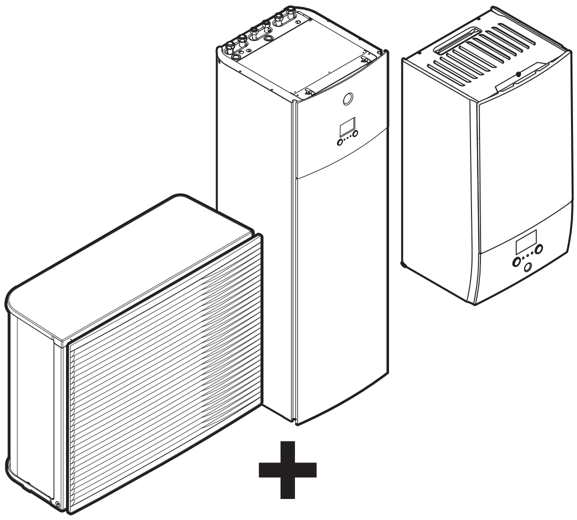
Service manual

Daikin Altherma 3 H HT F + W



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EPRA14DAW1
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ETVH16S18EA6V
ETVH16S23EA6V
ETVH16S18EA9W
ETVH16S23EA9W
ETVX16S18EA6V
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ETBH16EF6V
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ETBX16EF6V
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ETVZ16S18EA6V
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Disclaimer

Version log

Version code	Description	Date
ESIE21-06	Document release	June 2021
ESIE21-06A	See below	September 2021

The following updates have been applied to the Service Manual:

- Components – Compressor: To remove and to install the compressor updated.
- Components – User interface (on unit): Check procedures updated.
- Technical data – Wiring diagram: Wiring diagrams for Floor standing, Bizone and Wall mounted units updated.

Table of contents

1 General operation

The High temperature split (Top Grade) is a Heat Pump used for cooling and/or heating in residential applications.

Outdoor units

The outdoor unit consists of:

- Inverter compressor
- A switchbox containing necessary PCBs
- An air cooled heat-exchanger
- 2 expansion valves (main, and injection)
- Fan motor
- 2 water piping connections (Water IN and Water Out)

Heating mode

The compressor capacity step is defined by the condensing temperature, which is calculated through the high pressure sensor read-out.

In defrost or oil return operation the heat exchanger functions as a condenser, while its fan motor and the fan motor of the operational indoor units (if applicable) are stopped.

Cooling mode

The compressor capacity step is defined by the evaporation temperature, which is calculated through the low pressure sensor read-out.

Indoor units

Below list is only for reference for compatible units. Always refer to the Engineering Databook for compatibility.

Floorstanding ETVH/X + ETVZ		Wall mounted ETBH/X	
Floorstanding HPSU ETSH/X		Floorstanding heat pump convector FWXV	
Wall mounted heat pump convector FWXT		Concealed heat pump convector FWXM	
Stainless domestic hot water tank EKHWS(U)		Polypropylene domestic hot water tank EKHWP	

2 Troubleshooting

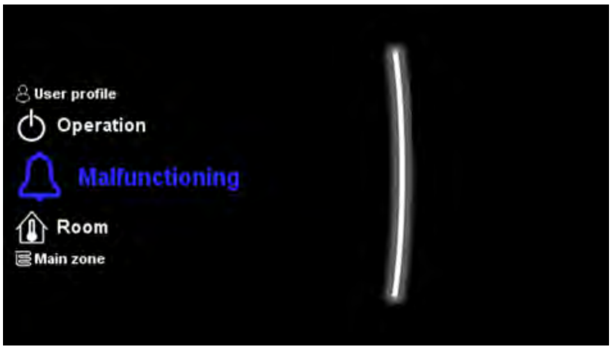
2.1 To display the help text in case of a malfunction

In case of a malfunction, the following will appear on the home screen depending on the severity:

- : Error
- : Malfunction

You can get a short and a long description of the malfunction as follows:

1	Press the left dial to open the main menu and go to `Malfunctioning`. **Result:** A short description of the error and the error code is displayed on the screen.	

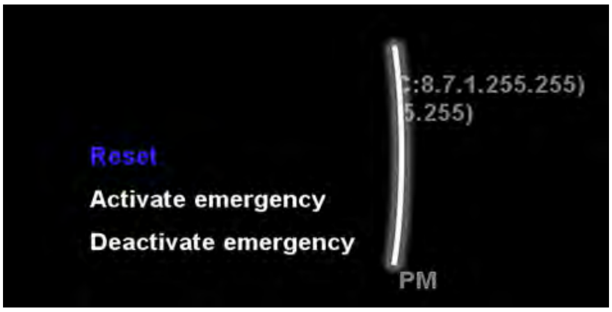


2	Press **?** in the error screen. **Result:** A long description of the error is displayed on the screen.	**?**

2.2 To reset the error code

1 Display the help text of the error, see "2.1 To display the help text in case of a malfunction" [▶ 10].

1	Press the left dial to open the menu and go to `Reset`.	



2	Press the left dial to reset the error. **Result:** The error has been reset.	

2.3 To check the malfunction history

Conditions: The user permission level is set to advanced end user.

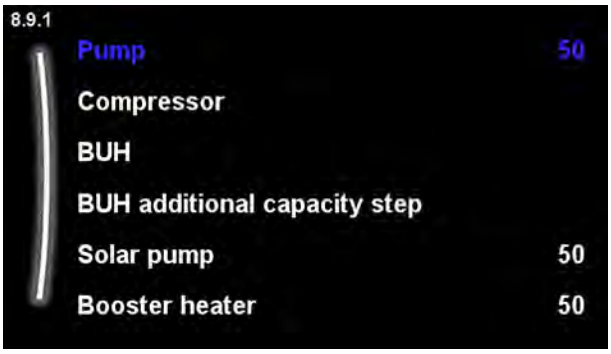
1	Go to [8.2]: `Information` > `Malfunction history`.	

You see a list of the most recent malfunctions.

2.4 To check the running hours of the system

1	Go to [8.9]: `Information` > `Running hours`.	

You see a list of the running hours of the components.



2.5 Error based troubleshooting

> **INFORMATION**
> When power reset of the unit is needed:
> In case the indoor unit has a separate power supply, also reset the power of the indoor unit.

2.5.1 7H-01 – Water flow problem

Trigger	Effect	Reset
System detects flow abnormality during operation.	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1 Check that all stop valves of the water circuit are open. See "4.3 Water circuit" [▶ 353].

Possible cause: Closed stop valve in the water circuit.

2 Purge the water circuit. See "4.3 Water circuit" [▶ 353].

Possible cause: Air in the water circuit.

3 Check the water flow. See "4.3 Water circuit" [▶ 353].

Possible cause: Water flow is too low.

4 Check the water pressure. See "4.3 Water circuit" [▶ 353].

Possible cause: Water pressure is too low.

5 Check if a by-pass is installed in the water circuit. See "4.3 Water circuit" [▶ 353].

Possible cause: No by-pass installed in the water circuit.

6 Clean the integrated filter of the shut-off valve. See "5 Maintenance" [▶ 364].

Possible cause: Dirty filter in the shut-off valve.

7 Clean the magnetic filter/dirt separator. See "5 Maintenance" [▶ 364].

Possible cause: Faulty or dirty magnetic filter/dirt separator.

8 Perform an electrical check of the water flow sensor. See "3.29 Water flow sensor" [▶ 312].

Possible cause: Faulty water flow sensor.

9 Perform a check of the 3-way valve. See "3.1 3-way valve" [▶ 101].

Possible cause: Faulty 3-way valve.

10 Perform a check of the water pump. See "3.31 Water pump" [▶ 326].

Possible cause: Faulty water pump.

11 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.2 7H-04 – Water flow problem during domestic hot water production

Trigger	Effect	Reset
Water flow abnormality determined mainly during domestic hot water.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

> **NOTICE**
>
> Focus the troubleshooting on the domestic hot water circuit.

1. Check that all stop valves of the water circuit are open. See "4.3 Water circuit" [▶ 353].

   Possible cause: Closed stop valve in the water circuit.

2. Purge the water circuit. See "4.3 Water circuit" [▶ 353].

   Possible cause: Air in the water circuit.

3. Check the water flow. See "4.3 Water circuit" [▶ 353].

   Possible cause: Water flow is too low.

4. Check the water pressure. See "4.3 Water circuit" [▶ 353].

   Possible cause: Water pressure is too low.

5. Check if a by-pass is installed in the water circuit. See "4.3 Water circuit" [▶ 353].

   Possible cause: No by-pass installed in the water circuit.

6. Clean the magnetic filter/dirt separator. See "5 Maintenance" [▶ 364].

   Possible cause: Faulty or dirty magnetic filter/dirt separator.

7. Perform an electrical check of the water flow sensor. See "3.29 Water flow sensor" [▶ 312].

   Possible cause: Faulty water flow sensor.

8. Perform a check of the 3-way valve. See "3.1 3-way valve" [▶ 101].

   Possible cause: Faulty 3-way valve.

9. Perform a check of the water pump. See "3.31 Water pump" [▶ 326].

   Possible cause: Faulty water pump.

10. Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

    Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.3 7H-05 – Water flow problem during heating/sampling

Trigger	Effect	Reset
Water flow abnormality determined mainly during space heating.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

> **NOTICE**
>
> Focus the troubleshooting on the space heating circuit.

1. Check that all stop valves of the water circuit are open. See "4.3 Water circuit" [▸ 353].

   Possible cause: Closed stop valve in the water circuit.

2. Purge the water circuit. See "4.3 Water circuit" [▸ 353].

   Possible cause: Air in the water circuit.

3. Check the water flow. See "4.3 Water circuit" [▸ 353].

   Possible cause: Water flow is too low.

4. Check the water pressure. See "4.3 Water circuit" [▸ 353].

   Possible cause: Water pressure is too low.

5. Check if a by-pass is installed in the water circuit. See "4.3 Water circuit" [▸ 353].

   Possible cause: No by-pass installed in the water circuit.

6. Clean the magnetic filter/dirt separator. See "5 Maintenance" [▸ 364].

   Possible cause: Faulty or dirty magnetic filter/dirt separator.

7. Perform an electrical check of the water flow sensor. See "3.29 Water flow sensor" [▸ 312].

   Possible cause: Faulty water flow sensor.

8. Perform a check of the 3-way valve. See "3.1 3-way valve" [▸ 101].

   Possible cause: Faulty 3-way valve.

9. Perform a check of the water pump. See "3.31 Water pump" [▸ 326].

   Possible cause: Faulty water pump.

10. Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

    Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.4 7H-06 – Water flow during cooling/defrost

Trigger	Effect	Reset
Water flow abnormality determined mainly during cooling or defrost operation.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

> **NOTICE**
>
> Focus the troubleshooting on the space cooling circuit.

1 Check that all stop valves of the water circuit are open. See "4.3 Water circuit" [▶ 353].

Possible cause: Closed stop valve in the water circuit.

2 Purge the water circuit. See "4.3 Water circuit" [▶ 353].

Possible cause: Air in the water circuit.

3 Check the water flow. See "4.3 Water circuit" [▶ 353].

Possible cause: Water flow is too low.

4 Check the water pressure. See "4.3 Water circuit" [▶ 353].

Possible cause: Water pressure is too low.

5 Check if a by-pass is installed in the water circuit. See "4.3 Water circuit" [▶ 353].

Possible cause: No by-pass installed in the water circuit.

6 Clean the magnetic filter/dirt separator. See "5 Maintenance" [▶ 364].

Possible cause: Faulty or dirty magnetic filter/dirt separator.

7 Perform an electrical check of the water flow sensor. See "3.29 Water flow sensor" [▶ 312].

Possible cause: Faulty water flow sensor.

8 Perform a check of the 3-way valve. See "3.1 3-way valve" [▶ 101].

Possible cause: Faulty 3-way valve.

9 Perform a check of the water pump. See "3.31 Water pump" [▶ 326].

Possible cause: Faulty water pump.

10 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

11 Perform a check of the backup heater. See "3.4 Backup heater" [▶ 142].

Possible cause: Faulty backup heater.

12 If installed, perform a check of the booster heater. See "3.7 Booster heater" [▶ 165].

Possible cause: Faulty booster heater.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.5 7H-07 – Water flow problem. Pump de-blocking active

Trigger	Effect	Reset
Unit detects that the water pump might be blocked.	Unit will NOT stop operating. Water pump de-blocking routine started (30 minutes).	Automatic reset when water pump is de-blocked.

To solve the error code

1 No specific check / repair procedures can be performed to solve this error code. Wait until the water pump de–blocking routine is finished (±30 minutes maximum).

> **INFORMATION**
>
> As long as the water pump de-blocking routine is active, the error code will be displayed on the user interface.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.6 80-01 – Entering water thermistor abnormality of outdoor unit

Trigger	Effect	Reset
Inlet water thermistor input is out of range.	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the inlet water thermistor (outdoor unit side). See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty inlet water thermistor (outdoor unit side).

2 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▶ 135].

Possible cause: Faulty ACS digital I/O PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.7 81-00 – Outlet water thermistor abnormality

Trigger	Effect	Reset
Outlet water thermistor input is out of range.	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the outlet water after heat exchanger thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty outlet water after heat exchanger thermistor.

2 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▶ 135].

Possible cause: Faulty ACS digital I/O PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.8 81-01 – Mixed water thermistor abnormality

Trigger	Effect	Reset
Outlet water thermistor bizone input is out of range.	Unit will not stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the outlet water thermistor bizone. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty outlet water thermistor for bizone.

2 Perform a check of the bizone PCB. See "3.6 Bizone PCB" [▶ 160].

Possible cause: Faulty bizone PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.9 81-06 – Entering water temperature thermistor abnormality (indoor unit)

Trigger	Effect	Reset
Inlet water thermistor input is out of range.	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the inlet water thermistor (indoor unit side). See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty inlet water thermistor (indoor unit side).

2 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.10 89-01 – Heat exchanger freeze-up protection activated during defrost (error)

Trigger	Effect	Reset
Several failed defrosts occured.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the inlet water thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty inlet water thermistor.

2 Perform a check of the outlet water after heat exchanger thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty outlet water after heat exchanger thermistor.

3 Perform a check of the refrigerant liquid thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty refrigerant liquid thermistor.

4 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

5 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▸ 135].

Possible cause: Faulty ACS digital I/O PCB.

6 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Refrigerant overcharge.

7 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Clogged refrigerant circuit.

8 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

9 Check the water flow. See "4.3 Water circuit" [▸ 353].

Possible cause: Water flow is too low.

10 Check the water pressure. See "4.3 Water circuit" [▸ 353].

Possible cause: Water pressure is too low.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.11 89-02 – Heat exchanger freeze-up protection activated during heating/domestic hot water

Trigger	Effect	Reset
Too low refrigerant temperature during heating/domestic hot water.	Unit will stop operating.	Automatic reset.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the 4-way valve. See "3.2 4-way valve" [▸ 127].

Possible cause: Faulty 4-way valve.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.12 89-03 – Heat exchanger freeze-up protection activated during defrost (warning)

Trigger	Effect	Reset
Refrigerant temperature or leaving water temperature is too low during defrost.	Unit will NOT stop operating.	Automatic reset.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the outlet water after heat exchanger thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty outlet water after heat exchanger thermistor.

2 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▸ 135].

Possible cause: Faulty ACS digital I/O PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.13 89-05 – Heat exchanger freeze-up protection activated during cooling (error)

Trigger	Effect	Reset
Water heat exchange freezing abnormality during cooling. Occurs after 1 automatic reset of error code 89-06.	Unit will stop operating.	Power reset.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the refrigerant liquid thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty refrigerant liquid thermistor.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

3 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▸ 135].

Possible cause: Faulty ACS digital I/O PCB.

4 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

Possible cause: Faulty hydro PCB.

5 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Refrigerant overcharge.

6 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Clogged refrigerant circuit.

7 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

8 Check the water flow. See "4.3 Water circuit" [▸ 353].

Possible cause: Water flow is too low.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.14 89-06 – Heat exchanger freeze-up protection activated during cooling (warning)

Trigger	Effect	Reset
Water heat exchange freezing abnormality during cooling.	Unit will stop operating.	Power reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the refrigerant liquid thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty refrigerant liquid thermistor.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

3 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▶ 135].

Possible cause: Faulty ACS digital I/O PCB.

4 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

5 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Refrigerant overcharge.

6 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Clogged refrigerant circuit.

7 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

8 Check the water flow. See "4.3 Water circuit" [▶ 353].

Possible cause: Water flow is too low.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.15 8F-00 – Abnormal increase outlet water temperature (domestic hot water)

Trigger	Effect	Reset
Outlet water after backup heater thermistor detects a too high temperature during domestic hot water without electrical heater.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1 Check the water circuit for an external heat source. See "4.3 Water circuit" [▶ 353].

Possible cause: Increased water temperature due to an external heat source.

2 Perform a check of the outlet water after backup heater thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty outlet water after backup heater thermistor.

3 Perform a check of the backup heater. See "3.4 Backup heater" [▶ 142].

Possible cause: Faulty backup heater.

4 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.16 8H-00 – Abnormal increase outlet water temperature

Trigger	Effect	Reset
Outlet water after backup heater thermistor detects a too high temperature during space heating without electrical heater.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1 Check the water circuit for an external heat source. See "4.3 Water circuit" [▶ 353].

Possible cause: Increased water temperature due to an external heat source.

2 Perform a check of the outlet water after backup heater thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty outlet water after backup heater thermistor.

3 Perform a check of the backup heater. See "3.4 Backup heater" [▸ 142].

Possible cause: Faulty backup heater.

4 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.17 8H-01 – Overheating mixed water circuit

Trigger	Effect	Reset
Water temperature in the mixed circuit is too high.	Unit will not stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the outlet water thermistor bizone. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty outlet water thermistor for bizone.

2 Check the field setting [9-00]. See "3.28 User interface" [▸ 304].

Possible cause: Mixed water temperature >[9-00] setting+5K.

3 Perform a check of the 3-way valve. See "3.1 3-way valve" [▸ 101].

Possible cause: Faulty 3-way valve.

> **INFORMATION**
>
> The bizone indoor unit contains two 3-way valves. Both might need to be checked.

4 Perform a check of the bizone PCB. See "3.6 Bizone PCB" [▸ 160].

Possible cause: Faulty bizone PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.18 8H-02 – Overheating mixed water circuit (thermostat)

Trigger	Effect	Reset
Thermal protector Q3L in mixed circuit is activated.	Unit will stop operating.	Automatic reset after reset of thermal protector.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1. Perform a check of the thermal protector of the mixed circuit. See "4.4 Manufacturer components" [▸ 362].

   Possible cause: Faulty thermal protector or faulty switching temperature of thermal protector.

2. Perform a check of the bizone PCB. See "3.6 Bizone PCB" [▸ 160].

   Possible cause: Faulty bizone PCB.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.19 8H-03 – Overheating water circuit (thermostat)

Trigger	Effect	Reset
Unit detects activated aquastat.	Pump will stop running.	Automatic reset when the circuit is closed.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1. Check the set trigger temperature of the safety thermostat. See "4.4 Manufacturer components" [▸ 362].

   Possible cause: Faulty trigger temperature setting of the safety thermostat.

2. Check the set water temperature. See "3.28 User interface" [▸ 304].

   Possible cause: Faulty water temperature setting.

3. Perform a check of the 3-way valve. See "3.1 3-way valve" [▸ 101].

   Possible cause: Faulty 3-way valve.

4. Perform a check of the operation of the Aquastat. See "4.4 Manufacturer components" [▸ 362].

   Possible cause: Faulty Aquastat.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.20 A1-00 – Zero cross detection problem

Trigger	Effect	Reset
Power supply abnormality. The sinus of the power supply crosses the 0-axis too often in ±10 seconds.	Unit will stop operating.	Manual reset via user interface.
		Power reset.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1. Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

   Possible cause: Faulty main PCB.

2. Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

   Possible cause: Faulty inverter PCB.

3. Perform a check of the noise filter PCB. See "3.21 Noise filter PCB" [▸ 241].

   Possible cause: Faulty noise filter PCB.

4. Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▸ 343].

   Possible cause:
   - Faulty or disturbance of the power supply (imbalance >4%),
   - Power drop,
   - Short circuit.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.21 A5-00 – Outdoor unit: High pressure peak cut / freeze protection problem

Trigger	Effect	Reset
Pressure is too high in heating / domestic hot water, too low in cooling.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1. Check the water pressure. See "4.3 Water circuit" [▸ 353].

   Possible cause: Water pressure is too low.

2. Check the water flow. See "4.3 Water circuit" [▸ 353].

   Possible cause: Water flow is too low.

3. Check that all stop valves of the water circuit are open. See "4.3 Water circuit" [▸ 353].

Possible cause: Closed stop valve in the water circuit.

4 Purge the water circuit. See "4.3 Water circuit" [▶ 353].

Possible cause: Air in the water circuit.

5 Perform a check of the outdoor air thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty ambient air thermistor.

6 Perform a check of all expansion valves. See "3.12 Expansion valve" [▶ 184].

Possible cause: Faulty expansion valve.

7 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Clogged refrigerant circuit.

8 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Refrigerant overcharge or shortage.

9 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.22 AA-01 – Backup heater overheated

Trigger	Effect	Reset
Thermal protector is activated. Measured water temperature too high.	Unit will stop operating.	Manual reset via user interface and manual reset of backup heater thermal protector.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check the water pressure. See "4.3 Water circuit" [▶ 353].

Possible cause: Water pressure is too low.

2 Check the water flow. See "4.3 Water circuit" [▶ 353].

Possible cause: Water flow is too low.

3 Purge the water circuit. See "4.3 Water circuit" [▶ 353].

Possible cause: Air in the water circuit.

4 Check the water circuit for an external heat source. See "4.3 Water circuit" [▶ 353].

Possible cause: Increased water temperature due to an external heat source.

5 Perform a check of the backup heater thermal protector. See "3.5 Backup heater thermal protector" [▶ 153].

Possible cause: Faulty backup heater thermal protector.

6 Perform a check of the outlet water after backup heater thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty outlet water after backup heater thermistor.

7 Perform a check of the backup heater. See "3.4 Backup heater" [▸ 142].

Possible cause: Faulty backup heater.

8 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

Possible cause: Faulty hydro PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.23 AA-02 – External backup heater overheated

Trigger	Effect	Reset
Thermal protector is activated. Measured water temperature too high.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Check the water pressure. See "4.3 Water circuit" [▸ 353].

Possible cause: Water pressure is too low.

2 Check the water flow. See "4.3 Water circuit" [▸ 353].

Possible cause: Water flow is too low.

3 Purge the water circuit. See "4.3 Water circuit" [▸ 353].

Possible cause: Air in the water circuit.

4 Check the water circuit for an external heat source. See "4.3 Water circuit" [▸ 353].

Possible cause: Increased water temperature due to an external heat source.

5 Perform a check of the backup heater thermal protector. See "3.5 Backup heater thermal protector" [▸ 153].

Possible cause: Faulty backup heater thermal protector.

6 Perform a check of the outlet water after backup heater thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty outlet water after backup heater thermistor.

7 Perform a check of the backup heater. See "3.4 Backup heater" [▸ 142].

Possible cause: Faulty backup heater.

8 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.24 AC-00 – Booster heater overheated

Trigger	Effect	Reset
Thermal protection of booster heater does NOT have any feedback signal anymore.	Error will be triggered when bridge connection over booster heater contact is NOT made.	Manual reset via user interface when bridge connection is made.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Check the water flow. See "4.3 Water circuit" [▸ 353].

   Possible cause: Water flow is too low.

2. Purge the water circuit. See "4.3 Water circuit" [▸ 353].

   Possible cause: Air in the water circuit.

3. Check the water circuit for an external heat source. See "4.3 Water circuit" [▸ 353].

   Possible cause: Increased water temperature due to an external heat source.

4. Check the domestic hot water tank and booster heater related settings. See "3.28 User interface" [▸ 304].

   Possible cause: Faulty booster heater settings.

5. Check that the bridge connector X21A of the hydro PCB is correctly connected. See "3.15 Hydro PCB" [▸ 199].

   Possible cause: Open jumper X21A on hydro PCB.

6. Perform a check of the booster heater thermal protector. See "3.8 Booster heater thermal protector" [▸ 165].

   Possible cause: Faulty booster heater thermal protector.

7. If installed, perform a check of the booster heater. See "3.7 Booster heater" [▸ 165].

   Possible cause: Faulty booster heater.

8. Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

   Possible cause: Faulty hydro PCB.

9. Perform a check of the power supply, connections, wiring,... between the outdoor unit, indoor unit and domestic hot water tank. See "4.1 Electrical circuit" [▸ 343].

   Possible cause: Faulty wiring between the outdoor unit, indoor unit and domestic hot water tank.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.25 AH-00 – Tank disinfection function not completed correctly

Trigger	Effect	Reset
Disinfection setpoint is NOT reached within 6 hours or NOT kept for the required time.	Unit will NOT stop operating.	Automatic reset when disinfection is completed.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1. Check when the disinfection is scheduled. Schedule it when there is little chance that water will be tapped so that the disinfection can finish in time.

   Possible cause: Large quantity of hot water has been tapped during/before disinfection.

2. Check the backup heater settings [2-00] to [2-04] and [4-00]. See "3.28 User interface" [▶ 304].

   Possible causes:
   - Backup heater is restricted during disinfection,
   - Backup heater NOT allowed.

3. Check the domestic hot water tank and booster heater related settings. See "3.28 User interface" [▶ 304].

   Possible cause: Faulty booster heater settings.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.26 AJ-03 – Too long domestic hot water heat-up time required

Trigger	Effect	Reset
Domestic hot water heat-up time >6 hours.	Unit will switch to space heating/cooling for 3 hours.	Automatic reset after a domestic hot water heat-up time <6 hours.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1. Perform a check of the backup heater. See "3.4 Backup heater" [▶ 142].

   Possible cause: Faulty backup heater.

2 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

3 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

4 Perform a check of the 3-way valve. See "3.1 3-way valve" [▶ 101].

Possible cause: Faulty 3-way valve.

5 Check the installation for a leaking field installed domestic hot water tap. See "4.3 Water circuit" [▶ 353].

Possible cause: Leaking field installed domestic hot water tap.

6 Check the settings of the backup heater [4-00]. See "3.28 User interface" [▶ 304].

Possible cause: Backup heater NOT allowed.

7 Check the software and EEPROM version on the user interface and PCB. See "3.28 User interface" [▶ 304].

Possible cause: Mismatch between the software ID and EEPROM on the PCB or user interface.

8 Check that the domestic hot water consumption is NOT too large. Lower if needed.

Possible cause: Domestic hot water consumption too large.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.27 C0-00 – Flow sensor malfunction

Trigger	Effect	Reset
Water flow sensor detects water flow 45 seconds after the water pump has stopped.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Check the water pressure. See "4.3 Water circuit" [▶ 353].

Possible cause: Water pressure is too low.

2 Check the water flow. See "4.3 Water circuit" [▶ 353].

Possible cause: Water flow is too low.

3 Purge the water circuit. See "4.3 Water circuit" [▶ 353].

Possible cause: Air in the water circuit.

4 Check the water circuit for an external pump. See "4.3 Water circuit" [▶ 353].

Possible cause: The detected water flow is caused by an external pump.

5 Perform an electrical check of the water flow sensor. See "3.29 Water flow sensor" [▶ 312].

Possible cause: Faulty water flow sensor.

6 For floor standing (and bizone) units ONLY: Check for the presence of an external source of vibration. See "4.5 External factors" [▶ 363].

Possible cause: The detected water flow is caused by an external source of vibration.

7 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.28 C4-00 – Heat exchanger temperature sensor problem

Trigger	Effect	Reset
Refrigerant liquid thermistor detects an open or short circuit during compressor operation.	Unit will stop operating.	Power reset.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the refrigerant liquid thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty refrigerant liquid thermistor.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.29 C5-00 – Heat exchanger thermistor abnormality

Trigger	Effect	Reset
Refrigerant heat exchanger temperature is out of range.	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the inlet water thermistor (outdoor unit side). See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty inlet water thermistor (outdoor unit side).

2 Perform a check of the outlet water after heat exchanger thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty outlet water after heat exchanger thermistor.

3 Perform a check of the refrigerant liquid thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty refrigerant liquid thermistor.

4 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▸ 135].

Possible cause: Faulty ACS digital I/O PCB.

5 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.30 CJ-02 – Room temperature sensor problem

Trigger	Effect	Reset
User interface room thermistor input is out of range.	Unit will NOT stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the room thermistor:

- Measure the room temperature and compare to the room temperature shown on the user interface (remote controller).
- If temperature shown on the user interface differs from the measured temperature, replace the user interface (remote controller). See documentation of the user interface (remote controller) for more information.

Possible cause: Faulty room thermistor.

2 Check the communication wiring between the remote controller and the unit. See "3.28 User interface" [▸ 304].

Possible cause: Faulty wiring between the remote controller and the unit.

3 Perform a power check of the user interface (main PCB) on the unit. See "3.28 User interface" [▶ 304].

Possible cause: User interface (main PCB) receives no power.

4 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.31 E1-00 – Outdoor unit: PCB defect

Trigger	Effect	Reset
Main PCB detects that EEPROM is abnormal.	Unit will stop operating.	Manual reset via user interface.
		Power reset.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

2 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

3 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▶ 255].

Possible cause: Faulty outdoor unit fan motor.

4 Perform a check of the compressor. See "3.9 Compressor" [▶ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

5 Wait until the rectifier voltage is below 10 V DC.

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

6 Check that the thermal interface grease is applied properly on the (PCB or refrigerant piping) contact surface of the heat sink. Adjust if needed.

Possible cause: Thermal interface grease NOT applied properly on the heat sink.

> **INFORMATION**
>
> Make sure to use thermal interface grease Shin Etsu G-776 (spare part number 2269571).

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.32 E2-00 – Leakage current detection error

Trigger	Effect	Reset
Leakage current PCB detected leakage current by the unit on power supply line.	Unit will stop operating.	Power supply reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the current sensor. See "3.11 Current sensor" [▶ 180].

Possible cause: Faulty current sensor.

2 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

3 Perform a check of the leakage current PCB. See "3.17 Leakage current PCB" [▶ 215].

Possible cause: Faulty leakage current PCB.

4 For 3-phase units ONLY: Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

5 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

6 Using a megger device, check the solenoid valve coils, 4-way valve coil, fan motors, compressor, crankcase heater (if present), bottom plate heater and plate heat exchanger heater if any earth leakage is found. Replace the component(s) that generate earth leakage.

7 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Refrigerant overcharge.

8 Check for the presence of humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Humidity in the refrigerant circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.33 E2-01 – Electric leakage detection

Trigger	Effect	Reset
Electric insulation too small or insufficient air flow on outdoor unit.	Malfunction stop.	Power reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check if the main PCB, leakage current PCB, and/or noise filter PCB are wet. Dry the respective PCB(s) if needed.

Possible cause: Wet main PCB, leakage current PCB, or noise filter PCB.

2 Check the main PCB, leakage current PCB, and noise filter PCB for the presence of foreign material (e.g. mousse, ...). Remove the material or replace the respective PCB as needed.

Possible cause: Foreign material on main PCB, leakage current PCB, or noise filter PCB.

3 Check if the main terminal is wet. Dry the main terminal if needed.

Possible cause: Wet main terminal.

4 Check if the communication cable is inside the ferrite core. See "4.1 Electrical circuit" [▸ 343].

Possible cause: Noise on communication cable.

5 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

6 Perform a check of the leakage current PCB. See "3.17 Leakage current PCB" [▸ 215].

Possible cause: Faulty leakage current PCB.

7 Perform a check of the noise filter PCB. See "3.21 Noise filter PCB" [▸ 241].

Possible cause: Faulty noise filter PCB.

8 Check the required space around the outdoor unit heat exchanger. See "4.5 External factors" [▸ 363].

Possible cause: Insufficient air flow or air by-pass due to required space specifications not met.

9 Clean the outdoor heat exchanger. See "5 Maintenance" [▸ 364].

Possible cause: Dirty outdoor heat exchanger.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.34 E3-00 – Outdoor unit: Actuation of high pressure switch

Trigger	Effect	Reset
High pressure switch opens due to measured pressure above high pressure switch operating point.	Unit will stop operating.	Manual reset via user interface.
High pressure control (measured pressure just below high pressure switch operating point) occurs 16 times within 300 minutes.		

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the refrigerant pressure sensor. See "3.25 Refrigerant pressure sensor" [▸ 274].

Possible cause: Faulty refrigerant pressure sensor.

2 Perform a check of all high pressure switches. See "3.14 High pressure switch" [▸ 194].

Possible cause: Faulty high pressure switch.

3 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

4 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Refrigerant overcharge.

5 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

6 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Clogged refrigerant circuit.

7 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▸ 255].

Possible cause: Faulty outdoor unit fan motor.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.35 E3-24 – High pressure switch abnormality

Trigger	Effect	Reset
High pressure switch opens due to measured pressure above high pressure switch operating point.	Unit will stop operating.	Manual reset via user interface.
High pressure control (measured pressure just below high pressure switch operating point) occurs 16 times within 300 minutes.		

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Perform a check of the refrigerant pressure sensor. See "3.25 Refrigerant pressure sensor" [▶ 274].

   Possible cause: Faulty refrigerant pressure sensor.

2. Perform a check of all high pressure switches. See "3.14 High pressure switch" [▶ 194].

   Possible cause: Faulty high pressure switch.

3. Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

   Possible cause: Faulty main PCB.

4. Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Refrigerant overcharge.

5. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

6. Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Clogged refrigerant circuit.

7. Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▶ 255].

   Possible cause: Faulty outdoor unit fan motor.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.36 E4-00 – Abnormal suction pressure

Trigger	Effect	Reset
Suction pressure was too low (detected by thermistor/pressure sensor or low pressure switch) for several times.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1. Perform a check of the compressor protection thermistor. See "3.27 Thermistors" [▶ 285].

   Possible cause: Faulty compressor protection thermistor.

2. Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Refrigerant shortage.

3. Check for the presence of humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Humidity in the refrigerant circuit.

4. Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Clogged refrigerant circuit.

5. Perform a check of all expansion valves. See "3.12 Expansion valve" [▶ 184].

   Possible cause: Faulty expansion valve.

6. Check the required space around the outdoor unit heat exchanger. See "4.5 External factors" [▶ 363].

   Possible cause: Insufficient air flow or air by-pass due to required space specifications not met.

7. Clean the outdoor heat exchanger. See "5 Maintenance" [▶ 364].

   Possible cause: Dirty outdoor heat exchanger.

8. Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

   Possible cause: Faulty main PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.37 E5-00 – Outdoor unit: Overheat of inverter compressor motor

Trigger	Effect	Reset
Compressor overload is detected.	Unit will NOT stop operating.	Automatic reset if the unit runs without warning for 60 seconds.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the discharge pipe thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty discharge pipe thermistor or connector fault.

2 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▶ 255].

Possible cause: Faulty outdoor unit fan motor.

3 Perform a check of the compressor. See "3.9 Compressor" [▶ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

4 Perform a check of all expansion valves. See "3.12 Expansion valve" [▶ 184].

Possible cause: Faulty expansion valve.

5 Perform a check of the 4-way valve. See "3.2 4-way valve" [▶ 127].

Possible cause: Faulty 4-way valve.

6 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

7 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

8 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Refrigerant shortage.

9 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

10 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Clogged refrigerant circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.38 E6-00 – Outdoor unit: Compressor startup defect

Trigger	Effect	Reset
The motor rotor does NOT rotate when the compressor is energized.	Unit will NOT stop operating.	Automatic reset after a continuous run for 10 minutes.
	Unit will stop operating	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Perform a check of the discharge pipe thermistor. See "3.27 Thermistors" [▸ 285].

   Possible cause: Faulty discharge pipe thermistor or connector fault.

2. Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▸ 347].

   Possible cause: Clogged refrigerant circuit.

3. Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▸ 347].

   Possible cause: Refrigerant overcharge or shortage.

4. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▸ 347].

   Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

5. Perform a check of the compressor. See "3.9 Compressor" [▸ 166].

   Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

6. Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

   Possible cause: Faulty main PCB.

7. Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

   Possible cause: Faulty inverter PCB.

8. Perform a check of the 4-way valve. See "3.2 4-way valve" [▸ 127].

   Possible cause: Faulty 4-way valve.

9. Perform a check of all expansion valves. See "3.12 Expansion valve" [▸ 184].

   Possible cause: Faulty expansion valve.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.39 E7-00 – Outdoor unit: Malfunction of outdoor unit fan motor

Trigger	Effect	Reset
Fan does NOT start 15~30 seconds after ON signal. It can occur that the error code is triggered when the fan motor is running caused by a faulty rotating sensor signal.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▸ 255].

   Possible cause: Faulty outdoor unit fan motor.

2. Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

   Possible cause: Faulty inverter PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.40 E8-00 – Outdoor unit: Power input overvoltage

Trigger	Effect	Reset
Compressor running current exceeds standard value for 2.5 seconds.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Check the outdoor temperature. See "4.5 External factors" [▸ 363].

   Possible cause: Outdoor temperature is out of operation range.

2. Perform a check of the compressor. See "3.9 Compressor" [▸ 166].

   Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

3. Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

   Possible cause: Faulty inverter PCB.

4. Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▸ 343].

   Possible cause:
   - Faulty or disturbance of the power supply (imbalance >4%),
   - Power drop,
   - Short circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.41 E9-00 – Malfunction of electronic expansion valve

Trigger	Effect	Reset
No continuity of the expansion valve.	Unit will stop operating.	Manual reset via user interface.
Minimum expansion valve opening and suction superheat <4 K and discharge superheat <5 K.		Power reset via outdoor unit.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1. Perform a check of all refrigerant side thermistors. See "3.27 Thermistors" [▶ 285].

   Possible cause: Faulty refrigerant side thermistor(s).

2. Perform a check of all expansion valves. See "3.12 Expansion valve" [▶ 184].

   Possible cause: Faulty expansion valve.

3. Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Clogged refrigerant circuit.

4. Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Refrigerant overcharge.

5. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

6. Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

   Possible cause: Faulty main PCB.

7. Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

   Possible cause:
   - Faulty or disturbance of the power supply (imbalance >4%),
   - Power drop,
   - Short circuit.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.42 EA-00 – Outdoor unit: Cool/heat switchover problem

Trigger	Effect	Reset
Room thermistor is NOT functioning within operation range.	Unit will NOT stop operating.	Automatic reset after a continuous operation for some time.
	If the error occurs too soon: unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Perform a check of the 4-way valve. See "3.2 4-way valve" [▶ 127].

   Possible cause: Faulty 4-way valve.

2. Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

   Possible cause: Faulty main PCB.

3. Perform a check of the room thermistor:

   - Measure the room temperature and compare to the room temperature shown on the user interface (remote controller).
   - If temperature shown on the user interface differs from the measured temperature, replace the user interface (remote controller). See documentation of the user interface (remote controller) for more information.

   Possible cause: Faulty room thermistor.

4. Check the communication wiring between the remote controller and the unit. See "3.28 User interface" [▶ 304].

   Possible cause: Faulty wiring between the remote controller and the unit.

5. Perform a power check of the user interface (main PCB) on the unit. See "3.28 User interface" [▶ 304].

   Possible cause: User interface (main PCB) receives no power.

6. Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

   Possible cause: Faulty hydro PCB.

7. Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Clogged refrigerant circuit.

8. Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Refrigerant overcharge or shortage.

9. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.43 EC-00 – Abnormal increase tank temperature

Trigger	Effect	Reset
Domestic hot water tank thermistor measures a too high temperature.	Unit will NOT stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Check the water circuit for an external heat source. See "4.3 Water circuit" [▶ 353].

   Possible cause: Increased water temperature due to an external heat source.

2. Perform a check of the domestic hot water tank thermistor. See "3.27 Thermistors" [▶ 285].

   Possible cause: Faulty domestic hot water tank thermistor.

3. Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

   Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.44 EC-04 – Tank preheating

Trigger	Effect	Reset
Unit is preheating the tank.	Unit will NOT stop operating.	Automatic reset.

To solve the error code

1. No specific check / repair procedures must be performed to solve this error code. The water in the heating system and the tank is too cold to perform defrost operation, so the tank needs to be preheated electrically. Wait until preheating operation is done.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.45 F3-00 – Outdoor unit: Malfunction of discharge pipe temperature

Trigger	Effect	Reset
Discharge pipe thermistor detects a too high temperature.	Unit will NOT stop operating.	Automatic reset when temperature drops normal level.
	If the error re-occurs too soon: unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1. Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Refrigerant overcharge or shortage.

2. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

3. Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Clogged refrigerant circuit.

4. Perform a check of the 4-way valve. See "3.2 4-way valve" [▶ 127].

   Possible cause: Faulty 4-way valve.

5. Perform a check of all expansion valves. See "3.12 Expansion valve" [▶ 184].

   Possible cause: Faulty expansion valve.

6. Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

   Possible cause: Faulty main PCB.

7. Perform a check of all refrigerant side thermistors. See "3.27 Thermistors" [▶ 285].

   Possible cause: Faulty refrigerant side thermistor(s).

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.46 F6-00 – Outdoor unit: Abnormal high pressure in cooling

Trigger	Effect	Reset
Outdoor heat exchanger thermistor measures a too high temperature.	Unit will NOT stop operating.	Automatic reset when temperature drops.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Clean the outdoor heat exchanger. See "5 Maintenance" [▶ 364].

   Possible cause: Dirty outdoor heat exchanger.

2. Perform a check of the heat exchanger thermistor. See "3.27 Thermistors" [▶ 285].

   Possible cause: Faulty heat exchanger thermistor.

3. Perform a check of all expansion valves. See "3.12 Expansion valve" [▶ 184].

   Possible cause: Faulty expansion valve.

4. Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

   Possible cause: Faulty main PCB.

5. Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Refrigerant overcharge.

6. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

7. Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Clogged refrigerant circuit.

8. Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▶ 255].

   Possible cause: Faulty outdoor unit fan motor.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.47 FA-00 – Outdoor unit: Abnormal high pressure, actuation of high pressure switch

Trigger	Effect	Reset
Outdoor heat exchanger thermistor measures a too high temperature.	Unit will NOT stop operating.	Automatic reset when temperature drops.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Clean the outdoor heat exchanger. See "5 Maintenance" [▶ 364].

   Possible cause: Dirty outdoor heat exchanger.

2. Check the outdoor temperature. See "4.5 External factors" [▶ 363].

   Possible cause: Outdoor temperature is out of operation range.

3 Check the required space around the outdoor unit heat exchanger. See "4.5 External factors" [▸ 363].

Possible cause: Insufficient air flow or air by-pass due to required space specifications not met.

4 Perform a check of the heat exchanger thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty heat exchanger thermistor.

5 Perform a check of all expansion valves. See "3.12 Expansion valve" [▸ 184].

Possible cause: Faulty expansion valve.

6 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

7 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Refrigerant overcharge.

8 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

9 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Clogged refrigerant circuit.

10 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▸ 255].

Possible cause: Faulty outdoor unit fan motor.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.48 H0-00 – Outdoor unit: Voltage/current sensor problem

Trigger	Effect	Reset
Compressor voltage (DC) is out of range before start-up.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

2 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

Possible cause: Faulty inverter PCB.

3 Perform a check of the noise filter PCB. See "3.21 Noise filter PCB" [▸ 241].

Possible cause: Faulty noise filter PCB.

4 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

5 Wait until the rectifier voltage is below 10 V DC.

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

6 Check that the thermal interface grease is applied properly on the (PCB or refrigerant piping) contact surface of the heat sink. Adjust if needed.

Possible cause: Thermal interface grease NOT applied properly on the heat sink.

INFORMATION

Make sure to use thermal interface grease Shin Etsu G-776 (spare part number 2269571).

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.49 H1-00 – External temperature sensor problem

Trigger	Effect	Reset
Optional external indoor or outdoor ambient thermistor input is out of range.	Unit will NOT stop operating.	Automatic reset when input is in range.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the external indoor or outdoor ambient thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty external indoor or outdoor ambient thermistor.

2 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.50 H3-00 – Outdoor unit: Malfunction of high pressure switch

Trigger	Effect	Reset
High pressure switch is activated when compressor is off.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of all high pressure switches. See "3.14 High pressure switch" [▶ 194].

Possible cause: Faulty high pressure switch.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

3 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.51 H4-00 – Malfunction of low pressure switch

Trigger	Effect	Reset
Low pressure switch is defective or NOT well connected.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the low pressure switch. See "3.18 Low pressure switch" [▶ 219].

Possible cause: Faulty low pressure switch.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.52 H5-00 – Malfunction of compressor overload protection

Trigger	Effect	Reset
Compressor overload protection is defective.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1. Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▸ 347].

   Possible cause: Clogged refrigerant circuit.

2. Perform a check of the compressor. See "3.9 Compressor" [▸ 166].

   Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

3. Check liquid back issue. Check expansion valve operation. See "3.12 Expansion valve" [▸ 184].

   Possible cause: Expansion valve CANNOT keep minimum superheat of 3 K while running as evaporator.

4. Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▸ 347].

   Possible cause: Refrigerant overcharge.

5. Perform a check of the 4-way valve. See "3.2 4-way valve" [▸ 127].

   Possible cause: Faulty 4-way valve.

6. Perform a check of the discharge pipe thermistor. See "3.27 Thermistors" [▸ 285].

   Possible cause: Faulty discharge pipe thermistor or connector fault.

7. Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

   Possible cause: Faulty main PCB.

8. For 3-phase units ONLY: Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

   Possible cause: Faulty inverter PCB.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.53 H6-00 – Outdoor unit: Malfunction of position detection sensor

Trigger	Effect	Reset
Compressor fails to start within 15 seconds after the compressor run command signal is sent.	Unit will NOT stop operating.	Automatic reset after a continuous operation of 10 minutes.
	If the error re-occurs within 8 minutes: unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the compressor. See "3.9 Compressor" [▶ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

3 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

4 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Clogged refrigerant circuit.

5 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Refrigerant overcharge or shortage.

6 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

7 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.54 H8-00 – Outdoor unit: Malfunction of compressor input system

Trigger	Effect	Reset
DC voltage or current sensor abnormality based on the compressor running frequency and the input current.	Unit will NOT stop operating.	Automatic reset when compressor runs normally for 60 minutes.
	If the error re-occurs too soon: unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

2 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

Possible cause: Faulty inverter PCB.

3 Perform a check of the compressor. See "3.9 Compressor" [▸ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

4 Perform a check of the reactor. See "3.24 Reactor" [▸ 270].

Possible cause: Faulty reactor.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.55 H9-00 – Outdoor unit: Malfunction of outdoor air thermistor

Trigger	Effect	Reset
Outdoor air thermistor input is out of range.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the outdoor air thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty ambient air thermistor.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.56 HC-00 – Tank temperature sensor problem

Trigger	Effect	Reset
Domestic hot water tank thermistor input is out of range.	Unit will NOT stop operating.	Automatic reset when resistance is within range.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the domestic hot water tank thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty domestic hot water tank thermistor.

2 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.57 HC-01 – Second tank temperature sensor problem

Trigger	Effect	Reset
Domestic hot water tank thermistor input is out of range.	Unit will NOT stop operating.	Automatic reset when resistance is within range.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the domestic hot water tank thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty domestic hot water tank thermistor.

2 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.58 HJ-10 – Water pressure sensor abnormality

Trigger	Effect	Reset
Water pressure input is out of range.	Unit will NOT stop operating.	Automatic reset when water pressure is within range.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check the main water supply and pressure of the installation. See "4.3 Water circuit" [▸ 353].

Possible cause: Main water supply or pressure outside expected range.

2 Check for leaks in the water circuit. See "4.3 Water circuit" [▸ 353].

Possible cause: Leak in the water circuit.

3 Perform a check of the water pressure sensor. See "3.30 Water pressure sensor" [▸ 316].

Possible cause: Faulty water pressure sensor.

4 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.59 J3-00 – Outdoor unit: Malfunction of discharge pipe thermistor

Trigger	Effect	Reset
Discharge pipe thermistor input is out of range.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1 Perform a check of the discharge pipe thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty discharge pipe thermistor or connector fault.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.60 J3-10 – Compressor port thermistor abnormality

Trigger	Effect	Reset
Compressor port temperature out of range (<–50°C or >156°C).	Unit will stop operating or CANNOT start operating.	Auto reset.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1 Perform a check of the compressor port thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty compressor port thermistor or connector fault.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.61 J5-00 – Malfunction of suction pipe thermistor

Trigger	Effect	Reset
Suction pipe thermistor input is out of range range.	Unit will stop operating.	Automatic reset.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the suction pipe thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty suction pipe thermistor or connector fault.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.62 J6-00 – Outdoor unit: Malfunction of heat exchanger thermistor

Trigger	Effect	Reset
Outdoor heat exchanger thermistor input is out of range.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the heat exchanger thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty heat exchanger thermistor.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.63 J6-07 – Outdoor unit: Malfunction of heat exchanger thermistor

Trigger	Effect	Reset
Heat exchanger thermistor input is out of range.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1 Perform a check of the heat exchanger (middle) thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty heat exchanger (middle) thermistor.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.64 J6-32 – Leaving water temperature thermistor abnormality (outdoor unit)

Trigger	Effect	Reset
Temperature sensor after plate type heat exchanger is broken.	Unit will NOT stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1 Perform a check of the outlet water after heat exchanger thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty outlet water after heat exchanger thermistor.

2 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▸ 135].

Possible cause: Faulty ACS digital I/O PCB.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.65 J6-33 – Sensor communication error

Trigger	Effect	Reset
Both sensors, outlet water after plate type heat exchanger and entering sensor of the indoor unit, are broken. Or entering sensor is broken and there is a communication error on the outdoor unit.	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the outlet water after heat exchanger thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty outlet water after heat exchanger thermistor.

2 Perform a check of the inlet water thermistor (outdoor unit side). See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty inlet water thermistor (outdoor unit side).

3 Perform a check of the inlet water thermistor (indoor unit side). See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty inlet water thermistor (indoor unit side).

4 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▶ 135].

Possible cause: Faulty ACS digital I/O PCB.

5 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.66 J8-00 – Malfunction of refrigerant liquid thermistor

Trigger	Effect	Reset
Refrigerant liquid thermistor detects an abnormal value (open or short circuit)	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the refrigerant liquid thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty refrigerant liquid thermistor.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

3 Check the water flow. See "4.3 Water circuit" [▶ 353].

Possible cause: Water flow is too low.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.67 JA-00 – Malfunction of high pressure sensor

Trigger	Effect	Reset
Refrigerant pressure sensor detects a value out of range (>5.6 MPa or <–0.05 MPa).	Unit will stop operating.	Manual reset via user interface.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the refrigerant pressure sensor. See "3.25 Refrigerant pressure sensor" [▶ 274].

Possible cause: Faulty refrigerant pressure sensor.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.68 JA-17 – Refrigerant pressure sensor abnormality

Trigger	Effect	Reset
Refrigerant pressure sensor input is out of range.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of the refrigerant pressure sensor. See "3.25 Refrigerant pressure sensor" [▶ 274].

Possible cause: Faulty refrigerant pressure sensor.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.69 L1-00 – Malfunction of inverter PCB

Trigger	Effect	Reset
Current sensor input is out of range prior or during start-up.	Unit will stop operating.	Reset power supply via outdoor unit.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

2 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.70 L3-00 – Outdoor unit: Electrical box temperature rise problem

Trigger	Effect	Reset
Switch box temperature is too high.	Unit will stop operating.	Manual reset via remote controller.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

2 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▶ 255].

Possible cause: Faulty outdoor unit fan motor.

3 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

4 Clean the outdoor heat exchanger. See "5 Maintenance" [▶ 364].

Possible cause: Dirty outdoor heat exchanger.

> **INFORMATION**
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.71 L4-00 – Outdoor unit: Malfunction of inverter radiating fin temperature rise

Trigger	Effect	Reset
Radiating fin thermistor measures a too high temperature.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

1 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▶ 255].

Possible cause: Faulty outdoor unit fan motor.

2 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

3 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

4 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

5 Wait until the rectifier voltage is below 10 V DC.

> **DANGER: RISK OF ELECTROCUTION**
> Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

6 Check that the thermal interface grease is applied properly on the (PCB or refrigerant piping) contact surface of the heat sink. Adjust if needed.

Possible cause: Thermal interface grease NOT applied properly on the heat sink.

> **INFORMATION**
>
> Make sure to use thermal interface grease Shin Etsu G-776 (spare part number 2269571).

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.72 L5-00 – Outdoor unit: Inverter instantaneous overcurrent

Trigger	Effect	Reset
An output overcurrent is detected by checking the current that flows in the inverter DC section.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Clogged refrigerant circuit.

2 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Refrigerant overcharge or shortage.

3 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

4 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

5 Perform a check of the compressor. See "3.9 Compressor" [▶ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

6 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

7 Wait until the rectifier voltage is below 10 V DC.

> **DANGER: RISK OF ELECTROCUTION**
>
> Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

8 Check that the thermal interface grease is applied properly on the (PCB or refrigerant piping) contact surface of the heat sink. Adjust if needed.

Possible cause: Thermal interface grease NOT applied properly on the heat sink.

> **INFORMATION**
>
> Make sure to use thermal interface grease Shin Etsu G-776 (spare part number 2269571).

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.73 L8-00 – Malfunction triggered by a thermal protection in the inverter PCB

Trigger	Effect	Reset
When compressor overload (except during start-up) is detected.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Clogged refrigerant circuit.

2 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Refrigerant overcharge or shortage.

3 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

4 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

Possible cause: Faulty inverter PCB.

5 Perform a check of the compressor. See "3.9 Compressor" [▸ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.74 L9-00 – Prevention of compressor lock

Trigger	Effect	Reset
Detection of start-up failure after time passed to avoid compressor lock.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Perform a check of the compressor. See "3.9 Compressor" [▶ 166].

   Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

2. Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

   Possible cause:
   - Faulty or disturbance of the power supply (imbalance >4%),
   - Power drop,
   - Short circuit.

3. Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

   Possible cause: Faulty inverter PCB.

4. Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Clogged refrigerant circuit.

5. Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Refrigerant overcharge or shortage.

6. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

   Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.75 LC-00 – Malfunction in communication system of outdoor unit

Trigger	Effect	Reset
Malfunction in communication system inside the outdoor unit between inverter PCB and outdoor unit (ACS system configuration error).	Unit will stop operating.	Manual reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

2 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

Possible cause: Faulty inverter PCB.

3 Perform a check of the ACS digital I/O PCB. See "3.3 ACS digital I/O PCB" [▸ 135].

Possible cause: Faulty ACS digital I/O PCB.

4 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▸ 255].

Possible cause: Faulty outdoor unit fan motor.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.76 LC-01 – Transmission system abnormality

Trigger	Effect	Reset
Malfunction in communication system inside the outdoor unit, between inverter PCB and outdoor unit (fan in stoppage).	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

2 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

Possible cause: Faulty inverter PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.77 P1-00 – Open phase power supply imbalance

Trigger	Effect	Reset
Malfunction in transmission system inside the outdoor unit.	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

2 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

3 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.78 P3-00 – Abnormal direct current

Trigger	Effect	Reset
Malfunction decision by exceeding direct current limit value.	Unit will stop operating.	Automatic reset.

To solve the error code

1 Replace the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Onboard sensor error.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.79 P4-00 – Outdoor unit: Malfunction of radiating fin temperature sensor

Trigger	Effect	Reset
Radiating fin thermistor input is out of range.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the radiation fin thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty radiation fin thermistor.

For single phase units

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

For three phase units

3 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.80 PJ-00 – Capacity setting mismatch

Trigger	Effect	Reset
Outdoor unit main PCB detects a defective capacity in EEPROM.	Unit will stop operating.	Manual reset via user interface.
		Power supply reset.

To solve the error code

1 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.81 U0-00 – Outdoor unit: Shortage of refrigerant

Trigger	Effect	Reset
Refrigerant shortage detected.	Unit will stop operating.	Automatic reset.
		Power reset via outdoor unit.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of all refrigerant side thermistors. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty refrigerant side thermistor(s).

2 Perform a check of the refrigerant pressure sensor. See "3.25 Refrigerant pressure sensor" [▸ 274].

Possible cause: Faulty refrigerant pressure sensor.

3 Check if the refrigerant circuit is clogged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Clogged refrigerant circuit.

4 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Refrigerant shortage.

5 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

6 Perform a check of the compressor. See "3.9 Compressor" [▸ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

7 Perform a check of all expansion valves. See "3.12 Expansion valve" [▸ 184].

Possible cause: Faulty expansion valve.

8 Check for leaks in the refrigerant circuit. Look for oil traces on the unit(s). Check the brazing points on the field piping. Perform a pressure test, see "4.2 Refrigerant circuit" [▸ 347].

Possible cause: Leak in the refrigerant circuit.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.82 U0-13 – Outdoor unit: shortage of refrigerant (in heating mode)

Trigger	Effect	Reset
Refrigerant shortage detection during heating.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Perform a check of all expansion valves. See "3.12 Expansion valve" [▸ 184].

Possible cause: Faulty expansion valve.

2 Perform a check of the suction pipe thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty suction pipe thermistor or connector fault.

3 Perform a check of the discharge pipe thermistor. See "3.27 Thermistors" [▸ 285].

Possible cause: Faulty discharge pipe thermistor or connector fault.

4 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

5 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Refrigerant shortage.

6 Perform a check of the refrigerant pressure sensor. See "3.25 Refrigerant pressure sensor" [▶ 274].

Possible cause: Faulty refrigerant pressure sensor.

7 Perform a check of the compressor. See "3.9 Compressor" [▶ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.83 U0-14 – Outdoor unit: shortage of refrigerant (in cooling mode)

Trigger	Effect	Reset
Refrigerant shortage (30% refrigerant) detection during cooling.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of all expansion valves. See "3.12 Expansion valve" [▶ 184].

Possible cause: Faulty expansion valve.

2 Perform a check of the suction pipe thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty suction pipe thermistor or connector fault.

3 Perform a check of the discharge pipe thermistor. See "3.27 Thermistors" [▶ 285].

Possible cause: Faulty discharge pipe thermistor or connector fault.

4 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Non-condensables and/or humidity in the refrigerant circuit.

5 Check if the refrigerant circuit is correctly charged. See "4.2 Refrigerant circuit" [▶ 347].

Possible cause: Refrigerant shortage.

6 Perform a check of the refrigerant pressure sensor. See "3.25 Refrigerant pressure sensor" [▶ 274].

Possible cause: Faulty refrigerant pressure sensor.

7 Perform a check of the compressor. See "3.9 Compressor" [▶ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.84 U1-00 – Malfunction by reverse phase/open phase

Trigger	Effect	Reset
Outdoor unit main PCB detects incorrect power supply.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

2 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.85 U2-00 – Outdoor unit: Defect of power supply voltage

Trigger	Effect	Reset
Power supply abnormality or instant power failure is detected.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

2 Perform a check of the compressor. See "3.9 Compressor" [▸ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

3 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▸ 255].

Possible cause: Faulty outdoor unit fan motor.

4 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

5 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

Possible cause: Faulty inverter PCB.

6 Perform a check of the noise filter PCB. See "3.21 Noise filter PCB" [▸ 241].

Possible cause: Faulty noise filter PCB.

7 Wait until the compressor restarts.

Possible cause:
- Momentary drop of voltage,
- Momentary power failure.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.86 U2-07 – Outdoor unit: Defect of power supply voltage

Trigger	Effect	Reset
Power supply abnormality or instant power failure is detected.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▸ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

2 Perform a check of the compressor. See "3.9 Compressor" [▸ 166].

Possible cause: Faulty compressor or miswiring of the compressor power supply cable.

3 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▶ 255].

Possible cause: Faulty outdoor unit fan motor.

4 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

5 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▶ 205].

Possible cause: Faulty inverter PCB.

6 Perform a check of the noise filter PCB. See "3.21 Noise filter PCB" [▶ 241].

Possible cause: Faulty noise filter PCB.

7 Wait until the compressor restarts.

Possible cause:
- Momentary drop of voltage,
- Momentary power failure.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.87 U3-00 – Under floor heating screed dry out function not completed correctly

Trigger	Effect	Reset
Under floor heating screed dry-out is interrupted.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

1 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.88 U4-00 – Indoor/outdoor unit communication problem

Trigger	Effect	Reset
Communication failure between outdoor and indoor unit.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

2 Perform a check of the power supply, connections, wiring,... between the outdoor unit, indoor unit and domestic hot water tank. See "4.1 Electrical circuit" [▶ 343].

Possible cause: Faulty wiring between the outdoor unit, indoor unit and domestic hot water tank.

3 Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

Possible cause: Faulty main PCB.

4 Perform a check of the outdoor unit fan motor. See "3.22 Outdoor unit fan motor" [▶ 255].

Possible cause: Faulty outdoor unit fan motor.

5 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

6 Wait until the rectifier voltage is below 10 V DC.

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

7 Check that the thermal interface grease is applied properly on the (PCB or refrigerant piping) contact surface of the heat sink. Adjust if needed.

Possible cause: Thermal interface grease NOT applied properly on the heat sink.

INFORMATION

Make sure to use thermal interface grease Shin Etsu G-776 (spare part number 2269571).

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.89 U5-00 – User interface communication problem

Trigger	Effect	Reset
Communication failure between unit and user interface.	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check the communication wiring between the user interface and the unit PCB. See "3.28 User interface" [▸ 304].

Possible cause: Faulty wiring between the user interface and the unit PCB.

2 Perform a power check of the user interface (main PCB) on the unit. See "3.28 User interface" [▸ 304].

Possible cause: User interface (main PCB) receives no power.

3 Check if the unit user interface functions correctly. See "3.28 User interface" [▸ 304].

Possible cause: Faulty user interface on unit.

4 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▸ 199].

Possible cause: Faulty hydro PCB.

5 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▸ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.90 U7-00 – Outdoor unit: Transmission malfunction between main microcomputer - inverter microcomputer

Trigger	Effect	Reset
Communication abnormality between main and inverter microcomputer.	Unit will stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the main PCB. See "3.20 Main PCB" [▸ 224].

Possible cause: Faulty main PCB.

2 Perform a check of the inverter PCB. See "3.16 Inverter PCB" [▸ 205].

Possible cause: Faulty inverter PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.91 U8-02 – Connection with room thermostat lost

Trigger	Effect	Reset
Communication abnormality between unit and room thermostat after connection was already made.	Unit will NOT stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:
- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

2 Check the communication wiring between the remote controller and the unit. See "3.28 User interface" [▶ 304].

Possible cause: Faulty wiring between the remote controller and the unit.

3 Perform a check of the room thermistor:
- Measure the room temperature and compare to the room temperature shown on the user interface (remote controller).
- If temperature shown on the user interface differs from the measured temperature, replace the user interface (remote controller). See documentation of the user interface (remote controller) for more information.

Possible cause: Faulty room thermistor.

4 Perform a power check of the user interface (main PCB) on the unit. See "3.28 User interface" [▶ 304].

Possible cause: User interface (main PCB) receives no power.

5 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.92 U8-03 – No connection with room thermostat

Trigger	Effect	Reset
Communication abnormality between unit and room thermostat, connection NOT possible.	Unit will NOT stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

2 Perform a check of the room thermistor:

- Measure the room temperature and compare to the room temperature shown on the user interface (remote controller).
- If temperature shown on the user interface differs from the measured temperature, replace the user interface (remote controller). See documentation of the user interface (remote controller) for more information.

Possible cause: Faulty room thermistor.

3 Check the communication wiring between the remote controller and the unit. See "3.28 User interface" [▶ 304].

Possible cause: Faulty wiring between the remote controller and the unit.

4 Perform a power check of the user interface (main PCB) on the unit. See "3.28 User interface" [▶ 304].

Possible cause: User interface (main PCB) receives no power.

5 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.93 U8-04 – Unknown USB device

Trigger	Effect	Reset
Unknown USB device.	Unit will NOT stop operating.	Manual reset via the user interface.

To solve the error code

1 Remove the USB/SDcard from the user interface.

Possible cause: Connected USB/SDcard to update the user interface or upload e-configuration data is NOT USB mass storage device. The USB's format MUST be FAT-32.

> **CAUTION**
>
> Always safely remove and eject media.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.94 U8-05 – File malfunction

Trigger	Effect	Reset
File malfunction.	Unit will NOT stop operating.	Manual reset via the user interface.

To solve the error code

1 Remove the USB/SDcard from the user interface.

Possible cause: Connected USB/SDcard to update the user interface or upload e-configuration data CANNOT be read because wrongly formatted, or the file config.cfg CANNOT be found on the USB/SDcard.

> **CAUTION**
>
> Always safely remove and eject media.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.95 U8-06 – Bizone kit CANOpen communication error

Trigger	Effect	Reset
Communication abnormality between user interface PCB and bizone kit box.	Unit will stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Perform a check of the user interface (main PCB) on the unit. See "3.28 User interface" [▶ 304].

Possible cause: Faulty user interface (main PCB).

2 Perform a check of the bizone kit PCB. See documentation of the bizone kit.

Possible cause: Faulty bizone kit PCB.

3 Check the communication wiring between the unit and the bizone kit box. See "4.1 Electrical circuit" [▶ 343].

Possible cause: Faulty wiring between the unit and the bizone kit box.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.96 U8-07 – P1/P2 communication error

Trigger	Effect	Reset
Lost communication between unit user interface and unit.	Unit will NOT stop operating.	Automatic reset.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1 Check the communication wiring between the user interface and the unit PCB. See "3.28 User interface" [▶ 304].

Possible cause: Faulty wiring between the user interface and the unit PCB.

2 Perform a power check of the user interface (main PCB) on the unit. See "3.28 User interface" [▶ 304].

Possible cause: User interface (main PCB) receives no power.

3 Check if the unit user interface functions correctly. See "3.28 User interface" [▶ 304].

Possible cause: Faulty user interface on unit.

4 Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

Possible cause: Faulty hydro PCB.

5 Check if the power supply is conform with the regulations. See "4.1 Electrical circuit" [▶ 343].

Possible cause:

- Faulty or disturbance of the power supply (imbalance >4%),
- Power drop,
- Short circuit.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.97 U8-11 – Connection with wireless gateway lost

Trigger	Effect	Reset
Communication abnormality between unit and wireless gateway.	Unit will NOT stop operating.	Automatic reset.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1. Check that the AP mode is active (= WLAN adapter active as access point).
2. For more information about the configuration and further troubleshooting, see the Daikin Residential Controller app or see the website: http://www.onlinecontroller.daikineurope.com/

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.98 UA-00 – Indoor unit, outdoor unit mismatching problem

Trigger	Effect	Reset
Signal transmission between outdoor and indoor unit abnormality. Improper combination of outdoor and indoor unit.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

INFORMATION

It is recommended to perform the checks in the listed order.

1. Check for improper combination of the indoor unit and the outdoor unit. See the combination table in the Databook for more information.
2. Perform a check of the power supply, connections, wiring,... between the outdoor unit, indoor unit and domestic hot water tank. See "4.1 Electrical circuit" [▶ 343].

   Possible cause: Faulty wiring between the outdoor unit, indoor unit and domestic hot water tank.

3. Perform a check of the main PCB. See "3.20 Main PCB" [▶ 224].

   Possible cause: Faulty main PCB.

4. Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

   Possible cause: Faulty hydro PCB.

INFORMATION

If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.99 UA-16 – Bizone/hydro communication problem

Trigger	Effect	Reset
Communication abnormality between hydro PCB and bizone PCB.	Unit will not stop operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

   Possible cause: Faulty hydro PCB.

2. Perform a check of the bizone PCB. See "3.6 Bizone PCB" [▶ 160].

   Possible cause: Faulty bizone PCB.

3. Perform a check of the current loop PCB. See "3.10 Current loop PCB" [▶ 177].

   Possible cause: Faulty current loop PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.100 UA-17 – Tank type problem

Trigger	Effect	Reset
[E-05] is not set as 1, or [E-07] is not set correctly.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Check for improper combination of the indoor unit and the water tank. See the combination table in the Databook for more information.
2. Check the setting [E-05] and [E-07] via the user interface. See "3.28 User interface" [▶ 304].

   Possible cause: Faulty [E-05] or [E-07] setting.

3. Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

   Possible cause: Faulty hydro PCB.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.101 UA-21 – Bizone PCB / hydro PCB mismatch error

Trigger	Effect	Reset
Communication abnormality between hydro PCB and bizone PCB after communication was already made.	Unit will stop operating.	Power reset via outdoor unit.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Perform a check of the hydro PCB. See "3.15 Hydro PCB" [▶ 199].

   Possible cause: Faulty hydro PCB.

2. Perform a check of the bizone PCB. See "3.6 Bizone PCB" [▶ 160].

   Possible cause: Faulty bizone PCB.

3. Perform a check of the current loop PCB. See "3.10 Current loop PCB" [▶ 177].

   Possible cause: Faulty current loop PCB.

4. Check for applicable ESV.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.5.102 UF-00 – Reversed piping or bad communication wiring detection

Trigger	Effect	Reset
Reversed piping or bad communication, wiring detection.	Unit will NOT start operating.	Manual reset via user interface.

To solve the error code

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

1. Check that the piping and wiring connections of the system are correctly installed. See "6.3 Piping diagram" [▶ 410] and "6.2 Wiring diagram" [▶ 370].

   Possible cause: Piping and/or wiring mismatch.

> **INFORMATION**
>
> If all procedures listed above have been performed and the problem is still present, contact the helpdesk.

2.6 Symptom based troubleshooting

2.6.1 Symptom: Incorrect energy metering read-out

Root cause category: hardware

Possible failure	Root cause	Check	Repair
kWh values measured with field supplied meters show different values as the user interface.	Backup heater wiring is NOT correct.	Check backup heater wiring, see the installer reference guide.	Adjust wiring if required.
Values on user interface are incorrect, show strange values.	User interface is replaced or reset to factory settings; Previous measurements are lost.	Check if user interface is replaced or reset.	Reset measurements of field supplied electrical meters and reset user interface and hydro PCB to factory settings.
Values on user interface are incorrect, show strange values.	Hydro PCB is replaced or reset to factory settings; Previous settings are lost.	Check if hydro PCB is replaced or reset.	Reset measurements of field supplied electrical meters and reset user interface and hydro PCB to factory settings.
Unit operates in emergency mode.	Backup heater is allowed in emergency mode, setting [4-00].	Check setting.	If you do NOT want the backup heater to run automatically in emergency mode, adjust setting.

2.6.2 Water pump related

Symptom: Increased water pump sound level

Root cause category: installation

Possible failure	Root cause	Check	Repair
Water filter blocked.	Dirty water.	▪ Check water filter, ▪ Check water quality.	Clean the water filter.
Air in the water circuit.	NOT enough air purged.	▪ Check if all air purge valves are open, ▪ Check if air purge valves are installed on all highest points of the field installed water circuit.	Purge air out of the unit and field supplied water system and backup heater.
Water pressure too low.	▪ Water pressure NOT checked during filling, ▪ Air was purged from the water circuit after filling, ▪ Leakage. ▪ Expansion vessel is broken or not properly pre-adjusted.	Check water pressure.	Adjust water pressure if required (±2 bar).

Possible failure	Root cause	Check	Repair
Water circuit partially blocked.	Obstruction in the water circuit.	Check water circuit for blockages.	Remove possible blockages and check the water quality.

Root cause category: component – mechanical

Possible failure	Root cause	Check	Repair
Water pump mechanical problem.	Internal pump friction.	Check water pump.	Replace water pump.
Air purge blocked - air trapped in water circuit.	Component failure.	Check air purge valve.	Replace air purge valve.

Symptom: Incorrect water pump operation

Root cause category: software control

Possible failure	Root cause	Check	Repair
Unexpected water pump behaviour.	Water pump software control.	Water pump start/stop conditions: ▪ During space heating (cooling) or domestic hot water off: the pump is off, ▪ During space heating (cooling) or domestic hot water on: pump operation depends on setting [F-0D] (continuous, sample or request). Remark: in domestic hot water operation the pump starts later than the compressor to avoid that the tank is cooled down by the cold water loop.	Replace water pump.

Root cause category: parameter (setting)

Possible failure	Root cause	Check	Repair
Incorrect setting of pump operation mode (continuous, sample, request) (setting [F-0D]).	Incorrect setting.	Confirm setting [F-0].	Adapt setting [F-0] if required (factory setting: [F-0]=1).

2.6.3 Tap water related

Symptom: High water pressure at tapping point

Root cause category: component – mechanical

Possible failure	Root cause	Check	Repair
Safety valve water side blocked.	Component failure.	Check safety valve.	If required, replace safety valve.
Field installed pressure reducing valve problem.	▪ Pressure reducing valve (to reduce pressure of the main water supply) NOT installed, ▪ Pressure reducing valve problem.	Check water system pressure before and after the water pressure reducing valve.	Install or replace water pressure reducing valve.

Symptom: Tap water has white colour

Root cause category: installation

Possible failure	Root cause	Check	Repair
Extreme formation of anode residue.	Water quality and composition of the water (chlorides, conductivity) can lead to accelerated reduction of the anode in the tank and aluminiumhydroxides will be formed on the bottom of the tank. (Remark: a NOT well controlled water softener can cause an increased amount of chlorides in the water.)	Visual check for aluminiumhydroxide residue is ONLY possible with endoscope.	▪ Drain and flush the tank to remove the aluminiumhydroxides, ▪ Check correct setting of field supplied water softener (if installed).

INFORMATION

ONLY for optional third party water tank with anode. See addendum book for impressed current anode system for further troubleshooting.

Symptom: Tap water has bad odour

Root cause category: installation

Possible failure	Root cause	Check	Repair
Water circuit - bad odour of supply water.	Bad quality/contamination of supply water.	Check the water quality (odour/contamination) at cold domestic water inlet.	Assure that quality of entering water is OK.

2.6.4 Symptom: User interface is failure or frozen screen

Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
Hydro PCB NOT operational.	▪ No power supply, ▪ Faulty transformer, ▪ PCB malfunction.	▪ Confirm if a small green led is blinking in regular intervals, ▪ Confirm power supply towards hydro PCB, ▪ Check good operation of transformer.	▪ Re-establish power to hydro PCB, ▪ Replace hydro PCB in case power supply and transformer are OK but led is NOT blinking.
Reactor coil broken.	Component problem.	Check continuity of the reactor coil.	Replace the reactor coil in case faulty.
P1/P2 transmission cable broken/short-circuit.		Check P1/P2 cable (16 V DC on BRC terminals and cable continuity).	Repair P1/P2 cable if required.
User interface failure.		Check user interface software version.	Update user interface software to the latest version. If problem persists, replace the user interface.
No display.	Display contrast too high or too low.		Adjust contrast.
Blocked screen.	Mismatch between software and EEPROM on user interface.		Power reset and user interface reset.

2.6.5 Symptom: Leak

Root cause category: installation

Possible failure	Root cause	Check	Repair
Drain connection of water safety valve leaking.	Bad connection between unit drain pipe and field drain pipe.	Check the drain connection of the water safety valve.	Correct the drain connection if required.
Drain of bottom drain plate NOT well connected.	Bad connection of bottom drain plate and field drain connection.	Check the drain connection between the bottom drain plate and the field drain.	Correct the drain connection if required.
Leakage of drain valve.	Valve NOT completely closed.	Check if drain valve is closed.	Close the drain valve.

Root cause category: component – mechanical

Possible failure	Root cause	Check	Repair
Expansion vessel NOT pressurized.	Component failure.	Check expansion vessel.	Replace expansion vessel.
Safety valve blocked.	Component failure.	Check safety valve.	Replace safety valve.
Safety valve leaking.	Component failure.	Check safety valve.	Replace safety valve.
Leakage of drain valve.	Component failure.	Check drain valve.	Replace drain valve.

Possible failure	Root cause	Check	Repair
Domestic hot water tank leakage.	Component failure.	Check tank visually for leakages.	Repair leakages. If NOT possible, complete unit has to be replaced.
Air Purge leakage.	Component failure.	Check air purge valve for leakages.	Replace air purge valve.

2.6.6 Symptom: Water flow or volume too low

1 If this symptom is determined, check the steps in error codes 7H-xx to solve the error. See "2.5 Error based troubleshooting" [▶ 12].

2.6.7 Compressor related

Symptom: Compressor does not start

Root cause category: software control

Possible failure	Root cause	Check	Repair
Compressor does NOT start because water loop temperature is too low.	Special software control activated - Water loop temperature is too low causing ONLY the backup heater to operate. Compressor will start when water temperature is high enough (for detailed water temperature values, see the operation range in the databook).	Normal unit operation – no specific countermeasure required.	—
Compressor guard timer active.	Compressor guard timer active. Once compressor has stopped it takes 180 seconds before it can restart.	Normal unit operation – no specific countermeasure required.	—

Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
Power cables (U, V, W) incorrectly connected to compressor.	Wrong assembly during repair.	Confirm that the U, V, W wiring is correctly connected. See "6.2 Wiring diagram" [▶ 370] for an indication how to connect correctly.	Correct the U, V, W wiring.

Symptom: Compressor does not increase frequency

Root cause category: software control

Possible failure	Root cause	Check	Repair
Compressor frequency limited - high discharge temperature protection function active.	In case the discharge temperature is higher than 105°C the compressor frequency will be reduced. When the discharge temperature is lower than 105°C the frequency can increase again.	Activation of the protection function can be caused by various reasons, therefore we recommend to check the following: ▪ Check refrigerant charge, ▪ Check expansion valve for correct operation, ▪ Check suction thermistor, ▪ Check discharge pipe thermistor.	Based on the diagnosis execute one of the following actions: ▪ Correct the refrigerant charge, ▪ Replace expansion valve, ▪ Replace suction thermistor, ▪ Replace discharge pipe thermistor.
Compressor frequency limited - high pressure protection function active.	In case high pressure is higher than 48.5 bar the compressor frequency will be reduced. When the pressure drops below 46.5 bar the compressor frequency can increase again.	Activation of the protection function can be caused by various reasons, therefore we recommend to check the following: ▪ Check refrigerant pressure sensor, ▪ Check high pressure side plate type heat exchanger for good water flow and heat exchange, ▪ Check the refrigerant charge.	Based on the diagnosis execute one of the following actions: ▪ Replace refrigerant pressure sensor, ▪ Optimize the water flow through the high pressure side plate type heat exchanger, ▪ Correct the refrigerant charge.
Compressor frequency limited.	Inverter control active – target water leaving temperature (target sat. high pressure) reached.	Check if saturated high pressure temperature is within range to heat up the water to the required temperature.	—
Compressor frequency limited - suction pipe superheat protection function active.	This protection control activates when suction superheat is >10°C and expansion valve is fully open (480 pulse). Unit returns to normal operation when suction superheat is <4°C. Remark: check the suction superheat by measuring the suction temperature (with contact thermometer) before the compressor and comparing with the saturated evaporation temperature.	Activation of the protection function can be caused by various reasons, therefore we recommend to check the following: ▪ Check refrigerant charge, ▪ Check expansion valve for correct operation, ▪ Check suction thermistor, ▪ Check the refrigerant circuit for blockages.	Based on the diagnosis execute one of the following actions: ▪ Correct the refrigerant charge, ▪ Replace expansion valve, ▪ Replace suction thermistor, ▪ Remove detected blockages from the refrigerant circuit.

Root cause category: installation

Possible failure	Root cause	Check	Repair
PHE condenser (water side) (partial) blockage.	Dirty water (particles).	▪ Check water flow rate registered by flow sensor, ▪ Check water side plate type heat exchanger for blockage.	▪ If required replace the water plate type heat exchanger, ▪ Check the water quality.

Root cause category: component – mechanical

Possible failure	Root cause	Check	Repair
Limited heat exchange between refrigerant loop and heat sink inverter could result in high inverter temperatures and limited compressor frequency.	▪ Bad contact between refrigerant loop and inverter heat sink, ▪ Lack of refrigerant.	Check contact between refrigerant loop and PCB heat sink.	—

Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
Discharge pipe thermistor – higher temperature measured than actual.	Deviation of thermistor (higher temperature measured than actual).	Check discharge pipe thermistor.	Replace discharge pipe thermistor or main PCB.
Heat sink inverter thermistor - deviation.	Deviation of thermistor (higher temperature measured than actual).	▪ Check heat sink inverter thermistor, ▪ Check PCB.	▪ Replace heat sink inverter thermistor, ▪ Replace PCB.
Expansion valve incorrect control - superheat too high.	▪ Faulty suction thermistor, ▪ Faulty expansion valve control.	▪ Check suction thermistor, ▪ Check the expansion valve.	▪ Replace suction thermistor, ▪ Replace expansion valve.

Symptom: Increased compressor sound level

Root cause category: component – mechanical

Possible failure	Root cause	Check	Repair
Compressor increased bearing friction/bearing failure.	▪ Bad lubrication of compressor internal rotating parts, ▪ Compressor at end of lifetime.	No checks possible.	Replace compressor.
Unit produces (loud) noise or shakes.	▪ Refrigerant overcharge, ▪ Mixing of air in refrigerant system, ▪ Refrigerant undercharge.	Check refrigerant.	After vacuum drying, charge correct amount of refrigerant.

Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
Expansion valve incorrect control - superheat too low.	▪ Faulty suction thermistor, ▪ Faulty expansion valve control.	▪ Check suction thermistor, ▪ Check the expansion valve.	▪ Replace thermistor when required, ▪ Replace expansion valve when required.

2.6.8 Symptom: Abnormal presence of ice

Possible failure	Root cause	Check	Repair
General ice build-up.	—	—	Outdoor unit installation MUST be protected from weather (wind, snow, ...). See installer reference guide for correct installation.
Ice build-up on the outdoor unit.	▪ Clogged drain holes, ▪ Snow on the outdoor unit, ▪ Ice building up on the casing.	Ice is NOT in direct contact with fins.	▪ Unclog drain holes or remove any scraps that can be used for ice to build up, ▪ Remove ice.
Defrost operation malfunction.	NOT enough defrost power: shortage of refrigerant.	▪ Check refrigerant charge, ▪ Check for leaks.	▪ Replace refrigerant, ▪ Fix leaks.
Ice build-up at entry spot of refrigerant.	Refrigerant shortage.	▪ Check refrigerant charge, ▪ Check for leaks.	▪ Replace refrigerant, ▪ Fix leaks.
Partial ice up of coil.	Partial refrigerant blockage.	Check refrigerant circuit.	Replace part where blockage occurs.
	Dirty coil.	Check if coil is dirty.	Clean coil.
	Bad weather conditions.	Unit is NOT powerful enough to defrost due to too strong wind, snow, ...	Outdoor unit installation MUST be protected from weather (wind, snow, ...). See installer reference guide for correct installation.

2.6.9 Symptom: Domestic hot water capacity shortage

Root cause category: end user

Possible failure	Root cause	Check	Repair
Too low domestic hot water setpoint.	User set too low domestic hot water setpoint by schedule or manual operation.	Check domestic hot water tank set temperature in combination with boiler volume and hot water usage.	Adapt domestic hot water setpoint (e.g. 50~55°C). (Remark: check the weather dependent settings (relation outdoor temperature - setpoint) in case weather dependent control is activated.)
Domestic hot water NOT activated.	—	Check if domestic hot water heating is activated.	—

Root cause category: parameter (setting)

Possible failure	Root cause	Check	Repair
Setting domestic hot water operation mode [6-0D] NOT set optimally.	Setting domestic hot water operation mode [6-0D] is set to 2 (scheduled ONLY).	Check setting [6-0D].	In case schedule is ONLY used, assure that the programmed schedule is in line with the timings hot water is required. Adapt the schedules if necessary.

Root cause category: installation

Possible failure	Root cause	Check	Repair
3-way valve does NOT switch correctly between space heating (cooling) connection and domestic hot water connection.	3-way valve incorrectly mounted.	Check the 3-way valve.	Correct the position of the 3-way valve.

Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
3-way valve blocked.	Component failure.	Check the 3-way valve.	Replace the 3-way valve.
Deviation of domestic hot water tank thermistor.	Domestic hot water tank thermistor measures a higher temperature than actual (component failure).	Check domestic hot water tank thermistor.	Replace domestic hot water tank thermistor.

2.6.10 Symptom: General capacity shortage

Root cause category: software control

Possible failure	Root cause	Check	Repair
Compressor frequency limited - high discharge temperature protection function active.	In case the discharge temperature is higher than 105°C the compressor frequency will be reduced. When the discharge temperature is lower than 105°C the frequency can increase again.	Activation of the protection function can be caused by various reasons, therefore we recommend to check the following: ▪ Check refrigerant charge, ▪ Check expansion valve for correct operation, ▪ Check suction thermistor, ▪ Check discharge pipe thermistor.	Based on the diagnosis execute one of the following actions: ▪ Correct the refrigerant charge, ▪ Replace expansion valve, ▪ Replace suction thermistor, ▪ Replace discharge pipe thermistor.
Compressor frequency limited - high pressure protection function active.	In case high pressure is higher than 48.5 bar the compressor frequency will be reduced. When the pressure drops below 46.5 bar the compressor frequency can increase again.	Activation of the protection function can be caused by various reasons, therefore we recommend to check the following: ▪ Check refrigerant pressure sensor, ▪ Check high pressure side plate type heat exchanger for good water flow and heat exchange, ▪ Check the refrigerant charge.	Based on the diagnosis execute one of the following actions: ▪ Replace refrigerant pressure sensor, ▪ Optimize the water flow through the high pressure side plate type heat exchanger, ▪ Correct the refrigerant charge.
▪ Compressor frequency limited, ▪ Suction pipe superheat protection function active.	This protection control activates when suction superheat is >10°C and expansion valve is fully open (480 pulse). Unit returns to normal operation when suction superheat is <4°C. Remark: check the suction superheat by measuring the suction temperature (with contact thermometer) before the compressor and comparing with the saturated evaporation temperature.	Activation of the protection function can be caused by various reasons, therefore we recommend to check the following: ▪ Check refrigerant charge, ▪ Check expansion valve for correct operation, ▪ Check suction thermistor, ▪ Check the refrigerant circuit for blockages.	Based on the diagnosis execute one of the following actions: ▪ Correct the refrigerant charge, ▪ Replace expansion valve, ▪ Replace suction thermistor, ▪ Remove detected blockages from the refrigerant circuit.

Root cause category: end user

Possible failure	Root cause	Check	Repair
Space heating (cooling) or domestic hot water operation is NOT activated on the user interface.	—	Confirm if space heating (cooling) operation or domestic hot water operation is activated on user interface.	Activate space heating (cooling) or domestic hot water operation on the user interface.

Root cause category: parameter (setting)

Possible failure	Root cause	Check	Repair
Displayed date/time is wrong - schedules NOT correctly executed.	▪ NOT set date/time after initial start-up, ▪ No power supply for more than 48 hours.	Check date/setting and content of schedules.	Set date/time according to operation manual instructions.
Displayed date/time is wrong - schedules NOT correctly executed.	Daylight Saving Time NOT set correctly.	Check Daylight Saving Time settings.	Set Daylight Saving Time according to operation manual.
Schedules NOT activated.	Schedules were NOT confirmed (see the schedule settings).	Check schedules on the user interface.	Set schedule according to user reference guide.
Holiday setting active.	Holiday setting is activated in the user interface.	Check holiday settings.	Set holiday settings correctly.
Backup heater operation disabled.	Setting backup heater operation mode [4-00] is set to 0 (disable).	Check setting [4-00].	Change setting [4-00] to 1.
Second step of the backup heater is NOT allowed.	Setting "enable backup heater step 2" [4-07] is set to 0 (NOT allowed).	Check setting [4-07].	Change setting [4-07] to 1.
Backup heater equilibrium point was set too low.	Setting "equilibrium temperature" [5-01] was set too low.	Check setting [5-01].	Change setting [5-01] to 0 or higher to more quickly allow backup heater operation.

