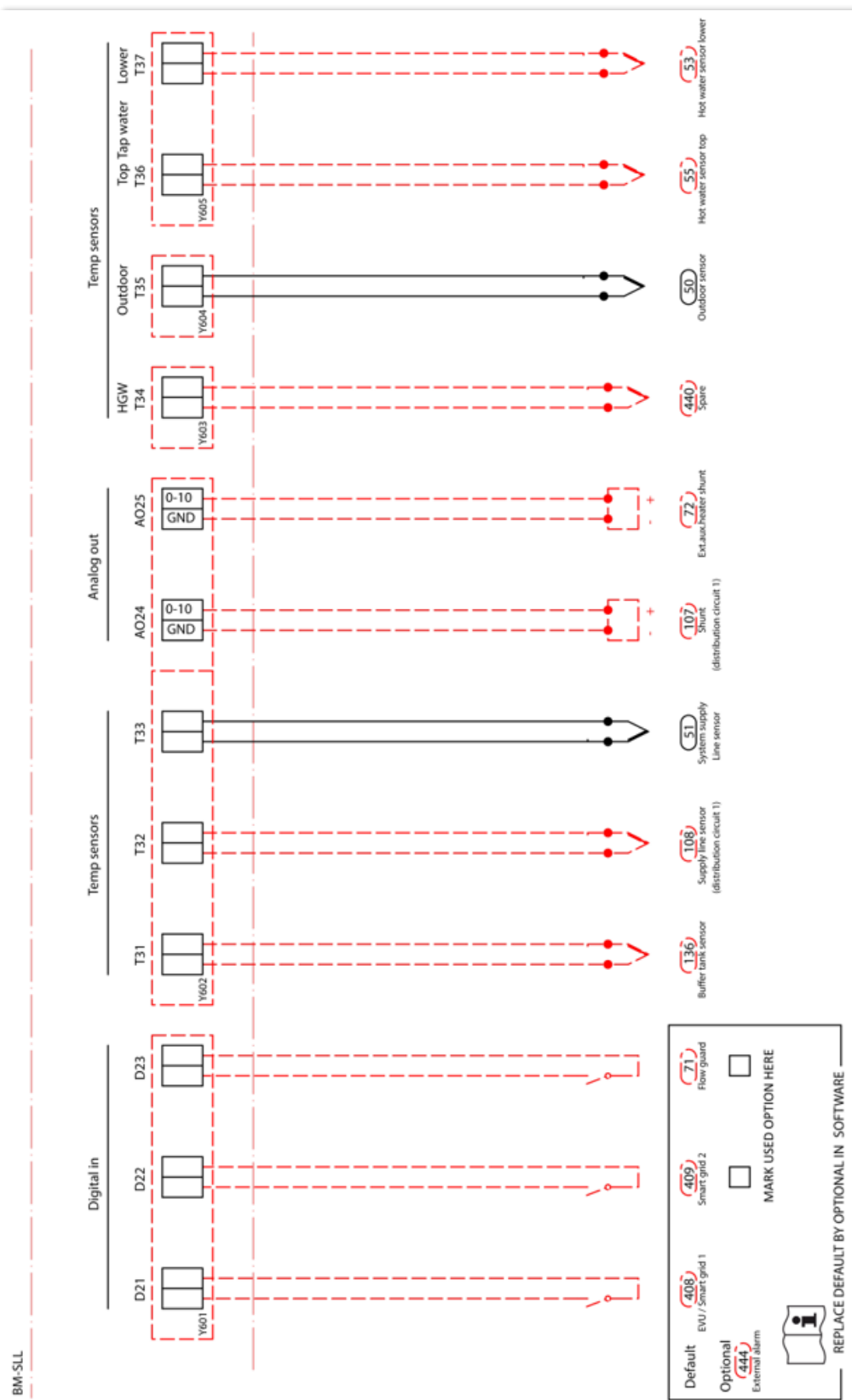
## Repair instructions

### WPE-I xx H 400 Premium



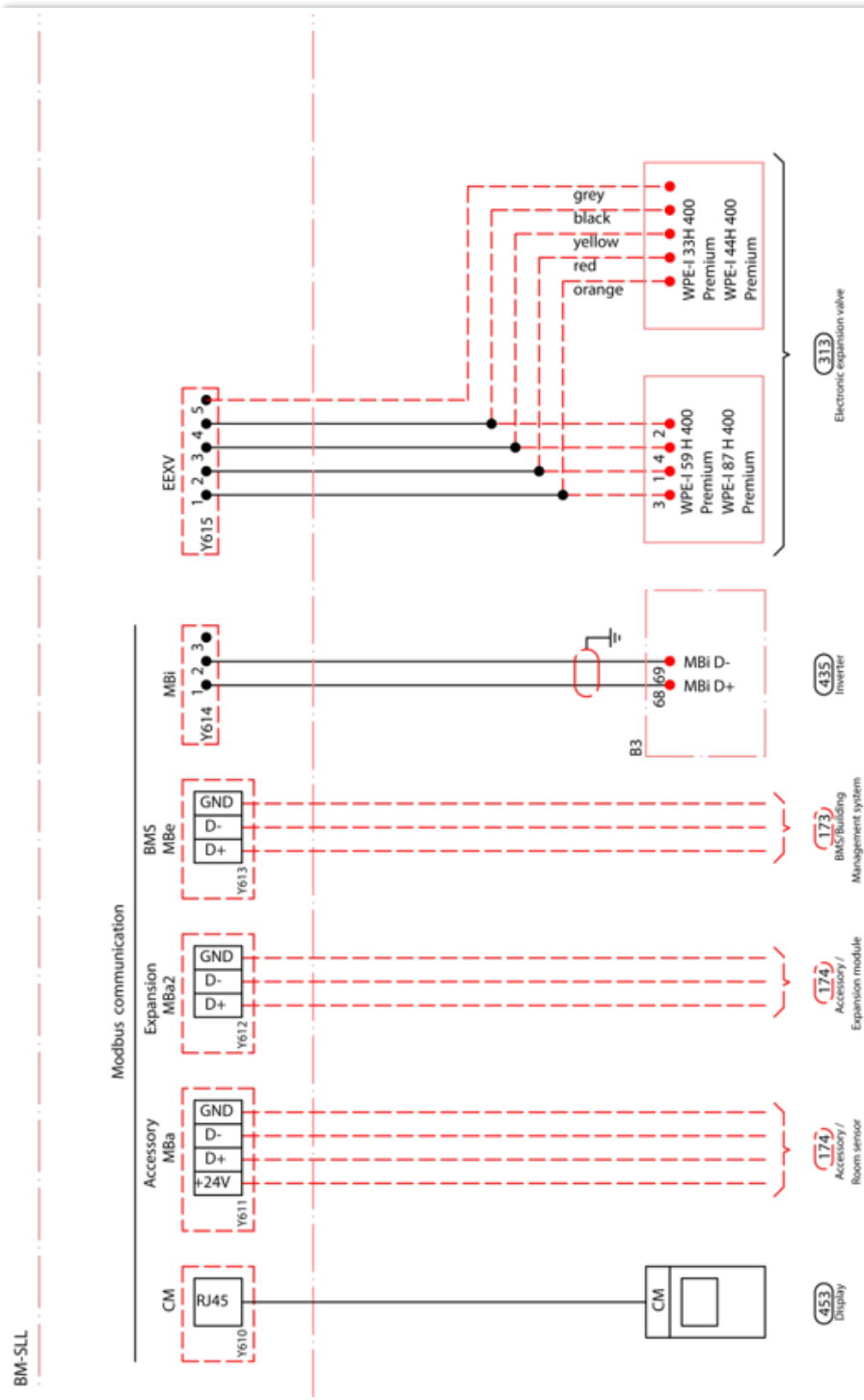
# Repair instructions

## WPE-I xx H 400 Premium



## Repair instructions

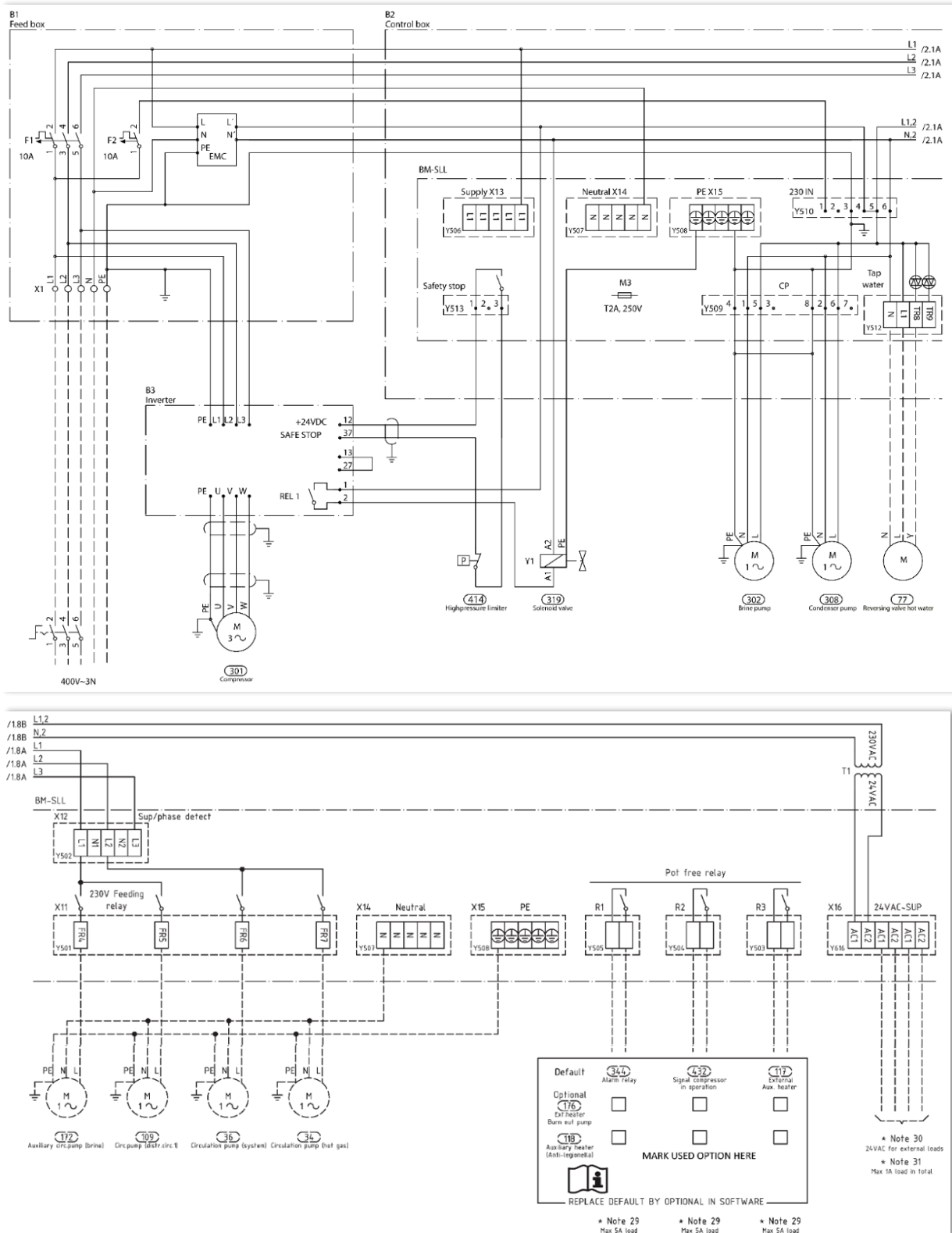
### WPE-I xx H 400 Premium



# Repair instructions

## WPE-I xx H 400 Premium

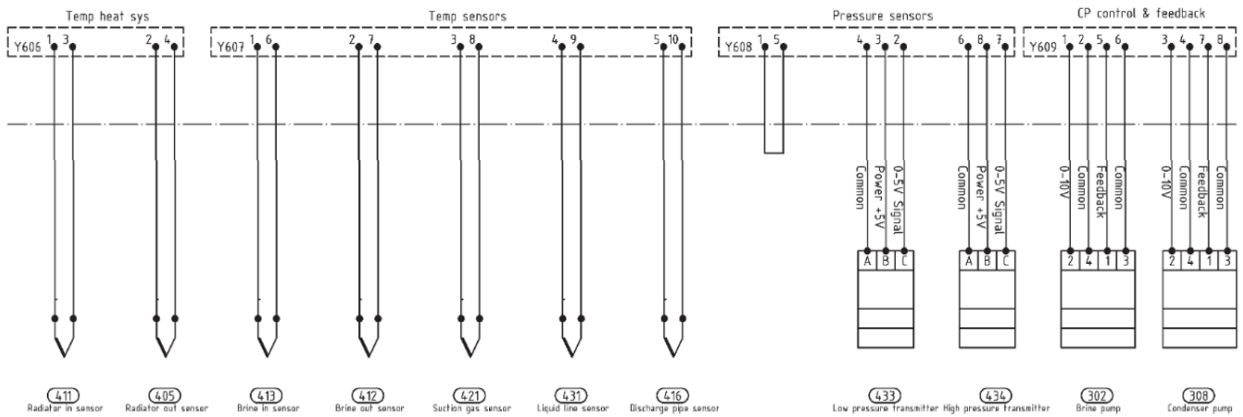
Connection diagram, versions A, B, C, D from May 2019



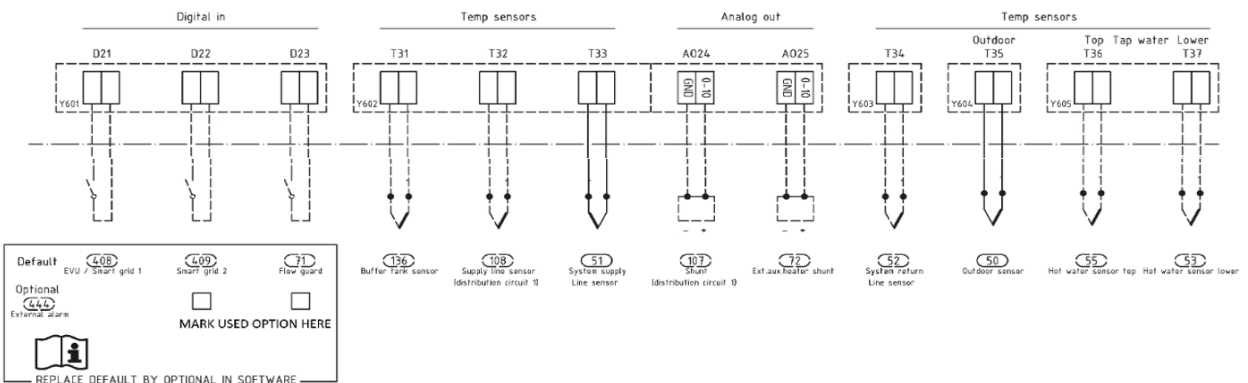
# Repair instructions

## WPE-I xx H 400 Premium

BM-SLL

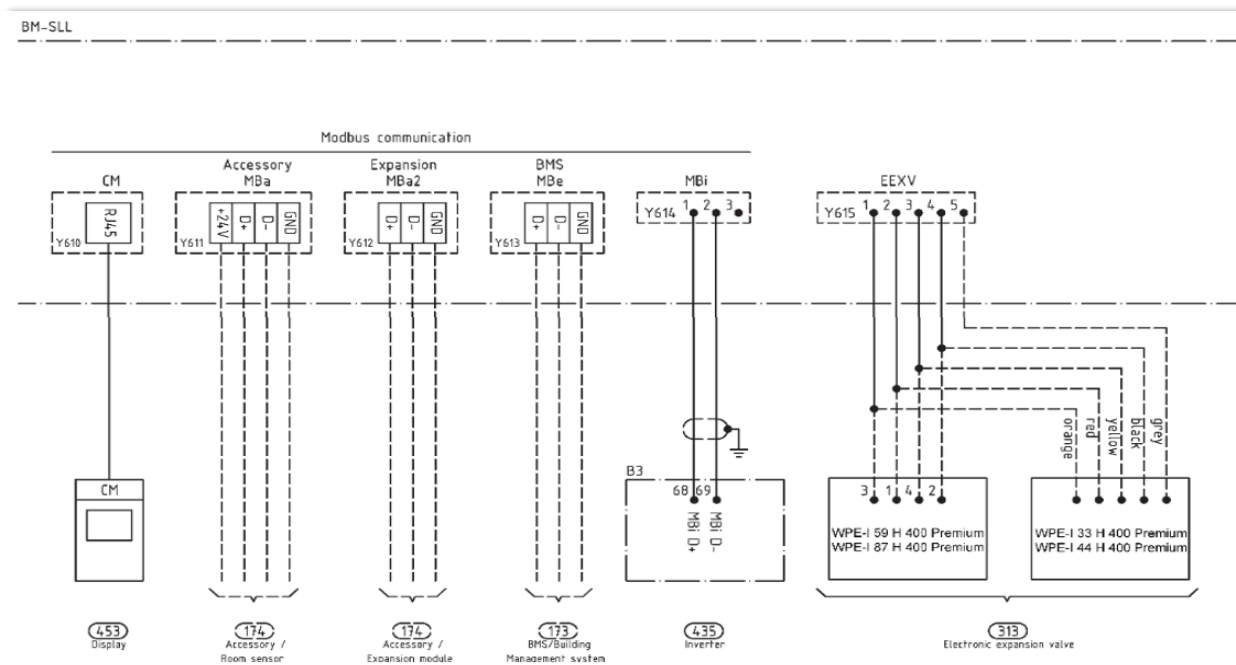


BM-SLL



## Repair instructions

### WPE-I xx H 400 Premium



Key to connection diagram, heat pump versions A, B, C, D

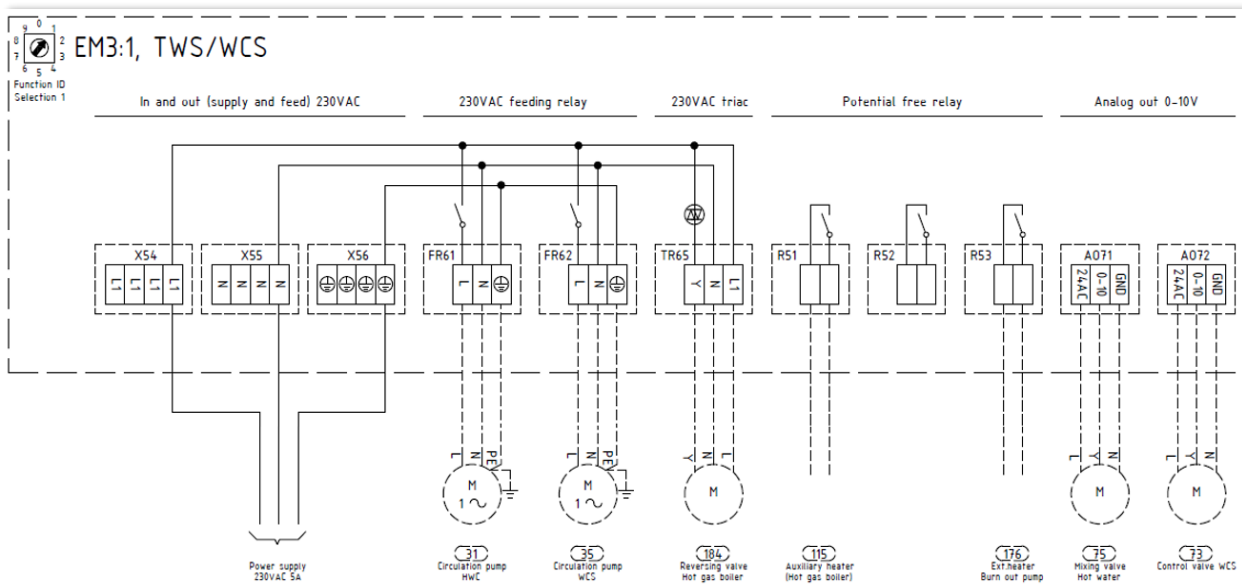
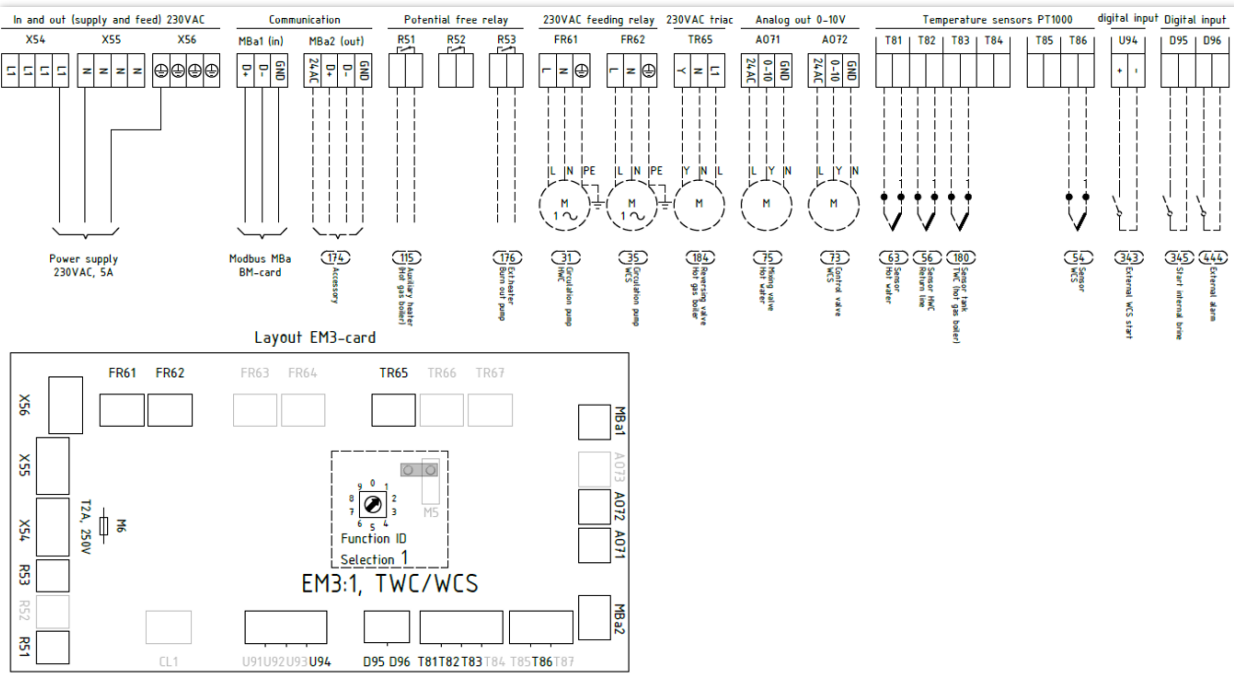
| Number / terminal  | Description                         | Number / terminal | Description                   |
|--------------------|-------------------------------------|-------------------|-------------------------------|
| 34 / FR7 / Y501    | Circulation pump, hot gas           | 319               | Valve, compressor lubrication |
| 36 / FR6 / Y501    | Circulation pump, heating circuit   | 344 / R1 / Y505   | Output, alarm                 |
| 50 / T35 / Y604    | Outside sensor                      | 405 / Y606        | Flow sensor                   |
| 51 / T33 / Y602    | Flow sensor, system                 | 407 / T32 / Y602  | Flow sensor, hot gas          |
| 52 / T34 / Y603    | Return sensor, system               | 408 / D21 / Y601  | PSU / smart grid 1            |
| 53 / T37 / Y605    | DHW sensor, bottom                  | 409 / D22 / Y601  | Smart grid 2                  |
| 55 / T36 / Y605    | DHW sensor, top                     | 411 / Y606        | Return sensor                 |
| 71 / D23 / Y601    | Flow switch (option)                | 412 / Y607        | Sensor, source outlet         |
| 72 / AO25 / Y602   | 2nd heat generator 0-10 V           | 413 / Y607        | Sensor, source inlet          |
| 77 / TR8 / Y512    | Diverter valve, heating/DHW         | 414 / Y513        | High pressure switch          |
| 107 / AO24 / Y602  | Mixing valve, heating circuit 1     | 416 / Y607        | Hot gas sensor                |
| 108 / T32 / Y602   | Flow sensor, heating circuit 1      | 421 / Y607        | Suction gas sensor            |
| 109 / FR5 / Y501   | Circulation pump, heating circuit 1 | 431 / Y607        | Sensor, condenser             |
| 117 / R3 / Y503    | Auxiliary heater HZG                | 432 / R2 / Y504   | Signal compressor running     |
| 118 / R1 / Y505    | Auxiliary heater WW                 | 433 / Y608        | Low pressure sensor           |
| 136 / T31 / Y602   | Buffer cylinder sensor              | 434 / Y608        | High pressure sensor          |
| 172 / FR4 / Y501   | Source pump, external               | 435 / Y614        | Inverter                      |
| 173 / Y613         | Modbus BMS, not used                | 444               | External alarm (option)       |
| 174 / Y612         | Connection, EM card                 | 453 / Y610        | CM module (display)           |
| 175 / Y611         | Connection, FE room controller      | B1                | Control panel, power supply   |
| 176 / (R1, R2, R3) | External heat generator             | B2                | Control panel, BM card        |
| 186 / TR9 / Y512   | Diverter valve, pool                | B3                | Inverter                      |
| 301                | Compressor                          | F1                | 10 A circuit breakers         |
| 302 / Y509         | Pump, source (power supply)         | F2                | 10 A circuit breaker          |
| 308 / Y509         | System pump (power supply)          | EMC               | EMC mains filter              |
| 313                | Electronic expansion valve          | T1                | Transformer 230/24 V AC       |

# Repair instructions

## WPE-I xx H 400 Premium

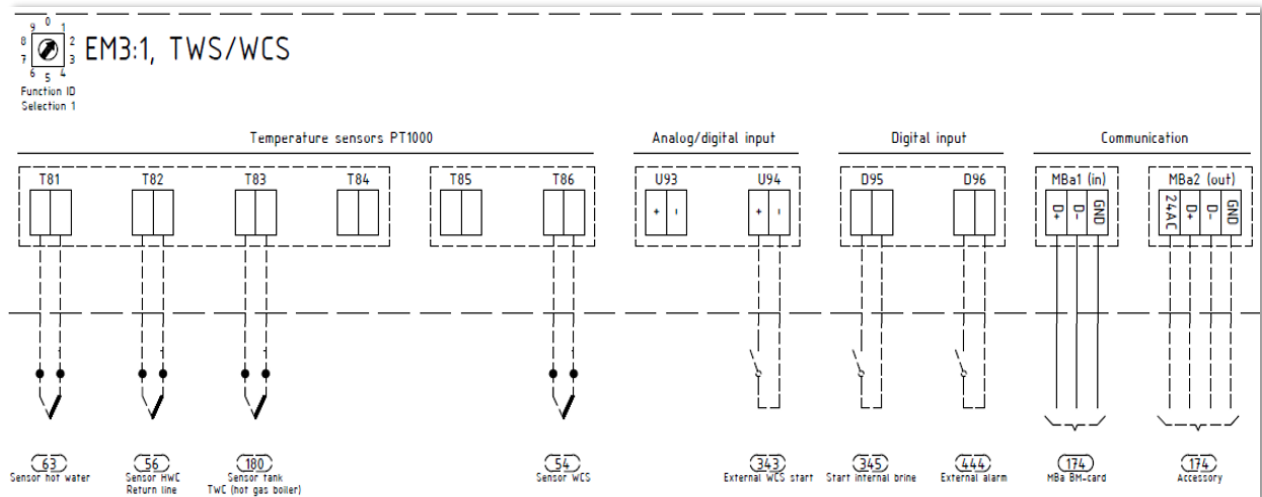
### 6.6.1 Connection diagrams EM

DHW functions, WCS / TWC (TWS)



## Repair instructions

### WPE-I xx H 400 Premium



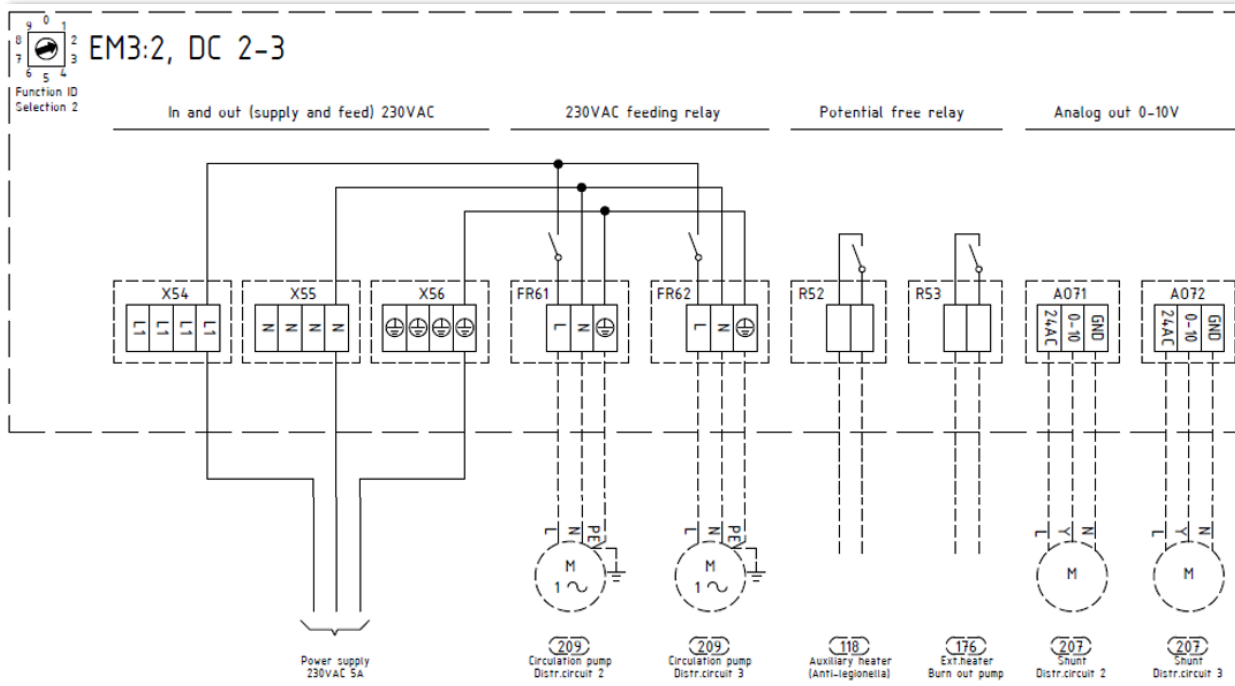
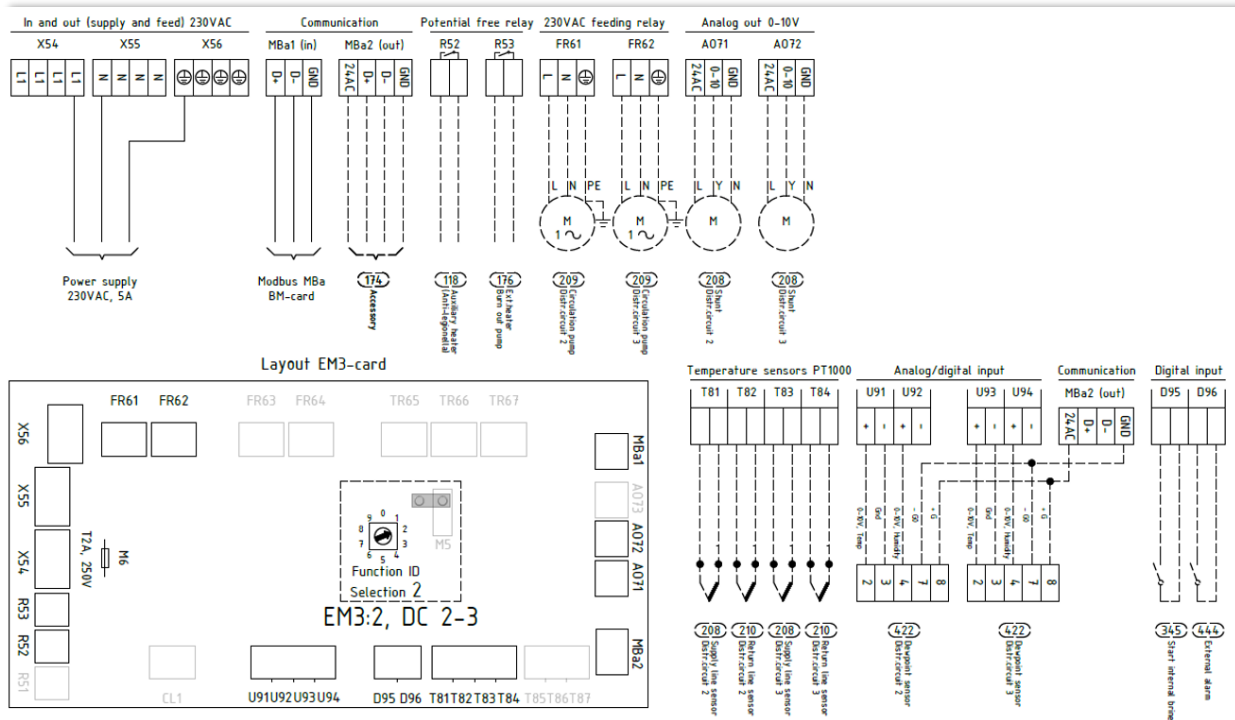
Key, EM card switch position 1, DHW functions

| Number / terminal | Description                          | Number / terminal | Description                           |
|-------------------|--------------------------------------|-------------------|---------------------------------------|
| 31 / FR61         | Pump, DHW circulation                | 180 / T83         | DHW cylinder sensor top               |
| 35 / FR62         | Pump, water charging system          | 184 / TR65        | Diverter valves, hot gas charging     |
| 54 / T86          | Sensor, water charging system return | 343 / U94         | External start, water charging system |
| 56 / T82          | Sensor, DHW circulation return       | 345 / D95         | External start, internal source pump  |
| 63 / T81          | Sensor DHW flow                      | 444 / D96         | External alarm contact                |
| 73 / AO72         | Mixing valve, water charging system  | T84               | Source sensor, inlet, primary         |
| 75 / AO71         | Mixing valve, DHW circulation        | T85               | Source sensor, outlet, primary        |
| 115 / R51         | Auxiliary heater, DHW cylinder       | AO73              | Source pump, primary, variable speed  |
| 174               | Modbus In/Out BM card / accessories  |                   |                                       |
| 176 / R53         | External auxiliary heater            |                   |                                       |

## Repair instructions

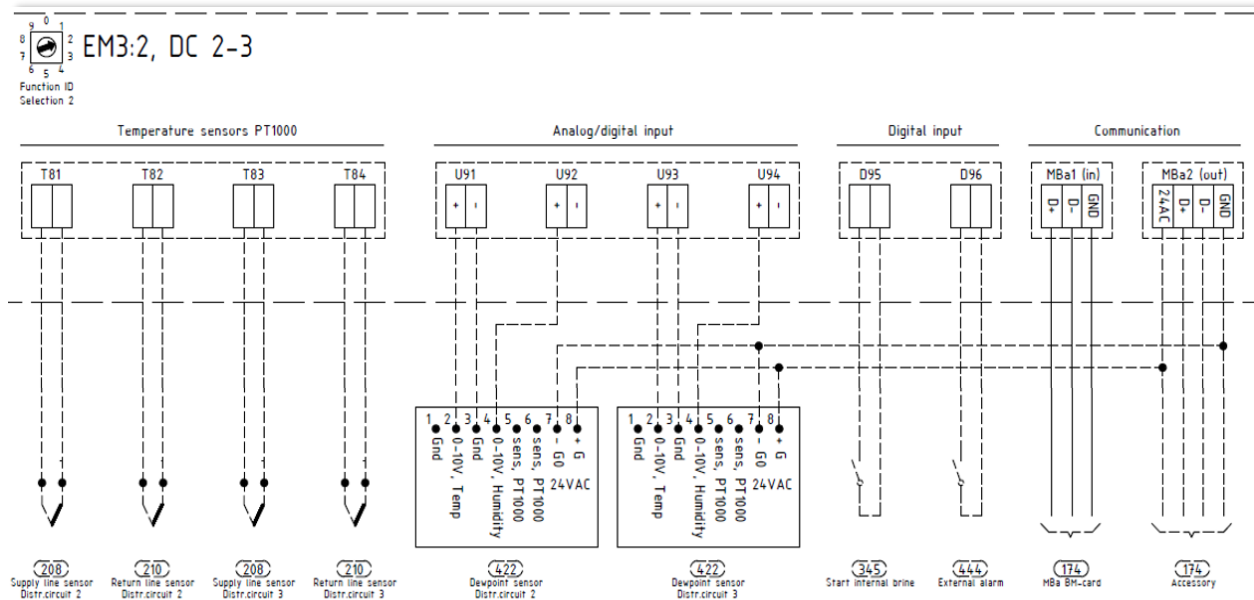
### WPE-I xx H 400 Premium

Heating circuits with mixer 2 and 3, DC 2-3



## Repair instructions

### WPE-I xx H 400 Premium



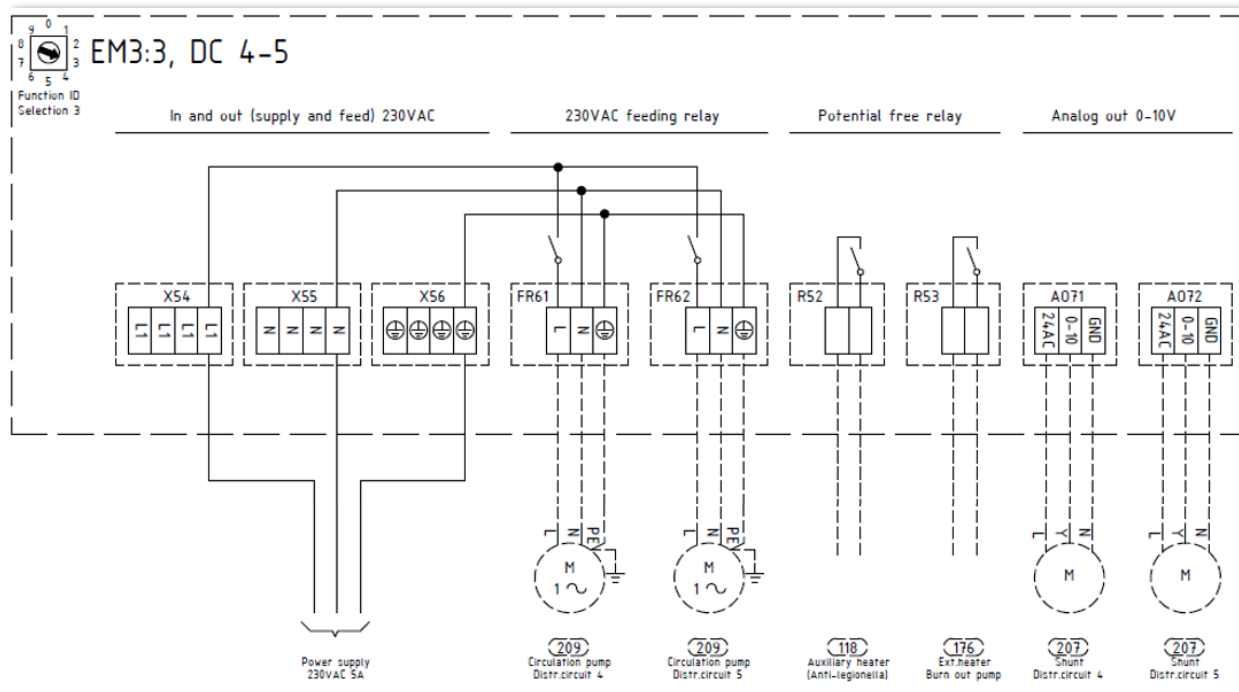
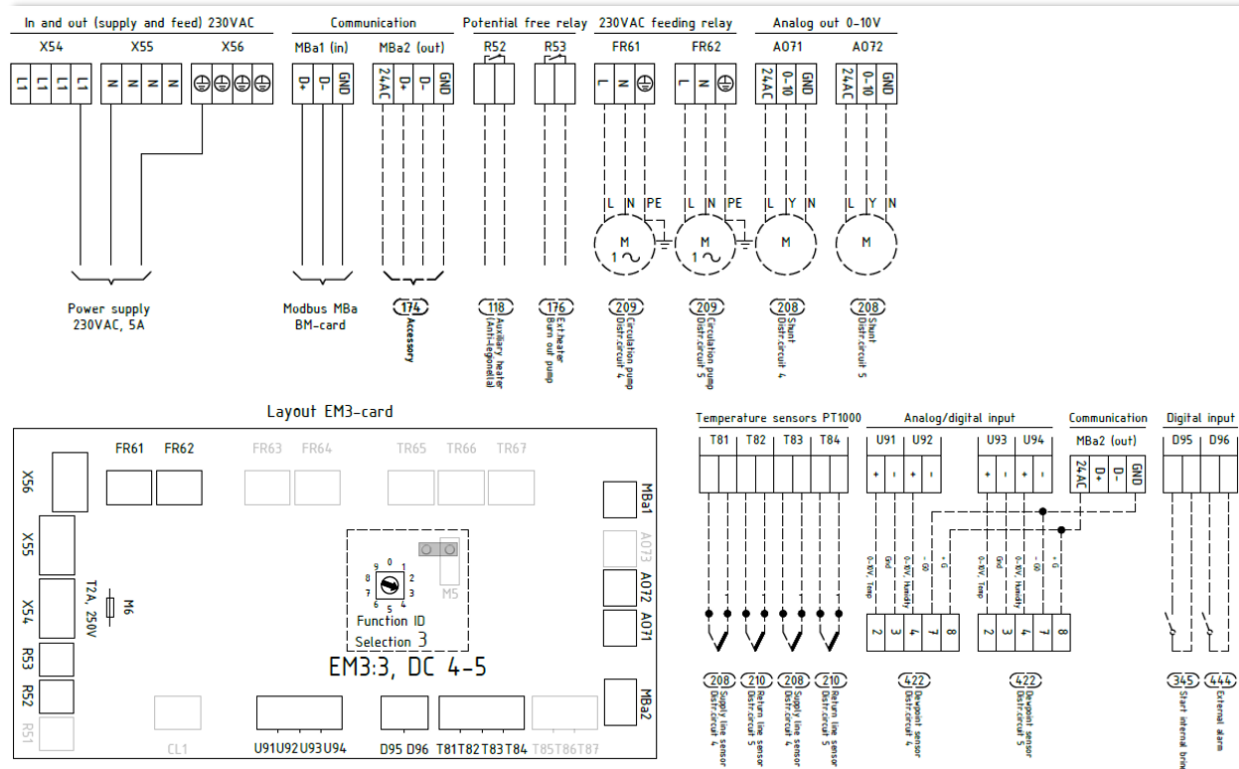
Key, EM card switch position 2, heating circuits 2 and 3

| Number / terminal | Description                         | Number / terminal | Description                          |
|-------------------|-------------------------------------|-------------------|--------------------------------------|
| 118 / R52         | Auxiliary heater                    | 210 / T82         | Sensor, heating circuit 2, return    |
| 174               | Modbus In/Out BM card / accessories | 210 / T84         | Sensor, heating circuit 3, return    |
| 176 / R53         | External auxiliary heater           | 345 / D95         | External start, internal source pump |
| 207 / AO71        | Mixing valve, heating circuit 2     | 422 / U91         | Dew point sensor, heating circuit 2  |
| 207 / AO72        | Mixing valve, heating circuit 3     | 422 / U92         | Dew point sensor, heating circuit 2  |
| 208 / T81         | Sensor, heating circuit 2, flow     | 422 / U93         | Dew point sensor, heating circuit 3  |
| 208 / T83         | Sensor, heating circuit 3, flow     | 422 / U94         | Dew point sensor, heating circuit 3  |
| 209 / FR61        | Pump, heating circuit 2             | 444 / D96         | External alarm contact               |
| 209 / FR62        | Pump, heating circuit 3             | TR65              | Heating/cooling, heating circuit 2   |
|                   |                                     | TR66              | Heating/cooling, heating circuit 3   |