Root cause category: installation

Possible failure	Root cause	Check	Repair
PHE condenser (partial) blockage.	Dirty water (particles).	▪ Check water flow rate registered by flow sensor, ▪ Check plate heat exchanger for blockage.	▪ If required replace the plate heat exchanger, ▪ Check the water quality.
3-way valve bypass between domestic hot water and space heating (cooling).	3-way valve incorrectly mounted.	Check the 3-way valve.	Correct the position of the 3-way valve.
Water filter blocked.	Dirty water.	▪ Check water filter, ▪ Check water quality.	▪ Clean the water filter, ▪ Check the water quality.

Possible failure	Root cause	Check	Repair
Air in the water circuit.	NOT enough air purged.	▪ Check if all air purge valves are open, ▪ Check if air purge valves are installed on all highest points of the field installed water circuit.	Purge air out of unit and field supplied water system and backup heater.
Water circuit (partially) blocked.	Dirty water.	Check water circuit (unit + field) for blockages.	Remove possible blockages and check the water quality.

Root cause category: component – mechanical

Possible failure	Root cause	Check	Repair
Refrigerant shortage.	▪ Refrigerant leakage, ▪ Incorrectly charged.	▪ Check refrigerant charge, ▪ Pressure test the system to check for leakage.	If required, repair the leak and charge the correct refrigerant amount.
Air Purge blocked - air trapped in water system.	Component failure.	Check air purge valve.	Replace air purge valve.

Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
Refrigerant pressure sensor - higher pressure measured than actual.	Deviation of refrigerant pressure sensor (higher value measured than actual).	Check refrigerant pressure sensor.	Replace refrigerant pressure sensor.
Discharge pipe thermistor – higher temperature measured than actual.	Deviation of thermistor (higher temperature measured than actual).	Check discharge pipe thermistor.	Replace discharge pipe thermistor or replace PCB.
Expansion valve incorrect control - superheat too high.	▪ Faulty suction thermistor, ▪ Faulty expansion valve control.	▪ Check suction thermistor, ▪ Check the expansion valve.	Replace suction thermistor or replace expansion valve.
Backup heater NOT working.	Component failure.	Check backup heater.	Replace backup heater.
Deviation of outlet water after backup heater thermistor will influence the backup heater control.	▪ Deviation of thermistor (higher temperature measured than actual), ▪ Bad contact between sensor and pipe.	Check outlet water after backup heater thermistor.	Replace outlet water after backup heater thermistor or PCB A1P.
Flow sensor deviation – flow measured higher than actual.	Component failure.	Check the flow sensor.	Replace the flow sensor.
3-way valve blocked.	Component failure.	Check the 3-way valve.	Replace the 3-way valve.

2.6.11 Symptom: Space heating (cooling) capacity shortage

Root cause category: end user

Possible failure	Root cause	Check	Repair
Space heating: too low leaving water temperature setpoint. Space cooling: too high leaving water temperature setpoint.	User set too low (space heating) or too high (space cooling) leaving water temperature setpoint by schedule or manual operation.	Check leaving water setpoint.	Adapt leaving water setpoint. (Remark: check the weather dependent settings (relation outdoor temperature - setpoint) in case weather dependent control is activated.)
Too low (space heating) or too high (space cooling) setpoint on room thermostat.	User set too low (space heating) or too high (space cooling) room setpoint by schedule or manual operation.	Check room thermostat setpoint.	Adapt room thermostat setpoint. (Remark: check the weather dependent settings (relation outdoor temperature - setpoint) in case weather dependent control is activated.)
Space heating (cooling) NOT activated.		Check if space heating (cooling) is activated.	

Root cause category: parameter (setting)

Possible failure	Root cause	Check	Repair
External room thermostat used with setting [C-07] on value 2 (= RT control).	Wrong setting of [C-07] - unit control method.	Check setting [C-07].	Adjust setting to match application - see installer reference guide.
Backup heater operation disabled (setting [4-00] is set to 0 or 2).	Setting backup heater operation mode [4-00] is set 0 (backup heater disabled) or 2 (ONLY domestic hot water).	Check setting [4-00].	Change setting [4-00] to 1.
Setting domestic hot water operation mode [6-0D] NOT set optimally.	Setting domestic hot water operation mode [6-0D] is set to 0 (reheat ONLY). This will cause the system to work too frequently in domestic hot water operation and less in space heating.	Check setting [6-0D].	It is advisable to set to factory setting (reheat + schedule) and program the schedule to heat the domestic hot water during periods of no space heating required.

Root cause category: installation

Possible failure	Root cause	Check	Repair
3-way valve does NOT switch correctly between space heating (cooling) connection and domestic hot water connection.	3-way valve incorrectly mounted.	Check the 3-way valve.	Correct the position of the 3-way valve.

Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
3-way valve blocked.	Component failure.	Check the 3-way valve.	Replace the 3-way valve.

Root cause category: system design

Possible failure	Root cause	Check	Repair
Water circuit – requested capacity too high.	Incorrect system selection.	Check required capacity by heat load calculation. See the capacity tables in the engineering data book to know max. system capacity at indicated conditions.	Adapt system design.
Water circuit - water volume too big.	▪ Long water piping, ▪ Too many heating emitters.	Check required capacity by heat load calculation. See the capacity tables in the engineering data book to know max. system capacity at indicated conditions.	Adapt system design.
Water circuit - pressure drop too big.	▪ Too small water piping, ▪ Too long water piping, ▪ Too many heating emitters.	Compare the pressure drop of the total system with the water pump characteristics (See check of water pump). Decreased water flow will cause a drop in capacity.	Adapt system design.

2.6.12 Symptom: Inaccurate temperature control

Root cause category: parameter (setting)

Possible failure	Root cause	Check	Repair
Incorrect setting of unit control method (setting [C-07]).	Incorrect setting of unit control method (setting [C-07]) (leaving water control, room thermostat control, ext. room thermostat control).	Check if setting [C-07] (leaving water control, room thermostat control, ext. room thermostat control) is set according to the application.	Adjust setting to match application.
Incorrect setting of pump operation mode (continuous, sample, request) (setting [F-0D]).	Incorrect setting.	Confirm setting [F-0].	Adjust setting [F-0] if required. (Factory setting: [F-0]=1).

Root cause category: installation

Possible failure	Root cause	Check	Repair
User interface – thermostat sensor value NOT representing room temperature.	Bad location of thermostat sensor (external influence) in case of room thermostat control (setting [C-07]=2).	Check if user interface is mounted in the correct position to measure the correct room temperature.	Correct the position of the user interface for more accurate room temperature measurement.

Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
Outlet water after backup heater thermistor deviation causes incorrect temperature control.	▪ Deviation of thermistor (lower temperature measured than actual), ▪ Bad contact between sensor and pipe.	Check outlet water after backup heater thermistor.	Replace outlet water after backup heater thermistor or hydro PCB.
Deviation of domestic hot water tank thermistor. (Remark: ONLY valid for inaccurate domestic hot water temperature control.)	▪ Deviation of thermistor, ▪ Bad contact between sensor and pipe.	Check domestic hot water tank thermistor.	Replace domestic hot water tank thermistor or hydro PCB.
User interface – thermostat sensor has incorrect reading of room temperature.	Deviation of user interface room temperature sensor.	Compare temperature measured by user interface with actual room temperature.	In case of deviation the room temperature offset can be adjusted through setting [2-0A].

FOR BIZONE UNITS ONLY:

Possible failure	Root cause	Check	Repair
Outlet water mixed zone (R7T) deviation causes incorrect tmeprature control of the mixed zone (low temperature).	Deviation of thermistor (lower temperature measured than actual). ▪ Bad contact between sensor and pipe.	Check outlet water mixed zone thermistor.	Replace outlet water mixed zone (R7T) thermistor or bizone PCB.
3-way valve bypassing.	3-way bypass valve jammed.	check operation 3-way mix valve.	See component check 3-way mixing valve.
Insufficient water flow in the mixed zone.	Bizone pump jammed.	Check bizone pump.	See component check bizone pump.
	Mixed circuit water filter clogged.	Verify mixed zone water filter.	Clean mixed zone water filter, see maintenance.

2.6.13 Symptom: Power consumption too high

Root cause category: end user

Possible failure	Root cause	Check	Repair
Too high domestic hot water setpoint.	User set too high domestic hot water setpoint by schedule or manual operation.	Check domestic hot water tank set temperature; avoid electric heater use.	Adapt domestic hot water setpoint (e.g. 50~55°C).
Too high leaving water temperature setpoint.	User set too high leaving water temperature setpoint by schedule or manual operation.	Check leaving water setpoint.	Adapt leaving water setpoint (e.g. <55°C will reduce backup heater operation).

Possible failure	Root cause	Check	Repair
Too high (space heating) or too low (space cooling) setpoint on room thermostat.	User set too high (space heating) or too low (space cooling) room setpoint by schedule or manual operation.	Check room thermostat setpoint.	Adapt room thermostat setpoint.

Root cause category: parameter (setting)

Possible failure	Root cause	Check	Repair
Too high leaving water temperature (LWT) - weather dependent.	Incorrect weather dependent setting --> too high LWT limit set [1-00]~[1-09].	Check leaving water temperature (LWT) high limit in weather dependent (setting [1-03]).	Adapt high leaving water temperature (LWT) limit for weather dependent heating (setting [1-03]).
User interface thermostat used with setting [C-07] on value 1 (= external thermostat control).	Wrong setting of [C-07] - unit control method.	Check setting [C-07].	Adjust setting to match application - see installer reference guide.
Pump keeps running all the time during space heating (cooling) operation.	Wrong setting of [F-0D] - pump operation.	Check pump operation mode setting [F-0D].	Change setting [F-0D] from continuous operation (value 0) to Sample (1) or Request (2). See installer reference guide for applicable value.
Setting disinfection operation day [2-00] was set to 0 (each day).	Setting disinfection operation day [2-00] was set to 0 (each day).	Check setting [2-00].	Adjust setting if necessary.
Unit is running in emergency operation and is using backup heater ONLY. [4-06] is set to 1.	Unit is running in emergency operation and is using backup heater ONLY. [4-06] is set to 1.	Check setting [4-06].	Adjust setting if necessary.
Backup heater equilibrium point was set too high.	Setting "equilibrium temperature" [5-01] was set too high.	Check setting [5-01].	Change setting [5-01] to less quickly allow backup heater operation.
Setting domestic hot water operation mode [6-0D] NOT set optimally.	Setting domestic hot water operation mode [6-0D] is set to 0 (reheat ONLY). This will cause the system to work too frequently in domestic hot water operation and less in space heating.	Check setting [6-0D] in combination with the re-heat setpoint [6-0C].	It is advisable to set to factory setting (reheat + schedule) and program the schedule to heat the domestic hot water during periods of no space heating required.

Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
Deviation of outlet water after backup heater thermistor will influence the backup heater control.	▪ Deviation of outlet water after backup heater thermistor (lower temperature measured than actual), ▪ Bad contact between sensor and pipe.	Check outlet water after backup heater thermistor.	▪ Replace outlet water after backup heater thermistor when required, ▪ Replace hydro PCB when required.

Root cause category: system design

Possible failure	Root cause	Check	Repair
Water circuit – requested capacity too high causing the system to run at full capacity.	Incorrect system selection.	Check required capacity by heat load calculation. See the capacity tables in the engineering data book to know max. system capacity at indicated conditions.	Adapt system design.

2.6.14 Symptom: System does not start or operate

Root cause category: software control

Possible failure	Root cause	Check	Repair
Thermostat ON conditions for space heating (cooling) are NOT met.	Thermostat ON conditions for space heating (cooling) are NOT met.	Confirm thermostat on conditions depending on the unit control method (setting [C-07]): ▪ Setting 1: external room thermostat indicates by contact when to start/stop, ▪ Setting 2: room thermostat control => compare setpoint with room thermistor value. - Thermo on: room temperature = setpoint - (hysteresis/2), - Thermo off = room temperature + (hysteresis/2). For setting of hysteresis, see setting [9-0C], ▪ Setting 3: outlet water temperature control => Thermo on: outlet water temperature = setpoint. Thermo off: outlet water temperature –1,5°C.	Change setpoint if required.

Possible failure	Root cause	Check	Repair
Thermostat ON conditions for domestic hot water operation are NOT met.	Thermostat ON conditions for domestic hot water operation are NOT met.	Confirm thermostat on conditions depending on the selected domestic hot water control type (setting [6-0D]).	Change setpoint if required.
Out of operation range (ambient temperature above 35°C).	Ambient temperature higher than 35°C.	No action - unit CANNOT operate when ambient temperature is above 35°C.	

Root cause category: end user

Possible failure	Root cause	Check	Repair
Space heating (cooling) or domestic hot water operation is NOT activated on the user interface.		Confirm if space heating (cooling) operation or domestic hot water operation is activated on user interface.	Activate space heating (cooling) or domestic hot water operation on the user interface.

Root cause category: parameter (setting)

Possible failure	Root cause	Check	Repair
Displayed date/time is wrong - schedules NOT correctly executed.	▪ NOT set date/time after initial start-up, ▪ No power supply for more than 48 hours.	Set date/time according to operation manual instructions.	Set date/time according to operation manual instructions.
Displayed date/time is wrong - schedules NOT correctly executed.	Daylight Saving Time NOT set correctly.	Check Daylight Saving Time settings.	Set Daylight Saving Time according to operation manual.
Incorrect setting of unit control method (setting [C-07]).	Incorrect setting of unit control method (setting [C-07]) (leaving water control, room thermostat control, ext. room thermostat control).	Check if setting [C-07] (leaving water control, room thermostat control, ext. room thermostat control) is in set according to the application.	
Incorrect setting of space heating OFF temperature (setting [4-02]) or space cooling OFF temperature (setting [F-01]).	Incorrect setting of space heating OFF temperature (setting [4-02]) or space cooling OFF temperature (setting [F-01]).	Check if setting space heating OFF temperature (setting [4-02]) is correct (keep at 35°C) or check if setting space cooling OFF temperature (setting [F-01]) is correct (keep at 10°C).	
Preferential kWh rate power supply settings and electrical connections do NOT match.	Preferential kWh rate power supply settings and electrical connections do NOT match.	Check preferential kWh rate power supply settings and electrical connections (see installer reference guide).	

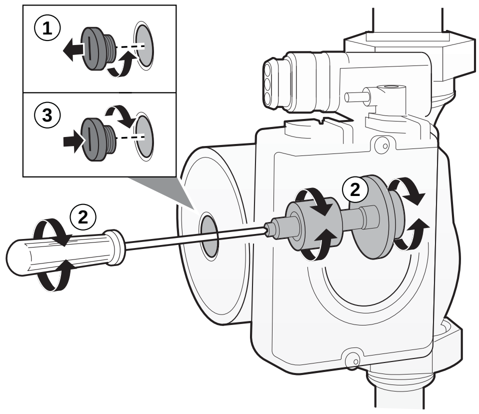
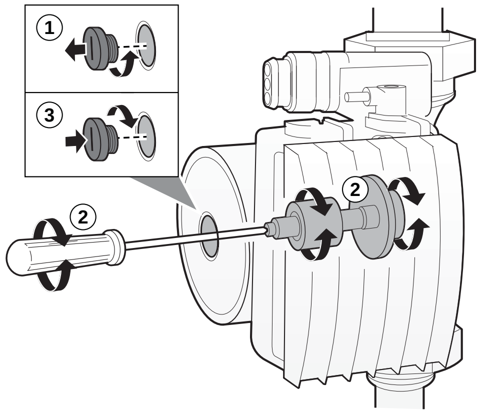
Root cause category: component – electrical

Possible failure	Root cause	Check	Repair
Hydro PCB NOT operational.	▪ No power supply, ▪ Faulty transformer, ▪ Hydro PCB malfunction.	▪ Confirm that HAP led is blinking in regular intervals, ▪ Confirm power supply towards hydro PCB, ▪ Check good operation of transformer.	▪ Re-establish power to hydro PCB. Replace hydro PCB in case power supply and transformer are OK but led is NOT blinking.
Outdoor unit PCB malfunction (Main PCB, inverter PCB, …)	▪ No power supply, ▪ Outdoor unit PCB malfunction.	▪ Confirm that HAP led is blinking in regular intervals, ▪ Confirm power supply towards outdoor unit PCB, ▪ Check good operation of outdoor unit PCB.	▪ Re-establish power to outdoor unit PCB. Replace outdoor unit PCB in case power supply is OK but led is NOT blinking or in case of PCB not operating correctly.
Reactor coil broken.	Component problem.	Check continuity of the reactor coil.	Replace the reactor coil in case faulty.

Root cause category: hardware

Possible failure	Root cause	Check	Repair
Cooling/heating operation starts, but stops immediately.	▪ Refrigerant overcharge, ▪ Mixing of air in refrigerant system.	Check refrigerant.	After vacuum drying, charge correct amount of refrigerant.

2.6.15 Symptom: The pump is blocked

Possible causes	Corrective action
If the unit has been powered off for a long time, lime might block the rotor of the pump.	Remove the screw of the stator housing and use a screwdriver to turn back and forth the ceramic shaft of the rotor until the rotor is deblocked.[a] **Note:** Do NOT use excessive force.  

[a] If you cannot deblock the rotor of the pump with this method, you will need to disassemble the pump and turn the rotor by hand.

3 Components

> **CAUTION**
>
> When replacing a component ALWAYS make sure the correct spare part for your unit is installed.

3.1 3-way valve

3.1.1 Domestic hot water/space heating 3-way valve

YJS 3-way valve

Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

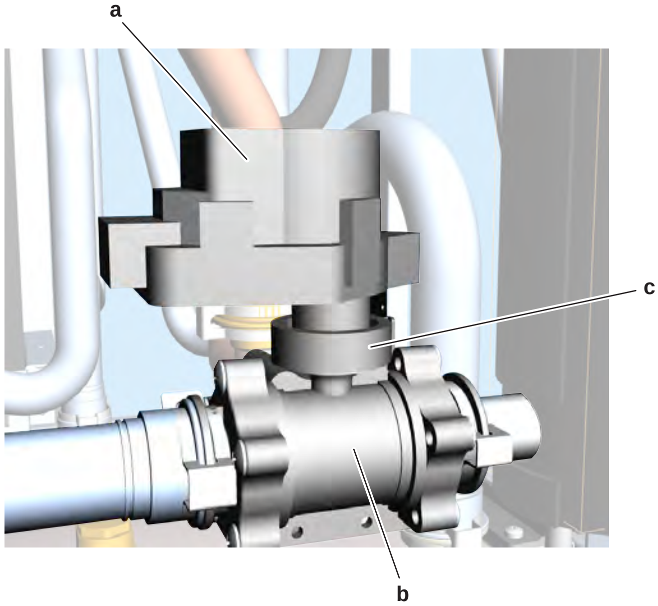
To perform a mechanical check of the 3-way valve

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Floor standing and Bizone units ONLY: Lower the switch box, see "3.23 Plate work" [▸ 261].
2. Carefully open the insulation of the 3-way valve.
3. Check that the 3-way valve motor is fixed correctly on the 3-way valve body. If needed tighten the 3-way valve motor fixation nut.



a 3-way valve motor
b 3-way valve body
c Fixation nut

Is the problem solved?	Action
Yes	No further actions required.

Is the problem solved?	Action
No	Perform an electrical check of the 3-way valve, see "Checking procedures" [▸ 101].

To perform an electrical check of the 3-way valve

Prerequisite: First perform a mechanical check of the 3-way valve, see "Check procedures" [▸ 101].

1 Turn ON the power of the unit.

2 Activate `DHW operation` via the user interface.

3 Measure the voltage on connector X28A pin 2 and X20A pin 1.

Result: The measured voltage MUST be 230 V AC.

4 De-activate `DHW operation` and activate `Space operation` via the user interface.

5 Disconnect the connector X20A from the 3-way valve.

6 Measure the voltage on connector X28A pin 2 and X20A pin 3.

Result: The measured voltage MUST be 230 V AC.

Are the measured voltages on connectors X28A and X20A correct?	Action
Yes	Perform a position check of the 3-way valve (automatic procedure), see "Checking procedures" [▸ 101].
No	Continue with the next step.

7 Measure the voltage on connector X28A pin 1 and 2.

Result: The measured voltage MUST be 230 V AC.

Is the measured voltage on connector X28A correct?	Action
Yes	Continue with the next step.
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▸ 199].

8 Disconnect connector X20A from the hydro PCB.

9 Activate `DHW operation` via the user interface.

10 Measure the resistance between X20A pin 1 and 5.

Result: The measured resistance MUST be 0 Ω.

11 De-activate `DHW operation` and activate `Space operation` via the user interface.

12 Measure the resistance between X20A pin 3 and 5.

Result: The measured resistance MUST be 0 Ω.

Is the resistance for both measurements on connector X20A correct?	Action
Yes	Relay KVR is switching correctly. Correct the wiring between X20A and X28A, see "6.2 Wiring Diagram" [▸ 370].

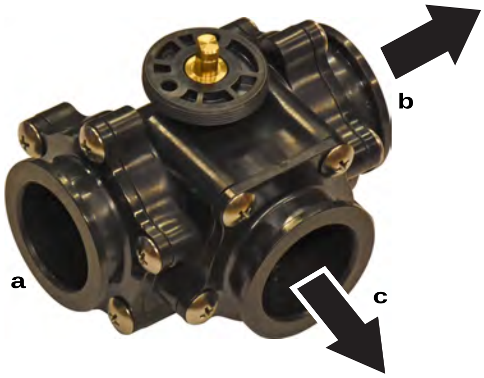
Is the resistance for both measurements on connector X20A correct?	Action
No	Relay KVR is NOT switching correctly. Replace the hydro PCB, see "3.15.2 Repair procedures" [▶ 202],

To perform a position check of the 3-way valve (automatic procedure)

Prerequisite: First perform an electrical check of the 3-way valve, see "Checking procedures" [▶ 101].

1 Turn ON the power of the unit.

2 Activate `DHW operation` via the user interface.



a Water inlet
b Domestic hot water exit
c Space heating exit

3 Use a contact thermometer to measure the temperature at the 3-way valve water inlet, the domestic hot water exit and the space heating exit.

Exit	Temperature
Domestic hot water	Same as the 3-way valve inlet
Space heating	"Much" lower than the 3-way valve inlet

4 De-activate `DHW operation` and activate `Space operation` via the user interface.

5 Use a contact thermometer to measure the temperature at the 3-way valve water inlet, the domestic hot water exit and the space heating exit.

Exit	Temperature
Domestic hot water	"Much" lower than the 3-way valve inlet
Space heating	Same as the 3-way valve inlet

Both temperature checks performed above are correct?	Action
Yes	Component is OK. Return to the troubleshooting of the specific error and continue with the next step.
No	Perform a position check of the 3-way valve (manual procedure), see "Checking procedures" [▶ 101].

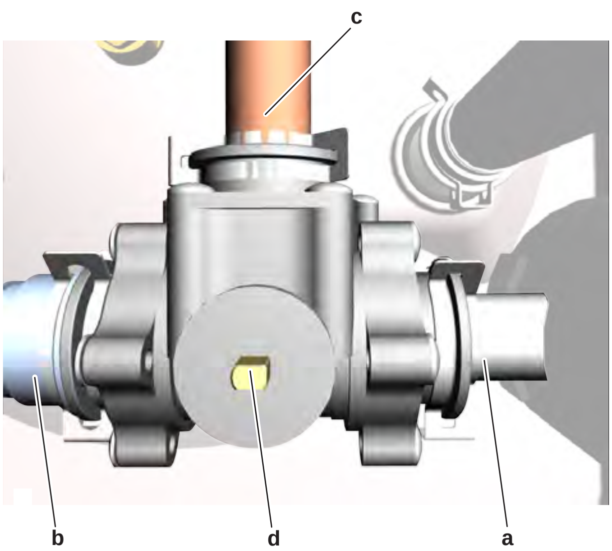
To perform a position check of the 3-way valve (manual procedure)

Prerequisite: First perform a position check (automatic procedure), see "Checking procedures" [▸ 101].

Prerequisite: Remove the nut that fixes the 3-way valve motor and remove the 3-way valve motor from the 3-way valve body.

1. Manually put the 3-way valve in the domestic hot water position by rotating the 3-way valve body axle.

> **CAUTION**
>
> Mark the original position of the 3-way valve body axle. At the end of this procedure, manually put the 3-way valve back in its original position by rotating the 3-way valve body axle.



a Water inlet
b Domestic hot water exit
c Space heating exit
d 3-way valve body axle in domestic hot water position

2. Use a contact thermometer to measure the temperature at the 3-way valve water inlet, the domestic hot water exit and the space heating exit.

Exit	Temperature
Domestic hot water	Same as the 3-way valve inlet
Space heating	"Much" lower than the 3-way valve inlet

3. Manually put the 3-way valve in the space heating position by rotating the 3-way valve body axle 90° counterclockwise.
4. Use a contact thermometer to measure the temperature at the 3-way valve water inlet, the domestic hot water exit and the space heating exit.

Exit	Temperature
Domestic hot water	"Much" lower than the 3-way valve inlet
Space heating	Same as the 3-way valve inlet

Both temperature checks performed above are correct?	Action
Yes	3-way valve body is OK, 3-way valve motor broken. Install a new 3-way valve motor, see "Repair procedures" [▸ 105].

Both temperature checks performed above are correct?	Action
No	3-way valve body broken, replace the 3-way valve body, see "Repair procedures" [▶ 105].

Repair procedures

To remove the 3-way valve motor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Floor standing and Bizone units ONLY: Lower the switch box, see "3.23 Plate work" [▶ 261].

2 Disconnect the 3-way valve motor connectors X20A and X28A.

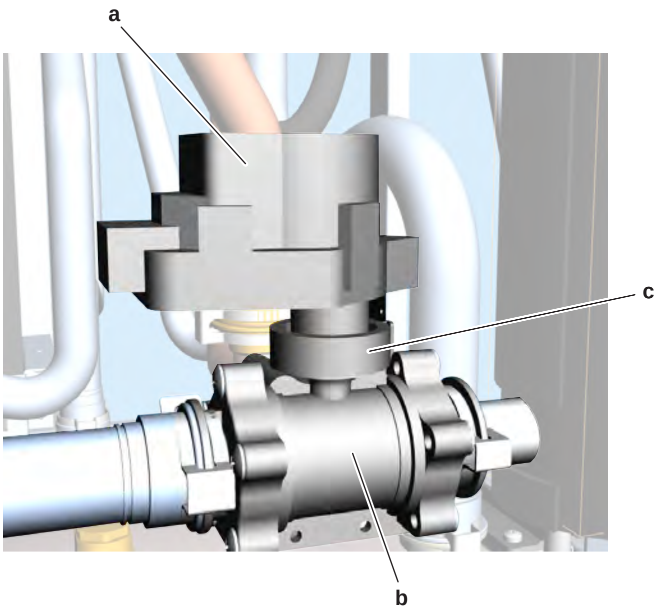
3 Route the 3-way valve motor harness through the grommet in the switch box.

4 Detach the cable clamps that fix the 3-way valve motor harness to the rear side of the switch box.

5 Cut all tie straps that fix the 3-way valve motor harness.

6 Carefully open the insulation of the 3-way valve.

7 Unscrew the nut that fixes the 3-way valve motor to the 3-way valve body.



a 3-way valve motor
b 3-way valve body
c Fixation nut

8 Remove the 3-way valve motor from the 3-way valve body.

9 To install the 3-way valve motor, see "Repair procedures" [▶ 105].

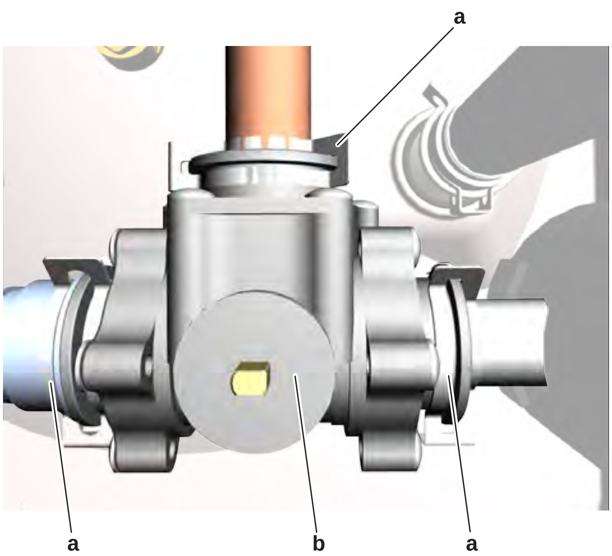
To remove the 3-way valve body

Prerequisite: Remove the 3-way valve motor, see "Repair procedures" [▶ 105].

1 Drain water from the water circuit, see "4.3.2 Repair procedures" [▶ 356].

2 Remove the insulation that covers the 3-way valve body.

3 Remove the 3 clips that fix the 3-way valve body to the piping.



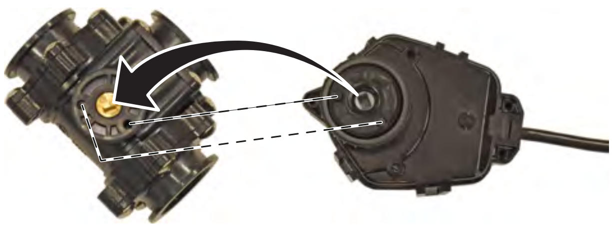
a Clip
b 3-way valve body

4 Remove the 3-way valve body.

5 To install the 3-way valve body, see "Repair procedures" [▶ 105].

To install the 3-way valve body

> **CAUTION**
>
> Align the 2 guide pins of the 3-way valve motor with the 2 holes in the 3-way valve body before joining the 3-way valve body shaft with the 3-way valve motor axle.



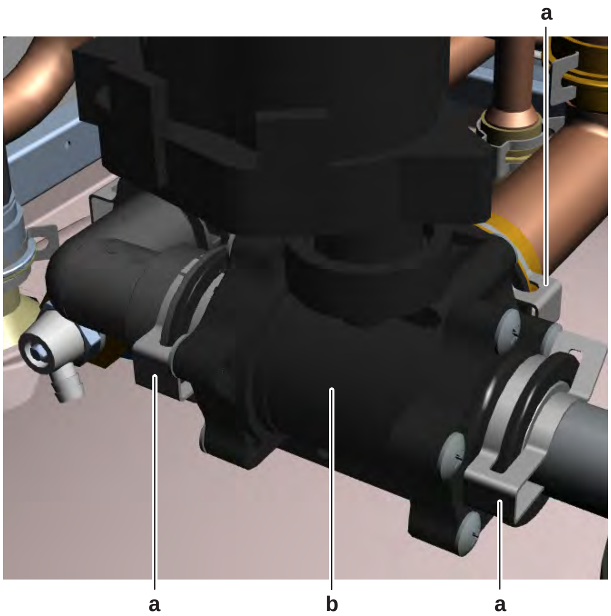
1 Install the 3-way valve motor on the 3-way valve body.

a Fixation nut
b 3-way valve motor
c 3-way valve body

2 Tighten the nut to fix the 3-way valve motor to the 3-way valve body.

> **NOTICE**
>
> Check the condition of the O-rings and replace if needed. Apply water to the O-rings before installation.

3 Install the 3-way valve body in the correct location.



a Clip
b 3-way valve body

4 Install the 3 clips to fix the 3-way valve body to the piping.

5 Install the insulation around the 3-way valve body.

6 Route the 3-way valve motor harness through the grommet in the switch box.

7 Connect the 3-way valve motor connectors X20A and X28A.

8 Install the cable clamps to fix the 3-way valve motor harness to the rear side of the switch box.

9 Install new tie straps to fix the 3-way valve harness.

10 Open the valve (if equipped) of the water circuit towards the expansion vessel.

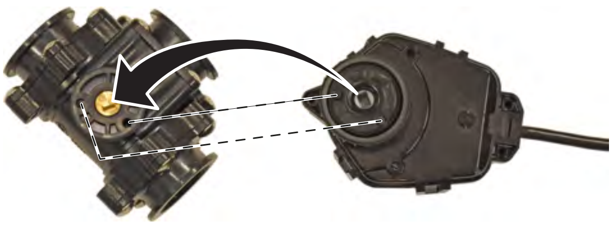
> **CAUTION**
>
> Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

11 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▶ 356].

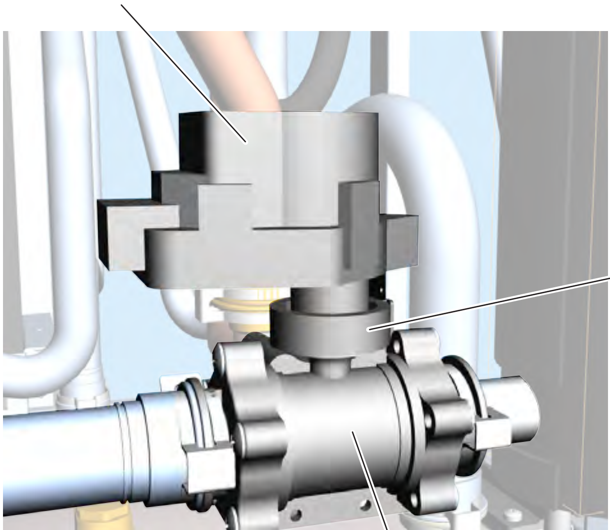
Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To install the 3-way valve motor

> **CAUTION**
>
> Align the 2 guide pins of the 3-way valve motor with the 2 holes in the 3-way valve body before joining the 3-way valve body shaft with the 3-way valve motor axle.



1 Install the 3-way valve motor on the 3-way valve body.



- **a** 3-way valve motor
- **b** 3-way valve body
- **c** Fixation nut

2 Tighten the nut to fix the 3-way valve motor to the 3-way valve body.
3 Put the insulation back in place.
4 Route the 3-way valve motor harness through the grommet in the switch box.
5 Connect the 3-way valve motor connectors X20A and X28A.
6 Install the cable clamps to fix the 3-way valve motor harness to the rear side of the switch box.
7 Install new tie straps to fix the 3-way valve harness.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

ESBE 3-way valve

NOTICE

This optional 3-way valve is ONLY used for wall mounted units and is field installed (outside the unit).

Checking procedures

INFORMATION

It is recommended to perform the checks in the listed order.

To perform a mechanical check of the 3-way valve

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 The 3-way valve knob MUST be fully pressed (= motor control). If NOT fully pressed, press the 3-way valve knob.
2 The 3-way valve knob MUST be in domestic hot water or space heating position, NOT in intermediate position. If in intermediate position, put the 3-way valve switch in domestic hot water or space heating position.

Is the problem solved?	Action
Yes	No further actions required.
No	Perform an electrical check of the 3-way valve, see "Checking procedures" [▸ 109].

To perform an electrical check of the 3-way valve

Prerequisite: First perform a mechanical check of the 3-way valve, see "Checking procedures" [▸ 109].

1 Turn ON the power of the unit.
2 Activate `DHW operation` via the user interface.
3 Measure the voltage on connector X2M pin 13 and pin 14a.

Result: The measured voltage MUST be 230 V AC.

4 Measure the voltage on connector X2M pin 13 and pin 12.

Result: The measured voltage MUST be 230 V AC.

5 De-activate `DHW operation` and activate `Space operation` via the user interface.

6 Measure the voltage on connector X2M pin 13 and pin 14a.

Result: The measured voltage MUST be 230 V AC.

7 Measure the voltage on connector X2M pin 13 and pin 12.

Result: The measured voltage MUST be 0 V AC.

Are the measured voltages correct?	Action
Yes	Perform a position check of the 3-way valve (automatic procedure), see "Checking procedures" [▸ 109].
No	Continue with the next step.

8 Measure the voltage on connector X17A pin 5 and 7.

Result: The measured voltage MUST be 230 V AC.

Is the measured voltage on connector X17A correct?	Action
Yes	Continue with the next step.
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▸ 199].

9 Disconnect connector X20A from the hydro PCB.

10 Activate `DHW operation` via the user interface.

11 Measure the resistance between X20A pin 3 and 5.

Result: The measured resistance MUST be 0 Ω.

12 De-activate `DHW operation` and activate `Space operation` via the user interface.

13 Measure the resistance between X20A pin 1 and 5.

Result: The measured resistance MUST be 0 Ω.

Is the resistance for both measurements on connector X20A correct?	Action
Yes	Relay KVR is switching correctly. Correct the wiring between X20A, X17A and X2M, see "6.2 Wiring Diagram" [▸ 370].
No	Relay KVR is NOT switching correctly. Replace the hydro PCB, see "3.15.2 Repair procedures" [▸ 202],

To perform a position check of the 3-way valve (automatic procedure)

Prerequisite: First perform an electrical check of the 3-way valve, see "Checking procedures" [▸ 109].

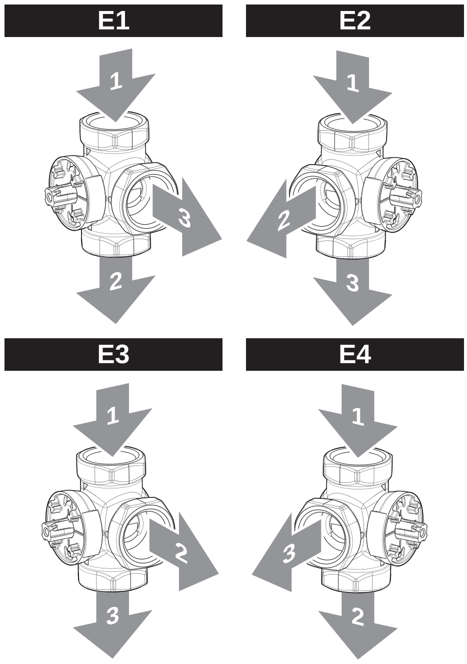
1 Turn ON the power of the unit.

2 Activate `DHW operation` via the user interface.

3 Use a contact thermometer to measure the temperature at the 3-way valve water inlet, the domestic hot water exit and the space heating exit.

Exit	Temperature
Domestic hot water	Same as the 3-way valve inlet
Space heating	"Much" lower than the 3-way valve inlet

4 The 3-way valve can be installed in accordance with one of the following four configurations. Water inlet and exit locations differ depending on the configuration used in your unit.



1 Water inlet
2 Domestic hot water exit
3 Space heating exit

5 De-activate `DHW operation` and activate `Space operation` via the user interface.

6 Use a contact thermometer to measure the temperature at the 3-way valve water inlet, the domestic hot water exit and the space heating exit.

Exit	Temperature
Domestic hot water	"Much" lower than the 3-way valve inlet
Space heating	Same as the 3-way valve inlet

Both temperature checks performed above are correct?	Action
Yes	Component is OK. Return to the troubleshooting of the specific error and continue with the next step.
No	Perform a position check of the 3-way valve (manual procedure), see "Checking procedures" [▶ 109].

To perform a position check of the 3-way valve (manual procedure)

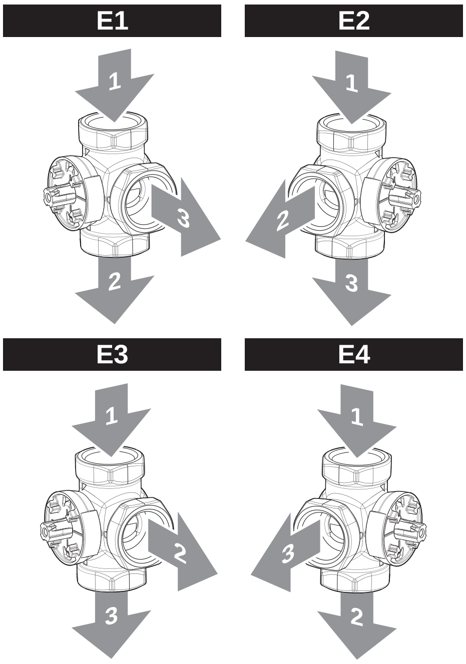
Prerequisite: First perform a position check (automatic procedure), see "Checking procedures" [▶ 109].

1 Manually put the 3-way valve in the domestic hot water position by rotating the 3-way valve knob.

2 Use a contact thermometer to measure the temperature at the 3-way valve water inlet, the domestic hot water exit and the space heating exit.

Exit	Temperature
Domestic hot water	Same as the 3-way valve inlet
Space heating	"Much" lower than the 3-way valve inlet

3 The 3-way valve can be installed in accordance with one of the following four configurations. Water inlet and exit locations differ depending on the configuration used in your unit.



1 Water inlet
2 Domestic hot water exit
3 Space heating exit

4 Manually put the 3-way valve in the space heating position by rotating the 3-way valve knob.

5 Use a contact thermometer to measure the temperature at the 3-way valve water inlet, the domestic hot water exit and the space heating exit.

Exit	Temperature
Domestic hot water	"Much" lower than the 3-way valve inlet
Space heating	Same as the 3-way valve inlet

Both temperature checks performed above are correct?	Action
Yes	Install a new 3-way valve motor, see "Repair procedures" [▸ 112].
No	Replace the valve body, see "Repair procedures" [▸ 112].

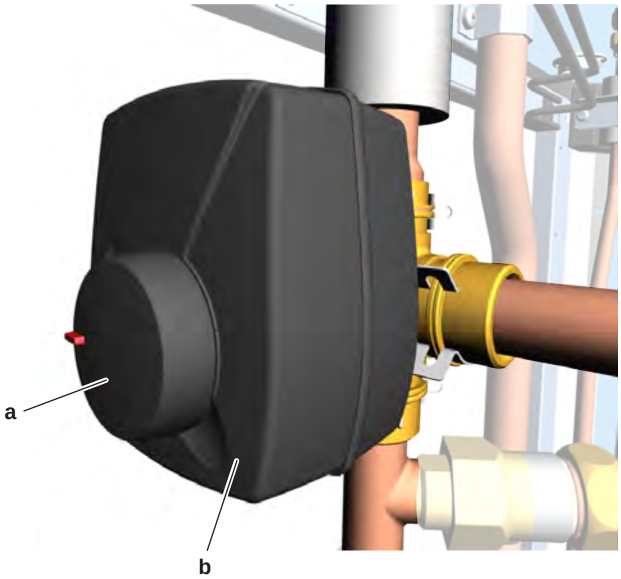
Repair procedures

To remove the 3-way valve motor

Prerequisite: Stop the unit operation via the user interface.

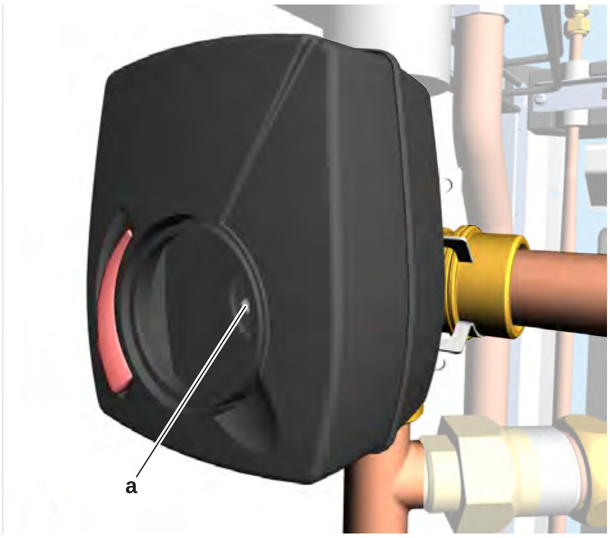
Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▶ 261].
2. Disconnect the 3-way valve motor wiring from the wire terminal X2M.
3. Route the 3-way valve motor harness through the grommet in the switch box.
4. Cut all tie straps that fix the 3-way valve motor harness.
5. Pull the 3-way valve knob and remove it from the 3-way valve motor.



a 3-way valve knob
b 3-way valve motor

6. Loosen the screw.



a Screw

7. Remove the 3-way valve motor from the 3-way valve body.
8. To install the 3-way valve motor, see "Repair procedures" [▶ 112].

To remove the 3-way valve body

Prerequisite: Remove the 3-way valve motor, see "Repair procedures" [▶ 112].

Prerequisite: Drain water from the piping to which the 3-way valve body is connected.

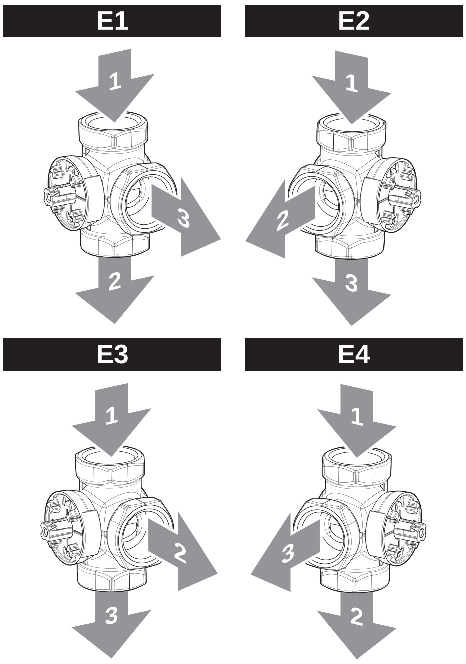
1. If applicable, remove the insulation that covers the 3-way valve body.
2. Remove the 3-way valve body from the water piping.

3 To install the 3-way valve body, see "Repair procedures" [▶ 112].

To install the 3-way valve body

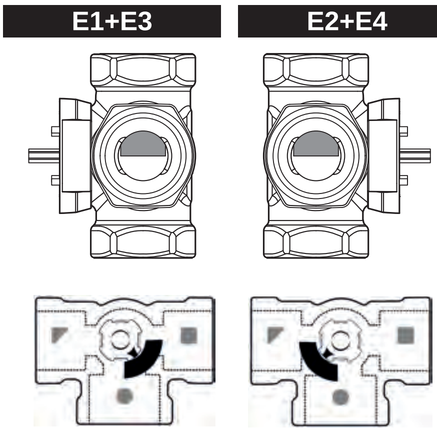
> **CAUTION**
>
> Make sure the 3-way valve body axle is aligned with the 3-way valve motor when installing the 3-way valve motor on the 3-way valve body.The 3-way valve motor is shipped with the 3-way valve knob in the central position. Do NOT change this position!

1 The 3-way valve can be installed in accordance with one of the following four configurations.

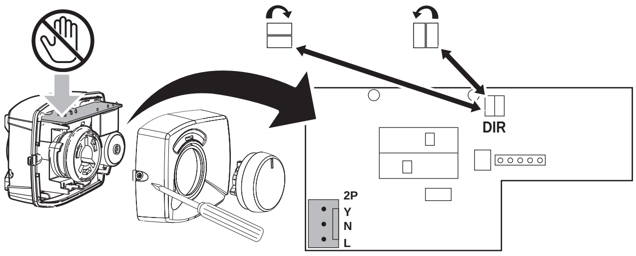


1 Water inlet
2 Domestic hot water exit
3 Space heating exit

2 Depending on the configuration used in your unit, put the 3-way valve body axle (notch) in the correct position (see image below).



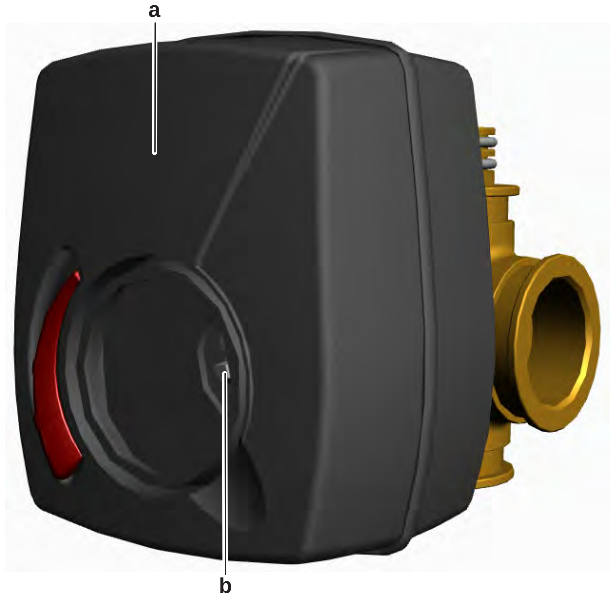
3 When installing in accordance with configurations E3 or E4, open the valve motor cover by loosening the screw and change the jumper so as to change the rotation direction of the valve.



◫ Position of the jumper in case of installation according to configurations E1 and E2.
⊟ Position of the jumper in case of installation according to configurations E3 and E4.

4 Install the 3-way valve motor on the 3-way valve body.

5 Tighten the screw to fix the 3-way valve motor to the 3-way valve body.



a 3-way valve motor
b Screw

6 Install the 3-way valve knob on the 3-way valve motor.

a 3-way valve knob
b 3-way valve motor

> **NOTICE**
>
> Check the condition of the O-rings and replace if needed. Apply water to the O-rings before installation.

7 Install the 3-way valve body on the water piping.

8 If applicable, install the insulation around the 3-way valve body.

9 Route the 3-way valve motor harness through the grommet in the switch box.

10 Connect the 3-way valve motor wiring to the wire terminal X2M.

11 Install new tie straps to fix the 3-way valve harness.

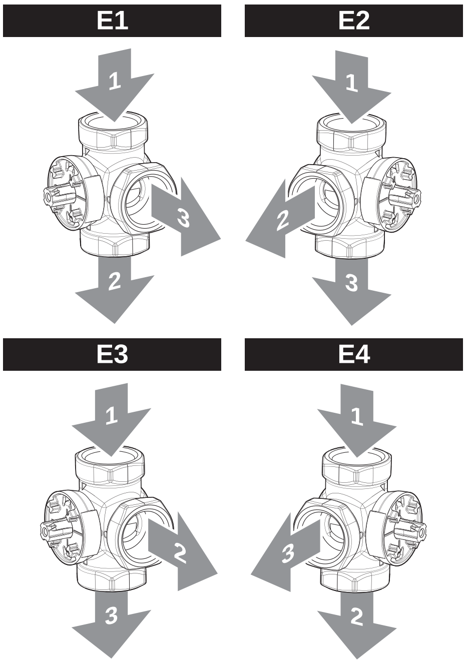
12 Open the stop valves and add water to the water circuit if needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To install the 3-way valve motor

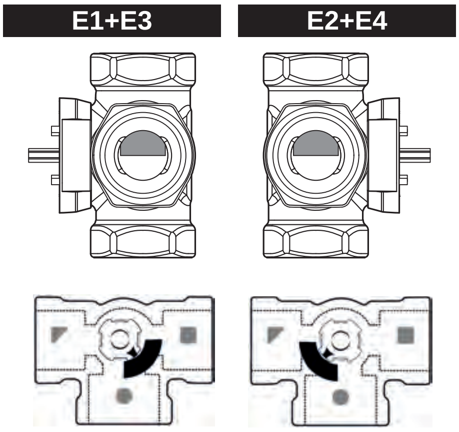
> **CAUTION**
>
> Make sure the 3-way valve body axle is aligned with the 3-way valve motor when installing the 3-way valve motor on the 3-way valve body.The 3-way valve motor is shipped with the 3-way valve knob in the central position. Do NOT change this position!

1 The 3-way valve can be installed in accordance with one of the following four configurations.

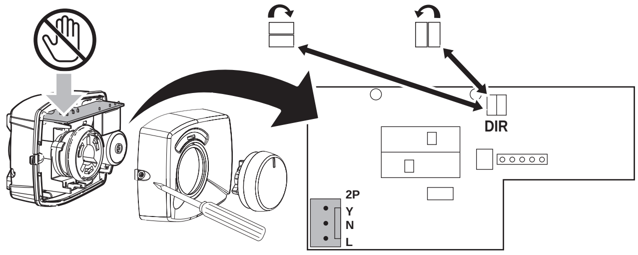


1 Water inlet
2 Domestic hot water exit
3 Space heating exit

2 Depending on the configuration used in your unit, put the 3-way valve body axle (notch) in the correct position (see image below).



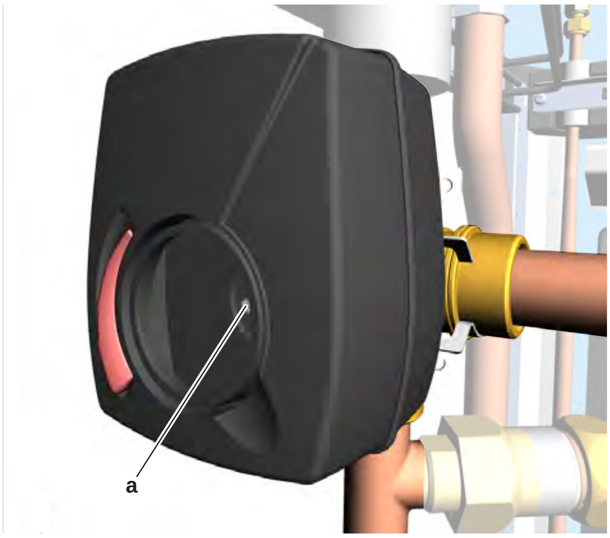
3 When installing in accordance with configurations E3 or E4, open the valve motor cover by loosening the screw and change the jumper so as to change the rotation direction of the valve.



- Position of the jumper in case of installation according to configurations E1 and E2.
- Position of the jumper in case of installation according to configurations E3 and E4.

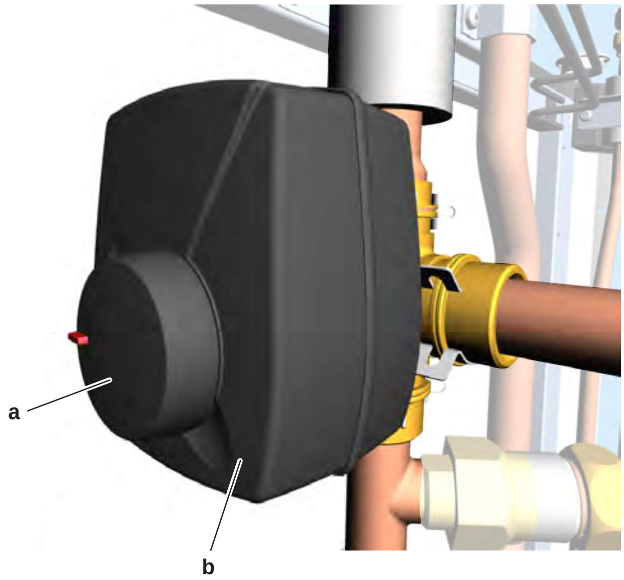
4 Install the 3-way valve motor on the 3-way valve body.

5 Tighten the screw to fix the 3-way valve motor to the 3-way valve body.



a Screw

6 Install the 3-way valve knob on the 3-way valve motor.



a 3-way valve knob
b 3-way valve motor

7 Route the 3-way valve motor harness through the grommet in the switch box.

8 Connect the 3-way valve motor wiring to the wire terminal X2M.

9 Install new tie straps to fix the 3-way valve harness.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.1.2 Bizone circuit 3-way valve

> **INFORMATION**
>
> The procedures described here are for the units with integrated (built-in) bizone circuit. For more information about the optional bizone kit, see documentation of the bizone kit.

Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a mechanical check of the 3-way valve

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Lower the switch box, see "3.23 Plate work" [▶ 261].

2 The 3-way valve knob MUST be fully pressed (= motor control). If NOT fully pressed, press the 3-way valve knob.

3 The 3-way valve knob MUST be in mixed zone open or closed position, NOT in intermediate position. If in intermediate position, put the 3-way valve switch in mixed zone open or closed position.

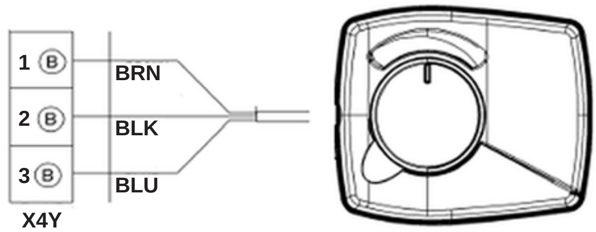
Is the problem solved?	Action
Yes	No further actions required.
No	Perform an electrical check of the 3-way valve, see "Checking procedures" [▸ 118].

To perform an electrical check of the 3-way valve

Prerequisite: First perform a mechanical check of the 3-way valve, see "Checking procedures" [▸ 118].

1. Turn ON the power of the unit.
2. Activate "mixed zone ONLY" via the user interface.
3. Measure the voltage on connector X4Y pin 1 and pin 3.

   Result: The measured voltage MUST be 230 V AC.



BRN Brown
BLK Black
BLU Blue

Are the measured voltages on connector X4Y correct?	Action
Yes	Skip the next steps and continue with activation of `Space operation` in the mixed and additional zone via the user interface.
No	Continue with the next step.

4. Disconnect connector X14A from the Bizone PCB.
5. Measure the voltage on connector X14A pin 2 and pin 3.

   Result: The measured voltage MUST be 12 V DC.

Is the measured voltage on connector X14A correct?	Action
Yes	Relay K7M broken, replace the relay K7M, see "6.2 Wiring diagram" [▸ 370].
No	Perform a check of the bizone PCB, see "3.6.1 Checking procedures" [▸ 160].

6. De-activate "mixed zone ONLY" and activate `Space operation` in the mixed and additional zone via the user interface.
7. Measure the voltage on connector X4Y pin 2 and pin 3.

   Result: The measured voltage MUST be 230 V AC.

Is the measured voltage on connector X4Y correct?	Action
Yes	Perform a position check of the 3-way valve (automatic procedure), see "Checking procedures" [▶ 118].
No	Continue with the next step.

8 Disconnect connector X14A from the Bizone PCB.

9 Measure the voltage on connector X14A pin 1 and pin 3.

Result: The measured voltage MUST be 12 V DC.

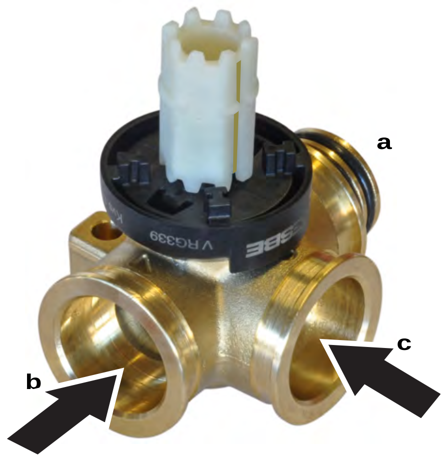
Is the measured voltage on connector X14A correct?	Action
Yes	Relay K6M broken, replace the relay K6M, see "6.2 Wiring diagram" [▶ 370].
No	Perform a check of the bizone PCB, see "3.6.1 Checking procedures" [▶ 160].

To perform a position check of the 3-way valve (automatic procedure)

Prerequisite: First perform an electrical check of the 3-way valve, see "Checking procedures" [▶ 118].

1 Turn ON the power of the unit.

2 Activate "mixed zone ONLY" via the user interface.



a Mixed zone out
b Mixed zone IN COLD
c Mixed zone IN HOT

3 Use a contact thermometer to measure the temperature at the 3-way valve mixed zone IN HOT, mixed zone IN COLD and mixed zone OUT.

Exit	Temperature
Mixed zone OUT	Same as the 3-way valve mixed zone IN HOT
Mixed zone IN COLD	"Much" lower than the 3-way valve mixed zone IN HOT

4 De-activate "mixed zone ONLY" and activate `Space operation` in the mixed and additional zone via the user interface.

5 Use a contact thermometer to measure the temperature at the 3-way valve mixed zone IN HOT, mixed zone IN COLD and mixed zone OUT.

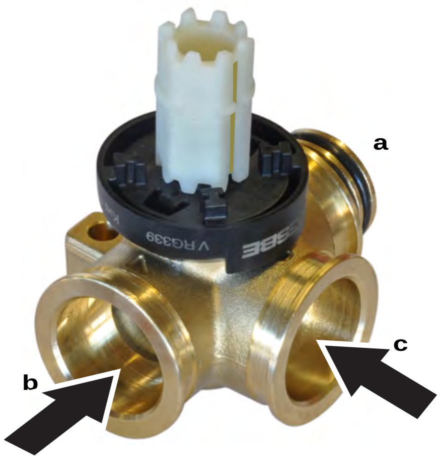
Exit	Temperature
Mixed zone OUT	Lower than the 3-way valve mixed zone IN HOT
Mixed zone OUT	Higher than the 3-way valve mixed zone IN COLD

Both temperature checks performed above are correct?	Action
Yes	Component is OK. Return to the troubleshooting of the specific error and continue with the next step.
No	Perform a position check of the 3-way valve (manual procedure), see "Checking procedures" [▶ 118].

To perform a position check of the 3-way valve (manual procedure)

Prerequisite: First perform a position check (automatic procedure), see "Checking procedures" [▶ 118].

1 Manually put the 3-way valve in the "mixed zone ONLY" position by rotating the 3-way valve knob.



a Mixed zone out
b Mixed zone IN COLD
c Mixed zone IN HOT

2 Use a contact thermometer to measure the temperature at the 3-way valve mixed zone IN HOT, mixed zone IN COLD and mixed zone OUT.

Exit	Temperature
Mixed zone OUT	Same as the 3-way valve mixed zone IN HOT
Mixed zone IN COLD	"Much" lower than the 3-way valve mixed zone IN HOT

3 Manually put the 3-way valve in the space heating (in the mixed and additional zone) position by rotating the 3-way valve knob.

4 Use a contact thermometer to measure the temperature at the 3-way valve mixed zone IN HOT, mixed zone IN COLD and mixed zone OUT.

Exit	Temperature
Mixed zone OUT	Lower than the 3-way valve mixed zone IN HOT
Mixed zone OUT	Higher than the 3-way valve mixed zone IN COLD

Both temperature checks performed above are correct?	Action
Yes	Install a new 3-way valve motor, see "Repair procedures" [▶ 122].
No	Replace the valve body, see "Repair procedures" [▶ 122].

Repair procedures

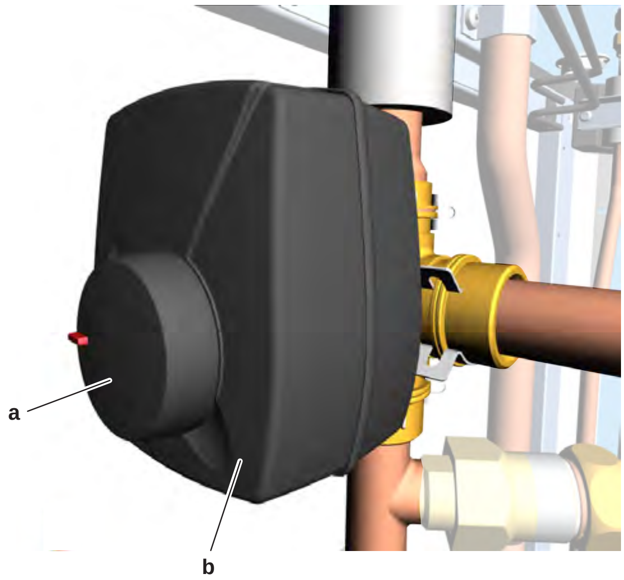
To remove the 3-way valve motor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

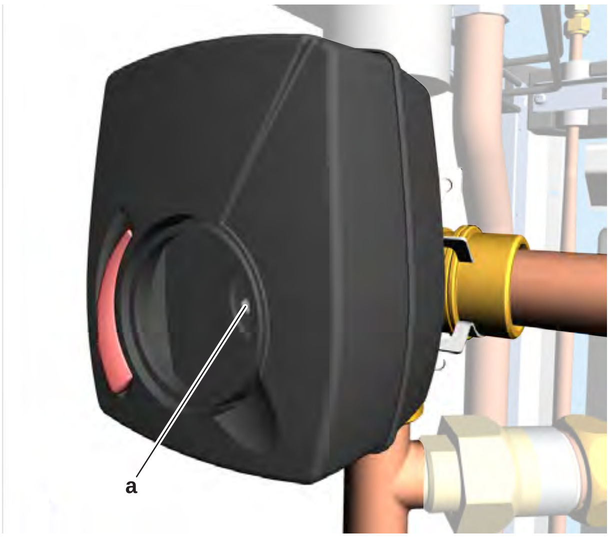
Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Lower the switch box, see "3.23 Plate work" [▶ 261].
2. Disconnect the 3-way valve motor connector X4Y.
3. Cut all tie straps that fix the 3-way valve motor harness.
4. Pull the 3-way valve knob and remove it from the 3-way valve motor.



a 3-way valve knob
b 3-way valve motor

5. Loosen the screw.



a Screw

6 Remove the 3-way valve motor from the 3-way valve body.

7 To install the 3-way valve motor, see "Repair procedures" [▶ 122].

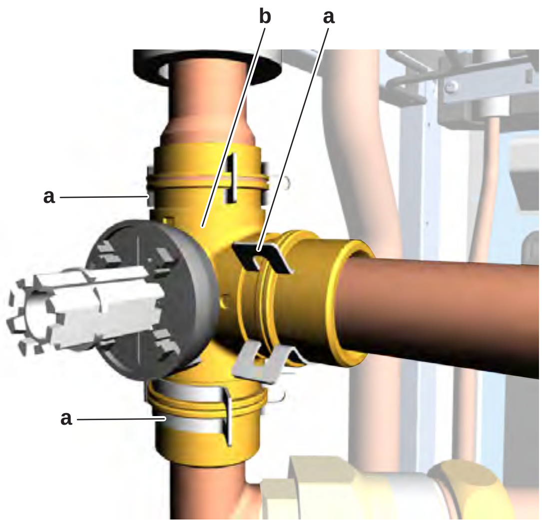
To remove the 3-way valve body

Prerequisite: Remove the 3-way valve motor, see "Repair procedures" [▶ 122].

1 Drain water from the water circuit, see "4.3.2 Repair procedures" [▶ 356].

2 Remove the insulation that covers the 3-way valve body.

3 Remove the 3 clips that fix the 3-way valve body to the piping.



a Clip
b 3-way valve body

4 Remove the 3-way valve body.

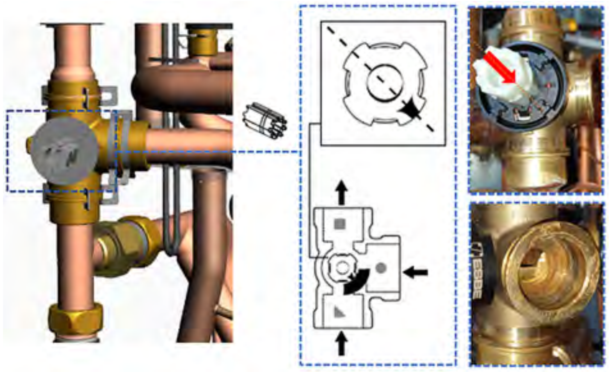
5 To install the 3-way valve body, see "Repair procedures" [▶ 122].

To install the 3-way valve body

CAUTION

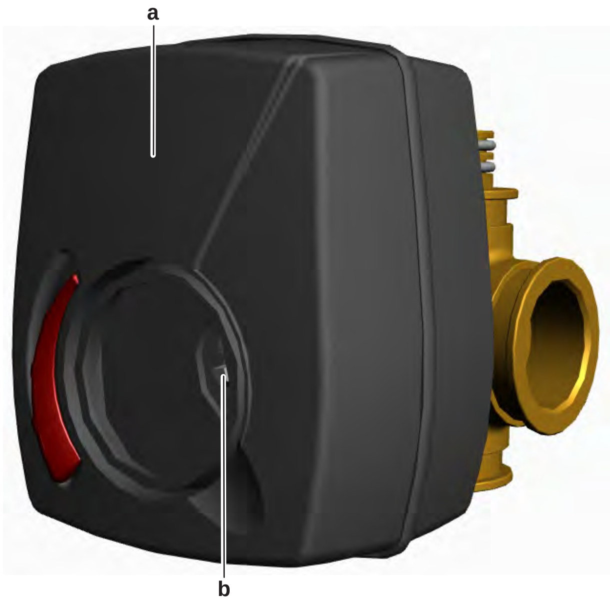
Make sure the 3-way valve body axle is aligned with the 3-way valve motor when installing the 3-way valve motor on the 3-way valve body.The 3-way valve motor is shipped with the 3-way valve knob in the central position. Do NOT change this position!

1 Check the position of the notch in the 3-way valve body axle. It can only have one position: the notch needs to point to perfectly in the middle between the "dot" and the "triangle" sign. Manually adjust as needed.



2 Install the 3-way valve motor on the 3-way valve body.

3 Tighten the screw to fix the 3-way valve motor to the 3-way valve body.



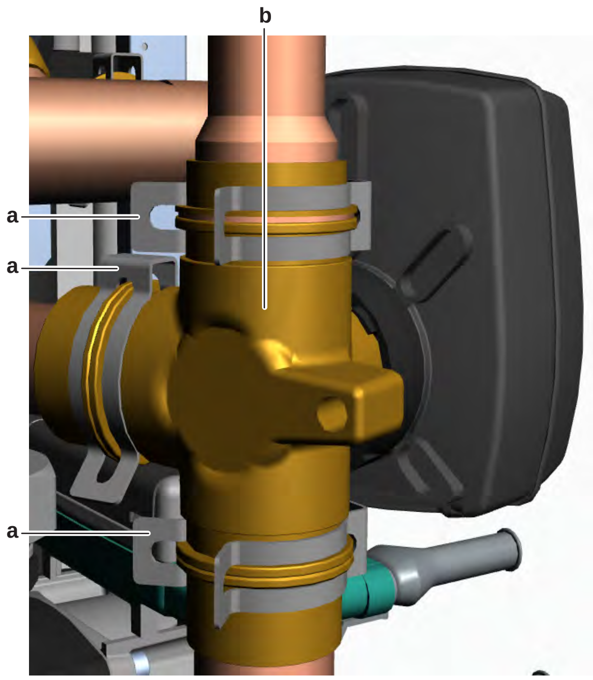
a 3-way valve motor
b Screw

4 Install the 3-way valve knob on the 3-way valve motor.

a 3-way valve knob
b 3-way valve motor

> **NOTICE**
>
> Check the condition of the O-rings and replace if needed. Apply water to the O-rings before installation.

5 Install the 3-way valve body.



a Clip
b 3-way valve body

6 Install the 3 clips to fix the 3-way valve body to the piping.

7 Install the insulation around the 3-way valve body.

8 Connect the 3-way valve motor connector X4Y.

9 Install new tie straps to fix the 3-way valve harness.

10 Open the valve (if equipped) of the water circuit towards the expansion vessel.

> **CAUTION**
>
> Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

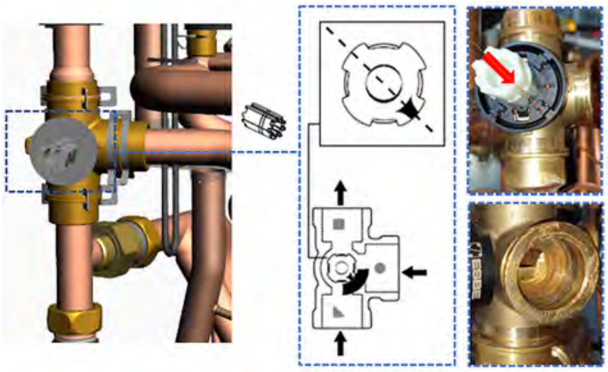
11 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▶ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To install the 3-way valve motor

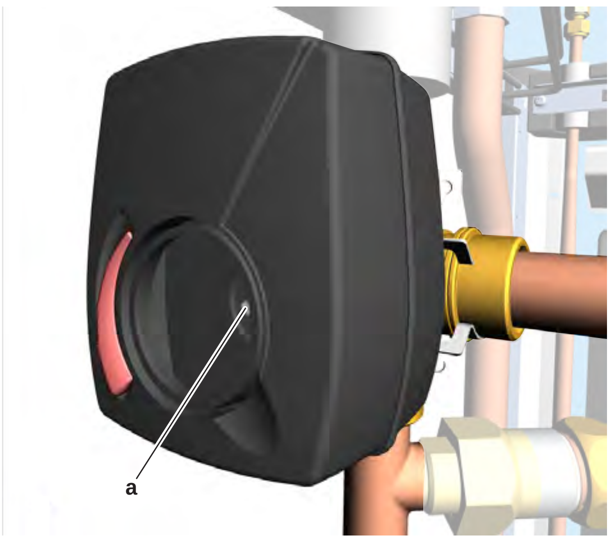
> **CAUTION**
>
> Make sure the 3-way valve body axle is aligned with the 3-way valve motor when installing the 3-way valve motor on the 3-way valve body.The 3-way valve motor is shipped with the 3-way valve knob in the central position. Do NOT change this position!

1 Check the position of the notch in the 3-way valve body axle. It can only have one position: the notch needs to point to perfectly in the middle between the "dot" and the "triangle" sign. Manually adjust as needed.



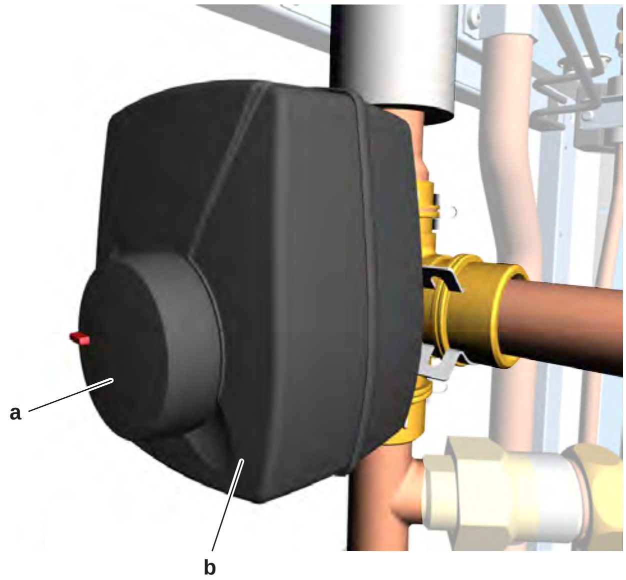
2 Install the 3-way valve motor on the 3-way valve body.

3 Tighten the screw to fix the 3-way valve motor to the 3-way valve body.



a Screw

4 Install the 3-way valve knob on the 3-way valve motor.



a 3-way valve knob
b 3-way valve motor

5 Connect the 3-way valve motor connector X4Y.

6 Install new tie straps to fix the 3-way valve harness.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.2 4-way valve

3.2.1 Checking procedures

INFORMATION

It is recommended to perform the checks in the listed order.

To perform a mechanical check of the 4-way valve

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

DANGER: RISK OF BURNING/SCALDING

The coil gets hot while energized. Wait for it to cool down.

2 Verify that the screw is firmly fixing the coil to the valve body.

3 Check if any damage or burst is present.

Is the 4-way valve coil firmly fixed and not visually damaged?	Action
Yes	Perform an electrical check of the 4-way valve, see "3.2.1 Checking procedures" [▶ 127].
No	Fix or replace the 4-way valve coil, see "3.2.2 Repair procedures" [▶ 132].

To perform an electrical check of the 4-way valve

1. First perform a mechanical check of the 4-way valve, see "3.2.1 Checking procedures" [▶ 127].
2. Unplug the 4-way valve connector from the appropriate PCB.
3. Measure the resistance of the 4-way valve coil between the pins of the 4-way valve connector.

   Result: The measured value must be 1,4 kΩ ± 10%.

Is the measured value correct?	Action
Yes	Continue with the next step.
No	Replace the 4-way valve coil, see "3.2.2 Repair procedures" [▶ 132].

When outdoor unit is combined with Heating + Cooling indoor unit

- WHEN OUTDOOR TEMPERATURE IS MILD AND UNIT CAN SWITCH BETWEEN HEATING AND COOLING

> **INFORMATION**
>
> This procedure is ONLY possible when the outdoor temperature is within the temperature range for both `Heating` and `Cooling` operation mode. See the databook on Business Portal for the temperature range of the operation modes.

1. Connect the 4-way valve connector to the appropriate PCB.
2. Turn ON the power using the respective circuit breaker.
3. Activate `Heating` operation via the user interface.
4. With the 4-way valve connector connected to the PCB, measure the voltage on the 4-way valve connection of the PCB.

   Result: The measured voltage MUST be 230 V AC.
5. De-activate `Heating` and activate `Cooling` operation via the user interface.
6. Measure the voltage on the 4-way valve connection on the PCB.

   Result: The measured voltage MUST be 0 V AC.

Are the measured voltages correct?	Action
Yes	Perform a position check of the 4-way valve, see "3.2.1 Checking procedures" [▶ 127].
No	Perform a check the main PCB, see "3.20 Main PCB" [▶ 224].

- WHEN OUTDOOR TEMPERATURE DOES NOT ALLOW THE UNIT TO RUN IN COOLING OR HEATING MODE

> **INFORMATION**
>
> Follow this procedure when the outdoor temperature is outside the temperature range for one of the operation modes (`Heating` or `Cooling`). The unit CANNOT operate in the mode for which the outdoor temperature is outside its temperature range. See the databook on Business Portal for the temperature range of the operation modes.

1 Connect the 4-way valve connector to the appropriate PCB.

2 Turn ON the power using the respective circuit breaker.

3 With the unit operating, connect the service monitoring tool to the unit and check whether the unit is operating in `Heating` or `Cooling` mode.

4 With the 4-way valve connector connected to the PCB, measure the voltage on the 4-way valve connection of the PCB. The measured voltage MUST be:

- 230 V AC when operating in `Heating` mode
- 0 V AC when operating in `Cooling` mode

Is the measured voltage correct?	Action
Yes	Perform a position check of the 4-way valve, see "3.2.1 Checking procedures" [▶ 127].
No	Perform a check the main PCB, see "3.20 Main PCB" [▶ 224].

When outdoor unit is combined with Heating only indoor unit

1 Connect the 4-way valve connector to the appropriate PCB.

2 Turn ON the power using the respective circuit breaker.

3 With the unit operating, connect the service monitoring tool to the unit and check whether the unit is operating in `Heating` or Defrost mode.

4 With the 4-way valve connector connected to the PCB, measure the voltage on the 4-way valve connection of the PCB. The measured voltage MUST be:

- 230 V AC when operating in `Heating` mode
- 0 V AC when operating in Defrost mode

Is the measured voltage correct?	Action
Yes	Perform a position check of the 4-way valve, see "3.2.1 Checking procedures" [▶ 127].
No	Perform a check the main PCB, see "3.20 Main PCB" [▶ 224].

To perform a position check of the 4-way valve

1 First perform an electrical check of the 4-way valve, see "3.2.1 Checking procedures" [▶ 127].

When outdoor unit is combined with Heating + Cooling indoor unit

- WHEN OUTDOOR TEMPERATURE IS MILD AND UNIT CAN SWITCH BETWEEN HEATING AND COOLING

> **INFORMATION**
>
> This procedure is ONLY possible when the outdoor temperature is within the temperature range for both `Heating` and `Cooling` operation mode. See the databook on Business Portal for the temperature range of the operation modes.

1 Activate `Heating` operation via the user interface.

> **INFORMATION**
>
> It is recommended to connect the service monitoring tool to the unit and verify the operation mode of the 4-way valve.

2 Check with a contact thermometer (or by touching) if the flow through the 4-way valve corresponds with the flow shown in the flow diagram. (See "6.3 Piping diagram" [▸ 410]).

> **INFORMATION**
>
> The flow through the 4-way valve is correct if the water temperature after the heat exchanger rises/drops when operating in `Heating`/`Cooling` mode.

Is the flow correct?	Action
Yes	Skip the next step of this procedure.
No	Perform the next step of this procedure.

3 Connect a manifold to one of the service ports of the refrigerant circuit and check the pressure (suction, discharge). Compare with normal operation conditions of the unit.

Refrigerant pressure correct?	Action
Yes	Replace the body of the 4-way valve, see "3.2.2 Repair procedures" [▸ 132].
No	Leaks may be found in the refrigerant circuit. Perform a pressure test of the refrigerant circuit, see "4.2.1 Checking procedures" [▸ 347].

4 De-activate `Heating` and activate `Cooling` operation via the user interface.

5 Check with a contact thermometer (or by touching) if the flow through the 4-way valve corresponds with the flow shown in the flow diagram. (See "6.3 Piping diagram" [▸ 410]).

> **INFORMATION**
>
> The flow through the 4-way valve is correct if the water temperature after the heat exchanger rises/drops when operating in `Heating`/`Cooling` mode.

Is the flow correct?	Action
Yes	4-way valve is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the body of the 4-way valve, see "3.2.2 Repair procedures" [▸ 132].

- WHEN OUTDOOR TEMPERATURE DOES NOT ALLOW THE UNIT TO RUN IN COOLING OR HEATING MODE

> **INFORMATION**
>
> Follow this procedure when the outdoor temperature is outside the temperature range for one of the operation modes (`Heating` or `Cooling`). The unit CANNOT operate in the mode for which the outdoor temperature is outside its temperature range. See the databook on Business Portal for the temperature range of the operation modes.

1. With the unit operating, connect the service monitoring tool to the unit and check whether the unit is operating in `Heating` or `Cooling` mode.
2. With the unit operating, connect the service monitoring tool to the unit and check whether the unit is operating in `Heating` or `Cooling` mode.
3. Check with a contact thermometer (or by touching) if the flow through the 4-way valve corresponds with the flow shown in the flow diagram of the specific operation mode. (See "6.3 Piping diagram" [▶ 410]).

> **INFORMATION**
>
> The flow through the 4-way valve is correct if the water temperature after the heat exchanger rises/drops when operating in `Heating`/`Cooling` mode.

Is the flow correct?	Action
Yes	4-way valve is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Perform the next step of this procedure.

4. Connect a manifold to one of the service ports of the refrigerant circuit and check the pressure (suction, discharge). Compare with normal operation conditions of the unit.

Refrigerant pressure correct?	Action
Yes	Replace the body of the 4-way valve, see "3.2.2 Repair procedures" [▶ 132].
No	Leaks may be found in the refrigerant circuit. Perform a pressure test of the refrigerant circuit, see "4.2.1 Checking procedures" [▶ 347].

When outdoor unit is combined with Heating only indoor unit

1. With the unit operating, connect the service monitoring tool to the unit and check whether the unit is operating in `Heating` or Defrost mode.
2. Check with a contact thermometer (or by touching) if the flow through the 4-way valve corresponds with the flow shown in the flow diagram of the specific operation mode. (See "6.3 Piping diagram" [▶ 410]).

> **INFORMATION**
>
> The flow through the 4-way valve is correct if the water temperature after the heat exchanger rises/drops when operating in `Heating`/Defrost mode.

Is the flow correct?	Action
Yes	Skip the next step.
No	Perform the next step of this procedure.

3 Connect a manifold to one of the service ports of the refrigerant circuit and check the pressure (suction, discharge). Compare with normal operation conditions of the unit.

Refrigerant pressure correct?	Action
Yes	Replace the body of the 4-way valve, see "3.2.2 Repair procedures" [▸ 132].
No	Leaks may be found in the refrigerant circuit. Perform a pressure test of the refrigerant circuit, see "4.2.1 Checking procedures" [▸ 347].

4 If the electrical check and position check have been performed with the unit operating in:

- Defrost mode: Wait for the unit to switch to `Heating` (service monitoring tool) mode and again perform the electrical check and position check.
- `Heating` mode: There is a possibility to put the unit in Defrost operation via `Forced defrost` (see installer reference guide for more information). Again perform the electrical check and position check when the unit is operating in Defrost mode.

Is the flow correct?	Action
Yes	4-way valve is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the body of the 4-way valve, see "3.2.2 Repair procedures" [▸ 132].

3.2.2 Repair procedures

To remove the 4-way valve coil

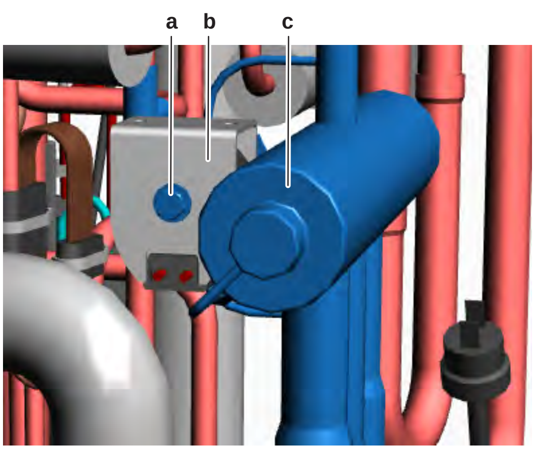
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

Prerequisite: If needed, remove any parts to create more space for the removal of the 4-way valve coil.

1 Remove the screw and remove the 4-way valve coil from the 4-way valve body.



a Screw
b 4-way valve coil

c 4-way valve body

2 Cut all tie straps that fix the 4-way valve coil harness.

3 Unplug the 4-way valve connector from the appropriate PCB.

4 To install the 4-way valve coil, see "3.2.2 Repair procedures" [▶ 132].

To remove the 4-way valve body

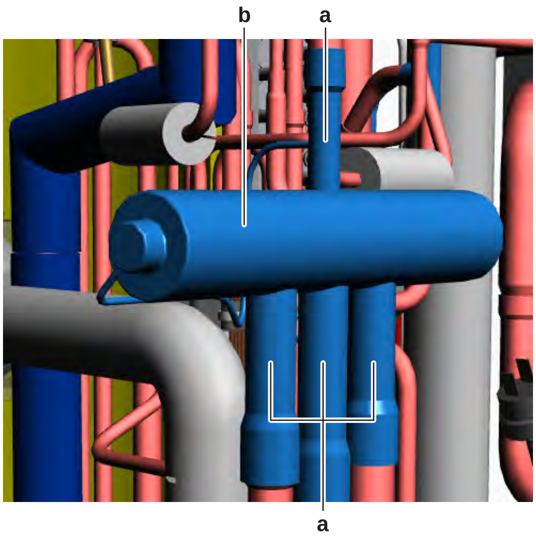
Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

1 Remove the 4-way valve coil from the 4-way valve body, see "3.2.2 Repair procedures" [▶ 132].

2 Remove and keep the putty (if installed) and the insulation (if installed) for re-use.

3 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

4 Wrap a wet rag around the components near the 4-way valve pipes. Heat the brazing points of the 4-way valve pipes using an oxygen acetylene torch and remove the 4-way valve pipes from the refrigerant pipes using pliers.



a 4-way valve pipe
b 4-way valve

5 Stop the nitrogen supply when the piping has cooled down.

6 Remove the 4-way valve.

> **INFORMATION**
>
> It is ALSO possible to cut the component pipe(s) using a pipe cutter. Make sure to remove the remaining component pipe end(s) from the refrigerant pipes by heating the brazing point(s) of the component pipe(s) using an oxygen acetylene torch.

7 Install plugs or caps on the open pipe ends of the refrigerant piping to avoid dirt or impurities from entering the piping.

8 To install the 4-way valve body, see "3.2.2 Repair procedures" [▶ 132].

To install the 4-way valve body

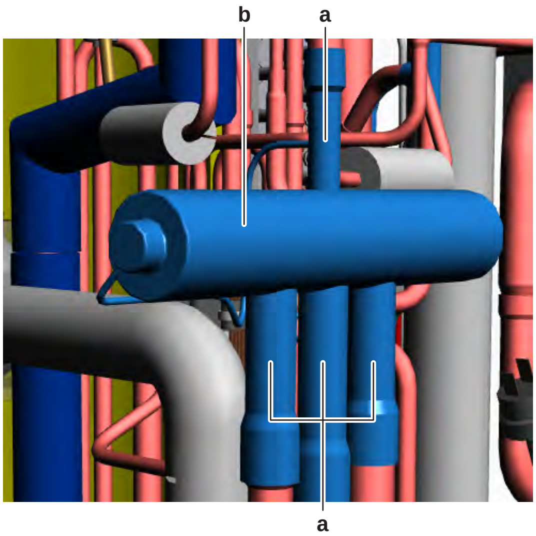
1 Remove the plugs or caps from the refrigerant piping and make sure they are clean.

2 Remove the 4-way valve coil from the spare part 4-way valve body.

3 Install the 4-way valve body in the correct location and correctly oriented. Insert the pipe ends in the pipe expansions.

4 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

5 Wrap a wet rag around the 4-way valve body and any other components near the 4-way valve and solder the 4-way valve pipes to the refrigerant pipes.



a 4-way valve pipe
b 4-way valve

> **CAUTION**
>
> Overheating the valve will damage or destroy it.

6 After soldering is done, stop the nitrogen supply after the component has cooled-down.

7 Install the putty (if available) and the insulation (if available) in their original location.

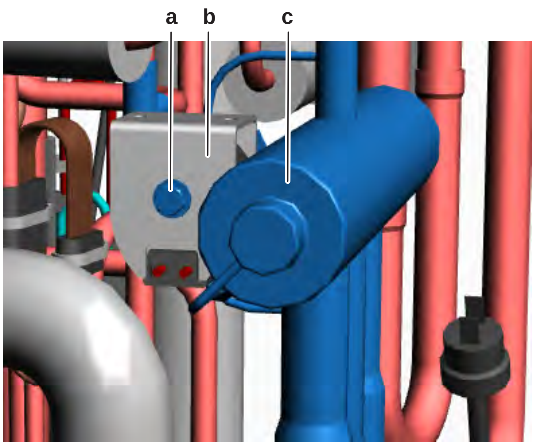
8 Install the 4-way valve coil on the 4-way valve body, see "3.2.2 Repair procedures" [▸ 132].

9 Perform a pressure test, see "4.2.1 Checking procedures" [▸ 347].

10 Add refrigerant to the refrigerant circuit, see "4.2.2 Repair procedures" [▸ 351].

To install the 4-way valve coil

1 Install the 4-way valve coil on the 4-way valve body.



a Screw
b 4-way valve coil
c 4-way valve body

2 Install and tighten the screw to fix the 4-way valve coil.

3 Route the 4-way valve coil harness towards the appropriate PCB.

4 Connect the 4-way valve connector to the appropriate PCB.

> **WARNING**
>
> When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

5 Fix the 4-way valve coil harness using new tie straps.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.3 ACS digital I/O PCB

3.3.1 Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a power check of the ACS digital I/O PCB

Prerequisite: Stop the unit operation via the user interface.

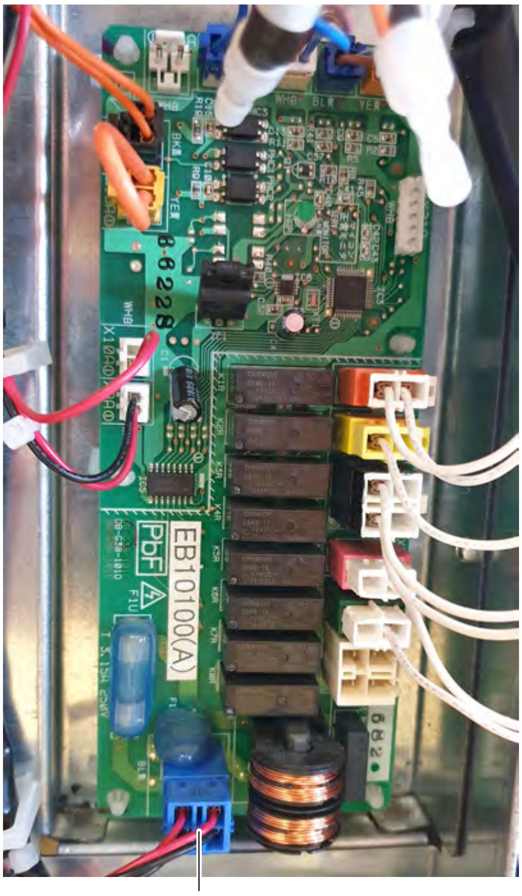
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Turn ON the power of the unit.

2 Measure the voltage between pins 1-2 of connector X1A of the ACS digital I/O PCB.

Result: The measured voltage MUST be 200~240 V AC.



a

a X1A connector

Is the measured voltage on the ACS digital I/O PCB correct?	Action
Yes	Return to "3.3.1 Checking procedures" [▶ 135] of the ACS digital I/O PCB and continue with the next procedure.
No	Continue with the next step.

For single phase units

3 Measure the output voltage on connector X803A on the noise filter PCB.

Result: The measured voltage MUST be 200~240 V AC.

Is the measured output voltage on the noise filter PCB correct?	Action
Yes	Correct the wiring between the noise filter PCB and the ACS digital I/O PCB, see "4.1.2 Repair procedures" [▶ 346].
No	Perform a check of the noise filter PCB, see "Checking procedures" [▶ 241].

For three phase units

4 Measure the output voltage on connector X803A on the main PCB.

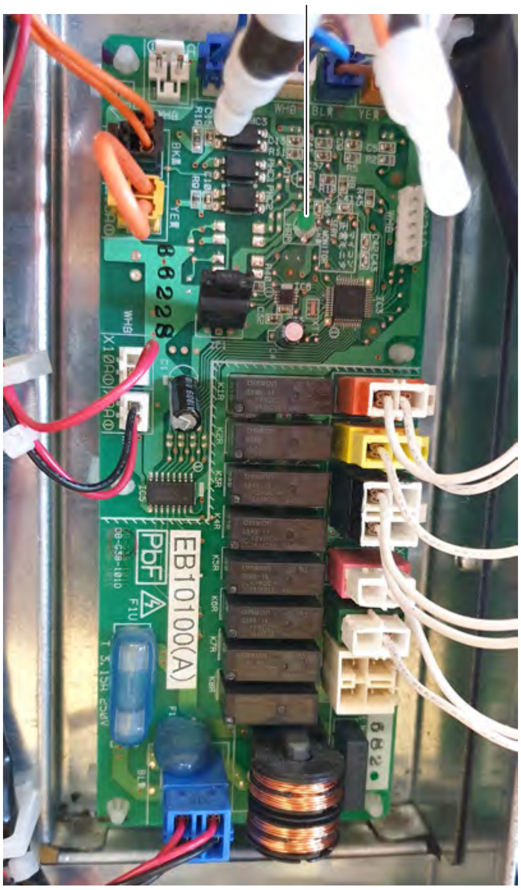
Result: The measured voltage MUST be 200~240 V AC.

Is the measured output voltage on the main PCB correct?	Action
Yes	Correct the wiring between the main PCB and the ACS digital I/O PCB, see "4.1.2 Repair procedures" [▶ 346].
No	Perform a check of the main PCB, see "Checking procedures" [▶ 232].

To check the HAP LED of the ACS digital I/O PCB

Prerequisite: First perform a power check of the ACS digital I/O PCB, see "3.3.1 Checking procedures" [▶ 135].

1 Locate the HAP LED on the ACS digital I/O PCB.



a HAP LED

Does the HAP LED blink in regular intervals (1 second ON/1 second OFF)?	Action
Yes	Return to "3.3.1 Checking procedures" [▶ 135] of the ACS digital I/O PCB and continue with the next procedure.
No	Replace the ACS digital I/O PCB, see "3.3.2 Repair procedures" [▶ 139].

To check if the correct spare part is installed

1 First perform all earlier checks of the ACS digital I/O PCB, see "3.3.1 Checking procedures" [▶ 135].

2 Visit your local spare parts webbank.

3 Enter the model name of your unit and check if the installed spare part number corresponds with the spare part number indicated in the webbank.

Is the correct spare part for the ACS digital I/O PCB installed?	Action
Yes	Return to "3.3.1 Checking procedures" [▶ 135] of the ACS digital I/O PCB and continue with the next procedure.
No	Replace the ACS digital I/O PCB, see "3.3.2 Repair procedures" [▶ 139].

To check the wiring of the ACS digital I/O PCB

Prerequisite: First perform all earlier checks of the ACS digital I/O PCB, see "3.3.1 Checking procedures" [▶ 135].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Check that all wires are properly connected and that all connectors are fully plugged-in.

2 Check that no connectors or wires are damaged.

3 Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▶ 370].

> **INFORMATION**
>
> Correct the wiring as needed.

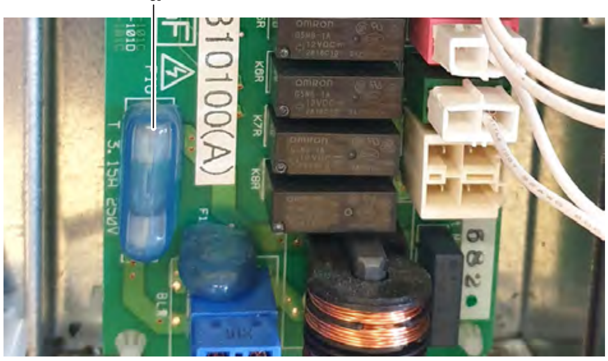
Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.3.1 Checking procedures" [▶ 135] of the ACS digital I/O PCB and continue with the next procedure.

To check the fuse of the ACS digital I/O PCB

Prerequisite: First perform all earlier checks of the ACS digital I/O PCB, see "3.3.1 Checking procedures" [▶ 135].

1 Measure the continuity of the fuse. If no continuity is measured, the fuse has blown.

a



a Fuse

Blown fuse on the ACS digital I/O PCB?	Action
Yes	Replace the blown fuse, see "3.3.2 Repair procedures" [▶ 139].
No	Return to "3.3.1 Checking procedures" [▶ 135] of the ACS digital I/O PCB and continue with the next procedure.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.3.2 Repair procedures

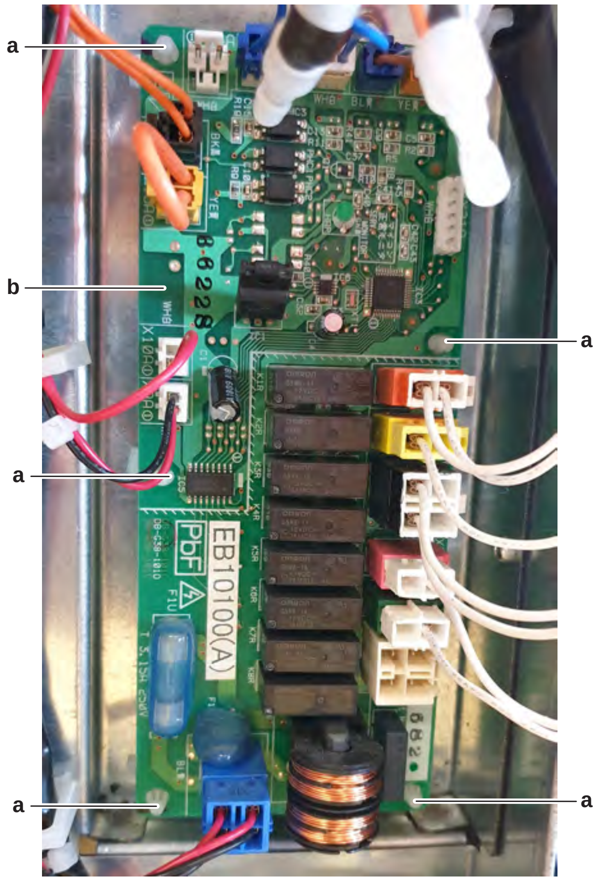
To remove the ACS digital I/O PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Disconnect all connectors from the ACS digital I/O PCB.
2. Carefully pull the ACS digital I/O PCB and unlatch the PCB supports one by one using a small pair of pliers.



a PCB support
b ACS digital I/O PCB

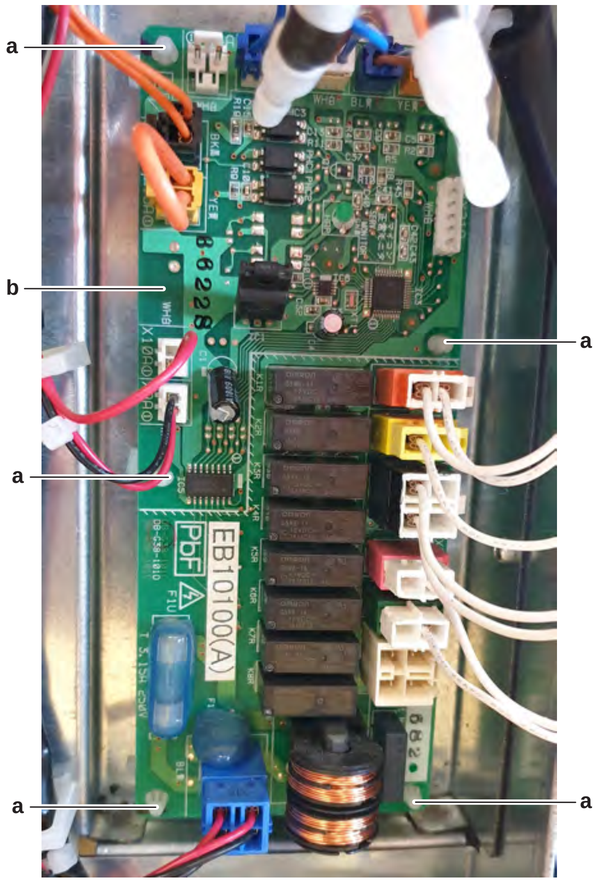
3 Remove the ACS digital I/O PCB from the switch box.

4 To install the ACS digital I/O PCB, see "3.3.2 Repair procedures" [▶ 139].

To install the ACS digital I/O PCB

1 Install the ACS digital I/O PCB in the correct location in the switch box.

2 Attach the ACS digital I/O PCB to the PCB supports.



a PCB support
b ACS digital I/O PCB

3 Connect all connectors to the ACS digital I/O PCB.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.3.1 Checking procedures" [▶ 135] of the ACS digital I/O PCB and continue with the next procedure.

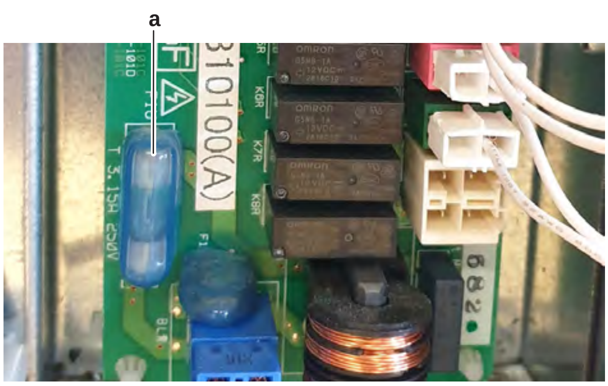
To remove the fuse of the ACS digital I/O PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Remove the fuse from the PCB.



a Fuse

2 To install a fuse on the ACS digital I/O PCB, see "3.3.2 Repair procedures" [▶ 139].

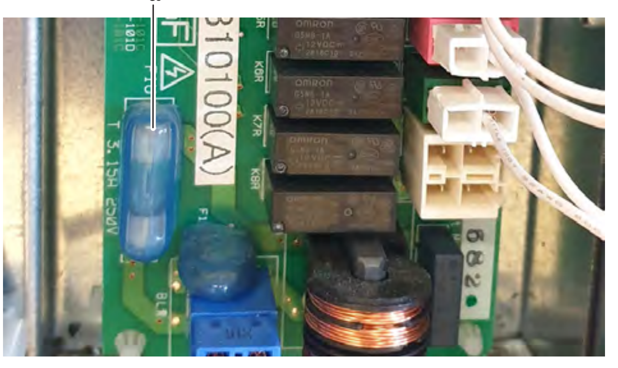
To install a fuse on the ACS digital I/O PCB

> **WARNING**
>
> For continued protection against risk of fire, replace ONLY with same type and rating of fuse.

1 Install the fuse on the correct location on the PCB.

> **CAUTION**
>
> Make sure the fuse is plugged-in correctly (contact with the fuse holder).

a



a Fuse

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.3.1 Checking procedures" [▶ 135] of the ACS digital I/O PCB and continue with the next procedure.

3.4 Backup heater

3.4.1 Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

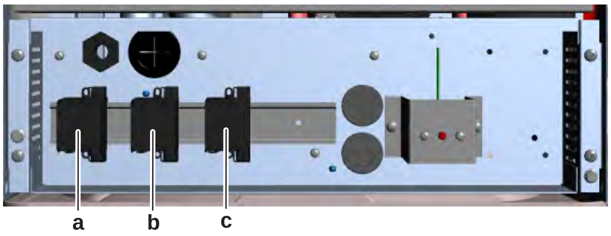
To perform a resistance check of the backup heater

Prerequisite: Stop the unit operation via the user interface.

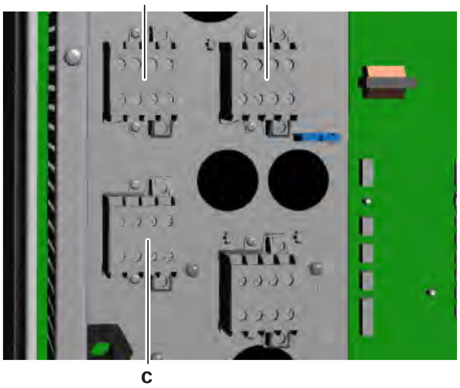
Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

A



B



A Floorstanding + Bizone units
B Wall mounted units
a Backup heater contactor K5M
b Backup heater contactor K1M
c Backup heater contactor K2M

2 Measure the backup heater resistance as shown in the table below. Tolerance = ± 10%.

		6 kW	**9 kW**
		1~230 V	**3N~400 V**
K1M/1	K5M/14	OL	OL
	K1M/3	26.5 Ω	106 Ω
	K1M/5	OL	106 Ω
K1M/3	K1M/5	OL	106 Ω
K2M/1	K5M/14	26.5 Ω	OL
	K2M/3	OL	53 Ω
	K2M/5	OL	53 Ω
K2M/3	K2M/5	26.5 Ω	53 Ω
K1M/5	K2M/1	OL	OL

INFORMATION

See the "6.2 Wiring diagram" [▸ 370] for more detailed information.

INFORMATION

Make sure that the wiring between the backup heater contactors and the backup heater connector is properly connected and NOT damaged (check continuity), see "6.2 Wiring diagram" [▸ 370].

Is the measured backup heater resistance correct?	Action
Yes	Return to "3.4.1 Checking procedures" [▶ 142] of the backup heater and continue with the next procedure.
No	Replace the backup heater, see "3.4.2 Repair procedures" [▶ 147].

To perform an insulation check of the backup heater

Prerequisite: First perform a resistance check of the backup heater, see "3.4.1 Checking procedures" [▶ 142].

1 Open all circuit breakers.

> **CAUTION**
>
> To prevent damage to the unit, all circuit breakers MUST be opened before using a Megger.

2 Set the Megger voltage to 500 V AC.

3 Connect the Megger ground test lead directly to the backup heater ground wire.

> **CAUTION**
>
> Do NOT connect the Megger ground test lead to any other ground wire.

4 Measure the insulation resistance between the following terminals. The measured insulation resistance MUST be >3 MΩ.

Unit	Terminals
*6V units	K1M1-ground, K1M3-ground, K2M1-ground, K2M3-ground, K2M5-ground.
*9W units	K1M1-ground, K1M3-ground, K1M5-ground, K2M1-ground, K2M3-ground, K2M5-ground.

Is the measured backup heater insulation resistance correct?	Action
Yes	Return to "3.4.1 Checking procedures" [▶ 142] of the backup heater and continue with the next procedure.
No	Replace the backup heater, see "3.4.2 Repair procedures" [▶ 147].

To perform an electrical check of the backup heater

Prerequisite: First perform an insulation check of the backup heater, see "3.4.1 Checking procedures" [▶ 142].

Prerequisite: Check the circuit breaker. Reset if it has tripped.

Prerequisite: Check that the backup heater thermal protector functions correctly. Reset if it has tripped. See "3.5 Backup heater thermal protector" [▶ 153].

1 Turn ON the power of the unit.

> **INFORMATION**
>
> If the circuit breaker or the backup heater thermal protector trips again, determine the root cause of the problem. Something is overloading the electrical circuit or creating a short-circuit.

2 Activate `Installer` on the user interface. See the installer reference guide for the correct procedure.

3 Go to `Actuator test run` via the user interface.

4 Activate backup heater: step 1.

5 Activate backup heater: step 2.

6 Check the status in the Actuators menu of the user interface. This MUST be:

- Backup heater: step 1 = ON
  And/Or
- Backup heater: step 2 = ON

7 Check if the field installed circuit breaker has tripped.

Did the fuse blow or did the field supplied circuit breaker of the backup heater trip?	Action
Yes	Replace the backup heater, see "3.4.2 Repair procedures" [▸ 147].
No	Return to "3.4.1 Checking procedures" [▸ 142] of the backup heater and continue with the next procedure.

To perform a check of the backup heater contactor(s)

Prerequisite: First perform an electrical check of the backup heater, see "3.4.1 Checking procedures" [▸ 142].

1 Measure the power supply voltage between the following terminals of the backup heater contactors:

For *6V units (with 1~, 230 V, 6 kW backup heater):

- K5M: 1-3, 3-5, 5-13
  All measured voltages MUST be 230 V AC ± 10%.

For *9W units (with 3~, 400 V, 9 kW backup heater):

- K5M: 1-3, 3-5, 1-5
  All measured voltages MUST be 400 V AC ± 10%.
- K5M: 1-13
  The measured voltage MUST be 230 V AC ± 10%.

Is the measured power supply voltage correct?	Action
Yes	Skip the next step.
No	Continue with the next step.

2 Check the power supply (source) of the backup heater.

Is the power supply (source) of the backup heater correct?	Action
Yes	Correct the wiring and/or components between the power supply (source) and the backup heater contactor, see "6.2 Wiring diagram" [▶ 370].
No	Adjust the power supply (source) of the backup heater.

3 With the `Actuator test run` still active, activate backup heater: step 1.

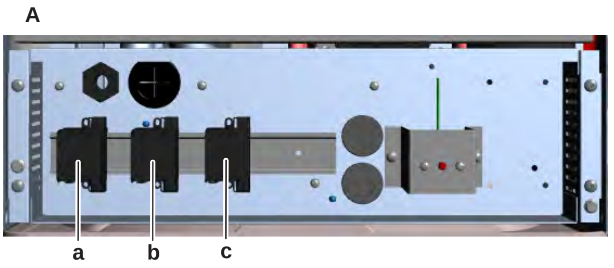
4 Measure the voltage between the following terminals of the backup heater contactors.

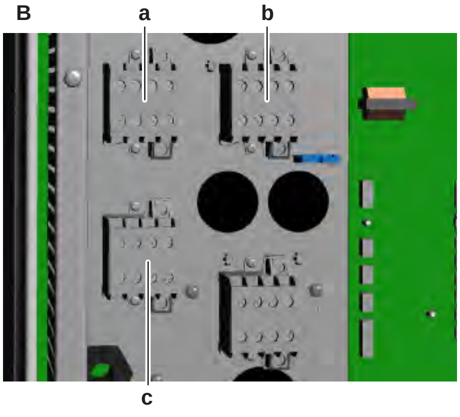
For *6V units (with 1~, 230 V, 6 kW backup heater):

- K1M: 2-4 / 1-3
- K5M: 2-4 / 1-3, 4-6 / 3-5, 6-14 / 5-13
  All measured voltages MUST be 230 V AC ± 10%.

For *9W units (with 3~, 400 V, 9 kW backup heater):

- K1M: 2-4 / 1-3, 4-6 / 3-5, 2-6 / 1-5
- K5M: 2-4 / 1-3, 4-6 / 3-5, 2-6 / 1-5
  All measured voltages MUST be 400 V AC ± 10%.
- K5M: 1-13
  The measured voltage MUST be 230 V AC ± 10%.





A Floorstanding + Bizone units
B Wall mounted units
a Backup heater contactor K5M
b Backup heater contactor K1M
c Backup heater contactor K2M

5 Activate backup heater: step 2.

6 Measure the voltage between the following terminals of the backup heater contactors.

For *6V units (with 1~, 230 V, 6 kW backup heater):
- K2M: 2-4 / 1-3, 4-6 / 3-5
- K5M: 2-4 / 1-3, 4-6 / 3-5, 6-14 / 5-13
- K2M: 1-K5M: 13
  All measured voltages MUST be 230 V AC ± 10%.

For *9W units (with 3~, 400 V, 9 kW backup heater):
- K2M: 2-4 / 1-3, 4-6 / 3-5, 2-6 / 1-5
- K5M: 2-4 / 1-3, 4-6 / 3-5, 2-6 / 1-5
  All measured voltages MUST be 400 V AC ± 10%.
- K5M: 1-13
  The measured voltage MUST be 230 V AC ± 10%.

INFORMATION

Make sure that the wiring between the backup heater contactors is properly connected and NOT damaged (check continuity), see "6.2 Wiring diagram" [▸ 370].

Are the measured voltages of the backup heater contactors correct?	Action
Yes	Return to "3.4.1 Checking procedures" [▸ 142] of the backup heater and continue with the next procedure.
No	Continue with the next step.

7 Measure the operating voltage on the specific contactor.

Is the measured operating voltage of the backup heater contactor correct?	Action
Yes	Replace the specific backup heater contactor(s), see "3.4.2 Repair procedures" [▸ 147].
No	Check for the reason of faulty operating voltage (broken wiring, faulty contact, ...), see "6.2 Wiring diagram" [▸ 370].

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.4.2 Repair procedures

To remove the backup heater

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Drain water from the water circuit, see "4.3.2 Repair procedures" [▸ 356].

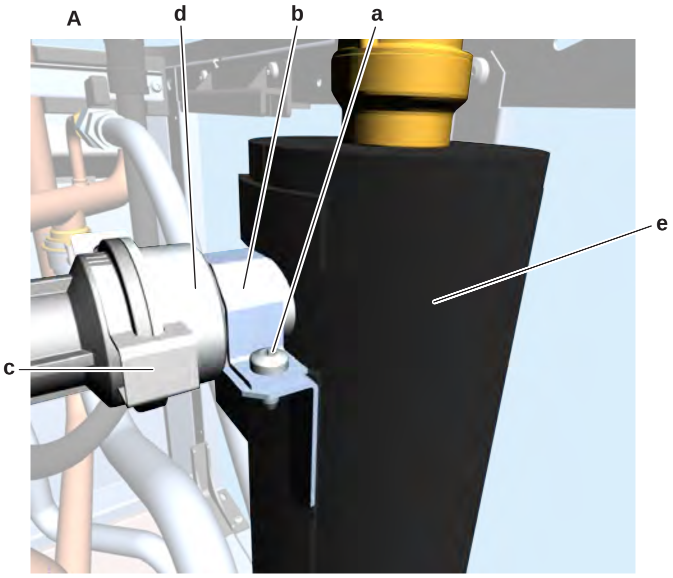
2 Cut all tie straps that fix the backup heater harness.

3 Wall mounted units ONLY: Remove the foam insulation.

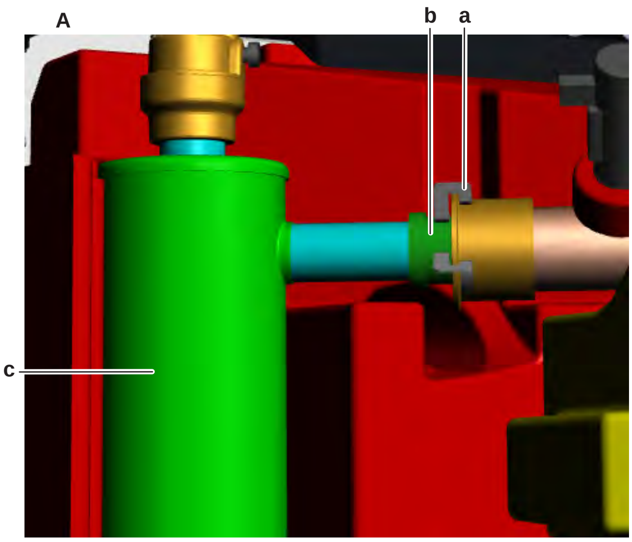
4 Unscrew and remove the air purge valve from the backup heater. Keep for reuse.

5 Cut the insulation that covers the upper backup heater coupling.

6 Floor standing and Bizone units ONLY: Open the insulation and remove the screw from the pipe clamp.



A Floor standing + Bizone units
a Screw
b Pipe clamp
c Clip
d Upper backup heater coupling
e Backup heater



A Wall mounted units
a Clip
b Upper backup heater coupling
c Backup heater

7 Remove the clip from the upper backup heater coupling.

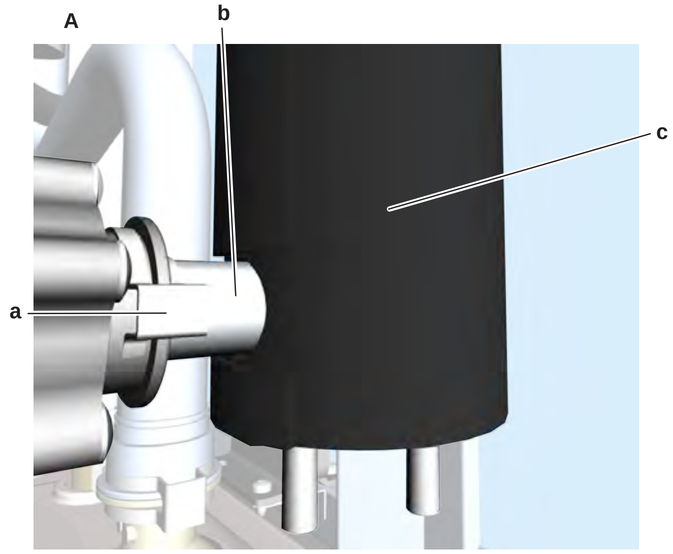
8 Separate the upper backup heater coupling.

INFORMATION

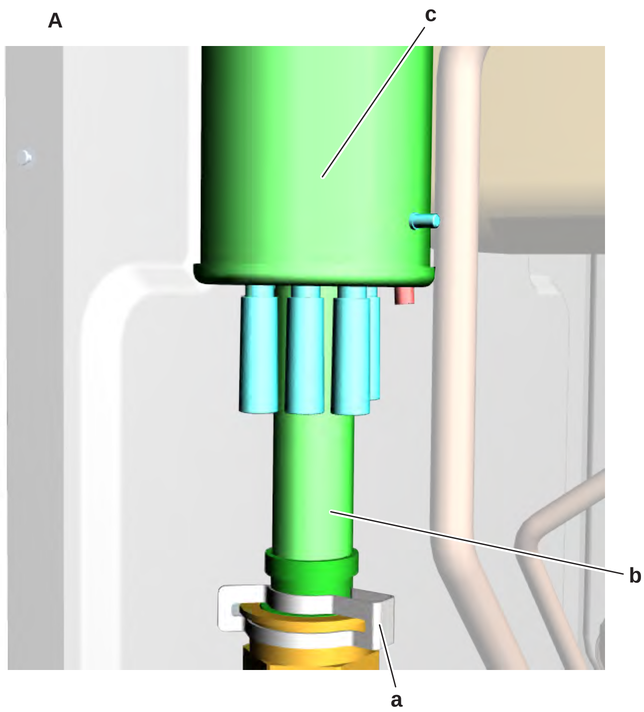
Make sure that the O-ring stays in place.

9 Remove the backup heater thermal protector sensor from the backup heater.

10 Remove the clip from the lower backup heater coupling.



A Floor standing + Bizone units
a Clip
b Lower backup heater coupling
c Backup heater



A Wall mounted units
a Clip
b Lower backup heater coupling
c Backup heater

11 Separate the lower backup heater coupling.

INFORMATION

Make sure that the O-ring stays in place.

12 Loosen the screws and disconnect the backup heater wiring from the wire terminals in the switch box.

13 Remove the screw and disconnect the ground wire from the switch box.

14 Guide the backup heater wiring and ground wire through the grommet in the switch box.

15 Remove the backup heater from the unit.

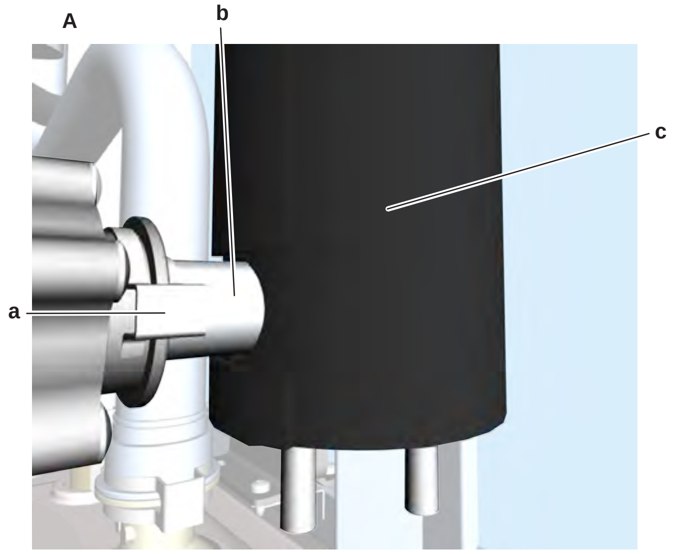
16 To install the backup heater, see "3.4.2 Repair procedures" [▸ 147].

To install the backup heater

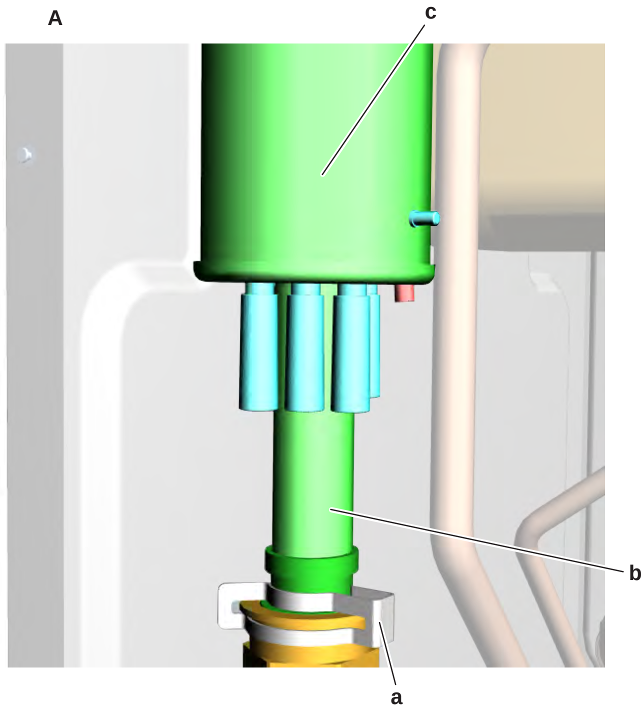
1 Install the backup heater in the correct location.

> **NOTICE**
>
> Check the condition of the O-rings and replace if needed. Apply water to the O-rings before installation.

2 Install the lower backup heater coupling and install the clip.

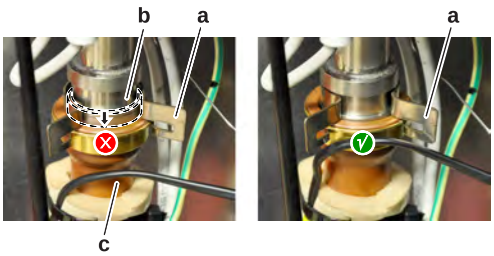


A Floor standing + Bizone units
a Clip
b Lower backup heater coupling
c Backup heater



A Wall mounted units
a Clip
b Lower backup heater coupling
c Backup heater

> **INFORMATION**
>
> Make sure that the back-up heater pipe is fully inserted in the back-up heater coupling.

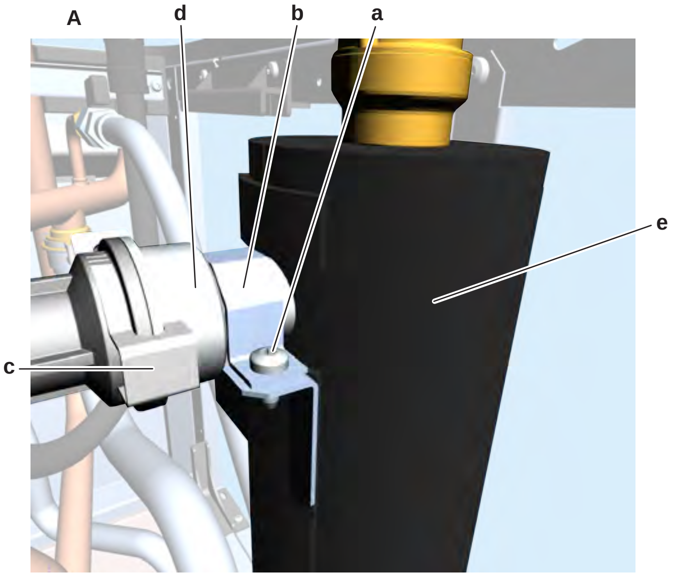


a Clip
b Backup heater pipe
c Backup heater coupling

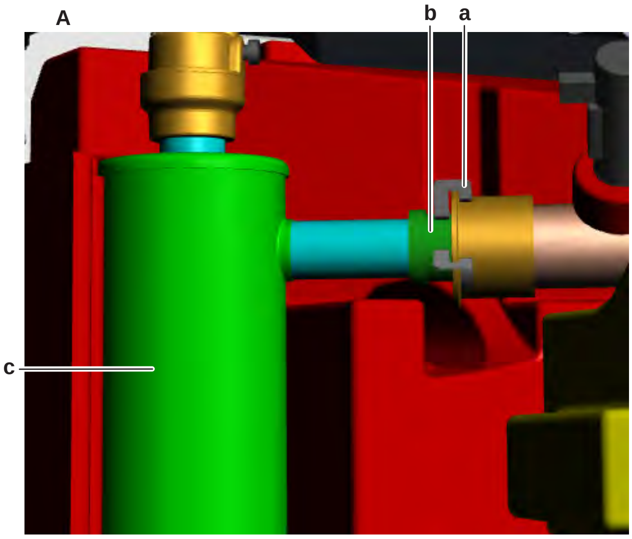
> **NOTICE**
>
> Check the condition of the O-rings and replace if needed. Apply water to the O-rings before installation.

3 Floor standing and Bizone units ONLY: Guide the upper backup heater pipe through the pipe clamp.

4 Install the upper backup heater coupling. Install the clip.



A Floor standing + Bizone units
a Screw
b Pipe clamp
c Clip
d Upper backup heater coupling
e Backup heater



A Wall mounted units
a Clip
b Upper backup heater coupling
c Backup heater

5. Floor standing and Bizone units ONLY: Install and tighten the screw on the pipe clamp.
6. Route the backup heater wiring and ground wire towards the switch box and through the grommet in the switch box.
7. Connect the ground wire to the switch box using the screw. Tighten the screw.
8. Connect the backup heater wiring to the wire terminals in the switch box and tighten the screws.
9. Install and restore all insulation.
10. Re-install the air purge valve on the backup heater.
11. Install the backup heater thermal protector sensor in the backup heater.
12. Fix the backup heater wiring using new tie straps.

> **INFORMATION**
>
> Take care NOT to damage the insulation during installation.

13 Open the valve (if equipped) of the water circuit towards the expansion vessel.

> **CAUTION**
>
> Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

14 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▶ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.4.1 Checking procedures" [▶ 142] of the backup heater and continue with the next procedure.

To remove the backup heater contactor(s)

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn off the respective circuit breaker of the unit and the backup heater.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Disconnect the wiring from the backup heater contactor terminals.
2. Remove the screws and remove the backup heater contactor(s) from the switch box.
3. To install the backup heater contactor(s), see "3.4.2 Repair procedures" [▶ 147].

To install the backup heater contactor(s)

1. Install the backup heater contactor(s) in the switch box and fix them using the screws.
2. Connect the wiring to the correct backup heater contactor terminals.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.4.1 Checking procedures" [▶ 142] of the backup heater and continue with the next procedure.

3.5 Backup heater thermal protector

3.5.1 Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a mechanical check of the backup heater thermal protector

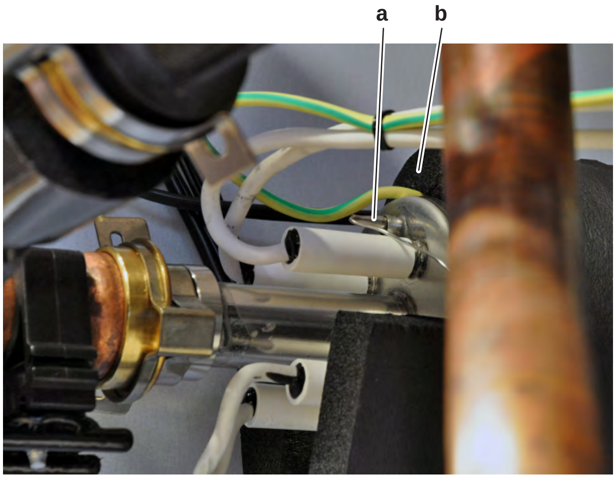
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 If the backup heater thermal protector has tripped:

- Sufficiently cool the sensor (7 K)
- Press the red button to reset the backup heater thermal protector



a Backup heater thermal protector sensor
b Backup heater

2 Remove the backup heater thermal protector sensor from the backup heater.

3 Submerge the backup heater thermal protector sensor in water.

DANGER: RISK OF BURNING/SCALDING

4 Heat the water above 95°C.

5 Measure the temperature of the water. The backup heater thermal protector MUST trip at a temperature of approximately 95°C.

Does the backup heater thermal protector trip at correct temperature?	Action
Yes	Perform an electrical check of the backup heater thermal protector, see "3.5.1 Checking procedures" [▶ 153]
No	Replace the backup heater thermal protector, see "3.5.2 Repair procedures" [▶ 155].

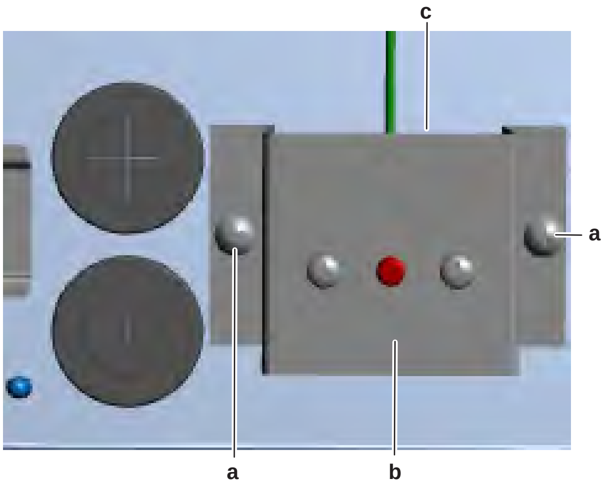
To perform an electrical check of the backup heater thermal protector

Prerequisite: First perform a mechanical check of the backup heater thermal protector, see "3.5.1 Checking procedures" [▶ 153].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the 2 screws from the backup heater thermal protector bracket.



a Screw
b Backup heater thermal protector bracket
c Backup heater thermal protector

2 Pull the backup heater thermal protector and bracket slightly to the front so the wire terminals (at the back of the thermal protector) are reachable.

3 Disconnect the wires from the backup heater thermal protector.

4 Measure the resistance between the backup heater thermal protector terminals 11-12 and 31-32.

Result: All contacts MUST be closed.

Are all contacts closed?	Action
Yes	Backup heater thermal protector is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the backup heater thermal protector, see "3.5.2 Repair procedures" [▶ 155].

3.5.2 Repair procedures

To remove the backup heater thermal protector

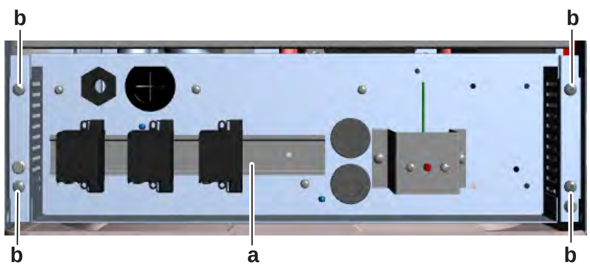
Floor standing and Bizone units

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

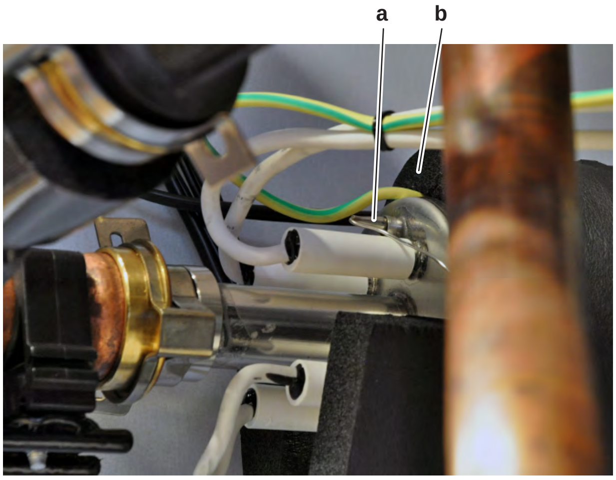
2 Remove the 4 screws that fix the installer switch box.



a Installer switch box
b Screw

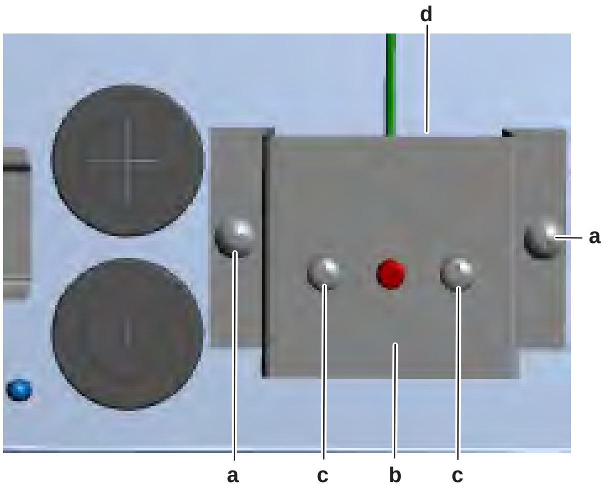
3 Tilt the installer switch box forward to create access to the bottom of the backup heater (where backup heater thermal protector sensor is installed).

4 Remove the backup heater thermal protector sensor from the backup heater.



a Backup heater thermal protector sensor
b Backup heater

5 Loosen and remove the 2 screws that fix the backup heater thermal protector bracket to the switch box.



a Screw
b Backup heater thermal protector bracket
c Screw
d Backup heater thermal protector

6 Loosen and remove the 2 screws that fix the backup heater thermal protector to the bracket.

7 Disconnect the wires from the backup heater thermal protector terminals.

8 Remove the backup heater thermal protector and sensor from the unit.

9 To install the backup heater thermal protector, see "3.5.2 Repair procedures" [▶ 155].

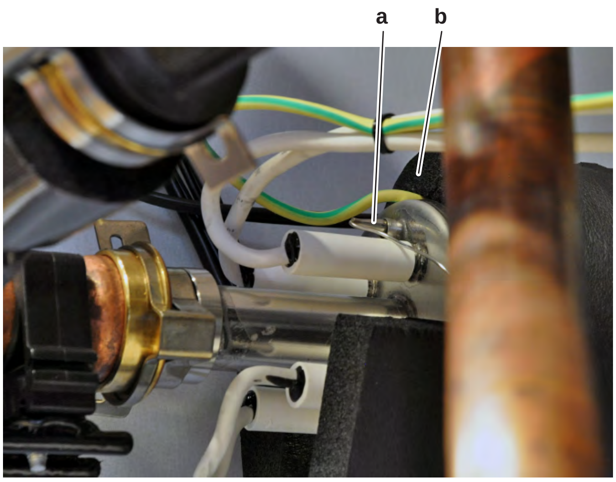
Wall mounted units

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

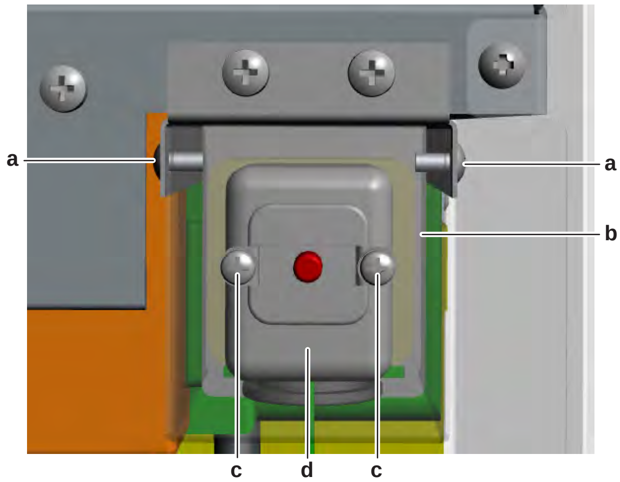
Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Remove the backup heater thermal protector sensor from the backup heater.



a Backup heater thermal protector sensor
b Backup heater

2 Loosen and remove the 2 screws that fix the backup heater thermal protector bracket to the switch box.



a Screw
b Backup heater thermal protector bracket
c Screw
d Backup heater thermal protector

3 Pull the backup heater thermal protector bracket towards the front.

4 Disconnect the wires from the backup heater thermal protector terminals.

5 Loosen and remove the 2 screws that fix the backup heater thermal protector to the bracket.

6 Remove the backup heater thermal protector and sensor from the unit.

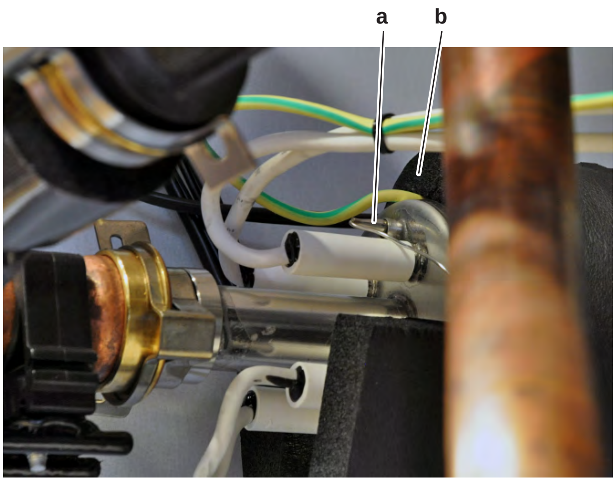
7 To install the backup heater thermal protector, see "3.5.2 Repair procedures" [▸ 155].

To install the backup heater thermal protector

Floor standing and Bizone units

1 Route the backup heater thermal protector sensor and wiring through the grommet of the switch box.

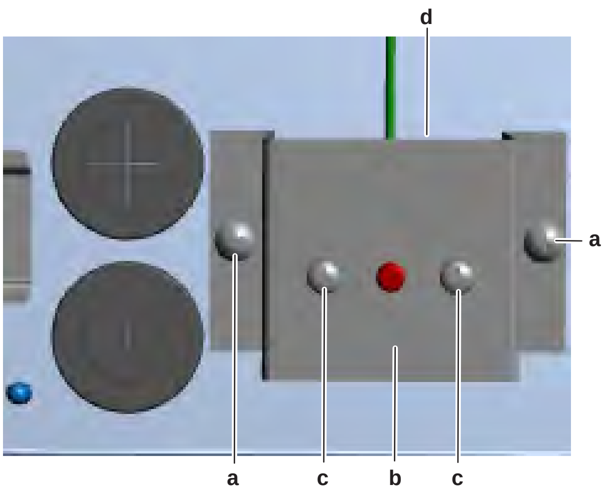
2 Insert the backup heater thermal protector sensor in the backup heater.



a Backup heater thermal protector sensor
b Backup heater

3 Connect the wires to the wire terminals at the back of the backup heater thermal protector.

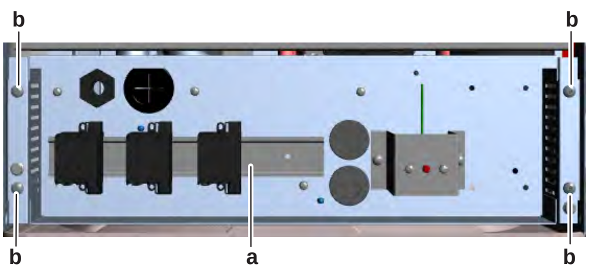
4 Install the backup heater thermal protector on the bracket. Install and tighten the 2 screws.



a Screw
b Backup heater thermal protector bracket
c Screw
d Backup heater thermal protector

5 Install the backup heater thermal protector bracket on the switch box. Install and tighten the 2 screws.

6 Install and fix the installer switch box with the 4 screws.



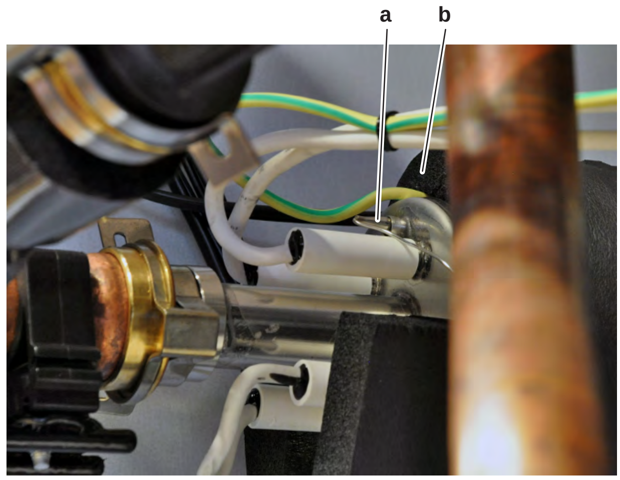
a Installer switch box
b Screw

Is the problem solved?	Action
Yes	No further actions required.

Is the problem solved?	Action
No	Return to the troubleshooting of the specific error and continue with the next procedure.

Wall mounted units

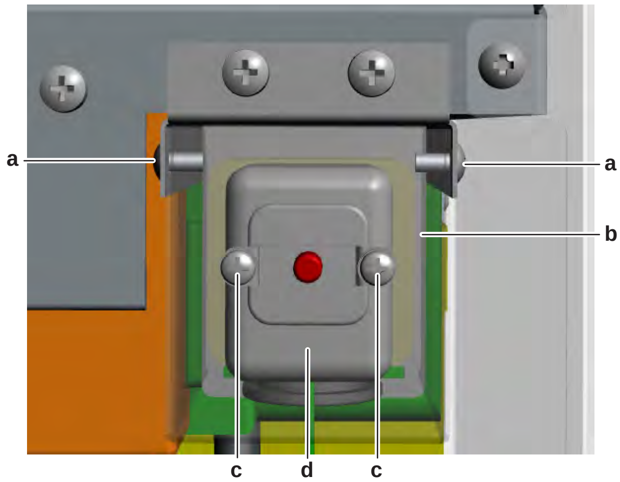
1 Insert the backup heater thermal protector sensor in the backup heater.



a Backup heater thermal protector sensor
b Backup heater

2 Connect the wires to the wire terminals at the back of the backup heater thermal protector.

3 Install the backup heater thermal protector on the bracket. Install and tighten the 2 screws.



a Screw
b Backup heater thermal protector bracket
c Screw
d Backup heater thermal protector

4 Install the backup heater thermal protector bracket on the unit. Install and tighten the 2 screws.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.6 Bizone PCB

> **INFORMATION**
>
> The procedures described here are for the units with integrated (built-in) bizone circuit. For more information about the optional bizone kit, see documentation of the bizone kit.

3.6.1 Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a power check of the bizone PCB

Prerequisite: Stop the unit operation via the user interface.

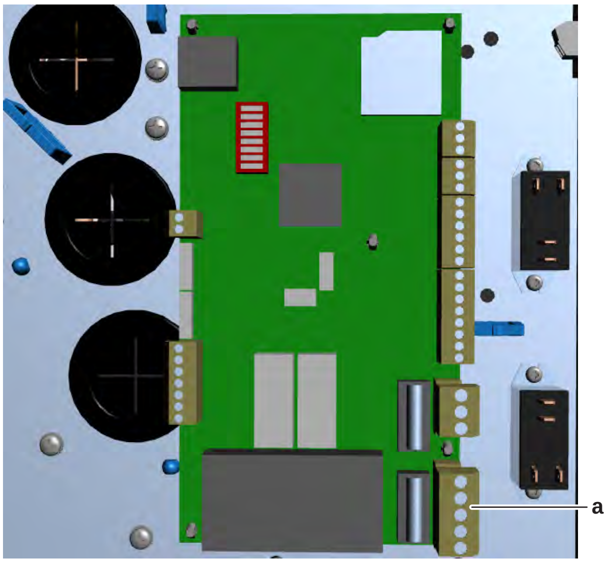
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Turn ON the power of the unit.

2 Measure the voltage on connector X1A between pins 1-3 on the bizone PCB.

Result: The measured voltage MUST be 230 V AC±10%.



a Connector X1A

Is the measured voltage on the PCB correct?	Action
Yes	Return to "3.6.1 Checking procedures" [▶ 160] of the PCB and continue with the next procedure.
No	Continue with the next step.

3 Measure the output voltage on the connector X27A on the hydro PCB.

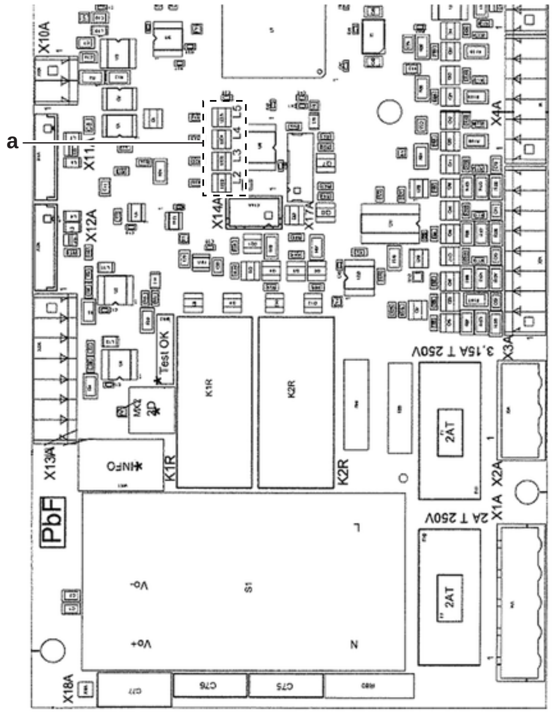
Result: The measured voltage MUST be 230 V AC±10%.

Is the measured output voltage on the hydro PCB correct?	Action
Yes	Correct the wiring between the bizone PCB and the hydro PCB, see "4.1.2 Repair procedures" [▶ 346].
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▶ 199].

To perform an electrical check of the bizone PCB

Prerequisite: First check the power supply to the bizone PCB, see "3.6.1 Checking procedures" [▶ 160].

1 Check the LEDs of the bizone PCB.



a LED's

2 LED 2 MUST be blinking.

LED 2 blinking?	Action
Yes	Return to "3.6.1 Checking procedures" [▶ 160] of the PCB and continue with the next procedure.
No	Continue with the next step.

3 Check if LED 5 is blinking.

LED 5 blinking?	Action
Yes	Communication error detected. Perform a check of the current loop PCB, see "3.10.1 Checking procedures" [▶ 177].
No	Replace the bizone PCB, see "3.6.2 Repair procedures" [▶ 163].

To check if the correct spare part is installed

Prerequisite: First perform all earlier checks of the bizone PCB, see "3.6.1 Checking procedures" [▶ 160].

1. Visit your local spare parts webbank.
2. Enter the model name of your unit and check if the installed spare part number corresponds with the spare part number indicated in the webbank.

Is the correct spare part for the bizone PCB installed?	Action
Yes	Return to "3.6.1 Checking procedures" [▶ 160] of the bizone PCB and continue with the next procedure.
No	Replace the bizone PCB, see "3.6.2 Repair procedures" [▶ 163].

To check the wiring of the bizone PCB

Prerequisite: First perform all earlier checks of the bizone PCB, see "3.6.1 Checking procedures" [▶ 160].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Check that all wires are properly connected and that all connectors are fully plugged-in.
2. Check that no connectors or wires are damaged.
3. Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▶ 370].

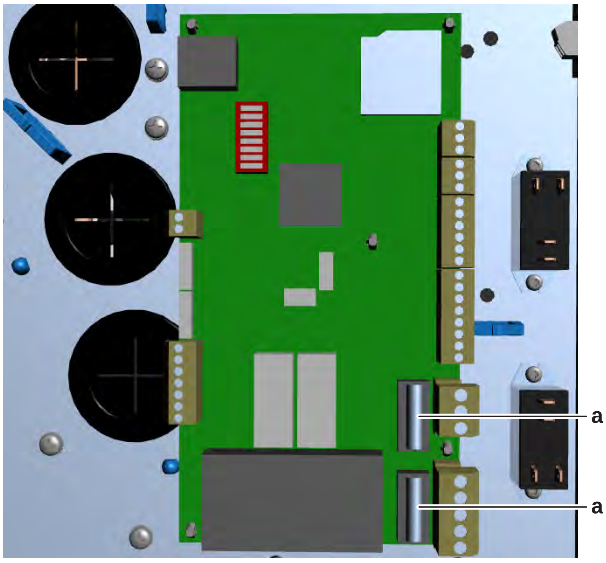
> **INFORMATION**
>
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.6.1 Checking procedures" [▶ 160] of the bizone PCB and continue with the next procedure.

To check the fuses of the bizone PCB

Prerequisite: First perform all earlier checks of the bizone PCB, see "3.6.1 Checking procedures" [▶ 160].

1. Measure the continuity of the fuse. If no continuity is measured, the fuse has blown.



a Fuse

Blown fuse on the bizone PCB?	Action
Yes	Replace the bizone PCB, see "3.6.2 Repair procedures" [▶ 163].
No	Return to "3.6.1 Checking procedures" [▶ 160] of the bizone PCB and continue with the next procedure.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.6.2 Repair procedures

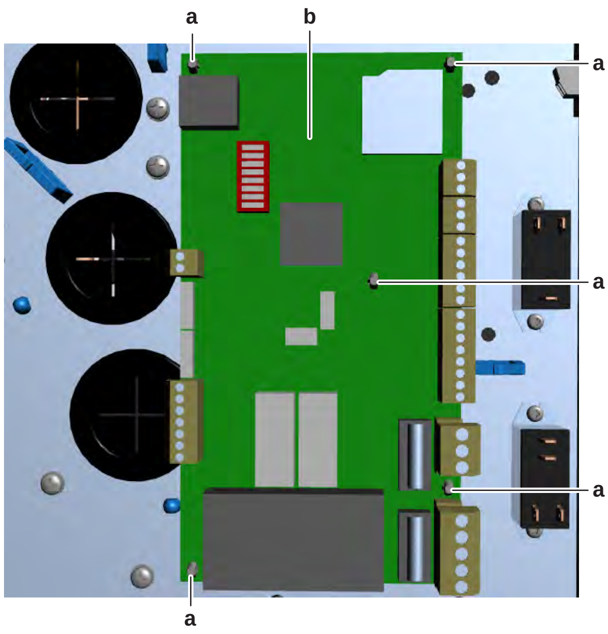
To remove the bizone PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Disconnect all connectors and the ground wire from the bizone PCB.
2. Carefully pull the bizone PCB and unlatch the PCB supports one by one using a small pliers.



a PCB support
b Bizone PCB

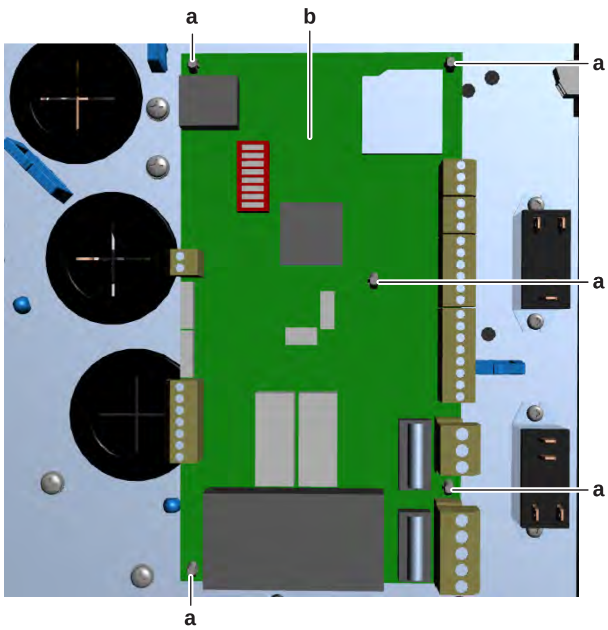
3 Remove the bizone PCB from the switch box.

4 To install the bizone PCB, see "3.6.2 Repair procedures" [▶ 163].

To install the bizone PCB

1 Install the bizone PCB in the correct location in the switch box.

2 Latch the PCB supports using a small pair of pliers to fix the PCB.



a PCB support
b Bizone PCB

3 Connect all connectors and ground wire to the bizone PCB.

> **INFORMATION**
>
> Use the wiring diagram and connection diagram for correct installation of the connectors, see "6.2 Wiring diagram" [▶ 370].

> **WARNING**
>
> When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.6.1 Checking procedures" [▸ 160] of the bizone PCB and continue with the next procedure.

3.7 Booster heater

3.7.1 Checking procedures

To perform an electrical check of the booster heater

1 For the correct procedure, see the installation manual of the water tank.

Does the booster heater function correctly?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the booster heater, see "3.7.2 Repair procedures" [▸ 165].

3.7.2 Repair procedures

To remove the booster heater

1 For the correct procedure, see the installation manual of the water tank.

2 To install the booster heater, see "3.7.2 Repair procedures" [▸ 165].

To install the booster heater

1 For the correct procedure, see the installation manual of the water tank.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.8 Booster heater thermal protector

3.8.1 Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a mechanical check of the booster heater thermal protector

1 For the correct procedure, see the installation manual of the water tank.

Does the booster heater thermal protector trip at 80~90°C?	Action
Yes	Perform an electrical check of the booster heater thermal protector, see "3.8.1 Checking procedures" [▶ 165].
No	Replace the booster heater thermal protector, see "3.8.2 Repair procedures" [▶ 166].

To perform an electrical check of the booster heater thermal protector

1 For the correct procedure, see the installation manual of the water tank.

All measured circuit breakers are closed?	Action
Yes	Booster heater thermal protector is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the booster heater thermal protector, see "3.8.2 Repair procedures" [▶ 166].

3.8.2 Repair procedures

To remove the booster heater thermal protector

1 For the correct procedure, see the installation manual of the water tank.

2 To install the booster heater thermal protector, see "3.8.2 Repair procedures" [▶ 166].

To install the booster heater thermal protector

1 For the correct procedure, see the installation manual of the water tank.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.9 Compressor

3.9.1 Checking procedures

INFORMATION

It is recommended to perform the checks in the listed order.

To perform an auditive check of the compressor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Open the compressor insulation.
2. Turn ON the power using the respective circuit breaker.
3. Start the unit operation via the user interface.
4. Wait for - or create condition to operate the compressor.
5. Listen to the compressor when it tries to operate. Judge if a mechanical lock is present.

INFORMATION

If you have a multimeter with data logging functionality, record the current in 1 of the U-V-W wires at compressor start-up. If mechanical lock is present, logged current will drastically increase to a peak value and the unit will trigger an error.

INFORMATION

If a mechanical lock is present, also check and eliminate the root cause. Mechanical lock is most likely caused by lack of lubrication (which might be related to overheat or wet operation), failing crankcase heater (if available), impurities in the refrigerant, ….

A mechanical lock is present on the compressor?	Action
Yes	Replace the compressor, see "3.9.2 Repair procedures" [▶ 172].
No	Perform an mechanical check of the compressor, see "3.9.1 Checking procedures" [▶ 166].

To perform a mechanical check of the compressor

Prerequisite: First perform an auditive check of the compressor, see "3.9.1 Checking procedures" [▶ 166].

Prerequisite: Stop the unit operation via the user interface.

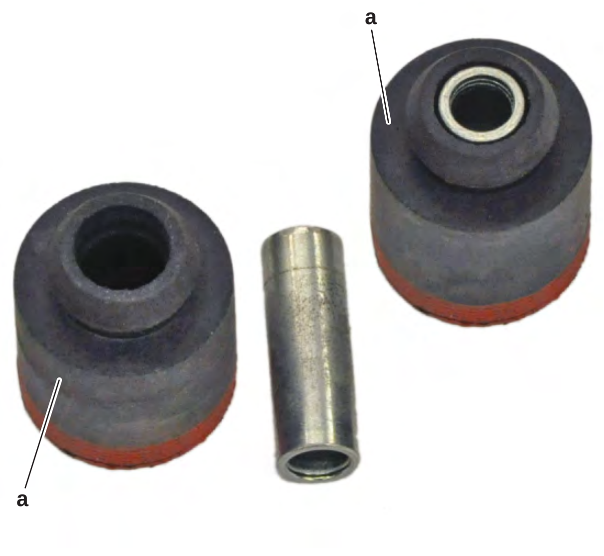
Prerequisite: Turn OFF the respective circuit breaker.

1. Wait until the rectifier voltage is below 10 V DC.

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

2. Visually check:
   - For oil drops around the compressor. Locate and fix as needed.
   - Pipes for signs of damage. Replace pipes as needed.
3. Check that the compressor bolts are correctly fixed. Fix as needed.
4. Check that the compressor wire terminals cover is correctly installed and fixed. Correct as needed.
5. Check the compressor dampers for any damage.



a Damper

> **INFORMATION**
>
> The compressor dampers may look different.

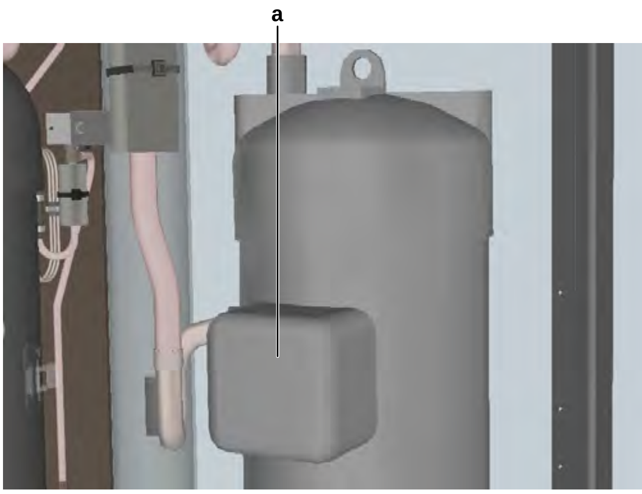
Compressor dampers are in a good condition?	Action
Yes	Perform an electrical check of the compressor, see "3.9.1 Checking procedures" [▶ 166].
No	Replace the compressor and/or damaged dampers, see "3.9.2 Repair procedures" [▶ 172].

To perform an electrical check of the compressor

1. First perform a mechanical check of the compressor, see "3.9.1 Checking procedures" [▶ 166].

> **DANGER: RISK OF ELECTROCUTION**
>
> Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

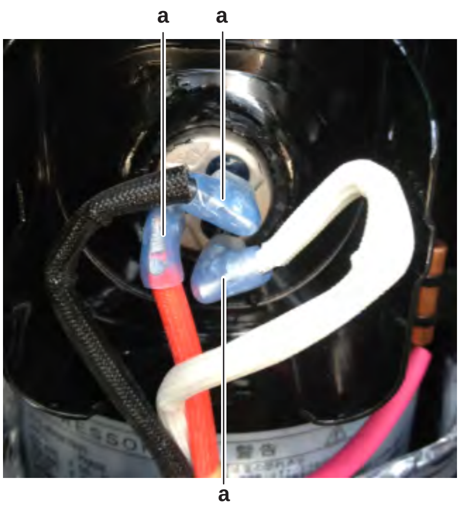
2. Remove the cover of the compressor wire terminals.



a Compressor wire terminals cover

3 Disconnect the Faston connectors from the compressor wire terminals U, V and W.

> **INFORMATION**
>
> Note the position of the Faston connectors on the compressor wire terminals to allow correct connection during installation.



a Faston connector

> **CAUTION**
>
> Before measuring the compressor motor windings resistance, measure the resistance of the multimeter probes by holding the probes against each other. If the measured resistance is NOT 0 Ω, this value MUST be substracted from the measured winding resistance.

4 Measure the resistance between the compressor motor windings U-V, V-W and U-W.

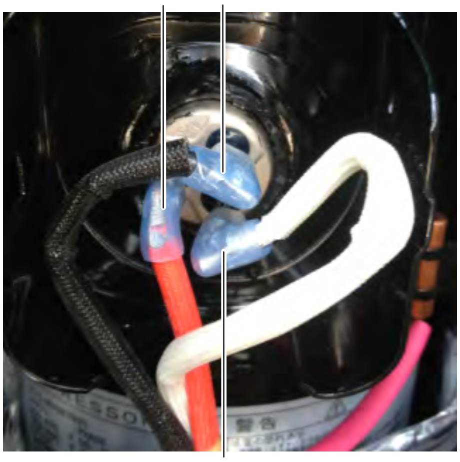
Result: All measurements MUST be approximately the same.

Winding	Resistance value
U-V	1.535 Ω±5%
V-W	1.496 Ω±5%
U-W	1.545 Ω±5%

Compressor motor winding measurements are correct?	Action
Yes	Continue with the next step.
No	Replace the compressor, see "3.9.2 Repair procedures" [▶ 172].

5 Measure the continuity of the U, V and W wires between the compressor and the PCB. If no continuity, correct as needed, see "6.2 Wiring diagram" [▶ 370].

6 Connect the Faston connectors to the compressor wire terminals U, V and W



a Faston connector

7 Install the compressor insulation.

8 Turn ON the power using the respective circuit breaker.

9 Start the unit operation via the user interface.

10 Wait for – or create condition to operate the compressor.

11 Once the compressor operates, measure the U-V-W inverter voltages. All measurements MUST be the same.

Inverter voltage measurements are correct?	Action
Yes	Continue with the next step.
No	Perform a check of the appropriate PCB, see "3 Components" [▶ 101].

12 Measure the current in each phase U, V and W while compressor is operating. All measurements MUST be the same.

Compressor motor winding current measurements are correct?	Action
Yes	Perform an insulation check of the compressor, see "3.9.1 Checking procedures" [▶ 166].
No	Preventively replace the compressor, see "3.9.2 Repair procedures" [▶ 172].

To perform an insulation check of the compressor

Prerequisite: First perform an electrical check of the compressor, see "3.9.1 Checking procedures" [▶ 166].

Prerequisite: Stop the unit operation via the user interface.

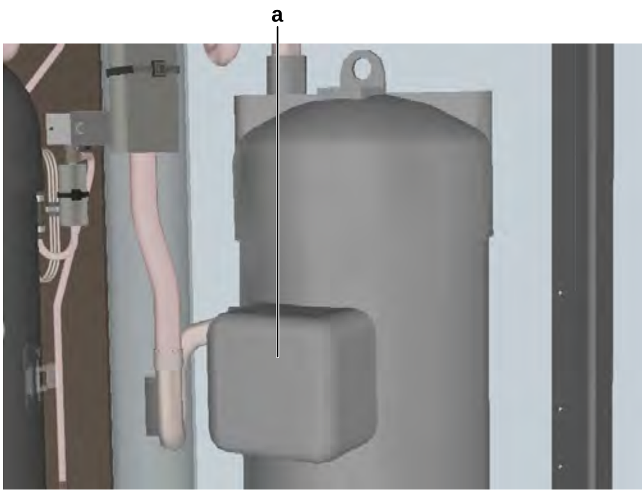
Prerequisite: Turn OFF the respective circuit breaker.

1 Wait until the rectifier voltage is below 10 V DC.

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

2 Remove the cover of the compressor wire terminals.

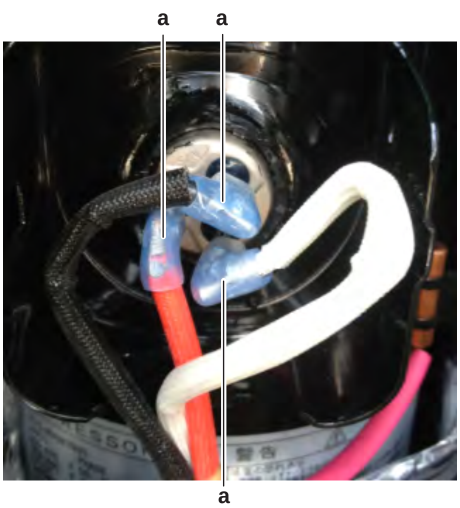


a Compressor wire terminals cover

3 Disconnect the Faston connectors from the compressor wire terminals U, V and W.

INFORMATION

Note the position of the Faston connectors on the compressor wire terminals to allow correct connection during installation.



a Faston connector

4 Set the Megger voltage to 500 V DC or 1000 V DC.

5 Measure the insulation resistance between the following terminals. The measured insulation resistance MUST be >3 MΩ.

- U–ground,
- V–ground,
- W–ground.

Compressor insulation measurements are correct?	Action
Yes	Compressor is OK. Return to troubleshooting of the specific error and continue with the next procedure.
No	Replace the compressor, see "3.9.2 Repair procedures" [▸ 172].

3.9.2 Repair procedures

To remove the compressor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

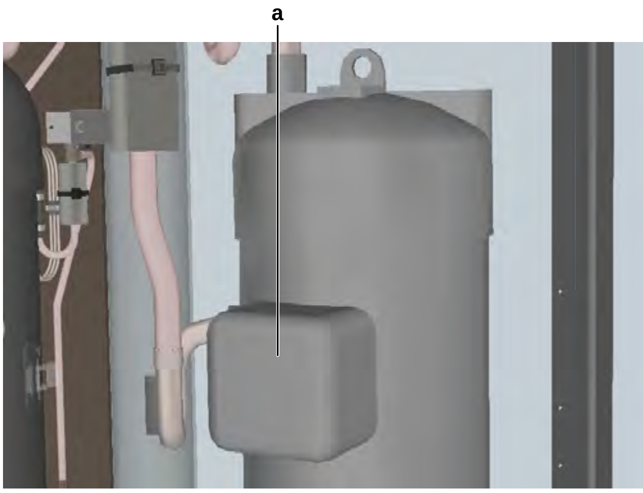
Prerequisite: Remove the compressor insulation.

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "4.2.2 Repair procedures" [▸ 351].

1 If needed, remove any parts to create more space for the removal of the compressor.

> **DANGER: RISK OF ELECTROCUTION**
>
> Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

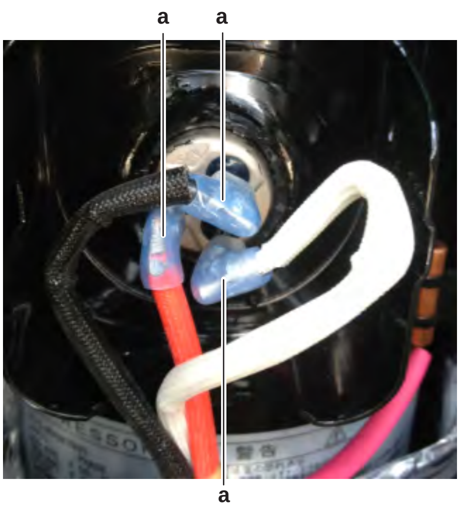
2 Remove the cover of the compressor wire terminals.



a Compressor wire terminals cover

3 Disconnect the Faston connectors from the compressor wire terminals U, V and W.

> **INFORMATION**
>
> Note the position of the Faston connectors on the compressor wire terminals to allow correct connection during installation.



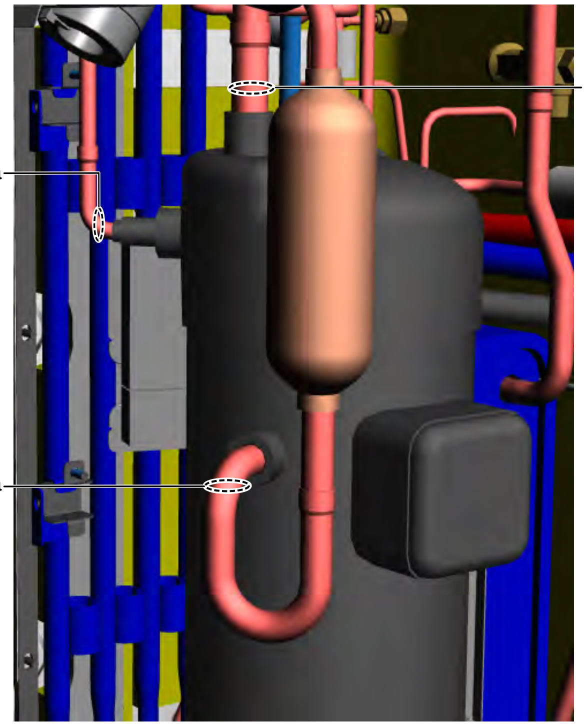
a Faston connector

4 Cut the tie strap and remove the compressor wiring from the compressor body.

a Tie strap

5 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

6 Wrap a wet rag around the components near the compressor pipes. Heat the brazing points of the compressor pipes using an oxygen acetylene torch and remove the refrigerant pipes from the compressor pipes using pliers.

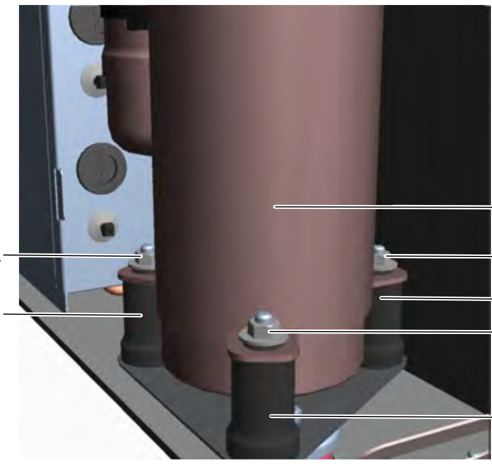


a Compressor pipe

7 Stop the nitrogen supply when the piping has cooled down.

> **INFORMATION**
>
> It is ALSO possible to cut the component pipe(s) using a pipe cutter. Make sure to remove the remaining component pipe end(s) from the refrigerant pipes by heating the brazing point(s) of the component pipe(s) using an oxygen acetylene torch.

8 Remove the nuts and bolts and remove the compressor from the unit.



a Nut
b Compressor
c Damper

9 Remove the 3 dampers from the compressor.

> **INFORMATION**
>
> The compressor dampers may look different.

10 Remove the bushings and keep them for re-use.

11 Install plugs or caps on the open pipe ends of the refrigerant piping to avoid dirt or impurities from entering the piping.

12 To install the compressor, see "3.9.2 Repair procedures" [▶ 172].

To install the compressor

1 Check the state of the dampers. Replace if worn.

2 Install the 3 dampers in the correct location on the unit.

3 Remove the plugs or caps from the refrigerant piping and make sure they are clean.

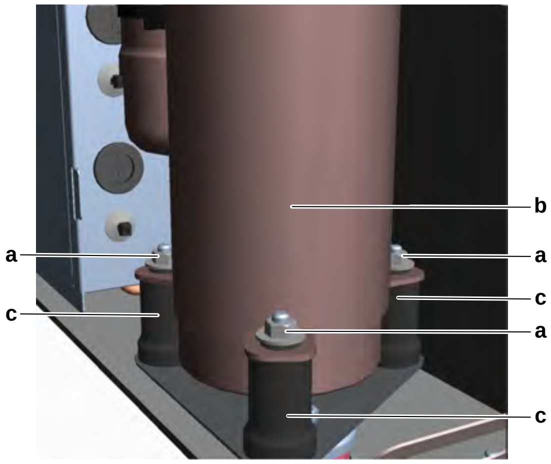
4 Remove the caps from the compressor pipes (of the new compressor).

CAUTION

The oil in the compressor is hygroscopic. Therefore remove the caps from the compressor pipes as late as possible.

5 Install the compressor on the correct location on the dampers. Properly insert the refrigerant pipes in the pipe expansions of the compressor pipes.

6 Install and tighten the bolts and nuts to fix the compressor to the dampers.



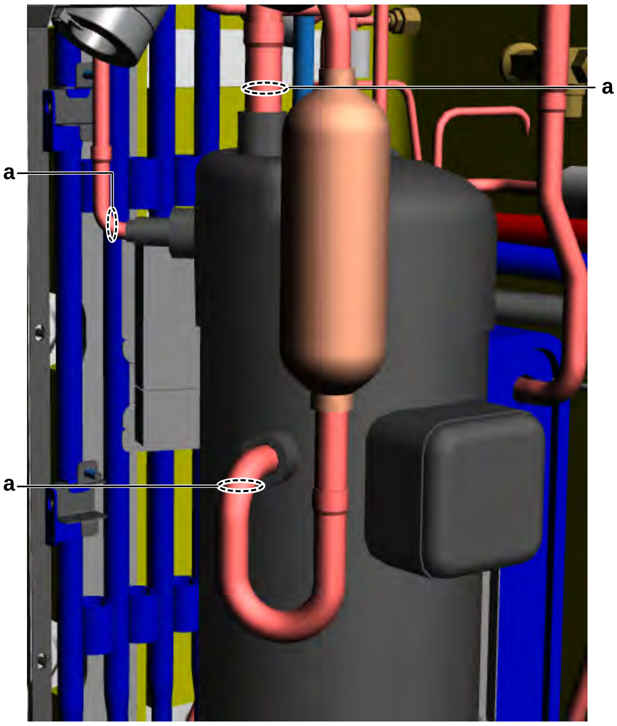
a Nut
b Compressor
c Damper

INFORMATION

The compressor dampers may look different.

7 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

8 Wrap a wet rag around the compressor pipes and any other components near the compressor and solder the compressor pipes to the refrigerant pipes.

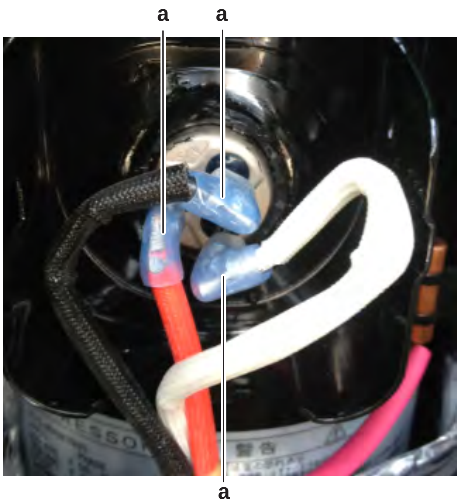


a Compressor pipe

> **CAUTION**
>
> Overheating the compressor pipes (and the oil inside the compressor pipes) will damage or destroy the compressor.

9 After soldering is done, stop the nitrogen supply after the component has cooled-down.

10 Connect the Faston connectors to the compressor wire terminals U, V and W

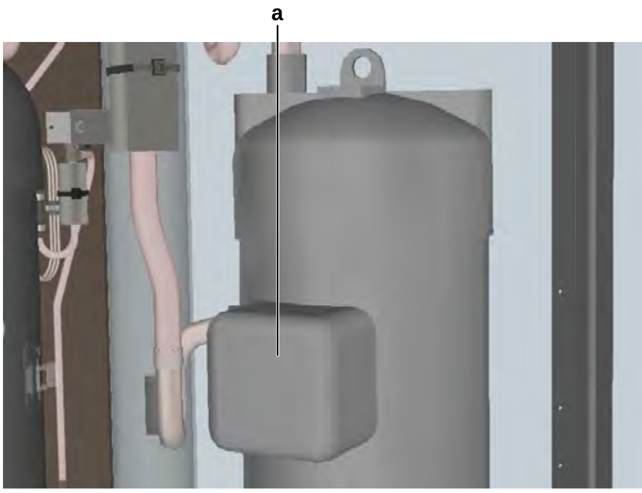


a Faston connector

11 Fix the compressor wiring to the protrusion on the compressor body using a new tie strap.

a Tie strap

12 Install the cover of the compressor wire terminals.



a Compressor wire terminals cover

13 Install the compressor insulation, see "3.9.2 Repair procedures" [▶ 172].

14 Perform a pressure test, see "4.2.1 Checking procedures" [▶ 347].

15 Add refrigerant to the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.10 Current loop PCB

3.10.1 Checking procedures

To perform a power check of the current loop PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Turn ON the power of the unit.
2. Measure the voltage on the connector X1A between pins 1-5 on the current loop PCB.

   Result: The measured voltage MUST be 5 V DC.

Is the measured voltage correct?	Action
Yes	Perform an electrical check of the current loop PCB, see "3.10.1 Checking procedures" [▸ 177].
No	Continue with the next step.