## Repair instructions

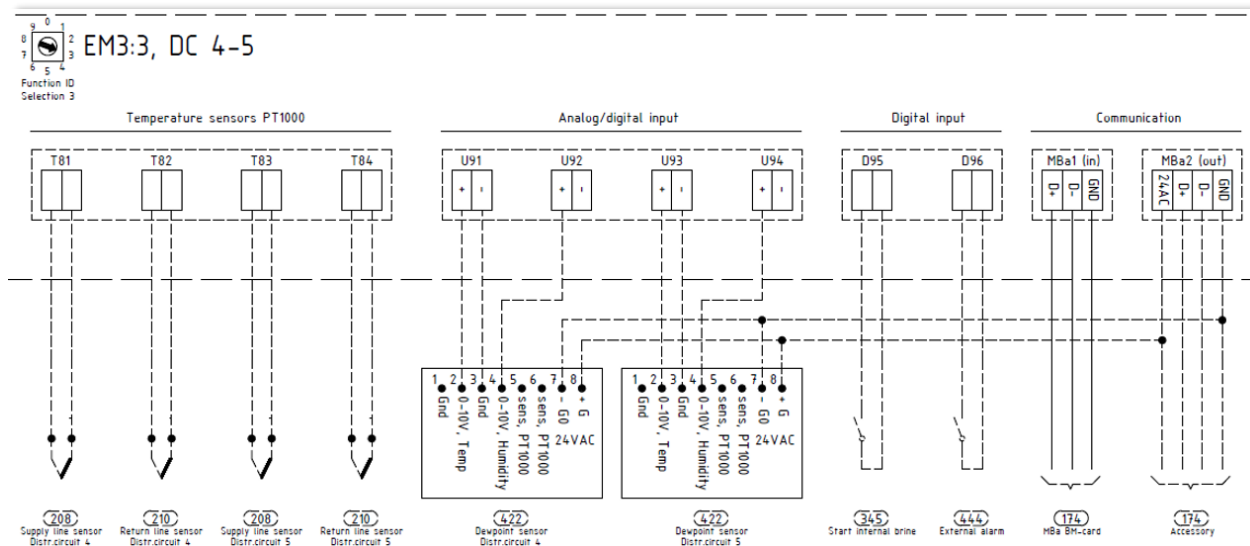
### WPE-I xx H 400 Premium

Heating circuits with mixer 4 and 5, DC 4-5



## Repair instructions

### WPE-I xx H 400 Premium

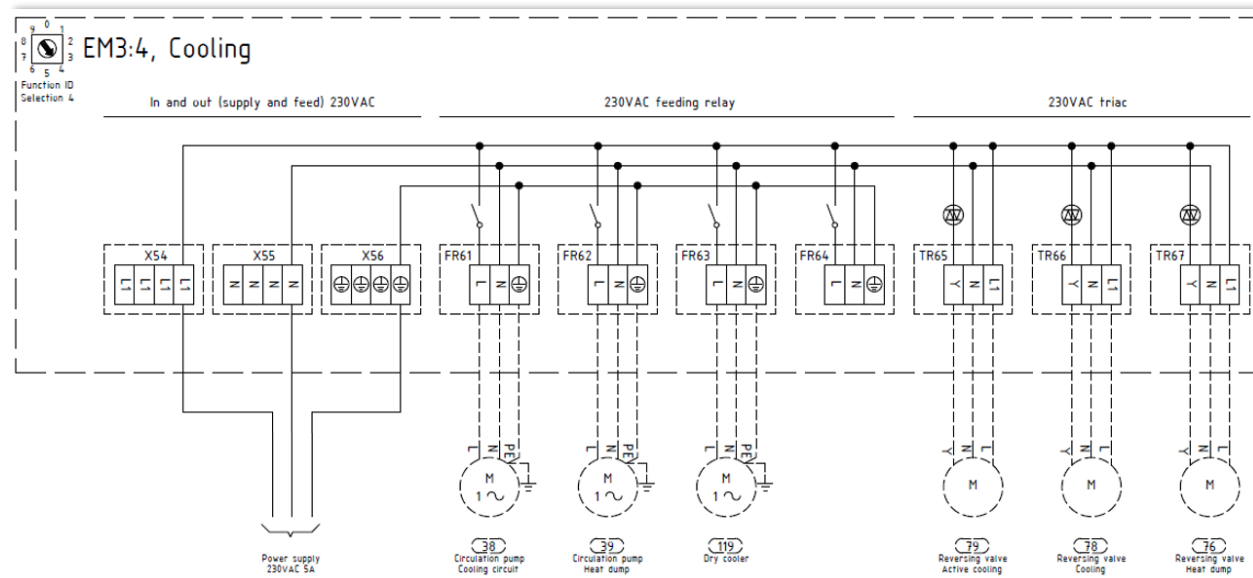
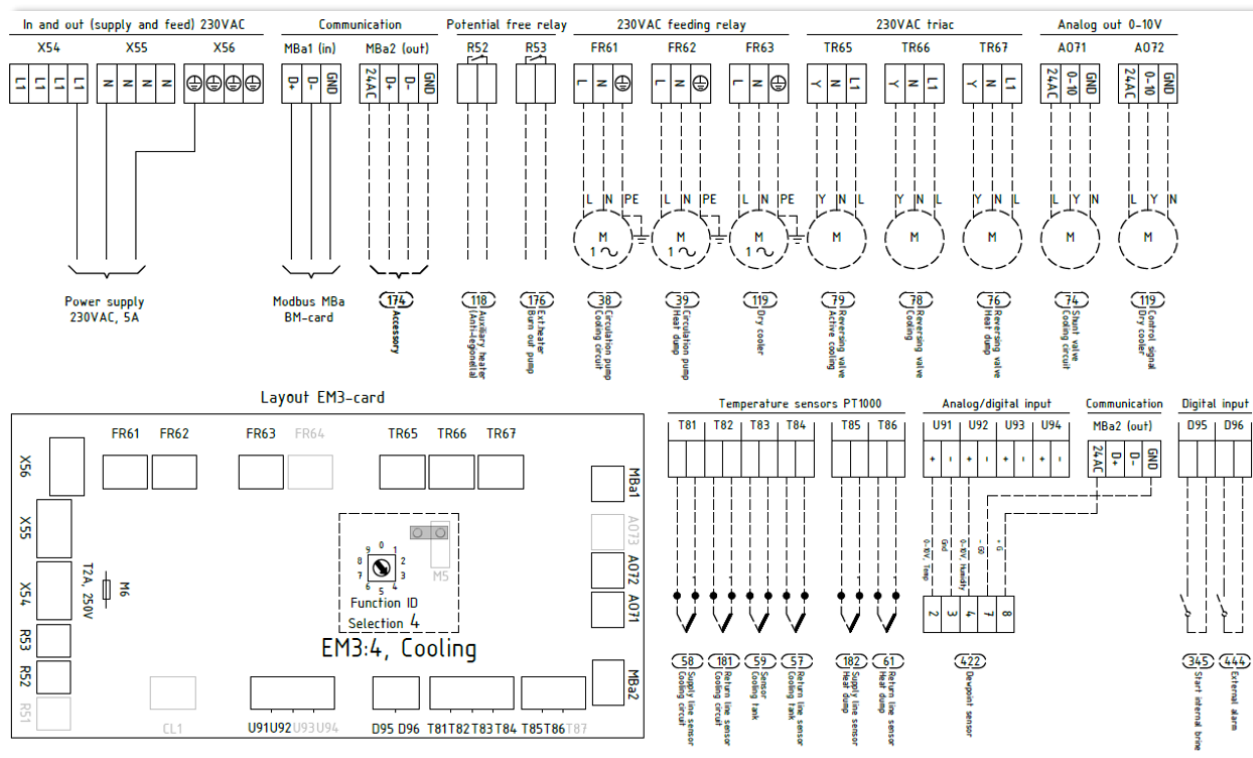


Key, EM card switch position 3, heating circuits 4 and 5

| Number / terminal | Description                         | Number / terminal | Description                          |
|-------------------|-------------------------------------|-------------------|--------------------------------------|
| 118 / R52         | Auxiliary heater                    | 210 / T82         | Sensor, heating circuit 4, return    |
| 174               | Modbus In/Out BM card / accessories | 210 / T84         | Sensor, heating circuit 5, return    |
| 176 / R53         | External auxiliary heater           | 345 / D95         | External start, internal source pump |
| 207 / AO71        | Mixing valve, heating circuit 4     | 422 / U91         | Dew point sensor, heating circuit 4  |
| 207 / AO72        | Mixing valve, heating circuit 5     | 422 / U92         | Dew point sensor, heating circuit 4  |
| 208 / T81         | Sensor, heating circuit 4, flow     | 422 / U93         | Dew point sensor, heating circuit 5  |
| 208 / T83         | Sensor, heating circuit 5, flow     | 422 / U94         | Dew point sensor, heating circuit 5  |
| 209 / FR61        | Pump, heating circuit 4             | 444 / D96         | External alarm contact               |
| 209 / FR62        | Pump, heating circuit 5             | TR65              | Heating/cooling, heating circuit 4   |
|                   |                                     | TR66              | Heating/cooling, heating circuit 5   |

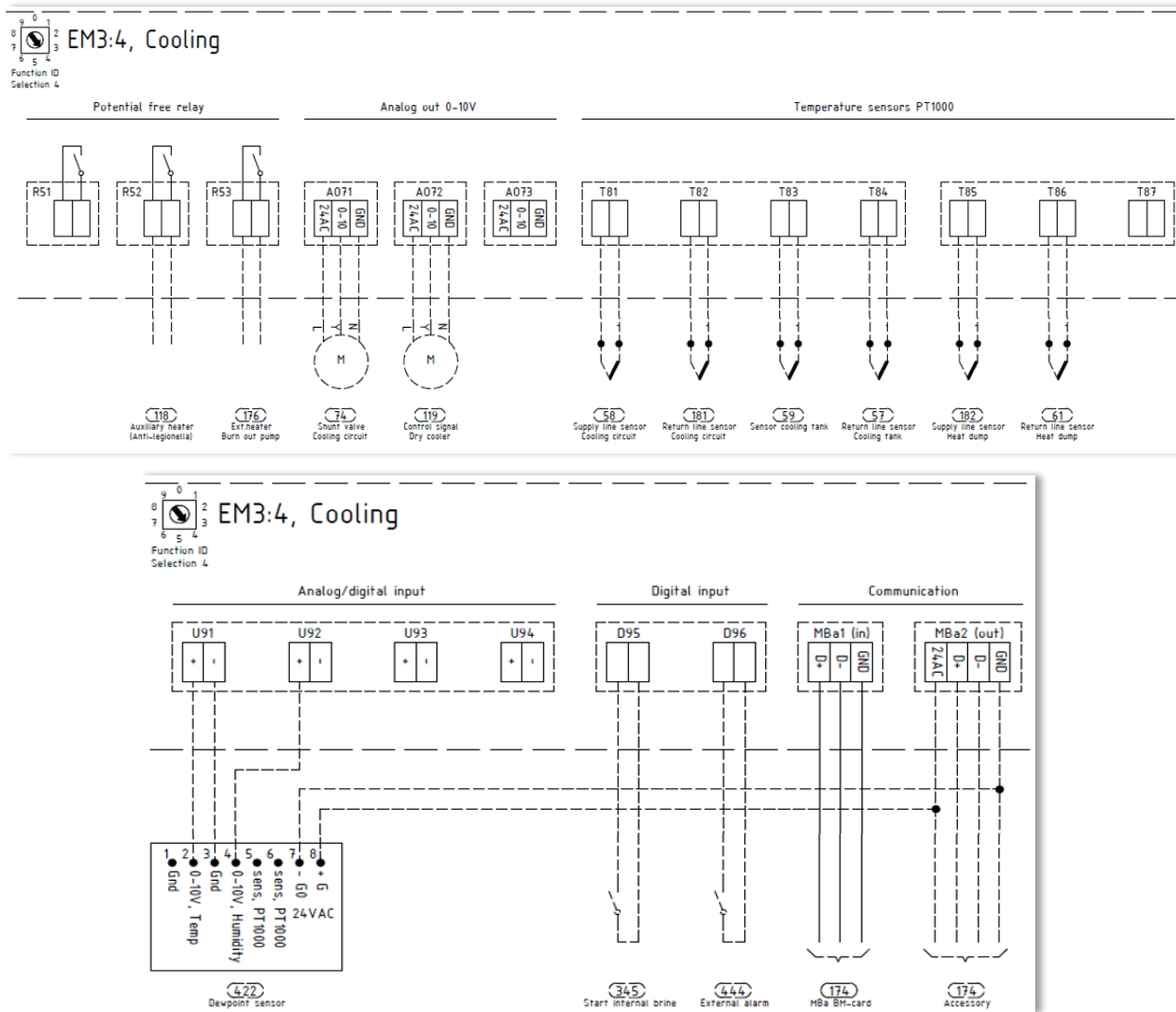
# Repair instructions WPE-I xx H 400 Premium

Cooling function: Cooling



## Repair instructions

### WPE-I xx H 400 Premium



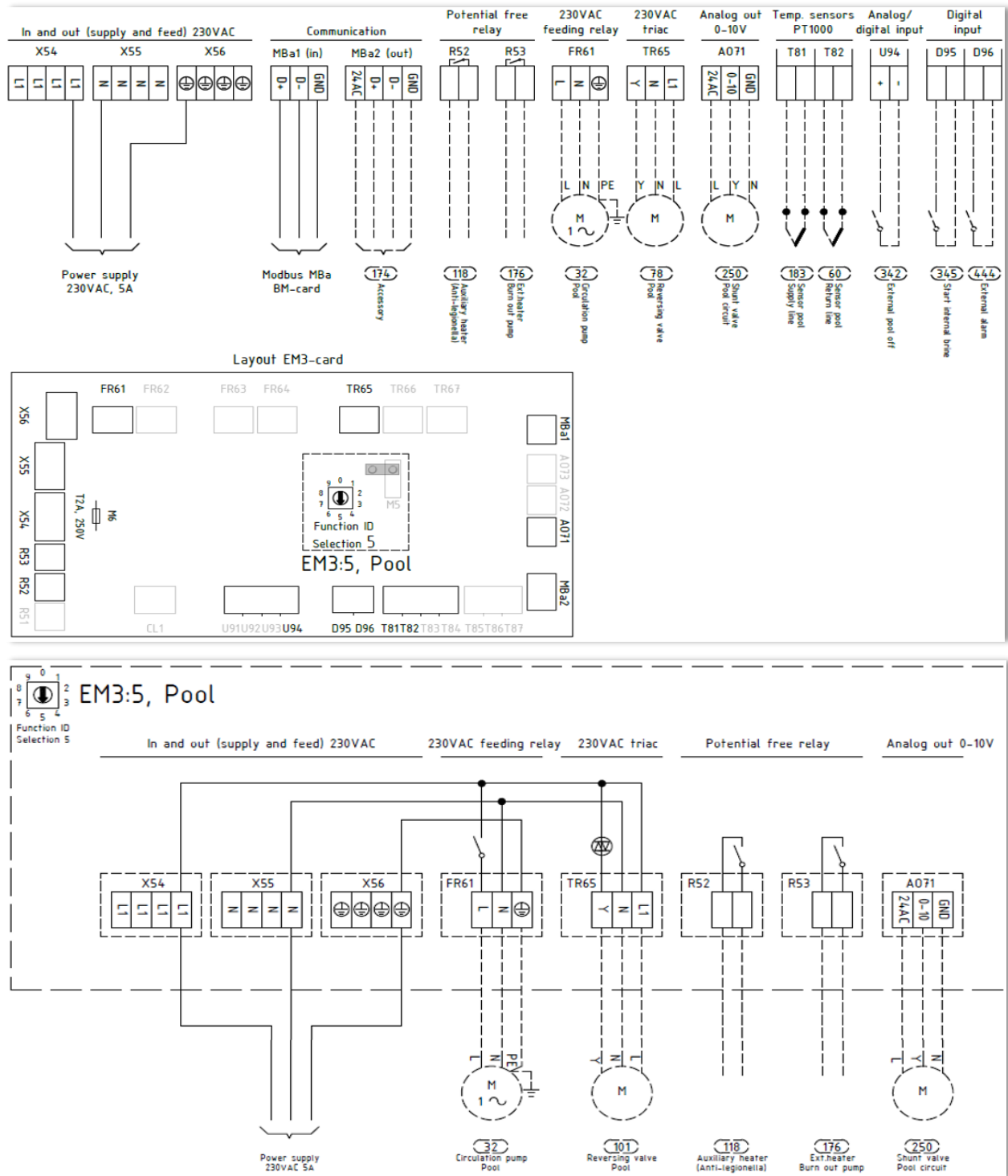
Key, EM card switch position 4, cooling

| Number / terminal | Description                         | Number / terminal | Description                              |
|-------------------|-------------------------------------|-------------------|------------------------------------------|
| 38 / FR61         | Pump, cooling circuit               | 119 / FR63        | Output, heat dissipation                 |
| 39 / FR62         | Pump, heat dissipation              | 119 / AO72        | Heat dissipation, control unit           |
| 57 / T84          | Sensor, buffer, cooling, top        | AO73              | Excess heat, mixing valve                |
| 58 / T81          | Sensor, cooling circuit, flow       | 174               | Modbus In/Out BM card / accessories      |
| 59 / T83          | Sensor, buffer, cooling, bottom     | 176 / R53         | Auxiliary heater                         |
| 61 / T86          | Sensor, heat dissipation, cold side | 181 / T82         | Sensor, cooling circuit, return          |
| 74 / AO71         | Mixing valve, cooling circuit       | 182 / T85         | Sensor, heat dissipation, hot side       |
| 76 / TR67         | Diverter valve, heat dissipation    | 345 / D95         | External switch-on, internal source pump |
| 78 / TR66         | Diverter valve, passive cooling     | 422 / U91         | Dew point sensor, cooling circuit        |
| 79 / TR65         | Diverter valve, active cooling      | 422 / U92         | Dew point sensor, cooling circuit        |
| 118 / R52         | Auxiliary heater / pasteurisation   | 444 / D96         | External alarm contact                   |