3. Measure the output voltage on the connector X10A between pins 1-5 on the hydro PCB.

   Result: The measured voltage MUST be 5 V DC.

Measured output voltage on hydro PCB is correct?	Action
Yes	Correct the wiring between the current loop PCB and the hydro PCB, see "4.1.2 Repair procedures" [▸ 346].
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▸ 199].

To perform an electrical check of the current loop PCB

Prerequisite: First perform a power check of the current loop PCB, see "3.10.1 Checking procedures" [▸ 177].

1. Connect the service monitoring tool to the X10A connector on the hydro PCB.
2. Check the communication between the bizone PCB and the hydro PCB. For example:
   - Read out of the mixed outlet water thermistor for bizone unit.

Is the communication between the PCB's correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next step.
No	Continue with the next step.

3. Check the wiring between the connectors X10A on the bizone PCB and current loop PCB:
   - Check that all wires are firmly and correctly connected
   - Check the continuity of all wires

Is the wiring between the PCB's correct?	Action
Yes	Continue with the next step.
No	Correct the wiring between the PCB's, see "4.1.2 Repair procedures" [▸ 346].

4. Perform a check of the bizone PCB, see "3.6.1 Checking procedures" [▸ 160].

Is the bizone PCB functioning correctly or is a communication error detected (LED 5 blinking)?	Action
Yes	Replace the current loop PCB, see "3.10.2 Repair procedures" [▸ 179].
No	Proceed as described in the bizone PCB checking procedures, see "3.6.1 Checking procedures" [▸ 160].

3.10.2 Repair procedures

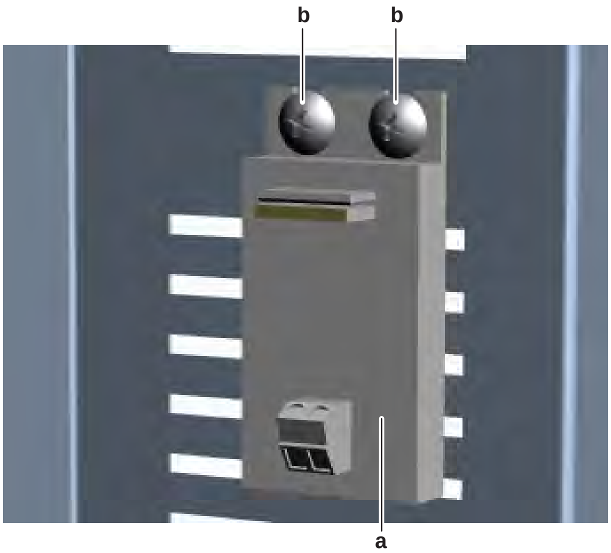
To remove the current loop PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Disconnect the 2 connectors X1A and X10A from the current loop PCB.



a Current loop PCB
b Screw

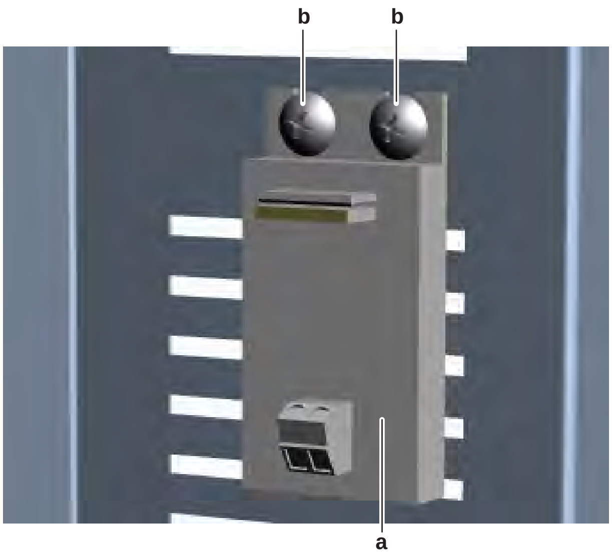
2 Remove the 2 screws and remove the current loop PCB from the switch box.

3 To install the current loop PCB, see "3.10.2 Repair procedures" [▸ 179].

To install the current loop PCB

1 Install the current loop PCB in the correct location in the switch box.

2 Install and tighten the screws to fix the current loop PCB.



a Current loop PCB
b Screw

3 Connect the 2 connectors X1A and X10A to the current loop PCB.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.11 Current sensor

3.11.1 Checking procedures

To perform an electrical check of the current sensor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

2 Visually check the current sensor for any damage or burnt-out components. If any damage is found, replace the current sensor, see "3.11.2 Repair procedures" [▶ 181].

3 Locate the current sensor connector on the leakage current PCB, see "6.2 Wiring diagram" [▶ 370].

a Connector X1A

4. Check the wiring from pins 1 and 2 of connector X1A to the current sensor.
5. Disconnect the current sensor connector from the connector X1A on the leakage current PCB and measure the resistance between pins 1 and 2 of current sensor connector.

   Result: The measured value MUST be approximately 27 Ω.
6. Set the Megger voltage to at least 500 V DC.
7. Measure the insulation resistance between the phase and ground.

   Result: The measured insulation resistance MUST be >1000 MΩ.

Are the measurements correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the current sensor, see "3.11.2 Repair procedures" [▶ 181].

3.11.2 Repair procedures

To remove the current sensor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

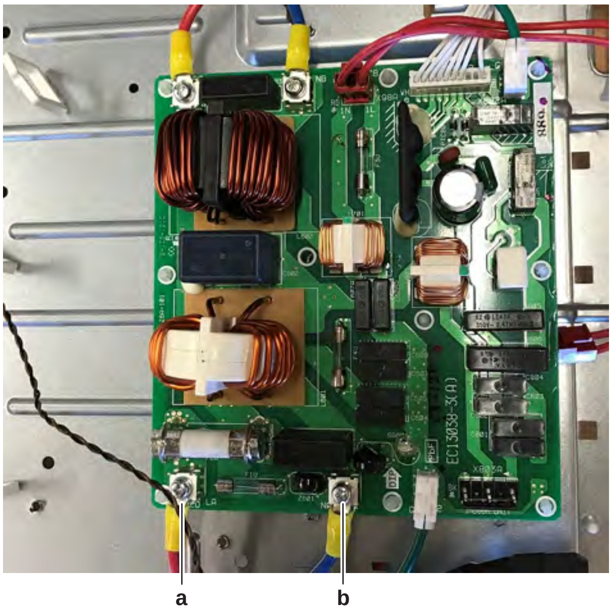
1. Remove the required plate work, see "3.23 Plate work" [▶ 261].

> **DANGER: RISK OF ELECTROCUTION**
>
> Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

2. Disconnect the current sensor connector from the leakage current PCB.

Single phase units

1. Loosen the screws and disconnect the power wiring LA and NA from the noise filter PCB.



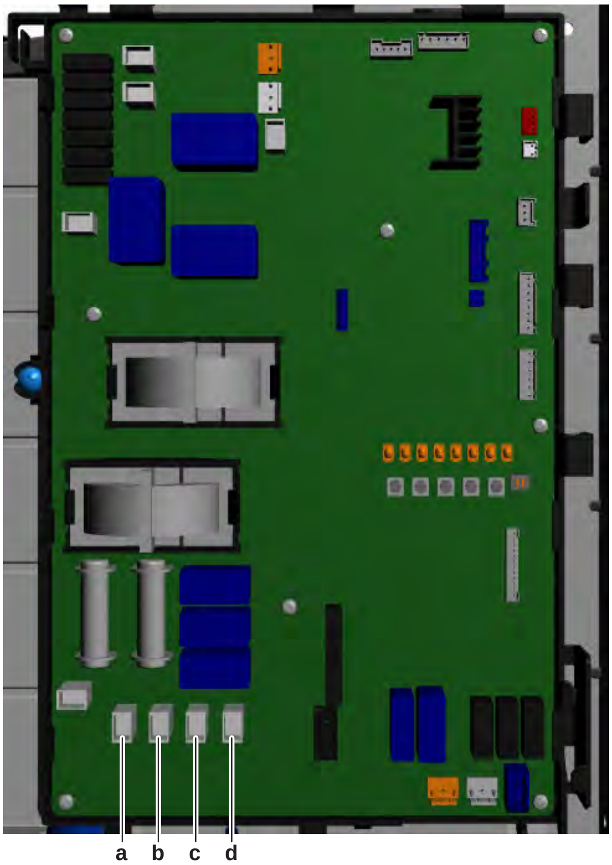
a LA
b NA

2 Remove the necessary tie straps from the wiring of the current sensor and the power wiring.

3 Slide the current sensor on the power wiring and remove the current sensor.

Three phase units

1 Disconnect the power wiring Faston connectors L1A, L2A, L3A and NA from the main PCB.



a L1A
b L2A
c L3A

d NA

2 Remove the necessary tie straps from the wiring of the current sensor and the power wiring.

3 Slide the current sensor on the power wiring and remove the current sensor.

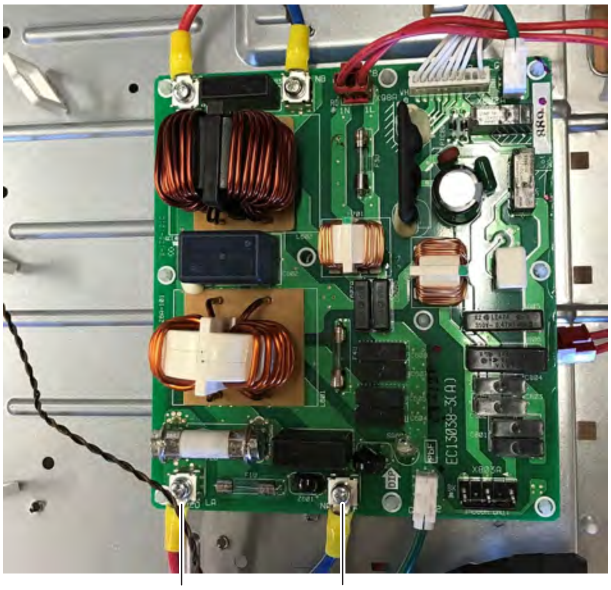
4 To install the current sensor, see "3.11.2 Repair procedures" [▶ 181].

To install the current sensor

Single phase units

1 Slide the current sensor on the power wiring LA and NA and install the current sensor in place.

2 Route the power wiring LA and NA to the noise filter PCB. Connect the wiring and tighten the screws.



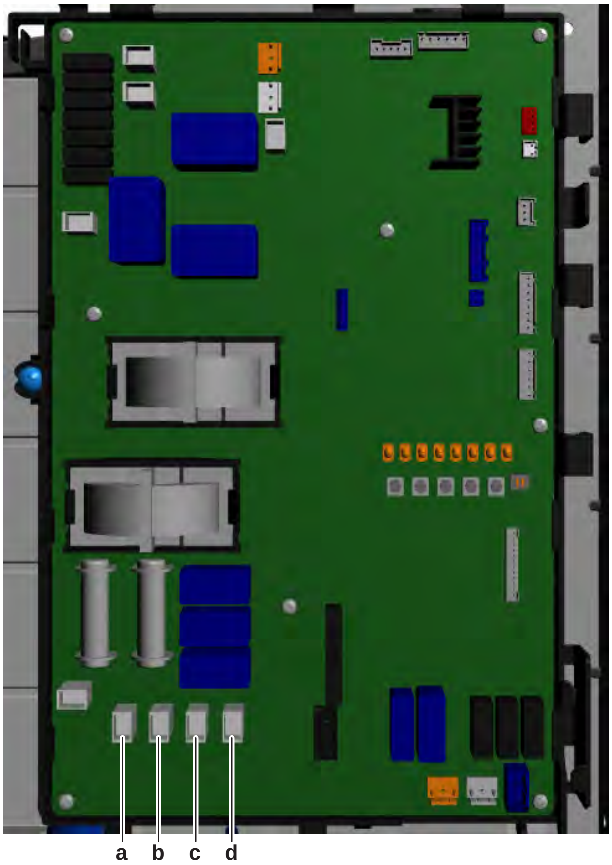
a b

a LA
b NA

Three phase units

1 Slide the current sensor on the power wiring L1A, L2A, L3A and NA and install the current sensor in place.

2 Route the power wiring L1A, L2A, L3A and NA to the main PCB. Connect the wiring (Faston connectors).



a L1A
b L2A
c L3A
d NA

For all units

1. Route the current sensor wiring towards the leakage current PCB.
2. Connect the current sensor connector to the leakage current PCB.
3. Install new tie wraps on the wiring of the current sensor and on the power wiring.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.12 Expansion valve

3.12.1 Checking procedures

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

To perform a mechanical check of the expansion valve

Prerequisite: Power OFF the unit for 3 minutes. Then turn ON the unit and listen to the expansion valve assembly. If the expansion valve does NOT make a latching sound, continue with the electrical check of the expansion valve, see "3.12.1 Checking procedures" [▸ 184].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Remove the expansion valve insulation (if applicable) and visually check:
   - For oil drops around the expansion valve. Locate and fix as necessary.
   - Pipes for signs of damage. Replace pipes as needed.
   - Coil wires for signs of damage. Replace expansion valve coil as needed. See "3.12.2 Repair procedures" [▸ 188].
2. Remove the expansion valve coil from the expansion valve body, see "3.12.2 Repair procedures" [▸ 188].
3. Slide the expansion valve magnet over the expansion valve body and gently rotate the magnet clockwise/counterclockwise to manually close/open the expansion valve. Listen to check if the valve is closing/opening and manually close the valve when check is done.

> **INFORMATION**
>
> After the check, remove the magnet from the expansion valve body and install the expansion valve coil on the expansion valve body. Make sure that the expansion valve coil is firmly slid onto the expansion valve body.

> **INFORMATION**
>
> It is highly recommended to perform a power reset after checking the valve using a magnet.

Does the expansion valve open?	Action
Yes	Perform an electrical check of the expansion valve, see "3.12.1 Checking procedures" [▸ 184].
No	Replace the expansion valve body, see "3.12.2 Repair procedures" [▸ 188].

To perform an electrical check of the expansion valve

1. First perform a mechanical check of the expansion valve, see "3.12.1 Checking procedures" [▸ 184].
2. Disconnect the electrical connector of the expansion valve coil from the appropriate PCB and measure the resistance of all windings (between the pins of each phase (wire) and the common wire) using a multi meter. All measurements MUST be approximately the same.

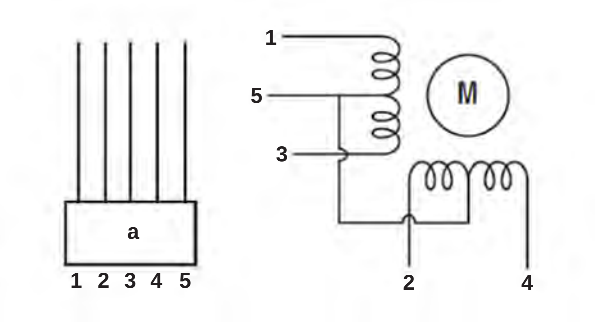
Name	Symbol	Location (PCB)	Connector	Winding resistance
Main expansion valve	Y1E	Main	X21A	46±3 Ω

Name	Symbol	Location (PCB)	Connector	Winding resistance
Injection expansion valve	Y3E	Main	X22A	46±3 Ω

INFORMATION

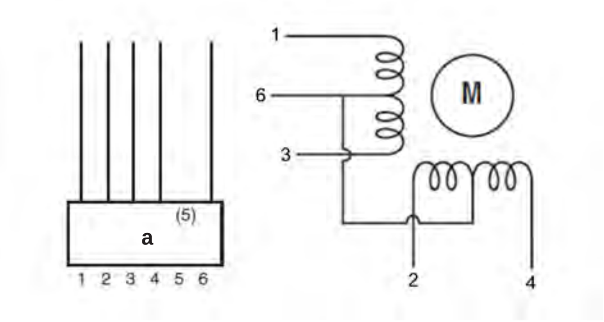
Below are shown examples of the resistance measurements in which the common wire is connected to pin 5 or to pin 6 of the expansion valve coil connector. Connections may differ according to the type of expansion valve.

- Connector pin 1-5,
- Connector pin 2-5,
- Connector pin 3-5,
- Connector pin 4-5.



a Connector

- Connector pin 1-6,
- Connector pin 2-6,
- Connector pin 3-6,
- Connector pin 4-6.



a Connector

3 Check the insulation resistance of the coil by measuring the resistance between the pins of each phase (1, 2, 3, 4) and GND on the unit.

Result: None of the measurements should be short-circuit.

WARNING

When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

Is the measured resistance correct?	Action
Yes	Perform an operation check of the expansion valve, see "3.12.1 Checking procedures" [▶ 184].
No	Replace the expansion valve coil, "3.12.2 Repair procedures" [▶ 188].

To perform an operation check of the expansion valve

Prerequisite: First perform an electrical check of the expansion valve, see "3.12.1 Checking procedures" [▶ 184].

1 Turn ON the power of the unit.

> **INFORMATION**
>
> When power is switched ON, PCB checks all expansion valve coil windings by current check. If winding is short or open, expansion valve error is triggered.

2 Start the unit operation via the user interface.

3 With the unit operating, connect the service monitoring tool to the unit.

4 When the expansion valve is closed according to the service monitoring tool, check the inlet and outlet of the valve with a contact thermometer or use an expansion valve stethoscope to see if refrigerant flows through the expansion valve. Check that the valve is NOT bleeding.

Result: There MUST be NO flow through the expansion valve.

5 When the expansion valve is open according to the service monitoring tool, check the inlet and outlet of the valve with a contact thermometer or use an expansion valve stethoscope to see if refrigerant flows through the expansion valve.

Result: Refrigerant MUST flow through the expansion valve.

6 Wait for the PCB to command the expansion valve to open (when closed) or to close (when open) (pulse output to expansion valve visible on service monitoring tool).

> **INFORMATION**
>
> If the PCB does NOT command the expansion valve to open or close (when it is supposed to), perform a check of the appropriate thermistors and pressure sensors (expansion valves are driven by superheat or subcool value calculated through the thermistors).

7 While in opening or closing sequence each expansion valve winding (Φ1, 2, 3, 4) is supplied with 12 V DC from the PCB. You will need a good multimeter, where its range is set to about 20 V DC, and during opening or closing sequence you may be able to measure the supply voltage for a short time. If you set the multimeter range to Auto, then most likely you may NOT read a value between switching ranges. The best way to check is to feel the movement of the valve by touching, rather than trying to measure the driving voltage.

8 When the expansion valve was commanded to close, check the inlet and outlet of the valve with a contact thermometer or use an expansion valve stethoscope to see if refrigerant flows through the expansion valve. Check that the valve is NOT bleeding.

Result: There MUST be NO flow through the expansion valve.

9 When the expansion valve was commanded to open, check the inlet and outlet of the valve with a contact thermometer or use an expansion valve stethoscope to see if refrigerant flows through the expansion valve.

Result: Refrigerant MUST flow through the expansion valve.

Is the flow through the expansion valve correct?	Action
Yes	Component is OK. Return to the troubleshooting of the specific error and continue with the next step.
No	Replace the expansion valve, see "3.12.2 Repair procedures" [▸ 188].

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.12.2 Repair procedures

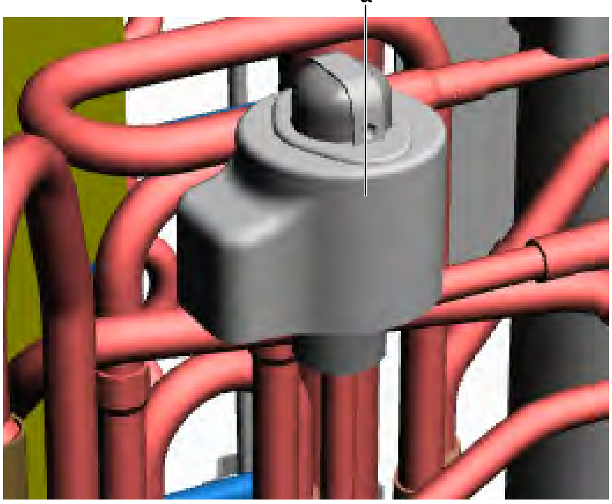
To remove the expansion valve coil

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 If needed, remove any parts or insulation to create more space for the removal.



a Expansion valve coil

2 Pull the expansion valve coil to remove it from the expansion valve body.

> **INFORMATION**
>
> It may be needed to turn the expansion valve coil 1/8 turn counter clockwise to unlock it. Make sure to note the correct orientation (position) of the expansion valve coil before removal.

3 Cut all tie straps that fix the expansion valve coil harness.

4 Disconnect the expansion valve coil connector (X21A for main expansion valve Y1E and X22A for injection expansion valve Y3E) from the main PCB.

5 To install the expansion valve coil, see "3.12.2 Repair procedures" [▶ 188].

To remove the expansion valve body

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

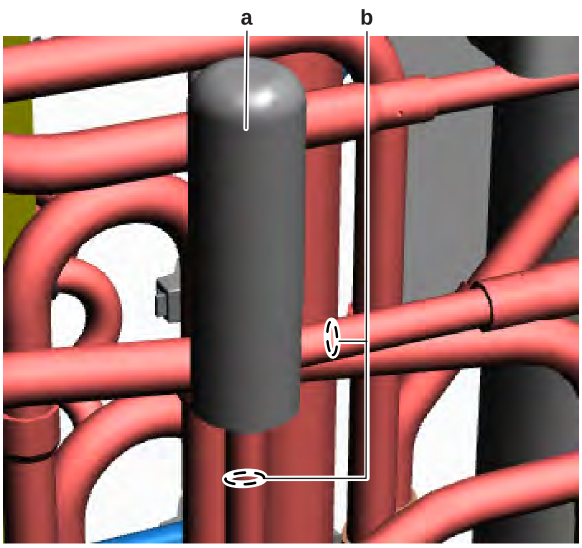
Prerequisite: If needed, remove any parts or insulation to create more space for the removal.

1 Remove the expansion valve coil, see "3.12.2 Repair procedures" [▶ 188].

2 Using a valve magnet, open the expansion valve.

3 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

4 Wrap a wet rag around the components near the expansion valve pipes. Heat the brazing points of the expansion valve pipes using an oxygen acetylene torch and remove the expansion valve pipes from the refrigerant pipes using pliers.



a Expansion valve body
b Expansion valve pipe

5 Stop the nitrogen supply when the piping has cooled down.

6 Remove the expansion valve body.

> **INFORMATION**
>
> It is ALSO possible to cut the component pipe(s) using a pipe cutter. Make sure to remove the remaining component pipe end(s) from the refrigerant pipes by heating the brazing point(s) of the component pipe(s) using an oxygen acetylene torch.

7 Install plugs or caps on the open pipe ends of the refrigerant piping to avoid dirt or impurities from entering the piping.

8 To install the expansion valve body, see "3.12.2 Repair procedures" [▶ 188].

To install the expansion valve body

1 Remove the plugs or caps from the refrigerant piping and make sure they are clean.

2 Remove the expansion valve coil from the spare part expansion valve body.

3 Install the expansion valve body in the correct location and correctly oriented. Insert the pipe ends in the pipe expansions.

4 Open the expansion valve using a valve magnet.

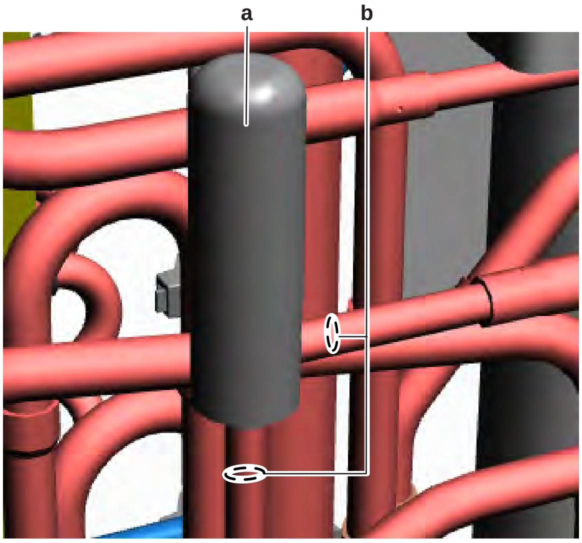
5 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

6 Wrap a wet rag around the expansion valve body and any other components near the expansion valve and solder the expansion valve pipes to the refrigerant pipes.

CAUTION

Overheating the valve will damage or destroy it.

7 After soldering is done, stop the nitrogen supply after the component has cooled-down.



a Expansion valve body
b Expansion valve pipe

8 To install the expansion valve coil, see "3.12.2 Repair procedures" [▶ 188].

9 Perform a pressure test, see "4.2.1 Checking procedures" [▶ 347].

10 Add refrigerant to the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

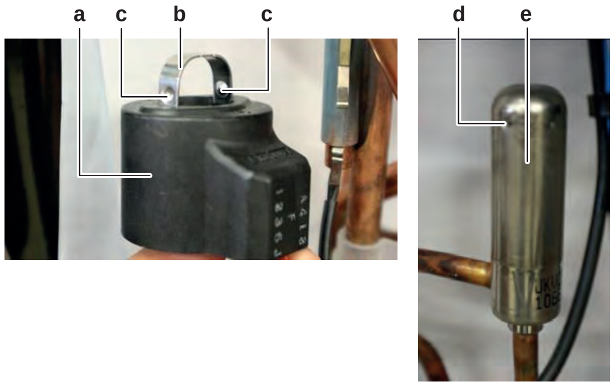
To install the expansion valve coil with bracket

1 Install the expansion valve coil on the expansion valve body.

INFORMATION

The expansion valve coil is equipped with a metal bracket. Fit the nipples of the metal bracket into the notches of the expansion valve body.

> **CAUTION**
>
> Make sure to install the expansion valve coil in the correct position (orientation).



- **a** Expansion valve coil
- **b** Metal bracket
- **c** Nipple
- **d** Notch
- **e** Expansion valve body

2 Route the expansion valve coil harness towards the appropriate PCB.

3 Connect the expansion valve coil connector to the appropriate PCB.

> **WARNING**
>
> When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

4 Fix the expansion valve coil harness using new tie straps.

5 Install the insulation cap on the expansion valve coil (if applicable).

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.12.1 Checking procedures" [▶ 184] of the expansion valve and continue with the next procedure.

3.13 Flash PCB

3.13.1 Checking procedures

To perform a power check of the flash PCB

Prerequisite: Stop the unit operation via the user interface.

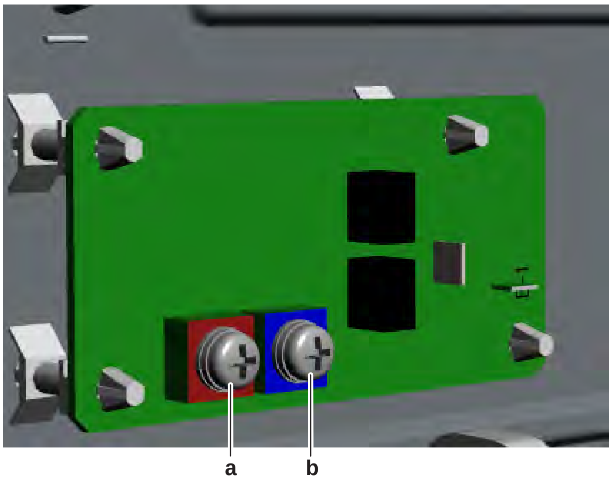
Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

2 Turn ON the power of the unit.

3 Measure the voltage between the wires L1-N on the flash PCB.

Result: The measured voltage MUST be 230 V AC.



a L1
b N

Is the measured voltage on the PCB correct?	Action
Yes	No further checks available.
No	Continue with the next step.

4 Measure the output voltage between the wires LB-NB on the noise filter PCB.

Result: The measured voltage MUST be 230 V AC.

Is the output voltage on the noise filter PCB correct?	Action
Yes	Correct the wiring between the flash PCB and the noise filter PCB, see "4.1.2 Repair procedures" [▶ 346].
No	Perform a check of the noise filter PCB, see "Checking procedures" [▶ 241].

3.13.2 Repair procedures

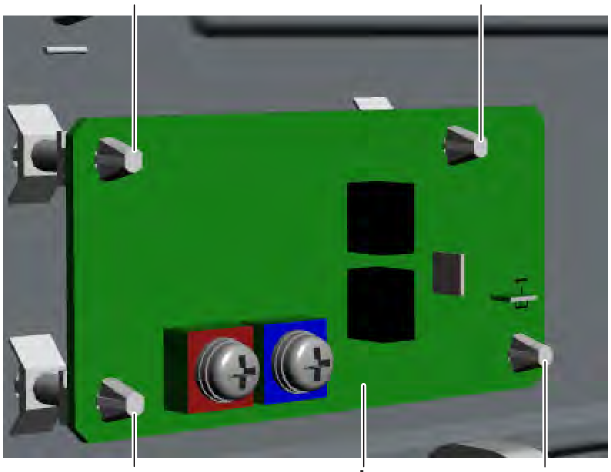
To remove the flash PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Loosen the screws to disconnect the wires L1 and N from the flash PCB.
2. Disconnect the ground wire from the flash PCB.
3. Carefully pull the PCB at the side and unlatch the PCB supports one by one using a small pair of pliers.
4. Remove the flash PCB from the main PCB mounting plate.



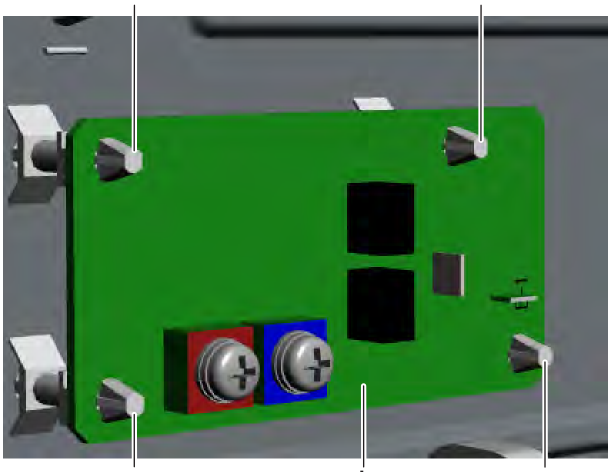
a PCB support
b Flash PCB

5 To install the new flash PCB, see "3.13.2 Repair procedures" [▶ 192].

To install the flash PCB

1 Install the flash PCB on its correct location.

2 Latch the PCB supports using a small pair of pliers to fix the PCB.



a PCB support
b Flash PCB

3 Connect the ground wire to the flash PCB.

4 Connect the L1 and N wires to the flash PCB and tighten the screws.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.14 High pressure switch

3.14.1 Checking procedures

To perform an electrical check of the high pressure switch

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▸ 261].

High pressure switch S1PH

2 Turn ON the power of the unit.

3 Start the unit operation via the user interface.

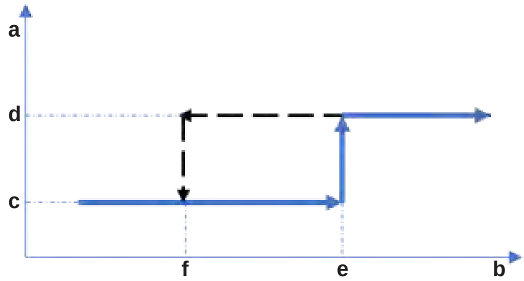
As there is NO service port to measure the pressure for this high pressure switch, use the pressure read-out of the refrigerant pressure sensor via service monitoring tool. Make sure that the refrigerant pressure sensor functions correctly. See "3.25.1 Checking procedures" [▸ 274].

4 Disconnect the connector X2A from the leakage current PCB.

5 Disconnect the wire (Faston connector) that connects the high pressure switch S1PH to the high pressure switch S2PH from the high pressure switch S2PH.

6 Measure the resistance between the Faston connector (disconnected from S2PH) and pin 1 of connector X2A.

7 Compare the result with the trigger and reset conditions of the high pressure switch (graphic below).



a High pressure switch protection control
b Pressure
c High pressure switch closed
d High pressure switch open
e High pressure switch operating pressure
f High pressure switch reset pressure

High pressure switch	Operating pressure (MPa)	Reset pressure
S1PH	5.16~5.6	3.9~4.0

8 If the measured refrigerant pressure is:

- Above operating pressure, the high pressure switch MUST be open. Check for the reason of the high pressure and resolve as needed.
- Below reset pressure, the high pressure switch MUST be closed.
- Between reset and operating pressure, check the latest error codes:
  If error code E3 was found, the high pressure switch was recently triggered open. In this case the high pressure switch MUST still be open.
  If NO error codes E3 was found, the high pressure switch was NOT triggered open and MUST be closed.

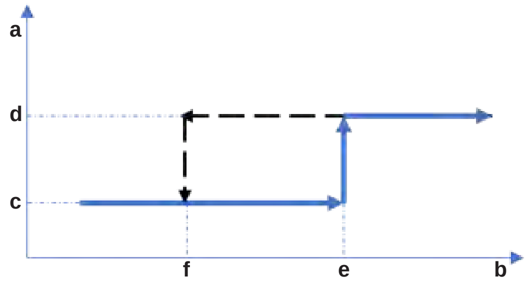
> **INFORMATION**
>
> If the high pressure switch was triggered open, it will stay open until the refrigerant pressure drops below the reset pressure of the high pressure switch.

High pressure switch connector measurements are correct?	Then
Yes	High pressure switch is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the high pressure switch, see "3.14.2 Repair procedures" [▸ 196].

High pressure switch S2PH

1 Recuperate the refrigerant from the refrigerant circuit, see "4.2.2 Repair procedures" [▸ 351].

2 Fill the refrigerant circuit with nitrogen until pressurized just below operating pressure of the high pressure switch.



a High pressure switch protection control
b Pressure
c High pressure switch closed
d High pressure switch open
e High pressure switch operating pressure
f High pressure switch reset pressure

High pressure switch	Operating pressure (MPa)	Reset pressure
S2PH	4.1~5.1	3.0~3.4

3 Disconnect the Faston connectors from the high pressure switch.

4 Measure the resistance between the Faston connections of the high pressure switch.

Result: The switch MUST be closed.

5 Fill the refrigerant circuit with nitrogen until pressurized just above operating pressure of the high pressure switch.

> **CAUTION**
>
> Do NOT pressurize the refrigerant circuit >4.17 MPa.

6 Measure the resistance between the Faston connections of the high pressure switch.

Result: The switch MUST be open.

> **INFORMATION**
>
> If the high pressure switch was triggered open, it will stay open until the refrigerant pressure drops below the reset pressure of the high pressure switch.

7 Lower the pressure of the nitrogen in the refrigerant circuit just above reset pressure of the high pressure switch.

8 Measure the resistance between the Faston connections of the high pressure switch.

Result: The switch MUST be open.

9 Lower the pressure of the nitrogen in the refrigerant circuit just below reset pressure of the high pressure switch.

10 Measure the resistance between the Faston connections of the high pressure switch.

Result: The switch MUST be closed.

High pressure switch connector measurements are correct?	Then
Yes	Continue with the next step.
No	Replace the high pressure switch, see "3.14.2 Repair procedures" [▶ 196].

11 Connect the Faston connectors to the high pressure switch S2PH and disconnect the connector X32A from the main PCB and the connector X2A from the leakage current PCB.

12 Make sure the pressure of the nitrogen in the refrigerant circuit is still below reset pressure of the high pressure switch S2PH.

13 Measure the resistance between the pin 1 of connector X2A and the pin 2 of connector X32A.

Result: The switches (S1PH and S2PH) MUST be closed.

Both high pressure switches closed?	Then
Yes	High pressure switch is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the high pressure switch S1PH, see "3.14.2 Repair procedures" [▶ 196].

3.14.2 Repair procedures

To remove the high pressure switch

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

1 If needed, remove any parts to create more space for the removal of the high pressure switch.

2 Disconnect the Faston connectors from the high pressure switch.

3 For S1PH removal:

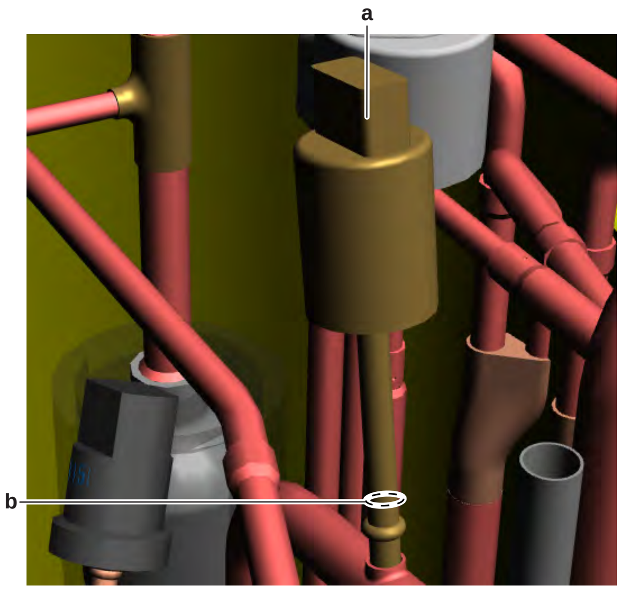
- Disconnect the Faston connectors from the high pressure switch S2PH.
- Disconnect the connector X32A from the main PCB.
- Disconnect the connector X2A from the leakage current PCB.

4 For S2PH removal: disconnect the Faston connectors from the high pressure switch.

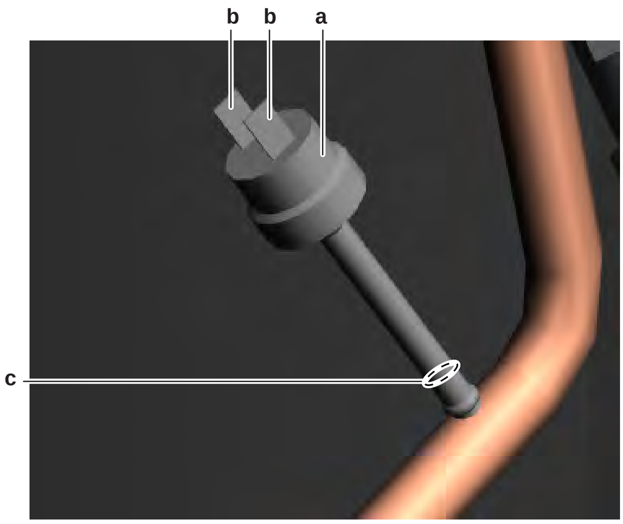
5 For S1PH ONLY: cut all tie straps that fix the high pressure switch harness.

6 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

7 Wrap a wet rag around the components near the high pressure switch. Heat the brazing point of the high pressure switch pipe using an oxygen acetylene torch and remove the high pressure switch pipe from the refrigerant pipe using pliers.



a High pressure switch S1PH
b High pressure switch pipe



a High pressure switch S2PH
b Faston connector
c High pressure switch pipe

8 Stop the nitrogen supply when the piping has cooled down.

9 Remove the high pressure switch.

INFORMATION

It is ALSO possible to cut the component pipe(s) using a pipe cutter. Make sure to remove the remaining component pipe end(s) from the refrigerant pipes by heating the brazing point(s) of the component pipe(s) using an oxygen acetylene torch.

10 Install a plug or cap on the refrigerant piping to avoid dirt or impurities from entering the piping.

11 To install the high pressure switch, see "3.14.2 Repair procedures" [▸ 196].

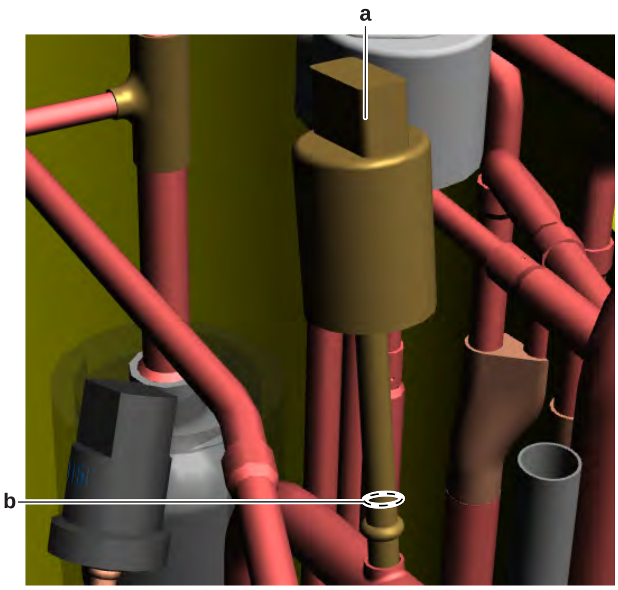
To install the high pressure switch

1 Remove the plug or cap from the refrigerant piping and make sure it is clean.

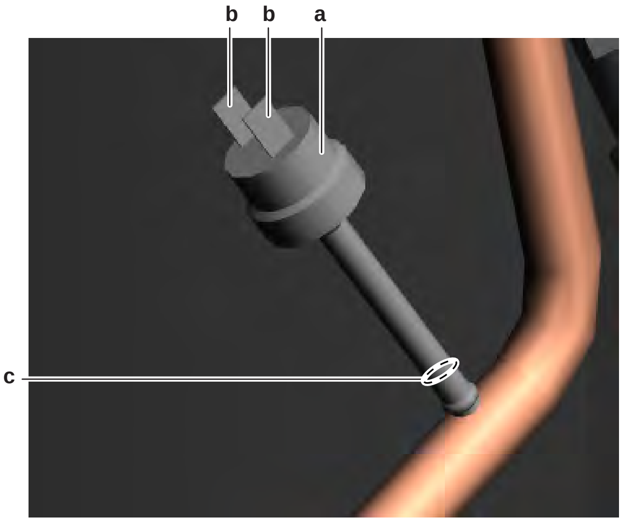
2 Install the high pressure switch in the correct location.

3 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

4 Wrap a wet rag around the high pressure switch and any other components near the high pressure switch and solder the high pressure switch pipe to the refrigerant pipe.



a High pressure switch S1PH
b High pressure switch pipe



a High pressure switch S2PH
b Faston connector
c High pressure switch pipe

CAUTION

Overheating the pressure switch will damage or destroy it.

5 After soldering is done, stop the nitrogen supply after the component has cooled-down.

6 Connect the Faston connectors to the high pressure switch.

7 For S1PH installation:

- Connect the Faston connectors to the high pressure switch S2PH.
- Connect the connector X32A to the main PCB.
- Connect the connector X2A to the leakage current PCB.

8 For S2PH installation: connect the Faston connectors to the high pressure switch.

9 For S1PH ONLY: install new tie straps to fix the high pressure switch harness.

10 Perform a pressure test, see "4.2.1 Checking procedures" [▶ 347].

11 Add refrigerant to the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.15 Hydro PCB

3.15.1 Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a power check of the hydro PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

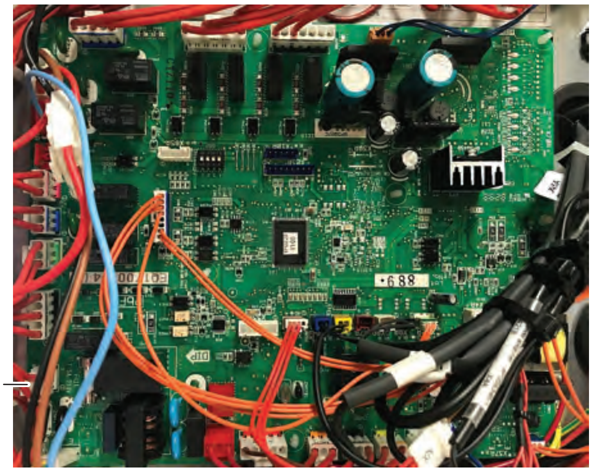
Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Turn ON the power of the unit.

2 Measure the voltage on the connector X1A on the PCB.

Result: The measured voltage MUST be 230 V AC.

a



a Power supply connector

Is the measured voltage on the hydro PCB correct?	Action
Yes	Return to "3.15.1 Checking procedures" [▶ 199] of the hydro PCB and continue with the next procedure.
No	Continue with the next step.

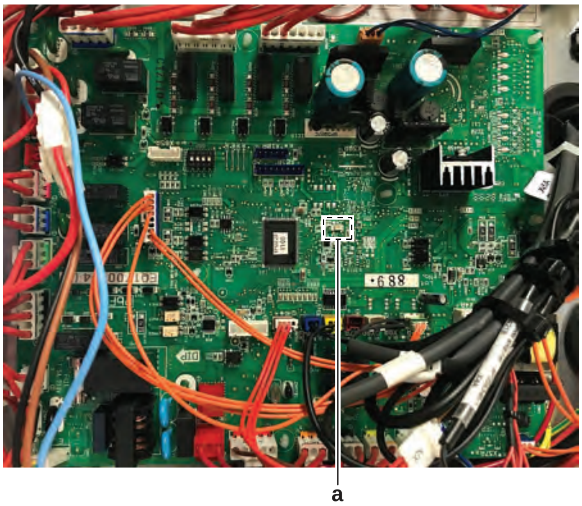
3 Check the power supply to the indoor unit, see "4.1.1 Checking procedures" [▶ 343].

Is the power supply to the indoor unit correct?	Action
Yes	Correct the wiring between the power supply terminal of the indoor unit and the hydro PCB, see "3.15.2 Repair procedures" [▶ 202].
No	See "To check the power supply to the indoor unit" ("4.1.2 Repair procedures" [▶ 346]) for the next steps.

To check the HAP LED of the hydro PCB

Prerequisite: First check the power supply to the hydro PCB, see "3.15.1 Checking procedures" [▶ 199].

1 Locate the HAP LED on the hydro PCB.



a HAP LED

> **INFORMATION**
>
> Make sure the correct software is available on the PCB. If NOT, update using the updater tool.

Does the HAP LED blink in regular intervals (1 second ON/1 second OFF)?	Action
Yes	Return to "3.15.1 Checking procedures" [▶ 199] of the hydro PCB and continue with the next procedure.

Does the HAP LED blink in regular intervals (1 second ON/1 second OFF)?	Action
No	Replace the hydro PCB, see "3.15.2 Repair procedures" [▸ 202]

To check if the correct spare part is installed

Prerequisite: First perform all earlier hydro PCB checks, see "3.15.1 Checking procedures" [▸ 199].

1 Visit your local spare parts webbank.

2 Enter the model name of your unit and check if the installed spare part number corresponds with the spare part number indicated in the webbank.

Is the correct spare part for the hydro PCB installed?	Action
Yes	Return to "3.15.1 Checking procedures" [▸ 199] of the hydro PCB and continue with the next procedure.
No	Replace the hydro PCB, see "3.15.2 Repair procedures" [▸ 202]

To check the wiring of the hydro PCB

Prerequisite: First perform all earlier hydro PCB checks, see "3.15.1 Checking procedures" [▸ 199].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Check that all wires are properly connected and that all connectors are fully plugged-in.

2 Check that no connectors or wires are damaged.

3 Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▸ 370].

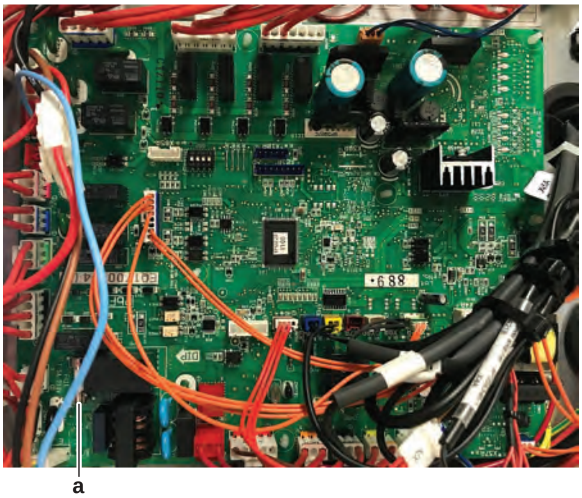
> **INFORMATION**
>
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.15.1 Checking procedures" [▸ 199] of the hydro PCB and continue with the next procedure.

To check the fuse of the hydro PCB

Prerequisite: First perform all earlier hydro PCB checks, see "3.15.1 Checking procedures" [▸ 199].

1 Measure the continuity of the fuse. If no continuity is measured, the fuse has blown.



a Fuse

Blown fuse on the hydro PCB?	Action
Yes	Replace the blown fuse, see "3.15.2 Repair procedures" [▸ 202]
No	Return to "3.15.1 Checking procedures" [▸ 199] of the hydro PCB and continue with the next procedure.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.15.2 Repair procedures

To correct the wiring from the main power supply terminal to the hydro PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▸ 261].
2. Make sure that all wires are firmly and correctly connected, see "6.2 Wiring diagram" [▸ 370].
3. Check the continuity of all wires.
4. Replace any damaged or broken wires.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.15.1 Checking procedures" [▸ 199] of the hydro PCB and continue with the next procedure.

To remove the hydro PCB

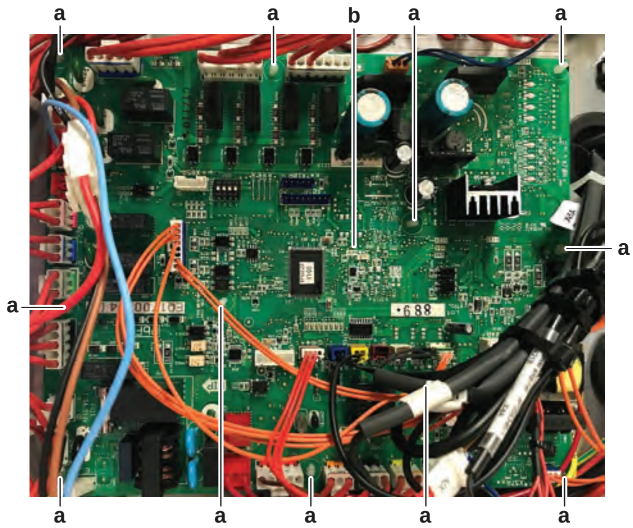
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Disconnect all connectors and the ground wire from the hydro PCB.

2 Carefully pull the hydro PCB and unlatch the PCB supports one by one using a small pliers.



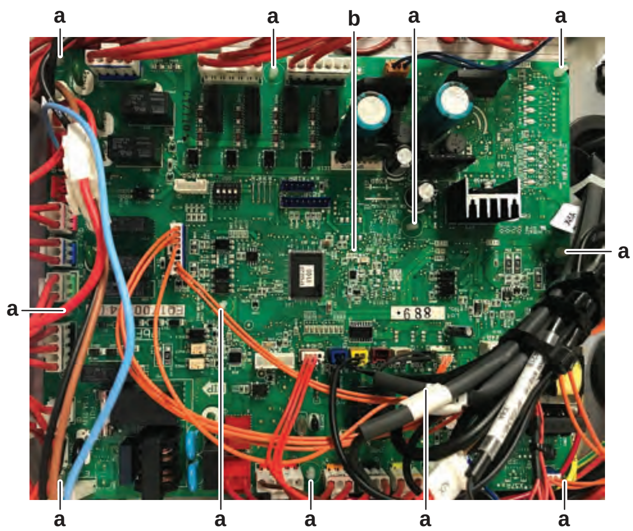
a PCB support
b Hydro PCB

3 Remove the hydro PCB from the switch box.

4 To install the hydro PCB, see "3.15.2 Repair procedures" [▶ 202].

To install the hydro PCB

1 Install the hydro PCB in the correct location in the switch box.



a PCB support
b Hydro PCB

2 Connect all connectors and ground wire to the hydro PCB.

> **INFORMATION**
>
> Use the wiring diagram and connection diagram for correct installation of the connectors, see "6.2 Wiring diagram" [▶ 370].

> **WARNING**
> When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.15.1 Checking procedures" [▶ 199] of the hydro PCB and continue with the next procedure.

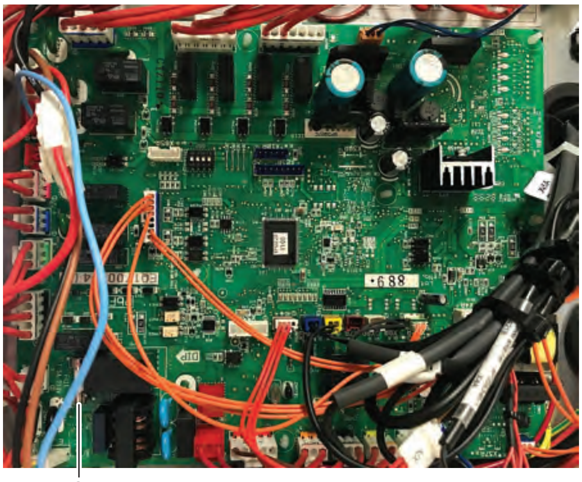
To remove a fuse of the hydro PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Remove the fuse from the PCB.



a Fuse

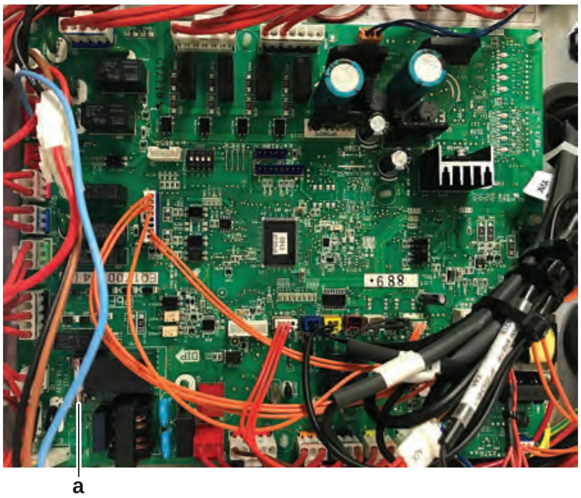
2 To install a fuse on the hydro PCB, see "3.15.2 Repair procedures" [▶ 202].

To install a fuse on the hydro PCB

> **WARNING**
> For continued protection against risk of fire, replace ONLY with same type and rating of fuse.

1 Install the fuse on the correct location on the PCB.

> **CAUTION**
> Make sure the fuse is plugged-in correctly (contact with the fuse holder).



a Fuse

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.15.1 Checking procedures" [▶ 199] of the hydro PCB and continue with the next procedure.

3.16 Inverter PCB

3.16.1 Single fan outdoor unit - single phase

Checking procedures

As the inverter PCB is integrated in the main PCB of the unit, see "3.20 Main PCB" [▶ 224] for the other check procedures.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

Repair procedures

As the inverter PCB is integrated in the main PCB of the unit, see "3.20 Main PCB" [▶ 224] for the repair procedures.

3.16.2 Single fan outdoor unit - three phase

Checking procedures

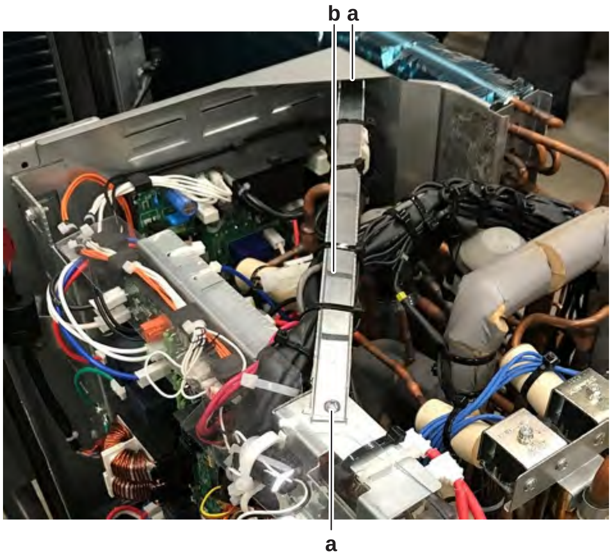
> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a power check of the inverter PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▸ 261].
2. Cut all tie straps that are fixed to the top beam.
3. Remove the 2 screws and remove the beam to create more space for easier access.

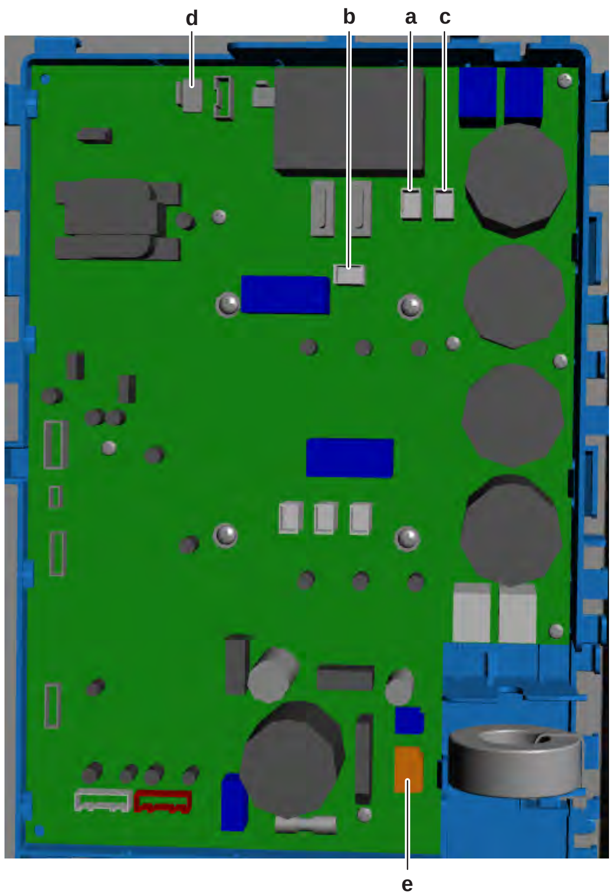


a Screw
b Beam

4. Turn ON the power of the unit.
5. Measure the voltage between the following wires on the inverter PCB.

   Result: All measurements MUST be 400 V AC.

   - L12A–L22A
   - L12A–L32A
   - L22A–L32A



a Wire L12A
b Wire L22A
c Wire L32A
d Connector X108A
e Connector X109A

Is the measured voltage correct?	Action
Yes	Skip the next step(s) and continue with the voltage measurement on connectors X108A and X109A on the inverter PCB.
No	Continue with the next step.

6 Measure the output voltage between the following wires on the noise filter PCB.

Result: All measurements MUST be 400 V AC.

- L12B–L22B
- L12B–L32B
- L22B–L32B

Is the measured output voltage on the noise filter PCB correct?	Action
Yes	Continue with the next step.
No	Perform a check of the noise filter PCB, see "Checking procedures" [▶ 250].

7 Perform a check of the reactors L1R, L2R and L3R.

Are the reactors OK?	Action
Yes	Correct the wiring between the inverter PCB and the noise filter PCB, see "4.1.2 Repair procedures" [▶ 346].
No	Replace the specific reactor, see "3.24.2 Repair procedures" [▶ 272].

8 Measure the voltage on the connectors X108A and X109A on the inverter PCB.

Result: The measured voltage MUST be 230 V AC.

Is the measured voltage correct?	Action
Yes	Return to "Checking procedures" [▶ 205] of the inverter PCB and continue with the next procedure.
No	Continue with the next step.

9 Measure the output voltage on the connectors X8A and X9A on the main PCB.

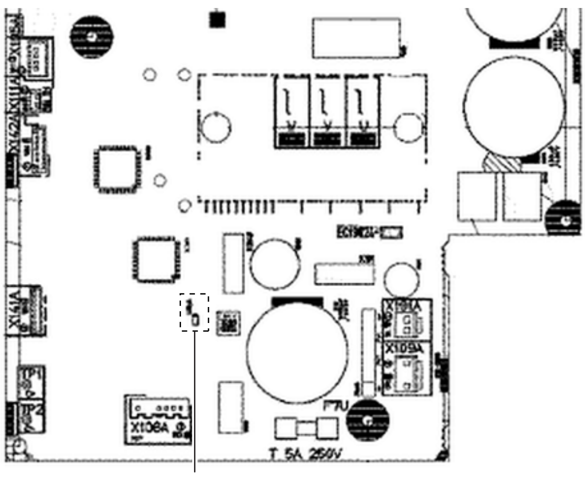
Result: The measured voltage MUST be 230 V AC.

Is the measured output voltage on the main PCB correct?	Action
Yes	Correct the wiring between the inverter PCB and the main PCB, see "4.1.2 Repair procedures" [▶ 346].
No	Perform a check of the main PCB, see "Checking procedures" [▶ 232].

To check the HAP LED of the inverter PCB

Prerequisite: First perform a power check of the inverter PCB, see "Checking procedures" [▶ 205].

1 Locate the HAP LED on the inverter PCB.



a

a HAP LED

Does the HAP LED blink in regular intervals (1 second ON/1 second OFF)?	Action
Yes	Return to "Checking procedures" [▶ 205] of the inverter PCB and continue with the next procedure.

Does the HAP LED blink in regular intervals (1 second ON/1 second OFF)?	Action
No	Replace the inverter PCB, see "Repair procedures" [▶ 210].

To check if the correct spare part is installed

Prerequisite: First perform all earlier checks of the inverter PCB, see "Checking procedures" [▶ 205].

1. Visit your local spare parts webbank.
2. Enter the model name of your unit and check if the installed spare part number corresponds with the spare part number indicated in the webbank.

Is the correct spare part for the inverter PCB installed?	Action
Yes	Return to "Checking procedures" [▶ 205] of the inverter PCB and continue with the next procedure.
No	Replace the inverter PCB, see "Repair procedures" [▶ 210].

To check the wiring of the inverter PCB

Prerequisite: First perform all earlier checks of the inverter PCB, see "Checking procedures" [▶ 205].

Prerequisite: Stop the unit operation via the user interface.

1. Turn OFF the respective circuit breaker.

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

2. Check that all wires are properly connected and that all connectors are fully plugged-in.
3. Check that no connectors or wires are damaged.
4. Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▶ 370].

INFORMATION

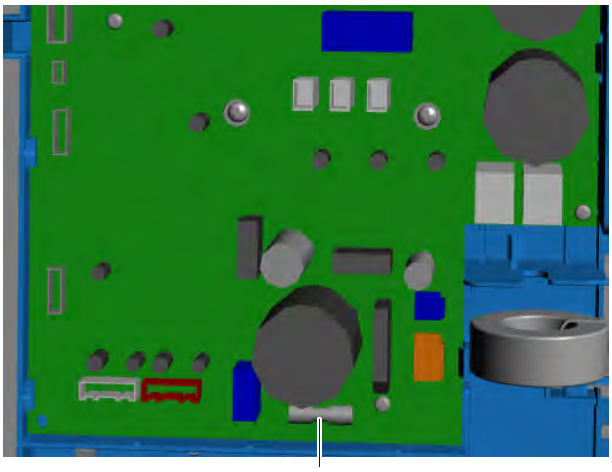
Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 205] of the inverter PCB and continue with the next procedure.

To check the fuses of the inverter PCB

Prerequisite: First perform all earlier checks of the inverter PCB, see "Checking procedures" [▶ 205].

1. Measure the continuity of the fuse. If no continuity is measured, the fuse has blown.



a Fuse

Any blown fuses on the inverter PCB?	Action
Yes	Replace the blown fuse(s), see "Repair procedures" [▶ 210].
No	Return to "Checking procedures" [▶ 205] of the inverter PCB and continue with the next procedure.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

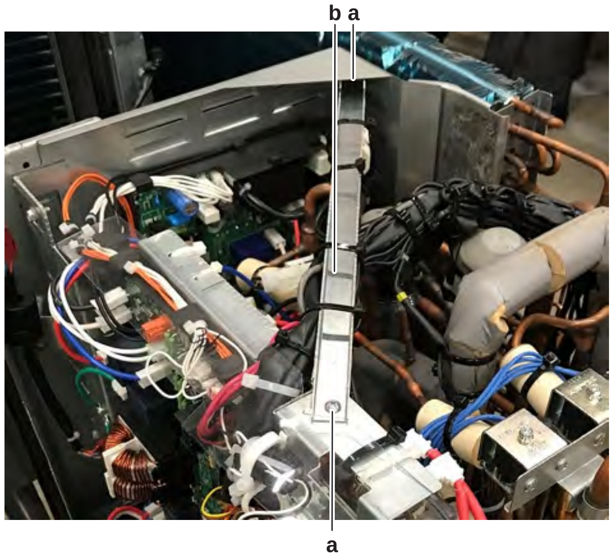
Repair procedures

To remove the inverter PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▶ 261].
2. Cut all tie straps that are fixed to the top beam.
3. Remove the 2 screws and remove the beam to create more space for easier access.



a Screw
b Beam

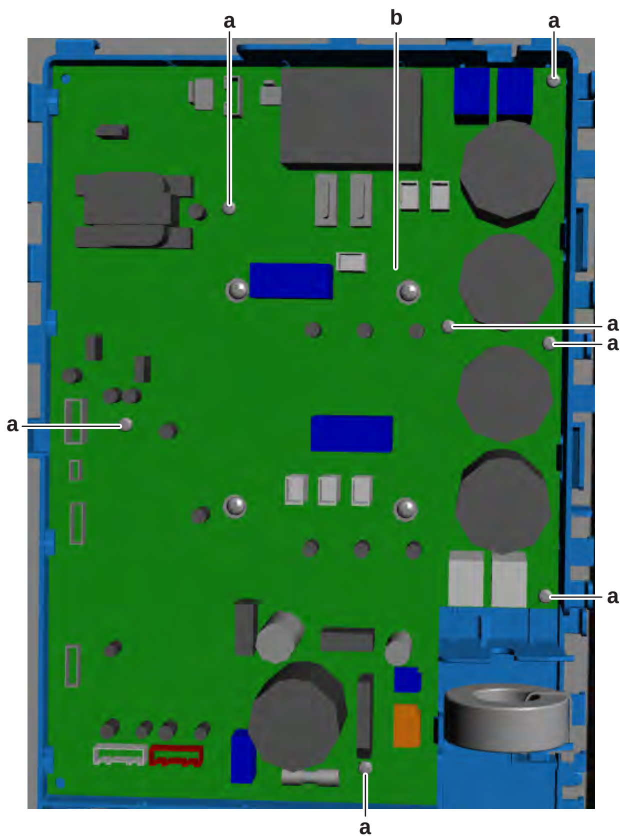
> **DANGER: RISK OF ELECTROCUTION**
>
> Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

4 Disconnect the Faston connectors from the U, V and W terminals on the inverter PCB.

5 Disconnect the Faston connectors from the L12A, L22A and L32A terminals on the inverter PCB.

6 Disconnect all connectors from the inverter PCB.

7 Remove the inverter PCB fixation screws.



a Fixation screw
b Inverter PCB

8 Remove the inverter PCB from the unit.

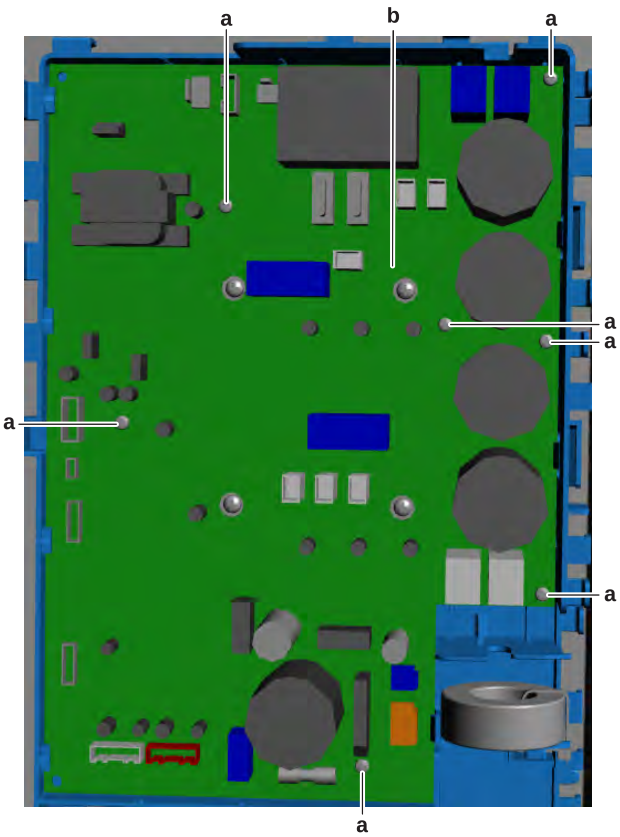
9 To install the inverter PCB, see "Repair procedures" [▶ 210].

To install the inverter PCB

1 Apply grease to the PCB contact surface of the heat sink. Distribute the grease as evenly as possible.

> **CAUTION**
>
> ALWAYS apply new grease on the PCB heat sink. NOT doing so may cause the PCB to fail due to insufficient cooling.

2 Install the inverter PCB in the correct location.



a Fixation screw
b Inverter PCB

3 Install and tighten the fixation screws.

4 Plug the Faston connectors to the U, V and W terminals on the inverter PCB.

5 Plug the Faston connectors to the L12A, L22A and L32A terminals on the inverter PCB.

6 Connect all connectors to the inverter PCB.

> **INFORMATION**
>
> Use the wiring diagram and connection diagram for correct installation of the connectors, see "6.2 Wiring diagram" [▶ 370].

WARNING

When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

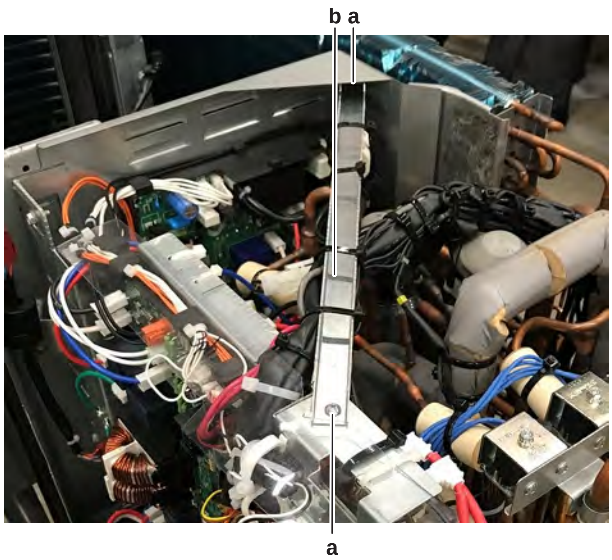
Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 205] of the inverter PCB and continue with the next procedure.

To remove a fuse of the inverter PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▶ 261].
2. Cut all tie straps that are fixed to the top beam.
3. Remove the 2 screws and remove the beam to create more space for easier access.

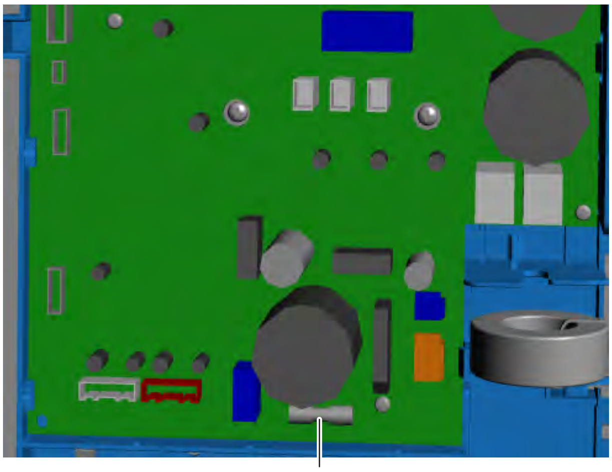


a Screw
b Beam

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

4. Remove the fuse from the PCB.



a Fuse

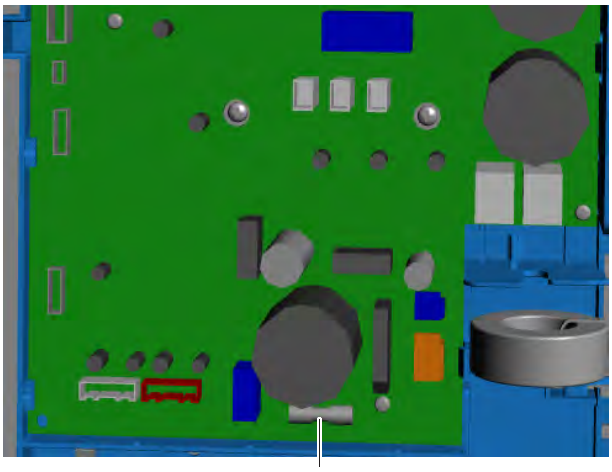
5 To install a fuse on the inverter PCB, see "Repair procedures" [▶ 210].

To install a fuse on the inverter PCB

> **WARNING**
>
> For continued protection against risk of fire, replace ONLY with same type and rating of fuse.

1 Install the fuse on the correct location on the PCB.

> **CAUTION**
>
> Make sure the fuse is plugged-in correctly (contact with the fuse holder).



a Fuse

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 205] of the inverter PCB and continue with the next procedure.

3.17 Leakage current PCB

3.17.1 Checking procedures

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

To perform a power check of the leakage current PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

> **INFORMATION**
> If needed, remove the reactors on the three phase units to create more space. See "3.24.2 Repair procedures" [▶ 272].

2 Turn ON the power of the unit.

3 Measure the voltage on connector X3A when connected to the leakage current PCB.

Result: The measured voltage MUST be 200~240 V AC.

a Connector X3A

Is the measured voltage correct?	Action
Yes	Return to "3.17.1 Checking procedures" [▶ 215] of the leakage current PCB and continue with the next procedure.
No	Continue with the next step.

4 Measure the output voltage between the pins 1-3 on the connector X77A on the main PCB.

Result: The measured voltage MUST be 200~240 V AC.

Is the measured output voltage on the main PCB correct?	Action
Yes	Correct the wiring between the main PCB and the leakage current PCB, see "4.1.2 Repair procedures" [▶ 346].
No	Perform a check of the main PCB, see "3.20 Main PCB" [▶ 224].

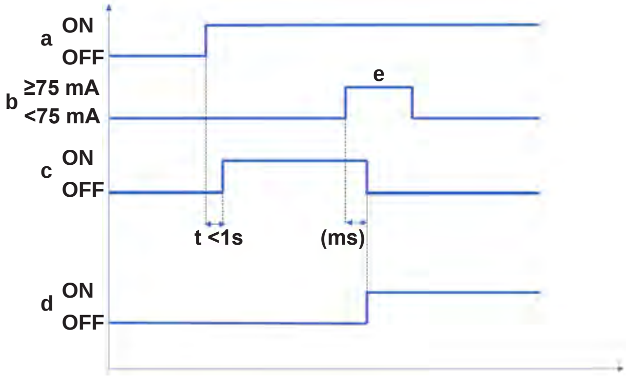
To perform an operation check of the leakage current PCB

Operation principle

The leakage current PCB has an indicator LED:

- The LED MUST be OFF during normal operation
- The LED MUST be ON when an earth leak is detected. Error E2-01 is triggered. See "2.5 Error based troubleshooting" [▶ 12].

a Indicator LED



a	Power supply
b	Current sensor input
c	Relay status
d	Indicator LED
e	Earth leak detection
ON	ON
OFF	OFF

Check procedure

Prerequisite: First check the power supply to the leakage current PCB, see "3.17.1 Checking procedures" [▶ 215].

1 Check if the indicator LED of the leakage current PCB is ON or OFF.

2 Measure the resistance between pins 1-4 of connector X2A on the leakage current PCB.

- If short-circuit (normal operation) is measured, indicator LED MUST be OFF.
- If open circuit (earth leak detected) is measured, indicator LED MUST be ON.

3 When no earth leak is detected (normal operation), measure the resistance between pins 1-4 of connector X2A on the leakage current PCB in the following conditions:

X1A connector	Measurement
Connected	Short-circuit
Disconnected	Open circuit

Does the leakage current PCB function correctly?	Action
Yes	Return to "3.17.1 Checking procedures" [▶ 215] of the leakage current PCB and continue with the next procedure.
No	Replace the leakage current PCB, see "3.17.2 Repair procedures" [▶ 218].

To check if the correct spare part is installed

Prerequisite: First perform all earlier checks of the leakage current PCB, see "3.17.1 Checking procedures" [▶ 215].

1. Visit your local spare parts webbank.
2. Enter the model name of your unit and check if the installed spare part number corresponds with the spare part number indicated in the webbank.

Is the correct spare part for the leakage current PCB installed?	Action
Yes	Return to "3.17.1 Checking procedures" [▶ 215] of the leakage current PCB and continue with the next procedure.
No	Replace the leakage current PCB, see "3.17.2 Repair procedures" [▶ 218].

To check the wiring of the leakage current PCB

Prerequisite: First perform all earlier checks of the leakage current PCB, see "3.17.1 Checking procedures" [▶ 215].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Check that all wires are properly connected and that all connectors are fully plugged-in.
2. Check that no connectors or wires are damaged.
3. Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▶ 370].

INFORMATION

Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.17.1 Checking procedures" [▶ 215] of the leakage current PCB and continue with the next procedure.

To check the fuses of the leakage current PCB

Prerequisite: First perform all earlier checks of the leakage current PCB, see "3.17.1 Checking procedures" [▶ 215].

1 Measure the continuity of the fuse. If no continuity is measured, the fuse has blown.

a

a Fuse

Blown fuse on the leakage current PCB?	Action
Yes	Replace the leakage current PCB, see "3.17.2 Repair procedures" [▶ 218].
No	Return to "3.17.1 Checking procedures" [▶ 215] of the leakage current PCB and continue with the next procedure.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.17.2 Repair procedures

To remove the leakage current PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

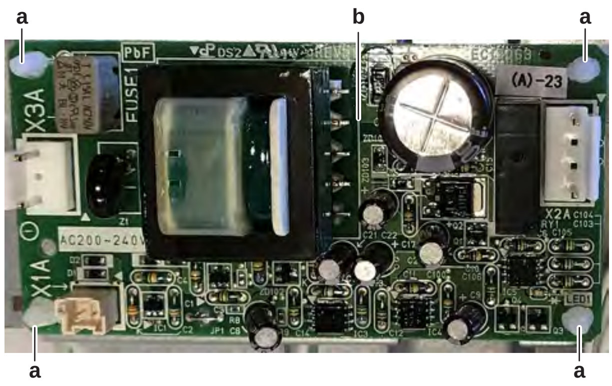
1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

> **INFORMATION**
>
> If needed, remove the reactors on the three phase units to create more space. See "3.24.2 Repair procedures" [▶ 272].

2 Disconnect all connectors from the leakage current PCB.

3 Carefully pull the PCB at the side and unlatch the PCB supports one by one using a small pair of pliers.

4 Remove the leakage current PCB from the main PCB mounting plate.

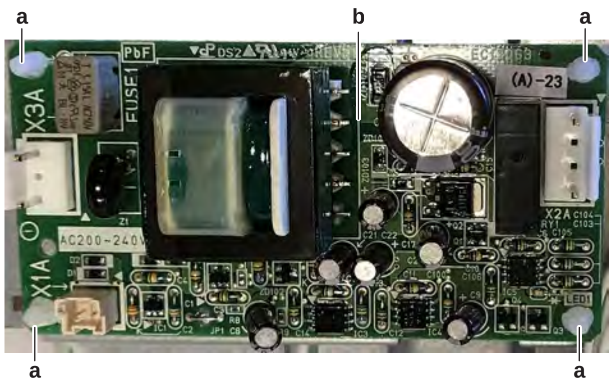


a PCB support
b Leakage current PCB

5 To install the new leakage current PCB, see "3.17.2 Repair procedures" [▶ 218].

To install the leakage current PCB

1 Align the PCB on the PCB supports, firmly latch the PCB supports to fix the PCB.



a PCB support
b Leakage current PCB

2 Connect all connectors to the leakage current PCB.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.17.1 Checking procedures" [▶ 215] of the leakage current PCB and continue with the next procedure.

3.18 Low pressure switch

3.18.1 Checking procedures

To perform an electrical check of the low pressure switch

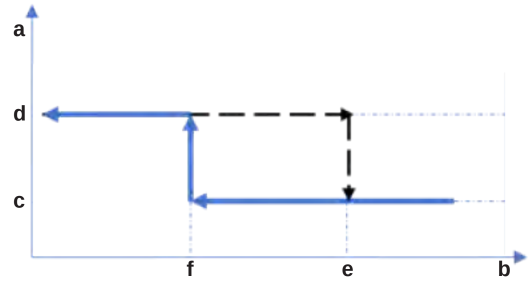
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Recuperate the refrigerant from the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

2 Connect a vacuum pump to the gas service port of the refrigerant circuit and vacuum to just above operating pressure of the low pressure switch.



- **a** Low pressure switch protection control
- **b** Pressure
- **c** Low pressure switch closed
- **d** Low pressure switch open
- **e** Low pressure switch reset pressure
- **f** Low pressure switch operating pressure

Low pressure switch	Operating pressure (MPa)	Reset pressure (MPa)
S1PL	−0.05~−0.01	0.02~0.08

3 Disconnect the low pressure switch connector from the appropriate PCB.

4 Measure contacts between the pins 1-2 of the low pressure switch connector.

Result: The switch MUST be closed.

5 Vacuum until pressurized just below operating pressure of the low pressure switch.

6 Measure again contacts between the pins 1-2 of the low pressure switch connector.

Result: The switch MUST be open.

INFORMATION

If the low pressure switch was triggered open, it will stay open until the refrigerant pressure rises above the reset pressure of the low pressure switch.

7 Fill the refrigerant circuit with nitrogen until pressurized just below reset pressure of the low pressure switch.

8 Measure again contacts between the pins 1-2 of the low pressure switch connector.

Result: The switch MUST be open.

9 Fill the refrigerant circuit with nitrogen until pressurized just above reset pressure of the low pressure switch.

10 Measure again contacts between the pins 1-2 of the low pressure switch connector.

Result: The switch MUST be closed.

Low pressure switch connector measurements are correct?	Then
Yes	Low pressure switch is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the low pressure switch, see "3.18.2 Repair procedures" [▶ 221].

3.18.2 Repair procedures

To remove the low pressure switch

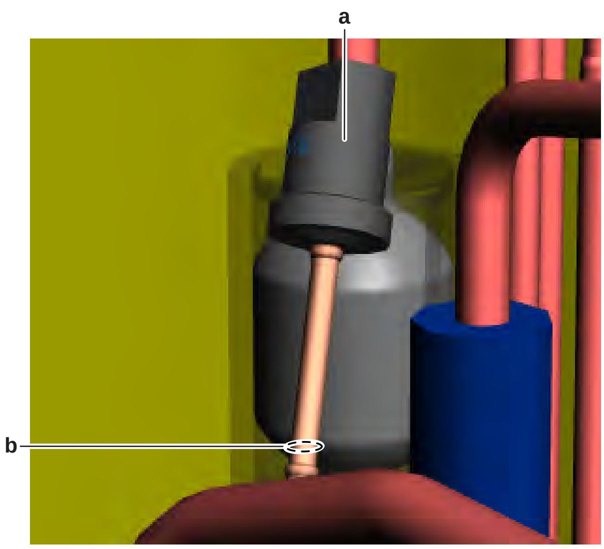
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

1. If needed, remove any parts to create more space for the removal of the low pressure switch.
2. Disconnect the low pressure switch connector from the appropriate PCB.
3. Cut all tie straps that fix the low pressure switch harness.
4. Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.
5. Wrap a wet rag around the components near the low pressure switch. Heat the brazing point of the low pressure switch pipe using an oxygen acetylene torch and remove the low pressure switch pipe from the refrigerant pipe using pliers.



a Low pressure switch
b Low pressure switch pipe

6. Stop the nitrogen supply when the piping has cooled down.
7. Remove the low pressure switch from the unit.

> **INFORMATION**
>
> It is ALSO possible to cut the component pipe(s) using a pipe cutter. Make sure to remove the remaining component pipe end(s) from the refrigerant pipes by heating the brazing point(s) of the component pipe(s) using an oxygen acetylene torch.

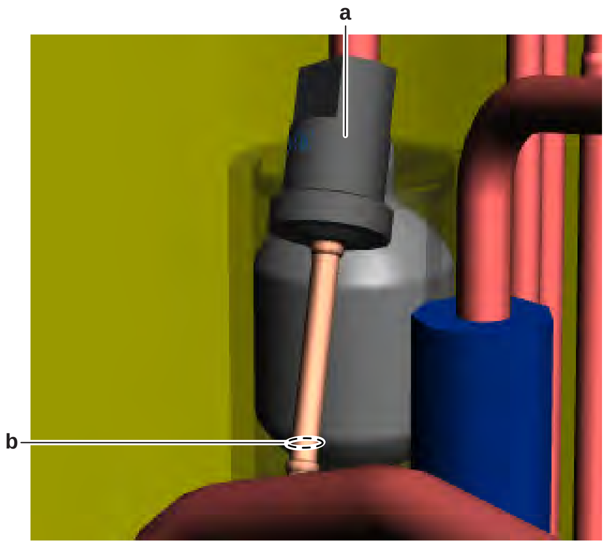
8. Install a plug or cap on the refrigerant piping to avoid dirt or impurities from entering the piping.
9. To install the low pressure switch, see "3.18.2 Repair procedures" [▶ 221].

To install the low pressure switch

1. Remove the plug or cap from the refrigerant piping and make sure it is clean.
2. Install the low pressure switch in the correct location.

3 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

4 Wrap a wet rag around the low pressure switch and any other components near the low pressure switch and solder the low pressure switch pipe to the refrigerant pipe.



a Low pressure switch
b Low pressure switch pipe

CAUTION

Overheating the pressure switch will damage or destroy it.

5 After soldering is done, stop the nitrogen supply after the component has cooled-down.

6 Route the low pressure switch harness towards the appropriate PCB.

7 Fix the harness using new tie straps.

8 Connect the low pressure switch connector to the appropriate PCB.

9 Perform a pressure test, see "4.2.1 Checking procedures" [▶ 347].

10 Add refrigerant to the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.19 Magnetic filter/dirt separator

3.19.1 Checking procedures

To perform a check of the magnetic filter/dirt separator

1 Perform To clean the magnetic filter/dirt separator in case of trouble, see "5 Maintenance" [▶ 364].

3.19.2 Repair procedures

To remove the magnetic filter/dirt separator

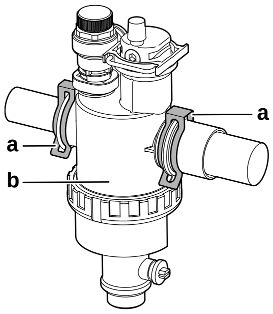
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Drain water from the water circuit, see "4.3.2 Repair procedures" [▶ 356].

2 Remove the 2 clips that fix the magnetic filter/dirt separator.



a Clip
b Magnetic filter/dirt separator

3 Remove the magnetic filter/dirt separator.

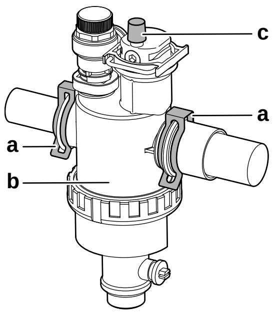
> **NOTICE**
>
> Although the water circuit is drained, some water may be spilled when removing the magnetic filter/dirt separator from the filter housing. ALWAYS clean up spilled water.

4 To install the magnetic filter/dirt separator, see "3.19.2 Repair procedures" [▶ 223].

To install the magnetic filter/dirt separator

> **NOTICE**
>
> Check the condition of the O-rings and replace if needed. Apply water to the O-rings before installation.

1 Install the magnetic filter/dirt separator in the correct location.



a Clip
b Magnetic filter/dirt separator
c Air purge valve

2 Install the 2 clips to fix the magnetic filter/dirt separator to the water circuit pipes.

3 Make sure that the air purge valve of the magnetic filter/dirt separator is in the open position.

4 Open the valve (if equipped) of the water circuit towards the expansion vessel.

> **CAUTION**
> Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

5 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▶ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.20 Main PCB

3.20.1 Single fan outdoor unit - single phase

Checking procedures

> **INFORMATION**
> It is recommended to perform the checks in the listed order.

To perform a power check of the main PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

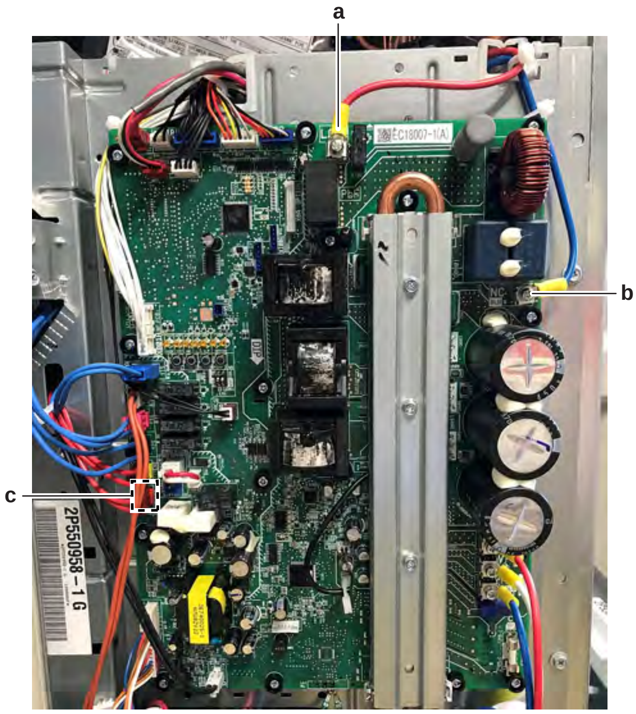
1 Turn ON the power of the unit.

2 Measure the voltage between the wires LC-NC on the main PCB.

Result: The measured voltage MUST be 230 V AC.

3 Measure the voltage on connector X99A on the main PCB.

Result: The measured voltage MUST be 230 V AC.



a LC
b NC
c Connector X99A

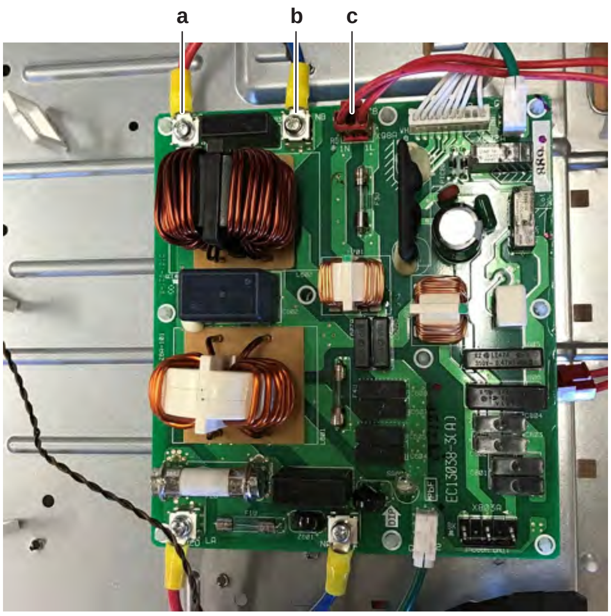
Does the main PCB receive power?	Action
Yes	Return to "Checking procedures" [▶ 224] of the main PCB and continue with the next procedure.
No	Continue with the next step.

4 Measure the output voltage between the wires LB-NB on the noise filter PCB.

Result: The measured voltage MUST be 230 V AC.

5 Measure the output voltage on connector X98A on the noise filter PCB.

Result: The measured voltage MUST be 230 V AC.



a LB
b NB
c Connector X98A

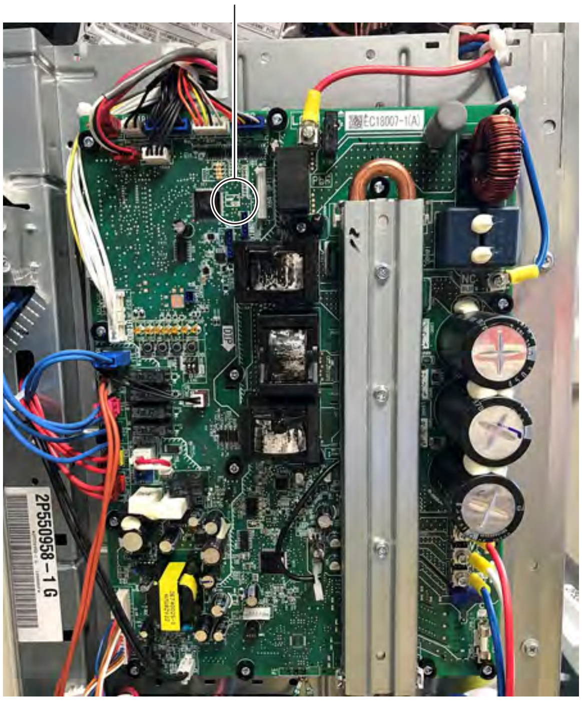
Output voltage on noise filter PCB correct?	Action
Yes	Correct the wiring between the main PCB and the noise filter PCB, see "4.1.2 Repair procedures" [▶ 346].
No	Perform a check of the noise filter PCB, see "Checking procedures" [▶ 241].

To check the HAP LED of the main PCB

Prerequisite: First check the power supply to the main PCB, see "Checking procedures" [▶ 224].

1 Locate the HAP LED on the main PCB.

a



a HAP LED

> **INFORMATION**
>
> Make sure the correct software is available on the PCB. If NOT, update using the updater tool.

Does the HAP LED blink in regular intervals (1 second ON/1 second OFF)?	Action
Yes	Return to "Checking procedures" [▶ 224] of the main PCB and continue with the next procedure.
No	Replace the main PCB, see "Repair procedures" [▶ 228].

To check if the correct spare part is installed

Prerequisite: First perform all earlier main PCB checks, see "Checking procedures" [▶ 224].

1 Visit your local spare parts webbank.

2 Enter the model name of your unit and check if the installed spare part number corresponds with the spare part number indicated in the webbank.

> **NOTICE**
>
> Also check that the correct spare part is installed for the capacity adapter.

Is the correct spare part for the PCB installed?	Action
Yes	Return to "Checking procedures" [▸ 224] of the main PCB and continue with the next procedure.
No	Replace the main PCB, see "Repair procedures" [▸ 228].

To check the wiring of the main PCB

Prerequisite: First perform all earlier main PCB checks, see "Checking procedures" [▸ 224].

Prerequisite: Stop the unit operation via the user interface.

1 Turn OFF the respective circuit breaker.

2 Check that all wires are properly connected and that all connectors are fully plugged-in.

3 Check that no connectors or wires are damaged.

4 Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▸ 370].

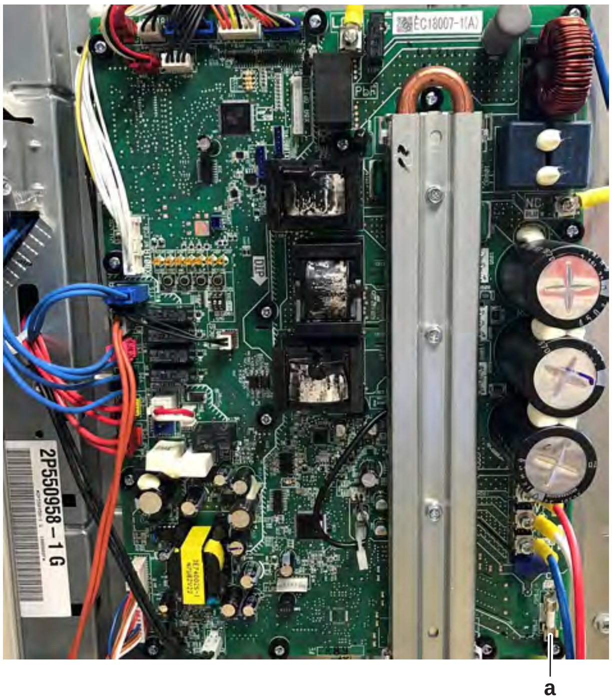
> **INFORMATION**
>
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▸ 224] of the PCB and continue with the next procedure.

To check the fuse of the main PCB

Prerequisite: First perform all earlier main PCB checks, see "Checking procedures" [▸ 224].

1 Measure the continuity of the fuse. If no continuity is measured, the fuse has blown.



a Fuse

Blown fuse on the main PCB?	Action
Yes	Replace the blown fuse, see "Repair procedures" [▸ 228].
No	Return to "Checking procedures" [▸ 224] of the main PCB and continue with the next procedure.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

Repair procedures

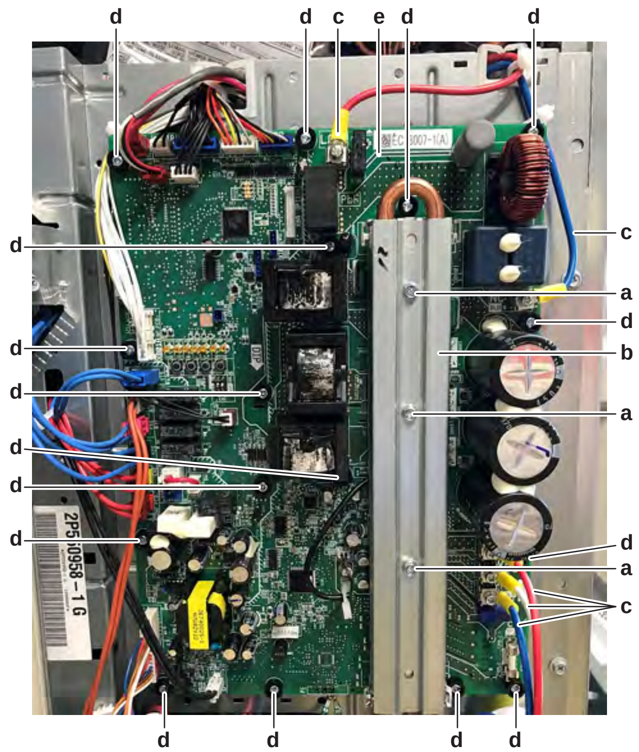
To remove the main PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Remove the 3 bolts from the main PCB heat sink cover.
2. Lift and pull the cover to remove it from the heat sink.



a Heat sink cover screw
b Heat sink cover
c Wires LC, NC, U, V and W
d PCB fixation screw
e Main PCB

3. Disconnect all connectors from the main PCB.
4. Loosen the screws to disconnect the LC, NC, U, V and W wires.
5. Remove all main PCB fixation screws.
6. Pull the refrigerant pipe forward and move the main PCB out.
7. Remove the bottom screw on the back of the main PCB to disconnect the ground wire.
8. To install the main PCB, see "Repair procedures" [▶ 228].

To install the main PCB

1. Use a piece of cloth to remove the old thermal interface grease and clean the refrigerant pipe.
2. Install the ground wire at the bottom back side of the main PCB. Install and tighten the screw.
3. Apply grease to the refrigerant pipe contact surface of the heat sink (on the main PCB). Distribute the grease as evenly as possible.

CAUTION

ALWAYS apply new grease on the PCB heat sink. NOT doing so may cause the PCB to fail due to insufficient cooling.

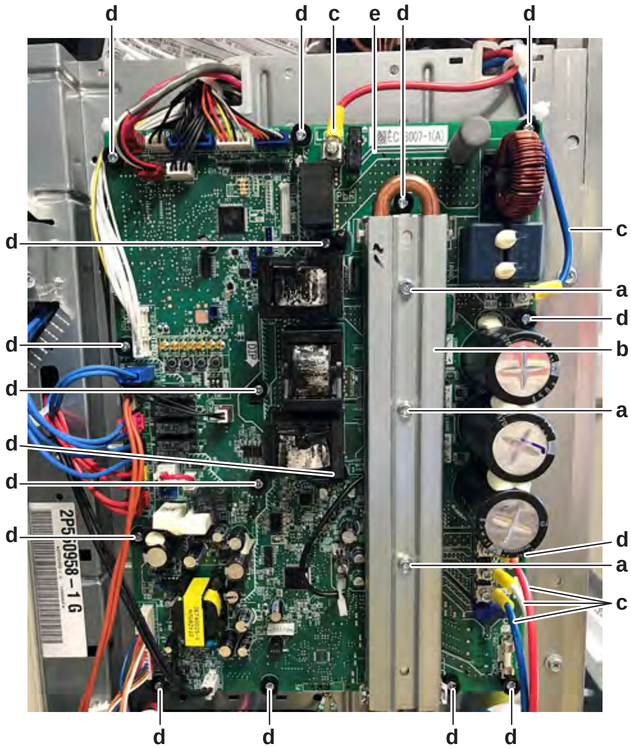
4. Carefully pull the refrigerant pipe forward and install the main PCB on its mounting plate in the correct location. Install and tighten the fixation screws.

INFORMATION

Make sure that the refrigerant pipe is correctly installed on the main PCB heat sink. Do NOT touch the part of the refrigerant pipe that is mounted in the heat sink.

5 Install the heat sink cover. Close and slide it downwards to fix the 2 hooks.

6 Install and tighten the 3 screws so that the heat sink cover presses the refrigerant pipe.



a Heat sink cover screw
b Heat sink cover
c Wires LC, NC, U, V and W
d PCB fixation screw
e Main PCB

7 Connect the LC, NC, U, V and W wires to the main PCB and tighten the screws.

8 Connect all connectors to the main PCB.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 224] of the PCB and continue with the next procedure.

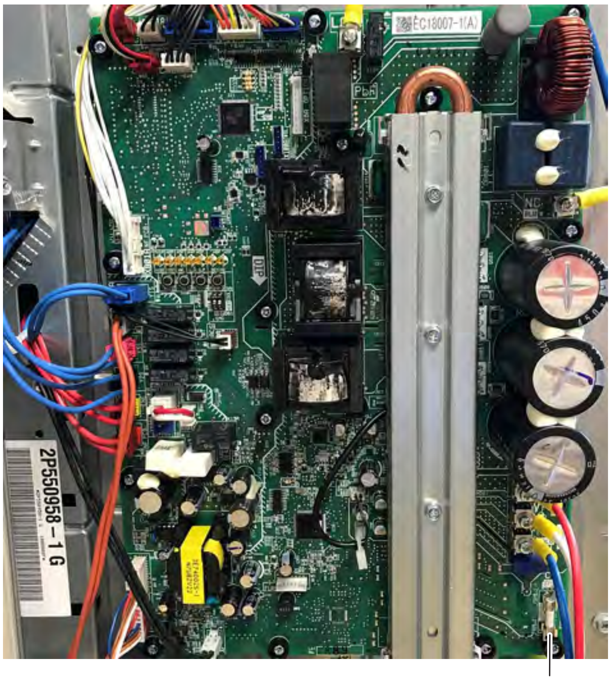
To remove a fuse of the main PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Remove the fuse from the PCB.



a

a Fuse

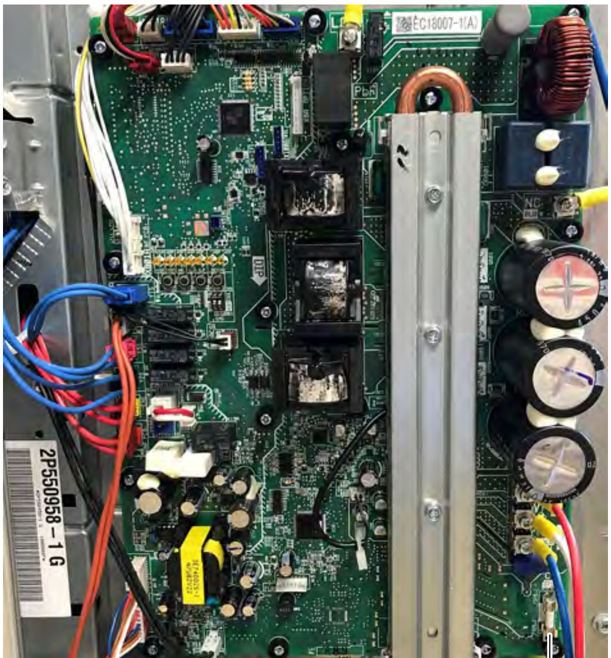
2 To install a fuse on the main PCB, see "Repair procedures" [▶ 228].

To install a fuse on the main PCB

> **WARNING**
>
> For continued protection against risk of fire, replace only with same type and rating of fuse.

1 Install the fuse on the correct location on the PCB.

> **CAUTION**
>
> Make sure the fuse is plugged-in correctly (contact with the fuse holder).



a

a Fuse

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 224] of the PCB and continue with the next procedure.

3.20.2 Single fan outdoor unit - three phase

Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a power check of the main PCB

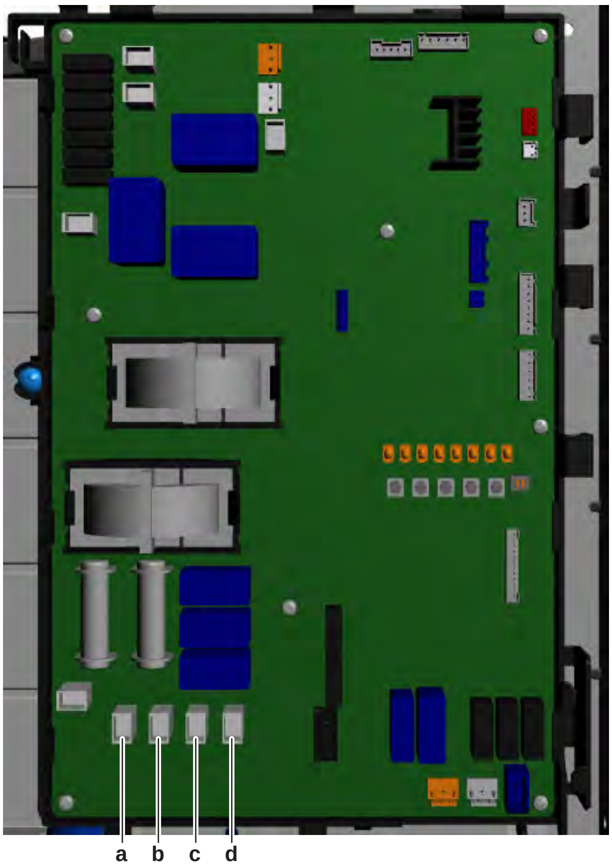
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▶ 261].
2. Turn ON the power of the unit.
3. Measure the voltage between the phases L1A-L2A-L3A on the main PCB.

   Result: All measurements MUST be 400 V AC ± 10%.
4. Measure the voltage between each phase and NA on the main PCB.

   Result: The measured voltages MUST be 230 V AC ± 10%.



a L1A
b L2A
c L3A

d NA

Is the measured voltage on the PCB correct?	Action
Yes	Return to "Checking procedures" [▶ 232] of the PCB and continue with the next procedure.
No	Continue with the next step.

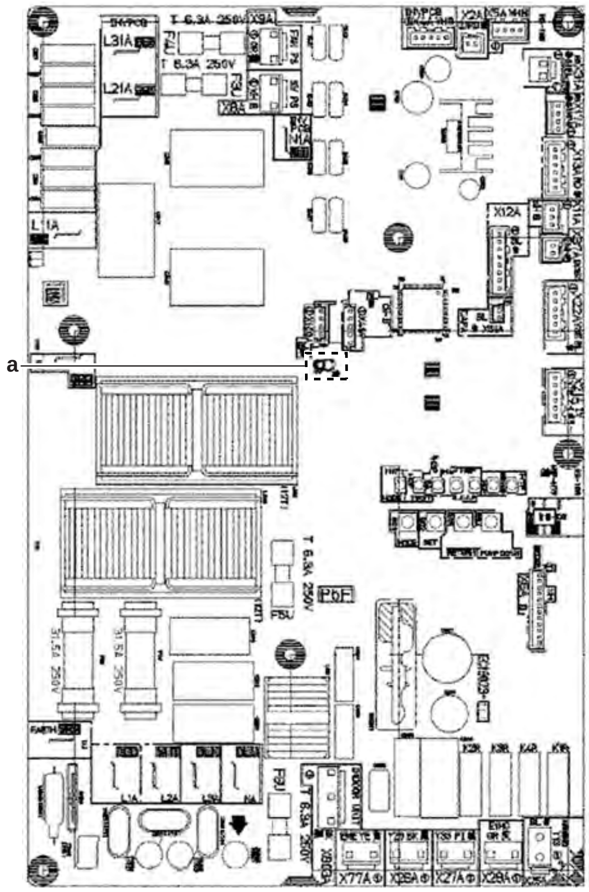
5 Check the power supply to the unit, see "4.1.1 Checking procedures" [▶ 343].

Does the unit receive power?	Action
Yes	Correct the wiring from the main power supply terminal to the main PCB, see "Repair procedures" [▶ 237].
No	Adjust the power supply to the unit, see "4.1.2 Repair procedures" [▶ 346].

To check the HAP LED of the main PCB

Prerequisite: First check the power supply to the main PCB, see "Checking procedures" [▶ 232].

1 Locate the HAP LED on the main PCB.



a HAP LED

> **INFORMATION**
>
> Make sure the correct software is available on the PCB. If NOT, update using the updater tool.

Does the HAP LED blink in regular intervals (1 second ON/1 second OFF)?	Action
Yes	Return to "Checking procedures" [▶ 232] of the main PCB and continue with the next procedure.
No	Replace the main PCB, see "Repair procedures" [▶ 237].

To perform an electrical check of the main PCB

Prerequisite: First perform all earlier main PCB checks, see "Checking procedures" [▶ 232].

1. Measure the output voltage between wires L11A, L21A and L31A on the main PCB.

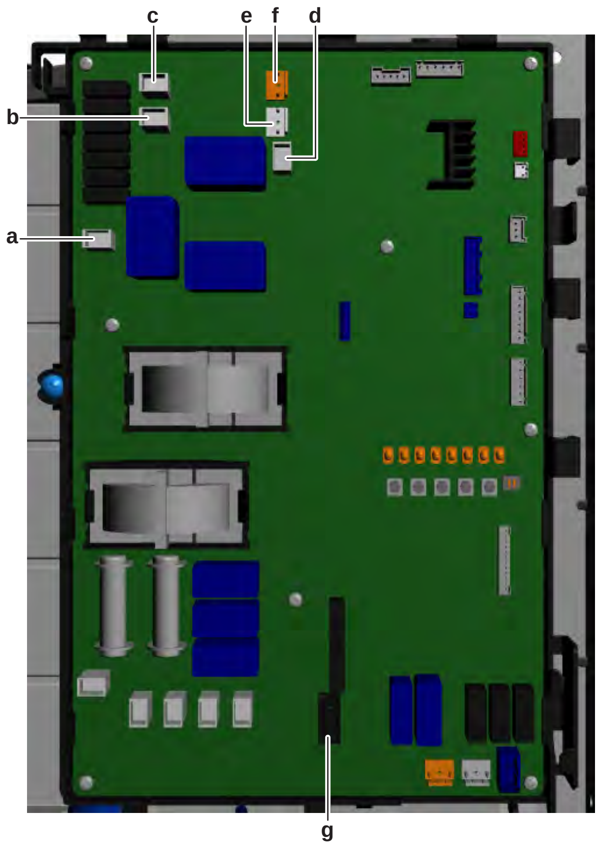
   Result: All measurements MUST be 400 V AC±10%.

2. Measure the output voltage between each phase and N1A on the main PCB.

   Result: The measured voltages MUST be 230 V AC±10%.

3. Measure the output voltage on the connectors X8A: 1-3, X9A: 1-3 and X803A: 1-3 on the main PCB.

   Result: All measured voltages MUST be 230 V AC±10%.



a L11A
b L21A
c L31A
d N1A
e Connector X8A
f Connector X9A
g Connector X803A

Is the output voltage on the main PCB correct?	Action
Yes	Return to "Checking procedures" [▶ 232] of the main PCB and continue with the next procedure.
No	Replace the main PCB, see "Repair procedures" [▶ 237].

To check if the correct spare part is installed

Prerequisite: First perform all earlier main PCB checks, see "Checking procedures" [▶ 232].

1. Visit your local spare parts webbank.
2. Enter the model name of your unit and check if the installed spare part number corresponds with the spare part number indicated in the webbank.

NOTICE

Also check that the correct spare part is installed for the capacity adapter.

Is the correct spare part for the PCB installed?	Action
Yes	Return to "Checking procedures" [▶ 232] of the main PCB and continue with the next procedure.
No	Replace the main PCB, see "Repair procedures" [▶ 237].

To check the wiring of the main PCB

Prerequisite: First perform all earlier main PCB checks, see "Checking procedures" [▶ 232].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Check that all wires are properly connected and that all connectors are fully plugged-in.
2. Check that no connectors or wires are damaged.
3. Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▶ 370].

INFORMATION

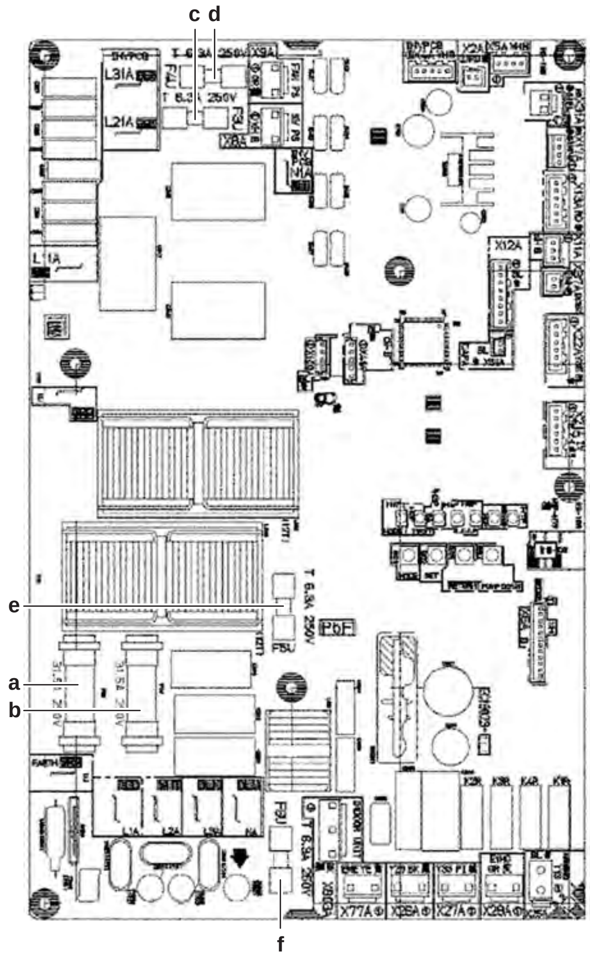
Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 232] of the PCB and continue with the next procedure.

To check the fuse of the main PCB

Prerequisite: First perform all earlier main PCB checks, see "Checking procedures" [▶ 232].

1 Measure the continuity of the fuse. If no continuity is measured, the fuse has blown.



a Fuse F1U
b Fuse F2U
c Fuse F3U
d Fuse F4U
e Fuse F5U
f Fuse F6U

For fuses F1U and F2U

Blown fuse on the main PCB?	Action
Yes	Replace the main PCB, see "Repair procedures" [▶ 237].
No	Return to "Checking procedures" [▶ 232] of the main PCB and continue with the next procedure.

For fuses F3U~F6U

Blown fuse on the main PCB?	Action
Yes	Replace the blown fuse, see "Repair procedures" [▶ 237].
No	Return to "Checking procedures" [▶ 232] of the main PCB and continue with the next procedure.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

Repair procedures

To correct the wiring from the main power supply terminal to the main PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▸ 261].
2. Make sure that all wires are firmly and correctly connected, see "6.2 Wiring diagram" [▸ 370].
3. Check the continuity of all wires.
4. Replace any damaged or broken wires.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▸ 232] of the PCB and continue with the next procedure.

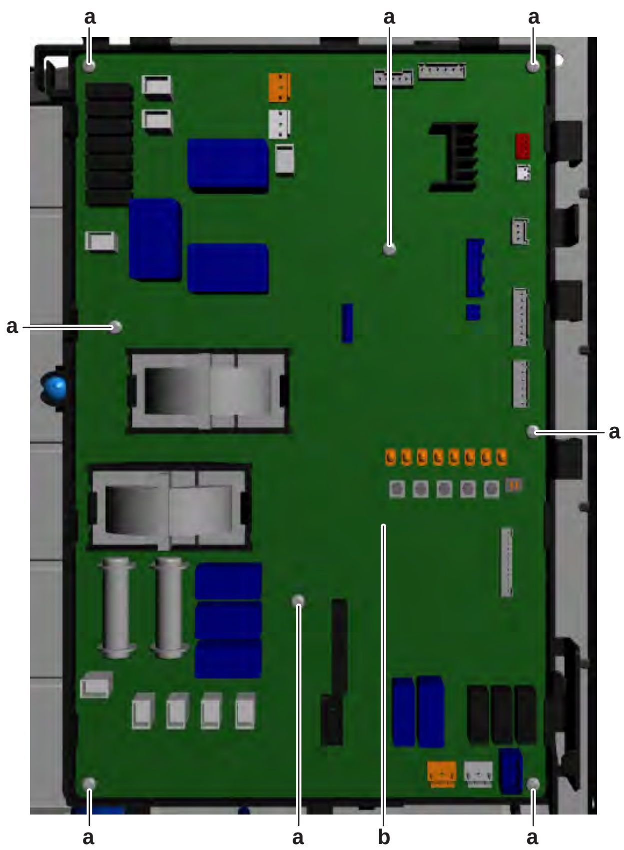
To remove the main PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Disconnect all Faston connectors from the main PCB.
2. Disconnect all connectors from the main PCB.
3. Remove all main PCB fixation screws.



a PCB fixation screw
b Main PCB

4 Remove the main PCB from the unit.

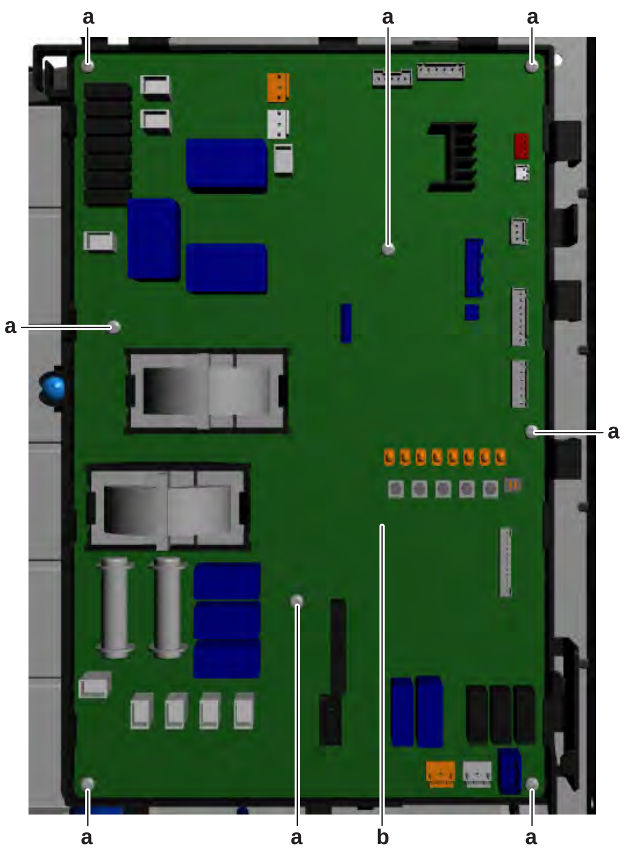
5 To install the main PCB, see "Repair procedures" [▸ 237].

To install the main PCB

1 Install the main PCB on its mounting plate in the correct location. Install and tighten the fixation screws.

2 Connect all Faston connectors to the main PCB.

3 Connect all connectors to the main PCB.



a PCB fixation screw
b Main PCB

> **INFORMATION**
>
> Use the wiring diagram and connection diagram for correct installation of the connectors, see "6.2 Wiring diagram" [▶ 370].

> **WARNING**
>
> When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 232] of the PCB and continue with the next procedure.

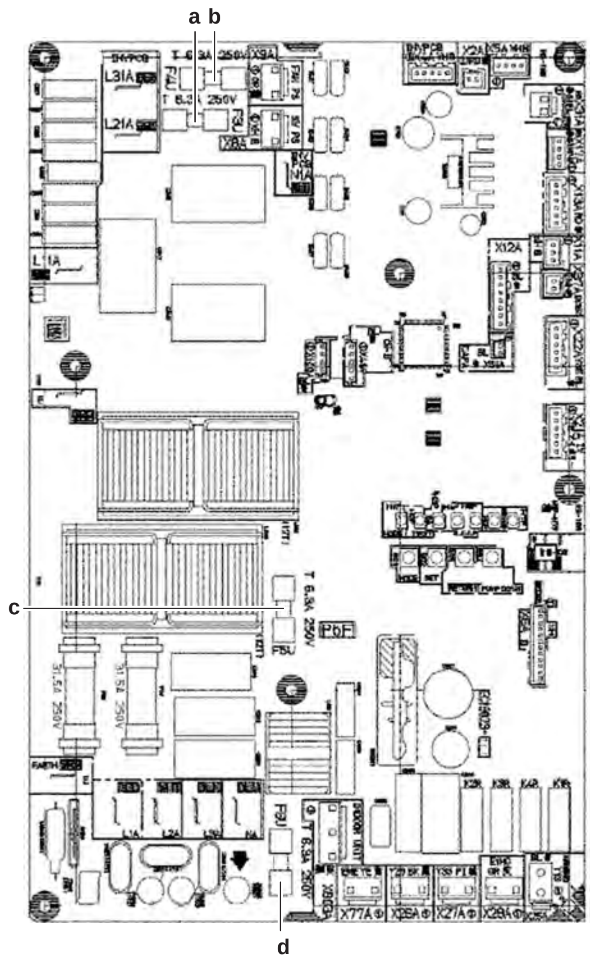
To remove a fuse of the main PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Remove the fuse from the PCB.



a Fuse F3U
b Fuse F4U
c Fuse F5U
d Fuse F6U

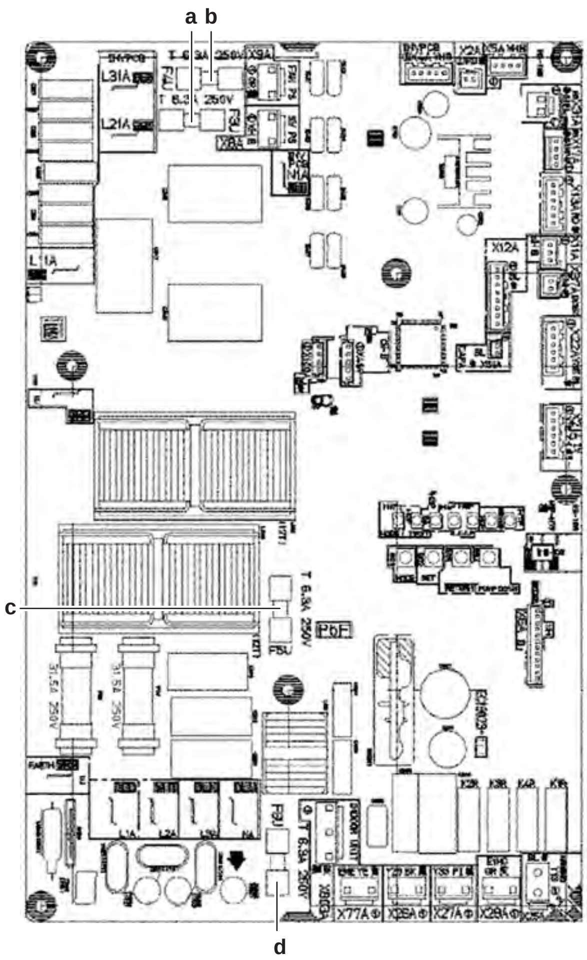
2 To install a fuse on the main PCB, see "Repair procedures" [▸ 237].

To install a fuse on the main PCB

> **WARNING**
> For continued protection against risk of fire, replace only with same type and rating of fuse.

1 Install the fuse on the correct location on the PCB.

> **CAUTION**
> Make sure the fuse is plugged-in correctly (contact with the fuse holder).



a Fuse F3U
b Fuse F4U
c Fuse F5U
d Fuse F6U

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 232] of the PCB and continue with the next procedure.

3.21 Noise filter PCB

3.21.1 Single fan outdoor unit - single phase

Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a power check of the noise filter PCB

Prerequisite: Stop the unit operation via the user interface.

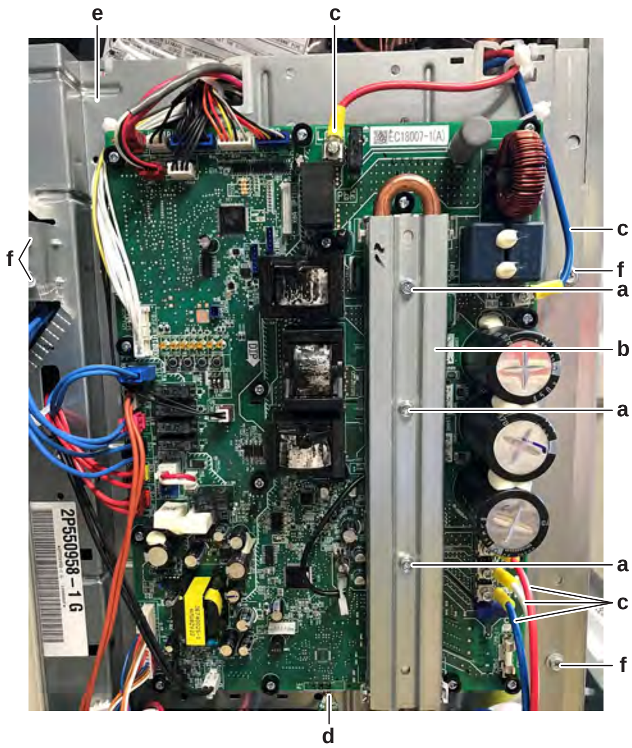
Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

> **DANGER: RISK OF ELECTROCUTION**
>
> Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

2 Remove the 3 screws from the main PCB heat sink cover.

3 Lift and pull the cover to remove it from the heat sink.



- **a** Heat sink cover screw
- **b** Heat sink cover
- **c** Wires LC, NC, U, V and W
- **d** Ground wire screw
- **e** Main PCB mounting plate
- **f** Main PCB mounting plate fixation screw

4 Disconnect all connectors from the main PCB.

5 Loosen the screws to disconnect the LC, NC, U, V and W wires.

6 Cut all cable ties that fix cables to the main PCB mounting plate.

7 Loosen the screw to disconnect the ground wires from the main PCB mounting plate.

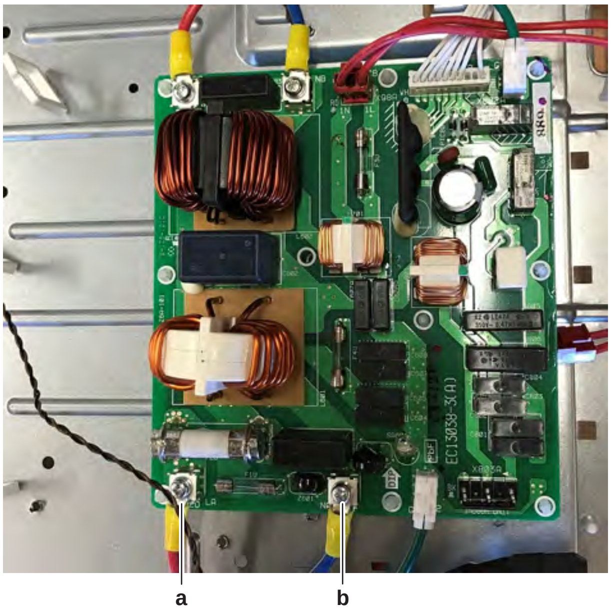
8 Remove all main PCB mounting plate fixation screws.

9 Pull the refrigerant pipe forward and put the main PCB mounting plate aside so that the PCB's on the back side are easily accessible.

> **CAUTION**
>
> The leakage current PCB and the noise filter PCB are still connected. Do NOT completely remove the main PCB mounting plate.

10 Turn ON the power of the unit.

11 Measure the voltage between the wires LA-NA of the noise filter PCB. Measured voltage MUST be 230 V AC.



a LA
b NA

Is the measured voltage on the PCB correct?	Action
Yes	Return to "Checking procedures" [▶ 241] procedures of the PCB and continue with the next procedure.
No	Continue with the next step.

12 Check the power supply to the unit, see "4.1.1 Checking procedures" [▶ 343].

Does the unit receive power?	Action
Yes	Correct the wiring from the main power supply terminal to the noise filter PCB, see "Repair procedures" [▶ 246].
No	Adjust the power supply to the unit, see "4.1.2 Repair procedures" [▶ 346].

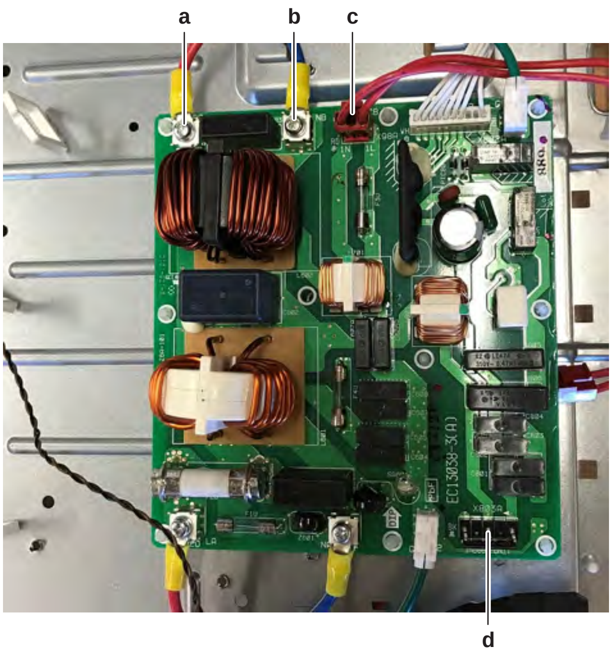
To perform an electrical check of the noise filter PCB

Prerequisite: First check the power supply to the noise filter PCB, see "Checking procedures" [▶ 241].

1 Measure the voltage between the output wires LB-NB of the noise filter PCB. The measured voltage MUST be 230 V AC.

2 Measure the voltage on the output connector X98A and between the pins 1-2 of output connector X803A.

Result: The measured voltage MUST be 230 V AC.



a LB
b NB
c Connector X98A
d Connector X803A

Is the output voltage on the noise filter PCB correct?	Action
Yes	Return to "Checking procedures" [▶ 241] of the noise filter PCB and continue with the next procedure.
No	Replace the noise filter PCB, see "Repair procedures" [▶ 246].

To check if the correct spare part is installed

Prerequisite: First perform all earlier checks of the noise filter PCB, see "Checking procedures" [▶ 241].

1. Visit your local spare parts webbank.
2. Enter the model name of your unit and check if the installed spare part number corresponds with the spare part number indicated in the webbank.

Is the correct spare part for the noise filter PCB installed?	Action
Yes	Return to "Checking procedures" [▶ 241] of the noise filter PCB and continue with the next procedure.
No	Replace the noise filter PCB, see "Repair procedures" [▶ 246].

To check the wiring of the noise filter PCB

Prerequisite: First perform all earlier checks of the noise filter PCB, see "Checking procedures" [▶ 241].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Check that all wires are properly connected and that all connectors are fully plugged-in.

2 Check that no connectors or wires are damaged.

3 Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▸ 370].

INFORMATION

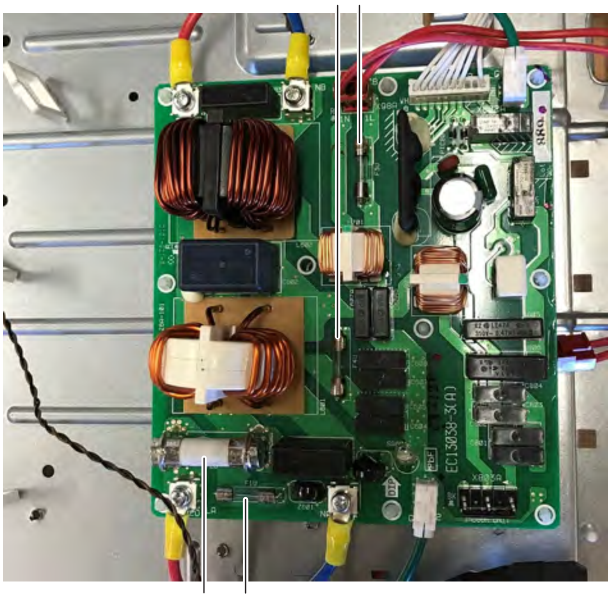
Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▸ 241] of the noise filter PCB and continue with the next procedure.

To check the fuses of the noise filter PCB

Prerequisite: First perform all earlier checks of the noise filter PCB, see "Checking procedures" [▸ 241].

1 Measure the continuity of the fuse. If no continuity is measured, the fuse has blown.



- **a** Fuse F1U
- **b** Fuse F2U
- **c** Fuse F3U
- **d** Fuse F4U

Blown fuse on the noise filter PCB?	Action
Yes	Replace the noise filter PCB, see "Repair procedures" [▸ 246].
No	Return to "Checking procedures" [▸ 241] of the noise filter PCB and continue with the next procedure.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

Repair procedures

To correct the wiring from the main power supply terminal to the noise filter PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▸ 261].
2. Make sure that all wires are firmly and correctly connected, see "6.2 Wiring diagram" [▸ 370].
3. Check the continuity of all wires.
4. Replace any damaged or broken wires.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▸ 241] of the noise filter PCB and continue with the next procedure.

To remove the noise filter PCB

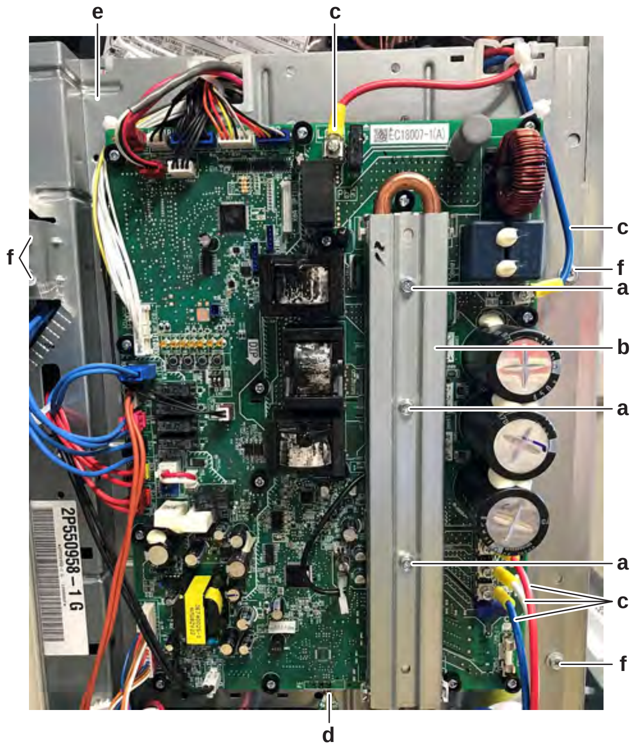
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▸ 261].

> **DANGER: RISK OF ELECTROCUTION**
>
> Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

2. Remove the 3 screws from the main PCB heat sink cover.
3. Lift and pull the cover to remove it from the heat sink.



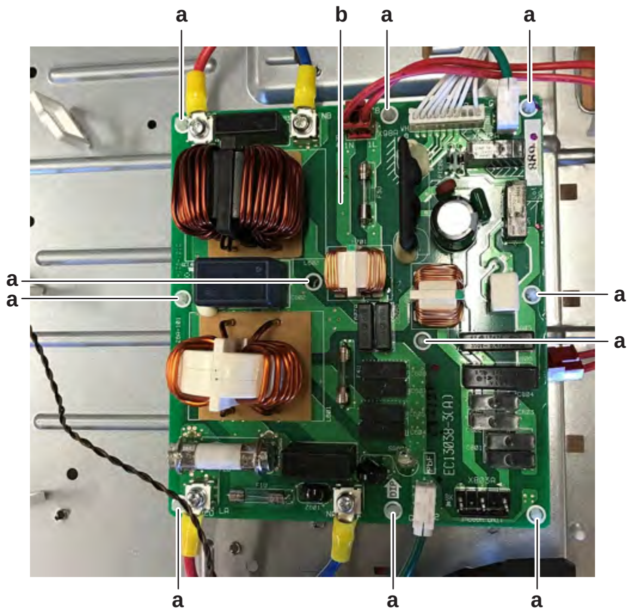
a Heat sink cover screw
b Heat sink cover
c Wires LC, NC, U, V and W
d Ground wire screw
e Main PCB mounting plate
f Main PCB mounting plate fixation screw

4. Disconnect all connectors from the main PCB.
5. Loosen the screws to disconnect the LC, NC, U, V and W wires.
6. Cut all cable ties that fix cables to the main PCB mounting plate.
7. Loosen the screw to disconnect the ground wires from the main PCB mounting plate.
8. Remove all main PCB mounting plate fixation screws.
9. Pull the refrigerant pipe forward and put the main PCB mounting plate aside so that the PCB's on the back side are easily accessible.

CAUTION

The leakage current PCB and the noise filter PCB are still connected. Do NOT completely remove the main PCB mounting plate.

10. Disconnect all connectors and FASTON connectors from the noise filter PCB.
11. Loosen the screws to disconnect the LA, LB, NA and NB wires.
12. Carefully pull the PCB at the side and unlatch the PCB supports one by one using a small pair of pliers.
13. Remove the noise filter PCB from the main PCB mounting plate.

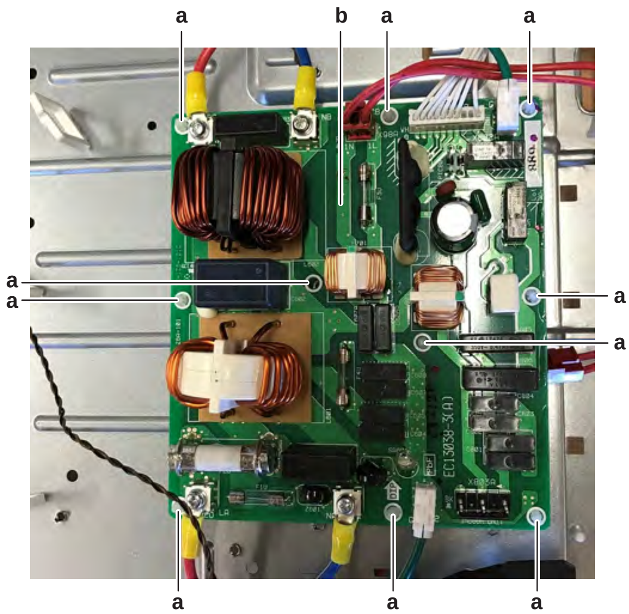


a PCB support
b Noise filter PCB

14 To install the new noise filter PCB, see "Repair procedures" [▶ 246].

To install the noise filter PCB

1 Install the noise filter PCB on its correct location.



a PCB support
b Noise filter PCB

2 Connect all connectors and FASTON connectors to the noise filter PCB.

3 Connect the LA, LB, NA and NB wires to the noise filter PCB and tighten the screws.

4 Remove the grease and apply new grease to the heat sink on the main PCB.

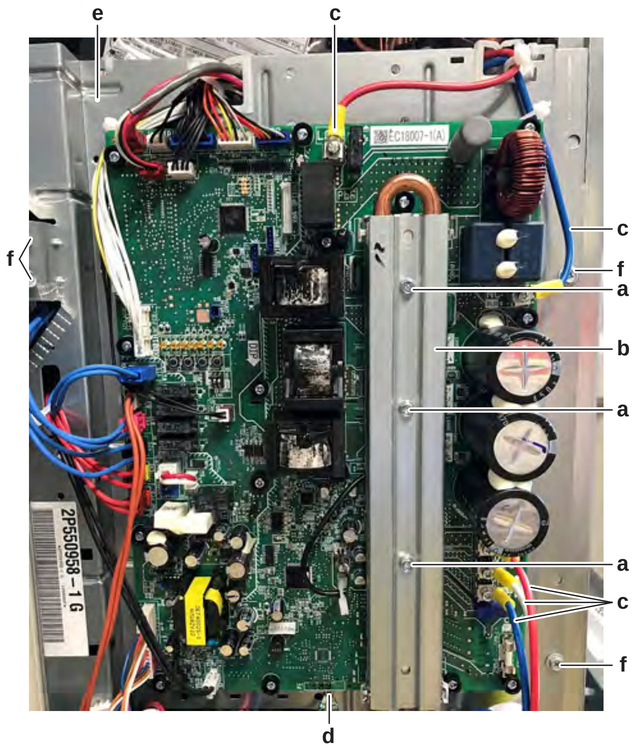
> **CAUTION**
>
> ALWAYS apply new grease on the PCB heat sink. NOT doing so may cause the PCB to fail due to insufficient cooling.

5 Pull the refrigerant pipe forward and install the main PCB mounting plate on its correct location. Install and tighten the fixation screws.

> **INFORMATION**
>
> Make sure that the refrigerant pipe is correctly installed on the main PCB heat sink. Do NOT touch the part of the refrigerant pipe that is mounted in the heat sink.

6 Install the heat sink cover. Close and slide it downwards to fix the 2 hooks.

7 Install and tighten the 3 screws so that the heat sink cover presses the refrigerant pipe.



- **a** Heat sink cover screw
- **b** Heat sink cover
- **c** Wires LC, NC, U, V and W
- **d** Ground wire screw
- **e** Main PCB mounting plate
- **f** Main PCB mounting plate fixation screw

8 Connect the ground wires to the main PCB mounting plate and tighten the screw.

9 Connect the LC, NC, U, V and W wires to the main PCB and tighten the screws.

10 Connect all connectors to the main PCB.

11 Fix the cables to the main PCB mounting plate using new tie straps.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 241] of the noise filter PCB and continue with the next procedure.

3.21.2 Single fan outdoor unit - three phase

Checking procedures

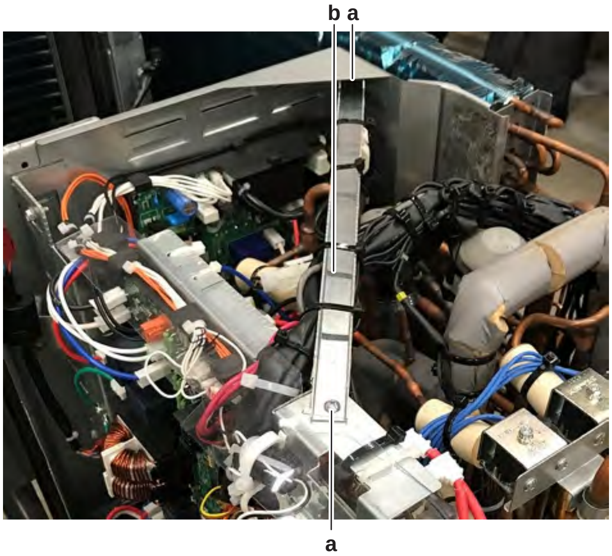
> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a power check of the noise filter PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▶ 261].
2. Cut all tie straps that are fixed to the top beam.
3. Remove the 2 screws and remove the beam to create more space for easier access.

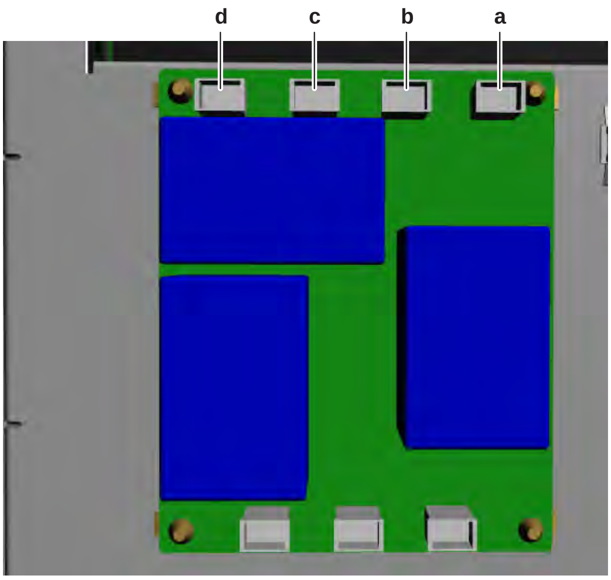


a Screw
b Beam

4. Turn ON the power of the unit.
5. Measure the voltage between the phases L11B-L21B-L31B on the noise filter PCB.

   Result: All measurements MUST be 400 V AC ± 10%.
6. Measure the voltage between each phase and N1B on the noise filter PCB.

   Result: The measured voltages MUST be 230 V AC ± 10%.



a L11B
b L21B
c L31B
d N1B

Is the measured voltage on the PCB correct?	Action
Yes	Return to "Checking procedures" [▸ 250] of the PCB and continue with the next procedure.
No	Continue with the next step.

7 Measure the output voltage between the phases L11A-L21A-L31A on the main PCB.

Result: All measurements MUST be 400 V AC ± 10%.

8 Measure the output voltage between each phase and N1A on the main PCB.

Result: The measured voltages MUST be 230 V AC ± 10%.

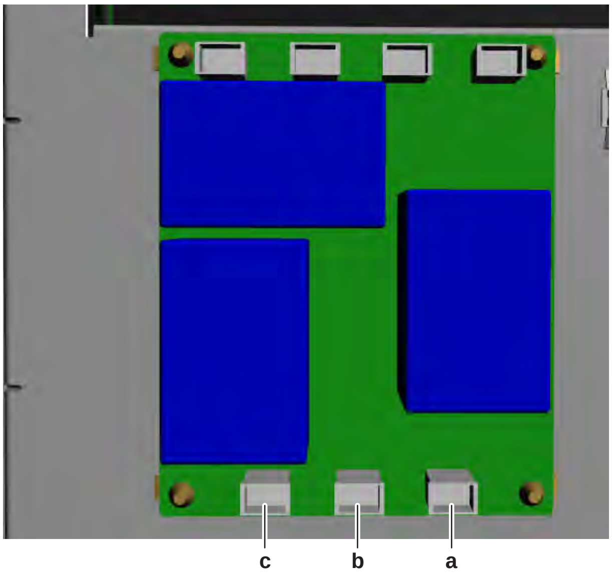
Is the measured output voltage on the main PCB correct?	Action
Yes	Correct the wiring between the main PCB and the noise filter PCB, see "4.1.2 Repair procedures" [▸ 346].
No	Perform a check of the main PCB, see "Checking procedures" [▸ 232].

To perform an electrical check of the noise filter PCB

Prerequisite: First check the power supply to the noise filter PCB, see "Checking procedures" [▸ 250].

1 Measure the voltage between output wires L12B-L22B-L32B on the noise filter PCB.

Result: All measurements MUST be 400 V AC ± 10%.



a L12B
b L22B
c L32B

Is the output voltage on the noise filter PCB correct?	Action
Yes	Return to "Checking procedures" [▶ 250] of the noise filter PCB and continue with the next procedure.
No	Replace the noise filter PCB, see "Repair procedures" [▶ 253].

To check if the correct spare part is installed

Prerequisite: First perform all earlier checks of the noise filter PCB, see "Checking procedures" [▶ 250].

1. Visit your local spare parts webbank.
2. Enter the model name of your unit and check if the installed spare part number corresponds with the spare part number indicated in the webbank.

Is the correct spare part for the noise filter PCB installed?	Action
Yes	Return to "Checking procedures" [▶ 250] of the noise filter PCB and continue with the next procedure.
No	Replace the noise filter PCB, see "Repair procedures" [▶ 253].

To check the wiring of the noise filter PCB

Prerequisite: First perform all earlier checks of the noise filter PCB, see "Checking procedures" [▶ 250].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Check that all wires are properly connected and that all connectors are fully plugged-in.
2. Check that no connectors or wires are damaged.

3 Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▶ 370].

> **INFORMATION**
>
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 250] of the noise filter PCB and continue with the next procedure.

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

Repair procedures

To remove the noise filter PCB

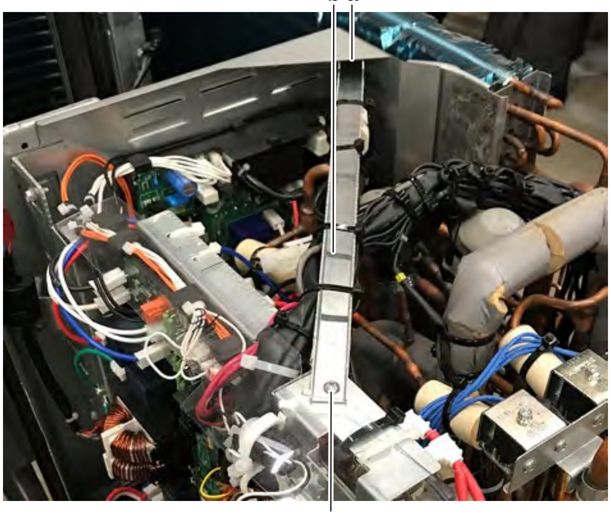
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

2 Cut all tie straps that are fixed to the top beam.

3 Remove the 2 screws and remove the beam to create more space for easier access.

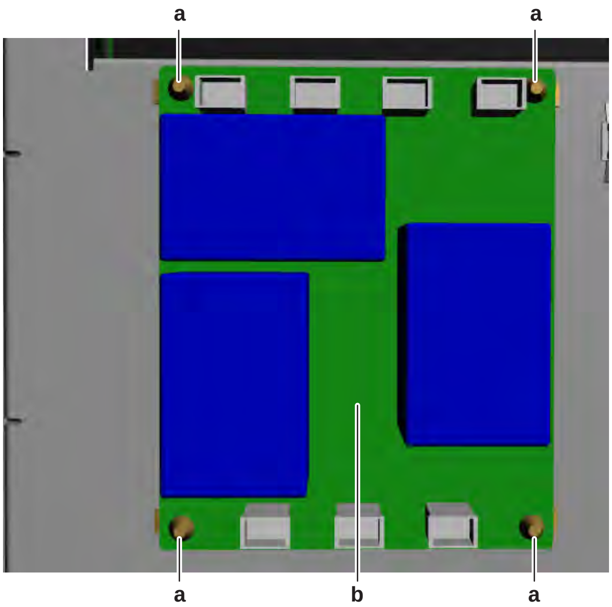


a Screw
b Beam

4 Disconnect all Faston connectors from the noise filter PCB.

5 Carefully pull the PCB at the side and unlatch the PCB supports one by one using a small pair of pliers.

6 Remove the noise filter PCB from the main PCB mounting plate.

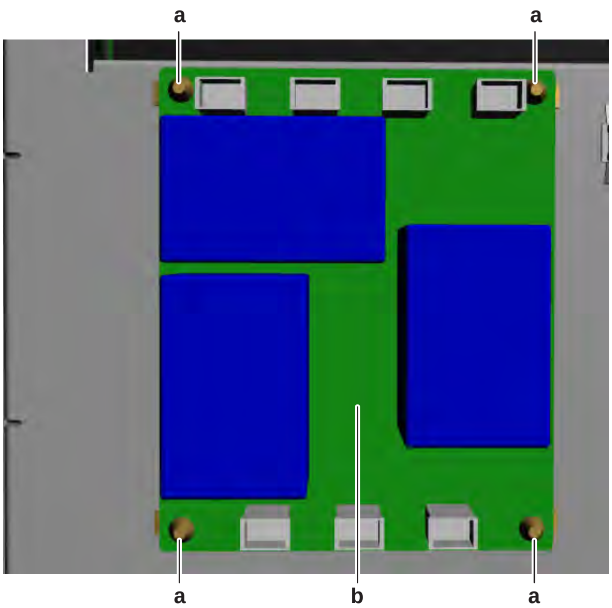


a PCB support
b Noise filter PCB

7 To install the new noise filter PCB, see "Repair procedures" [▶ 253].

To install the noise filter PCB

1 Install the noise filter PCB on its correct location.



a PCB support
b Noise filter PCB

2 Connect all Faston connectors to the noise filter PCB.

Is the problem solved?	Action
Yes	No further actions required.

Is the problem solved?	Action
No	Return to "Checking procedures" [▶ 250] of the noise filter PCB and continue with the next procedure.

3.22 Outdoor unit fan motor

3.22.1 Checking procedures

INFORMATION

It is recommended to perform the checks in the listed order.

To perform a mechanical check of the propeller fan blade assembly

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. If propeller fan blade touches the bellmounth, check if the fan motor is correctly mounted on its base, see "3.22.2 Repair procedures" [▶ 259].
2. Check the state of the propeller fan blade assembly for damage, deformations and cracks.

Is the propeller fan blade assembly damaged?	Action
Yes	Replace the propeller fan blade assembly, see "3.22.2 Repair procedures" [▶ 259].
No	Perform a mechanical check of the DC fan motor assembly, see "3.22.1 Checking procedures" [▶ 255].

To perform a mechanical check of the DC fan motor assembly

Prerequisite: First perform a mechanical check of the propeller fan blade assembly, see "3.22.1 Checking procedures" [▶ 255].

1. Visually check:
   - For any burnt-out part or wire. If found, replace the fan motor, see "3.22.2 Repair procedures" [▶ 259].
   - That fan motor fixation bolts are correctly installed and fixed. Correct as needed.
2. Manually rotate the fan motor shaft. Check that it rotates smoothly.
3. Check the friction of the DC fan motor shaft bearing.

Is the DC fan motor shaft friction normal?	Action
Yes	Perform an electrical check of the DC fan motor assembly, see "3.22.1 Checking procedures" [▶ 255].

Is the DC fan motor shaft friction normal?	Action
No	Replace the DC fan motor assembly, see "3.22.2 Repair procedures" [▶ 259].

To perform an electrical check of the DC fan motor assembly

1 First perform a mechanical check of the DC fan motor assembly, see "3.22.1 Checking procedures" [▶ 255].

INFORMATION

Check the DC fan motor power supply (voltage) circuit on the PCB.

2 Turn ON the power of the unit.

3 Activate `Cooling` or `Heating` operation via the user interface.

4 Check the functioning of the outdoor unit fan.

Outdoor unit fan ...	Action
Rotates continuously (without interruption)	DC fan motor assembly is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
Does not rotate or rotates for a short time	Continue with the next step.

INFORMATION

The DC fan motor connector MUST be plugged into the appropriate PCB.

5 Confirm via the service monitoring tool that the DC fan motor assembly receives an ON signal.

6 Turn OFF the unit via the user interface.

7 Turn OFF the respective circuit breaker.

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

8 Disconnect the DC fan motor connector X106A from the appropriate PCB and measure the resistance on the connector pins shown below. The measured resistance MUST be:

VDC	Comm	Resistance	VDC	Comm	Resistance
2	1	OL	1	2	59 kΩ
2	3	1.2 kΩ	3	2	1.2 kΩ
2	4	108 kΩ	4	2	108 kΩ
2	7	OL	7	2	65.5 kΩ

INFORMATION

The measured resistance values may deviate from the listed values due to instability during the measurements.

DC fan motor resistance measurements are correct?	Action
Yes	Continue with the next step.
No	Replace the DC fan motor, see "3.22.2 Repair procedures" [▶ 259].

9 Turn ON the power of the unit.

Single phase units

10 With the DC fan motor connector X106A disconnected from the main PCB, measure the voltage on the connector pins 1-2 (= fan motor power supply) of the connector on the main PCB.

Result: The voltage MUST be 200~390 V DC.

11 Measure the voltage on the connector pins 2-3 (= fan motor control) of the connector on the main PCB.

Result: The voltage MUST be 15±10% V DC.

Are both measured voltages correct?	Action
Yes	Continue with the next step.
No	Perform a check of the main PCB, see "Checking procedures" [▶ 224].

12 Measure the voltage on the DC fan motor connector X106A pins 2-4 (= rotation command) on the main PCB.

Result: The measured voltage should be 0~7 V DC. It should NOT be 0 V DC.

Is the measured voltage 0 V DC?	Action
Yes	Perform a check of the main PCB, see "Checking procedures" [▶ 224].
No	Continue with the next step.

13 Connect the DC fan motor connector to the PCB. Remove the plastic insert from the connector for easier measurement.

CAUTION

Ensure that the system CANNOT start the fan. Disable all modes (heating, cooling, ...) on the unit. The unit MUST be kept powered.

14 Manually (slowly) rotate the fan blade propeller 1 turn and measure the voltage on the DC fan motor connector pins 2-7.

Result: 4 pulses MUST be measured.

Pulses are measured during fan blade propeller rotation?	Action
Yes	Perform a check of the main PCB, see "Checking procedures" [▶ 224].
No	Replace the DC fan motor, see "3.22.2 Repair procedures" [▶ 259].

Three phase units

15 With the DC fan motor connector X106A disconnected from the inverter PCB, measure the voltage on the connector pins 1-2 (= fan motor power supply) of the connector on the inverter PCB.

Result: The voltage MUST be 200~390 V DC.

16 Measure the voltage on the connector pins 2-3 (= fan motor control) of the connector on the inverter PCB.

Result: The voltage MUST be 15±10% V DC.

Are both measured voltages correct?	Action
Yes	Continue with the next step.
No	Perform a check of the inverter PCB, see "Checking procedures" [▸ 205].

17 Measure the voltage on the DC fan motor connector X106A pins 2-4 (= rotation command) on the inverter PCB.

Result: The measured voltage should be 0~7 V DC. It should NOT be 0 V DC.

Is the measured voltage 0 V DC?	Action
Yes	Perform a check of the inverter PCB, see "Checking procedures" [▸ 205].
No	Continue with the next step.

18 Connect the DC fan motor connector to the PCB. Remove the plastic insert from the connector for easier measurement.

CAUTION

Ensure that the system CANNOT start the fan. Disable all modes (heating, cooling, ...) on the unit. The unit MUST be kept powered.

19 Manually (slowly) rotate the fan blade propeller 1 turn and measure the voltage on the DC fan motor connector pins 2-7.

Result: 4 pulses MUST be measured.

Pulses are measured during fan blade propeller rotation?	Action
Yes	Perform a check of the inverter PCB, see "Checking procedures" [▸ 205].
No	Replace the DC fan motor, see "3.22.2 Repair procedures" [▸ 259].

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.22.2 Repair procedures

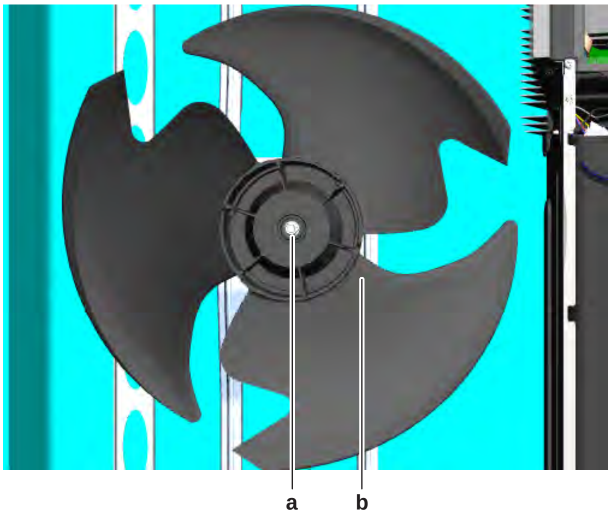
To remove the propeller fan blade assembly

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

2 Remove the nut that fixes the propeller fan blade assembly.



a Nut
b Propeller fan blade assembly

3 Pull and remove the propeller fan blade assembly from the DC fan motor assembly.

> **INFORMATION**
> Use a pulley remover if the propeller cannot be removed manually.

4 To install the propeller fan blade assembly, see "3.22.2 Repair procedures" [▶ 259].

To remove the DC fan motor assembly

1 Remove the propeller fan blade assembly from the DC fan motor assembly, see "3.22.2 Repair procedures" [▶ 259].

> **DANGER: RISK OF ELECTROCUTION**
> Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

2 Disconnect the DC fan motor connector from the main PCB (single phase units) or inverter PCB (three phase units).

3 Unlock the ferrite bead (three phase units ONLY).

4 Cut the tie straps that fix the DC fan motor harness.

5 Slightly bend the harness retainers to detach the DC fan motor harness.

6 Remove the 4 screws that fix the DC fan motor assembly.

7 Remove the DC fan motor assembly from the unit.

8 To install the DC fan motor assembly, see "3.22.2 Repair procedures" [▶ 259].

To install the DC fan motor assembly

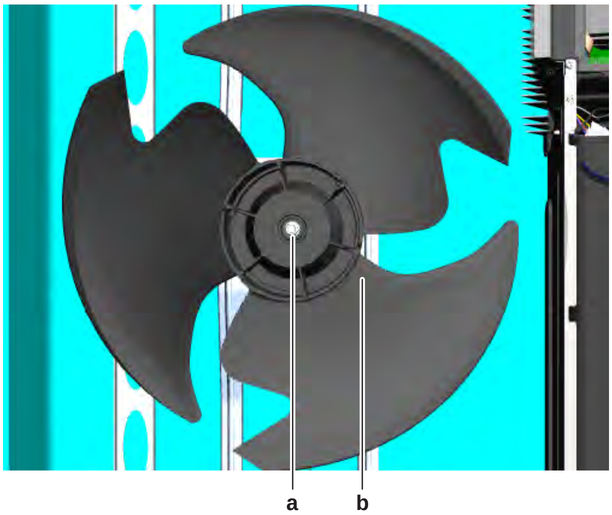
1. Install the DC fan motor assembly in the correct location.
2. Fix the DC fan motor assembly to the unit by tightening the screws.
3. Route the DC fan motor harness through the harness retainers and bend the harness retainers to attach the DC fan motor harness.
4. Install new tie straps to fix the DC fan motor harness.
5. Connect the DC fan motor connector to the connector on the main PCB (single phase units) or inverter PCB (three phase units).
6. Lock the ferrite bead.
7. Install the propeller fan blade assembly, see "3.22.2 Repair procedures" [▶ 259].

To install the propeller fan blade assembly

1. Install the propeller fan blade assembly on the DC fan motor assembly.

> **CAUTION**
>
> Do NOT install a damaged propeller fan blade assembly.

2. Install and tighten the nut to fix the propeller fan blade assembly.



a Nut
b Propeller fan blade assembly

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.22.1 Checking procedures" [▶ 255] of the outdoor unit fan motor and continue with the next procedure.

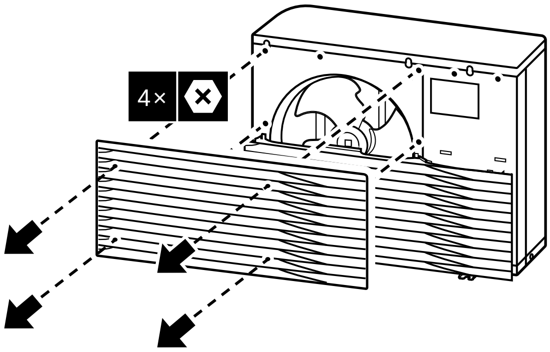
3.23 Plate work

3.23.1 Outdoor unit

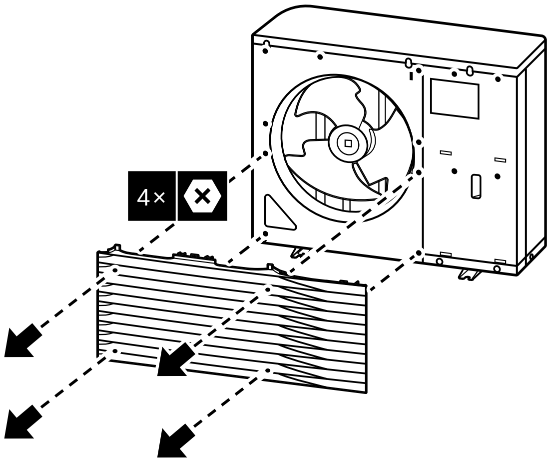
To remove the discharge grille, and put the grille in safety position

> **WARNING**
>
> **Rotating fan.** Before powering ON or servicing the outdoor unit, make sure that the discharge grille covers the fan as protection against a rotating fan. See:
>
> - "To install the discharge grille" [▸ 263]
> - "To remove the discharge grille, and put the grille in safety position" [▸ 261]

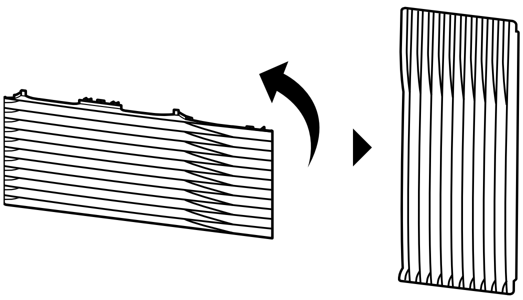
1 Remove the upper part of the discharge grille.



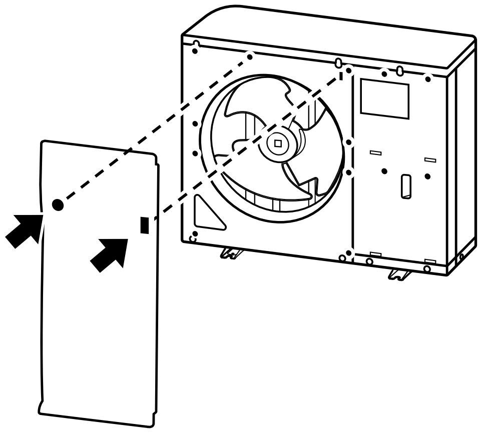
2 Remove the lower part of the discharge grille.



3 Rotate the lower part of the discharge grille.

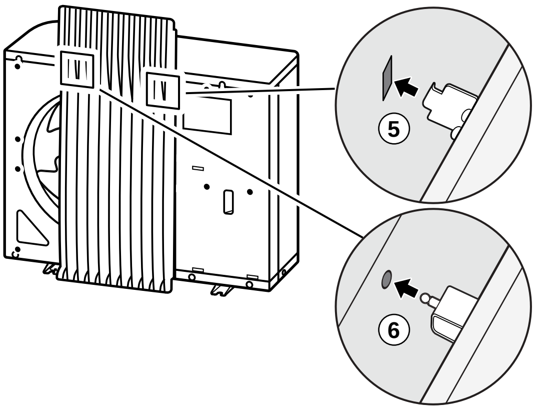


4 Align the ball stud and hook on the grille with their counterparts on the unit.



5 Insert the hook.

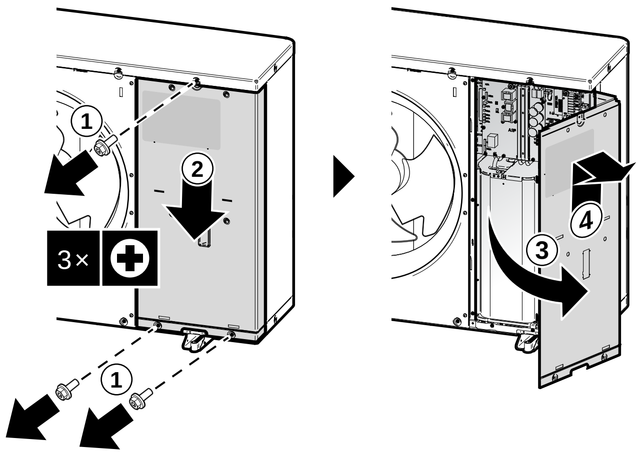
6 Insert the ball stud.



To open the outdoor unit

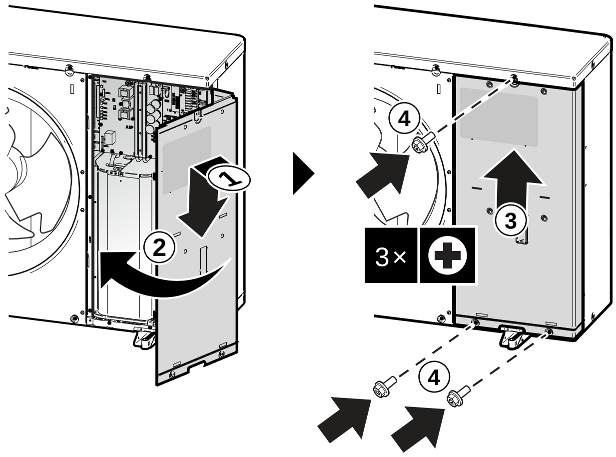
DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING/SCALDING



To close the outdoor unit

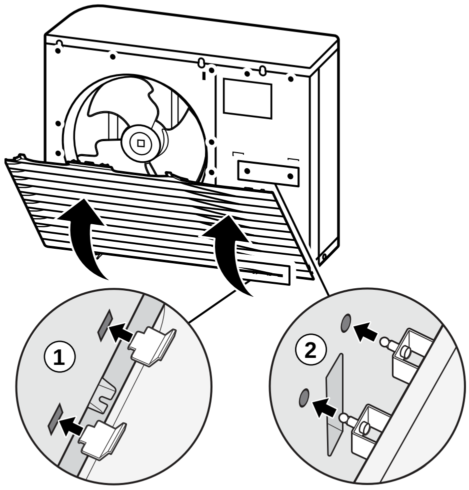
> **NOTICE**
>
> When closing the outdoor unit cover, make sure that the tightening torque does NOT exceed 4.1 N•m.



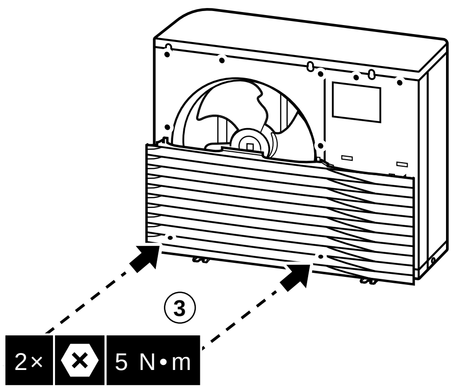
To install the discharge grille

Install the lower part of the discharge grille

1. Insert the hooks.
2. Insert the ball studs.



3. Fix the 2 lower screws.



Install the upper part of the discharge grille

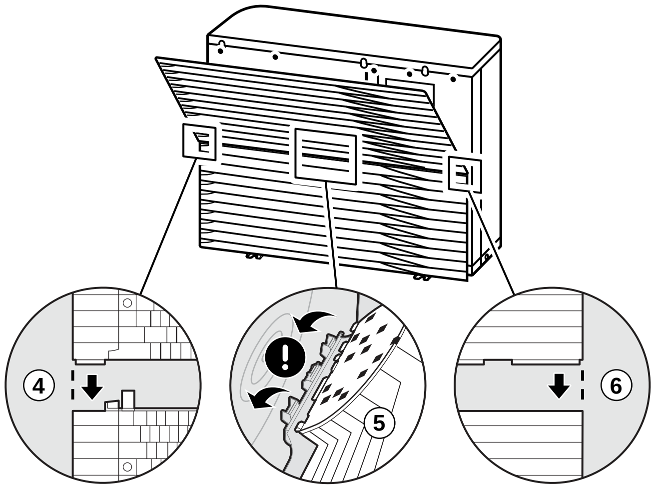
NOTICE

Vibrations. Make sure the upper part of the discharge grille is attached seamlessly to the lower part to prevent vibrations.

4 Align and attach the left side.

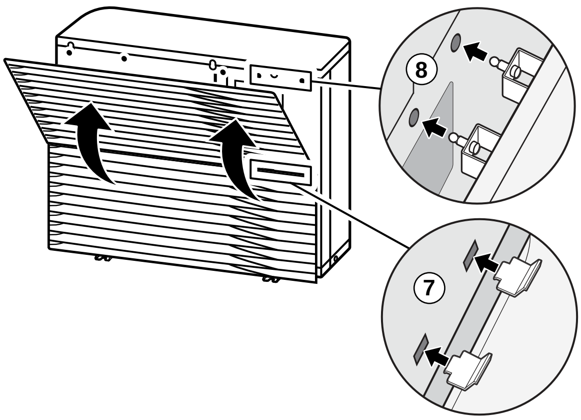
5 Align and attach the middle part.

6 Align and attach the right side.

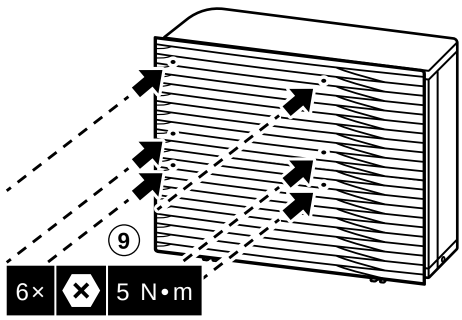


7 Insert the hooks.

8 Insert the ball studs.



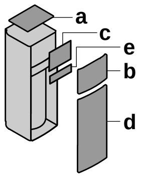
9 Fix the 6 remaining screws.



3.23.2 Indoor unit

To open the indoor unit

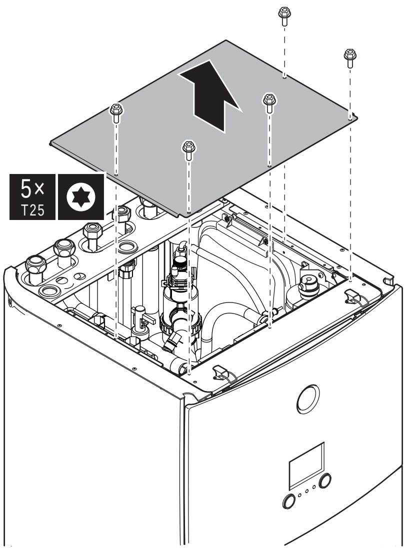
Overview

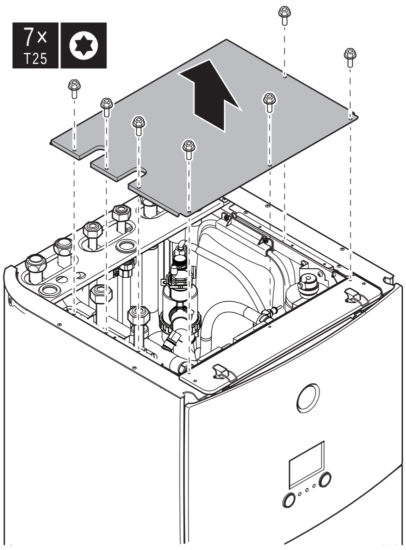


a Top panel
b User interface panel
c Switch box cover
d Front panel
e High voltage switch box cover

Open

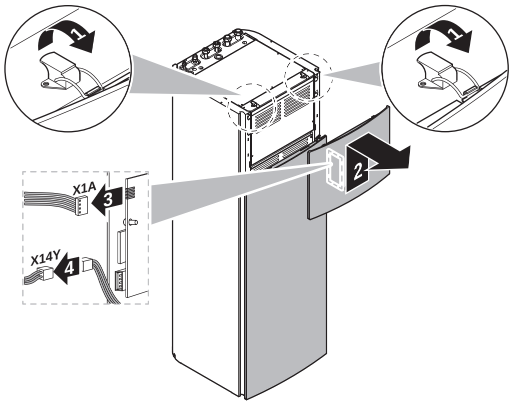
1. Remove the top panel.



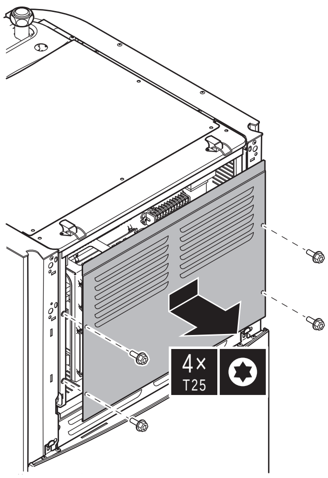


2. Remove the user interface panel. Open the hinges at the top and slide the top panel upwards.

> **NOTICE**
>
> If you remove the user interface panel, also disconnect the cables from the back of the user interface panel to prevent damage.

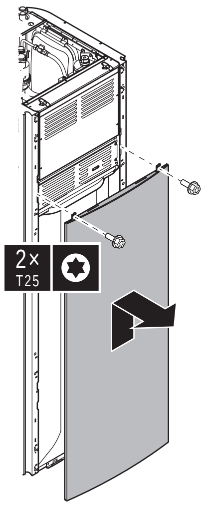


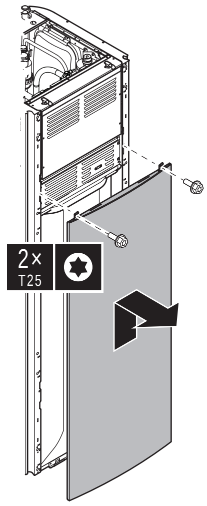
3 Remove the switch box cover.