## Repair instructions

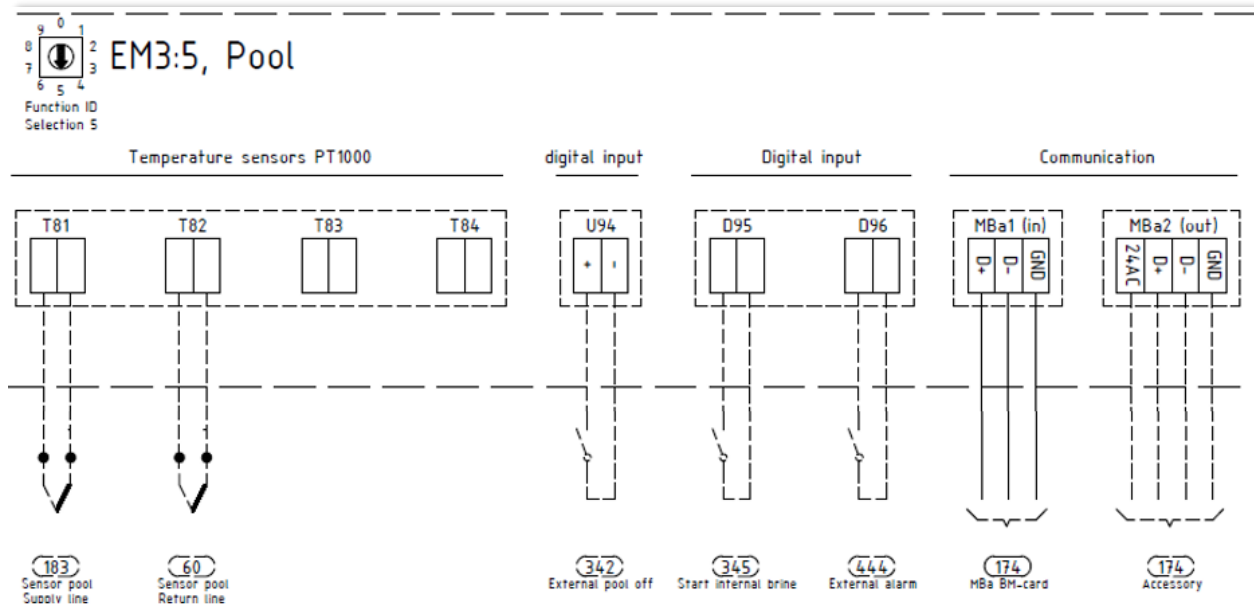
### WPE-I xx H 400 Premium

Pool operation: Pool



## Repair instructions

### WPE-I xx H 400 Premium



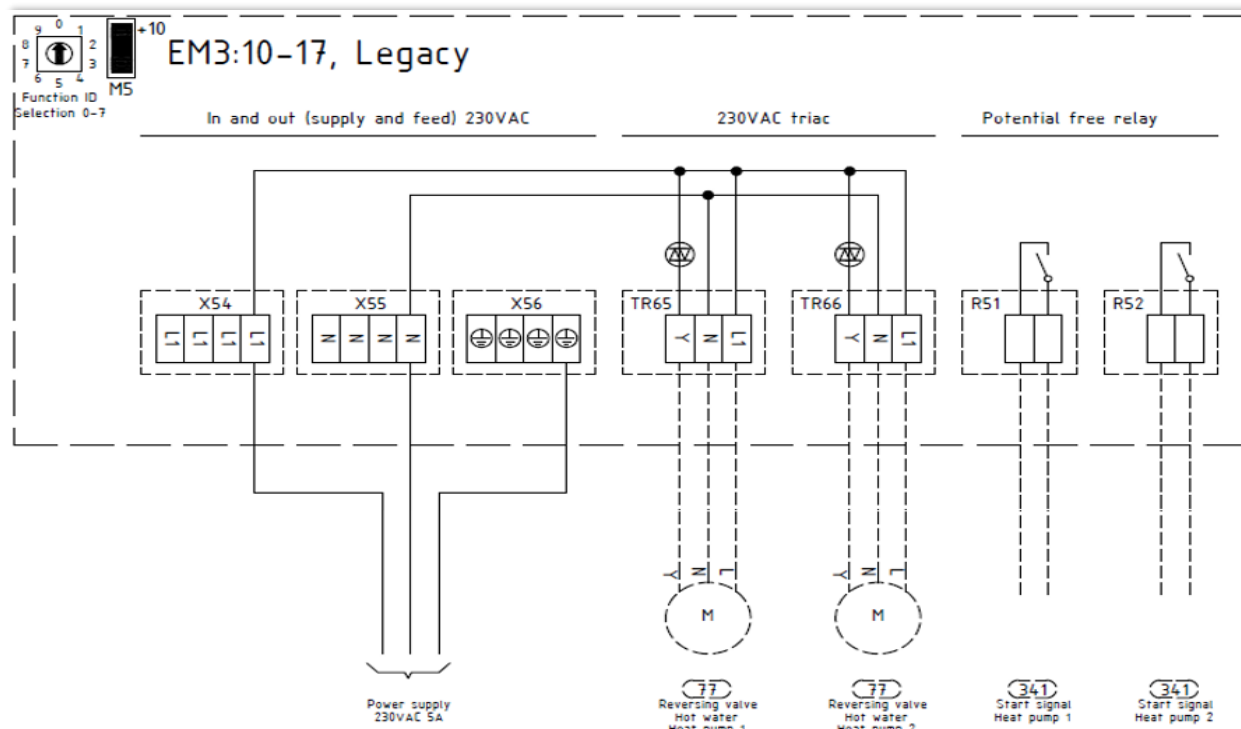
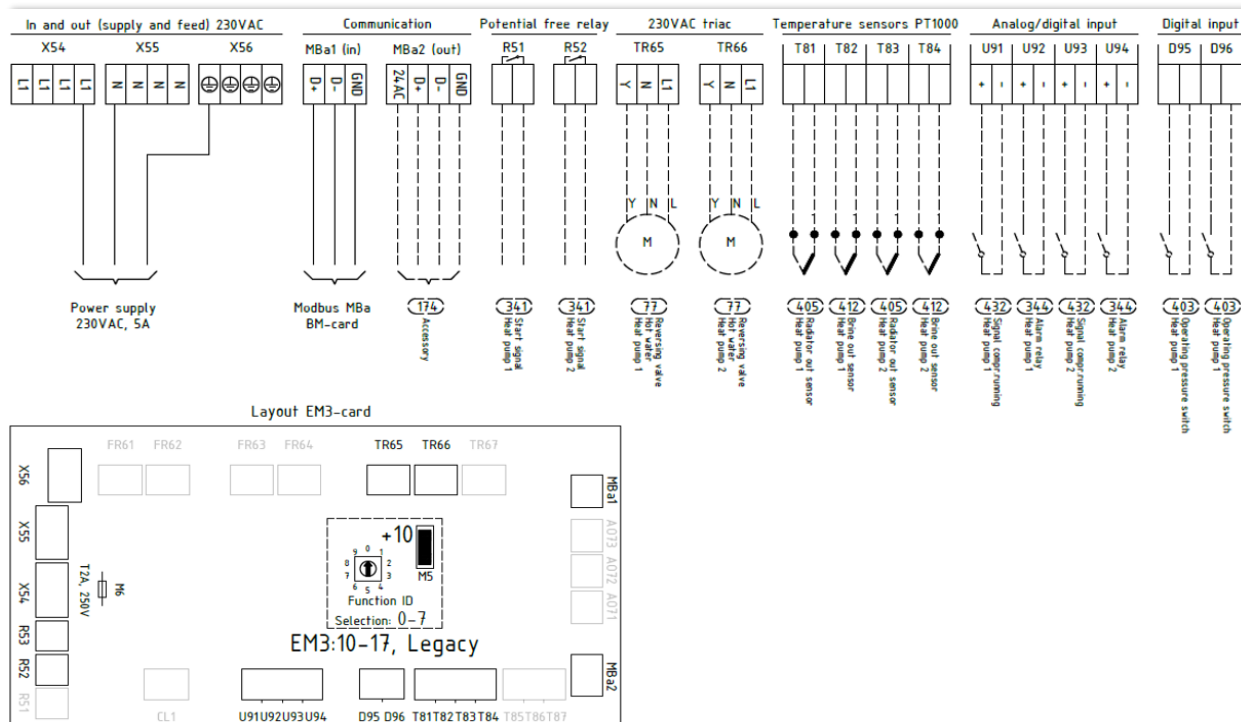
Key, EM card switch position 5, pool

| Number / terminal | Description                       | Number / terminal | Description                              |
|-------------------|-----------------------------------|-------------------|------------------------------------------|
| 32 / FR61         | Pool charging pump                | 174               | Modbus In/Out BM card / accessories      |
| 60 / T82          | Sensor, pool return               | 176 / R53         | Auxiliary heater                         |
| 78(101) / TR65    | Diverter valve, heating / pool    | 250 / AO71        | Mixing valve                             |
| 103 / T81         | Sensor, pool, flow                | 342 / U94         | External, pool, off                      |
| 118 / R52         | Auxiliary heater / pasteurisation | 345 / D95         | External switch-on, internal source pump |
|                   |                                   | 444 / D96         | External alarm contact                   |

## Repair instructions

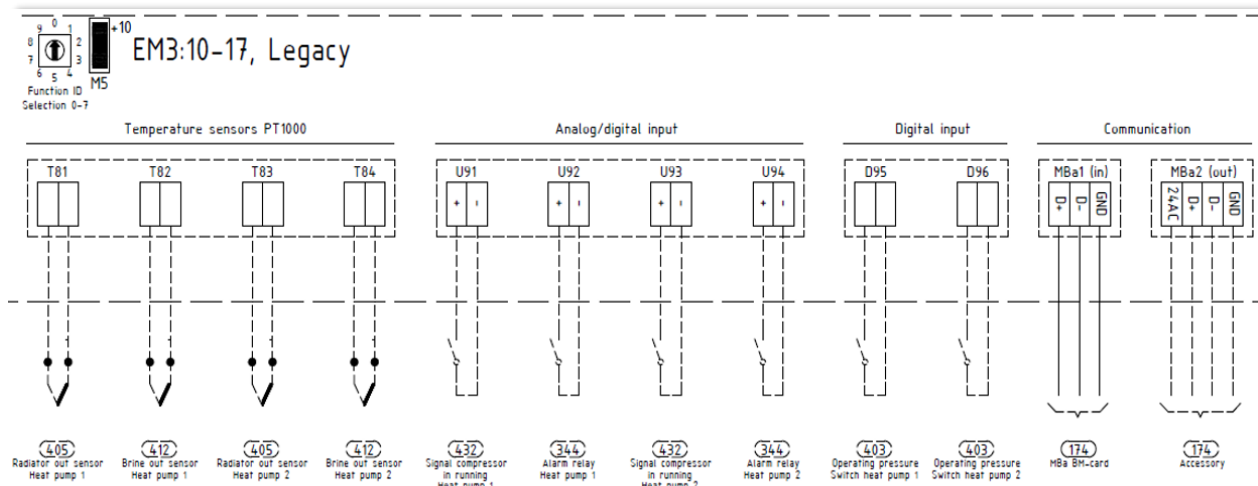
### WPE-I xx H 400 Premium

#### External heat pump: Legacy



## Repair instructions

### WPE-I xx H 400 Premium



Key, EM card switch position 6-15, existing (legacy) heat pump

| Number / terminal | Description                       | Number / terminal | Description                              |
|-------------------|-----------------------------------|-------------------|------------------------------------------|
| 77 / TR65         | Diverter valve, heating/DHW, HP 1 | 403 / D95         | Pressure switch, external input, HP 1    |
| 77 / TR66         | Diverter valve, heating/DHW, HP 2 | 403 / D96         | Pressure switch, external input, HP 2    |
| 174               | Modbus In/Out BM card             | 405 / T81         | Flow sensor, HP 1                        |
| 341 / R51         | Output, start, HP 1               | 405 / T83         | Flow sensor, HP 2                        |
| 341 / R52         | Output, start, HP 2               | 412 / T82         | Sensor, source outlet, HP 1              |
| 344 / U92         | External alarm input, HP 1        | 412 / T84         | Sensor, source outlet, HP 2              |
| 344 / U94         | External alarm input, HP 2        | 432 / U91         | External input, compressor running, HP 1 |
|                   |                                   | 432 / U93         | External input, compressor running, HP 2 |

## Repair instructions

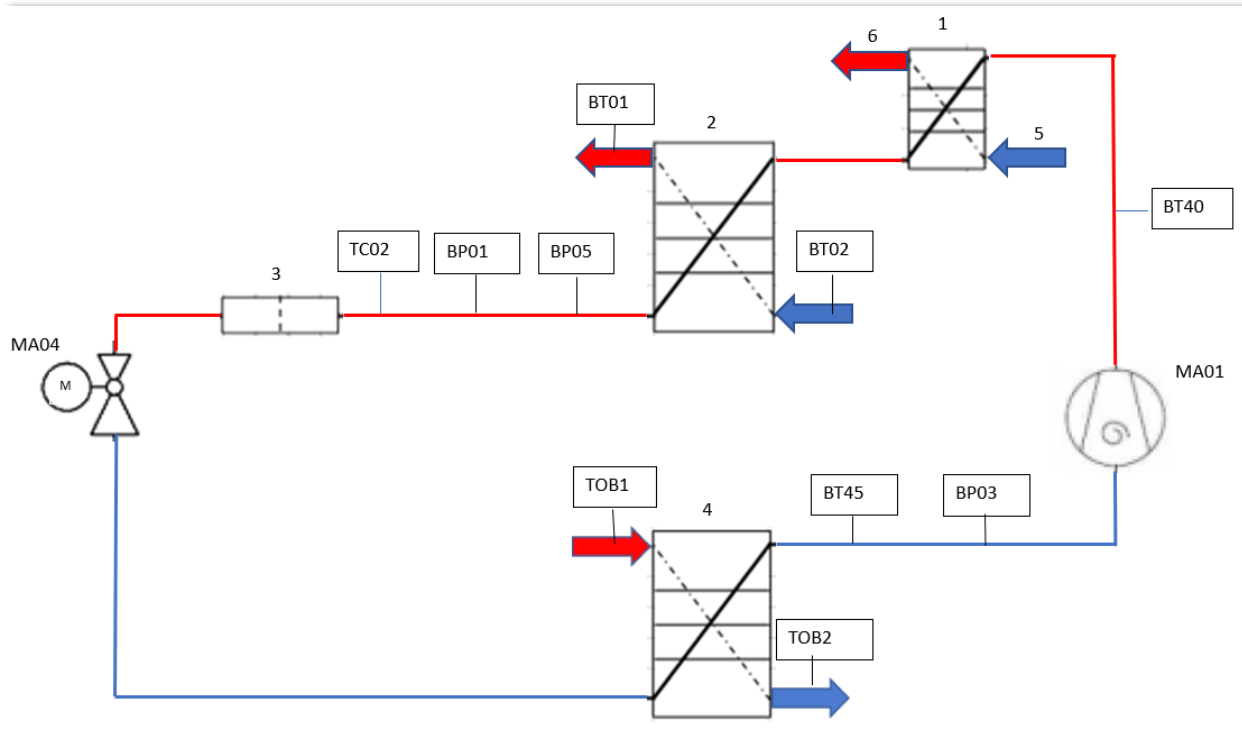
### WPE-I xx H 400 Premium

#### 6.7 Hydraulic diagram

The internal hydraulic scheme can be found on the refrigerant circuit diagram.

System hydraulic schemes can be found in the Toolbox.

#### 6.8 Refrigerant circuit diagram



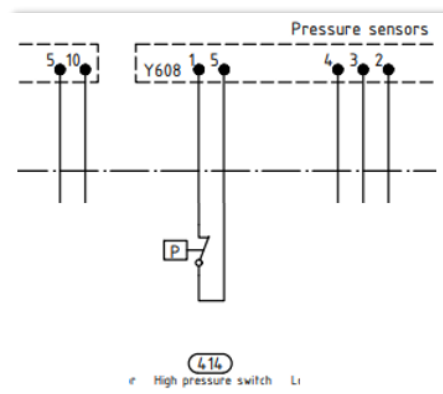
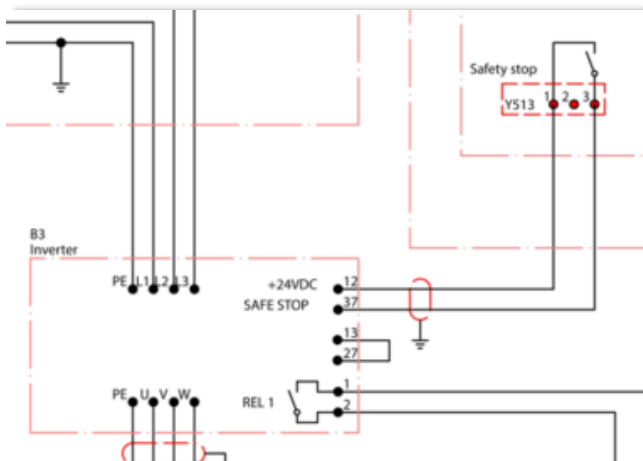
| Number | Designation                  | Number | Designation              |
|--------|------------------------------|--------|--------------------------|
| MA01   | Compressor                   | 3      | Filter dryer             |
| MA04   | Electronic expansion valve   | 4      | Evaporator               |
| BT40   | Hot gas sensor, 416          | 5      | Return, heating water    |
| BT01   | Flow, heating circuit, 405   | 6      | Flow, heating water      |
| BT02   | Return, heating circuit, 411 | BP05   | High pressure switch     |
| TOB1   | Sensor, source inlet, 413    | BP01   | High pressure transducer |
| TOB2   | Sensor, source outlet, 412   | BP03   | Low pressure transducer  |
| 1      | Hot gas heat exchanger       | TC02   | Condenser sensor, 431    |
| 2      | Condenser                    | BT45   | Evaporator sensor, 421   |

## Repair instructions

### WPE-I xx H 400 Premium

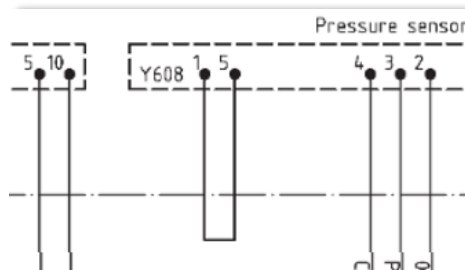
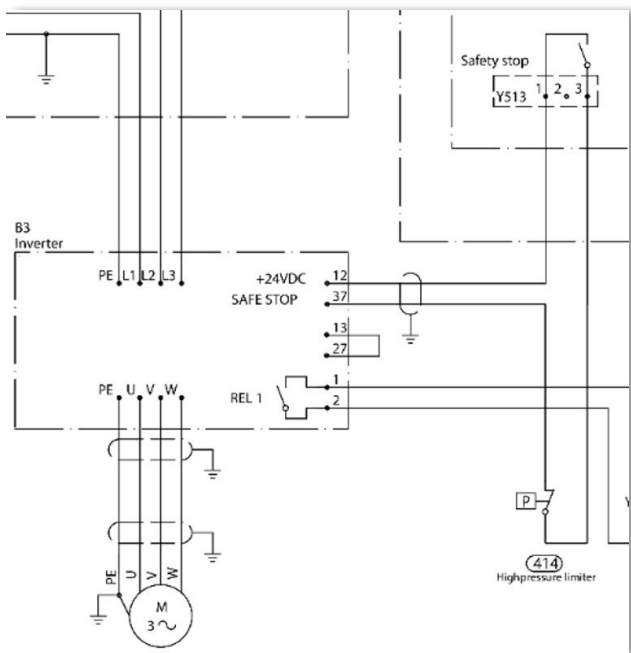
#### 6.9 Safety equipment

Up to April 2019, the refrigerant circuit protection function is activated via the "Safety stop" function of the BM card and ensured via the inverter. The actual high pressure switch is connected on the BM card to terminal Y608, 1-5 (pos. 414).



If an impermissible temperature or pressure outside the measuring range is determined by the BM card, the contact Y513, 1-3 is closed and the safety stop function is activated by the inverter.

From May 2019, the high pressure switch is integrated directly into the inverter safety loop. The previously used input Y608, 1-5 of the high pressure switch has been replaced by a wire jumper. When the high pressure switch is tripped, this directly triggers a high pressure message. Perfect function should be checked annually and documented.



## Repair instructions

### WPE-I xx H 400 Premium

#### High pressure switch

| Appliance          | Type               | Spare part no. |
|--------------------|--------------------|----------------|
| Version A, B, C, D | Danfoss ACB-4U B87 | 338834         |

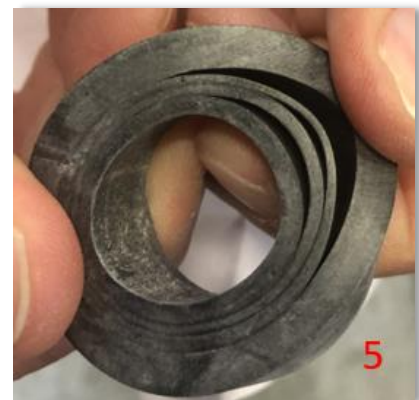


|                       |                    |
|-----------------------|--------------------|
| Type                  | Danfoss ACB-4U B87 |
| Response pressure     | 45 bar             |
| Bursting pressure     | 140 bar            |
| Reset                 | Automatic          |
| Electrical connection | 6.35 mm tab        |
| Mechanical connection | 6 mm solder        |
| Medium temperature    | -55 - +135 °C      |

#### 6.10 Standard delivery

The following are delivered with the appliance:

- 1x outside sensor (1)
- 1x immersion or contact sensor (2)
- 1x split ferrite (3)
- Fixing materials (4)
- Rubber gasket for PE fitting of cable grommet (5)



## Repair instructions

### WPE-I xx H 400 Premium

## 7. Status indicators

See chapter BM card.

### 7.1 Operation

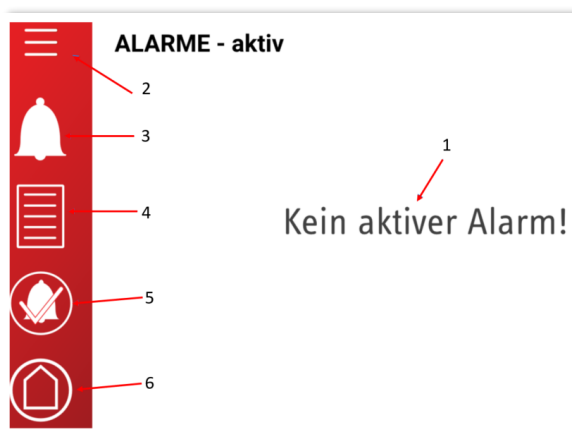
Detailed information about the status displays can be found in the operating instructions.

### 7.2 Fault

A class A or B fault is indicated with the alarm symbol and a brief description of the fault on the start screen. Tapping on the "!" symbol on the start screen takes you to the fault message level.



If there is no message, "No active alarm!" is displayed in the following menu.



| Position | Description                                                           | Position | Description                                   |
|----------|-----------------------------------------------------------------------|----------|-----------------------------------------------|
| 1        | Message display. If there is no fault, "No active alarm" is displayed | 4        | Show alarm history.                           |
| 2        | Back to selection menu.                                               | 5        | Acknowledge alarm message.                    |
| 3        | Show other active alarms.                                             | 6        | "Home button" to toggle to the start display. |

## Repair instructions

### WPE-I xx H 400 Premium

#### 8. Fault descriptions

The appliance function can be stopped by various factors. All messages are divided into categories. Depending on the importance of the message, a follow-up action is then carried out.

| Category | Follow-up action                                                                                                                                                                                                                                                                                                           |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A        | Faults of this category switch off the compressor immediately. The fault must be acknowledged. An exception to this are faults in the power supply. They are reset automatically. After a shutdown, reheating is carried out via the external heat generator unless the fault message relates to the external heat source. |
| B        | These messages must be acknowledged.                                                                                                                                                                                                                                                                                       |
| C        | Messages of this category are reset automatically. These are often messages with a limiter function. Messages of this category are often maximum flow temperature, high return temperature or room temperature reached.                                                                                                    |
| D        | Messages of this category are reset automatically. The messages relate to communication and information between Genesis versions within a cascade. These messages interrupt the DHW function of the secondary heat pumps.                                                                                                  |
| E        | Messages of this category are reset automatically. They relate to information output by secondary (legacy) competitor heat pumps.                                                                                                                                                                                          |

| No. | Fault                       | Category | Fault detection                                                                                          | Fault cause                                                                                                                      |
|-----|-----------------------------|----------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 1   | High pressure switch        | A        | Contacts for the high pressure switch on the BM module are not closed.                                   | High pressure switch has responded or is not connected.                                                                          |
| 2   | High pressure               | A        | High pressure transducer has transmitted a pressure of $\geq 41.5$ bar five times in maximum five hours. | No heat transfer to the heating system. Faulty pressure transducer. Problem in the refrigerant circuit.                          |
| 3   | Low pressure                | A        | Low pressure transducer has transmitted a pressure of $\leq 2.3$ bar five times in maximum five hours.   | Insufficient heat transfer from the heat source. Faulty pressure transducer. Problem in the refrigerant circuit.                 |
| 4   | BM card communication       | A        | Communication from the BM card to the CM card is disrupted.                                              | The CM card has lost the connection to the BM card. This message overwrites all other messages until the connection is restored. |
| 4   | Pressure differential       | A        | Pressure differential between low and high pressure at the compressor is too high.                       | Faulty pressure transducer. Problem in the refrigerant circuit. Actuation of circulation pumps malfunctioning.                   |
| 5   | Modbus communication        | A        | Modbus communication between inverter and BM module malfunctioning.                                      | Faulty or disconnected connecting cable. Faulty inverter. Faulty BM module.                                                      |
| 6   | Inverter                    | A        | Three inverter alarms occurred in two hours.                                                             | Faulty inverter. Connection between BM module and inverter malfunctioning. Defective power supply.                               |
| 7   | IO calibration              | AI A     | Calibration of pressure transducer failed.                                                               | Faulty BM card. Pressure transducer not connected.                                                                               |
| 8   | I/O stepper motor           | A        | Calibration of expansion valve failed.                                                                   | Faulty BM module. Expansion valve not connected.                                                                                 |
| 9   | I/O temperature calibration | A        | Calibration of temperature sensor failed.                                                                | Faulty BM module. Temperature sensor not connected.                                                                              |