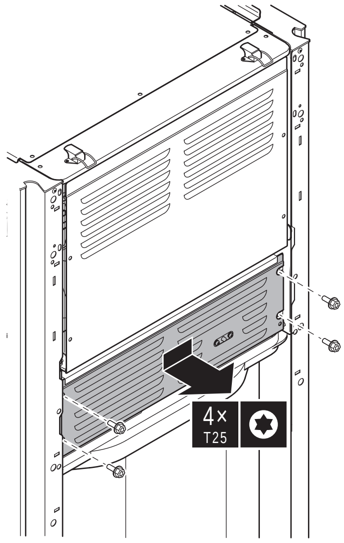
4 If necessary, remove the front plate. This is, for example, necessary in the following cases:

- "To lower the switch box on the indoor unit" [▶ 269]
- When you need access to the high voltage switch box

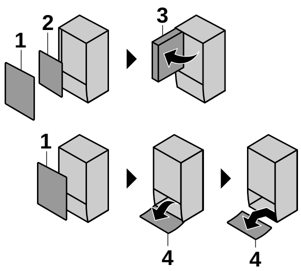




5 If you need access to the high voltage components, remove the high voltage switch box cover.



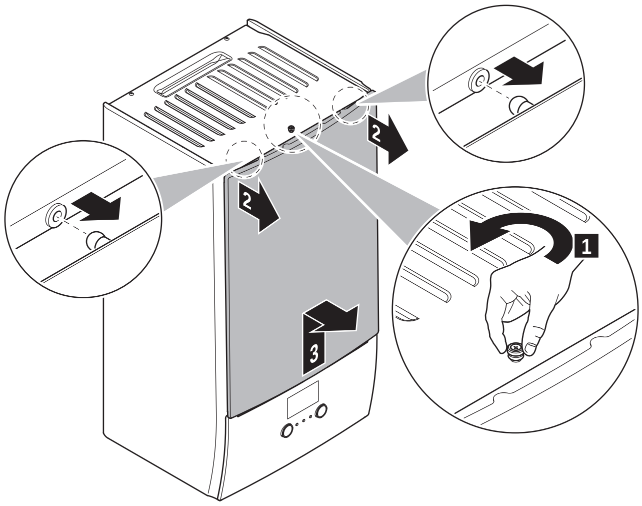
Overview



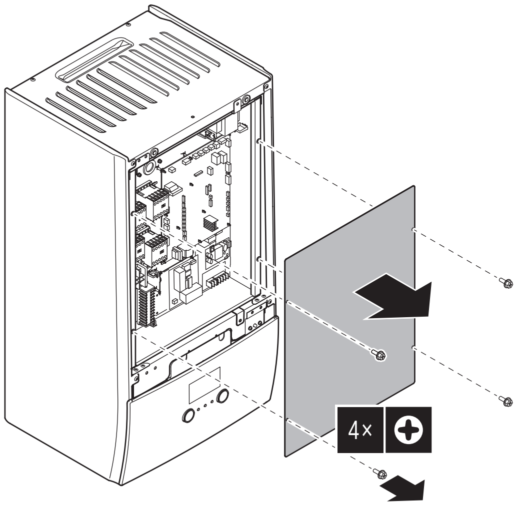
1 Front panel
2 Switch box cover
3 Switch box
4 User interface panel

Open

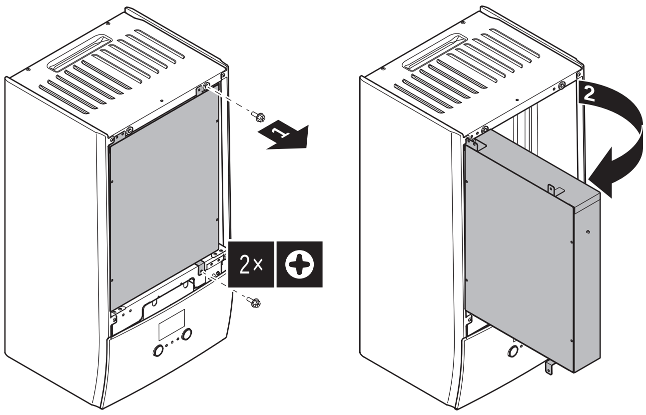
6 Remove the front panel.



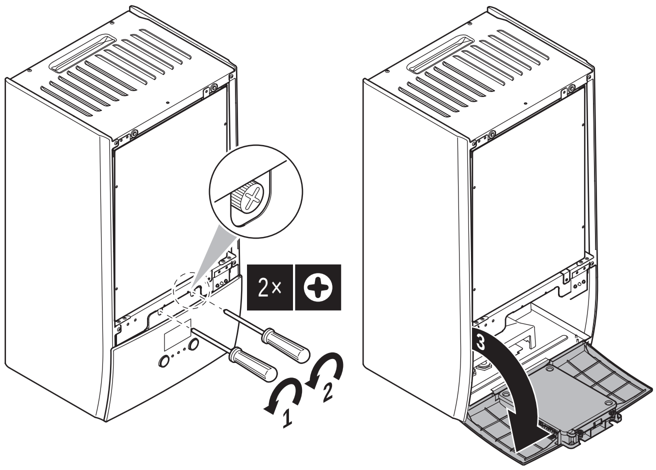
7 If you have to connect electrical wiring, remove the switch box cover.



8 If you have to do work behind the switch box, open the switch box.

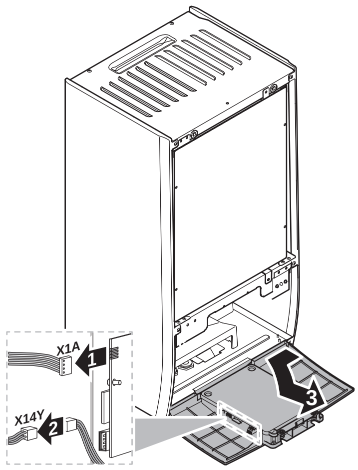


9 If you have to do work behind the user interface panel or upload new software into the user interface, open the user interface panel.



10 Optional: Remove the user interface panel.

> **NOTICE**
>
> If you remove the user interface panel, also disconnect the cables from the back of the user interface panel to prevent damage.

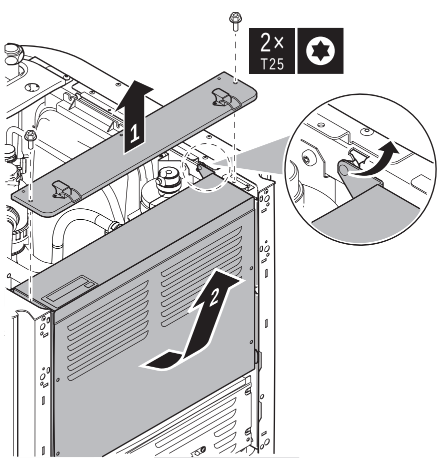


To lower the switch box on the indoor unit

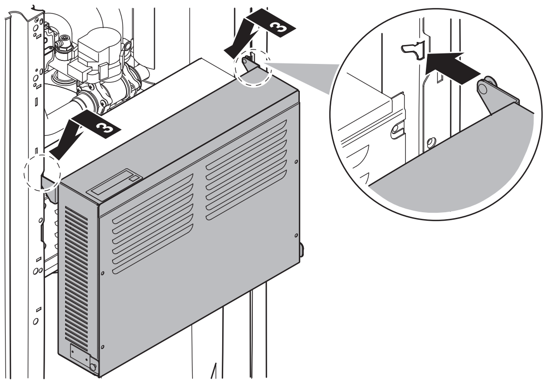
During the installation, you will need access to the inside of the indoor unit. To have easier front access, put the switch box lower on the unit as follows:

Prerequisite: The user interface panel and front panel have been removed.

1. Remove the fixing plate at the top of the unit.
2. Tilt the switch box to the front and lift it out of its hinges.



3 Place the switch box lower on the unit. Use the 2 hinges located lower on the unit.



3.24 Reactor

3.24.1 Checking procedures

To perform an electrical check of the reactor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

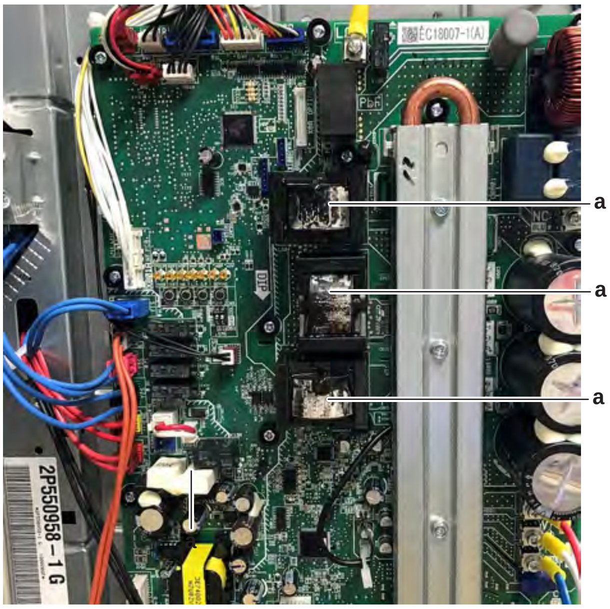
1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

For single phase units

1 Check that the reactors are firmly installed on the main PCB.



a Reactor

2 Using a megger device of 500 V DC, check the insulation resistance. Make sure there is no earth leakage.

Is the measured insulation resistance correct?	Action
Yes	Continue with the next step.
No	Replace the reactor, see "3.24.2 Repair procedures" [▶ 272].

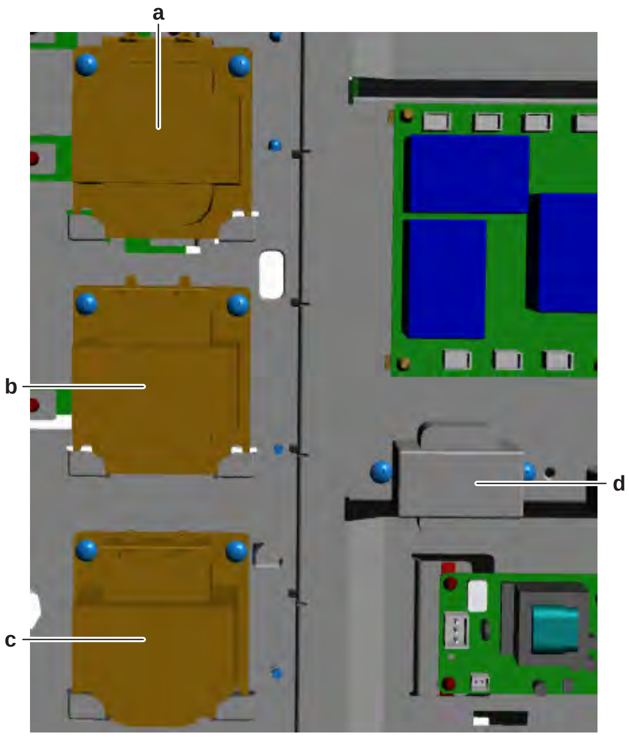
3 Measure the continuity of the reactor.

Is the continuity measurement correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next step.
No	Replace the reactor, see "3.24.2 Repair procedures" [▶ 272].

For three phase units

1 Visually check the reactor for any damage or burnt-out components. If any damage is found, replace the reactor, see "3.24.2 Repair procedures" [▶ 272].

2 Check the connections of the reactors on the inverter PCB and noise filter PCB and check continuity of the wires, see "6.2 Wiring diagram" [▶ 370].



a Reactor L1R
b Reactor L2R
c Reactor L3R
d Reactor L4R

3 Remove Faston connectors from the reactor.

4 Using a megger device of 500 V DC, check the insulation resistance. Make sure there is no earth leakage.

Is the measured insulation resistance correct?	Action
Yes	Continue with the next step.

Is the measured insulation resistance correct?	Action
No	Replace the reactor, see "3.24.2 Repair procedures" [▸ 272].

5 Measure the continuity of the reactor.

Is the continuity measurement correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next step.
No	Replace the reactor, see "3.24.2 Repair procedures" [▸ 272].

3.24.2 Repair procedures

For single phase units

As the reactors are part of the main PCB, replace the complete main PCB. See "Repair procedures" [▸ 228].

For three phase units

See procedures below.

To remove the reactor

Prerequisite: Stop the unit operation via the user interface.

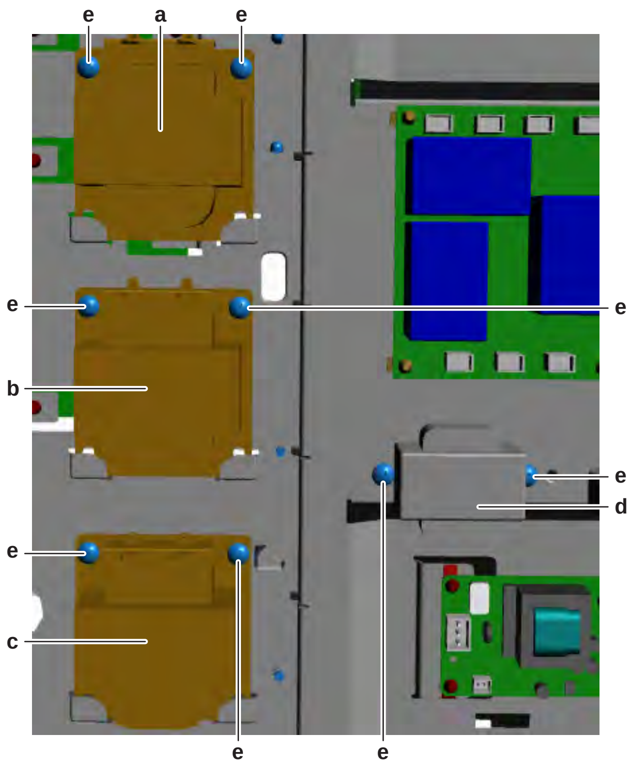
Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▸ 261].

DANGER: RISK OF ELECTROCUTION

Wait for at least 10 minutes after the circuit breaker has been turned OFF, to be sure the rectifier voltage is below 10 V DC before proceeding.

2 Remove the Faston connectors to disconnect the wires from the reactor.



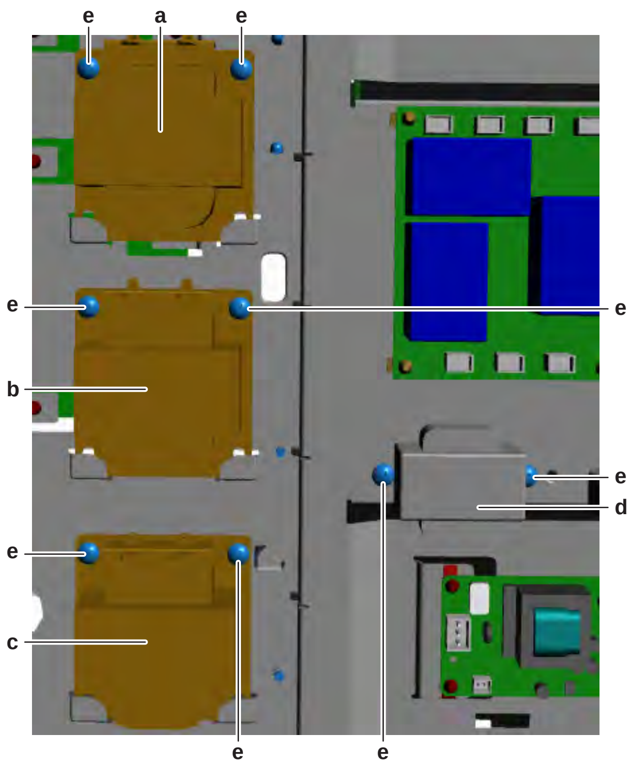
a Reactor L1R
b Reactor L2R
c Reactor L3R
d Reactor L4R
e Screw

3 Remove the 2 screws that fix the reactor to the main PCB mounting plate.

4 To install the reactor, see "3.24.2 Repair procedures" [▶ 272].

To install the reactor

1 Install the reactor on the correct location on the main PCB mounting plate.



a Reactor L1R
b Reactor L2R
c Reactor L3R
d Reactor L4R
e Screw

2 Install the 2 screws that fix the reactor to the main PCB mounting plate.

3 Connect the wiring to the reactor using the Faston connectors.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.25 Refrigerant pressure sensor

3.25.1 Checking procedures

To perform an electrical check of the refrigerant pressure sensor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

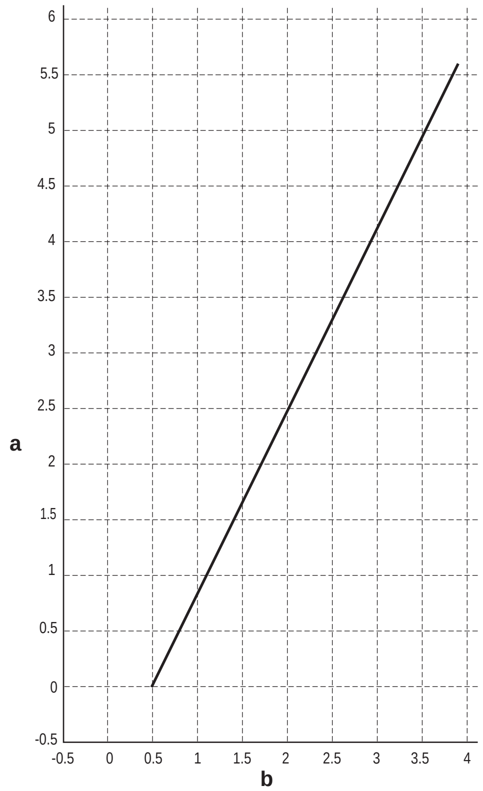
Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Turn ON the power of the unit.

2 Near the refrigerant pressure sensor, measure the refrigerant temperature using a contact thermometer.

3 Using the R32 refrigerant thermodynamic properties table (see R32 refrigerant service manual for more information), determine the refrigerant pressure that corresponds with the measured refrigerant temperature.

4 Using the graphic below, determine the expected sensor output voltage based on the pressure obtained in the previous step.



a Detected pressure (MPa)
b Output voltage (V)

V (DC)	Detected pressure MPa
0.5	0.00
0.6	0.17
0.7	0.33
0.8	0.50
0.9	0.67
1.0	0.83
1.1	1.00
1.2	1.17
1.3	1.33
1.4	1.50
1.5	1.67
1.6	1.83
1.7	2.00
1.8	2.17
1.9	2.33
2.0	2.50
2.1	2.67
2.2	2.83
2.3	3.00
2.4	3.17

V (DC)	Detected pressure MPa
2.5	3.33
2.6	3.50
2.7	3.67
2.8	3.83
2.9	4.00
3.0	4.17
3.1	4.33
3.2	4.50
3.3	4.67
3.4	4.83
3.5	5.00
3.6	5.17
3.7	5.33
3.8	5.50
3.9	5.67

5 Measure the voltage on X17A: pins 1–3 (= refrigerant pressure sensor output signal).

6 Check that the measured voltage is in line with the expected voltage through the read refrigerant pressure.

INFORMATION

Connect the service monitoring tool to monitor the high pressure.

If the measured output voltage value matches the voltage determined through the measured pressure, but the pressure via the service monitoring tool is NOT correct, replace the applicable PCB.

The measured voltage is inside the expected range?	Action
Yes	Refrigerant pressure sensor is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

7 Unplug the refrigerant pressure sensor connector X17A and measure the voltage (power supply) between pins 3–4 on main PCB.

Result: The measured voltage MUST be +5 V DC.

Is the measured voltage +5 V DC?	Then
Yes	Replace the refrigerant pressure sensor, see "3.25.2 Repair procedures" [▶ 277].
No	Perform a check of the main PCB, see "3.20 Main PCB" [▶ 224].

3.25.2 Repair procedures

To remove the refrigerant pressure sensor

Prerequisite: Stop the unit operation via the user interface.

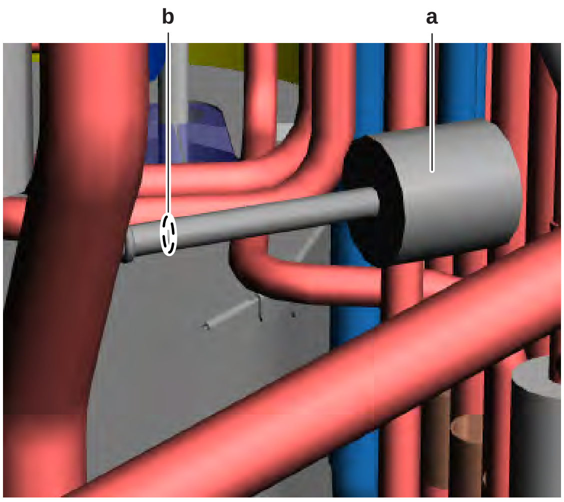
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "4.2.2 Repair procedures" [▸ 351].

Prerequisite: If needed, remove any parts or insulation to create more space for the removal.

1. Cut all tie straps that fix the refrigerant pressure sensor harness.
2. Disconnect the refrigerant pressure sensor connector from the PCB.
3. Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.
4. Wrap a wet rag around the components near the refrigerant pressure sensor. Heat the brazing point of the refrigerant pressure sensor pipe using an oxygen acetylene torch and remove the refrigerant pressure sensor pipe from the refrigerant pipe using pliers.



a Refrigerant pressure sensor
b Refrigerant pressure sensor pipe

5. Stop the nitrogen supply when the piping has cooled down.
6. Remove the refrigerant pressure sensor.

> **INFORMATION**
>
> It is ALSO possible to cut the component pipe(s) using a pipe cutter. Make sure to remove the remaining component pipe end(s) from the refrigerant pipes by heating the brazing point(s) of the component pipe(s) using an oxygen acetylene torch.

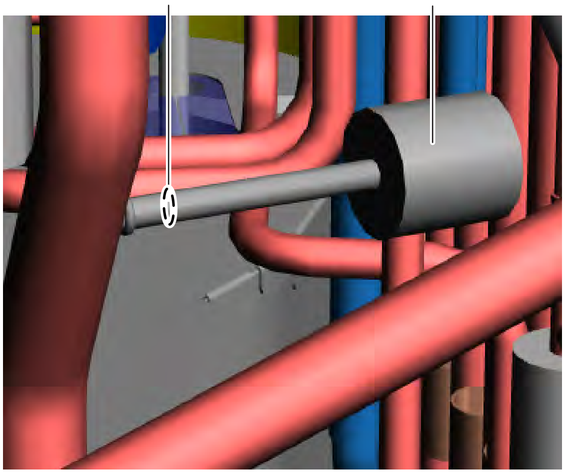
7. Install a plug or cap on the refrigerant piping to avoid dirt or impurities from entering the piping.
8. To install the refrigerant pressure sensor, see "3.25.2 Repair procedures" [▸ 277].

To install the refrigerant pressure sensor

1. Remove the plug or cap from the refrigerant piping and make sure it is clean.
2. Install the refrigerant pressure sensor in the correct location.

3 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

4 Wrap a wet rag around the refrigerant pressure sensor and any other components near the pressure sensor and solder the refrigerant pressure sensor pipe to the refrigerant pipe.



a Refrigerant pressure sensor
b Refrigerant pressure sensor pipe

> **CAUTION**
>
> Overheating the pressure sensor will damage or destroy it.

5 After soldering is done, stop the nitrogen supply after the component has cooled-down.

6 Route the refrigerant pressure sensor harness towards the appropriate PCB.

7 Connect the refrigerant pressure sensor connector to the appropriate PCB.

8 Fix the refrigerant pressure sensor harness using new tie straps.

9 Perform a pressure test, see "4.2.1 Checking procedures" [▶ 347].

10 Add refrigerant to the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.26 Solenoid valve

3.26.1 Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a mechanical check of the solenoid valve

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Visually check:

- For oil drops around the solenoid valve. Locate and fix as needed.
- Pipes for signs of damage. Replace pipes as needed.

2 Verify that the screw is firmly fixing the coil to the valve body.

3 Check coil and coil wires if any damage or burst is present.

Is the solenoid valve coil firmly fixed and not visually damaged?	Action
Yes	Perform an electrical check of the solenoid valve, see "3.26.1 Checking procedures" [▸ 278].
No	Fix or replace the solenoid valve coil, see "3.26.2 Repair procedures" [▸ 281].

To perform an electrical check of the solenoid valve

Prerequisite: First perform a mechanical check of the solenoid valve, see "3.26.1 Checking procedures" [▸ 278].

1 Unplug the solenoid valve connector from the appropriate PCB.

2 Measure the resistance of the solenoid valve coil.

Name	Symbol	Location (PCB)	Connector	Winding resistance
Low pressure by-pass valve	Y2S	Main	X26A	2.3 kΩ±10%
Hot gas by-pass valve	Y3S	Main	X27A	2.3 kΩ±10%
Liquid injection valve	Y4S	ACS digital I/O	X7A	2.3 kΩ±10%

Is the measured value correct?	Action
Yes	Continue with the next step.
No	Replace the solenoid valve coil, see "3.26.2 Repair procedures" [▸ 281].

3 Re-connect the solenoid valve connector to the appropriate PCB.

4 Turn ON the power using the respective circuit breaker.

5 Turn on the unit using the user interface.

6 Connect the service monitoring tool to the unit and check if the specific solenoid valve is activated or NOT.

7 Measure the voltage (power supply) on the solenoid valve connection on the PCB. The measured voltage MUST be:

- 0 V AC when the solenoid valve is NOT activated
- 230 V AC when the solenoid valve is activated

8 Wait for the activation or deactivation of the specific solenoid valve and again measure the voltage (power supply) on the solenoid valve connection on the PCB.

For Y2S and Y3S

Are the measured voltages correct?	Action
Yes	Perform a position check of the solenoid valve, see "3.26.1 Checking procedures" [▶ 278].
No	Perform a check of the main PCB, see "3.20 Main PCB" [▶ 224].

For Y4S

Are the measured voltages correct?	Action
Yes	Perform a position check of the solenoid valve, see "3.26.1 Checking procedures" [▶ 278].
No	Perform a check of the ACS digital I/O PCB, see "3.3.1 Checking procedures" [▶ 135].

To perform an operation check of the solenoid valve

Prerequisite: First perform an electrical check of the solenoid valve, see "3.26.1 Checking procedures" [▶ 278].

1. Connect the service monitoring tool to the unit and check if the specific solenoid valve is activated or NOT.
2. Check the position of the specific solenoid valve. The solenoid valve MUST be:
   - In closed position (NOT energized) when NOT activated
   - In open position (energized) when activated
3. If the solenoid valve is closed, check the valve inlet and outlet for any leaks. Replace the valve body if any leaks are found, see "3.26.2 Repair procedures" [▶ 281].
4. If the solenoid valve is open, check with a contact thermometer (or by touching) if refrigerant flows through the solenoid valve.
5. Wait for the activation or deactivation of the specific solenoid valve and again perform the above checks.

Is the solenoid valve operating correctly?	Action
Yes	Component is OK. Return to the troubleshooting of the specific error and continue with the next step.
No	Replace the solenoid valve body, see "3.26.2 Repair procedures" [▶ 281].

Problem solved?

After all checking procedures listed above have been performed:

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.26.2 Repair procedures

To remove the solenoid valve coil

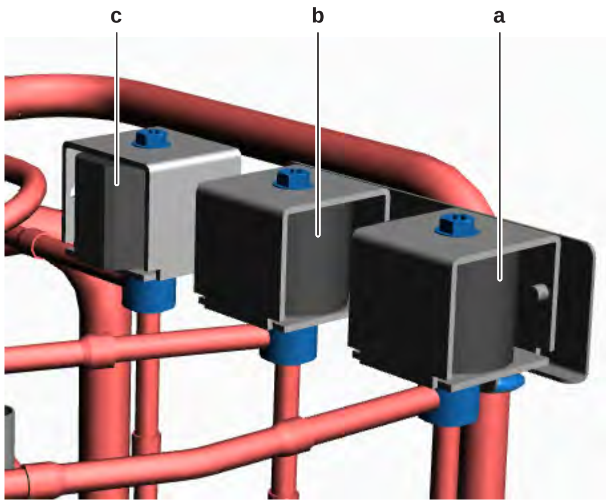
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

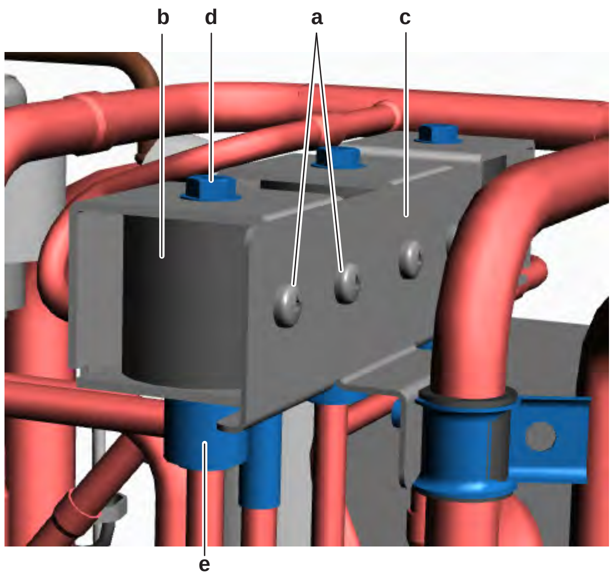
Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

Prerequisite: If needed, remove any parts or insulation to create more space for the removal.

1 For the low pressure by-pass solenoid valve Y2S and the hot gas by-pass solenoid valve Y3S ONLY: Remove the screws that fix the solenoid valve to the bracket.



a Solenoid valve Y2S
b Solenoid valve Y3S
c Solenoid valve Y4S



a Screw
b Solenoid valve coil
c Bracket
d Screw
e Solenoid valve body

2 Remove the screw that fixes the solenoid valve coil to the solenoid valve body.

3 Remove the solenoid valve coil from the solenoid valve body.

4 Disconnect the solenoid valve connector from the appropriate PCB.

5 Cut all tie straps that fix the solenoid valve harness.

6 To install the solenoid valve coil, see "3.26.2 Repair procedures" [▶ 281].

To remove the solenoid valve body

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

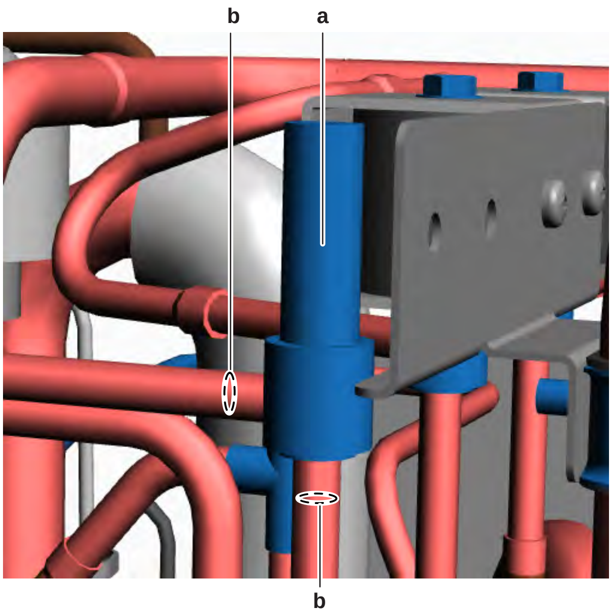
Prerequisite: If needed, remove any parts or insulation to create more space for the removal.

1 Remove the solenoid valve coil, see "3.26.2 Repair procedures" [▶ 281].

2 Using a valve magnet, open the solenoid valve.

3 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

4 Wrap a wet rag around the components near the solenoid valve body pipes. Heat the brazing points of the solenoid valve body pipes using an oxygen acetylene torch and remove the solenoid valve body pipes from the refrigerant pipes using pliers.



a Solenoid valve body
b Pipe

5 Stop the nitrogen supply when the piping has cooled down.

6 Remove the solenoid valve body.

> **INFORMATION**
>
> It is ALSO possible to cut the component pipe(s) using a pipe cutter. Make sure to remove the remaining component pipe end(s) from the refrigerant pipes by heating the brazing point(s) of the component pipe(s) using an oxygen acetylene torch.

7 Install plugs or caps on the open pipe ends of the refrigerant piping to avoid dirt or impurities from entering the piping.

8 To install the solenoid valve body, see "3.26.2 Repair procedures" [▶ 281].

To install the solenoid valve body

1 Remove the plugs or caps from the refrigerant piping and make sure they are clean.

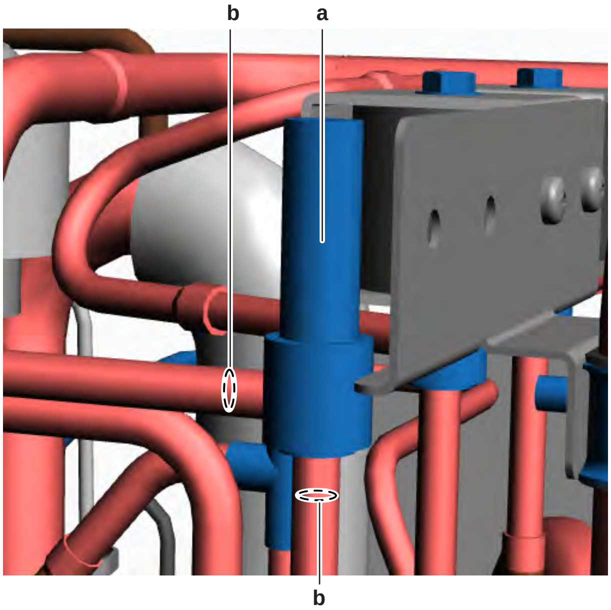
2 Remove the solenoid valve coil from the spare part solenoid valve body.

3 Install the solenoid valve body in the correct location and correctly oriented. Insert the pipe ends in the pipe expansions.

4 Open the solenoid valve using a valve magnet.

5 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

6 Wrap a wet rag around the solenoid valve body and any other components near the solenoid valve and solder the solenoid valve body pipes to the refrigerant pipes.



a Solenoid valve body
b Pipe

CAUTION

Overheating the valve will damage or destroy it.

7 After soldering is done, stop the nitrogen supply after the component has cooled-down.

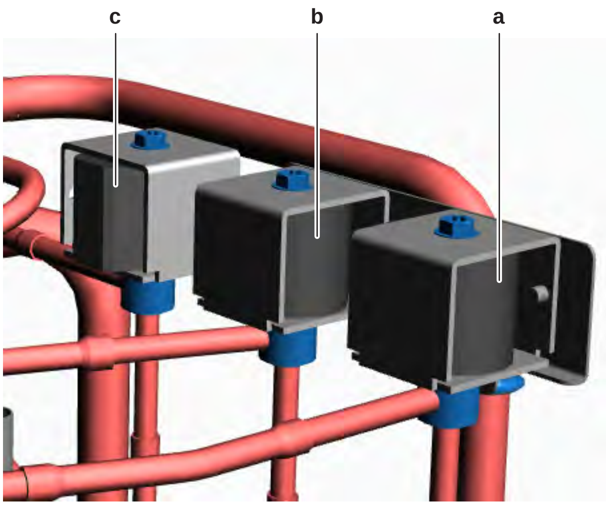
8 To install the solenoid valve coil, see "3.26.2 Repair procedures" [▶ 281].

9 Perform a pressure test, see "4.2.1 Checking procedures" [▶ 347].

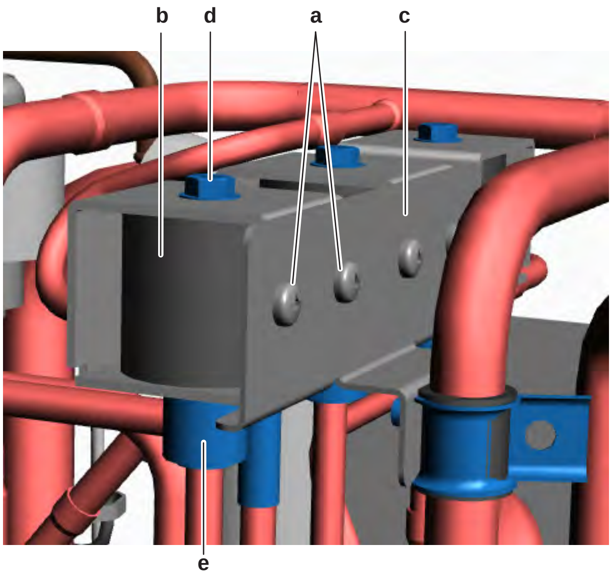
10 Add refrigerant to the refrigerant circuit, see "4.2.2 Repair procedures" [▶ 351].

To install the solenoid valve coil

1 Install the solenoid valve coil on the solenoid valve body.



a Solenoid valve Y2S
b Solenoid valve Y3S
c Solenoid valve Y4S



a Screw
b Solenoid valve coil
c Bracket
d Screw
e Solenoid valve body

2 Install and tighten the screw to fix the solenoid valve coil to the solenoid valve body.

3 For the low pressure by-pass solenoid valve Y2S and the hot gas by-pass solenoid valve Y3S ONLY: Install and tighten the screws to fix the solenoid valve to the bracket.

4 Route the solenoid valve harness towards the switch box.

5 Connect the solenoid valve connector to the appropriate PCB.

> **WARNING**
>
> When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

6 Fix the solenoid valve harness using new tie straps.

> **INFORMATION**
>
> Replace all cable ties that were cut during removal.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "3.26.1 Checking procedures" [▸ 278] of the solenoid valve and continue with the next procedure.

3.27 Thermistors

3.27.1 Refrigerant side thermistors

Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a mechanical check of the specific thermistor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Locate the thermistor and remove the insulation if needed. Check that the thermistor is correctly installed and that there is thermal contact between the thermistor and the piping or ambient (for air thermistor).

Is the thermistor correctly installed (thermal contact between the thermistor and the piping)?	Action
Yes	Perform an electrical check of the specific thermistor, see "Checking procedures" [▸ 285].
No	Correctly install the thermistor, see "Repair procedures" [▸ 288].

To perform an electrical check of the specific thermistor

1 First perform a mechanical check of the thermistor, see "Checking procedures" [▸ 285].

2 Locate the thermistor.

> **INFORMATION**
>
> Remove the thermistor from its holder if not reachable with a contact thermometer.

3 Measure the temperature using a contact thermometer.

Name	Symbol	Location (PCB)	Connector (pins)	Reference (table)
Air thermistor	R1T	Main (O/U)	X11A:1-2	A

Name	Symbol	Location (PCB)	Connector (pins)	Reference (table)
Discharge pipe thermistor	R2T	Main (O/U)	X12A:1-2	B
Suction thermistor	R3T	Main (O/U)	X12A:3-4	A
Heat exchanger thermistor	R4T	Main (O/U)	X12A:5-6	A
Heat exchanger (middle) thermistor	R5T	Main (O/U)	X12A:7-8	A
Refrigerant liquid thermistor	R6T	Main (O/U)	X13A: 1-2	A
Compressor protection (shell) thermistor	R7T	Main (O/U)	X13A: 3-4	B
Compressor protection (port) thermistor	R8T	Main (O/U)	X13A: 5-6	B

4 Determine the thermistor resistance that matches the measured temperature.

Thermistor – Table A

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
–20	197.81	10	39.96	40	10.63	70	3.44
–19	186.53	11	38.08	41	10.21	71	3.32
–18	175.97	12	36.30	42	9.81	72	3.21
–17	166.07	13	34.62	43	9.42	73	3.11
–16	156.80	14	33.02	44	9.06	74	3.01
–15	148.10	15	31.50	45	8.71	75	2.91
–14	139.94	16	30.06	46	8.37	76	2.82
–13	132.28	17	28.70	47	8.05	77	2.72
–12	125.09	18	27.41	48	7.75	78	2.64
–11	118.34	19	26.18	49	7.46	79	2.55
–10	111.99	20	25.01	50	7.18	80	2.47

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
–9	106.03	21	23.91	51	6.91		
–8	100.41	22	22.85	52	6.65		
–7	95.14	23	21.85	53	6.41		
–6	90.17	24	20.90	54	6.65		
–5	85.49	25	20.00	55	6.41		
–4	81.08	26	19.14	56	6.18		
–3	76.93	27	18.32	57	5.95		
–2	73.01	28	17.54	58	5.74		
–1	69.32	29	16.80	59	5.14		
0	65.84	30	16.10	60	4.87		
1	62.54	31	15.43	61	4.70		
2	59.43	32	14.79	62	4.54		
3	56.49	33	14.18	63	4.38		
4	53.71	34	13.59	64	4.23		
5	51.09	35	13.04	65	4.08		
6	48.61	36	12.51	66	3.94		
7	46.26	37	12.01	67	3.81		
8	44.05	38	11.52	68	3.68		
9	41.95	39	11.06	69	3.56		

Thermistor – Table B

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
0	806.5	40	118.7	80	25.38	120	7.131
5	618.9	45	96.13	85	21.37	125	6.181
10	478.8	50	78.29	90	18.06	130	5.374
15	373.1	55	64.1	95	15.33	135	4.686
20	292.9	60	52.76	100	13.06	140	4.098
25	231.4	65	43.63	105	11.17	145	3.594
30	184.1	70	36.26	110	9.585	150	3.161
35	147.4	75	30.27	115	8.254		

5. Disconnect the thermistor connector from the appropriate PCB.
6. Measure the resistance between the appropriate pins of the thermistor connector.
7. Check that the measured resistance value matches the resistance determined through the measured temperature (earlier step in the procedure).

- E.g. R1T thermistor:
- Measured temperature with contact thermometer: 23.1°C,
- Resistance value determined through temperature (using the thermistor table A):
  Resistance at 23°C: 21.85 kΩ,
  Resistance at 24°C: 20.90 kΩ,
- Disconnect connector and measure resistance between X11A pin 1-2:
  Measured resistance: 21.86 kΩ,
- Measured resistance value is inside the range. R1T thermistor passes the check.

INFORMATION

All thermistors have a resistance tolerance of 3%.

INFORMATION

In most cases, the user interface allows to monitor the thermistors.

If the measured resistance value matches the resistance determined through the measured temperature, but the temperature for the corresponding thermistor is NOT correct on the user interface display, replace the applicable PCB.

Does the measured resistance of the thermistor match with the temperature determined resistance?	Action
Yes	Thermistor is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the specific thermistor, see "Repair procedures" [▶ 288].

Repair procedures

To remove the thermistor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

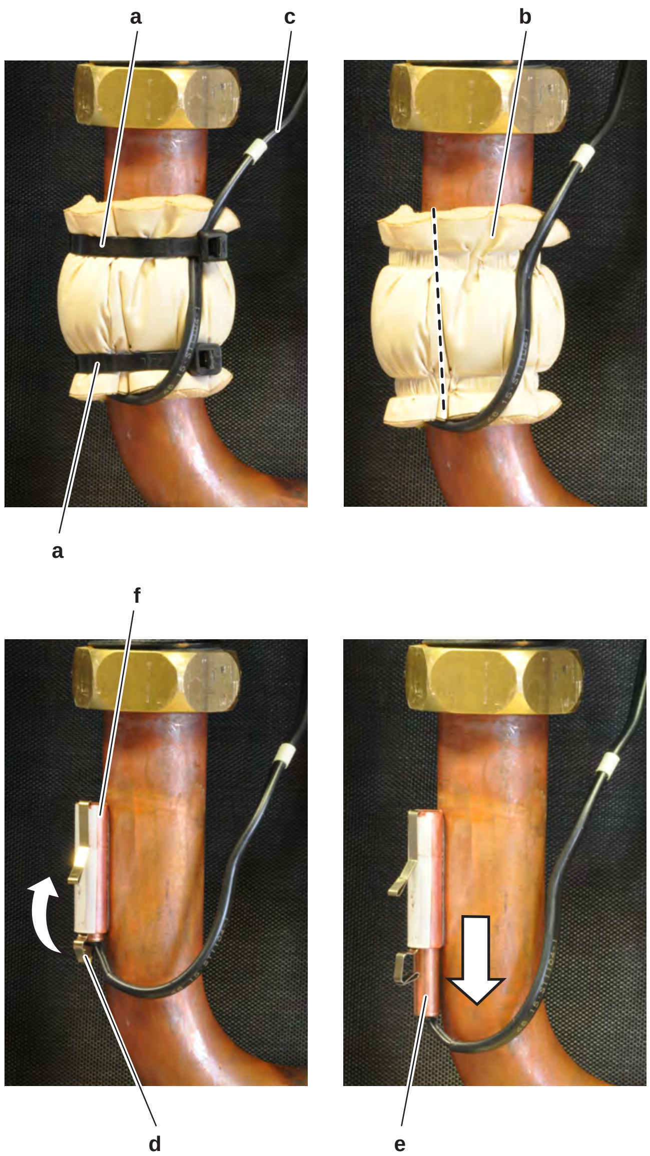
Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Locate the thermistor that needs to be removed.

2 Remove the thermistor from the thermistor holder as follows:

- For air (ambient) thermistor:
  Open the thermistor holder and remove the thermistor from the holder.

- For refrigerant piping thermistors:
  - Cut the tie straps that fix the insulation and the thermistor wire.
  - Cut and remove the insulation.
  - Pull the clip that fixes the thermistor.
  - Remove the thermistor from the thermistor holder.



a Tie strap
b Insulation
c Thermistor wire
d Clip
e Thermistor
f Thermistor holder

3 Cut all tie straps that fix the thermistor harness.

4 Disconnect the thermistor connector from the appropriate PCB and remove the thermistor.

> **INFORMATION**
>
> Some of the thermistors are wired to the same connector. See connector and pin information of the thermistors at the start of the electrical check procedure and "6.2 Wiring diagram" [▸ 370]. ALWAYS replace the complete set of thermistors wired to the same connector.

5 When removing the complete set of thermistors wired to the same connector:

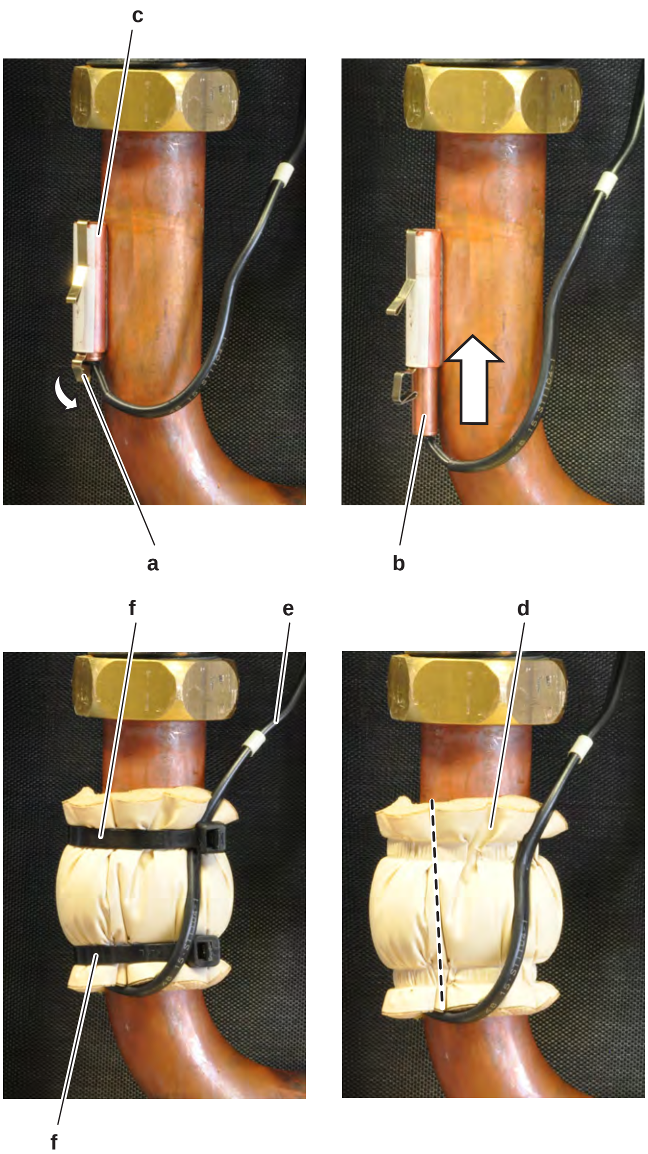
- Remove all other thermistors wired to the connector from their thermistor holder,
- Disconnect the thermistor connector,
- Remove the complete set of thermistors.

6 To install the thermistor, see "Repair procedures" [▸ 288].

To install the thermistor

1 Install the thermistor in the thermistor holder as follows:

- For air (ambient) thermistor:
  Correctly install the thermistor in the holder and close the thermistor holder.
- For refrigerant piping thermistors:
  Pull the clip and install the thermistor in the specific thermistor holder. Make sure the clip is in the correct position (blocking the thermistor).



a Clip
b Thermistor
c Thermistor holder
d Insulation
e Thermistor wire
f Tie strap

2 Route the thermistor harness towards the appropriate PCB.

3 Connect the thermistor connector to the appropriate PCB.

> **INFORMATION**
>
> Some of the thermistors are wired to the same connector. See connector and pin information of the thermistors at the start of the electrical check procedure and "6.2 Wiring diagram" [▶ 370]. ALWAYS replace the complete set of thermistors wired to the same connector.

4 When installing the complete set of thermistors wired to the same connector:
- Install all other thermistors wired to the connector in their thermistor holder,
- Route the thermistor harness of all thermistors towards the appropriate PCB or intermediate connector,
- Connect the thermistor connector.

> **WARNING**
>
> When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

5 Fix the thermistor harness using new tie straps

6 Install the insulation around the thermistor.

7 Fix the insulation and the thermistor wire using new tie straps.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.27.2 Water side thermistors

Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a mechanical check of the specific thermistor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▶ 261].

2 Locate the thermistor and remove the insulation if needed. Check that the thermistor is correctly installed and that there is thermal contact between the thermistor and the piping.

Is the thermistor correctly installed (thermal contact between the thermistor and the piping)?	Action
Yes	Perform an electrical check of the specific thermistor, see "Checking procedures" [▶ 291].
No	Correctly install the thermistor, see "Repair procedures" [▶ 297].

To perform an electrical check of the specific thermistor

1. First perform a mechanical check of the thermistor, see "Checking procedures" [▶ 291].
2. Locate the thermistor.

> **INFORMATION**
>
> Remove the thermistor from its holder if not reachable with a contact thermometer.

3. Measure the temperature using a contact thermometer.

Floor standing units

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Inlet water thermistor (indoor unit side)	R1T	Hydro (I/U)	X5A: 1-2	–	A
Outlet water after backup heater thermistor	R2T	Hydro (I/U)	X6A: 1-2	–	A
Domestic hot water tank thermistor	R5T	Hydro (I/U)	X9A: 1-2	–	A
Domestic hot water tank thermistor (TOP)	R8T	Hydro (I/U)	X4A: 1-3	X8Y: 1-2	A
Inlet water thermistor (outdoor unit side)	R9T	A4P (O/U)	X11A: 1-2	–	A
Outlet water after plate type heat exchanger thermistor	R10T	A4P (O/U)	X12A: 1-2	–	A

Wall mounted units

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Inlet water thermistor (indoor unit side)	R1T	Hydro (I/U)	X5A: 1-2	–	A
Outlet water after backup heater thermistor	R2T	Hydro (I/U)	X6A: 1-2	–	A
Domestic hot water tank thermistor (ONLY with optional domestic hot water tank installed)	R5T	Hydro (I/U)	X9A: 1-2	–	For domestic hot water tank EKHWP: A For domestic hot water tank EKHWS or third party domestic hot water tank: B
Inlet water thermistor (outdoor unit side)	R9T	A4P (O/U)	X11A: 1-2	–	A
Outlet water after plate type heat exchanger thermistor	R10T	A4P (O/U)	X12A: 1-2	–	A

INFORMATION

When an optional bizone kit is installed, it contains an outlet water thermistor bizone. For more information about the bizone kit, see documentation of the bizone kit.

Bizone units

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Inlet water thermistor (indoor unit side)	R1T	Hydro (I/U)	X5A: 1-2	–	A

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Outlet water after backup heater thermistor	R2T	Hydro (I/U)	X6A: 1-2	–	A
Domestic hot water tank thermistor	R5T	Hydro (I/U)	X9A: 1-2	–	A
Outlet water thermistor bizone	R7T	Bizone (I/U)	X3A: 5-6	–	A
Domestic hot water tank thermistor (TOP)	R8T	Hydro (I/U)	X4A: 1-3	X8Y: 1-2	A
Inlet water thermistor (outdoor unit side)	R9T	A4P (O/U)	X11A: 1-2	–	A
Outlet water after plate type heat exchanger thermistor	R10T	A4P (O/U)	X12A: 1-2	–	A

4 Determine the thermistor resistance that matches the measured temperature.

Thermistor – Table A

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
–20	197.81	10	39.96	40	10.63	70	3.44
–19	186.53	11	38.08	41	10.21	71	3.32
–18	175.97	12	36.30	42	9.81	72	3.21
–17	166.07	13	34.62	43	9.42	73	3.11
–16	156.80	14	33.02	44	9.06	74	3.01
–15	148.10	15	31.50	45	8.71	75	2.91
–14	139.94	16	30.06	46	8.37	76	2.82
–13	132.28	17	28.70	47	8.05	77	2.72
–12	125.09	18	27.41	48	7.75	78	2.64
–11	118.34	19	26.18	49	7.46	79	2.55
–10	111.99	20	25.01	50	7.18	80	2.47

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
–9	106.03	21	23.91	51	6.91		
–8	100.41	22	22.85	52	6.65		
–7	95.14	23	21.85	53	6.41		
–6	90.17	24	20.90	54	6.65		
–5	85.49	25	20.00	55	6.41		
–4	81.08	26	19.14	56	6.18		
–3	76.93	27	18.32	57	5.95		
–2	73.01	28	17.54	58	5.74		
–1	69.32	29	16.80	59	5.14		
0	65.84	30	16.10	60	4.87		
1	62.54	31	15.43	61	4.70		
2	59.43	32	14.79	62	4.54		
3	56.49	33	14.18	63	4.38		
4	53.71	34	13.59	64	4.23		
5	51.09	35	13.04	65	4.08		
6	48.61	36	12.51	66	3.94		
7	46.26	37	12.01	67	3.81		
8	44.05	38	11.52	68	3.68		
9	41.95	39	11.06	69	3.56		

Thermistor – Table B

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
0	806.5	40	118.7	80	25.38	120	7.131
5	618.9	45	96.13	85	21.37	125	6.181
10	478.8	50	78.29	90	18.06	130	5.374
15	373.1	55	64.1	95	15.33	135	4.686
20	292.9	60	52.76	100	13.06	140	4.098
25	231.4	65	43.63	105	11.17	145	3.594
30	184.1	70	36.26	110	9.585	150	3.161
35	147.4	75	30.27	115	8.254		

5 Disconnect the thermistor connector from the appropriate PCB and measure the resistance between the appropriate pins of the thermistor connector.

6 Check that the measured resistance value matches the resistance determined through the measured temperature (earlier step in the procedure). E.g. R1T thermistor:

- Measured temperature with contact thermometer: 23.1°C,
- Resistance value determined through temperature (using the thermistor table A):
  Resistance at 23°C: 21.85 kΩ,
  Resistance at 24°C: 20.90 kΩ,
- Disconnect connector and measure resistance between X5A pin 1-2:
  Measured resistance: 21.86 kΩ,
- Measured resistance value is inside the range. R1T thermistor passes the check.

INFORMATION

All thermistors have a resistance tolerance of 3%.

INFORMATION

In most cases, the user interface allows to monitor the thermistors.

If the measured resistance value matches the resistance determined through the measured temperature, but the temperature for the corresponding thermistor is NOT correct on the user interface display, replace the applicable PCB.

INFORMATION

See the overview of the thermistors at the start of the procedure and the "6.2 Wiring diagram" [▶ 370] to determine if the specific thermistor is either:

- Directly connected to the PCB
- Connected to an intermediate connector which is connected to the PCB

For thermistors directly connected to the PCB

Does the measured resistance of the thermistor match with the temperature determined resistance?	Then
Yes	Thermistor is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the specific thermistor, see "Repair procedures" [▶ 297].

For thermistors connected to an intermediate connector

Does the measured resistance of the thermistor match with the temperature determined resistance?	Action
Yes	Thermistor is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

7 Disconnect the thermistor from the intermediate connector and measure the resistance of the thermistor (between the appropriate pins of the connector).

Does the measured resistance of the thermistor match with the temperature determined resistance?	Action
Yes	Correct the wiring between the thermistor connector on the PCB and the intermediate connector, see "6.2 Wiring diagram" [▶ 370].
No	Replace the specific thermistor, see "Repair procedures" [▶ 297].

Repair procedures

To remove the thermistor

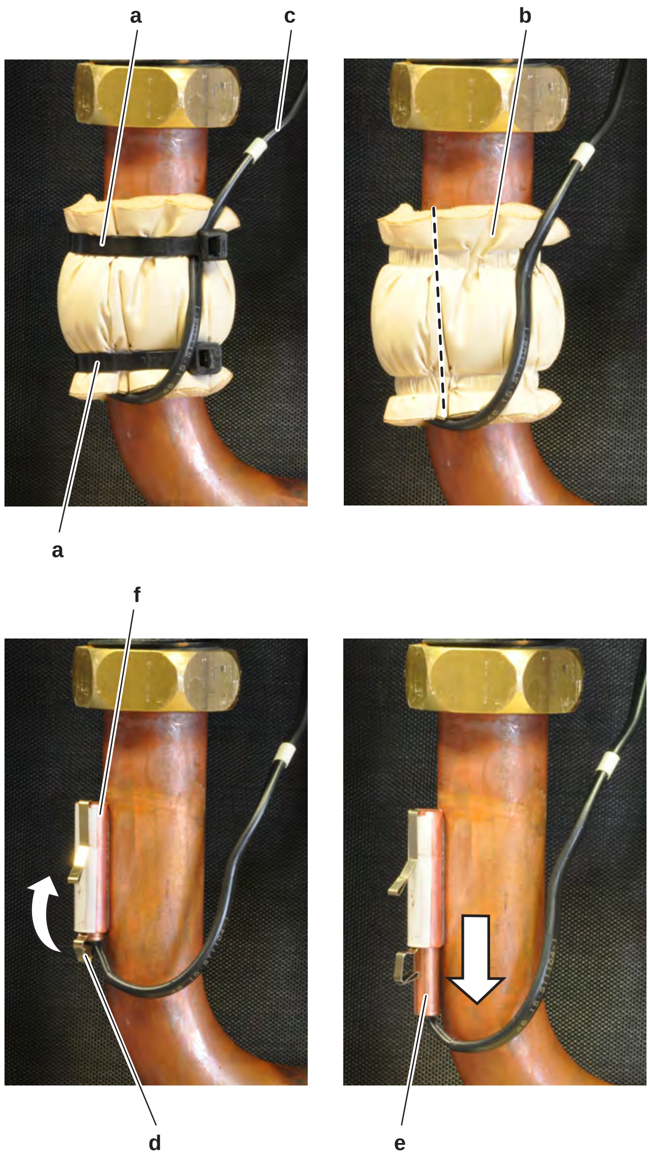
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Locate the thermistor that needs to be removed.

2 Cut the tie straps that fix the insulation and the thermistor wire.



a Tie strap
b Insulation

c Thermistor wire
d Clip
e Thermistor
f Thermistor holder

3 Cut and remove the insulation.

4 Pull the clip that fixes the thermistor.

5 Remove the thermistor from the thermistor holder.

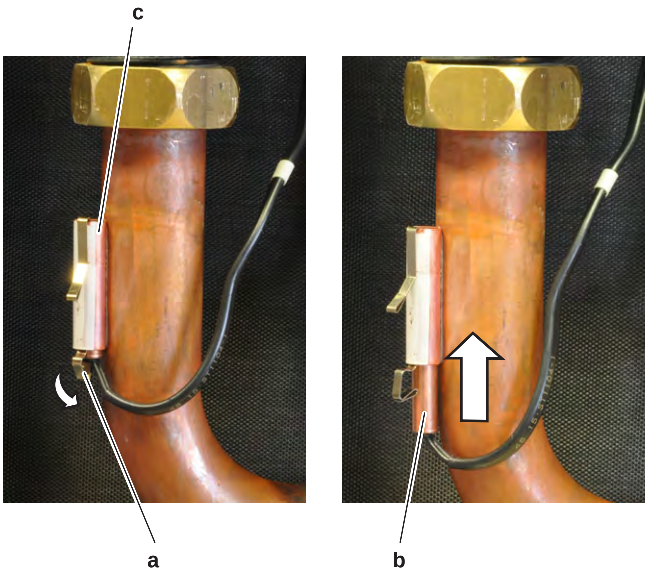
> **INFORMATION**
>
> See the overview of the thermistors at the start of the electrical check procedure and the "6.2 Wiring diagram" [▶ 370] to determine if the specific thermistor is either:
>
> - Directly connected to the PCB
> - Connected to an intermediate connector which is connected to the PCB

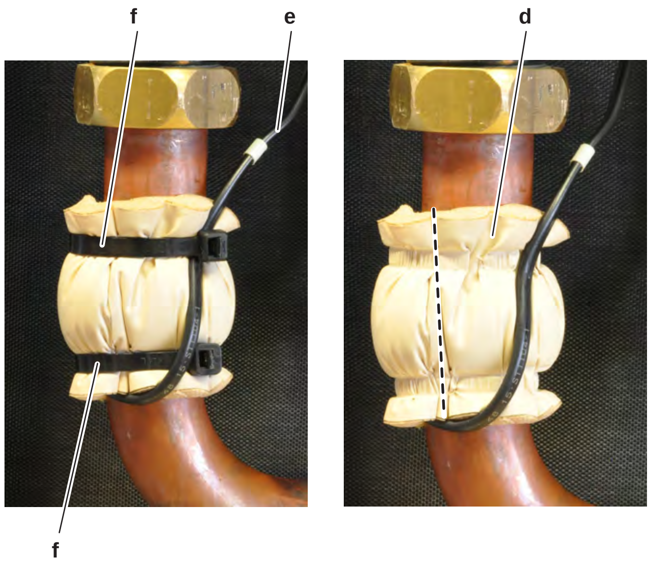
6 If connected to an intermediate connector, disconnect the thermistor connector from the intermediate connector. If directly connected to the PCB, disconnect the thermistor connector from the PCB.

7 To install the thermistor, see "Repair procedures" [▶ 297].

To install the thermistor

1 Pull the clip and install the thermistor in the specific thermistor holder. Make sure the clip is in the correct position (blocking the thermistor).





- **a** Clip
- **b** Thermistor
- **c** Thermistor holder
- **d** Insulation
- **e** Thermistor wire
- **f** Tie strap

2. Install the insulation around the thermistor.
3. Fix the insulation and the thermistor wire using new tie straps.

> **INFORMATION**
>
> See the overview of the thermistors at the start of the electrical check procedure and the "6.2 Wiring diagram" [▸ 370] to determine if the specific thermistor is either:
>
> - Directly connected to the PCB
> - Connected to an intermediate connector which is connected to the PCB

4. If connected to an intermediate connector, connect the thermistor connector to the intermediate connector. If directly connected to the PCB, connect the thermistor connector to the appropriate PCB.

> **WARNING**
>
> When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.27.3 Other thermistors

Checking procedures

To perform a mechanical check of the external thermistor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Locate the thermistor.
2. Remove the insulation if needed. Check that the thermistor is correctly installed and that there is thermal contact between the thermistor and the piping or ambient.

Is the thermistor correctly installed (thermal contact between the thermistor and the piping or ambient)?	Action
Yes	Perform an electrical check of the specific thermistor, see "Checking procedures" [▶ 299].
No	Correctly install the thermistor, see "Repair procedures" [▶ 304].

To perform an electrical check of the external thermistor

Prerequisite: First perform a mechanical check of the thermistor, see "Checking procedures" [▶ 299].

1. Locate the thermistor:

> **INFORMATION**
>
> Remove the thermistor from its holder if not reachable with a contact thermometer.

2. Measure the temperature using a contact thermometer.

Name	Symbol	Location (PCB)	Connector (pins)	Unit terminal (wires)	Reference (table)
External indoor or outdoor ambient thermistor	R6T	Hydro	X22A: 1-2	X5M: 8-7	A

3. Determine the thermistor resistance that matches the measured temperature.

Thermistor – Table A

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
–20	197.81	10	39.96	40	10.63	70	3.44
–19	186.53	11	38.08	41	10.21	71	3.32
–18	175.97	12	36.30	42	9.81	72	3.21
–17	166.07	13	34.62	43	9.42	73	3.11
–16	156.80	14	33.02	44	9.06	74	3.01
–15	148.10	15	31.50	45	8.71	75	2.91
–14	139.94	16	30.06	46	8.37	76	2.82
–13	132.28	17	28.70	47	8.05	77	2.72
–12	125.09	18	27.41	48	7.75	78	2.64
–11	118.34	19	26.18	49	7.46	79	2.55
–10	111.99	20	25.01	50	7.18	80	2.47

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
–9	106.03	21	23.91	51	6.91		
–8	100.41	22	22.85	52	6.65		
–7	95.14	23	21.85	53	6.41		
–6	90.17	24	20.90	54	6.65		
–5	85.49	25	20.00	55	6.41		
–4	81.08	26	19.14	56	6.18		
–3	76.93	27	18.32	57	5.95		
–2	73.01	28	17.54	58	5.74		
–1	69.32	29	16.80	59	5.14		
0	65.84	30	16.10	60	4.87		
1	62.54	31	15.43	61	4.70		
2	59.43	32	14.79	62	4.54		
3	56.49	33	14.18	63	4.38		
4	53.71	34	13.59	64	4.23		
5	51.09	35	13.04	65	4.08		
6	48.61	36	12.51	66	3.94		
7	46.26	37	12.01	67	3.81		
8	44.05	38	11.52	68	3.68		
9	41.95	39	11.06	69	3.56		

4 Disconnect the thermistor connector from the appropriate PCB.

5 Measure the resistance between the appropriate pins of the thermistor.

6 Check that the measured resistance value matches the resistance determined through the measured temperature (earlier step in the procedure). E.g. R6T thermistor:

- Measured temperature with contact thermometer: 23.1°C,
- Resistance value determined through temperature (using the thermistor table A):
  Resistance at 23°C: 21.85 kΩ,
  Resistance at 24°C: 20.90 kΩ,
- Disconnect connector and measure resistance between X22A pin 1-2:
  Measured resistance: 21.86 kΩ,
- Measured resistance value is inside the range. R6T thermistor passes the check.

INFORMATION

All thermistors have a resistance tolerance of 3%.

INFORMATION

In most cases, the user interface allows to monitor the thermistors.

If the measured resistance value matches the resistance determined through the measured temperature, but the temperature for the corresponding thermistor is NOT correct on the user interface display, replace the applicable PCB.

Does the measured resistance of the thermistor match with the temperature determined resistance?	Action
Yes	Thermistor is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

INFORMATION

Make sure that the wiring between the wiring terminal on the unit and the thermistor is properly connected and NOT damaged (check continuity), see "6.2 Wiring diagram" [▸ 370].

7 Disconnect the thermistor wiring from the wiring terminal on the unit and measure the resistance of the thermistor (between the thermistor wires).

Does the measured resistance of the thermistor match with the temperature determined resistance?	Action
Yes	Correct the wiring between the wiring terminal on the unit and the thermistor connector on the PCB, see "6.2 Wiring diagram" [▸ 370].
No	Replace the specific thermistor, see "Repair procedures" [▸ 304].

To perform an electrical check of the fin thermistor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Locate the thermistor on the appropriate PCB.

2 Measure the temperature using a contact thermometer.

Name	Symbol	Location (PCB)	Connector (pins)	Reference (table)
Radiation fin thermistor	R11T	▪ Single phase units: Main (O/U) ▪ Three phase units: Inverter (O/U)	X111A: 1-2	A

INFORMATION

The thermistors may vary according to the specific unit.

3 Determine the thermistor resistance that matches the measured temperature.

Thermistor – Table A

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
–20	197.81	10	39.96	40	10.63	70	3.44
–19	186.53	11	38.08	41	10.21	71	3.32
–18	175.97	12	36.30	42	9.81	72	3.21
–17	166.07	13	34.62	43	9.42	73	3.11
–16	156.80	14	33.02	44	9.06	74	3.01
–15	148.10	15	31.50	45	8.71	75	2.91
–14	139.94	16	30.06	46	8.37	76	2.82
–13	132.28	17	28.70	47	8.05	77	2.72
–12	125.09	18	27.41	48	7.75	78	2.64
–11	118.34	19	26.18	49	7.46	79	2.55
–10	111.99	20	25.01	50	7.18	80	2.47
–9	106.03	21	23.91	51	6.91		
–8	100.41	22	22.85	52	6.65		
–7	95.14	23	21.85	53	6.41		
–6	90.17	24	20.90	54	6.65		
–5	85.49	25	20.00	55	6.41		
–4	81.08	26	19.14	56	6.18		
–3	76.93	27	18.32	57	5.95		
–2	73.01	28	17.54	58	5.74		
–1	69.32	29	16.80	59	5.14		
0	65.84	30	16.10	60	4.87		
1	62.54	31	15.43	61	4.70		
2	59.43	32	14.79	62	4.54		
3	56.49	33	14.18	63	4.38		
4	53.71	34	13.59	64	4.23		
5	51.09	35	13.04	65	4.08		
6	48.61	36	12.51	66	3.94		
7	46.26	37	12.01	67	3.81		
8	44.05	38	11.52	68	3.68		
9	41.95	39	11.06	69	3.56		

4 Measure the resistance between the appropriate connection points of the thermistor.

5 Check that the measured resistance value matches the resistance determined through the measured temperature (earlier step in the procedure). E.g. R11T thermistor:

- Measured temperature with contact thermometer: 23.1°C,
- Resistance value determined through temperature (using the thermistor table A):
  Resistance at 20°C: 24.3 kΩ,
  Resistance at 25°C: 19.4 kΩ,
- Measure resistance between X111A pin 1-2:
  Measured resistance: 21.86 kΩ,
- Measured resistance value is inside the range. R11T thermistor passes the check.

INFORMATION

All thermistors have a resistance tolerance of 3%.

Does the measured resistance of the thermistor match with the temperature determined resistance?	Action
Yes	Thermistor is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the specific PCB, see "3 Components" [▸ 101].

Repair procedures

To remove the external thermistor

1 See the documentation of the specific thermistor for more details.

2 To install the external thermistor, see "Repair procedures" [▸ 288].

To install the external thermistor

1 Install the specific thermistor. See the documentation of the specific thermistor if needed for more details.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.28 User interface

3.28.1 User interface on unit

Checking procedures

INFORMATION

It is recommended to perform the checks in the listed order.

To check the power supply to the user interface

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the user interface panel from the unit, see "3.23 Plate work" [▶ 261]. Make sure to keep it connected electrically.

2 Turn ON the power to the unit.

3 Measure the voltage on the connector X1A pins 1-4 OR connector X1B pins 1-2 (depending on which connector is installed) on the user interface main PCB.

Result: The measured voltage MUST be 12 V DC.

Does the user interface receive power?	Action
Yes	Check if the user interface functions correctly, see "Checking procedures" [▶ 304].
No	Continue with the next step.

4 Measure the voltage on the connector X48A on the hydro PCB.

Result: The measured voltage MUST be 12 V DC.

Is the measured voltage correct?	Action
Yes	Correct the wiring between the hydro PCB and the user interface, see "6.2 Wiring diagram" [▶ 370].
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▶ 199].

To check the correct functioning of the user interface

Prerequisite: First perform a power check of the user interface, see "Checking procedures" [▶ 304].

1 Check the display for the following items:

- Pinhole, bright spot, black spot, white spot, black line, white line, foreign particle, bubble:
  The color of a small area is different from the remainder. The phenomenon does NOT change with voltage.
- Contrast variation:
  The color of a small area is different from the remainder. The phenomenon changes with voltage.
- Polarizer defect:
  Scratch, dirt, particle, bubble on polarizer or between polarizer and glass.
- Dot defect:
  The pixel appears bright or dark abnormally.
- Functional defect:
  No display, abnormal display, open or missing segment, short circuit, false viewing direction.
- Glass defect:
  Glass cracks, shaved corner of glass, surplus glass.

2 Check that information is shown correctly and can be navigated through on the display of the user interface.

3 Check that settings can be changed and saved, see "Repair procedures" [▶ 307].

Does the user interface function correctly?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

4 Perform a check of the communication wiring between the user interface and the unit PCB.

> **INFORMATION**
>
> Malfunction of the user interface might ALSO be caused by a faulty user interface PCB. Replace relevant PCB as needed, see "Repair procedures" [▶ 307].

Is the communication wiring correct?	Action
Yes	Replace the relevant part of the user interface, see "Repair procedures" [▶ 307].
No	Correct the wiring between the user interface and the unit PCB, see "6.2 Wiring diagram" [▶ 370].

To check the settings

1 See the relevant documentation (installer reference guide, ...) to check the specific setting.

Is the setting correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Adjust the specific setting see "Repair procedures" [▶ 307].

To check the software and EEPROM version

1 Compare the software ID and EEPROM version of the user interface and the PCB with the ones provided in the Updater Tool. Re-install the software with the Updater Tool if versions do NOT match.

Is the installed software and EEPROM version correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Re-install the software with the Updater Tool see "Repair procedures" [▶ 307].

To check the communication wiring between the user interface and the unit PCB

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the user interface panel from the unit, see "3.23 Plate work" [▶ 261]. Make sure to keep it connected electrically.

2 Make sure that all wires between the user interface connector X1A OR X1B (depending on which connector is installed) and the connector X18A on the hydro PCB are firmly and correctly connected, see "6.2 Wiring diagram" [▶ 370].

3 Check the continuity of all wires.

4 Replace any damaged or broken wires.

> **INFORMATION**
>
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

Repair procedures

To remove the user interface

TO REMOVE THE USER INTERFACE MAIN PCB

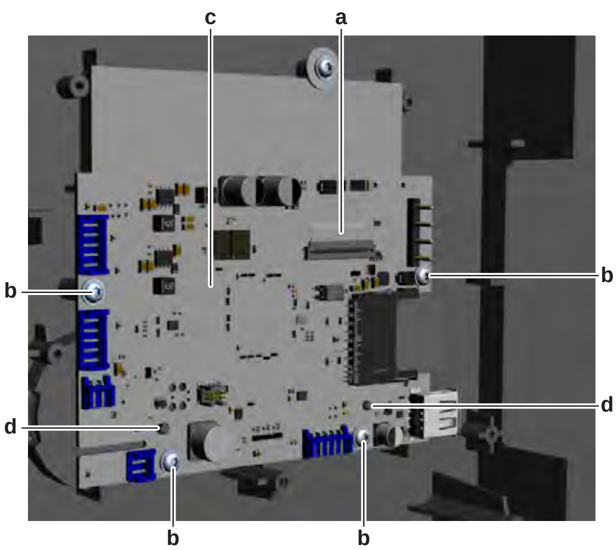
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the user interface panel from the unit, see "3.23 Plate work" [▶ 261].

2 Remove the 4 screws and remove the cover at the back of the user interface panel.

3 Disconnect all wire connectors from the user interface main PCB.



a Display connector
b Screw
c User interface main PCB
d PCB support

4 Disconnect the display connector from the user interface main PCB.

5 Remove the 4 screws from the user interface main PCB.

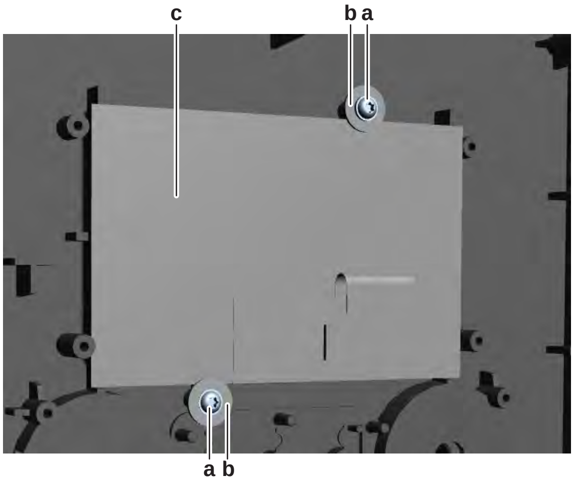
6 Carefully pull the user interface display PCB and unlatch the PCB supports one by one using a small pliers.

7 Carefully remove the user interface main PCB from the user interface panel while guiding the display connector through the hole in the PCB.

TO REMOVE THE USER INTERFACE DISPLAY

Prerequisite: Remove the user interface main PCB.

1 Remove the 2 screws and remove the 2 spacers.



a Screw
b Spacer
c User interface display

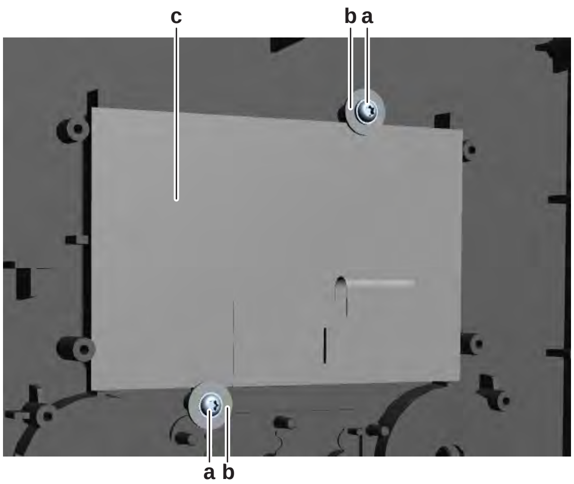
2 Carefully pull and remove the display from the user interface panel.

3 To install the user interface, see "Repair procedures" [▸ 307].

To install the user interface

TO INSTALL THE USER INTERFACE DISPLAY

1 Install the user interface display in the correct location and correct orientation on the user interface panel.



a Screw
b Spacer
c User interface display

2 Install the 2 spacers. Install and tighten the 2 screws to fix the user interface display.

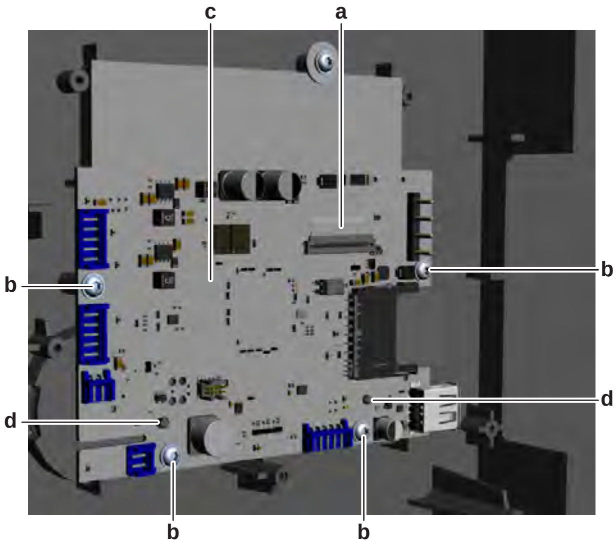
TO INSTALL THE USER INTERFACE MAIN PCB

Prerequisite: Make sure the user interface display is correctly installed.

1 Route the display connector through the hole in the user interface main PCB.

2 Carefully install the user interface main PCB on its PCB supports and make sure the display connector is positioned correctly.

3 Fix the user interface main PCB using the 4 screws.



a Display connector
b Screw
c User interface main PCB
d PCB support

4 Connect the display connector to the user interface main PCB.

WARNING

When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

5 Connect all wire connectors to the user interface main PCB.

6 Install the cover and fix it using the 4 screws.

7 Install the user interface panel on the unit.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To adjust the settings

1 See the relevant documentation (installer reference guide, …) to adjust the specific setting.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To install the software

1 Install the software using the Updater Tool. See the Daikin Business Portal (authentication required) for more information about the Updater Tool.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.28.2 Remote controller user interface

Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To check the correct functioning of the remote controller user interface

1. Check the display for the following items:
   - Pinhole, bright spot, black spot, white spot, black line, white line, foreign particle, bubble:
     The color of a small area is different from the remainder. The phenomenon does NOT change with voltage.
   - Contrast variation:
     The color of a small area is different from the remainder. The phenomenon changes with voltage.
   - Polarizer defect:
     Scratch, dirt, particle, bubble on polarizer or between polarizer and glass.
   - Dot defect:
     The pixel appears bright or dark abnormally.
   - Functional defect:
     No display, abnormal display, open or missing segment, short circuit, false viewing direction.
   - Glass defect:
     Glass cracks, shaved corner of glass, surplus glass.
2. Check that information is shown correctly and can be navigated through on the display of the remote controller user interface.
3. Check that settings can be changed and saved, see "Repair procedures" [▶ 311].

Does the remote controller user interface function correctly?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

4. Perform a check of the communication wiring between the remote controller and the unit PCB.

Communication wiring is correct?	Action
Yes	Replace the remote controller user interface, see "Repair procedures" [▶ 311].

Communication wiring is correct?	Action
No	Correct the wiring between the remote controller and the unit PCB, see "6.2 Wiring diagram" [▶ 370].

To check the settings

1 See the relevant documentation (installer reference guide, remote controller manual, ...) to check if the specific setting is correct.

Is the setting correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Adjust the specific setting see "Repair procedures" [▶ 311].

To check the software and EEPROM version

1 Compare the software ID and EEPROM version of the remote controller user interface and the PCB with the ones provided in the Updater Tool. Re-install the software with the Updater Tool if versions do NOT match.

Is the installed software and EEPROM version correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Re-install the software with the Updater Tool see "Repair procedures" [▶ 311].

To check the communication wiring between the remote controller and the unit PCB

1 Make sure that all wires between the remote controller user interface P1/P2 and the connector X18A on the hydro PCB are firmly and correctly connected, see "6.2 Wiring diagram" [▶ 370].

2 Check the continuity of all wires.

3 Replace any damaged or broken wires.

> **INFORMATION**
>
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

Repair procedures

To remove the user interface

1 See relevant manual of the user interface (remote controller) for the correct procedure.

2 To intall the user interface, see "Repair procedures" [▶ 311].

To install the user interface

1 See relevant manual of the user interface (remote controller) for the correct procedure.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To adjust the settings

1 See the relevant documentation (installer reference guide, remote controller manual, …) to adjust the specific setting.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To install the software

1 Install the software using the Updater Tool. See the Business Portal (http://www.mydaikin.eu) for more information about the Updater Tool.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.29 Water flow sensor

3.29.1 Checking procedures

To perform an electrical check of the water flow sensor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Turn ON the power of the unit.

2 Activate `Installer` on the user interface. See the installer reference guide for the correct procedure.

3 Go to `Actuator test run` via the user interface.

4 Activate the `Pump`.

5 Select `Flow rate`.

Result: The displayed flow rate MUST be 5~60 l/min.

6 Measure the water flow with a calibrated external flow meter.

7 Measure the frequency on connector X34A between pins 2-3 (= flow sensor output signal) on the hydro PCB.

> **INFORMATION**
>
> The flow sensor connector MUST be plugged into X34A on hydro PCB.

8 Using the following formula, calculate the water flow rate:

Flow rate [l/min] = (output frequency [Hz]/200) x 60

9 Check that the calculated water flow rate is in line with the measured water flow.

> **INFORMATION**
>
> In most cases, the user interface allows to monitor the water flow.
>
> If the calculated water flow matches the measured water flow, but the water flow is NOT correct on the user interface display, replace the applicable PCB.

Do the measured and calculated water flow match?	Action
Yes	Water flow sensor is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

10 Unplug the water flow sensor connector X34A and measure the voltage (power supply) between pins 1–2 on hydro PCB.

Result: The measured voltage MUST be +5 V DC.

Is measured voltage +5 V DC?	Then
Yes	Continue with the next step.
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▶ 199].

11 Disconnect the water flow sensor harness from the water flow sensor and from the connector X34A. Measure the continuity of the wiring harness.

Is continuity of the wiring harness correct?	Action
Yes	Replace the water flow sensor, see "3.29.2 Repair procedures" [▶ 313].
No	Replace the water flow sensor harness, see "3.29.2 Repair procedures" [▶ 313].

3.29.2 Repair procedures

To remove the water flow sensor wiring harness

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Floor standing and Bizone units ONLY: Lower the switch box, see "3.23 Plate work" [▶ 261].

2 Disconnect the connector from the water flow sensor.

3 Disconnect the other end of the wiring harness from the hydro PCB.

4 Cut all tie straps that fix the wiring harness, and remove the wiring harness from the unit.

5 To install the water flow sensor wiring harness, see "3.29.2 Repair procedures" [▸ 313].

To install the water flow sensor wiring harness

1 Connect the wiring harness to the connector X34A on the hydro PCB.

2 Route the wiring harness towards the water flow sensor and connect the wiring harness to the water flow sensor.

3 Fix the wiring harness using new tie straps.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To remove the water flow sensor

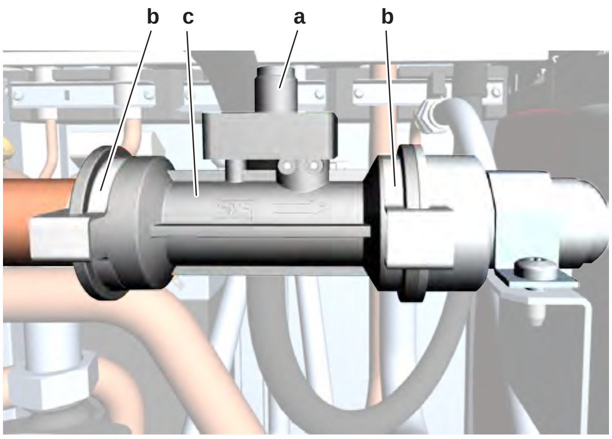
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "3.23 Plate work" [▸ 261].

2 Drain the water circuit, see "4.3.2 Repair procedures" [▸ 356].

3 Loosen the water flow sensor connector nut.



a Water flow sensor connector nut
b Clip
c Water flow sensor

4 Unplug the water flow sensor harness from the water flow sensor.

5 Remove the 2 clips that fix the water flow sensor.

6 Remove the water flow sensor.

7 Clean any spilled water.

8 To install the new water flow sensor, see "3.29.2 Repair procedures" [▸ 313].

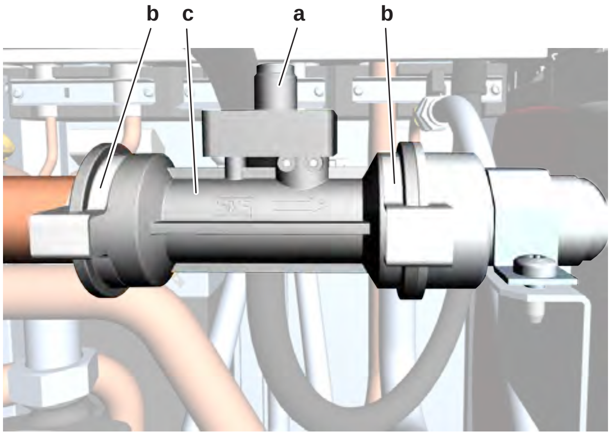
To install the water flow sensor

> **NOTICE**
> Check the condition of the O-rings and replace if needed. Apply water to the O-rings before installation.

1 Mount the O-rings on the water flow sensor.

2 Install the water flow sensor on the inlet pipe. Ensure that the O-ring does NOT get damaged.

3 Slide the clip over the connection until it snaps into place.



a Water flow sensor connector nut
b Clip
c Water flow sensor

4 Install the water flow sensor on the outlet pipe. Ensure that the O-ring does NOT get damaged.

5 Slide the clip over the connection until it snaps into place.

6 Connect the water flow sensor harness to the water flow sensor.

7 Tighten the water flow sensor connector nut.

INFORMATION

Replace all cable ties that were cut during removal.

8 Open the valve (if equipped) of the water circuit towards the expansion vessel.

CAUTION

Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

9 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▶ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.30 Water pressure sensor

3.30.1 Floor standing and Bizone units

Checking procedures

To perform an electrical check of the water pressure sensor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

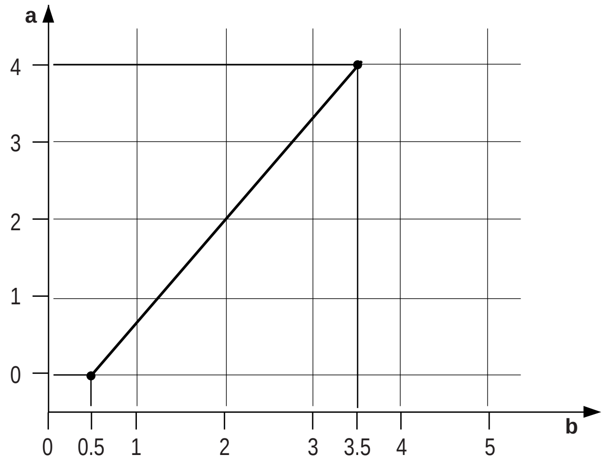
1 Turn ON the power of the unit.

2 Read the water pressure on the home screen of the user interface.

Result: The pressure MUST be 1~2 bar.

3 Measure the water pressure using a pressure gauge.

4 Using the graphic below, determine the expected sensor output voltage based on the measured pressure.



a Pressure (bar)
b Output voltage (V)

V DC	Detected pressure (bar)
0.5	0.00
0.6	0.13
0.7	0.26
0.8	0.40
0.9	0.53
1.0	0.66
1.1	0.80
1.2	0.93
1.3	1.06
1.4	1.20
1.5	1.33
1.6	1.46
1.7	1.59

V DC	Detected pressure (bar)
1.8	1.73
1.9	1.86
2.0	1.99
2.1	2.13
2.2	2.26
2.3	2.39
2.4	2.53
2.5	2.66
2.6	2.79
2.7	2.9
2.8	3.06
2.9	3.19
3.0	3.32
3.1	3.46
3.2	3.59
3.3	3.72
3.4	3.86
3.5	3.99

INFORMATION

The water pressure sensor connector MUST be plugged into the appropriate PCB.

5 Measure the voltage on connector X60A between pins 2–3 (= water pressure sensor output) on the hydro PCB.

6 Check that the measured voltage is in line with the expected voltage through the measured water pressure.

INFORMATION

In most cases, the user interface allows to monitor the water pressure.

If the measured output voltage value matches the voltage determined through the measured water pressure, but the water pressure is NOT correct on the user interface display, replace the applicable PCB.

The measured voltage is inside the expected range?	Action
Yes	Water pressure sensor is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

7 With the water pressure sensor connector X7Y connected, measure the voltage between pin 1–2 (= water pressure output).

8 Check that the measured voltage is in line with the expected voltage through the measured water pressure.

The measured voltage is inside the expected range?	Action
Yes	Correct the wiring between the hydro PCB and the water pressure sensor connector X7Y, see "6.2 Wiring diagram" [▶ 370].
No	Continue with the next step.

9 Measure the voltage between pin 2–3 (= water pressure sensor power supply) of the water pressure sensor connector X7Y.

I measured voltage…	Then
Is +5 V DC	Skip the next step.
Is NOT +5 V DC	Continue with the next step in the procedure

10 Unplug the connector X60A and measure the voltage (power supply) between pin 3–4 on hydro PCB.

Is the measured voltage +5 V DC?	Action
Yes	Correct the wiring between the hydro PCB and the connector X7Y, see "6.2 Wiring diagram" [▶ 370].
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▶ 199].

11 Disconnect the connector from the water pressure sensor and the connector X7Y and measure the continuity of the wiring harness.

Is continuity of the wiring harness correct?	Action
Yes	Replace the water pressure sensor, see "Repair procedures" [▶ 318].
No	Replace the water pressure sensor harness, see "Repair procedures" [▶ 318].

Repair procedures

To remove the water pressure sensor wiring harness

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Floor standing and Bizone units ONLY: Lower the switch box, see "3.23 Plate work" [▶ 261].

2 Disconnect the connector from the water pressure sensor.

3 Disconnect the other end of the wiring harness from the connector X7Y.

4 Cut all tie straps that fix the wiring harness, and remove the wiring harness from the unit.

5 To install the water pressure sensor wiring harness, see "Repair procedures" [▶ 318].

To install the water pressure sensor wiring harness

1. Connect the wiring harness to the connector X7Y.
2. Route the wiring harness towards the water pressure sensor and connect the wiring harness to the water pressure sensor.
3. Fix the wiring harness using new tie straps.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

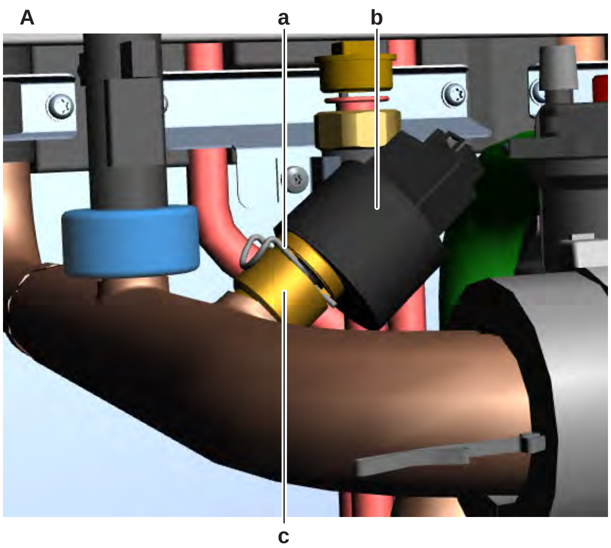
To remove the water pressure sensor

Prerequisite: Stop the unit operation via the user interface.

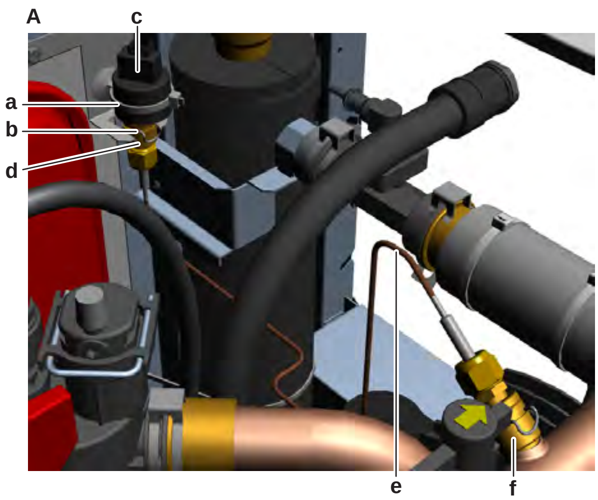
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Drain water from the water circuit, see "4.3.2 Repair procedures" [▶ 356].
2. Disconnect the water pressure sensor connector from the water pressure sensor.
3. ONLY for Heating + Cooling units: Cut the tie strap on the water pressure sensor.
4. Remove the clip that fixes the water pressure sensor to the coupling piece.



A Heating ONLY units
a Clip
b Water pressure sensor
c Coupling piece



A Heating+Cooling units
a Tie strap
b Clip
c Water pressure sensor
d Coupling piece
e Capillary tube
f Coupling piece

5 Push the water pressure sensor to release and remove it from the coupling piece. Remove the O-ring.

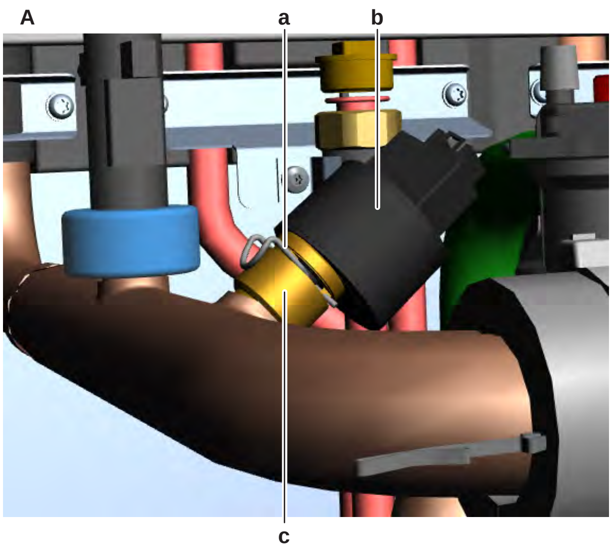
> **INFORMATION**
>
> For heating and cooling units: the capillary tube and joint adapters (coupling pieces) can ALSO be replaced as separate parts.

6 To install the water pressure sensor, see "Repair procedures" [▶ 318].

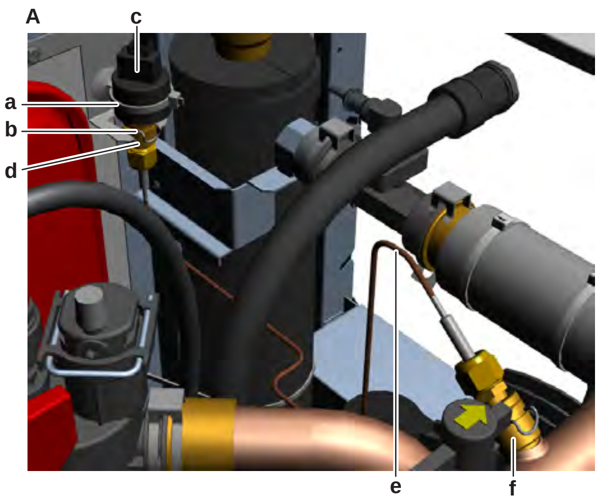
To install the water pressure sensor

1 Install the new O-ring in the coupling piece.

2 Install the water pressure sensor in the coupling piece and push to secure it.



A Heating ONLY units
a Clip
b Water pressure sensor
c Coupling piece



A Heating+Cooling units
a Tie strap
b Clip
c Water pressure sensor
d Coupling piece
e Capillary tube
f Coupling piece

3 Install the clip to secure the water pressure sensor to the coupling piece.

4 Connect the water pressure sensor connector to the water pressure sensor.

> **INFORMATION**
>
> Replace all cable ties that were cut during removal.

> **INFORMATION**
>
> For heating and cooling units: the capillary tube and joint adapters (coupling pieces) can ALSO be replaced as separate parts.

5 Open the valve (if equipped) of the water circuit towards the expansion vessel.

> **CAUTION**
>
> Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

6 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▸ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.30.2 Wall mounted units

Checking procedures

To perform an electrical check of the water pressure sensor

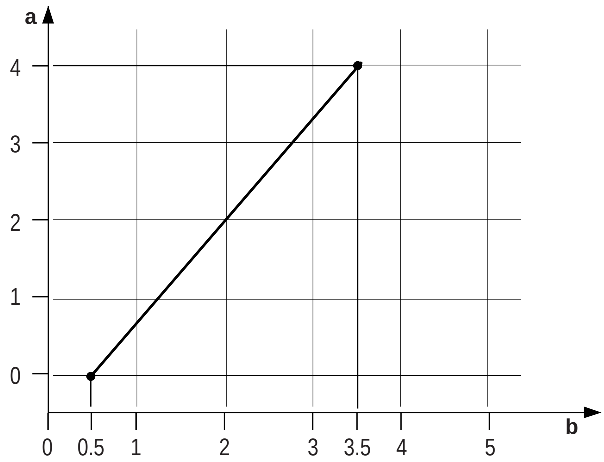
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Turn ON the power of the unit.
2. Read the water pressure on the home screen of the user interface.

   Result: The pressure MUST be 1~2 bar.
3. Using the graphic below, determine the expected sensor output voltage based on the measured pressure.



a Pressure (bar)
b Output voltage (V)

V DC	Detected pressure (bar)
0.5	0.00
0.6	0.13
0.7	0.26
0.8	0.40
0.9	0.53
1.0	0.66
1.1	0.80
1.2	0.93
1.3	1.06
1.4	1.20
1.5	1.33
1.6	1.46
1.7	1.59
1.8	1.73
1.9	1.86
2.0	1.99
2.1	2.13
2.2	2.26
2.3	2.39
2.4	2.53
2.5	2.66

V DC	Detected pressure (bar)
2.6	2.79
2.7	2.9
2.8	3.06
2.9	3.19
3.0	3.32
3.1	3.46
3.2	3.59
3.3	3.72
3.4	3.86
3.5	3.99

INFORMATION

The water pressure sensor connector MUST be plugged into the appropriate PCB.

4 Measure the voltage on connector X60A between pins 2–3 (= water pressure sensor output) on the hydro PCB.

5 Check that the measured voltage is in line with the expected voltage through the measured water pressure.

INFORMATION

In most cases, the user interface allows to monitor the water pressure.

If the measured output voltage value matches the voltage determined through the measured water pressure, but the water pressure is NOT correct on the user interface display, replace the applicable PCB.

The measured voltage is inside the expected range?	Action
Yes	Water pressure sensor is OK. Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

6 With the water pressure sensor connector X7Y connected, measure the voltage between pin 1–2 (= water pressure output).

7 Check that the measured voltage is in line with the expected voltage through the measured water pressure.

The measured voltage is inside the expected range?	Action
Yes	Correct the wiring between the hydro PCB and the water pressure sensor connector X7Y, see "6.2 Wiring diagram" [▶ 370].
No	Continue with the next step.

8 Measure the voltage between pin 2–3 (= water pressure sensor power supply) of the water pressure sensor connector X7Y.

I measured voltage…	Then
Is +5 V DC	Skip the next step.
Is NOT +5 V DC	Continue with the next step in the procedure

9 Unplug the connector X60A and measure the voltage (power supply) between pin 3–4 on hydro PCB.

Is the measured voltage +5 V DC?	Action
Yes	Correct the wiring between the hydro PCB and the connector X7Y, see "6.2 Wiring diagram" [▶ 370].
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▶ 199].

10 Disconnect the connector from the water pressure sensor and the connector X7Y and measure the continuity of the wiring harness.

Is continuity of the wiring harness correct?	Action
Yes	Replace the water pressure sensor, see "Repair procedures" [▶ 324].
No	Replace the water pressure sensor harness, see "Repair procedures" [▶ 324].

Repair procedures

To remove the water pressure sensor wiring harness

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1. Disconnect the connector from the water pressure sensor.
2. Disconnect the other end of the wiring harness from the connector X7Y.
3. Cut all tie straps that fix the wiring harness, and remove the wiring harness from the unit.
4. To install the water pressure sensor wiring harness, see "Repair procedures" [▶ 324].

To install the water pressure sensor wiring harness

1. Connect the wiring harness to the connector X7Y.
2. Route the wiring harness towards the water pressure sensor and connect the wiring harness to the water pressure sensor.
3. Fix the wiring harness using new tie straps.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To remove the water pressure sensor

Prerequisite: Stop the unit operation via the user interface.

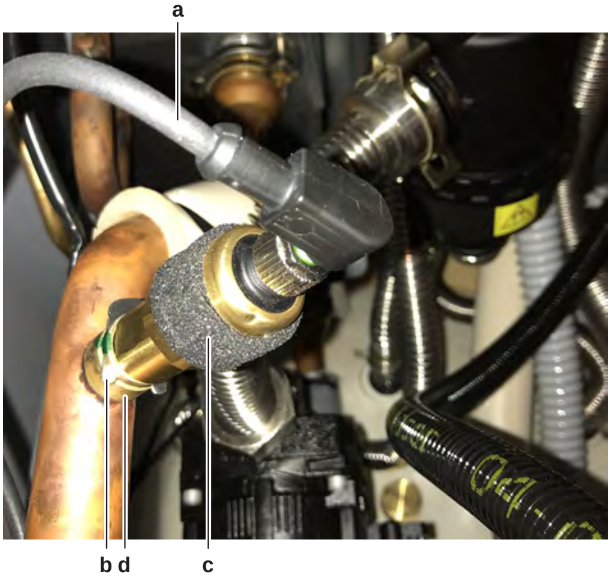
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Drain water from the water circuit, see "4.3.2 Repair procedures" [▶ 356].

2 Disconnect the water pressure sensor connector from the water pressure sensor.

3 Remove the clip that fixes the water pressure sensor to the coupling piece.



a Water pressure sensor harness
b Clip
c Water pressure sensor
d Coupling piece

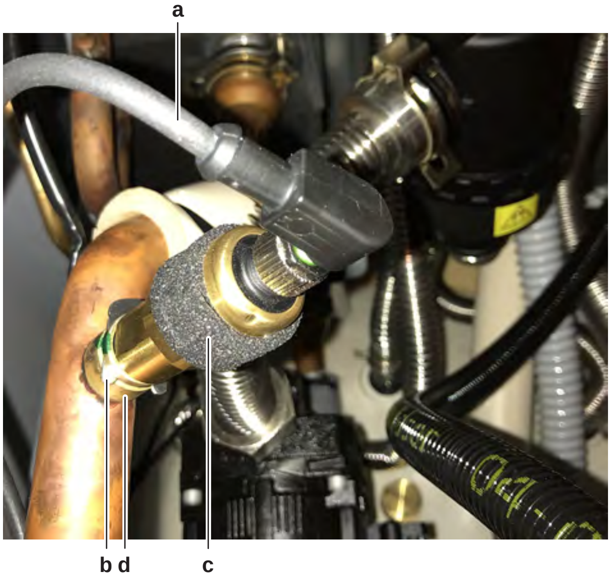
4 Push the water pressure sensor to release and remove it from the coupling piece. Remove the O-ring.

5 To install the water pressure sensor, see "Repair procedures" [▶ 324].

To install the water pressure sensor

1 Install the new O-ring in the coupling piece.

2 Install the water pressure sensor in the coupling piece and push to secure it.



a Water pressure sensor harness
b Clip
c Water pressure sensor

d Coupling piece

3 Install the clip to secure the water pressure sensor to the coupling piece.

4 Connect the water pressure sensor connector to the water pressure sensor.

> **INFORMATION**
>
> Replace all cable ties that were cut during removal.

5 Open the valve (if equipped) of the water circuit towards the expansion vessel.

> **CAUTION**
>
> Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

6 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▶ 356].

7 Purge the water circuit, see "4.3.2 Repair procedure" [▶ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.31 Water pump

3.31.1 Main pump

Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To perform a mechanical check of the water pump

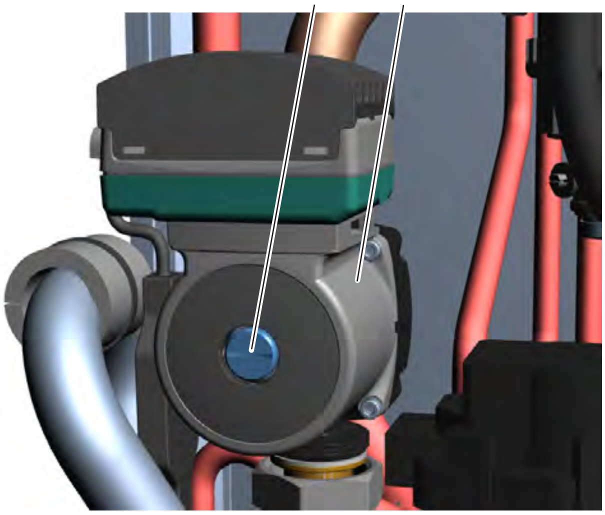
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Floor standing and Bizone units ONLY: Lower the switch box, see "3.23 Plate work" [▶ 261].

2 Remove the seal cover from the pump and insert a flat screwdriver in the slot of the rotor shaft of the water pump (through the hole in the pump motor cover); press and turn it to rotate the water pump rotor shaft.



a Seal
b Water pump motor

Does the rotor of the water pump motor rotate smoothly?	Action
Yes	Perform an electrical check of the water pump, see "Checking procedures" [▸ 326].
No	Continue with the next step.

3 Remove the water pump, see "Repair procedures" [▸ 331].

4 Check for impurities or any objects that may block the water pump.

Any impurities or objects found?	Action
Yes	Remove the impurities or objects that may block the water pump, see "Repair procedures" [▸ 331].
No	Replace the water pump, see "Repair procedures" [▸ 331].

To perform an electrical check of the water pump

1 First perform a mechanical check of the water pump, see "Checking procedures" [▸ 326].

2 Turn ON the power of the unit.

3 Activate `Installer` on the user interface. See the installer reference guide for the correct procedure.

4 Go to `Actuator test run` via the user interface.

5 Activate the `Pump`.

> **CAUTION**
>
> When the water pump is active and the connector PWM is disconnected from the PCB, the water pump motor will run at full speed.

6 Check if the pump is working (by listening or by touching the pump).

Is the water pump working?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Perform the next step.

7 Stop the unit operation via the user interface.

Floor standing + wall mounted units

1 Unplug the power supply connector from the water pump.

2 Turn ON the power of the unit.

Activate the water pump.

3 Remove the cap from the power supply connector and measure the voltage between L - N. The voltage MUST be 195~253 V AC.

Is the measured voltage correct?	Action
Yes	Skip the next step(s) and continue with the measurement of the PWM signal.
No	Continue with the next step.

4 Unplug the water pump connector X16A and measure the voltage between pins 3–5 on the hydro PCB. The measured voltage MUST be 195~253 V AC.

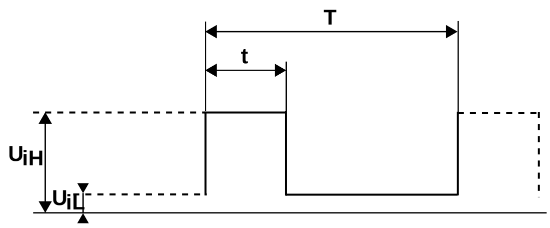
Is the measured voltage correct?	Action
Yes	Replace the power supply wiring harness between the water pump and the hydro PCB, see "Repair procedures" [▶ 331].
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▶ 199].

5 Connect the power supply connector to the water pump.

6 Unplug the PWM signal connector from the water pump.

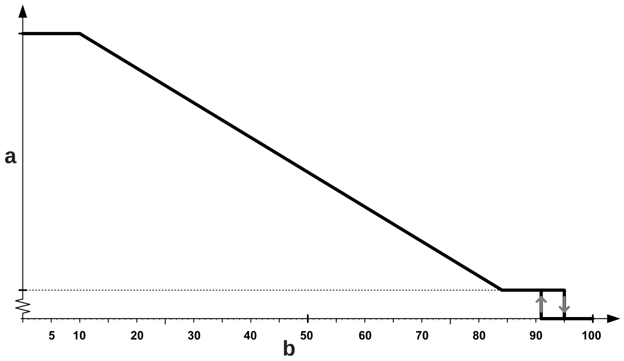
7 Remove the cap from the PWM signal connector and measure the PWM signal between the PWM-GND.

- When using an oscilloscope, the measured signal MUST look like the illustration shown below:



T	Period of time of complete cycle
t	Period of time of high-level input voltage
U_{IH}	High-level input voltage
U_{IL}	Low-level input voltage
d	Duty cycle (t/T x 100) [%]

- When using any equipment that is capable to measure the duty cycle, the measured signal MUST show profile A (see illustration below). The PWM signal (duty cycle) is disproportional to the water pump speed (flow rate) in the range of 10% to 84% and the speed (flow rate) remains at its maximum value when the PWM signal (duty cycle) is below 10%.



a Pump speed
b PWM signal (duty cycle) [%]

Is the measured PWM signal correct?	Action
Yes	Replace the water pump, see "Repair procedures" [▶ 331].
No	Continue with the next step.

8 Unplug the water pump connector X25A and measure the PWM signal between pins 1-2 on the hydro PCB. The measured signal MUST be as mentioned in the previous step.

Is the measured PWM signal correct?	Action
Yes	Continue with the next step.
No	Perform a check of the hydro PCB, see "3.15.1 Checking procedures" [▶ 199].

9 Connect the water pump connector X25A

10 Disconnect the connector X25Y and measure the PWM signal. The measured signal MUST be as mentioned in the previous step.

Is the measured PWM signal correct?	Action
Yes	Replace the PWM signal harness between the water pump and the intermediate connector X25Y, see "Repair procedures" [▶ 331].
No	Correct the wiring between the hydro PCB and the intermediate connector X25Y, see "6.2 Wiring diagram" [▶ 370].

Bizone units

1 Unplug the power supply connector from the water pump.

2 Turn ON the power of the unit.

3 Remove the cap from the power supply connector and measure the voltage between L - N. The voltage MUST be 195~253 V AC.

Is the measured voltage correct?	Action
Yes	Skip the next step(s) and continue with the measurement of the PWM signal.

Is the measured voltage correct?	Action
No	Continue with the next step.

4 Measure the voltage on the water pump connector X1Y : L - N. The voltage MUST be 195~253 V AC.

Is the measured voltage correct?	Action
Yes	Replace the power supply wiring harness between the water pump and the connector X1Y, see "Repair procedures" [▶ 331].
No	Continue with the next step.

5 Unplug the water pump connector X1A and measure the voltage between pins 2–5 on the bizone PCB. The measured voltage MUST be 195~253 V AC.

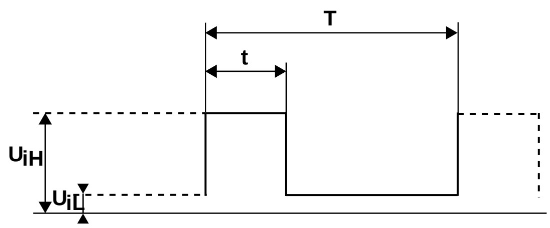
Is the measured voltage correct?	Then
Yes	Correct the wiring between the bizone PCB and water pump connector X1Y, see "6.2 Wiring diagram" [▶ 370].
No	Perform a check of the bizone PCB, see "3.6.1 Checking procedures" [▶ 160].

6 Connect the power supply connector to the water pump.

7 Unplug the PWM signal connector from the water pump.

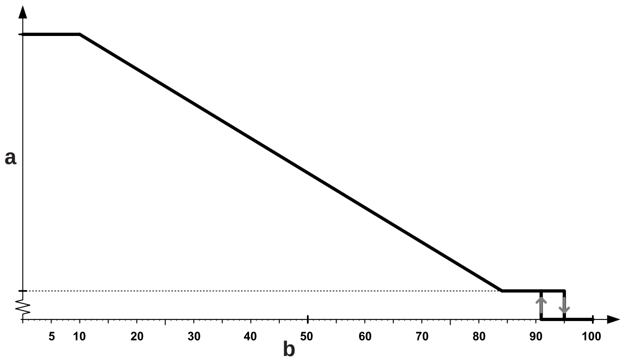
8 Remove the cap from the PWM signal connector and measure the PWM signal between the PWM-GND.

- When using an oscilloscope, the measured signal MUST look like the illustration shown below:



T Period of time of complete cycle
t Period of time of high-level input voltage
U_{IH} High-level input voltage
U_{IL} Low-level input voltage
d Duty cycle (t/T x 100) [%]

- When using any equipment that is capable to measure the duty cycle, the measured signal MUST show profile A (see illustration below). The PWM signal (duty cycle) is disproportional to the water pump speed (flow rate) in the range of 10% to 84% and the speed (flow rate) remains at its maximum value when the PWM signal (duty cycle) is below 10%.



a Pump speed
b PWM signal (duty cycle) [%]

Is the measured PWM signal correct?	Action
Yes	Replace the water pump, see "Repair procedures" [▶ 331].
No	Continue with the next step.

9 Measure the PWM signal on the water pump connector X5YA: 1-2. The measured signal MUST be as mentioned in the previous step.

Is the measured PWM signal correct?	Action
Yes	Replace the PWM signal wiring harness between the water pump and the connector X5YA, see "Repair procedures" [▶ 331].
No	Continue with the next step.

10 Unplug the water pump connector X13A and measure the PWM signal between pins 6-7 on the bizone PCB. The measured signal MUST be as mentioned in the previous step.

Is the measured PWM signal correct?	Action
Yes	Correct the wiring between the bizone PCB and the water pump connector X5YA, see "6.2 Wiring diagram" [▶ 370].
No	Perform a check of the bizone PCB, see "3.6.1 Checking procedures" [▶ 160].

Repair procedures

To remove impurities from the water pump

Prerequisite: Remove the water pump, see "Repair procedures" [▶ 331].

1 Remove any impurities or objects that may block the water pump.

2 Install the water pump, see "Repair procedures" [▶ 331].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▶ 326] of the water pump and continue with the next procedure.

To remove the water pump motor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Floor standing and Bizone units ONLY: Lower the switch box, see "3.23 Plate work" [▸ 261].
2. Disconnect the connectors from the water pump motor.
3. Remove the 4 bolts that fix the water pump motor to the pump housing.
4. Separate the water pump motor from the pump housing.
5. Remove the water pump motor.
6. To install the water pump motor, see "Repair procedures" [▸ 331].

To install the water pump motor

1. Install the motor on the water pump housing.

> **CAUTION**
>
> Make sure to correctly install the water pump motor and the seal.

2. Fix the water pump motor by tightening the 4 bolts.
3. Connect the connectors to the water pump motor.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▸ 326] of the water pump and continue with the next procedure.

To remove the water pump

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Drain water from the water circuit, see "4.3.2 Repair procedures" [▸ 356].
2. Disconnect the connectors from the water pump motor.
3. Unscrew the upper and lower nuts that fix the water pump to the water circuit pipes.

> **CAUTION**
>
> Use a counterforce when unscrewing or tightening the nuts to make sure NOT to damage the piping.

4. Remove the water pump.
5. To install the water pump, see "Repair procedures" [▸ 331].

To install the water pump

1. Install the water pump in the correct location.
2. Fix the water circuit pipes to the water pump by tightening the upper and lower nuts.

> **CAUTION**
>
> Use a counterforce when unscrewing or tightening the nuts to make sure NOT to damage the piping.

3 Connect the connectors to the water pump motor.

4 Open the valve (if equipped) of the water circuit towards the expansion vessel.

> **CAUTION**
>
> Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

5 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▸ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To remove the water pump wiring harness

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Lower the switch box, see "3.23 Plate work" [▸ 261].

2 Disconnect the appropriate connector (power supply connector and/or PWM signal connector) from the water pump.

3 Disconnect the other end of the wiring harness from the appropriate connector:

Floor standing + wall mounted units

- X16A on hydro PCB for power supply wiring harness
- X25A on hydro PCB for PWM signal wiring harness

Bizone units

- X1Y for power supply wiring harness
- X5YA for PWM signal wiring harness

4 Cut all tie straps that fix the wiring harness, and remove the wiring harness from the unit.

5 To install the water pump appropriate wiring harness, see "Repair procedures" [▸ 331].

To install the water pump wiring harness

1 Connect the wiring harness to the appropriate connector:

Floor standing + wall mounted units

- X16A on hydro PCB for power supply wiring harness
- X25A on hydro PCB for PWM signal wiring harness

Bizone units

- X1Y for power supply wiring harness
- X5YA for PWM signal wiring harness

2 Route the wiring harness towards the water pump and connect the wiring harness to the appropriate connector (power supply and/or PWM signal) of the water pump.

3 Fix the wiring harness using new tie straps.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

3.31.2 Bizone pump

INFORMATION

The procedures described here are for the units with integrated (built-in) bizone circuit. For more information about the optional bizone kit, see documentation of the bizone kit.

Checking procedures

INFORMATION

It is recommended to perform the checks in the listed order.

To perform a mechanical check of the water pump

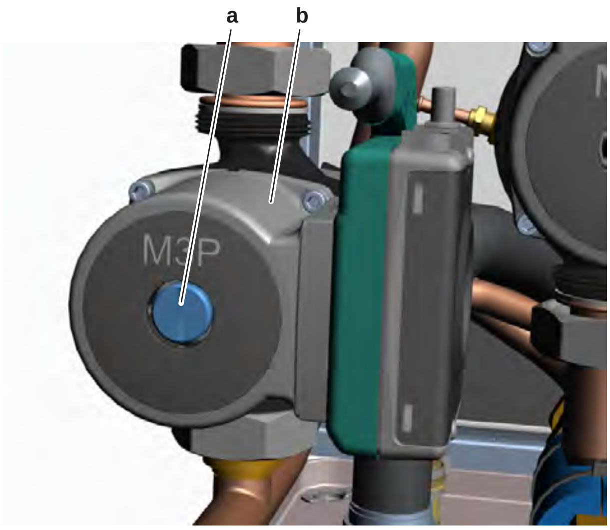
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Lower the switch box, see "3.23 Plate work" [▸ 261].

2 Remove the seal cover from the pump and insert a flat screwdriver in the slot of the rotor shaft of the water pump (through the hole in the pump motor cover); press and turn it to rotate the water pump rotor shaft.



a Rotor shaft
b Water pump motor

3 Inspect the rotor of the water pump motor. It MUST rotate smoothly.

Does the rotor of the water pump motor rotate smoothly?	Action
Yes	Perform an electrical check of the water pump, see "Checking procedures" [▸ 334].
No	Continue with the next step.

4 Remove the water pump, see "Repair procedures" [▸ 337].

5 Check for impurities or any objects that may block the water pump.

Any impurities or objects found?	Action
Yes	Remove the impurities or objects that may block the water pump, see "Repair procedures" [▸ 337].
No	Replace the water pump, see "Repair procedures" [▸ 337].

To perform an electrical check of the water pump

1 First perform a mechanical check of the water pump, see "Checking procedures" [▸ 334].

2 Turn ON the power of the unit.

3 Create a thermo request on the main zone ONLY, see installer reference guide for more information.

CAUTION

When the water pump is active and the connector PWM is disconnected from the PCB, the water pump motor will run at full speed.

4 Check if the pump is working (by listening or by touching the pump).

Is the water pump working?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Perform the next step.

5 Stop the unit operation via the user interface.

6 Unplug the power supply connector from the water pump.

7 Turn ON the power of the unit.

8 Remove the cap from the power supply connector and measure the voltage between L - N. The voltage MUST be 195~253 V AC.

Is the measured voltage correct?	Action
Yes	Skip the next step(s) and continue with the measurement of the PWM signal.
No	Continue with the next step.

9 Measure the voltage on the water pump connector X2Y: L - N. The voltage MUST be 195~253 V AC.

Is the measured voltage correct?	Action
Yes	Replace the power supply wiring harness between the water pump and the connector X2Y, see "Repair procedures" [▶ 337].
No	Continue with the next step.

10 Unplug the water pump connector X1A and measure the voltage between pins 2–4 on the bizone PCB. The measured voltage MUST be 195~253 V AC.

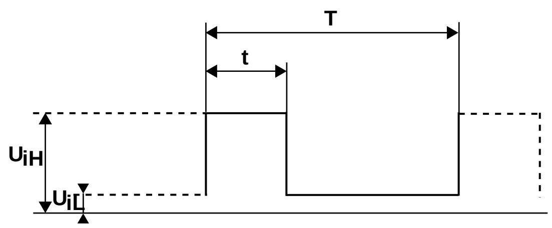
Is the measured voltage correct?	Then
Yes	Correct the wiring between the bizone PCB and water pump connector X2Y, see "6.2 Wiring diagram" [▶ 370].
No	Perform a check of the bizone PCB, see "3.6.1 Checking procedures" [▶ 160].

11 Connect the power supply connector to the water pump.

12 Unplug the PWM signal connector from the water pump.

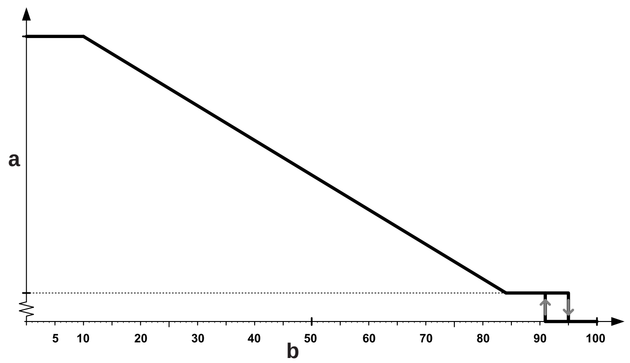
13 Remove the cap from the PWM signal connector and measure the PWM signal between the PWM-GND.

- When using an oscilloscope, the measured signal MUST look like the illustration shown below:



T Period of time of complete cycle
t Period of time of high-level input voltage
U_{IH} High-level input voltage
U_{IL} Low-level input voltage
d Duty cycle (t/T x 100) [%]

- When using any equipment that is capable to measure the duty cycle, the measured signal MUST show profile A (see illustration below). The PWM signal (duty cycle) is disproportional to the water pump speed (flow rate) in the range of 10% to 84% and the speed (flow rate) remains at its maximum value when the PWM signal (duty cycle) is below 10%.



a Pump speed
b PWM signal (duty cycle) [%]

Is the measured PWM signal correct?	Action
Yes	Replace the water pump, see "Repair procedures" [▶ 337].
No	Continue with the next step.

14 Measure the PWM signal on the water pump connector X3YA: 1-2. The measured signal MUST be as mentioned in the previous step.

Is the measured PWM signal correct?	Action
Yes	Replace the PWM signal wiring harness between the water pump and the connector X3YA, see "Repair procedures" [▶ 337].
No	Continue with the next step.

15 Unplug the water pump connector X13A and measure the PWM signal between pins 4-5 on the bizone PCB. The measured signal MUST be as mentioned in the previous step.

Is the measured PWM signal correct?	Action
Yes	Correct the wiring between the bizone PCB and the water pump connector X3YA, see "6.2 Wiring diagram" [▶ 370].
No	Perform a check of the bizone PCB, see "3.6.1 Checking procedures" [▶ 160].

Repair procedures

To remove impurities from the water pump

Prerequisite: Remove the water pump, see "Repair procedures" [▶ 337].

1 Remove any impurities or objects that may block the water pump.

2 Install the water pump, see "Repair procedures" [▶ 337].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To remove the water pump motor

Prerequisite: Stop the unit operation via the user interface.

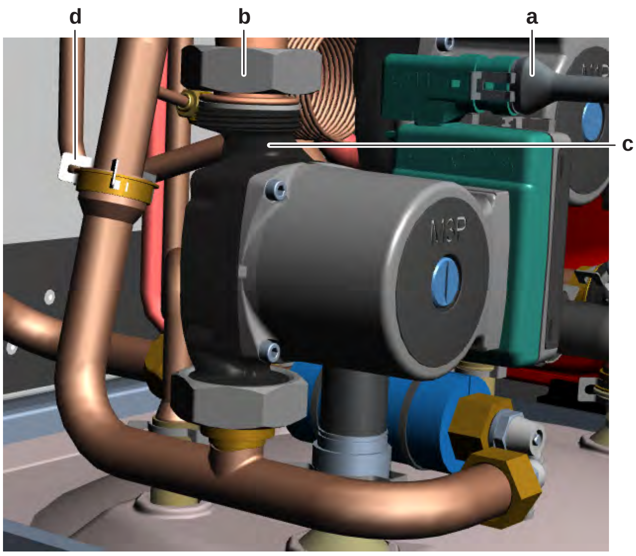
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Lower the switch box, see "3.23 Plate work" [▶ 261].

2 Drain water from the water circuit, see "4.3.2 Repair procedures" [▶ 356].

3 Disconnect the connectors from the water pump motor.



a Connector
b Nut
c Water pump
d Clip

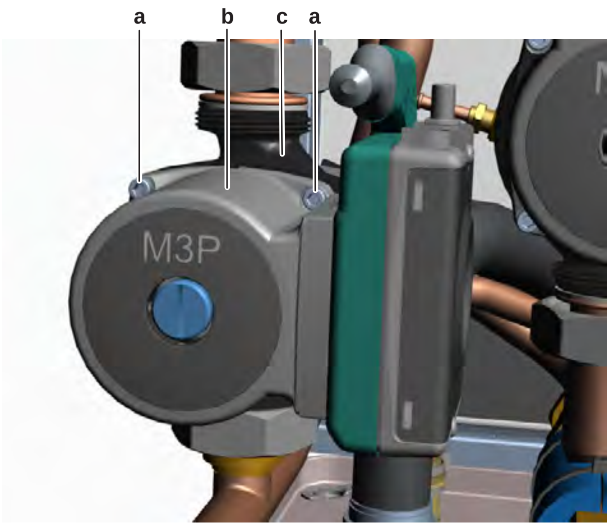
4 Unscrew the upper nut that fixes the water pump to the bizone circuit piping.

> **CAUTION**
>
> Use a counterforce when unscrewing or tightening the nuts to make sure NOT to damage the piping.

5 Remove the clip from the bizone circuit piping and loosen the coupling fixture.

6 Remove the complete assembly (water pump + water filter + bizone piping) from the unit.

7 Remove the 4 bolts that fix the water pump motor to the pump housing.



a Bolt
b Water pump motor
c Pump housing

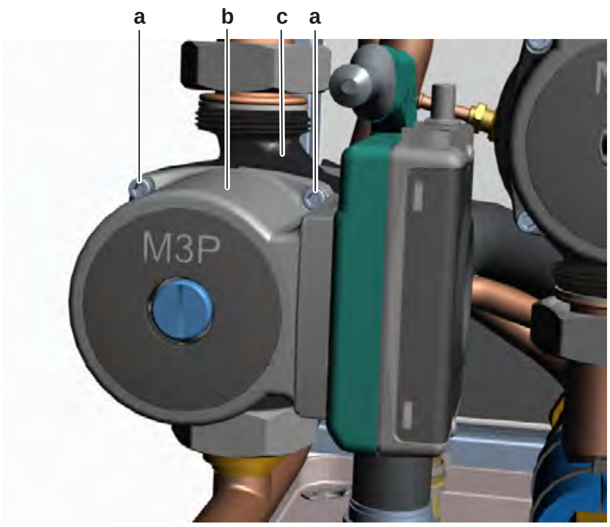
8 Separate the water pump motor from the pump housing.

9 Remove the water pump motor.

10 To install the water pump motor, see "Repair procedures" [▶ 337].

To install the water pump motor

1 Install the motor on the water pump housing.



a Bolt
b Water pump motor
c Pump housing

> **CAUTION**
>
> Make sure to correctly install the water pump motor and the seal.

2 Fix the water pump motor by tightening the 4 bolts.

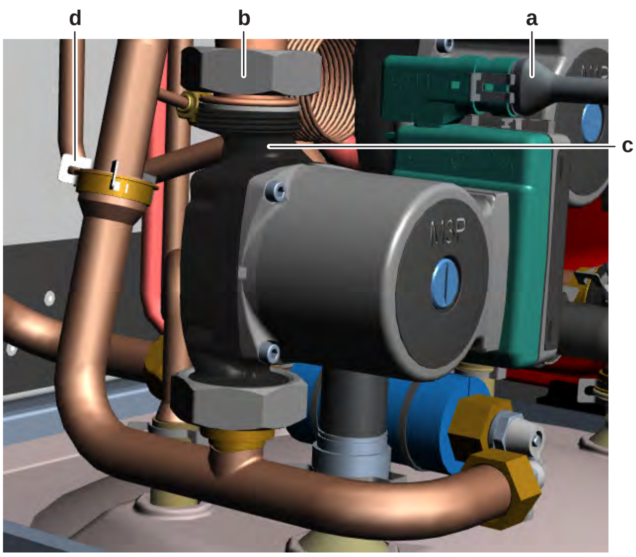
3 Install the complete assembly (water pump + water filter + bizone piping) on the correct location in the unit.

4 Tighten the upper nut to fix the water pump to the bizone circuit piping.

> **INFORMATION**
>
> ALWAYS install new seals before connecting the water pump to the piping.

> **CAUTION**
>
> Use a counterforce when unscrewing or tightening the nuts to make sure NOT to damage the piping.

5 Correctly install the coupling fixture and the clip to properly connect the bizone circuit piping.



a Connector

b Nut
c Water pump
d Clip

6 Connect the connectors to the water pump motor.

7 Open the valve (if equipped) of the water circuit towards the expansion vessel.

> **CAUTION**
> Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

8 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▸ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "Checking procedures" [▸ 334] of the water pump and continue with the next procedure.

To remove the water pump

Prerequisite: Stop the unit operation via the user interface.

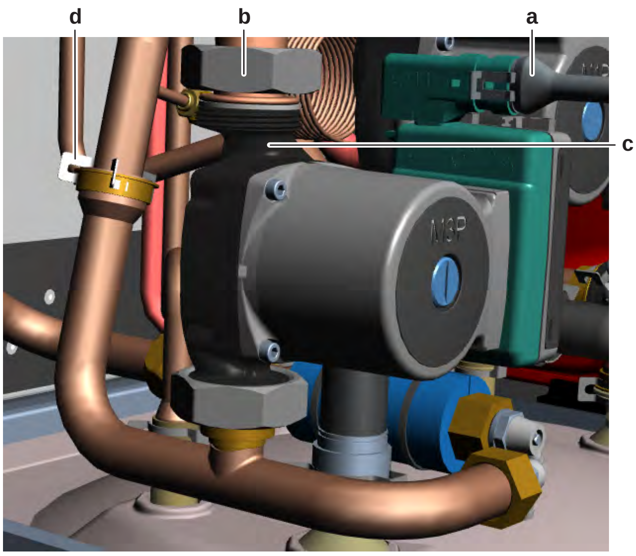
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Lower the switch box, see "3.23 Plate work" [▸ 261].

2 Drain water from the water circuit, see "4.3.2 Repair procedures" [▸ 356].

3 Disconnect the connectors from the water pump motor.



a Connector
b Nut
c Water pump
d Clip

4 Unscrew the upper nut that fixes the water pump to the bizone circuit piping.

> **CAUTION**
> Use a counterforce when unscrewing or tightening the nuts to make sure NOT to damage the piping.

5 Remove the clip from the bizone circuit piping and loosen the coupling fixture.

6 Remove the complete assembly (water pump + water filter + bizone piping) from the unit.

7 Remove the bizone piping from the water pump (lower connection).

8 To install the water pump, see "Repair procedures" [▸ 337].

To install the water pump

1 Connect the bizone piping to the water pump (lower connection).

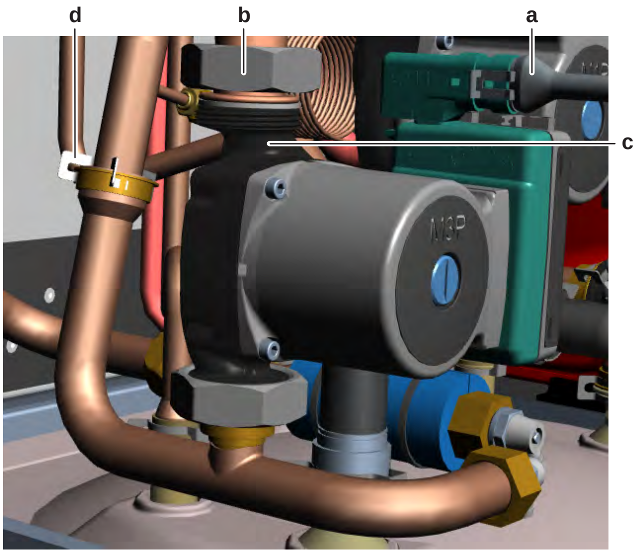
2 Install the complete assembly (water pump + water filter + bizone piping) on the correct location in the unit.

3 Tighten the upper nut to fix the water pump to the bizone circuit piping.

> **INFORMATION**
>
> ALWAYS install new seals before connecting the water pump to the piping.

> **CAUTION**
>
> Use a counterforce when unscrewing or tightening the nuts to make sure NOT to damage the piping.

4 Correctly install the coupling fixture and the clip to properly connect the bizone circuit piping.



a Connector
b Nut
c Water pump
d Clip

5 Connect the connectors to the water pump motor.

6 Open the valve (if equipped) of the water circuit towards the expansion vessel.

> **CAUTION**
>
> Make sure to open the valve (if equipped) towards the expansion vessel, otherwise the overpressure will be generated.

7 Open the stop valves and add water to the water circuit if needed, see "4.3.2 Repair procedures" [▸ 356].

Is the problem solved?	Action
Yes	No further actions required.

Is the problem solved?	Action
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To remove the water pump wiring harness

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Lower the switch box, see "3.23 Plate work" [▸ 261].
2. Disconnect the appropriate connector (power supply connector and/or PWM signal connector) from the water pump.
3. Disconnect the other end of the wiring harness from the appropriate connector:
   - X2Y for power supply wiring harness
   - X3YA for PWM signal wiring harness
4. Cut all tie straps that fix the wiring harness, and remove the wiring harness from the unit.
5. To install the water pump appropriate wiring harness, see "Repair procedures" [▸ 337].

To install the water pump wiring harness

1. Connect the wiring harness to the appropriate connector:
   - X2Y for power supply wiring harness
   - X3YA for PWM signal wiring harness
2. Route the wiring harness towards the water pump and connect the wiring harness to the appropriate connector (power supply and/or PWM signal) of the water pump.
3. Fix the wiring harness using new tie straps.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

4 Third party components

4.1 Electrical circuit

4.1.1 Checking procedures

To check the power supply of the unit

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Check that the power supply cables and earth connection are firmly fixed to the power supply terminal X1M.
2. Measure the insulation resistance between each power supply terminal and the ground using a megger device of 500 V DC. All measurements MUST be >1MΩ. If insulation resistance is <1MΩ, earth leakage is present.
3. Turn ON the power of the unit.

For single phase units

4. Measure the voltage between L and N on the power supply terminal X1M. The voltage MUST be 230 V AC ± 10%.

For three-phase units

5. Measure the voltage between the phases L1-L2-L3 on the power supply terminal X1M. The voltage MUST be 400 V AC ± 10%.
6. Measure the voltage between L1 and N on the power supply terminal X1M. The voltage MUST be 230 V AC ± 10%.
7. Unbalance between the phases MUST NOT exceed 2%.

Is the measured voltage (power supply) correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Adjust the power supply, see "4.1.2 Repair procedures" [▸ 346].

To check the power supply to the indoor unit

In case of normal power supply (power supply through the outdoor unit)

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "3.23 Plate work" [▸ 261].
2. Check that the power supply cables and earth connection are firmly fixed to the indoor unit power supply terminal X1M.
3. Turn ON the power using the respective circuit breaker.

4 Measure the voltage between L and N on the indoor unit power supply terminal X1M.

Result: The voltage MUST be 230 V AC ± 10%.

Is the measured voltage (power supply) correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

5 Check the power supply to the unit, see "4.1.1 Checking procedures" [▶ 343].

Does the unit receive power?	Action
Yes	Correct the wiring from the main power supply terminal to the indoor unit power supply terminal, see "4.1.2 Repair procedures" [▶ 346].
No	Adjust the power supply to the unit, see "4.1.2 Repair procedures" [▶ 346].

In case of preferential kWh rate power supply (separate power supply)

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

6 Remove the required plate work, see "3.23 Plate work" [▶ 261].

7 Check that the power supply cables and earth connection are firmly fixed to the indoor unit power supply terminal X2M.

8 Turn ON the power using the respective circuit breaker.

9 Measure the voltage between terminals 5-6 on the indoor unit power supply terminal X2M.

Result: The voltage MUST be 230 V AC±10%.

Does the indoor unit receive power?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Adjust the power supply to the indoor unit, see "4.1.2 Repair procedures" [▶ 346].

To check the wiring between the outdoor unit, indoor unit, and domestic hot water tank

1 Check that all wires are properly connected and that all connectors are fully plugged-in.

2 Check that no connectors or wires are damaged.

3 Check that the wiring corresponds with the wiring diagram, see "6.2 Wiring diagram" [▶ 370].

> **INFORMATION**
>
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

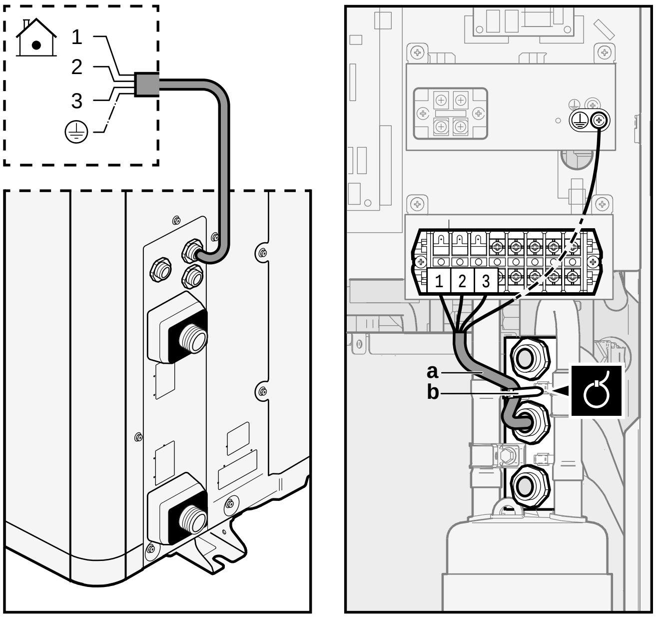
To check if the communication cable is inside the ferrite core

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Check if the communication cable is routed inside the ferrite core.



a Communication cable
b Ferrite core

> **INFORMATION**
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To check the communication wiring between the unit and the bizone kit box

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the user interface panel from the unit, see "3.23 Plate work" [▸ 261]. Make sure to keep it connected electrically.

2 Make sure that all wires between the user interface connector X3 and the bizone kit box are firmly and correctly connected, see "6.2 Wiring diagram" [▸ 370].

3 Check the continuity of all wires.

4 Replace any damaged or broken wires.

> **INFORMATION**
>
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

4.1.2 Repair procedures

To adjust the power supply

1. Make sure that the power source is in line with the requirements described in the databook.
2. Adjust the power supply within 50 Hz ± 3%.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To correct the wiring from the main power supply terminal to the indoor unit power supply terminal

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Make sure that all wires are firmly and correctly connected, see "6.2 Wiring diagram" [▸ 370].
2. Check the continuity of all wires.
3. Replace any damaged or broken wires.

> **INFORMATION**
>
> If applicable, also check the electrical components between the main power supply terminal and the indoor unit power supply terminal (e.g. intermediate terminal, noise filter, fuse, …).

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To correct the wiring between PCB's

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1. Make sure that all wires are firmly and correctly connected, see "6.2 Wiring diagram" [▸ 370].
2. Check the continuity of all wires.
3. Replace any damaged or broken wires.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

4.2 Refrigerant circuit

4.2.1 Checking procedures

> **INFORMATION**
>
> It is recommended to perform the checks in the listed order.

To check if the refrigerant circuit is clogged

1. Turn ON the power of the unit.
2. Activate `Heating` operation via the user interface.
3. Wait for the system to run at a more or less stable condition.
4. On the refrigerant liquid piping (between the refrigerant/water heat exchanger and the outdoor unit heat exchanger (coil)), using a contact thermometer, measure the temperature before and after every restricting device. If a big temperature difference is measured (>2.5~4K), an internal pipe obstruction may be present at this location.

> **INFORMATION**
>
> Focus on positions with a potential risk for clogging such as:
>
> - Filters
> - Valves
> - Brazing points
> - …

> **INFORMATION**
>
> A bigger temperature drop before and after the expansion valve can be normal, however excessive ice is indicating a malfunction of the expansion valve or internal obstruction of the valve (dirt or ice build up in case of humidity in the system).

Temperature drop found?	Action
Yes	Replace the clogged part, see "4.2.2 Repair procedures" [▸ 351].
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To check if the refrigerant circuit is correctly charged

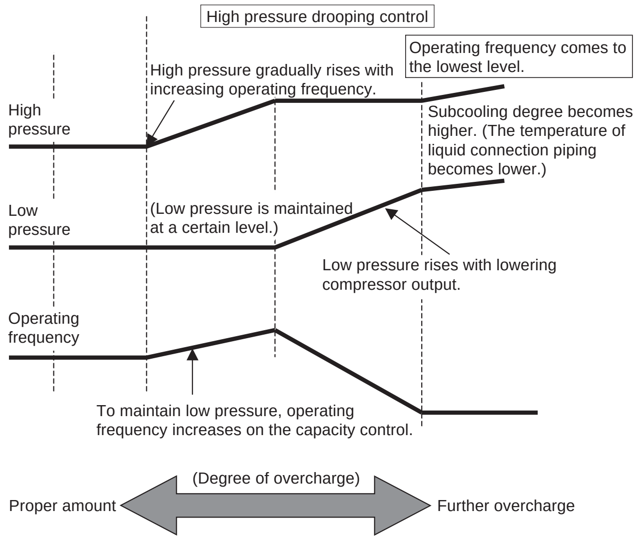
Due to the relationship to pressure control and electronic expansion valve control, the amount of refrigerant needs to be examined according to operating conditions.

Refer to the procedures shown below for correct examination.

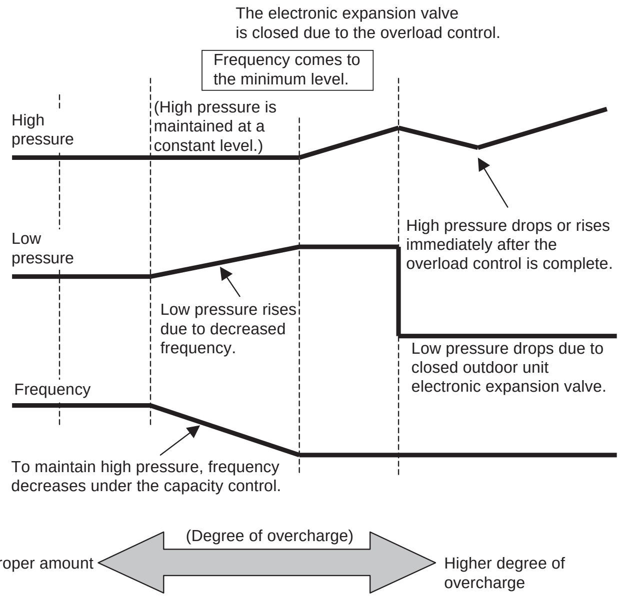
Refrigerant overcharge diagnosis

1. High pressure rises. Consequently, overload control is conducted to cause insufficient cooling capacity.
2. The superheated degree of suction gas lowers (or the wet operation is performed). Consequently, the compressor consumes more power and is noisy (before over-current relay trips).

Cooling



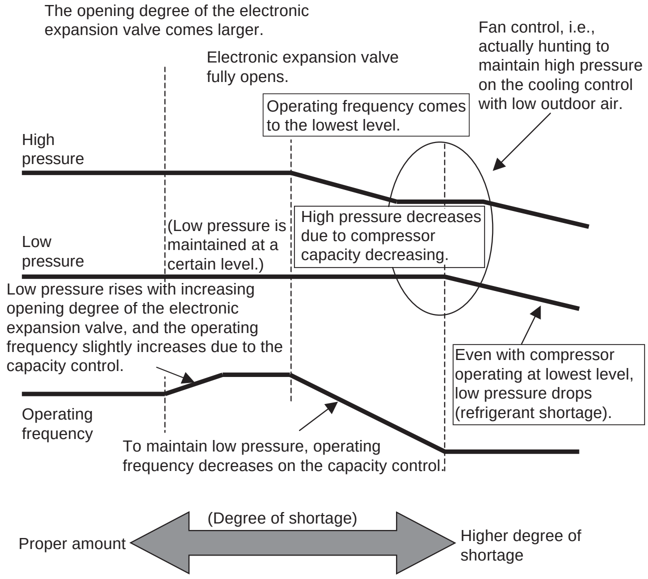
Heating



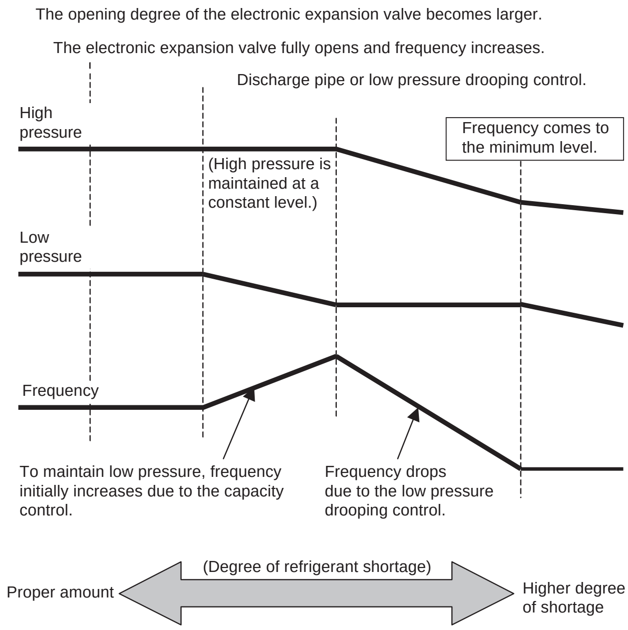
Refrigerant shortage diagnosis

1. The superheated degree of suction gas rises. Consequently, the compressor discharge gas temperature becomes higher than normal.
2. The superheated degree of suction gas rises. Consequently, the electronic expansion valve turns open more than normal or completely open for average output.
3. Low pressure drops to cause the unit not to reach cooling capacity (or heating capacity).

Cooling



Heating



Is the refrigerant circuit charged correctly?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.

Is the refrigerant circuit charged correctly?	Action
No	Add or recuperate refrigerant until correctly charged, see "4.2.2 Repair procedures" [▸ 351].

To check for non-condensables in the refrigerant circuit

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Wait for the refrigerant to reach the outdoor temperature.
2. Connect a manometer to the service port.
3. Measure the pressure of the refrigerant. The measured pressure converted into saturated temperature MUST be in line with the expected pressure / saturated temperature at current ambient temperature.
4. If the measured pressure is significantly higher (>5K), non-condensables gasses are most likely present in the refrigerant.

Any non-condensables found in the refrigerant circuit?	Action
Yes	To replace the refrigerant, see "4.2.2 Repair procedures" [▸ 351].
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To perform a pressure test of the refrigerant circuit

1. Perform a pressure test in line with local legislation.

> **CAUTION**
>
> Do NOT pressurize the refrigerant circuit >4.17 MPa.

Is the pressure in the refrigerant circuit correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the leaking part of the refrigerant circuit, see "4.2.2 Repair procedures" [▸ 351].

To check if the refrigerant field piping is conform with the regulations

1. Check if the refrigerant field piping is conform with the regulations. Adjust as needed. See installation manual for field piping specifications.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

4.2.2 Repair procedures

To replace the clogged/leaking part of the refrigerant circuit

1 See the correct procedure for the component that needs to be repaired. See also "Repair information" [▶ 352] for more details.

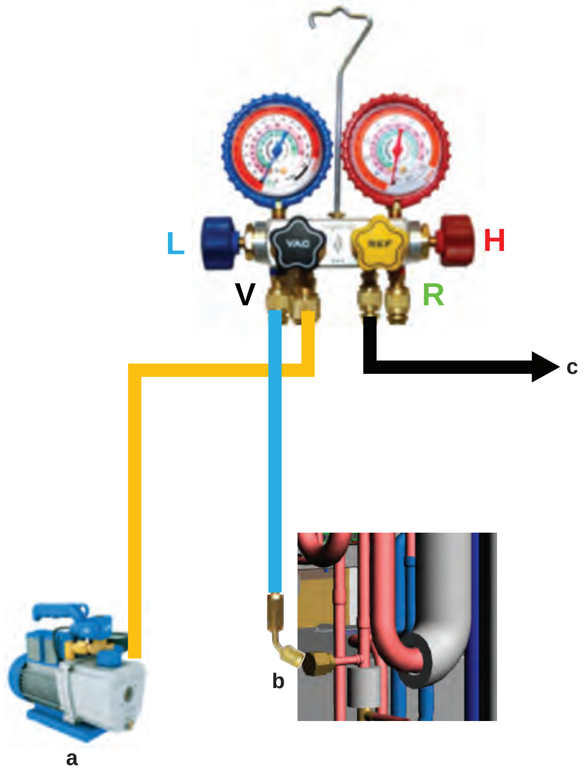
Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To recuperate the refrigerant

Prerequisite: Stop the unit operation via the user interface.

1 Manually open all expansion valves.

2 Connect the vacuum pump, manifold, recovery unit, and refrigerant bottle to the service port of the refrigerant circuit as shown below.



a Vacuum pump
b Connect flexible hose to service port
c To recovery pump
L Low pressure
H High pressure
V Vacuum
R Refrigerant

3 To add refrigerant, see "4.2.2 Repair procedures" [▶ 351].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To add refrigerant

1 See the installer reference guide for the correct procedure.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to troubleshooting of the specific error and continue with the next procedure.

Repair information

Refrigerant piping handling

- Make sure that the applied pressure is never higher than the unit design pressure indicated on the nameplate (PS).
- Work according to the F-gas regulation and/or local regulations.
- Make sure the correct amount of refrigerant is charged after repair according to the F-gas regulation label on the unit (factory + additional where required).
- Make sure to use the appropriate equipment and tools according to the refrigerant and unit type.
- R32 can be charged in gas phase.
- Make sure to use a digital scale (no charging cylinder).
- Execute correct vacuum drying procedure after repair:
  - –0.1 MPa / –760 mm Hg / –750 Torr / –1 bar for at least 1 hour.
  - Connect the unit according to the available service ports.
  - Use related field setting where necessary to open expansion valve / solenoid valve.

To perform refrigerant pump down operation

The unit is equipped with an automatic pump down operation which will collect all refrigerant from the field piping and indoor unit in the outdoor unit. To protect the environment, make sure to perform the following pump down operation when relocating the unit.

DANGER: RISK OF EXPLOSION

Pump down – Refrigerant leakage. If you want to pump down the system, and there is a leak in the refrigerant circuit:

- Do NOT use the unit's automatic pump down function, with which you can collect all refrigerant from the system into the outdoor unit. **Possible consequence:** Self-combustion and explosion of the compressor because of air going into the operating compressor.
- Use a separate recovery system so that the unit's compressor does NOT have to operate.

CAUTION

Some outdoor units are equipped with a low pressure switch to protect the compressor by switching it off. NEVER short-circuit the low pressure switch during pump down operation.

1 Remove the refrigerant connection cover, see "3.23 Plate work" [▶ 261].

2 Remove the cap from the stop valves.

3 Perform pump down operation, see installer reference guide for the correct procedure.

4 After 5~10 minutes (after only 1~2 minutes in case temperature <–10°C), close the liquid stop valve using a hexagonal wrench.

5 Check the manifold if vacuum is reached. Close the gas stop valve and stop forced cooling operation.

Refrigerant piping repair

- Make sure to cover open pipe ends during repair so no dust or moisture can enter.
- Make sure to re-apply insulation removed during repair.
- Pipe expansion / flare making:
  - Remove any burrs on the cut surface using the correct tool such as reamer or scraper (note that excessive deburring can thin the pipe walls and cause cracking of the pipe).
  - Make sure the flare has the correct size (use a flare gauge).
  - Make sure no particles remain in the piping.
  - Apply just a drop of refrigerant oil on the inner surface of the flare.
  - Make sure the flare connection is tightened with the correct torque (torque values refer to installation manual).
- Brazing:
  - Use the correct brazing tool.
  - Use a phosphor copper filler metal (silver composition of 0 to 2%). Do not use flux material.
  - Flush the piping before brazing with nitrogen to avoid oxidation of the inside of the copper tubes (nitrogen purity ≥99.99%).

4.3 Water circuit

4.3.1 Checking procedures

To check for an external pump

1 Inspect the installation outside the unit and check for the presence of an external pump. This may have an impact on the water flow inside the unit.

An external pump was found in the installation?	Action
Yes	Remove the external pump from the installation, see "4.3.2 Repair procedures" [▶ 356].
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To check the water pressure

1 Turn ON the power of the unit.

> **INFORMATION**
>
> Make sure that the water pressure sensor is functioning correctly.

2 Read the water pressure on the home screen of the user interface.

Result: The pressure MUST be 1~2 bar.

Is the water pressure correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Add or remove water from the water circuit until the pressure is correct, see "4.3.2 Repair procedures" [▶ 356].

To check the water flow

1 Turn ON the power using the respective circuit breaker.

2 Activate `Cooling` or `Heating` operation via the user interface.

> **INFORMATION**
>
> Make sure that the water flow sensor is functioning correctly.

3 Navigate to the information menu on the user interface, see installer reference guide for correct procedure.

4 Read the water flow in the information menu on the user interface. The water flow MUST be 25 l/min.

Is the water flow correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Continue with the next step.

5 Check the water pressure, see "4.3.1 Checking procedures" [▶ 353].

Is the water pressure correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Add or remove water from the water circuit until the pressure is correct, see "4.3.2 Repair procedures" [▶ 356].

To check if the water circuit stop valves are open

1 The stop valves are located outside the unit. Check that all valves are in open position (in line with the piping).

All valves are open?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.

All valves are open?	Action
No	Open the specific valve(s) of the water circuit, see "4.3.2 Repair procedures" [▶ 356].

To check for an external heat source

1 Inspect the installation outside the unit and check for the presence of an external heat source. This may have an impact on the water temperature inside the unit.

An external heat source was found in the installation?	Action
Yes	Remove the external heat source from the installation, see "4.3.2 Repair procedures" [▶ 356].
No	Return to the troubleshooting of the specific error and continue with the next procedure.

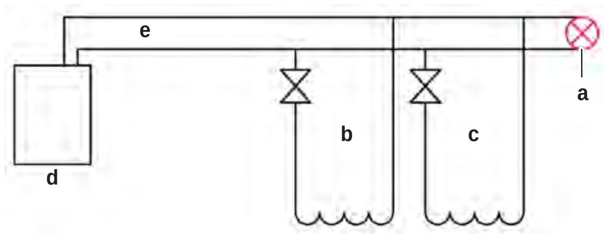
To check if the field installed air purge valves are installed on the correct locations

1 Check the installation outside the unit. All highest points of the installation MUST have air purge valves installed. The air purge valves MUST NOT be installed on other locations.

All air purge valves are installed on the correct locations?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Install the specific air purge valve(s) on the correct location(s) in the water circuit, see "4.3.2 Repair procedures" [▶ 356].

To check if a by-pass is installed in the water circuit

1 A by-pass MUST be installed in the water circuit outside the unit. This is needed to make sure that water can still flow through the circuit even when all loops (underfloor heating, radiators, …) are shut-off (e.g. for anti-freeze function).



a By-pass
b Underfloor heating (cooling) circuit
c Radiators circuit
d Indoor or outdoor unit
e Space heating (cooling) water circuit

Is a by-pass installed in the water circuit?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Install a by-pass in the water circuit, see "4.3.2 Repair procedures" [▶ 356].

To check for a leaking field installed domestic hot water tap

1 Inspect the installation outside the unit and check for a leaking domestic hot water tap.

Was a leaking domestic hot water tap found in the installation?	Action
Yes	Replace the leaking domestic hot water tap, see "4.3.2 Repair procedures" [▶ 356].
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To check for leaks in the water circuit

1 Inspect the installation outside the unit and check for leaks.

A leak was found in the installation?	Action
Yes	Repair the leak in the installation, see "4.3.2 Repair procedures" [▶ 356].
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To check the main water supply and pressure

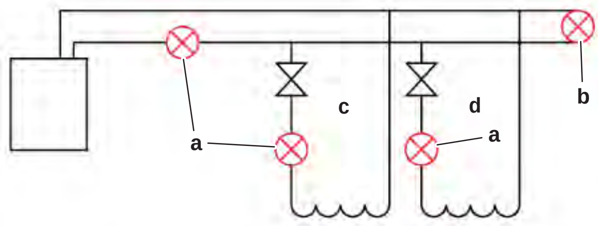
1 Check that the main water supply and pressure of the installation is within the expected range (>1 bar).

Main water supply and pressure within expected range?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Adjust the main water supply of the installation, see "4.3.2 Repair procedures" [▶ 356].

4.3.2 Repair procedures

To remove the external pump from the water circuit

1 If an external pump is found in the installation outside the unit, the pump MUST be programmed as such that it ONLY works when the water pump of the unit is off. See the specific dealer manual of the external pump for this procedure.



a External pump
b By-pass
c Underfloor heating circuit
e Radiators circuit

2 If impossible to program as such, the external pump needs to be removed from the installation.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To remove/drain water from the water circuit

> **INFORMATION**
> This procedure partially drains the water circuit, sufficient for component replacement.

Prerequisite: Stop the unit operation via the user interface.

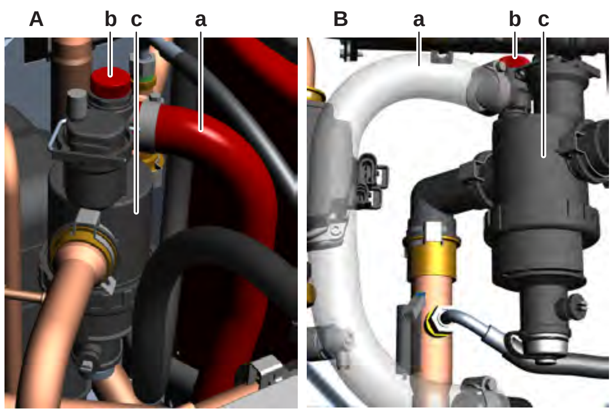
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Floor standing and Bizone units ONLY: Lower the switch box, see "3.23 Plate work" [▸ 261].

2 Close the stop valves of the water circuit.

3 Standard, a drain hose is installed on the safety valve on the magnetic filter/dirt separator. Open the safety valve and drain water from the water circuit. Collect the drained water in the drain pan, bottle, sink,… using the installed drain hose.

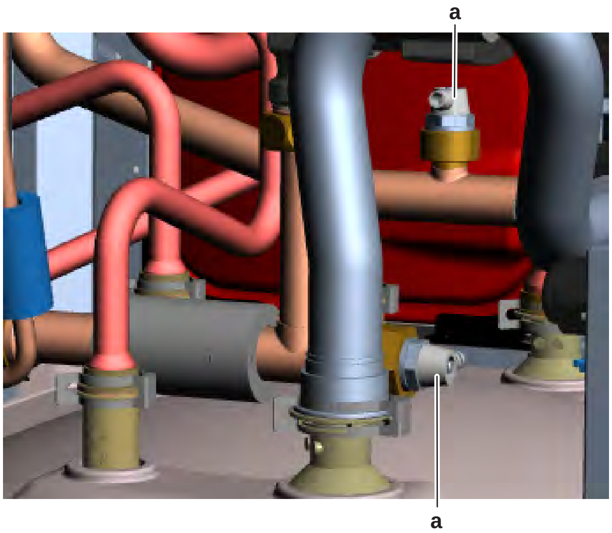


A Floor standing + Bizone units
B Wall mounted units
a Drain hose
b Safety valve
c Magnetic filter/dirt separator

4 Open the air purge valves, see "4.3.2 Repair procedures" [▸ 356].

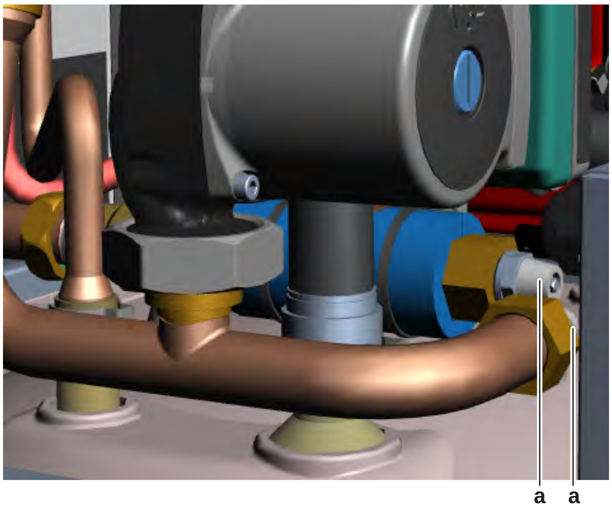
5 Open the drain valve(s) to drain water from the water circuit. Collect the drained water in a drain pan, bottle,….

Floor standing units



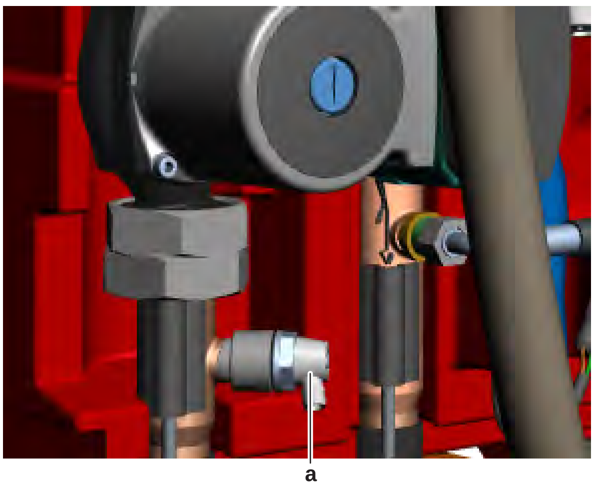
a Drain valve

Bizone units



a Drain valve

Wall mounted units



a Drain valve

6 To add water to the water circuit, see "4.3.2 Repair procedures" [▸ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To add water to the water circuit

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 To fill the water circuit, use a field supply filling kit. Make sure you comply with the applicable legislation.

2 Purge the water circuit, see "4.3.2 Repair procedures" [▸ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To open the stop valves of the water circuit

1 The stop valves are located outside the unit. Open the valves by placing them in line with the piping.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To open the air purge valves of the water circuit

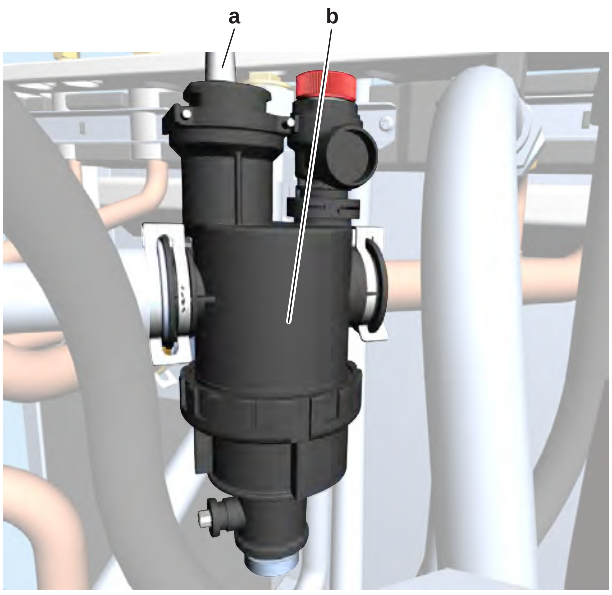
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

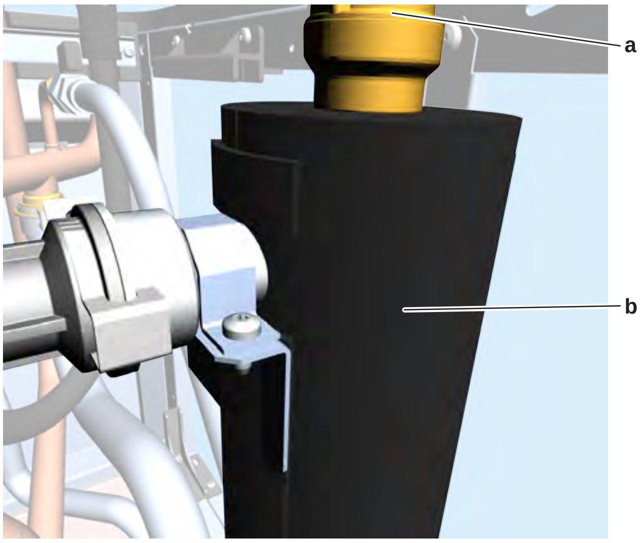
Prerequisite: Remove the required plate work, see "3.23 Plate work" [▸ 261].

1 Floor standing and Bizone units ONLY: Lower the switch box, see "3.23 Plate work" [▸ 261].

2 Place the air purge valves, installed inside the unit, in the open position by turning the valves clockwise.



a Air purge valve
b Magnetic filter/dirt separator



a Air purge valve
b Backup heater

3 Place all field installed air purge valves in the open position.

4 Purge the water circuit, see "4.3.2 Repair procedures" [▶ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To install the field installed air purge valves on the highest points of the water circuit

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Install field installed air purge valves on all highest points of the installation outside the unit.

2 Purge the water circuit, see "4.3.2 Repair procedures" [▶ 356].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To purge the water circuit

1. Check that all field installed air purge valves are installed in the correct locations, see "4.3.1 Checking procedures" [▸ 353].
2. See "To open the air purge valves of the water circuit" [▸ 359] for detailed information about the unit air purge valves.
3. See the installer reference guide for the correct air purge procedure.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To remove the external heat source from the water circuit

1. Remove the external heat source from the installation outside the unit.

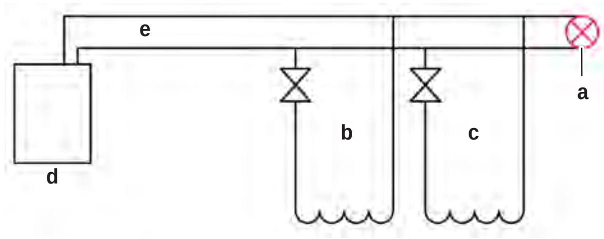
Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To install a by-pass in the water circuit

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Install a by-pass in the water circuit outside the installation as shown below.



a By-pass
b Underfloor heating (cooling) circuit
c Radiators circuit
d Indoor or outdoor unit
e Space heating (cooling) water circuit

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To replace the leaking domestic hot water tap in the water circuit

1 Replace the leaking domestic hot water tap in the water circuit with a correct one.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To repair the leak in the water circuit

1 Repair the leak in the water circuit.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To adjust the main water supply of the installation

1 Adjust the main water supply of the installation to be within the expected range (>1 bar).

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

4.4 Manufacturer components

4.4.1 Checking procedures

To check the correct operation / setting of the manufacturer component

1 See the specific dealer manual to check for the correct installation, operation or setting of your component.

Does the component function correctly?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Adjust the specific component, see "4.4.2 Repair procedures" [▶ 362].

4.4.2 Repair procedures

To adjust the manufacturer component

1 See the specific dealer manual to adjust your component.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

4.5 External factors

4.5.1 Checking procedures

To check the outdoor temperature

1 The temperature ranges for the different operation modes of the unit can be found in the databook on Business Portal.

> **INFORMATION**
>
> If the outdoor temperature is outside the range of operation, the unit may NOT operate or may NOT deliver the required capacity.

Is the outdoor temperature within the operating range?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Wait for the outdoor temperature to return within the operating range.

To check for an external source of vibration

1 Check for the presence of an external source of vibration (e.g. a washing machine,...) near the indoor unit.

2 If needed, Install an anti-vibration rubber under the indoor unit to filter out the vibrations.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To check the required space around the outdoor unit heat exchanger

1 Check if the space around the outdoor unit heat exchanger is sufficient. See the installation manual for the required space specifications. Adjust as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

5 Maintenance

NOTICE

General maintenance/inspection checklist. Next to the maintenance instructions in this chapter, a general maintenance/inspection checklist is also available on the Daikin Business Portal (authentication required).

The general maintenance/inspection checklist is complementary to the instructions in this chapter and can be used as a guideline and reporting template during maintenance.

5.1 To clean the outdoor unit heat exchanger

1. Straighten the hair fins.
2. Clear the outdoor unit heat exchanger from dust, leaves,... using a fin-comb or compressed air/N_2.

CAUTION

Avoid bending or damaging the hair fins of the outdoor unit heat exchanger during the cleaning process.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

5.2 To clean the magnetic filter/dirt separator in case of trouble

1. Remove the magnetic filter/dirt separator from the unit. See "3.19.2 Repair procedures" [▶ 223].

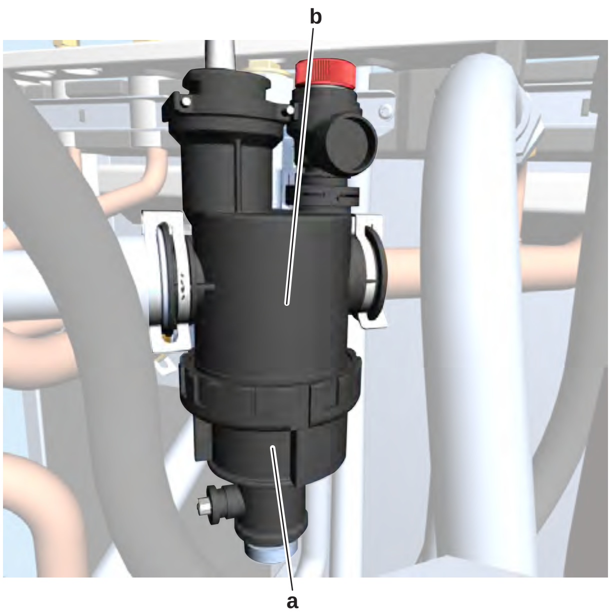
NOTICE

To protect the piping connected to the magnetic filter/dirt separator from damage it is recommended to perform this procedure with the magnetic filter/dirt separator removed from the unit.

2. Unscrew the bottom of the magnetic filter/dirt separator housing. Use an appropriate tool if needed.

NOTICE

Opening the magnetic filter/dirt separator is ONLY required in case of severe issues. Preferably this action is never to be done during the complete lifetime of the magnetic filter/dirt separator.

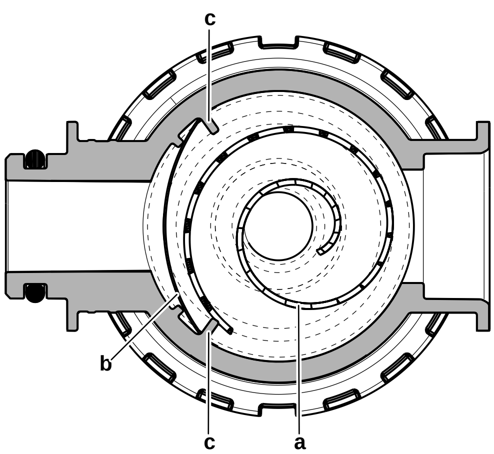


a Bottom part to be unscrewed
b Magnetic filter/dirt separator housing

3 Remove the strainer and the rolled-up filter from the magnetic filter/dirt separator housing and clean with water.

4 Install the cleaned rolled-up filter and strainer in the magnetic filter/dirt separator housing.

> **INFORMATION**
>
> Correctly install the strainer in the magnetic filter/dirt separator housing using the protrusions.



a Rolled-up filter
b Strainer
c Protrusion

5 Install and properly tighten the bottom of the magnetic filter/dirt separator housing.

6 Install the magnetic filter/dirt separator in the unit. See "3.19.2 Repair procedures" [▸ 223].

Is the problem solved?	Action
Yes	No further actions required.

Is the problem solved?	Action
No	Replace the magnetic filter/dirt separator, see "3.19.2 Repair procedures" [▶ 223].

5.3 To yearly clean the magnetic filter/dirt separator – flushing

Prerequisite: Stop the unit operation via the user interface.

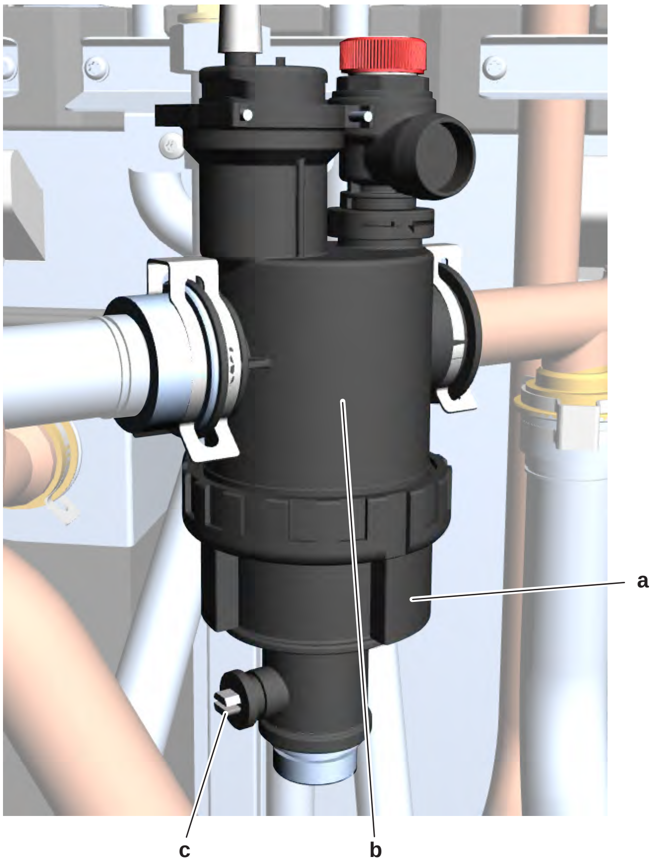
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "3.23 Plate work" [▶ 261].