## Repair instructions

### WPE-I xx H 400 Premium

| No. | Fault                                   | Category | Fault detection                                                                                                                     | Fault cause                                                                                                                                                 |
|-----|-----------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10  | I/O phase detection                     | A        | Incorrect phase sequence or missing phase.                                                                                          | Reset automatically as soon as the power supply is stable again. If this occurs frequently without actual voltage problems, the BM module must be replaced. |
| 11  | I/O settings                            | A        | BM module is configured incorrectly.                                                                                                | An incorrect appliance type has been selected.                                                                                                              |
| 12  | Sensor, condenser<br>Y607   4 9   431   | A        | Sensor alarm from BM module.                                                                                                        | Check sensor and connection to BM module, and replace if required.                                                                                          |
| 13  | Sensor, suction gas<br>Y607   3 8   421 | A        | Sensor alarm from BM module.                                                                                                        | Check sensor and connection to BM module, and replace if required.                                                                                          |
| 14  | Sensor, hot gas<br>Y607   5 10   416    | A        | Sensor alarm from BM module.                                                                                                        | Check sensor and connection to BM module, and replace if required.                                                                                          |
| 15  | Flow sensor/brine pressure switch       | A        | Flow sensor of source or brine pressure switch has responded. Only active if connection 71 is used and the function is switched on. | Check sensors and connection. Check brine pressure and source pump. Message only appears if this function is enabled.                                       |
| 16  | Source temperature, minimum             | A        | The minimum source temperature was reached five times in five hours.                                                                | Check source pressure and source pump. Check source sensor Y607   1 6 and 2 7   413 and 412.                                                                |
| 17  | Maximum hot gas temperature             | A        | The maximum hot gas temperature was exceeded three times in eight hours.                                                            | Check settings. Discharge to heating system malfunctioning. Check temperature sensor Y607   5 10   416                                                      |
| 18  | Low compressor speed                    | A        | Compressor speed falls below 880 rpm five times in five hours.                                                                      | This fault does not occur in this appliance type. Select correct appliance type.                                                                            |
| 19  | Minimum superheating                    | A        | Superheating fell below 1 K (below the set superheating?) five times in five hours.                                                 | Faulty expansion valve. Faulty evaporator sensor.                                                                                                           |
| 20  | Parameters exceeded                     | A        | The appliance was outside the parameters at the lowest enabled compressor stage for 40 seconds five times in five hours.            | Check temperature sensor. Check settings. Check refrigerant circuit.                                                                                        |
| 21  | Appliance profile                       | A        | An incorrect appliance profile has been selected.                                                                                   | Check selected appliance profile, and correct.                                                                                                              |
| 22  | Maximum time, pasteurisation function   | B        | Pasteurisation function was not ended within 3.5 hours.                                                                             | Check the system hydraulics. Check temperature sensor.                                                                                                      |
| 23  | Sensor, source inlet                    | B        | Sensor fault on the BM module.<br>Y607   1 6   413                                                                                  | Check sensor and connection to BM module, and replace if required.                                                                                          |
| 24  | Sensor, source outlet                   | B        | Sensor fault on the BM module.<br>Y607   2 7   412                                                                                  | Check sensor and connection to BM module, and replace if required.                                                                                          |

## Repair instructions

### WPE-I xx H 400 Premium

| No. | Fault                                 | Category | Fault detection                                                                                     | Fault cause                                                                                               |
|-----|---------------------------------------|----------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 25  | Condenser in                          | B        | Sensor fault on the BM module.                                                                      | Check sensor and connection to BM module, and replace if required.                                        |
| 26  | Condenser out                         | B        | Sensor fault on the BM module.                                                                      | Check sensor and connection to BM module, and replace if required.                                        |
| 27  | Sensor, cooling                       | B        | Sensor fault on the EM3 module.                                                                     | Check sensor and connection to EM3 module, and replace if required.                                       |
| 28  | Maximum source temperature difference | B        | The temperature differential between the source inlet and source outlet exceeds the selected value. | Check sensor and connection to BM module, and replace if required. Check settings. Check the source pump. |
| 29  | Sensor mixer circuit 1                | B        | Sensor of the first heating circuit with mixer has been interrupted or has a short circuit.         | Check sensor and connection to BM module, and replace if required. Y602   T32   108                       |
| 30  | Sensor mixer circuit 2                | B        | Sensor of the second heating circuit with mixer has been interrupted or has a short circuit.        | Check sensor and connection to EM3 module, and replace if required.                                       |
| 31  | Sensor mixer circuit 3                | B        | Sensor of the third heating circuit with mixer has been interrupted or has a short circuit.         | Check sensor and connection to EM3 module, and replace if required.                                       |
| 32  | Sensor mixer circuit 4                | B        | Sensor of the fourth heating circuit with mixer has been interrupted or has a short circuit.        | Check sensor and connection to EM3 module, and replace if required.                                       |
| 33  | Sensor mixer circuit 5                | B        | Sensor of the fifth heating circuit with mixer has been interrupted or has a short circuit.         | Check sensor and connection to EM3 module, and replace if required.                                       |
| 34  | HG sensor                             | DHW B    | Hot gas DHW sensor has been interrupted or has a short circuit.                                     | Check sensor and connection to BM module, and replace if required. HGW   T34   440                        |
| 35  | Internal auxiliary heater             | B        | High limit safety cut-out of internal auxiliary heater has responded.                               | These appliances do not have an internal auxiliary heater. Check appliance profile, and correct.          |
| 36  | Minimum source inlet Temperature      | B        | Minimum selected temperature for the source inlet was reached at the source inlet sensor.           | Check temperature sensor 413. Check the source circuit. Adjust the settings.                              |
| 37  | Minimum source outlet Temperature     | B        | Minimum selected temperature for the source outlet was reached at the source outlet sensor.         | Check temperature sensor 412. Check the source circuit. Adjust the settings.                              |
| 38  | Outside sensor                        | B        | Sensor fault on the BM module. Outdoor   T35   50                                                   | Check sensor and connection to BM module, and replace if required.                                        |
| 39  | Sensor, cooling return                | B        | Sensor fault on the EM3 module.                                                                     | Check sensor and connection to EM3 module, and replace if required.                                       |

## Repair instructions

### WPE-I xx H 400 Premium

| No. | Fault                                  | Category | Fault detection                                                                                                      | Fault cause                                                                                                           |
|-----|----------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 40  | Sensor, cooling flow                   | B        | Sensor fault on the EM3 module.                                                                                      | Check sensor and connection to EM3 module, and replace if required.                                                   |
| 41  | Sensor, cylinder, cooling return       | B        | Sensor fault on the EM3 module.                                                                                      | Check sensor and connection to EM3 module, and replace if required.                                                   |
| 42  | Sensor, excess, heating return         | B        | Sensor fault on the EM3 module.                                                                                      | Check sensor and connection to EM3 module, and replace if required.                                                   |
| 43  | Sensor, excess, heating flow           | B        | Sensor fault on the EM3 module.                                                                                      | Check sensor and connection to EM3 module, and replace if required.                                                   |
| 44  | Sensor, pool return                    | B        | Sensor fault on the EM3 module.                                                                                      | Check sensor and connection to EM3 module, and replace if required.                                                   |
| 45  | Sensor, system flow                    | B        | Sensor fault on the BM module.                                                                                       | Check sensor and connection to BM module, and replace if required.                                                    |
| 46  | Sensor, water charging system (WCS)    | B        | Sensor fault on the EM3 module.                                                                                      | Check sensor and connection to EM3 module, and replace if required.                                                   |
| 47  | Sensor, water discharging system (TWC) | B        | Sensor fault on the EM3 module.<br>DHW flow sensor downstream of mixing valve. AI1                                   | Check sensor and connection to EM3 module, and replace if required.                                                   |
| 48  | Sensor, DHW, cylinder outlet           | B        | Sensor fault on the EM3 module. Sensor above auxiliary heating element. Pasteurisation circuit must be enabled. AI4  | Check sensor and connection to EM3 module, and replace if required. Check pasteurisation function.                    |
| 49  | Sensor, cylinder, bottom               | B        | Sensor fault on the BM module.                                                                                       | Check sensor and connection to BM module, and replace if required.                                                    |
| 50  | Sensor, DHW return                     | B        | Sensor fault on the EM3 module.                                                                                      | Check sensor and connection to EM3 module, and replace if required.                                                   |
|     | Buffer configuration                   | B        | Settings of the buffer function or buffer system incorrect.                                                          | Correct the buffer settings.                                                                                          |
| 51  | Sensor, system flow, minimum           | C        | The system flow sensor transmits a temperature lower than 70 % of the selected temperature for more than three hours | Check sensor and connection to BM module, and replace if required. Check the selected temperature. Hydraulic problem. |
| 52  | Sensor, system flow maximum            | C        | The system flow sensor transmits a temperature higher than the selected set temperature for more than three hours.   | Check sensor and connection to BM module, and replace if required. Check the selected temperature. Hydraulic problem. |
| 53  | Sensor, flow, cooling                  | C        | Temperature deviation at the sensor downstream of the mixing valve for the cooling circuit.                          | Check sensor and connection to EM3 module, and replace if required. Check settings. Check the mixer and control.      |
| 54  | Coolant buffer monitoring              | C        | Temperature deviation at the sensor in the coolant buffer.                                                           | Check sensor and connection to EM3 module, and replace if required. Check and correct settings.                       |

## Repair instructions

### WPE-I xx H 400 Premium

| No. | Fault                               | Category | Fault detection                                                                                         | Fault cause                                                                                                                   |
|-----|-------------------------------------|----------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 55  | Mixer circuit 1, sensor             | C        | Selected alarm temperature for mixer circuit 1 was reached.                                             | Check hydraulics for mixer circuit 1. Check and adjust settings. Ensure function and position of sensor.                      |
| 56  | Mixer circuit 2, sensor             | C        | Selected alarm temperature for mixer circuit 2 was reached.                                             | Check hydraulics for mixer circuit 2. Check and adjust settings. Ensure function and position of sensor.                      |
| 57  | Mixer circuit 3, sensor             | C        | Selected alarm temperature for mixer circuit 3 was reached.                                             | Check hydraulics for mixer circuit 3. Check and adjust settings. Ensure function and position of sensor.                      |
| 58  | Mixer circuit 4, sensor             | C        | Selected alarm temperature for mixer circuit 4 was reached.                                             | Check hydraulics for mixer circuit 4. Check and adjust settings. Ensure function and position of sensor.                      |
| 59  | Mixer circuit 5, sensor             | C        | Selected alarm temperature for mixer circuit 5 was reached.                                             | Check hydraulics for mixer circuit 5. Check and adjust settings. Ensure function and position of sensor.                      |
| 60  | External alarm                      | C        | Alarm contact for an external fault message has responded.                                              | Check function on the BM card. Check settings.                                                                                |
| 61  | Room temperature sensor             | C        | Communication with room sensor interrupted.                                                             | Check settings. Check connection and room sensor.                                                                             |
| 62  | Limit temperature, heat sink        | C        | Selected temperature deviation for the heat sink has been reached.                                      | Check temperature sensor at EM3. Adjust settings for the cooling cylinder.                                                    |
| 63  | Minimum DHW temperature             | C        | The limit for the minimum DHW temperature has been reached at sensor T81 of the EM3.                    | Check mixer for DHW heating. Check position and function of sensor T801. Check settings. Ensure charging of the DHW cylinder. |
| 64  | DHW return temperature, minimum.    | C        | Selected minimum DHW temperature return has been reached at sensor T82 of the EM3.                      | Check mixer for DHW heating. Check position and function of sensor T82. Check settings. Ensure charging of the DHW cylinder.  |
| 65  | Fault communication with primary    | D        | Communication fault of a secondary heat pump with the primary heat pump.                                | Check RJ45 connecting cable and settings for communication.                                                                   |
| 66  | Fault, communication with secondary | D        | Communication fault of the primary heat pump with a secondary heat pump.                                | Check RJ45 connecting cable and settings for communication.                                                                   |
| 67  | Number of secondary heat pumps      | D        | The number of secondary heat pumps communicating with the primary heat pump is lower than expected.     | Check RJ45 connecting cable and settings for communication.                                                                   |
| 68  | Secondary heat pump class A         | D        | A secondary heat pump reports a class A fault. The number of the secondary heat pump is also displayed. | Check the fault list of the secondary heat pump reporting the fault and remedy fault.                                         |
| 69  | Secondary heat pump class B         | D        | A secondary heat pump reports a class B fault. The number of the secondary heat pump is also displayed. | Check the fault list of the secondary heat pump reporting the fault and remedy fault.                                         |

## Repair instructions

### WPE-I xx H 400 Premium

| No. | Fault                                    | Category | Fault detection                                                          | Fault cause                                                                                                                                                                   |
|-----|------------------------------------------|----------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 70  | Legacy heat pump – pressure switch alarm | E        | The high or low pressure switch of a competitor heat pump has responded. | This fault only occurs if an EM3 module has been programmed to control a competitor heat pump and this heat pump has triggered the fault contact.                             |
| 71  | Legacy heat pump – central fault         | E        | A central fault of a competitor heat pump has responded.                 | This fault only occurs if an EM3 module has been programmed to control a competitor heat pump and this heat pump has triggered a general fault contact.                       |
| 72  | Legacy heat pump – communication fault   | E        | Communication fault of the EM3 card with the primary heat pump.          | This fault only occurs if an EM3 module has been programmed to control a competitor heat pump and communication of the EM3 card with the primary heat pump is malfunctioning. |

## Repair instructions

### WPE-I xx H 400 Premium

#### 8.1 Stop conditions

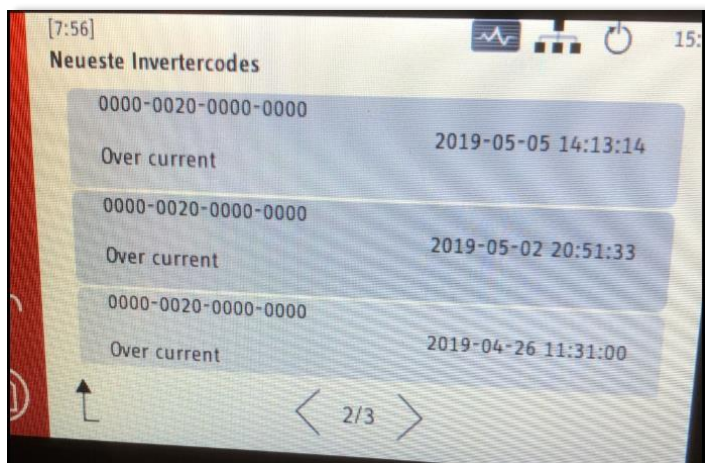
The System information > Stop conditions menu shows why the appliance shut down. Possible causes for appliance shutdowns are:

- No heat demand (standard shutdown condition)
- Appliance running outside of operating range (SOA parameters).
- Insufficient superheating
- Flow temperature too high
- Low pressure
- Pressure differential between high and low pressure too high.
- High pressure
- Inverter transmits stop command.
- Low compressor speed.

#### 8.2 Inverter alarm without fault message

If an inverter alarm occurs without a fault message appearing on the display, the cause may be a faulty Modbus connection or the message was not transmitted to the controller as a fault. The message can be read on the controller in the "Reason for stop" parameter.

Inverter faults are displayed if the inverter detects a fault and transmits this message to the programming unit (CM module). The changeover to inverter fault mode is automatic. The displayed inverter faults are displayed depending on the heat pump profile used. A displayed message is also indicated via an LED on the inverter.



#### 8.3 Trip lock fault (internal inverter fault)

Internal inverter fault or safety-related occurrences are known as "trip lock faults". If this type of fault occurs, a standard fault reset is not sufficient to reboot the appliance.

In such cases, the electrical power supply to the appliance should be switched off. The inverter must be zero volt for at least 30 seconds. Then, the power supply can be restored. Trip lock faults are messages A38 (internal inverter fault) and A72 (safety related).

## Repair instructions

### WPE-I xx H 400 Premium

#### 8.4 Inverter fault messages

An inverter fault message is always a "class A" fault. An inverter fault can be displayed in decimal form (A28, A69, A14, etc.) if it is a specific message. Often, an inverter fault is displayed in hexadecimal form (e.g. 0000-4000-0000-0000) because it may be a combination of multiple faults. The hexadecimal code is split into two fault blocks. The display should be read as follows:

|              |           |              |           |
|--------------|-----------|--------------|-----------|
| 0000         | 0000      | 0000         | 0000      |
| Block 1_1    | Block 1_2 | Block 2_1    | Block 2_2 |
| Fault code 1 |           | Fault code 2 |           |

Examples:

| Display             | Meaning         |
|---------------------|-----------------|
| 0000-4000-0000-0000 | Phase missing   |
| 0000-0000-0000-0004 | Overcurrent     |
| A8                  | DC undervoltage |

##### 8.4.1 Inverter fault list

| Fault code 1 (hex) | Fault code (dec) | Designation                                                                  | Remedy                                                                                                                                                                                                                                                                                          |
|--------------------|------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0000-0001          | A28              | The braking resistor is not connected or is faulty.                          | Check braking resistors 2-15.                                                                                                                                                                                                                                                                   |
| 0000-0002          | A69              | Temperature of output stage too hot or too cold.                             | Check the ambient temperature. Check air routing for inverter cooling. Test the function of the fan.                                                                                                                                                                                            |
| 0000-0004          | A14              | An earth fault was detected.                                                 | Check inverter, compressor and all connections for an earth fault.                                                                                                                                                                                                                              |
| 0000-0008          | A65              | Temperature of control circuit exceeds limit of 80 °C.                       | Check the ambient temperature. Check air routing for inverter cooling. Test the function of the fan.                                                                                                                                                                                            |
| 0000-0010          | A17              | Communication time-out                                                       | Check function of data cables. Check for EMC problems.                                                                                                                                                                                                                                          |
| 0000-0020          | A13              | Overcurrent. The current exceeds the rated current by 200 % for 1.5 seconds. | Check compressor for a mechanical problem. Compressor startup ramp malfunctioning or compressor must start up against high pressure in the refrigerant circuit.                                                                                                                                 |
| 0000-0040          | A12              | Torque maximum.                                                              | If the message appears during the inverter acceleration or deceleration ramp, a control problem or refrigeration problem may exist (no pressure equalisation, expansion valve does not open, etc.). If the message appears in every operating mode, there may be a mechanical compressor fault. |
| 0000-0080          | A11              | Compressor thermistor excess temperature.                                    | Check inverter for incorrect wiring. Check that the correct heat pump type is selected. This fault cannot occur in this appliance series.                                                                                                                                                       |
| 0000-0100          | A10              | Compressor excess temperature.                                               | This fault is displayed if the compressor is actuated at 100 % speed for a long time.                                                                                                                                                                                                           |

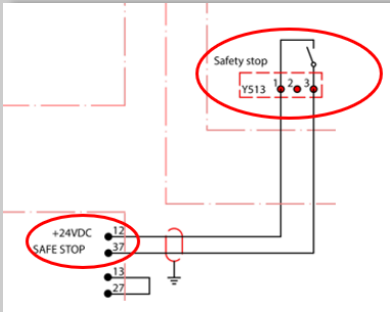
## Repair instructions

### WPE-I xx H 400 Premium

| Fault code 1 (hex) | Fault code (dec) | Designation                               | Remedy                                                                                                                                                         |
|--------------------|------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0000-0200          | A9               | Inverter overload                         | The internal inverter counter reports an overload if the inverter is actuated at full load for too long.                                                       |
| 0000-0400          | A8               | DC undervoltage                           | Check mains power supply.                                                                                                                                      |
| 0000-0800          | A7               | DC overvoltage                            | Check mains power supply.                                                                                                                                      |
| 0000-1000          | A16              | Compressor short circuit                  | A short circuit occurred in the compressor or in the power cable to the compressor.                                                                            |
| 0000-2000          | A33              | Voltage dip                               | Check voltage to ensure constant supply. A power-OFF must not interrupt the load voltage to the appliance.                                                     |
| 0000-4000          | A4               | Voltage imbalance and AC minimum          | This message occurs if a phase is missing or a phase deviates too greatly from the average of the three individual phases. Check power supply and power cable. |
| 0000-8000          |                  | "AMA" (automatic motor adaptation) failed | Calibration to the existing compressor type failed. A communication problem may exist or an incorrect appliance type was selected.                             |
| 0001-0000          | A2               | Undervoltage at analogue input.           | This function is not supported in this appliance series.                                                                                                       |
| 0002-0000          | A38              | Internal inverter fault                   | Check power supply and wiring for possible faults.                                                                                                             |
| 0004-0000          | A26              | Brake overload.                           | This function is not supported in this appliance series.                                                                                                       |
| 0008-0000          | A30              | Phase U missing.                          | Motor voltage U between inverter and compressor missing.                                                                                                       |
| 0010-0000          | A31              | Phase V missing.                          | Motor voltage V between inverter and compressor missing.                                                                                                       |
| 0020-0000          | A32              | Phase W missing.                          | Motor voltage W between inverter and compressor missing.                                                                                                       |
| 0040-0000          | A34              | Fault, bus communication                  | Bus communication failed. Check the wiring.                                                                                                                    |
| 0080-0000          | A47              | Low voltage supply 24 V DC too low.       | Check wiring and power supply.                                                                                                                                 |
| 0100-0000          | A36              | Central fault                             | Check power supply for irregularities.                                                                                                                         |
| 0200-0000          | A48              | 1.8 V power supply too low.               | The power supply in the 1.8 V DC control circuit is too low. Check wiring and power supply.                                                                    |
| 0400-0000          | A25              | Braking resistor                          | This function is not enabled. This message indicates that the brake function is faulty. The inverter can still be actuated and is functioning.                 |
| 0800-0000          | A27              | Brake IGBT                                | This function is not enabled. This message indicates that the output for the brake function is faulty. The inverter can still be actuated and is operational.  |
| 1000-0000          | A67              | Setting changes have been carried out.    | After setting changes, the inverter was not reset with a voltage reset.                                                                                        |

## Repair instructions

### WPE-I xx H 400 Premium

| Fault code 1 (hex) | Fault code (dec) | Designation               | Remedy                                                                                                                                                                                                                              |
|--------------------|------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2000-0000          | A80              | Inverter was reset.       | The inverter has been reset to the factory setting. A power reset is required.                                                                                                                                                      |
| 4000-0000          | A68              | Safety stop               | <p>The "Safety stop" function on the BM card has responded. Terminal 37 on the inverter is supplied with 24 V and the message is generated.</p>  |
| 8000-0000          | A63              | Power consumption minimum | The compressor power consumption is too low. The required current for the "Release brake" function was not reached.                                                                                                                 |

## Repair instructions

### WPE-I xx H 400 Premium

| Fault code 2<br>(hex) | Fault code<br>(dec) | Designation                          | Remedy                                                                                                                                         |
|-----------------------|---------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 0000-0020             |                     | No flow rate                         | This function is not implemented on the inverter.                                                                                              |
| 0000-0040             |                     | Pump dry running                     | This function is not implemented on the inverter.                                                                                              |
| 0000-0080             |                     | End of curve                         | This function is not implemented on the inverter.                                                                                              |
| 0000-0100             |                     | Operation outside curve              | This function is not implemented on the inverter.                                                                                              |
| 0000-0200             | A19                 | Hot gas temperature, maximum         | This function is not implemented on the inverter.                                                                                              |
| 0000-0400             | A18                 | Compressor start failed.             | After the compressor start, the compressor could not be accelerated to the defined speed. A mechanical compressor fault may have occurred.     |
| 0000-0800             | W49                 | Speed limit.                         | This message is displayed if the compressor is not in the specified speed band.                                                                |
| 0000-1000             |                     | External lock                        | This function is not implemented on the inverter.                                                                                              |
| 0000-2000             |                     | Setting combination not permissible. | This function is not implemented on the inverter.                                                                                              |
| 0000-4000             | A84                 | No safety option selected.           | This function is not implemented on the inverter.                                                                                              |
| 0002-0000             |                     | KTY fault                            | This function is not implemented on the inverter.                                                                                              |
| 0004-0000             |                     | Fan fault                            | This function is not implemented on the inverter.                                                                                              |
| 0008-0000             |                     | ECB Fault                            | This function is not implemented on the inverter.                                                                                              |
| 0200-0000             | A59                 | Current AC maximum                   | The power consumption of the compressor is higher than that selected in the inverter settings. Mechanical compressor damage may have occurred. |
| 2000-0000             | A90                 | Encoder loss                         | This function is not implemented on the inverter.                                                                                              |
| 4000-0000             | A74                 | PTC thermistor                       | This function is not implemented on the inverter.                                                                                              |
| 8000-0000             | A72                 | Safety alarm                         | Trip lock fault. One or more safety related inverter faults have occurred.                                                                     |

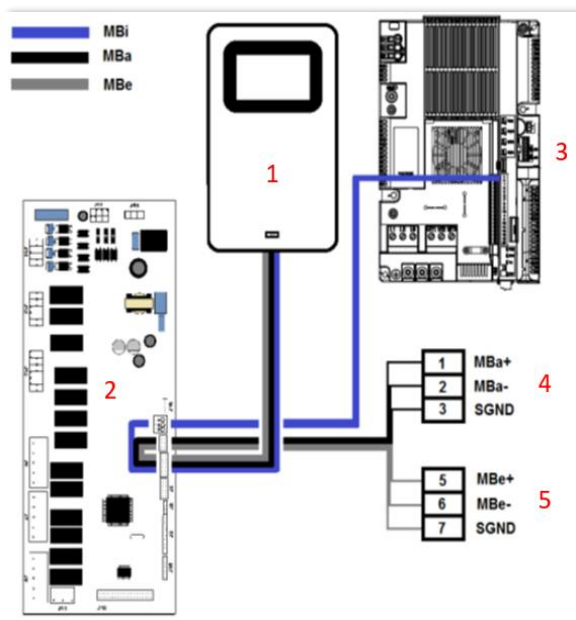
## Repair instructions

### WPE-I xx H 400 Premium

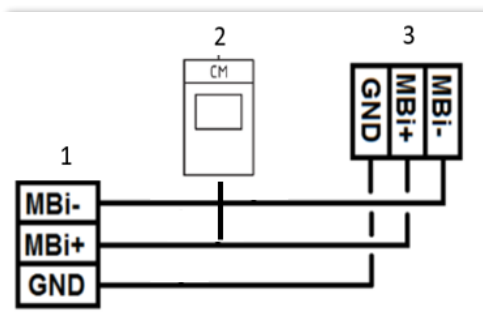
## 9. Further information on troubleshooting and fault rectification

### 9.1 Modbus communication malfunctioning

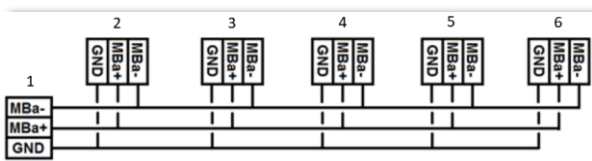
All communication objects are connected via Modbus. Within the Modbus connection, there is always one master (generally the CM module of the first heat pump) and up to 247 slaves with a Modbus ID number from 1 – 247. Slaves are BM modules, inverters or EM3 modules. Maximum 16 heat pumps are enabled. Within a cascade, the first heat pump is the master heat pump. All other heat pumps are slave appliances. A direct external actuation of the heat pumps is not enabled and only permitted with an ISG. Slaves always reply to the master with information. If the "master" heat pump fails, the entire cascade will not function.



| Number | Designation                                                                                                                                                             |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | CM module (master)                                                                                                                                                      |
| 2      | BM module (slave)                                                                                                                                                       |
| 3      | Inverter (slave)                                                                                                                                                        |
| 4      | MBa bus (slave)                                                                                                                                                         |
| 5      | MBe bus (slave)                                                                                                                                                         |
| MBi    | Modbus internal<br>Communication between CM module, BM module and inverter                                                                                              |
| MBa    | Modbus accessory<br>Communication between CM module and accessories (EM3, room sensor)                                                                                  |
| MBe    | Modbus external<br>A higher ranking control unit can be connected (building management system). The appliance can then be controlled via Modbus RTU (RS-485) or TCP/IP. |



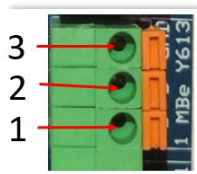
| Modbus, internal (MBi) |                                        |
|------------------------|----------------------------------------|
| 1                      | BM card                                |
| 2                      | CM card (connected to RJ45 on BM card) |
| 3                      | Inverter (slave)                       |



| Modbus accessory (MBa) example |                                  |
|--------------------------------|----------------------------------|
| 1                              | BM card (master heat pump!)      |
| 2                              | EM card for DHW functions        |
| 3                              | EM card for cooling mode         |
| 4                              | EM card for pool                 |
| 5                              | EM card for legacy heat pump 1+2 |
| 6                              | EM card for legacy heat pump 3+4 |

## Repair instructions

### WPE-I xx H 400 Premium



MBe



RJ45

#### Modbus external (MBe):

In the case of a connection to a higher ranking control unit, the CM module is also a slave!

Activation and settings are carried out via Main menu > Settings > Building management system  
Modbus = RTU

If TCP/IP is selected, communication is via the RJ45 socket on the CM module. The MBe connections are no longer active. An ISG can be used.

Address = 1 - 247

Baud rate = 2400 - 115,200 baud

Parity = even, none, odd

Stop bits are set based on the parity.

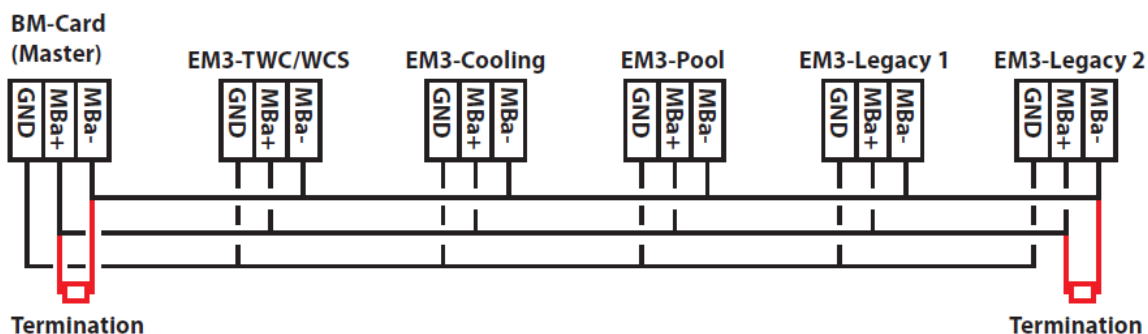
The Settings > Communication analysis parameter shows the quality of the Modbus connection. The quality is calculated according to the following formula:

Quality = packages (transmitted packages to the slaves) / packages + fault (incorrect or faulty replies from slaves) + time-outs (no replies or replies too late from slaves)

In the event of communication faults, check the following

- Check wiring for lead break or short circuit
- Check connection settings (baud rate, address, parity and stop bits)
- Time-out time set too low?
- Earth contacts for bus subscribers correctly wired?
- Incorrect bus subscriber polarity? (+/-, A/B)
- More than one master in the bus connection? Subscribers with the same ID in the system?

To achieve the maximum signal strength, the predefined jumper for the used function should be set at the end of a MBa2 or MBe network. The wiring diagram looks like this:



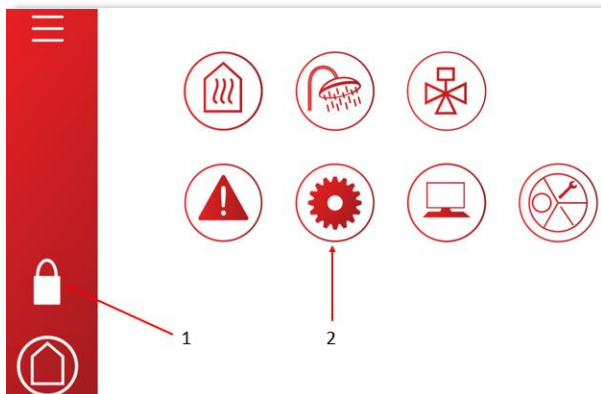
## Repair instructions

### WPE-I xx H 400 Premium

#### 10. Checking components

##### 10.1 Relay test

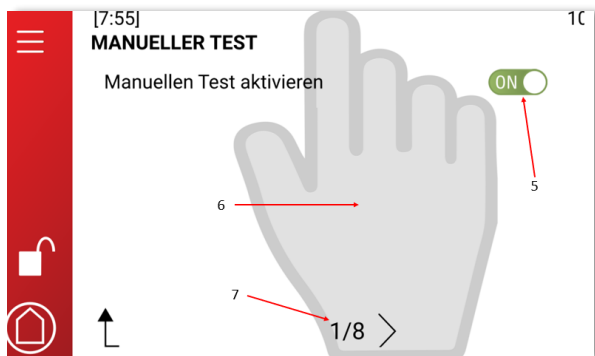
Once a code has been entered, a relay test can be carried out on the system control unit in parameter "Manual test".



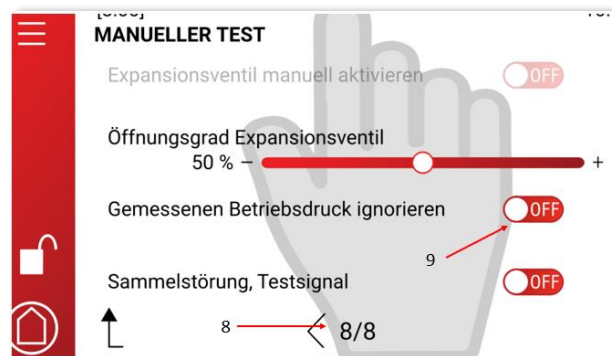
- 1 – Enter code
- 2 – Select system control unit



- 3 – Scroll to page 5
- 4 – Select manual test



- 5 – To switch on relay test, move the DIP switch from "Off" to "On".
- 6 – The active relay test is indicated by a "hand symbol".
- 7 – Scroll through the menu to select and switch on the individual outputs manually.

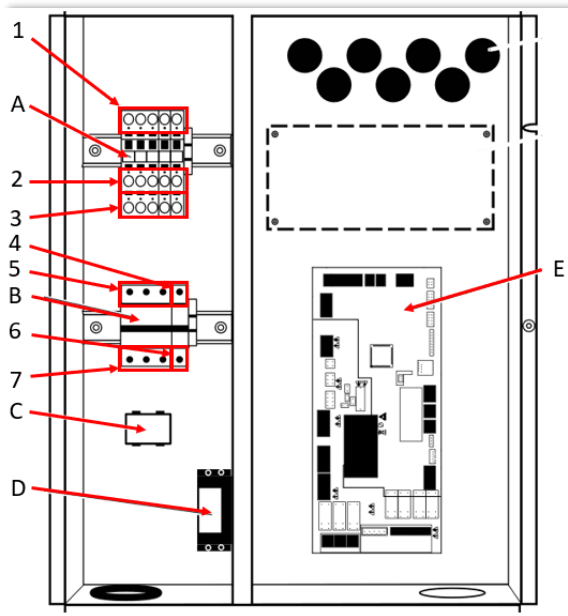


- 8 – Page 8
- 9 – If the function "Ignore operating pressure" is selected on page 8, the high pressure transducer is ignored. A safety shutdown is only carried out via the high pressure switch.

## Repair instructions

### WPE-I xx H 400 Premium

#### 10.2 Voltage measurements



| Position | Designation                                                      |
|----------|------------------------------------------------------------------|
| A        | Mains terminal, 400 V, N, Pe                                     |
| B        | 10 A circuit breaker (3 + 1)                                     |
| C        | EMC filter                                                       |
| D        | Transformer 230 V AC – 24 V AC                                   |
| E        | BM module                                                        |
| 1        | Mains voltage input, 400 V, N, Pe                                |
| 2        | Low voltage output for control. L1, L2, L3, N, Pe                |
| 3        | 400 V, Pe – output for inverter                                  |
| 4        | L1 input for power supply to BM module and 24 V AC transformer.  |
| 5        | L1, L2, L3 voltage input for relay outputs FR4 – FR 7            |
| 6        | L1 output for power supply to BM module and 24 V AC transformer. |
| 7        | L1, L2, L3 voltage output for relay outputs FR4 – FR 7           |

Power is supplied via a power cable to the appliance. Power must not be interrupted, for example, during a power supply utility blocking time.

When the power supply is interrupted during operation, the following occurs:

- Pumps are no longer actuated. Heat transfer to the system is no longer guaranteed. There is no frost protection.
- Calculation of the heating/cooling integrals is interrupted. Once power is restored, the heating and cooling requirements are recalculated. The heat pump restarts with a delay.
- If the power supply is interrupted when the compressor is in operation, the inverter could be overloaded and irreparably damaged.

## Repair instructions

### WPE-I xx H 400 Premium

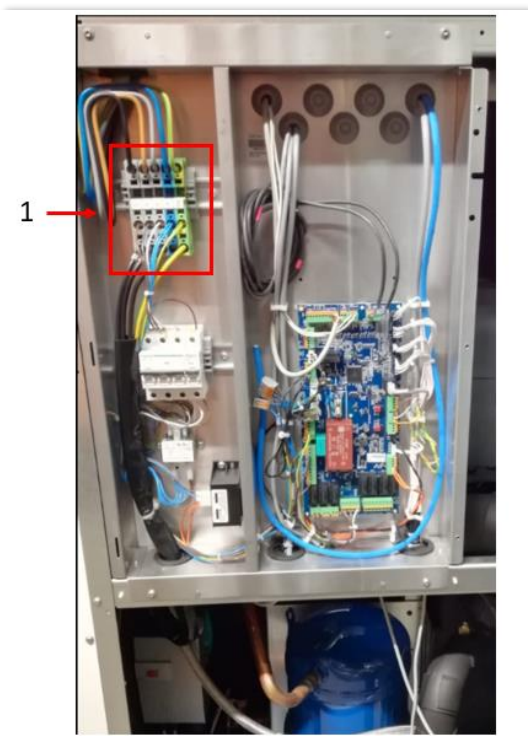
#### 11. Special repair guidelines

##### 11.1 Inverter replacement

Before opening the casing, switch off the power supply to the appliance for at least five minutes and take precautions to prevent startup. In versions A and B, the inverter is behind the back panel. In versions C and D, the inverter is located behind the left side panel. Specialised expertise is required when replacing this component. The zero volt state of the electronic components must always be ascertained after opening the casing.

The inverter was replaced in May 2020. From the new model, the SOA parameters have been adjusted to the new compressor. Expansion valve control is also adjusted when the new inverter software is detected. It is not permissible to use an inverter with a date of manufacture from May 2020 in appliances before April 2020. If this cannot be avoided, then the compressor must also be replaced by the current model.

1. Remove the front cover and the internal control panel cover and check the zero volt state at the connection (1).
2. Remove the left side panel. In versions A and B, remove 3x TX20 screws at the front and back. In versions C and D, three screws are inserted at the front. At the back, the panel is hooked into a guide. Once the screws have been removed, the side section must be pulled forward.



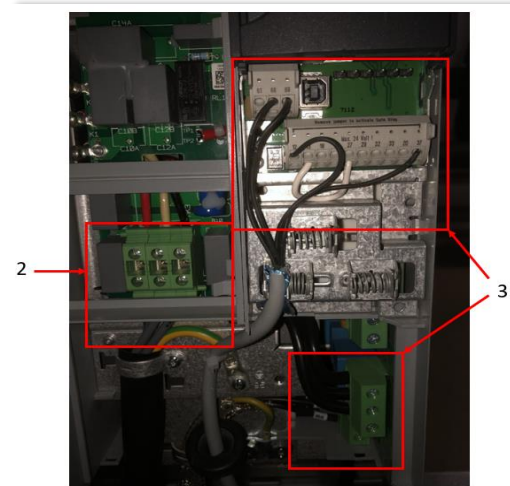
## Repair instructions

### WPE-I xx H 400 Premium

- Only the back panel needs to be removed in versions A and B. Remove the six TX20 screws.



- Disconnect the compressor connecting cable at the compressor (1), the inverter power cable (2) and all other cables (3) at the inverter.



- Remove the two TX20 screws to loosen and tilt the inverter support plate.



- Once the four retaining nuts have been removed, the inverter can now be replaced.



Assemble in reverse order.

## Repair instructions

### WPE-I xx H 400 Premium

#### 11.2 Compressor replacement

Before opening the casing, switch off the power supply to the appliance for at least five minutes and take precautions to prevent startup. Work on the refrigerant circuit must be carried out by qualified and trained persons as specified.

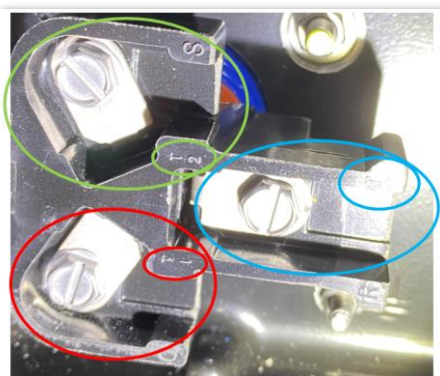
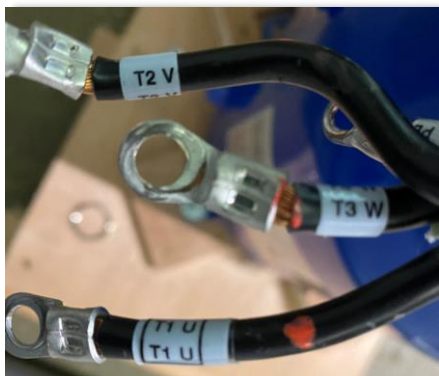
Before and after repairs to the refrigerant circuit, the refrigerant circuit data must be fully documented and stored with the order.

Based on the weight of the compressor, use an appropriate tool and auxiliary aids to carry out repairs. The filter dryer, and the expansion valve if required, should always be replaced too.

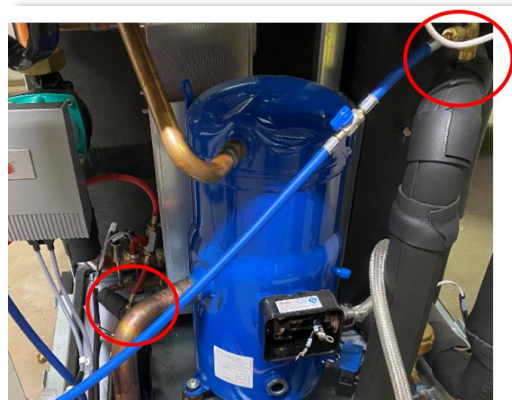
Compressors and inverters have been replaced from May 2020. The current compressor can be used in appliances with a date of manufacture up to April 2020. In appliances manufactured after May 2020, a compressor assigned to this date of manufacture must be used.

The following process is recommended when replacing a compressor:

- Switch off the power, open the appliance and check the zero fault state.
- Disconnect the compressor from the power supply. The power cable is labelled. The wires are also labelled in the compressor junction box. Remove the oil lubrication solenoid valve.



- Draw off refrigerant subject to specification into a container for disposal or recycling. Determine the drawn amount using scales. Use both service valves.

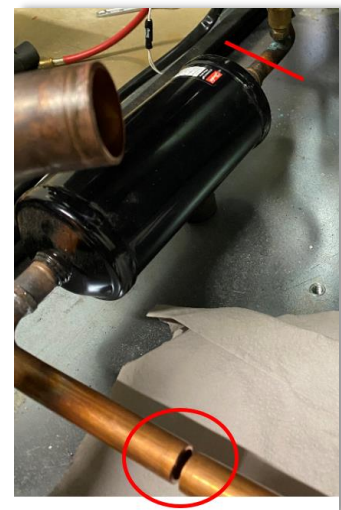


## Repair instructions WPE-I xx H 400 Premium

- Purge the refrigerant circuit with nitrogen.



- Use a pipe cutter to separate the filter dryer and compressor from the refrigerant circuit at a suitable place. To reduce the number of female connections, it is possible to unsolder the suction gas pipe for the compressor. The suction gas pipe is connected with a flexible pipe. The pipe has a generous range of movement.



## Repair instructions

### WPE-I xx H 400 Premium

- Prepare pipe connections depending on the point of separation (deburr and clean) and install the new compressor and filter dryer.
- For soldering, cover all temperature critical parts with a wet cloth and unscrew the element from the service valve if required. While adding nitrogen, solder the prepared connections with brazing solder (silver solder recommended).



- Pressure test with nitrogen at approx. 15 bar to ensure tightness.
- Evacuate the refrigerant circuit up to the daily limit vacuum.
- Purge the refrigerant circuit with nitrogen and evacuate again to the daily limit vacuum.
- Then fill the system with the refrigerant charge volume specified on the type plate. Take refrigerant from the refrigerant bottle in liquid form and add it in gas form.
- Install insulation and electrical connections and commission the appliance.

#### 11.3 Evaporator replacement

Before opening the casing, switch off the power supply to the appliance for at least five minutes and take precautions to prevent startup. Work on the refrigerant circuit must be carried out by qualified and trained persons as specified.

Before and after repairs to the refrigerant circuit, the refrigerant circuit data must be fully documented and stored with the order. Based on the weight of the evaporator, use an appropriate tool and auxiliary aids to carry out repairs. Always replace the filter dryer.

The evaporator is located behind the right side panel. Before cutting out the brine line, shut off the brine circuit. The BDF valve (ball drain & fill valve, see figure 1) can be used to drain any brine from the appliance in a controlled manner.

Pipes that carry brine are connected by means of hoses. We recommend removing the hoses and unsoldering the pipes from the evaporator while detached (figure 2).

## Repair instructions WPE-I xx H 400 Premium

The pipes from the refrigerant circuit should be unsoldered from the evaporator while still installed. Ensure that the expansion valve is kept cold (figure 2).



Fig. 1

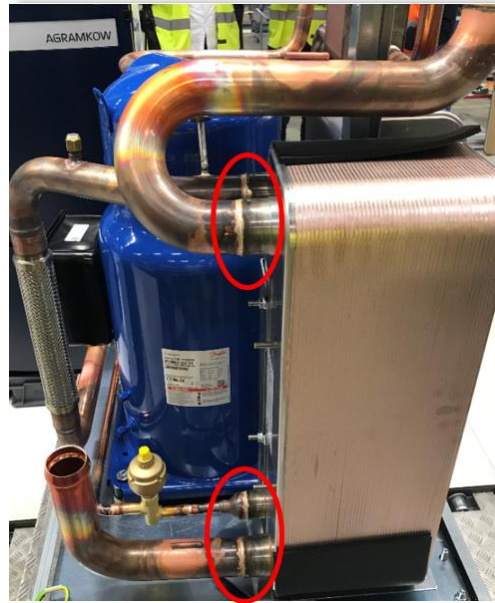


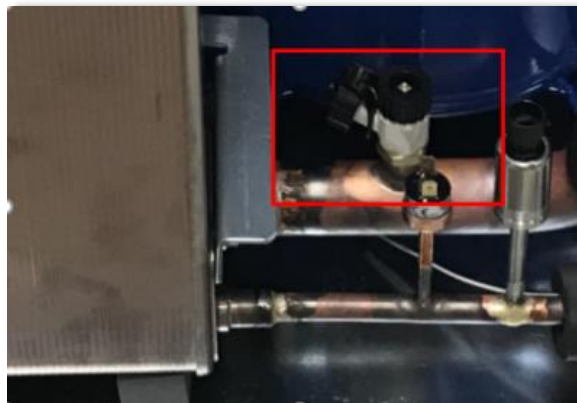
Fig. 2

### 11.4 Condenser replacement

Before opening the casing, switch off the power supply to the appliance for at least five minutes and take precautions to prevent startup. Work on the refrigerant circuit must be carried out by qualified and trained persons as specified.

Before and after repairs to the refrigerant circuit, the refrigerant circuit data must be fully documented and stored with the order. Based on the weight of the condenser, use an appropriate tool and auxiliary aids to carry out repairs. Always replace the filter dryer.

The condenser is located behind the left side panel. Before cutting out the heating circuit line, shut off the heating circuit. The BDF valve (ball drain & fill valve, see figure) can be used to drain any heating water from the appliance in a controlled manner.



## Repair instructions

### WPE-I xx H 400 Premium

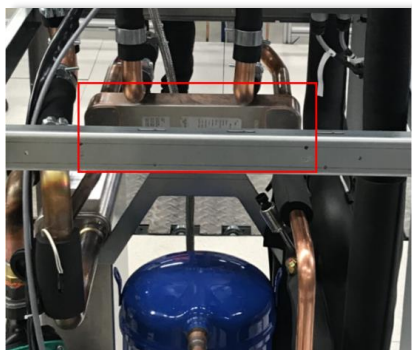
#### 11.5 Hot gas heat exchanger replacement

Before opening the casing, switch off the power supply to the appliance for at least five minutes and take precautions to prevent startup. Work on the refrigerant circuit must be carried out by qualified and trained persons as specified.

Before and after repairs to the refrigerant circuit, the refrigerant circuit data must be fully documented and stored with the order.

Use an appropriate tool and auxiliary aids to carry out repairs. Always replace the filter dryer. The hot gas heat exchanger is located in the centre of the appliance above the condenser. Before cutting out the heating circuit line, shut off the heating circuit. There is no separate drain valve for draining the heat exchanger.

Image from version A, B:



#### 11.6 Expansion valve replacement

Before opening the casing, switch off the power supply to the appliance for at least five minutes and take precautions to prevent startup. Work on the refrigerant circuit must be carried out by qualified and trained persons as specified.

Before and after repairs to the refrigerant circuit, the refrigerant circuit data must be fully documented and stored with the order. If such repairs are carried out, the filter dryer should always be replaced too. The expansion valve is located at the bottom, at the front right of the appliance. Ensure the correct spare part is used.

Version A, B



Version C, D



## Repair instructions

### WPE-I xx H 400 Premium

#### 11.7 Pressure sensor replacement

Before opening the casing, switch off the power supply to the appliance for at least five minutes and take precautions to prevent startup. Work on the refrigerant circuit must be carried out by qualified and trained persons as specified. Before and after repairs to the refrigerant circuit, the refrigerant circuit data must be fully documented and stored with the order. If such repairs are carried out, the filter dryer should always be replaced too.

The position of pressure sensors is documented in the appliance overview. The high and low pressure sensors look the same but the pressure range is different. Never interchange the sensors.

#### 11.8 Circulation pump replacement

Before opening the casing, switch off the power supply to the appliance for at least five minutes and take precautions to prevent startup.

Before replacing the buffer/DHW charging pump, shut off the heating circuit. The BDF valve (ball drain & fill valve, see figure in section 11.4) can be used to drain any heating water from the appliance in a controlled manner.

Before replacing the brine circulation pump, shut off the brine circuit. The BDF valve (ball drain & fill valve, see figure 1, section 11.3) can be used to drain any brine from the appliance in a controlled manner

#### 11.9 Accessing the refrigerant circuit

The refrigerant circuit should only be accessed if all other possible fault causes have been ruled out. Before work is started, refrigerant circuit data must be documented and compared with the following table.

Key points of some refrigerant circuit data at 10 K superheating and 0 K supercooling. To EN 12900.

| Model                   | rpm  | rps | To | -25   |      | -20   |       | -15   |       | -10   |       | -5    |       | 0     |       | 5     |       | 10    |       | 15    |       |
|-------------------------|------|-----|----|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                         |      |     | Tc | Qo    | Pe   | Qo    | Pe    | Qo    | Pe    | Qo    | Pe    | Qo    | Pe    | Qo    | Pe    | Qo    | Pe    | Qo    | Pe    | Qo    | Pe    |
|                         |      |     |    |       |      |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VZH088AG (version A, B) | 1500 | 25  | 20 | -     | -    | 5400  | 1.47  | 6600  | 1.54  | 8100  | 1.62  | 9800  | 1.68  | 11800 | 1.67  | 14000 | 1.55  | -     | -     | -     | -     |
|                         |      |     | 30 | -     | -    | 4800  | 2.04  | 6000  | 2.01  | 7400  | 2.03  | 9000  | 2.08  | 10800 | 2.1   | 12900 | 2.07  | 15300 | 1.95  | 17900 | 1.69  |
|                         |      |     | 40 | -     | -    | 4200  | 2.92  | 5300  | 2.74  | 6600  | 2.66  | 8100  | 2.65  | 9800  | 2.67  | 11700 | 2.69  | 13800 | 2.65  | 16200 | 2.54  |
|                         |      |     | 50 | -     | -    | -     | -     | 4500  | 3.79  | 5700  | 3.57  | 7000  | 3.47  | 8500  | 3.44  | 10200 | 3.46  | 12100 | 3.47  | 14300 | 3.45  |
|                         |      |     | 60 | -     | -    | -     | -     | -     | -     | -     | -     | 5700  | 4.59  | 7000  | 4.47  | 8500  | 4.45  | 10100 | 4.47  | 11900 | 4.5   |
|                         |      |     | 68 | -     | -    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     |
|                         | 3600 | 60  | 20 | 11300 | 4.19 | 13800 | 4.26  | 16800 | 4.34  | 20300 | 4.42  | 24500 | 4.53  | 29300 | 4.65  | 34800 | 4.8   | -     | -     | -     | -     |
|                         |      |     | 30 | 9800  | 5.04 | 12200 | 5.11  | 15000 | 5.18  | 18300 | 5.26  | 22200 | 5.36  | 26700 | 5.47  | 31800 | 5.6   | 37600 | 5.75  | 44200 | 5.93  |
|                         |      |     | 40 | -     | -    | 10700 | 6.21  | 13300 | 6.27  | 16300 | 6.34  | 19900 | 6.42  | 23900 | 6.51  | 28500 | 6.61  | 33800 | 6.74  | 39800 | 6.89  |
|                         |      |     | 50 | -     | -    | -     | -     | 11500 | 7.75  | 14200 | 7.79  | 17300 | 7.84  | 20900 | 7.91  | 25000 | 7.98  | 29700 | 8.08  | 35000 | 8.19  |
|                         |      |     | 60 | -     | -    | -     | -     | -     | -     | -     | -     | 14400 | 9.77  | 17500 | 9.8   | 21000 | 9.84  | 25000 | 9.89  | 29600 | 9.96  |
|                         |      |     | 68 | -     | -    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | 17300 | 11.76 | 20800 | 11.78 | 24800 | 11.81 |
|                         | 6000 | 100 | 20 | -     | -    | 22500 | 7.65  | 27400 | 7.96  | 33200 | 8.31  | 40000 | 8.71  | 48000 | 9.18  | 57100 | 9.72  | -     | -     | -     | -     |
|                         |      |     | 30 | -     | -    | 20200 | 9.04  | 24900 | 9.28  | 30400 | 9.56  | 36700 | 9.88  | 44100 | 10.25 | 52500 | 10.68 | 62100 | 11.18 | 73000 | 11.77 |
|                         |      |     | 40 | -     | -    | 18100 | 10.85 | 22300 | 11.02 | 27300 | 11.21 | 33100 | 11.44 | 39800 | 11.71 | 47400 | 12.02 | 56200 | 12.4  | 66000 | 12.85 |
|                         |      |     | 50 | -     | -    | -     | -     | 19500 | 13.35 | 23900 | 13.46 | 29000 | 13.59 | 34900 | 13.74 | 41600 | 13.94 | 49300 | 14.18 | 58000 | 14.49 |

## Repair instructions

### WPE-I xx H 400 Premium

|                      |      |     |    |       |      |       |       |       |       |       |       |       |       |       |       |        |       |        |       |        |       |
|----------------------|------|-----|----|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------|-------|--------|-------|
|                      |      |     | 60 | -     | -    | -     | -     | -     | -     | -     | -     | 24200 | 16.5  | 29100 | 16.54 | 34800  | 16.61 | 41300  | 16.72 | 48800  | 16.87 |
|                      |      |     | 68 | -     | -    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -      | -     | -      | -     | -      | -     |
| VZH117AG (version C) | 1500 | 25  | 20 | -     | -    | 7200  | 1.93  | 8900  | 2.03  | 10800 | 2.13  | 13100 | 2.2   | 15800 | 2.19  | 18800  | 2.04  | -      | -     | -      | -     |
|                      |      |     | 30 | -     | -    | 6400  | 2.68  | 8000  | 2.64  | 9900  | 2.67  | 12100 | 2.73  | 14500 | 2.76  | 17300  | 2.72  | 20500  | 2.56  | 24100  | 2.22  |
|                      |      |     | 40 | -     | -    | 5600  | 3.83  | 7100  | 3.59  | 8900  | 3.49  | 10900 | 3.48  | 13100 | 3.51  | 15700  | 3.53  | 18600  | 3.49  | 21800  | 3.33  |
|                      |      |     | 50 | -     | -    | -     | -     | 6100  | 4.97  | 7700  | 4.69  | 9400  | 4.55  | 11500 | 4.52  | 13700  | 4.54  | 16300  | 4.56  | 19100  | 4.54  |
|                      |      |     | 60 | -     | -    | -     | -     | -     | -     | -     | -     | 7700  | 6.02  | 9400  | 5.88  | 11400  | 5.84  | 13500  | 5.87  | 16000  | 5.92  |
|                      |      |     | 68 | -     | -    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -      | -     | -      | -     | -      | -     |
|                      |      |     | 20 | 15100 | 5.5  | 18500 | 5.59  | 22500 | 5.69  | 27300 | 5.81  | 32900 | 5.95  | 39300 | 6.11  | 46700  | 6.3   | -      | -     | -      | -     |
|                      | 3600 | 60  | 30 | 13100 | 6.63 | 16400 | 6.71  | 20200 | 6.81  | 24600 | 6.91  | 29800 | 7.04  | 35800 | 7.18  | 42600  | 7.35  | 50400  | 7.55  | 59300  | 7.78  |
|                      |      |     | 40 | -     | -    | 14400 | 8.16  | 17900 | 8.24  | 21900 | 8.33  | 26700 | 8.43  | 32100 | 8.55  | 38300  | 8.69  | 45400  | 8.85  | 53400  | 9.05  |
|                      |      |     | 50 | -     | -    | -     | -     | 15500 | 10.17 | 19100 | 10.23 | 23200 | 10.3  | 28000 | 10.38 | 33600  | 10.48 | 39900  | 10.61 | 47000  | 10.76 |
|                      |      |     | 60 | -     | -    | -     | -     | -     | -     | -     | -     | 19300 | 12.83 | 23400 | 12.87 | 28100  | 12.92 | 33600  | 12.99 | 39800  | 13.09 |
|                      |      |     | 68 | -     | -    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | 23200  | 15.44 | 27900  | 15.47 | 33300  | 15.51 |
|                      |      |     | 20 | -     | -    | 30200 | 10.05 | 36800 | 10.45 | 44600 | 10.91 | 53700 | 11.44 | 64400 | 12.05 | 76600  | 12.76 | -      | -     | -      | -     |
|                      |      |     | 30 | -     | -    | 27200 | 11.88 | 33400 | 12.19 | 40700 | 12.55 | 49300 | 12.97 | 59200 | 13.46 | 70500  | 14.02 | 83400  | 14.68 | 98000  | 15.45 |
|                      | 6000 | 100 | 40 | -     | -    | 24200 | 14.25 | 30000 | 14.47 | 36700 | 14.73 | 44500 | 15.02 | 53400 | 15.37 | 63700  | 15.79 | 75400  | 16.29 | 88600  | 16.88 |
|                      |      |     | 50 | -     | -    | -     | -     | 26200 | 17.54 | 32100 | 17.68 | 38900 | 17.84 | 46800 | 18.05 | 55800  | 18.31 | 66100  | 18.63 | 77900  | 19.03 |
|                      |      |     | 60 | -     | -    | -     | -     | -     | -     | -     | -     | 32400 | 21.67 | 39000 | 21.72 | 46700  | 21.81 | 55400  | 21.95 | 65500  | 22.16 |
|                      |      |     | 68 | -     | -    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -      | -     | -      | -     | -      | -     |
| VZH170AG (version D) | 1500 | 25  | 20 | -     | -    | 11200 | 3.1   | 13600 | 3.07  | 16400 | 3.05  | 19800 | 2.98  | 23600 | 2.84  | 28100  | 2.6   | -      | -     | -      | -     |
|                      |      |     | 30 | -     | -    | 9900  | 4.02  | 12200 | 3.96  | 14900 | 3.95  | 18000 | 3.95  | 21600 | 3.93  | 25800  | 3.85  | 30500  | 3.68  | 35800  | 3.39  |
|                      |      |     | 40 | -     | -    | 8500  | 5.29  | 10600 | 5.11  | 13100 | 5.03  | 16000 | 5.01  | 19200 | 5.02  | 23000  | 5.03  | 27300  | 5     | 32200  | 4.89  |
|                      |      |     | 50 | -     | -    | -     | -     | 8900  | 6.72  | 11000 | 6.5   | 13600 | 6.38  | 16400 | 6.34  | 19800  | 6.35  | 23600  | 6.37  | 27900  | 6.36  |
|                      |      |     | 60 | -     | -    | -     | -     | -     | -     | -     | -     | 10800 | 8.24  | 13200 | 8.07  | 16000  | 8     | 19200  | 7.99  | 22900  | 8.01  |
|                      |      |     | 68 | -     | -    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -      | -     | -      | -     | -      | -     |
|                      | 3600 | 60  | 20 | 22900 | 7.46 | 27500 | 7.63  | 33000 | 7.81  | 39700 | 7.98  | 47700 | 8.12  | 57000 | 8.19  | 67700  | 8.18  | -      | -     | -      | -     |
|                      |      |     | 30 | 20200 | 9.38 | 24600 | 9.47  | 29900 | 9.61  | 36200 | 9.78  | 43600 | 9.94  | 52300 | 10.08 | 62300  | 10.17 | 73800  | 10.2  | 86800  | 10.12 |
|                      |      |     | 40 | -     | -    | 21900 | 11.86 | 26800 | 11.9  | 32500 | 12.01 | 39300 | 12.15 | 47100 | 12.3  | 56200  | 12.44 | 66600  | 12.54 | 78500  | 12.58 |
|                      |      |     | 50 | -     | -    | -     | -     | 23400 | 14.82 | 28500 | 14.81 | 34300 | 14.87 | 41200 | 14.97 | 49200  | 15.1  | 58400  | 15.23 | 68900  | 15.33 |
|                      |      |     | 60 | -     | -    | -     | -     | -     | -     | -     | -     | 28500 | 18.23 | 34200 | 18.23 | 40900  | 18.3  | 48700  | 18.4  | 57700  | 18.51 |
|                      |      |     | 68 | -     | -    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | 33200  | 21.33 | 39800  | 21.37 | 47400  | 21.45 |
|                      | 6000 | 100 | 20 | -     | -    | 45100 | 13.28 | 54800 | 13.87 | 66400 | 14.52 | 80100 | 15.27 | 95900 | 16.18 | 114200 | 17.3  | -      | -     | -      | -     |
|                      |      |     | 30 | -     | -    | 39900 | 16.27 | 49000 | 16.84 | 59800 | 17.39 | 72400 | 17.97 | 87000 | 18.62 | 103700 | 19.39 | 122800 | 20.34 | 144500 | 21.51 |
|                      |      |     | 40 | -     | -    | 35600 | 19.83 | 44100 | 20.45 | 53900 | 20.97 | 65300 | 21.44 | 78500 | 21.91 | 93500  | 22.42 | 110800 | 23.03 | 130300 | 23.78 |
|                      |      |     | 50 | -     | -    | -     | -     | 38900 | 24.85 | 47700 | 25.42 | 57800 | 25.86 | 69400 | 26.22 | 82700  | 26.55 | 97800  | 26.89 | 115000 | 27.29 |
|                      |      |     | 60 | -     | -    | -     | -     | -     | -     | -     | -     | 48900 | 31.4  | 58800 | 31.73 | 70100  | 31.94 | 83100  | 32.09 | 97900  | 32.23 |
|                      |      |     | 68 | -     | -    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -      | -     | -      | -     | -      | -     |

## Repair instructions

### WPE-I xx H 400 Premium

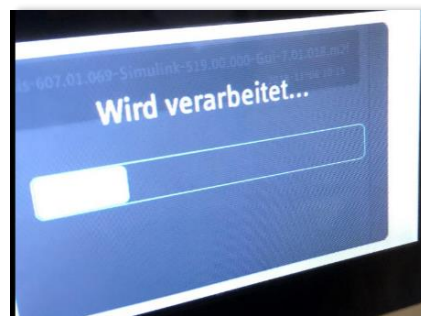
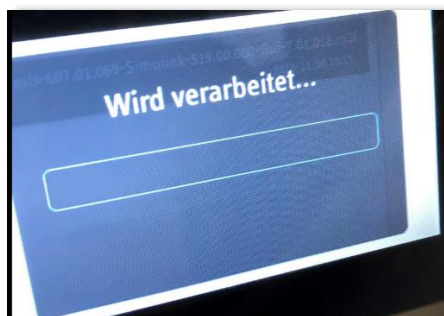
| Symbol | Meaning                       | Symbol | Meaning                 |
|--------|-------------------------------|--------|-------------------------|
| To     | Evaporation temperature in °C | Qo     | Cooling capacity in W   |
| Tc     | Condensing temperature in °C  | Pe     | Power consumption in kW |

#### 11.10 Software update

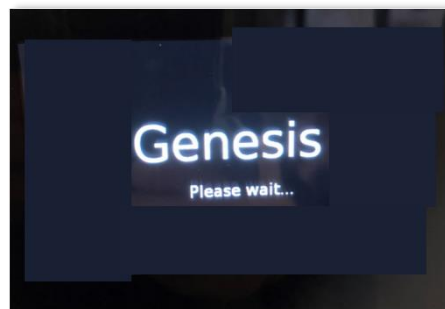
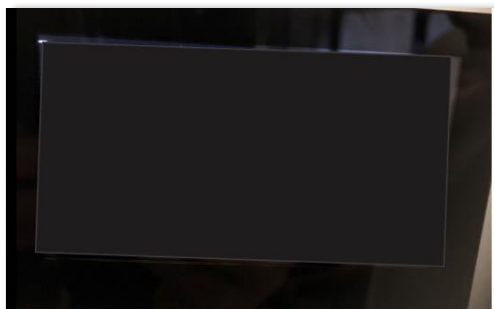
A software update always contains the software package for all connected PCBs. This means that the software updates the CM card, BM card and any connected EM cards. As soon as a USB stick with usable software in the main directory is inserted into the USB port on the back of the CM card, the update compatibility is displayed:



To load the displayed software, confirm with "O.K.". The update progress is displayed:



After a successful update, the controller restarts.



The appliance must not be disconnected from the power supply during the update.  
Information about the software version used can be found under:  
Display menu – Process data – Version information

## Repair instructions

### WPE-I xx H 400 Premium

## 12. Software versions

### 12.1 Minimum software versions

| Control                                 | Software version |
|-----------------------------------------|------------------|
| CM card, appliances up to December 2018 | 1.00.004         |
| CM card, appliances from January 2019   | 1.00.007         |
| CM card, appliances from January 2020   | STE 2.00.000     |
| BM card (also includes the EM3 card)    | 7.01.168         |
| ISG                                     | 10.2.0           |

### 12.2 Software history

| Version      | Date           | Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.00.004     | April 2019     | Software version at the start of distribution.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 1.00.005     | May 2019       | Small corrections to terms and, in some cases, new translations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.00.006     | September 2019 | Pool control revised.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1.00.007     | November 2019  | Heat pump names matched in the appliance configuration. Recommended minimum software version for appliances up to April 2020. Required minimum software version to enable updating to versions $\geq$ STE 2.00.000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1.01.001     | January 2020   | Text below the menu symbols. Parameter lists rearranged. Process data shows values of EM cards. Information menu can be selected with the "I" button. Touchscreen lock possible. Maximum DHW temperature adjustable up to 60 °C. Mixer circuits 2-5 can cool without EM4 card. Appliance profile is recognised automatically unless the CM card is replaced.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| STE 2.00.000 | September 2020 | Software name changed from m2f to m3f. First, the controller must have at least 1.00.007 software so that this software can be updated. Entire menu structure revised. Recommended minimum software version for appliances from January 2020. External source pump with variable speed. System return sensor can be used. Individual pool heating within a cascade by each slave heat pump. Flow switch can be actuated for each heat pump in a cascade. Current limiter can be connected. Output restriction adjustable. Version A 14-40 kW Version B 16-55 kW Version C 21-90 kW Version D 31-120 kW Buffer systems adjustable. "Change history" parameter available. Monitoring the inverter temperature. Compressor is stepped down when the maximum hot gas temperature is reached (compressor previously stopped immediately). System status can be read out. Functions in manual mode added. |
| STE 2.01.000 | August 2021    | Program function heating, DHW, DHW control, cooling available. Pump for hot gas extraction can be used with variable speed. Buffer system 5 can be set. Network setting revised. Heating/cooling prioritisation can be set. Screed drying program / concrete core activation can be set. Response time of DHW circulation line mixing valve can be set from 2-99 s. Fixed value for heating circuits with mixer 1-5 can be set. External switch-on of internal source pump possible. Stage limit revised (now always uses the lowest in case of simultaneous demand). Compressor continues to run in the manual test unless the expansion valve is actuated manually. Cooling buffer faults are only reported when the cooling function is active. Mixers of heating circuits 2-5 can always be actuated in manual mode and not only when the heating function is active.                           |
| STE 2.02.003 | November 2021  | Compatibility for new processor series K21 BGA Chip.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Repair instructions

### WPE-I xx H 400 Premium

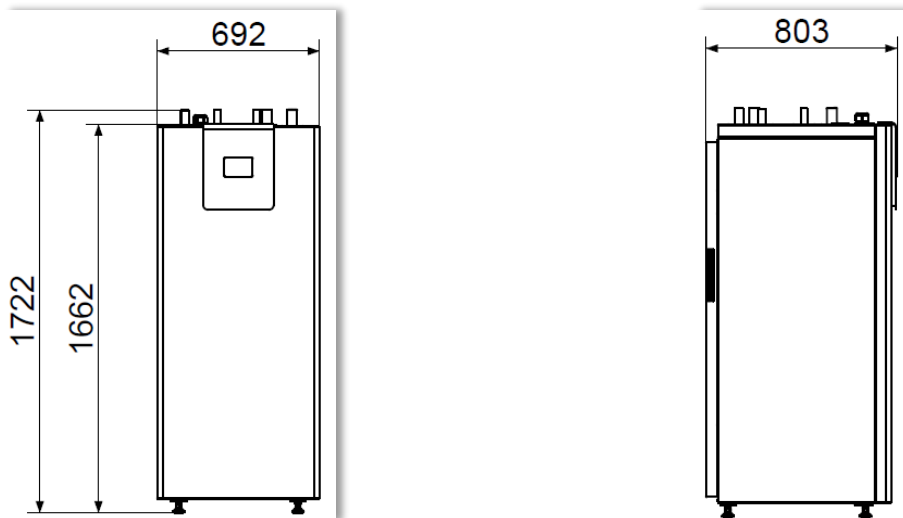
#### 13.Maintenance

For the maintenance of these appliances, observe the maintenance checklist in maintenance manual D0000081136. Work through the maintenance recommendations in the correct order.

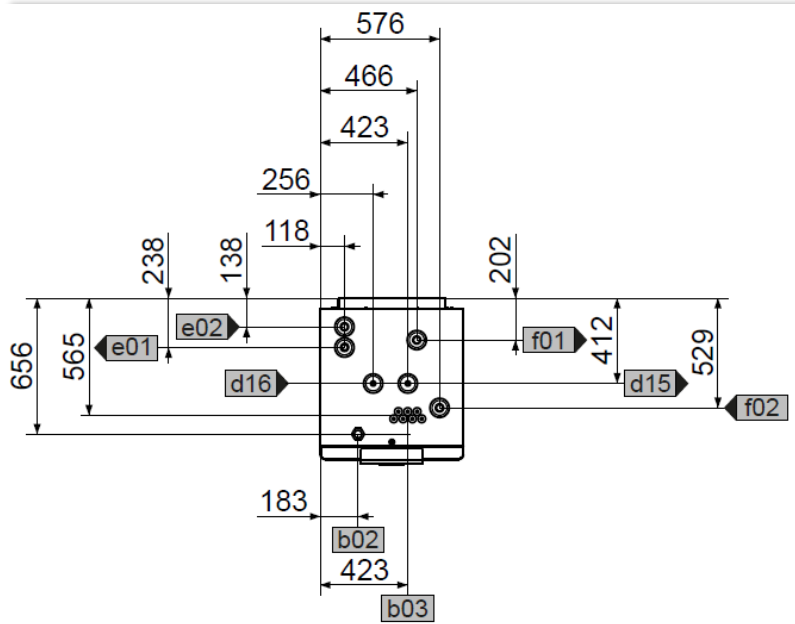
#### 14.Specification

##### 14.1 Dimensions

Version A, B



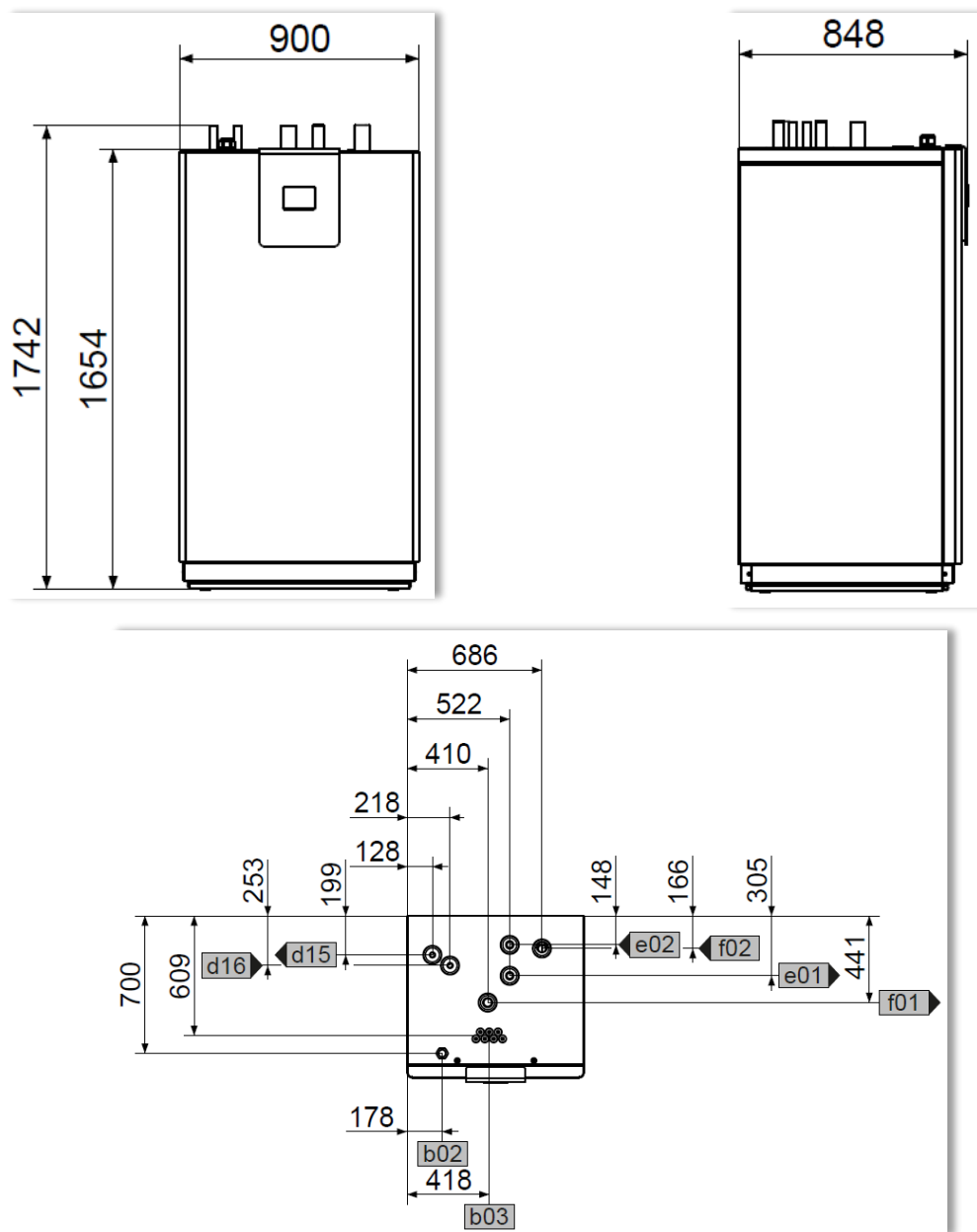
## Repair instructions WPE-I xx H 400 Premium



| Number | Designation                                | Dimension |
|--------|--------------------------------------------|-----------|
| b02    | Feed-through bushing, power cable          |           |
| b03    | Feed-through bushing, sensor and bus cable |           |
| d15    | Flow, hot gas extraction, DHW              | 28 mm Cu  |
| d16    | Return, hot gas extraction, DHW            | 28 mm Cu  |
| e01    | Heating flow                               | 35 mm Cu  |
| e02    | Heating return                             | 35 mm Cu  |
| f01    | Brine outlet                               | 42 mm Cu  |
| f02    | Brine inlet                                | 42 mm Cu  |

## Repair instructions WPE-I xx H 400 Premium

Version C, D



| Number | Designation                                | Dimension |
|--------|--------------------------------------------|-----------|
| b02    | Feed-through bushing, power cable          |           |
| b03    | Feed-through bushing, sensor and bus cable |           |
| d15    | Flow, hot gas extraction, DHW              | 28 mm Cu  |
| d16    | Return, hot gas extraction, DHW            | 28 mm Cu  |
| e01    | Heating flow                               | 42 mm Cu  |
| e02    | Heating return                             | 42 mm Cu  |
| f01    | Brine outlet                               | 54 mm Cu  |
| f02    | Brine inlet                                | 54 mm Cu  |

## Repair instructions

### WPE-I xx H 400 Premium

#### 14.2 Specification

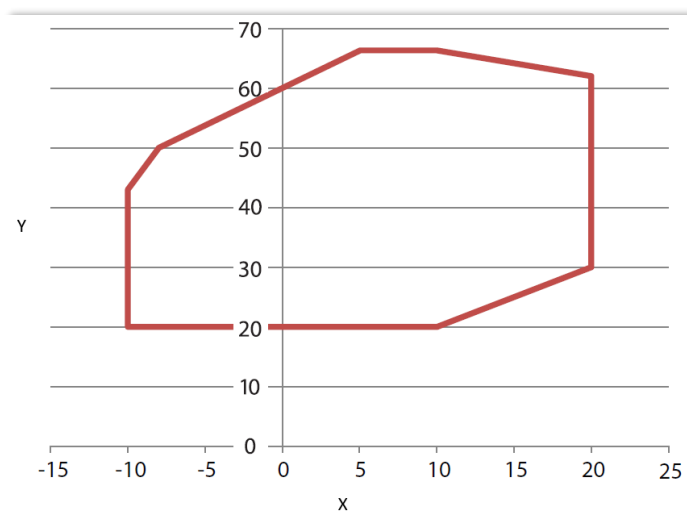
|                                                                       |  |       |  | Version A        | Version B   | Version C   | Version D |
|-----------------------------------------------------------------------|--|-------|--|------------------|-------------|-------------|-----------|
| Refrigerant                                                           |  |       |  |                  |             |             |           |
| Type                                                                  |  |       |  | R410A (GWP 2088) |             |             |           |
| Quantity (CO <sub>2</sub> equivalent)                                 |  | Kg    |  | 4.1 (8560)       | 5.7 (11692) | 8.7 (18165) |           |
| From May 2020                                                         |  |       |  |                  | 6.3 (13154) | 9.0 (18792) |           |
| Maximum operating pressure                                            |  | mPa   |  |                  | 4.3         |             |           |
| Compressor                                                            |  |       |  |                  |             |             |           |
| Type                                                                  |  |       |  | Scroll           |             |             |           |
| Oil                                                                   |  |       |  | POE              |             |             |           |
| Electrical data                                                       |  |       |  |                  |             |             |           |
| Mains voltage                                                         |  | V     |  | 400              |             |             |           |
| Maximum power consumption, compressor                                 |  | CW    |  | 14               | 17.5        | 22.2        | 32.5      |
| Maximum power consumption, circulation pump                           |  | CW    |  | 0.7              | 0.7         | 1           | 1         |
| Fuse protection                                                       |  | A     |  | C 32             | C 40        | C 50        | C 63      |
| Short circuit capacity (Ssc)                                          |  | MW    |  |                  | 2.1         | 2.4         | 3.2       |
| Heat pump data                                                        |  |       |  |                  |             |             |           |
| COP at B0/W35, EN 14511                                               |  | COP   |  | 4.73             | 4.6         | 4.5         | 4.71      |
| Compressor speed 3600 rpm                                             |  |       |  |                  |             |             |           |
| Heating output at B0/W35                                              |  | CW    |  | 20.18            | 26.73       | 35.6        | 52.0      |
| Compressor speed 3600 rpm                                             |  |       |  |                  |             |             |           |
| Power consumption at B0/W35                                           |  | CW    |  | 4.26             | 5.81        | 7.91        | 11.0      |
| Compressor speed 3600 rpm                                             |  |       |  |                  |             |             |           |
| Output range                                                          |  | CW    |  | 10 - 33          | 11 - 44     | 14 - 59     | 21 - 88   |
| Minimum pressure, refrigerant circuit                                 |  | mPa   |  |                  | 0.23        |             |           |
| Maximum pressure, refrigerant circuit                                 |  | mPa   |  |                  | 4.3         |             |           |
| Hydraulic data                                                        |  |       |  |                  |             |             |           |
| Nominal flow rate, brine ΔT=3 K, compressor speed 3600 rpm            |  | l/min |  |                  | 114         | 138.6       | 200.4     |
| Nominal flow rate, heating circuit ΔT=10 K, compressor speed 3600 rpm |  | l/min |  |                  | 40.2        | 53.4        | 77.4      |
| Available external pressure differential, brine                       |  | kPa   |  |                  | 72          | 112         | 77        |
| Available external pressure differential, heating system              |  | kPa   |  |                  | 76          | 116         | 99        |
| Pressure differential, brine                                          |  | kPa   |  |                  | 63.1        | 28.4        | 40.0      |
| Pressure differential, heating system                                 |  | kPa   |  |                  | 10.9        | 2.9         | 9.0       |
| Maximum system pressure, brine                                        |  | mPa   |  |                  | 0.6         |             |           |
| Maximum system pressure, heating system                               |  | mPa   |  |                  | 0.6         |             |           |
| Minimum/maximum brine temperature                                     |  | °C    |  | -10 °C/20 °C     |             |             |           |
| Minimum/maximum heating system temperature                            |  | °C    |  | 20 °C/65 °C      |             |             |           |
| Sound power level EN 12102, B0/W35, compressor speed 6000 rpm         |  | dB(A) |  | 55               | 56          | 61          | 63        |
| Sound power level EN 12102, B0/W35, compressor speed 1500 rpm         |  | dB(A) |  | 40               | 40          | 46          | 46        |
| Weight                                                                |  | Kg    |  | 300              | 310         | 430         | 550       |

## Repair instructions WPE-I xx H 400 Premium

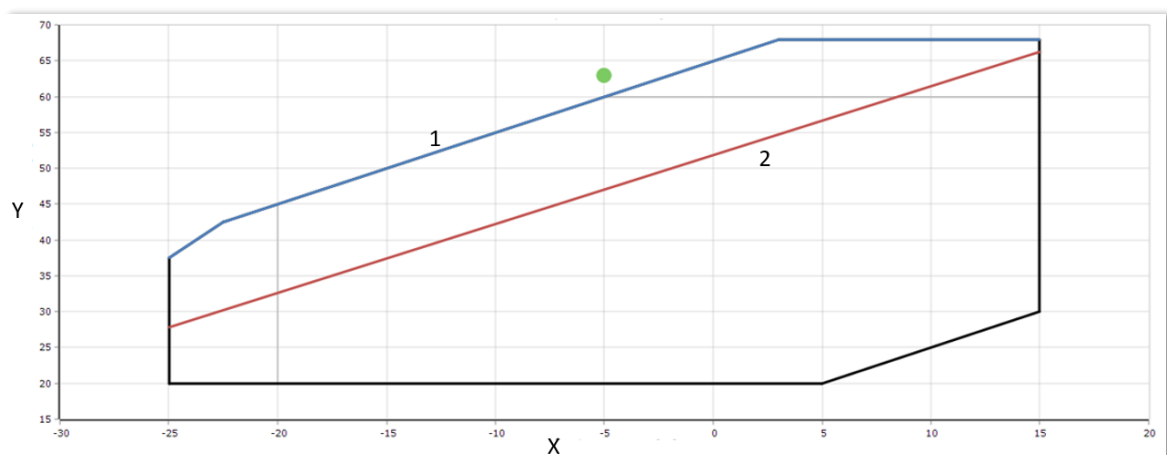
### 14.3 Operating range

This shows the operating range of the heat pump with the resulting minimum and maximum temperatures for brine and heating water.

Manufacture up to April 2020



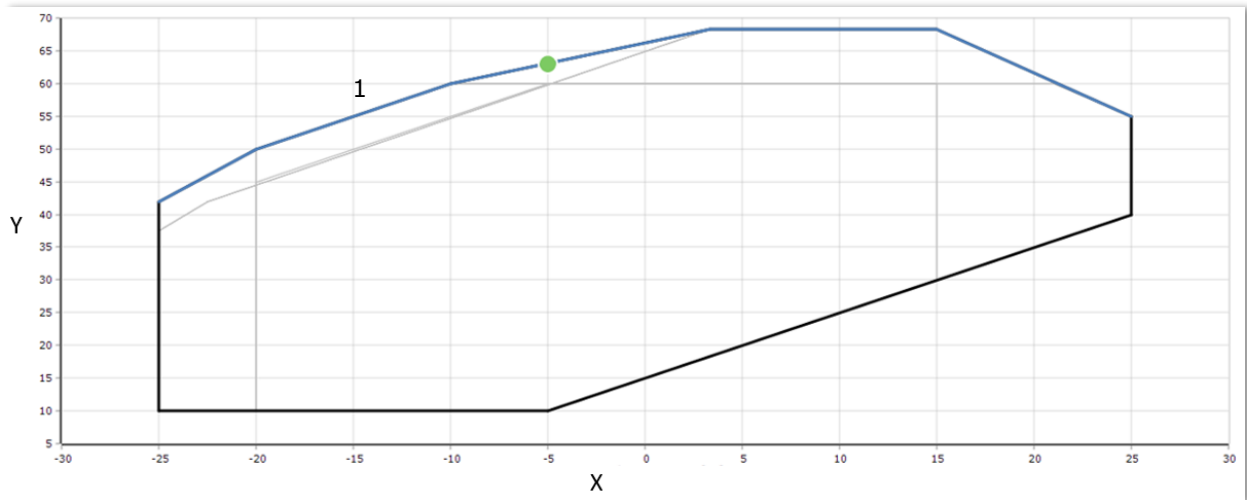
| Position | Designation                     |
|----------|---------------------------------|
| X        | Brine temperature in °C         |
| Y        | Heating water temperature in °C |



| Position | Designation                               |
|----------|-------------------------------------------|
| X        | Evaporation temperature in °C             |
| Y        | Condensation temperature in °C            |
| 1        | At 3900 rpm (65 Hz) and 6 K superheating  |
| 2        | At 3900 rpm (65 Hz) and 30 K superheating |

## Repair instructions WPE-I xx H 400 Premium

Manufacture from May 2020



| Position | Designation                               |
|----------|-------------------------------------------|
| X        | Evaporation temperature in °C             |
| Y        | Condensation temperature in °C            |
| 1        | At 3000 rpm (50 Hz) and 10 K superheating |

Observe also the specification in the operating and installation instructions.

### 15.Change history

| Version       | Change                                                                                                                                           |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| D0000086652-b | Document creation                                                                                                                                |
| D0000086652-c | Revision of the function description<br>Compressor replacement<br>Spare parts numbers added<br>Text corrections<br>Updating of software versions |