1 Floor standing and Bizone units ONLY: Lower the switch box, see "3.23 Plate work" [▶ 261].

> **INFORMATION**
>
> Water pressure is required to clean the magnetic filter/dirt separator. Do NOT close the stop valves of the water circuit.

2 Remove the magnetic sleeve from the magnetic filter/dirt separator.



a Magnetic sleeve
b Magnetic filter/dirt separator
c Valve

3 Remove the cap on the bottom of the magnetic filter/dirt separator.

4 Connect a drain hose to the bottom of the magnetic filter/dirt separator.

5 Open the valve on the bottom of the magnetic filter/dirt separator to drain water from the water circuit. Collect the drained water in the drain pan, bottle, sink,… using the installed drain hose.

6 Wait until the drained water is clear.

7 Close the valve on the bottom of the magnetic filter/dirt separator and install the magnetic sleeve.

8 Add water to the water circuit if needed, see "3.19.2 Repair procedures" [▶ 223].

> **INFORMATION**
>
> During a normal flushing operation you will NOT lose too much water. It is NOT required to air-purge the system.

> **CAUTION**
>
> In case additives are used, take care of the % after flushing the system every year.

Is the problem solved?	Action
Yes	No further actions required.
No	Replace the magnetic filter/dirt separator, see "3.19.2 Repair procedures" [▶ 223].

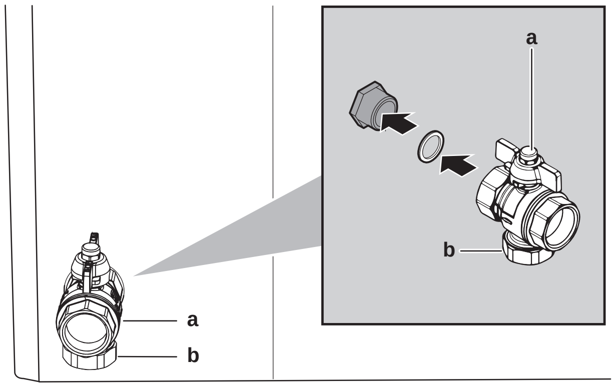
5.4 To clean the integrated filter of the shut-off valve

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Close the shut-off valve.

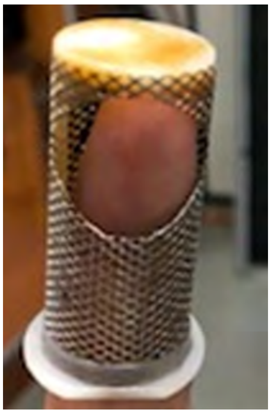
2 Unscrew the bottom cap.



a Shut-off valve
b Bottom cap

3 Pull the filter out of the shut-off valve.

4 Clean the filter with water and a soft brush.



a Filter

5 When cleaned, reinstall the filter in the shut-off valve.

> **NOTICE**
> Handle the water filter with care. Do NOT use excessive force when you reinsert the water filter so as NOT to damage the water filter mesh.

6 Screw the bottom cap back on.

7 Open the shut-off valve.

8 Make sure that the air purge valves are in the open position.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

6 Technical data

6.1 Detailed information setting mode

6.1.1 Detailed information setting mode: Indoor unit

See the installer reference guide on business portal for more information.

6.1.2 Detailed information setting mode: Outdoor unit

See the installer reference guide on business portal for more information.

6.1.3 Detailed information setting mode: Remote controller

See the installer reference guide on business portal for more information.

6.2 Wiring diagram

6.2.1 Wiring diagram: Indoor unit – Floor standing

See the internal wiring diagram supplied with the unit (on the inside of the indoor unit switch box cover). The abbreviations used are listed below.

Notes to go through before starting the unit

English	Translation
Notes to go through before starting the unit	Notes to go through before starting the unit
X1M	Main terminal
X2M	Field wiring terminal for AC
X5M	Field wiring terminal for DC
X6M	Backup heater power supply terminal
X10M	Smart grid terminal
—·—·—·—	Earth wiring
- - - - - - -	Field supply
①	Several wiring possibilities
	Option
	Not mounted in switch box
	Wiring depending on model
	PCB
Note 1: Connection point of the power supply for the BUH/BSH should be foreseen outside the unit.	Note 1: Connection point of the power supply for the backup heater/booster heater should be foreseen outside the unit.
Backup heater power supply	Backup heater power supply
☐ 6T1 (3~, 230 V, 6 kW)	☐ 6T1 (3~, 230 V, 6 kW)
☐ 6V3 (1N~, 230 V, 6 kW)	☐ 6V3 (1N~, 230 V, 6 kW)
☐ 6WN/9WN (3N~, 400 V, 6/9 kW)	☐ 6WN/9WN (3N~, 400 V, 6/9 kW)
User installed options	User installed options
☐ Remote user interface	☐ User interface used as room thermostat
☐ Ext. indoor thermistor	☐ External indoor thermistor
☐ Ext outdoor thermistor	☐ External outdoor thermistor
☐ Digital I/O PCB	☐ Digital I/O PCB
☐ Demand PCB	☐ Demand PCB
☐ Safety thermostat	Safety thermostat
☐ Smart Grid	Smart grid
☐ WLAN module	WLAN module
☐ WLAN cartridge	WLAN cartridge

English	Translation
☐ Bizone mixing kit	Bizone mixing kit
Main LWT	Main leaving water temperature
☐ On/OFF thermostat (wired)	☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)	☐ On/OFF thermostat (wireless)
☐ Ext. thermistor	☐ External thermistor
☐ Heat pump convector	☐ Heat pump convector
Add LWT	Additional leaving water temperature
☐ On/OFF thermostat (wired)	☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)	☐ On/OFF thermostat (wireless)
☐ Ext. thermistor	☐ External thermistor
☐ Heat pump convector	☐ Heat pump convector

Position in switch box

English	Translation
Position in switch box	Position in switch box

Legend

A1P		Main PCB
A2P	*	On/OFF thermostat (PC=power circuit)
A3P	*	Heat pump convector
A4P	*	Digital I/O PCB
A8P	*	Demand PCB
A11P		MMI (= user interface connected to the indoor unit) – Main PCB
A14P	*	User interface PCB
A15P	*	Receiver PCB (wireless On/OFF thermostat)
A20P	*	WLAN module
A30P	*	Bizone mixing kit PCB
CN* (A4P)	*	Connector
DS1(A8P)	*	DIP switch
F1B	#	Overcurrent fuse backup heater
F1U, F2U (A4P)	*	Fuse 5 A 250 V for digital I/O PCB
K1A, K2A	*	High voltage Smart grid relay
K1M, K2M		Contactor backup heater
K5M		Safety contactor backup heater
K*R (A1P-A4P)		Relay on PCB
M2P	#	Domestic hot water pump
M2S	#	2-way valve for cooling mode
PC (A15P)	*	Power circuit

PHC1 (A4P)	*	Optocoupler input circuit
Q1L		Thermal protector backup heater
Q4L	#	Safety thermostat
Q*DI	#	Earth leakage circuit breaker
R1H (A2P)	*	Humidity sensor
R1T (A2P)	*	Ambient sensor On/OFF thermostat
R2T (A2P)	*	External sensor (floor or ambient)
R6T	*	External indoor or outdoor ambient thermistor
S1S	#	Preferential kWh rate power supply contact
S2S	#	Electrical meter pulse input 1
S3S	#	Electrical meter pulse input 2
S4S	#	Smart grid feed-in
S6S~S9S	*	Digital power limitation inputs
S10S-S11S	#	Low voltage Smart grid contact
SS1 (A4P)	*	Selector switch
TR1		Power supply transformer
X6M	#	Backup heater power supply terminal strip
X10M	*	Smart grid power supply terminal strip
X*, X*A, J*, X*H*, X*Y		Connector
X*M		Terminal strip

* Optional

\# Field supply

Translation of text on wiring diagram

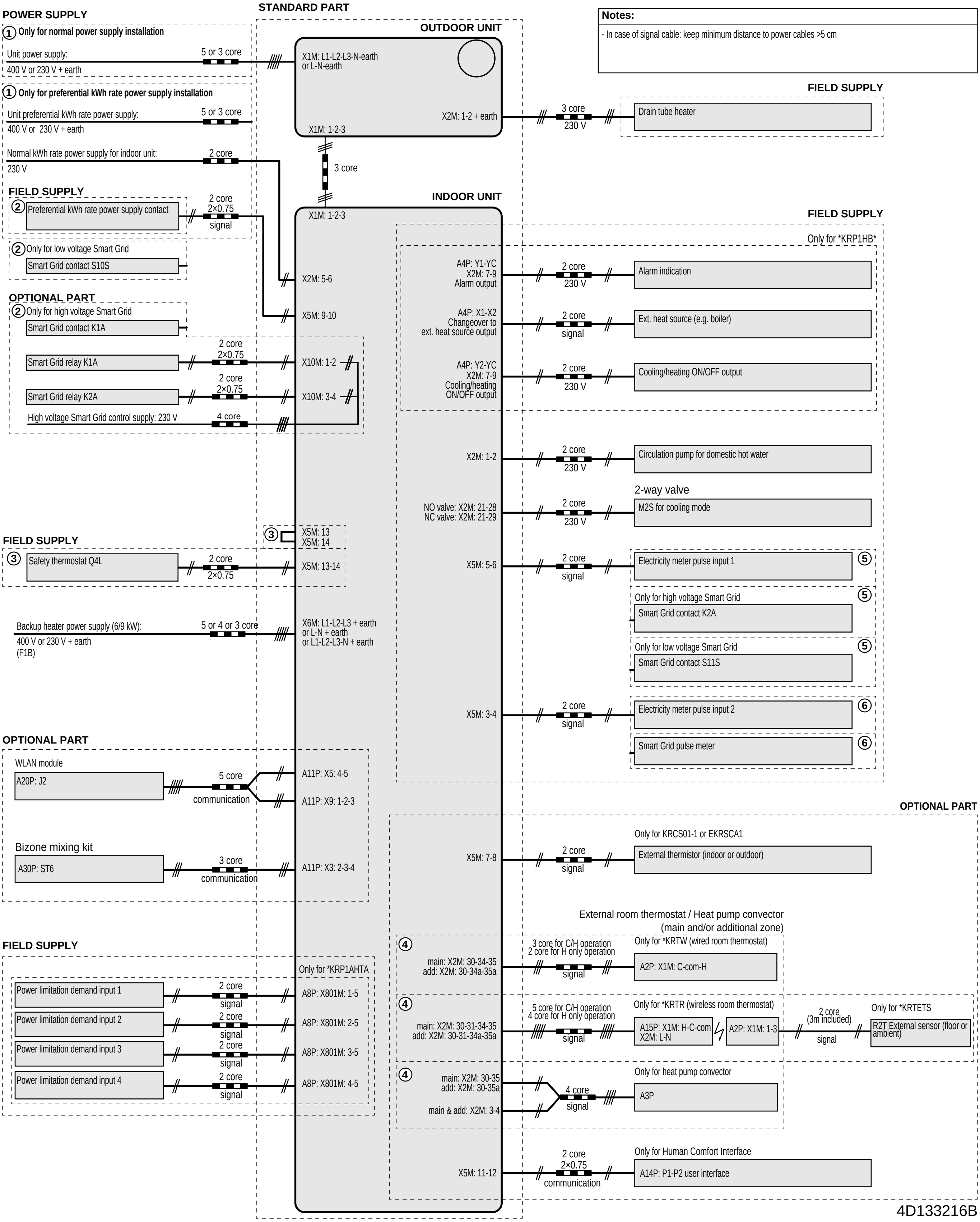
English	Translation
(1) Main power connection	(1) Main power connection
For HP tariff	For heat pump tariff
Indoor unit supplied from outdoor	Indoor unit supplied from outdoor
Normal kWh rate power supply	Normal kWh rate power supply
Only for normal power supply (standard)	Only for normal power supply (standard)
Only for preferential kWh rate power supply (outdoor)	Only for preferential kWh rate power supply (outdoor)
Outdoor unit	Outdoor unit
Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB)	Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB)
SWB	Switch box
Use normal kWh rate power supply for indoor unit	Use normal kWh rate power supply for indoor unit
(2) Backup heater power supply	(2) Backup heater power supply

English	Translation
Only for ***	Only for ***
(3) User interface	(3) User interface
Only for remote user interface	Only for the user interface used as room thermostat
SD card	Card slot for WLAN cartridge
WLAN cartridge	WLAN cartridge
(5) Ext. thermistor	(5) External thermistor
SWB	Switch box
(6) Field supplied options	(6) Field supplied options
12 V DC pulse detection (voltage supplied by PCB)	12 V DC pulse detection (voltage supplied by PCB)
230 V AC Control Device	230 V AC Control Device
230 V AC supplied by PCB	230 V AC supplied by PCB
Bizone mixing kit	Bizone mixing kit
Continuous	Continuous current
DHW pump output	Domestic hot water pump output
DHW pump	Domestic hot water pump
Electrical meters	Electrical meters
For HV smartgrid	For high voltage Smart Grid
For LV smartgrid	For low voltage Smart Grid
For safety thermostat	For safety thermostat
For safety thermostat	For safety thermostat
For smartgrid	For Smart Grid
Inrush	Inrush current
Max. load	Maximum load
Normally closed	Normally closed
Normally open	Normally open
Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)	Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)
Shut-off valve	Shut-off valve
Smartgrid contacts	Smart Grid contacts
Smartgrid PV power pulse meter	Smart Grid photovoltaic power pulse meter
SWB	Switch box
(7) Option PCBs	(7) Option PCBs
Alarm output	Alarm output
Changeover to ext. heat source	Changeover to external heat source
Max. load	Maximum load

English	Translation
Min. load	Minimum load
Only for demand PCB option	Only for demand PCB option
Only for digital I/O PCB option	Only for digital I/O PCB option
Options: external heat source output, solar pump connection, alarm output	Options: external heat source output, solar pump connection, alarm output
Options: On/OFF output	Options: On/OFF output
Power limitation digital inputs: 12 V DC / 12 mA detection (voltage supplied by PCB)	Power limitation digital inputs: 12 V DC / 12 mA detection (voltage supplied by PCB)
Refer to operation manual	Refer to the operation manual
Solar input	Solar input
Solar pump connection	Solar pump connection
Space C/H On/OFF output	Space cooling/heating On/OFF output
SWB	Switch box
(8) External On/OFF thermostats and heat pump convector	(8) External On/OFF thermostats and heat pump convector
Additional LWT zone	Additional leaving water temperature zone
Main LWT zone	Main leaving water temperature zone
Only for external sensor (floor/ambient)	Only for external sensor (floor or ambient)
Only for heat pump convector	Only for heat pump convector
Only for wired On/OFF thermostat	Only for wired On/OFF thermostat
Only for wireless On/OFF thermostat	Only for wireless On/OFF thermostat

Electrical connection diagram

For more details, please check the unit wiring.



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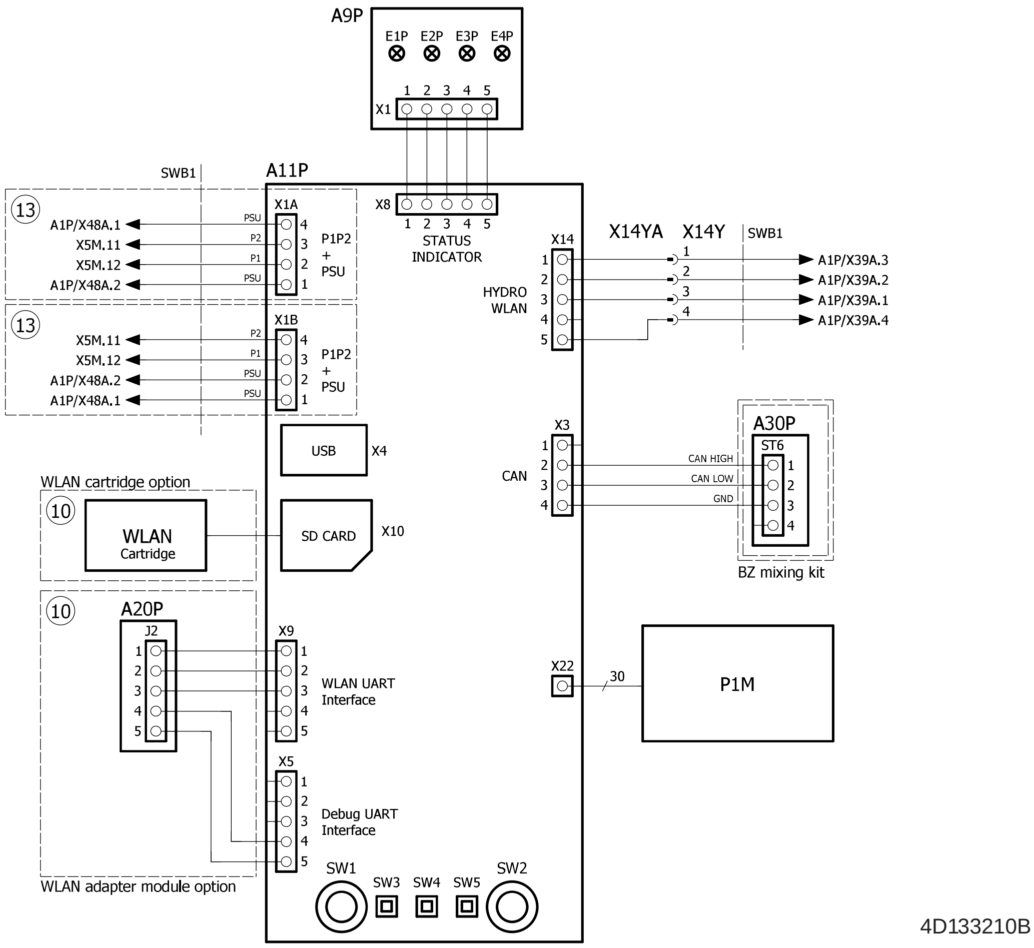
INFORMATION

The diagrams shown in this manual may be incorrect due to changes/updates to the unit. Correct diagrams are supplied with the unit and can also be found in the technical data book.



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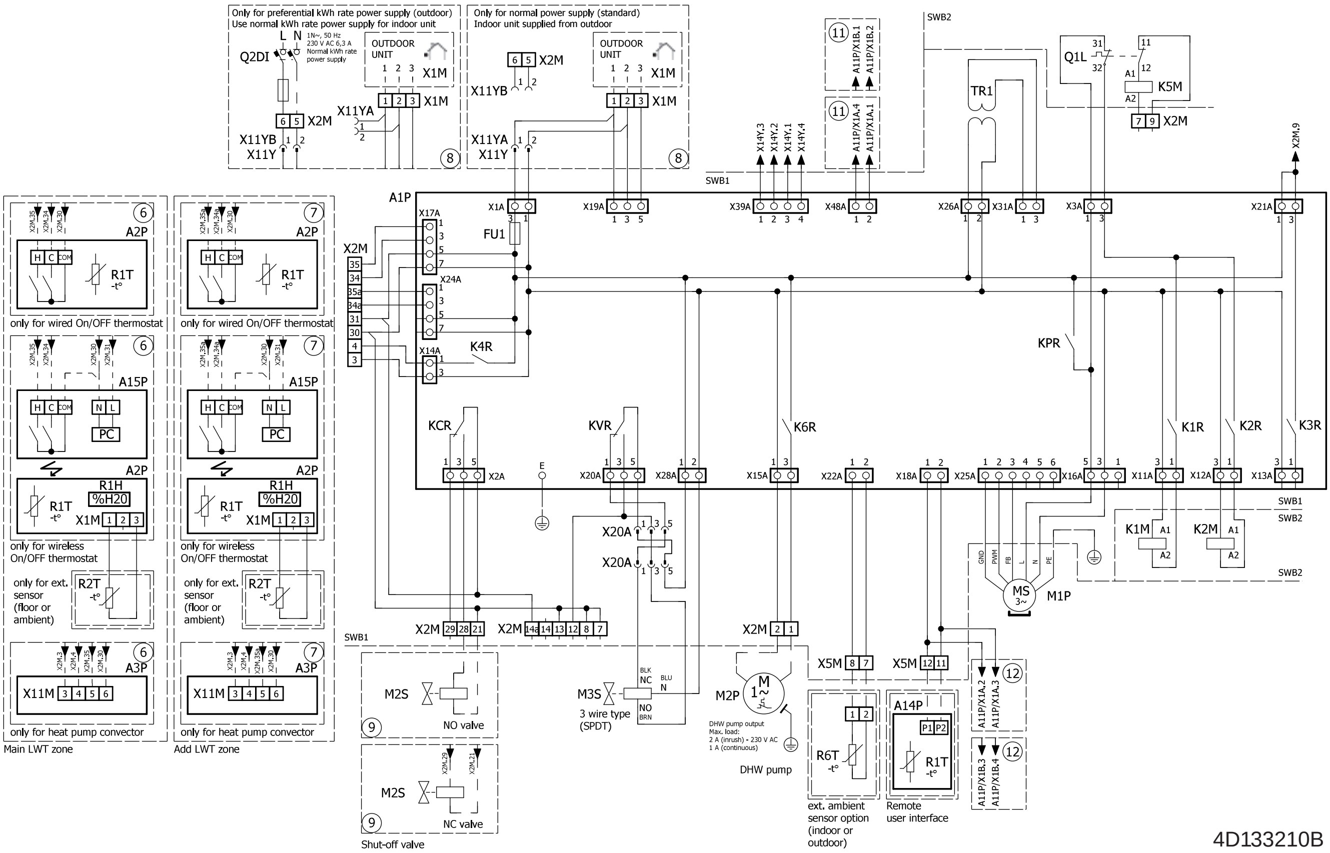

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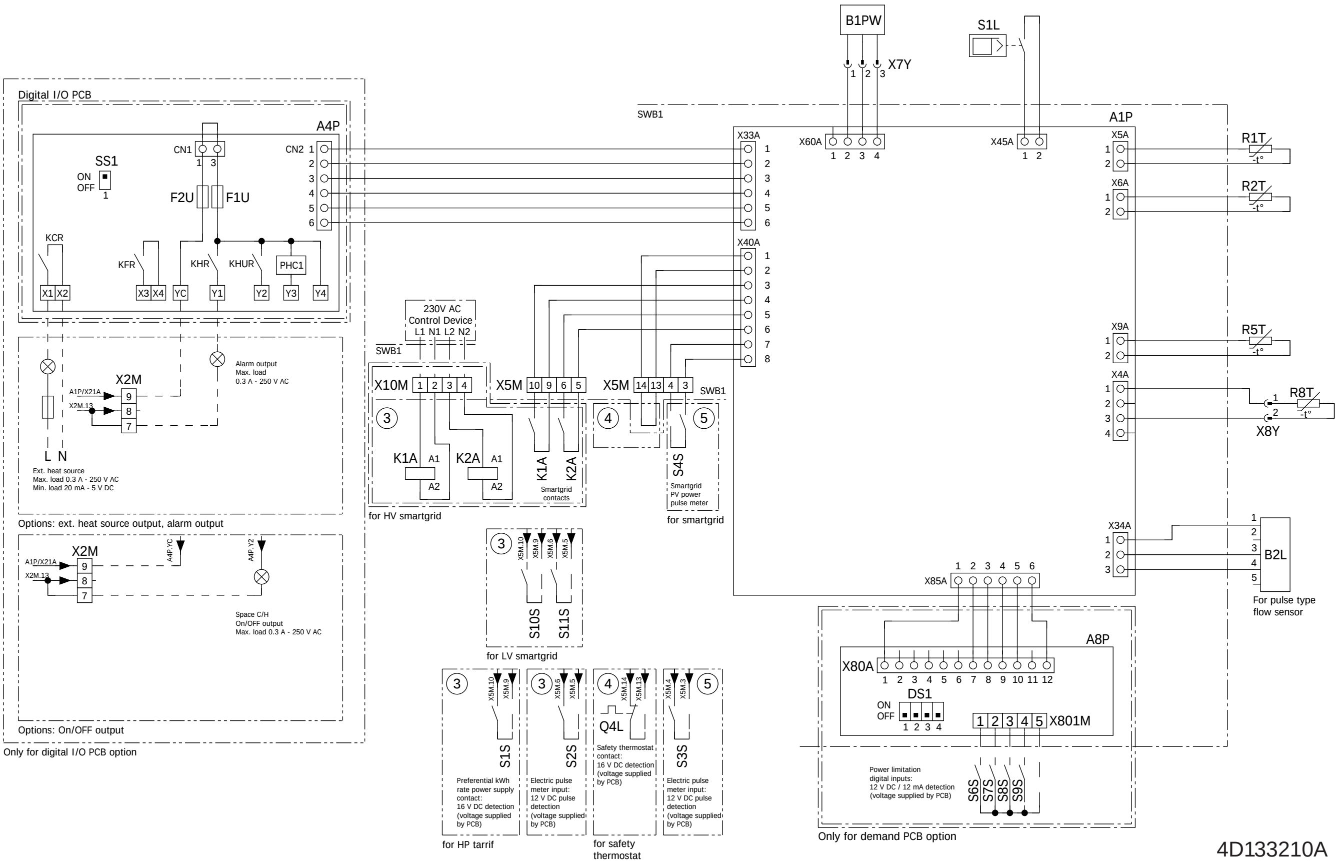
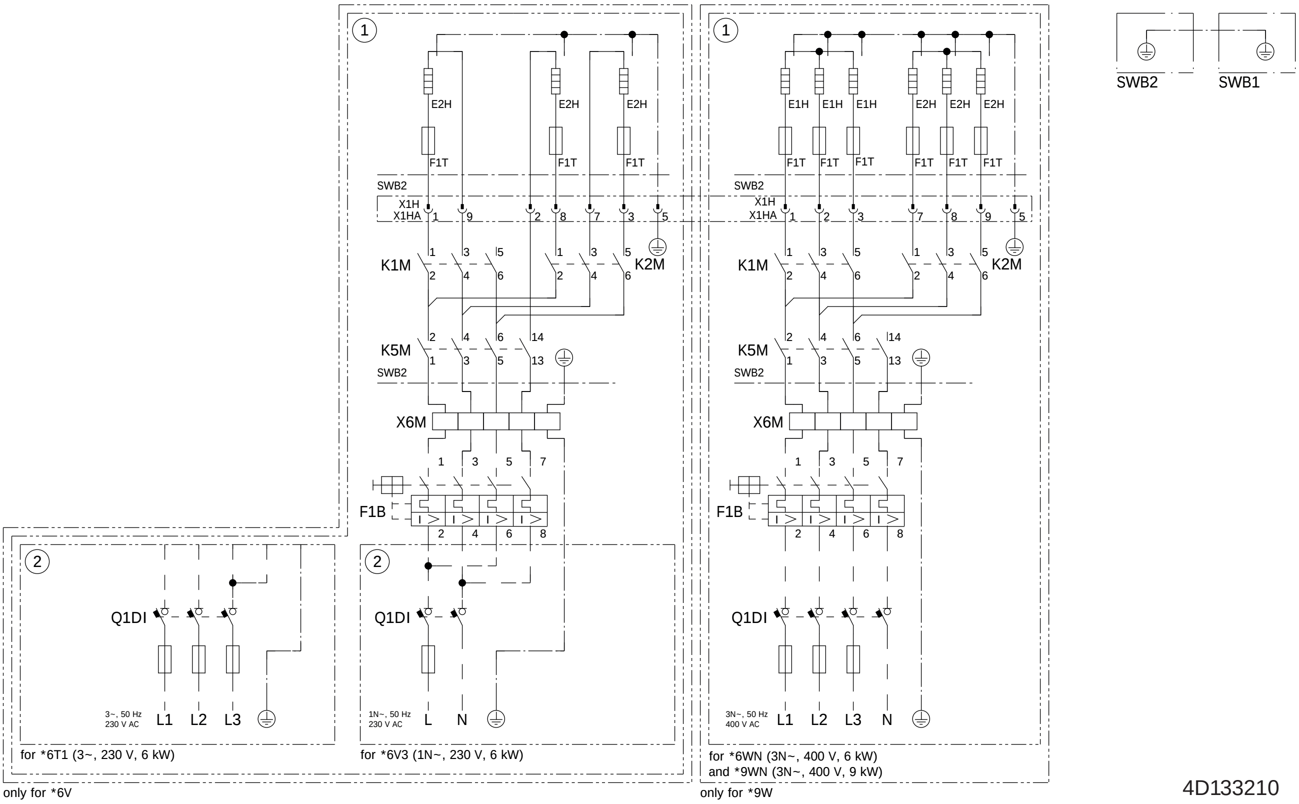


> **INFORMATION**
>
> The diagrams shown in this manual may be incorrect due to changes/updates to the unit. Correct diagrams are supplied with the unit and can also be found in the technical data book.



INFORMATION

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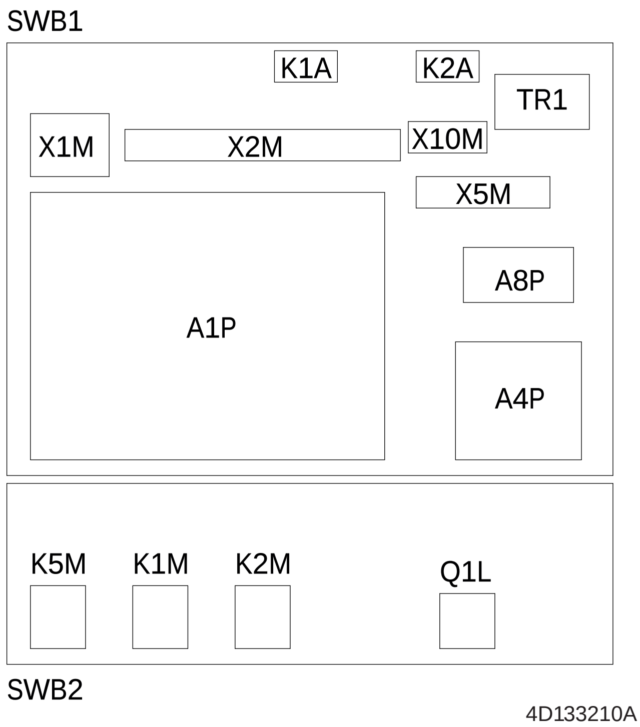
Switch box



6.2.2 Wiring diagram: Indoor unit – Bizone

See the internal wiring diagram supplied with the unit (on the inside of the indoor unit switch box cover). The abbreviations used are listed below.

Notes to go through before starting the unit

English	Translation
Notes to go through before starting the unit	Notes to go through before starting the unit
X1M	Main terminal
X2M	Field wiring terminal for AC
X5M	Field wiring terminal for DC
X6M	Backup heater power supply terminal
X10M	Smart grid terminal
—·—·—·—	Earth wiring
- - - - - - -	Field supply
①	Several wiring possibilities
	Option
	Not mounted in switch box
	Wiring depending on model
	PCB
Note 1: Connection point of the power supply for the BUH/BSH should be foreseen outside the unit.	Note 1: Connection point of the power supply for the backup heater/booster heater should be foreseen outside the unit.
Backup heater power supply	Backup heater power supply
☐ 6T1 (3~, 230 V, 6 kW)	☐ 6T1 (3~, 230 V, 6 kW)
☐ 6V3 (1N~, 230 V, 6 kW)	☐ 6V3 (1N~, 230 V, 6 kW)
☐ 6WN/9WN (3N~, 400 V, 6/9 kW)	☐ 6WN/9WN (3N~, 400 V, 6/9 kW)
User installed options	User installed options
☐ Remote user interface	☐ User interface used as room thermostat
☐ Ext. indoor thermistor	☐ External indoor thermistor
☐ Ext outdoor thermistor	☐ External outdoor thermistor
☐ Digital I/O PCB	☐ Digital I/O PCB
☐ Demand PCB	☐ Demand PCB
☐ Safety thermostat	Safety thermostat
☐ Smart Grid	Smart grid
☐ WLAN module	WLAN module
☐ WLAN cartridge	WLAN cartridge
Main LWT	Main leaving water temperature

English	Translation
☐ On/OFF thermostat (wired)	☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)	☐ On/OFF thermostat (wireless)
☐ Ext. thermistor	☐ External thermistor
☐ Heat pump convector	☐ Heat pump convector
Add LWT	Additional leaving water temperature
☐ On/OFF thermostat (wired)	☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)	☐ On/OFF thermostat (wireless)
☐ Ext. thermistor	☐ External thermistor
☐ Heat pump convector	☐ Heat pump convector

Position in switch box

English	Translation
Position in switch box	Position in switch box

Legend

A1P		Main PCB
A2P	*	On/OFF thermostat (PC=power circuit)
A3P	*	Heat pump convector
A4P	*	Digital I/O PCB
A5P		Bizone PCB
A6P		Current loop PCB
A8P	*	Demand PCB
A11P		MMI (= user interface connected to the indoor unit) – Main PCB
A14P	*	User interface PCB
A15P	*	Receiver PCB (wireless On/OFF thermostat)
A20P	*	WLAN module
CN* (A4P)	*	Connector
DS1(A8P)	*	DIP switch
F1B	#	Overcurrent fuse backup heater
F1U, F2U (A4P)	*	Fuse 5 A 250 V for digital I/O PCB
FU1 (A1P)		Fuse T 5 A 250 V for PCB
K1A, K2A	*	High voltage Smart grid relay
K1M, K2M		Contactor backup heater
K5M		Safety contactor backup heater
K6M		Relay 3-way valve bypass
K7M		Relay 3-way valve flow
K*R (A1P-A4P)		Relay on PCB
M2P	#	Domestic hot water pump

M2S	#	2-way valve for cooling mode
PC (A15P)	*	Power circuit
PHC1 (A4P)	*	Optocoupler input circuit
Q1L		Thermal protector backup heater
Q3L, Q4L	#	Safety thermostat
Q*DI	#	Earth leakage circuit breaker
R1H (A2P)	*	Humidity sensor
R1T (A2P)	*	Ambient sensor On/OFF thermostat
R2T (A2P)	*	External sensor (floor or ambient)
R6T	*	External indoor or outdoor ambient thermistor
S1S	#	Preferential kWh rate power supply contact
S2S	#	Electrical meter pulse input 1
S3S	#	Electrical meter pulse input 2
S4S	#	Smart grid feed-in
S6S~S9S	*	Digital power limitation inputs
S10S-S11S	#	Low voltage Smart grid contact
SS1 (A4P)	*	Selector switch
TR1		Power supply transformer
X6M	#	Backup heater power supply terminal strip
X10M	*	Smart grid power supply terminal strip
X*, X*A, J*, X*H*, X*Y		Connector
X*M		Terminal strip

* Optional

\# Field supply

Translation of text on wiring diagram

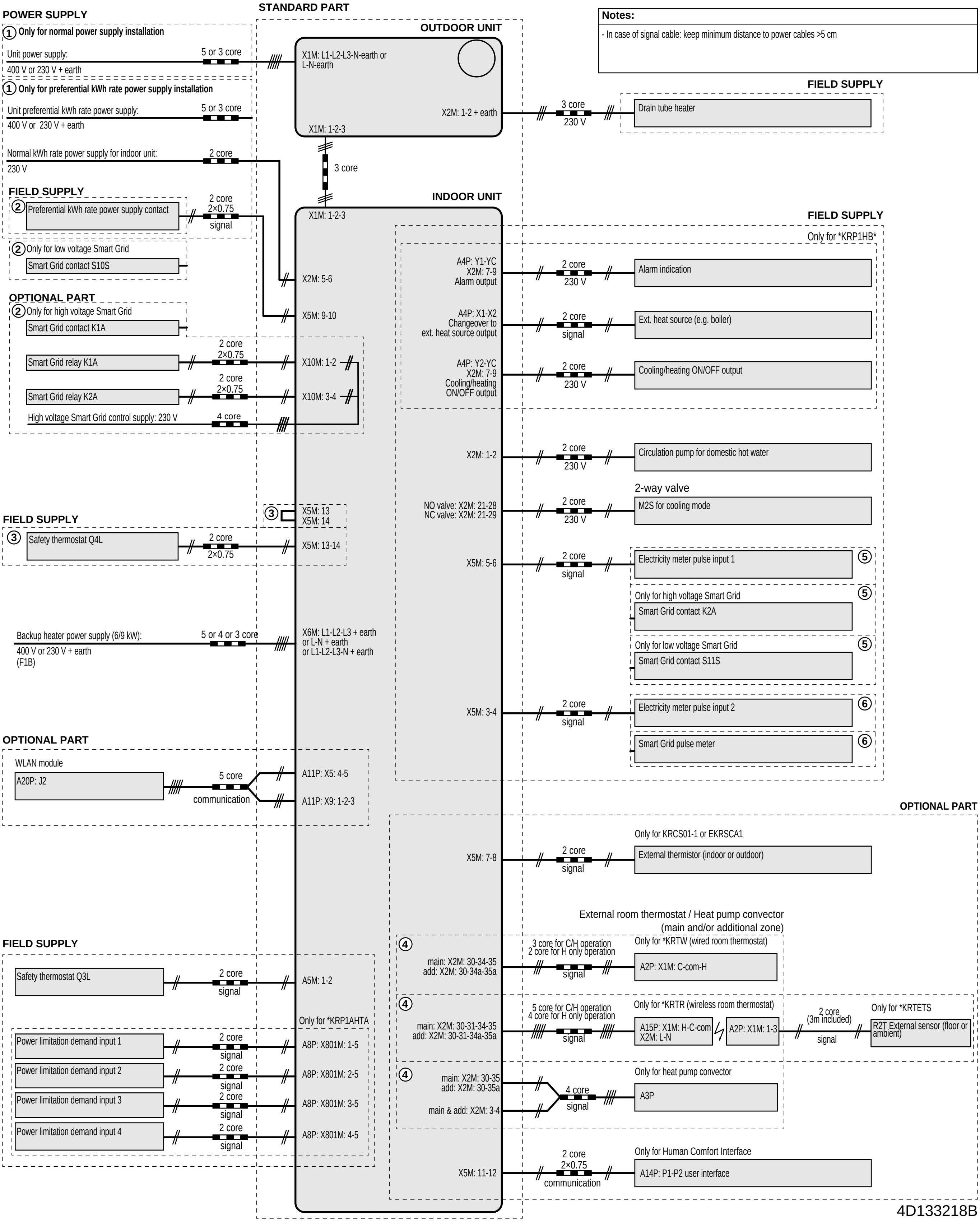
English	Translation
(1) Main power connection	(1) Main power connection
For HP tariff	For heat pump tariff
Indoor unit supplied from outdoor	Indoor unit supplied from outdoor
Normal kWh rate power supply	Normal kWh rate power supply
Only for normal power supply (standard)	Only for normal power supply (standard)
Only for preferential kWh rate power supply (outdoor)	Only for preferential kWh rate power supply (outdoor)
Outdoor unit	Outdoor unit
Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB)	Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB)
SWB	Switch box

English	Translation
Use normal kWh rate power supply for indoor unit	Use normal kWh rate power supply for indoor unit
(2) Backup heater power supply	(2) Backup heater power supply
Only for ***	Only for ***
(3) User interface	(3) User interface
Only for remote user interface	Only for the user interface used as room thermostat
SD card	Card slot for WLAN cartridge
WLAN cartridge	WLAN cartridge
(5) Ext. thermistor	(5) External thermistor
SWB	Switch box
(6) Field supplied options	(6) Field supplied options
12 V DC pulse detection (voltage supplied by PCB)	12 V DC pulse detection (voltage supplied by PCB)
230 V AC Control Device	230 V AC Control Device
230 V AC supplied by PCB	230 V AC supplied by PCB
Continuous	Continuous current
DHW pump output	Domestic hot water pump output
DHW pump	Domestic hot water pump
Electrical meters	Electrical meters
For HV smartgrid	For high voltage Smart Grid
For LV smartgrid	For low voltage Smart Grid
For safety thermostat	For safety thermostat
For safety thermostat	For safety thermostat
For smartgrid	For Smart Grid
Inrush	Inrush current
Max. load	Maximum load
Normally closed	Normally closed
Normally open	Normally open
Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)	Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)
Shut-off valve	Shut-off valve
Smartgrid contacts	Smart Grid contacts
Smartgrid PV power pulse meter	Smart Grid photovoltaic power pulse meter
SWB	Switch box
(7) Option PCBs	(7) Option PCBs
Alarm output	Alarm output
Changeover to ext. heat source	Changeover to external heat source

English	Translation
Max. load	Maximum load
Min. load	Minimum load
Only for demand PCB option	Only for demand PCB option
Only for digital I/O PCB option	Only for digital I/O PCB option
Options: external heat source output, solar pump connection, alarm output	Options: external heat source output, solar pump connection, alarm output
Options: On/OFF output	Options: On/OFF output
Power limitation digital inputs: 12 V DC / 12 mA detection (voltage supplied by PCB)	Power limitation digital inputs: 12 V DC / 12 mA detection (voltage supplied by PCB)
Refer to operation manual	Refer to the operation manual
Solar input	Solar input
Solar pump connection	Solar pump connection
Space C/H On/OFF output	Space cooling/heating On/OFF output
SWB	Switch box
(8) External On/OFF thermostats and heat pump convector	(8) External On/OFF thermostats and heat pump convector
Additional LWT zone	Additional leaving water temperature zone
Main LWT zone	Main leaving water temperature zone
Only for external sensor (floor/ambient)	Only for external sensor (floor or ambient)
Only for heat pump convector	Only for heat pump convector
Only for wired On/OFF thermostat	Only for wired On/OFF thermostat
Only for wireless On/OFF thermostat	Only for wireless On/OFF thermostat

Electrical connection diagram

For more details, please check the unit wiring.



INFORMATION

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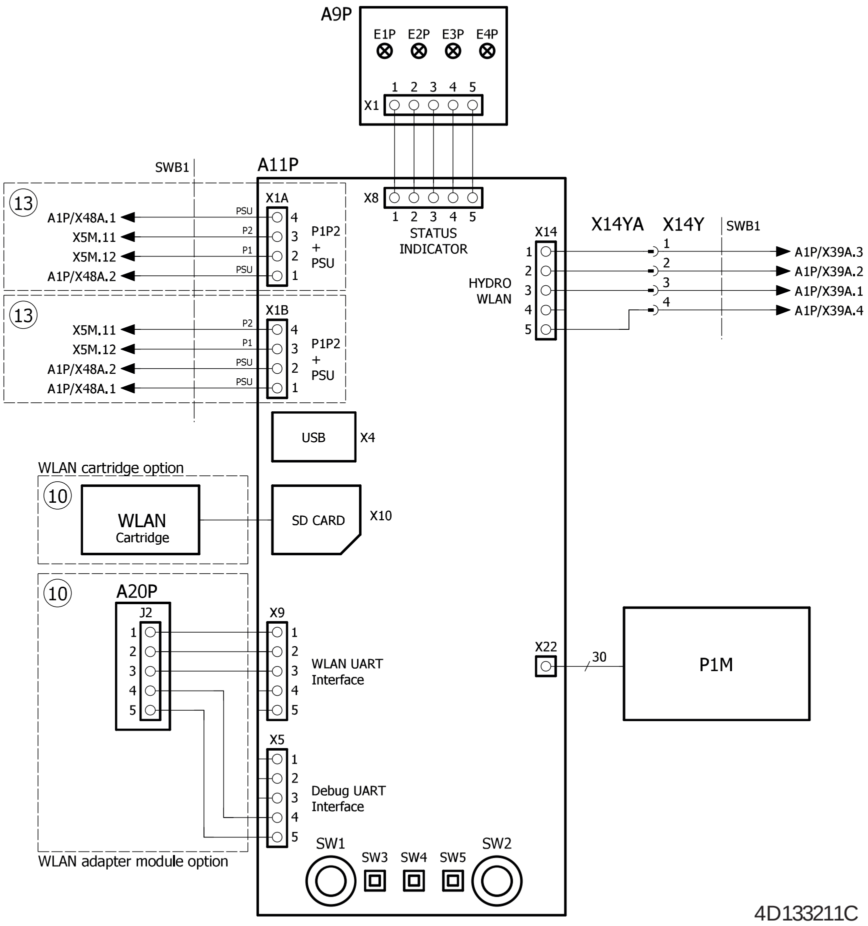

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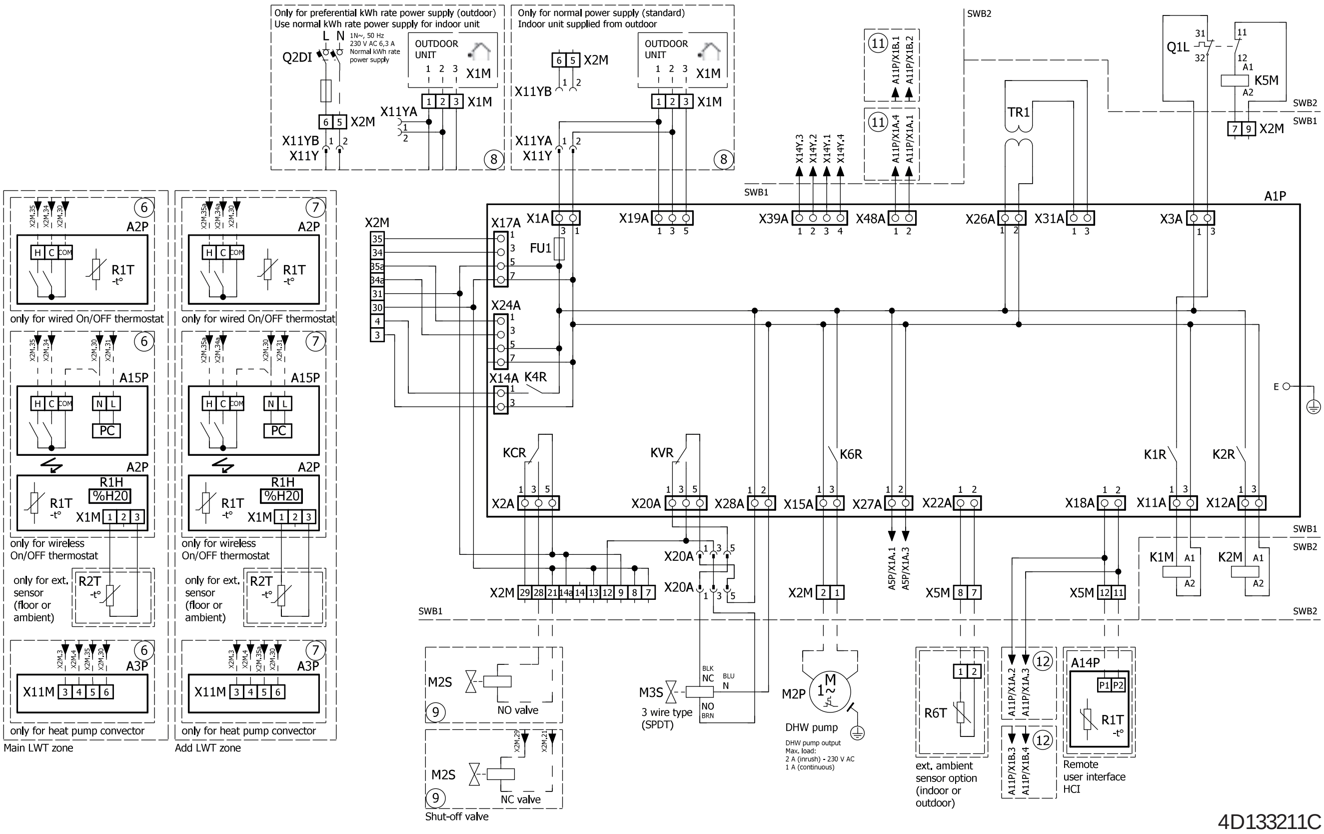

INFORMATION

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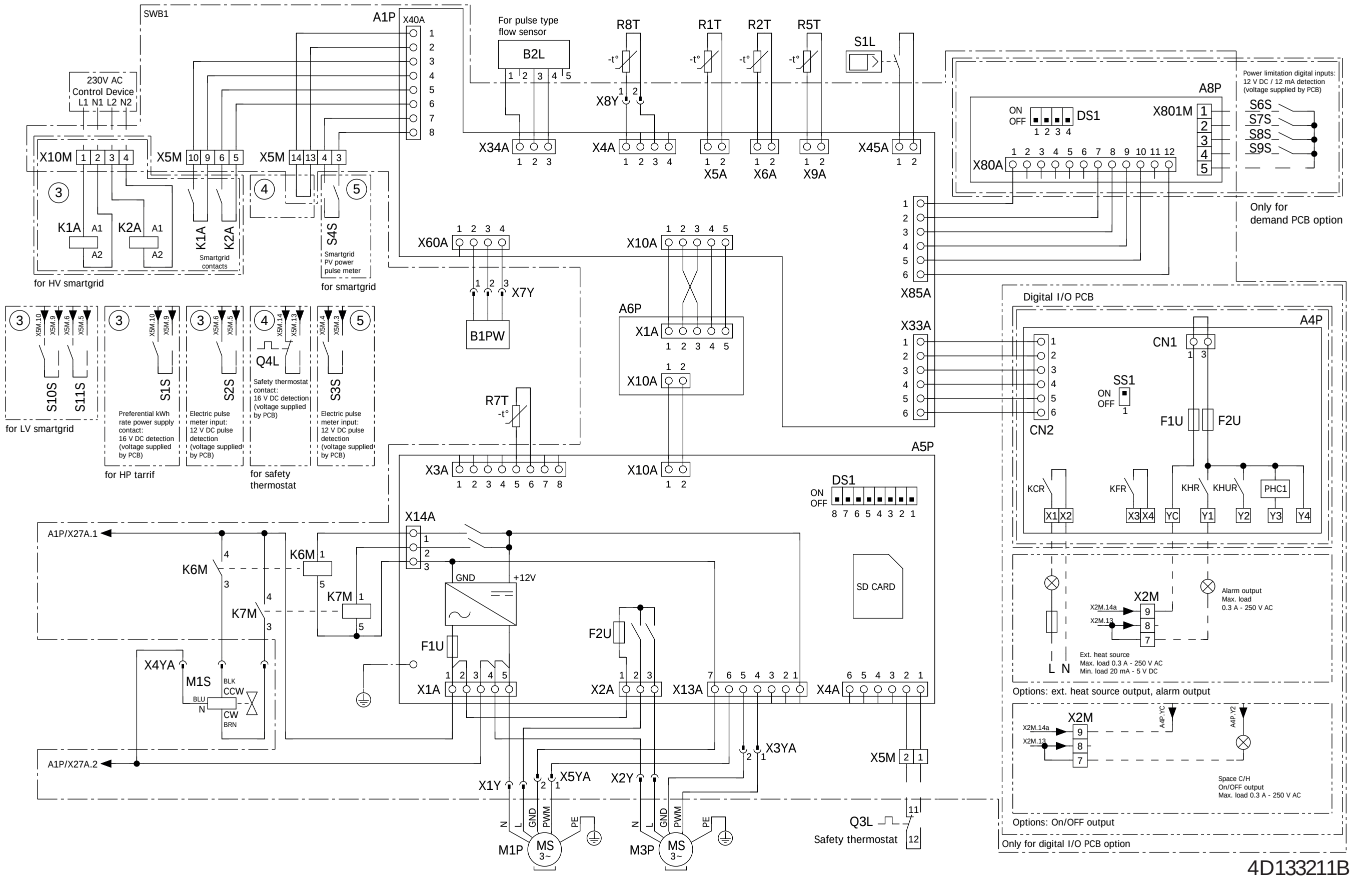

INFORMATION

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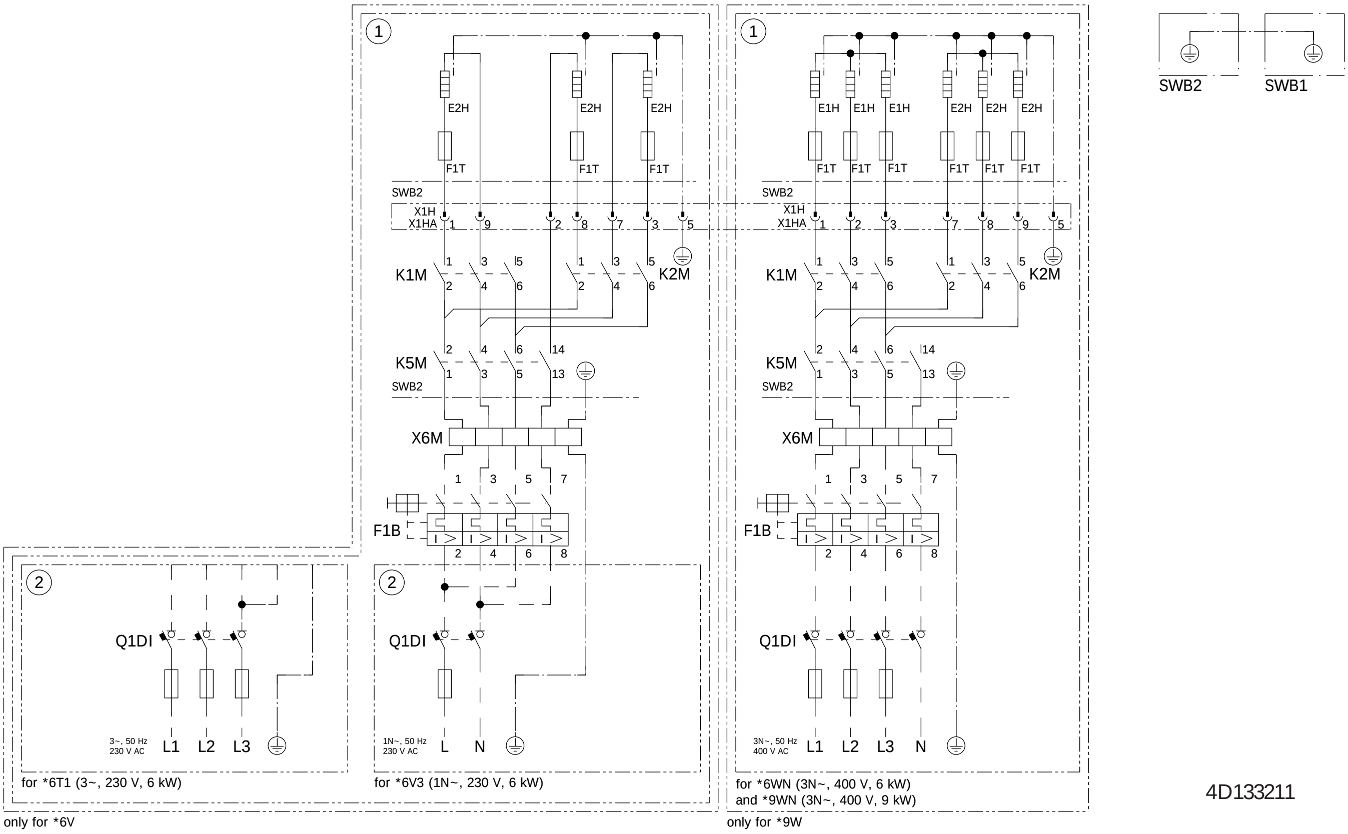

INFORMATION

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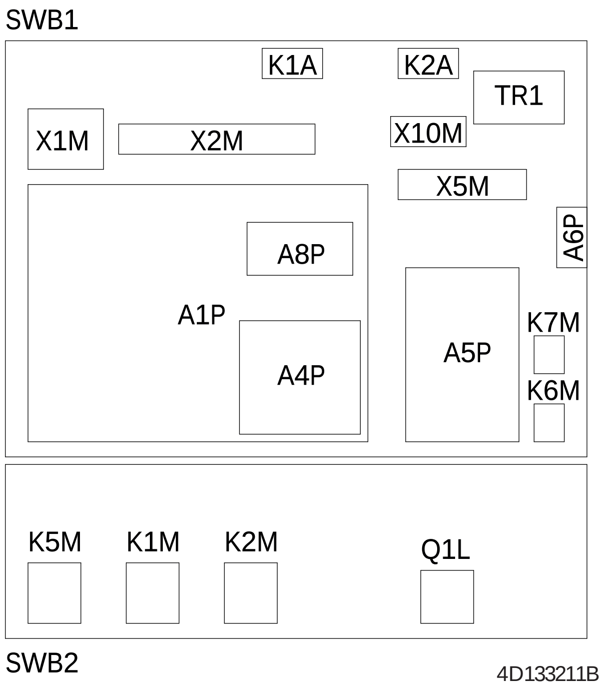
Switch box



6.2.3 Wiring diagram: Indoor unit – Wall mounted

See the internal wiring diagram supplied with the unit (on the inside of the indoor unit switch box cover). The abbreviations used are listed below.

Notes to go through before starting the unit

English	Translation
Notes to go through before starting the unit	Notes to go through before starting the unit
X1M	Main terminal
X2M	Field wiring terminal for AC
X5M	Field wiring terminal for DC
X6M	Backup heater power supply terminal
X7M, X8M	Booster heater power supply terminal
X10M	Smart grid terminal
–·–·–·–·	Earth wiring
-------	Field supply
①	Several wiring possibilities
	Option
	Not mounted in switch box
	Wiring depending on model
	PCB
Note 1: Connection point of the power supply for the BUH/BSH should be foreseen outside the unit.	Note 1: Connection point of the power supply for the backup heater/booster heater should be foreseen outside the unit.
Backup heater power supply	Backup heater power supply
☐ 6T1 (3~, 230 V, 6 kW)	☐ 6T1 (3~, 230 V, 6 kW)
☐ 6V3 (1N~, 230 V, 6 kW)	☐ 6V3 (1N~, 230 V, 6 kW)
☐ 6WN/9WN (3N~, 400 V, 6/9 kW)	☐ 6WN/9WN (3N~, 400 V, 6/9 kW)
User installed options	User installed options
☐ Remote user interface	☐ User interface used as room thermostat
☐ Ext. indoor thermistor	☐ External indoor thermistor
☐ Ext outdoor thermistor	☐ External outdoor thermistor
☐ Digital I/O PCB	☐ Digital I/O PCB
☐ Demand PCB	☐ Demand PCB
☐ Safety thermostat	Safety thermostat
☐ Smart Grid	Smart grid
☐ WLAN module	WLAN module
☐ WLAN cartridge	WLAN cartridge

English	Translation
☐ Bizone mixing kit	Bizone mixing kit
☐ Domestic hot water tank	☐ Domestic hot water tank
Main LWT	Main leaving water temperature
☐ On/OFF thermostat (wired)	☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)	☐ On/OFF thermostat (wireless)
☐ Ext. thermistor	☐ External thermistor
☐ Heat pump convector	☐ Heat pump convector
Add LWT	Additional leaving water temperature
☐ On/OFF thermostat (wired)	☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)	☐ On/OFF thermostat (wireless)
☐ Ext. thermistor	☐ External thermistor
☐ Heat pump convector	☐ Heat pump convector

Position in switch box

English	Translation
Position in switch box	Position in switch box

Legend

A1P		Main PCB
A2P	*	On/OFF thermostat (PC=power circuit)
A3P	*	Heat pump convector
A4P	*	Digital I/O PCB
A8P	*	Demand PCB
A11P		MMI (= user interface connected to the indoor unit) – Main PCB
A14P	*	User interface PCB
A15P	*	Receiver PCB (wireless On/OFF thermostat)
A20P	*	WLAN module
A30P	*	Bizone mixing kit PCB
B1PW		Water pressure sensor
BSK (A3P)		Solar pump station relay
CN* (A4P)	*	Connector
DS1(A8P)	*	DIP switch
F1B	#	Overcurrent fuse backup heater
F2B	#	Overcurrent fuse booster heater
F1U, F2U (A4P)	*	Fuse 5 A 250 V for digital I/O PCB
K1A, K2A	*	High voltage Smart grid relay
K1M, K2M		Contactor backup heater
K3M	*	Contactor booster heater

K5M		Safety contactor backup heater
K*R (A1P-A4P)		Relay on PCB
M2P	#	Domestic hot water pump
M2S	#	2-way valve for cooling mode
M3S	*	3-way valve for floorheating/domestic hot water
PC (A15P)	*	Power circuit
PHC1 (A4P)	*	Optocoupler input circuit
Q1L		Thermal protector backup heater
Q2L	*	Thermal protector booster heater
Q4L	#	Safety thermostat
Q*DI	#	Earth leakage circuit breaker
R1H (A2P)	*	Humidity sensor
R1T (A2P)	*	Ambient sensor On/OFF thermostat
R2T (A2P)	*	External sensor (floor or ambient)
R5T		Domestic hot water thermistor
R6T	*	External indoor or outdoor ambient thermistor
S1S	#	Preferential kWh rate power supply contact
S2S	#	Electrical meter pulse input 1
S3S	#	Electrical meter pulse input 2
S4S	#	Smart grid feed-in
S6S~S9S	*	Digital power limitation inputs
S10S-S11S	#	Low voltage Smart grid contact
SS1 (A4P)	*	Selector switch
TR1		Power supply transformer
X6M	#	Backup heater power supply terminal strip
X6M	*	Booster heater power supply connector
X7M, X8M		Booster heater power supply terminal strip
X10M	*	Smart grid power supply terminal strip
X*, X*A, J*, X*Y*, Y*		Connector
X*M		Terminal strip

* Optional

\# Field supply

Translation of text on wiring diagram

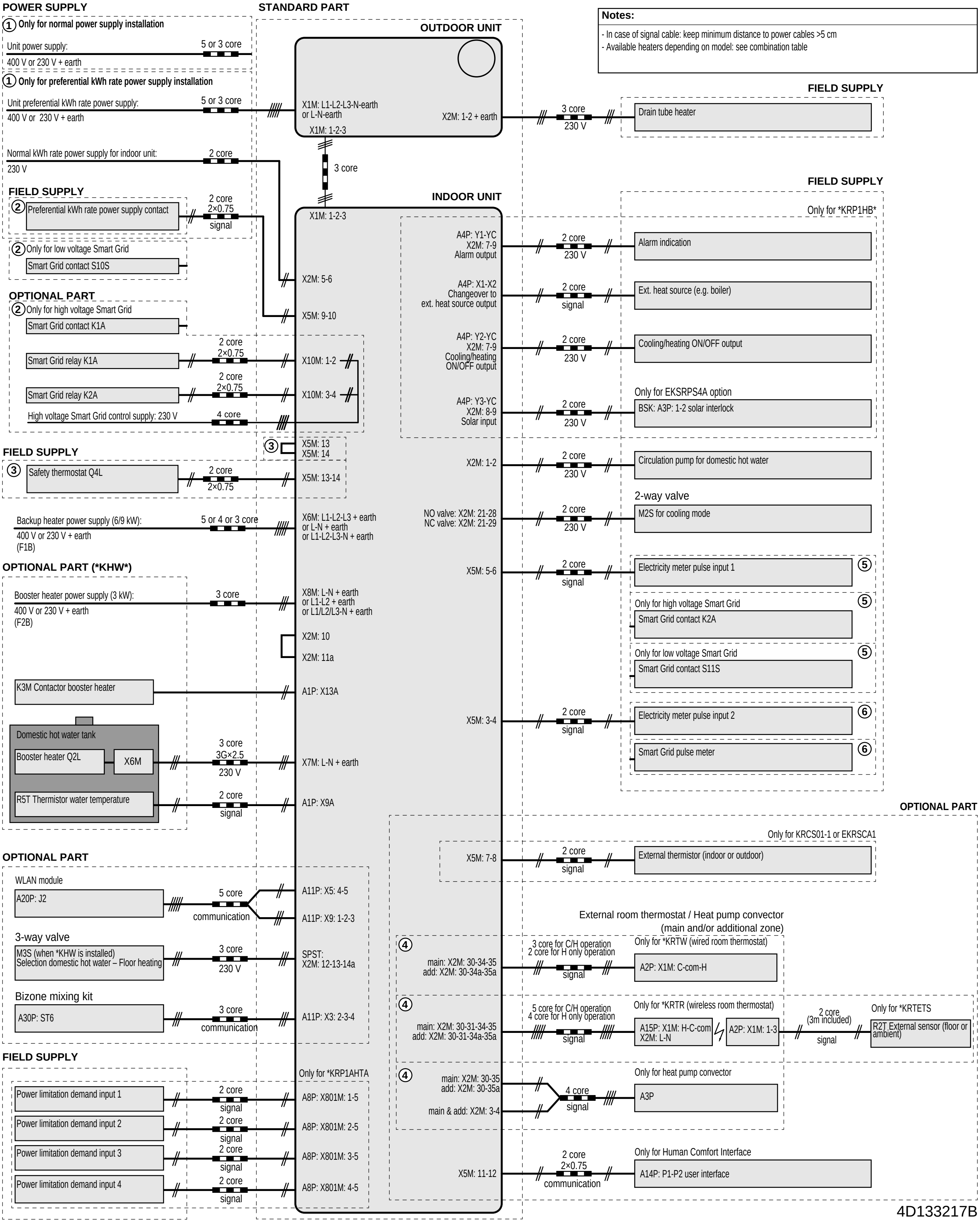
English	Translation
(1) Main power connection	(1) Main power connection
For HP tariff	For heat pump tariff
Indoor unit supplied from outdoor	Indoor unit supplied from outdoor
Normal kWh rate power supply	Normal kWh rate power supply

English	Translation
Only for normal power supply (standard)	Only for normal power supply (standard)
Only for preferential kWh rate power supply (outdoor)	Only for preferential kWh rate power supply (outdoor)
Outdoor unit	Outdoor unit
Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB)	Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB)
SWB	Switch box
Use normal kWh rate power supply for indoor unit	Use normal kWh rate power supply for indoor unit
(2) Backup heater power supply	(2) Backup heater power supply
Only for ***	Only for ***
(3) User interface	(3) User interface
Only for remote user interface	Only for the user interface used as room thermostat
SD card	Card slot for WLAN cartridge
WLAN cartridge	WLAN cartridge
(4) Domestic hot water tank	(4) Domestic hot water tank
3 wire type SPST	3 wire type SPST
Booster heater power supply	Booster heater power supply
Only for ***	Only for ***
SWB	Switch box
(5) Ext. thermistor	(5) External thermistor
SWB	Switch box
(6) Field supplied options	(6) Field supplied options
12 V DC pulse detection (voltage supplied by PCB)	12 V DC pulse detection (voltage supplied by PCB)
230 V AC Control Device	230 V AC Control Device
230 V AC supplied by PCB	230 V AC supplied by PCB
Bizone mixing kit	Bizone mixing kit
Continuous	Continuous current
DHW pump output	Domestic hot water pump output
DHW pump	Domestic hot water pump
Electrical meters	Electrical meters
For HV smartgrid	For high voltage Smart Grid
For LV smartgrid	For low voltage Smart Grid
For safety thermostat	For safety thermostat
For safety thermostat	For safety thermostat

English	Translation
For smartgrid	For Smart Grid
Inrush	Inrush current
Max. load	Maximum load
Normally closed	Normally closed
Normally open	Normally open
Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)	Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)
Shut-off valve	Shut-off valve
Smartgrid contacts	Smart Grid contacts
Smartgrid PV power pulse meter	Smart Grid photovoltaic power pulse meter
SWB	Switch box
(7) Option PCBs	(7) Option PCBs
Alarm output	Alarm output
Changeover to ext. heat source	Changeover to external heat source
Max. load	Maximum load
Min. load	Minimum load
Only for demand PCB option	Only for demand PCB option
Only for digital I/O PCB option	Only for digital I/O PCB option
Options: external heat source output, solar pump connection, alarm output	Options: external heat source output, solar pump connection, alarm output
Options: On/OFF output	Options: On/OFF output
Power limitation digital inputs: 12 V DC / 12 mA detection (voltage supplied by PCB)	Power limitation digital inputs: 12 V DC / 12 mA detection (voltage supplied by PCB)
Refer to operation manual	Refer to the operation manual
Solar input	Solar input
Solar pump connection	Solar pump connection
Space C/H On/OFF output	Space cooling/heating On/OFF output
SWB	Switch box
(8) External On/OFF thermostats and heat pump convector	(8) External On/OFF thermostats and heat pump convector
Additional LWT zone	Additional leaving water temperature zone
Main LWT zone	Main leaving water temperature zone
Only for external sensor (floor/ambient)	Only for external sensor (floor or ambient)
Only for heat pump convector	Only for heat pump convector
Only for wired On/OFF thermostat	Only for wired On/OFF thermostat
Only for wireless On/OFF thermostat	Only for wireless On/OFF thermostat

Electrical connection diagram

For more details, please check the unit wiring.



INFORMATION

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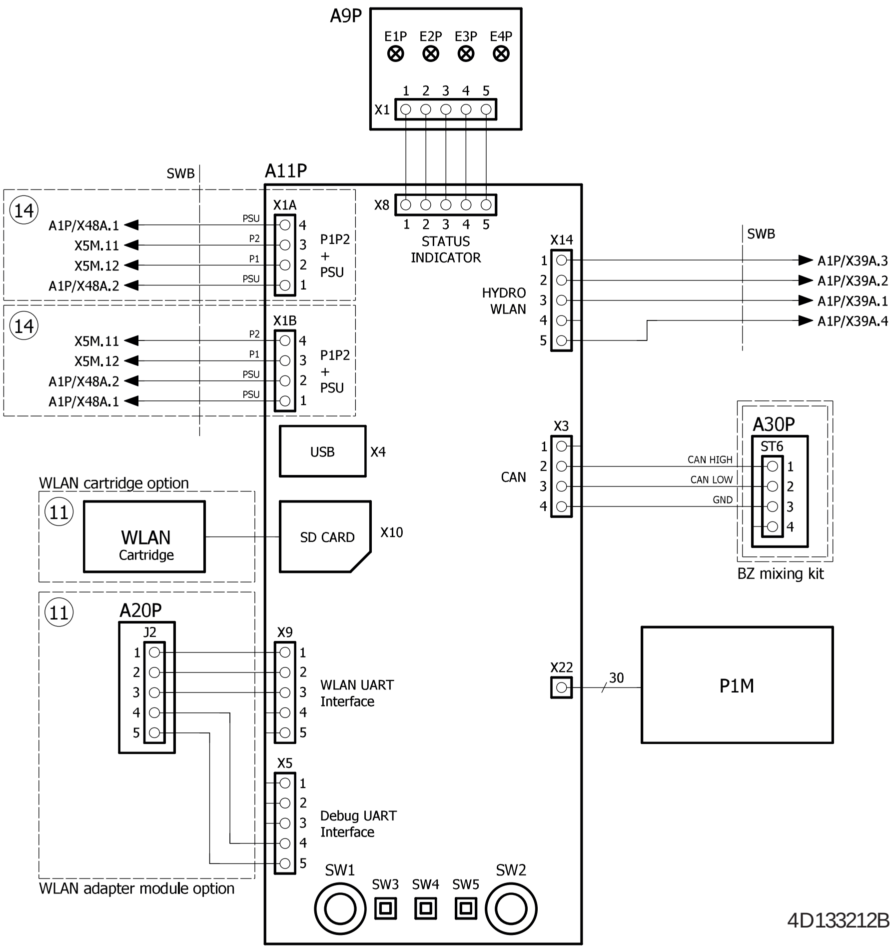

INFORMATION

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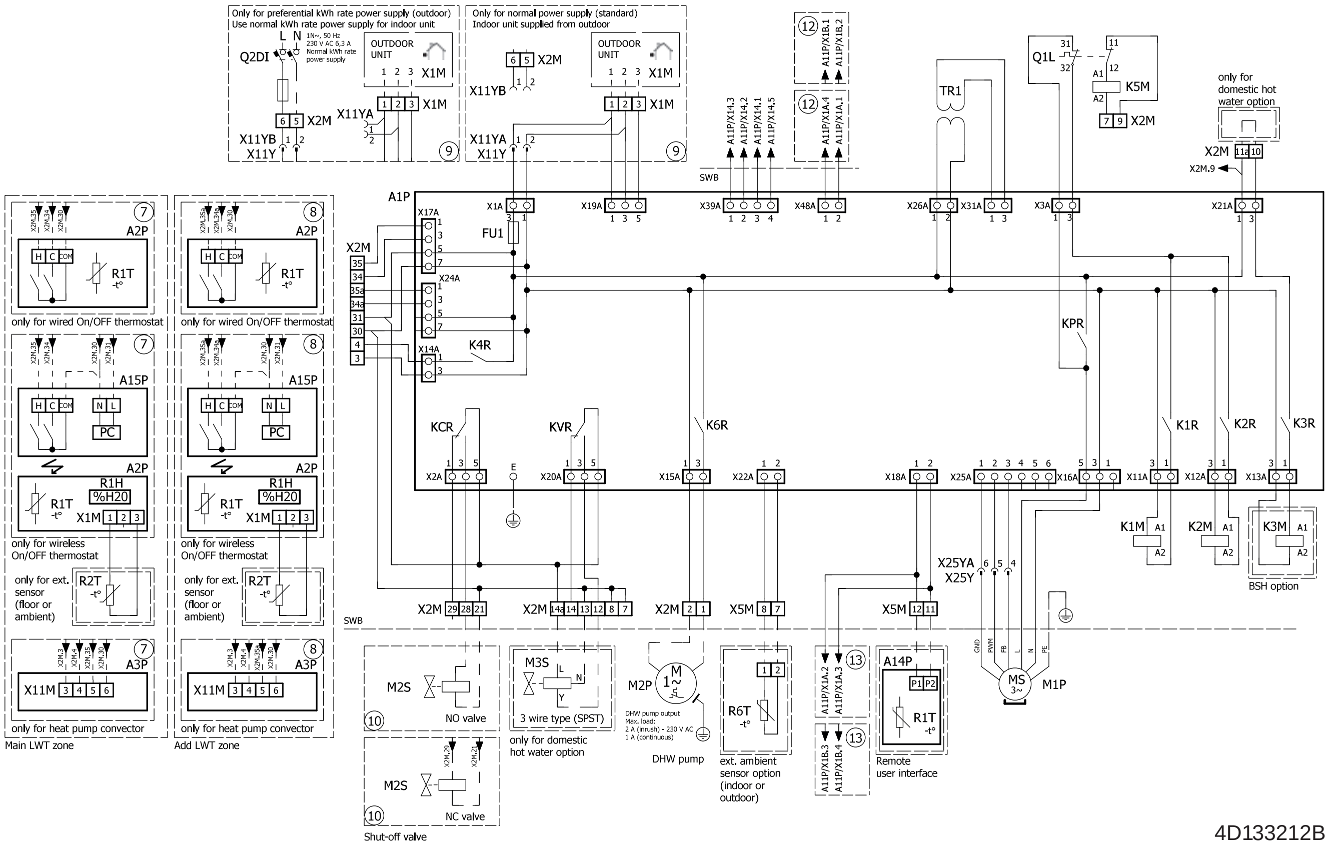

INFORMATION

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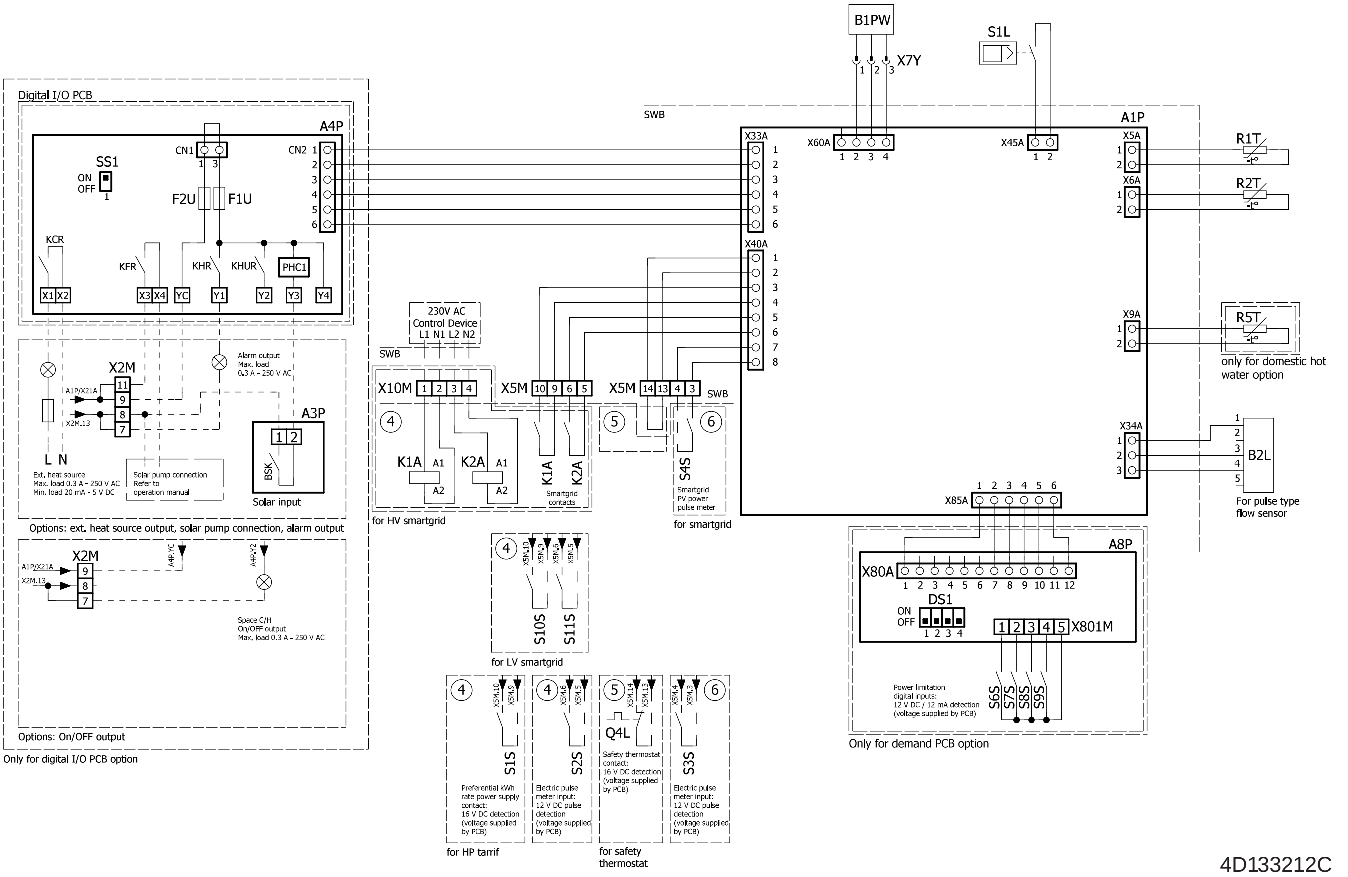

INFORMATION

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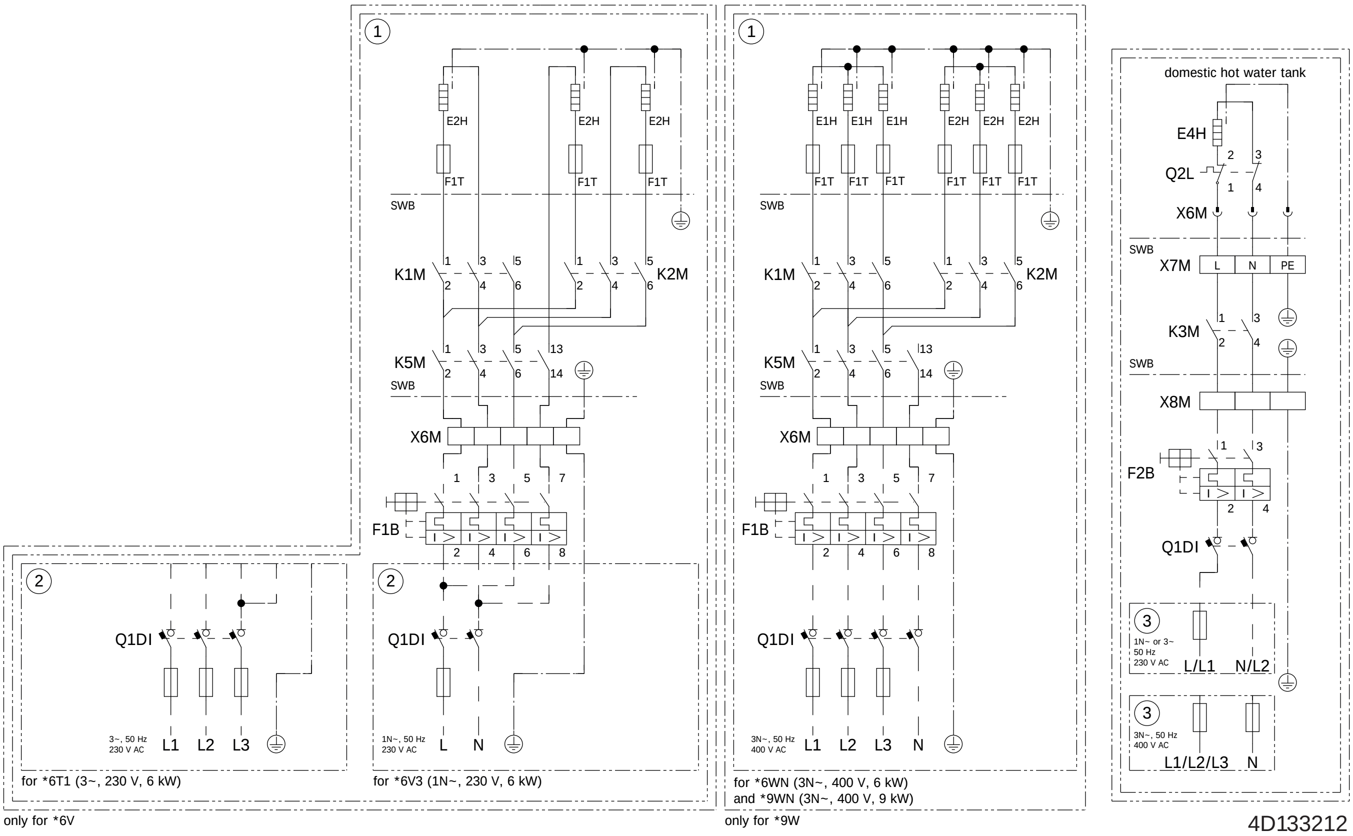

> **INFORMATION**
>
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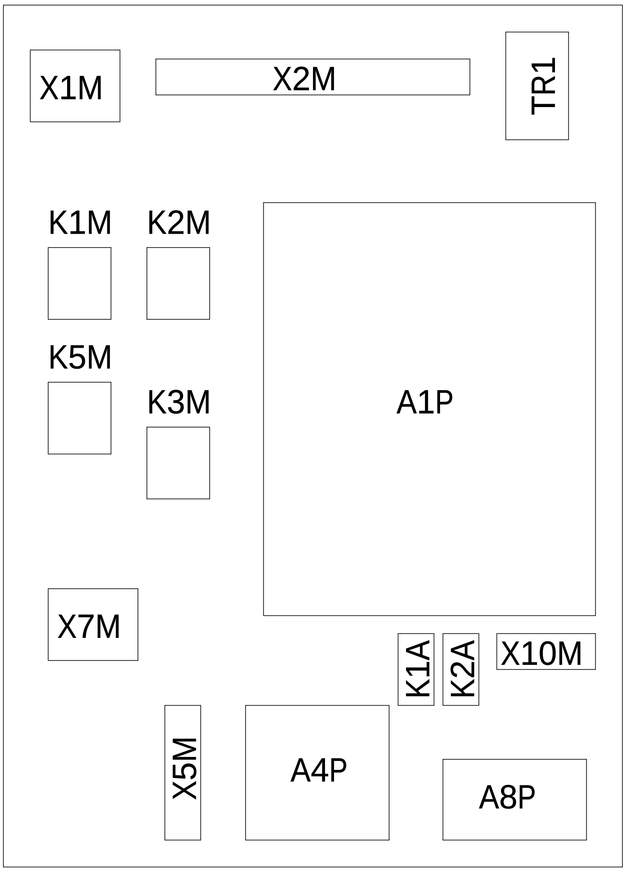
Switch box



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6.2.4 Wiring diagram: Outdoor unit

The wiring diagram is delivered with the unit, located at the inside of the switch box cover.

English	Translation
Electronic component assembly	Electronic component assembly
Front side view	Front side view
Indoor	Indoor
OFF	OFF
ON	ON
Outdoor	Outdoor
Position of compressor terminal	Position of compressor terminal
Position of elements	Position of elements
Rear side view	(only for W1 models) Rear side view
Right side view	Right side view
See note ***	See note ***

Notes:

1	Symbols:	
	L	Live
	N	Neutral
	⏚	Protective earth
		Noiseless earth
		Field wiring
	═:═	Option
		Terminal strip
	-o-	Terminal
		Connector
	-●-	Connection

2	Colours:	
	BLK	Black
	RED	Red
	BLU	Blue
	WHT	White
	GRN	Green
	YLW	Yellow
	PNK	Pink
	ORG	Orange
	GRY	Grey
	BRN	Brown
3	This wiring diagram applies only to the outdoor unit.	
4	When operating, do not short-circuit protective devices S1PH, S2PH and S1PL.	
5	Refer to the combination table and the option manual for how to connect the wiring to X6A, X41A and X2M.	
6	The factory setting of all switches is OFF, do not change the setting of the selector switch (DS1).	
7	(only for W1 models) Ferrite core Z8C consists of 2 separate core parts.	

Legend in case of V3 models:

A1P	Printed circuit board (main)
A2P	Printed circuit board (noise filter)
A3P	Printed circuit board (leakage current)
A4P	Printed circuit board (ACS)
A5P	Printed circuit board (flash)
BS1~BS4 (A1P)	Push button switch
C1~C4 (A1P, A2P)	Capacitor
DS1 (A1P)	DIP switch
E1H	Drain tube heater (field supply)
E1HHEX~E3HHEX	Plate heat exchanger heaters
F1U	Field fuse (field supply)
F1U~F4U (A2P)	Fuse
F6U (A1P)	Fuse (T 5.0 A / 250 V)
H1P~H7P (A1P)	Light-emitting diode (service monitor is orange)
HAP (A1P)	Light-emitting diode (service monitor is green)
K1R (A1P)	Magnetic relay (Y1S)
K1R (A4P)	Magnetic relay (E1HHEX~E3HHEX)
K2R (A1P)	Magnetic relay (Y2S)

K2R (A4P)	Magnetic relay (E1H)
K3R (A1P)	Magnetic relay (Y3S)
K4R (A1P)	Magnetic relay (E1HC)
K10R (A1P)	Magnetic relay
K11M (A1P)	Magnetic contactor
K13R~K15R (A1P, A2P)	Magnetic relay
L1R~L3R (A1P)	Reactor
M1C	Compressor motor
M1F	Fan motor
PS (A1P)	Switching power supply
Q1DI	Earth leakage circuit breaker (30 mA) (field supply)
R1~R5 (A1P, A2P)	Resistor
R1T	Thermistor (outdoor air)
R2T	Thermistor (compressor discharge)
R3T	Thermistor (compressor suction)
R4T	Thermistor (air heat exchanger, distributor)
R5T	Thermistor (air heat exchanger, middle)
R6T	Thermistor (refrigerant liquid)
R7T	Thermistor (compressor shell)
R8T	Thermistor (compressor port)
R9T	Thermistor (entering water)
R10T	Thermistor (leaving water)
R11T	Thermistor (fin)
RC (A2P)	Signal receiver circuit
S1NPH	High pressure sensor
S1PH, S2PH	High pressure switch
S1PL	Low pressure switch
T1A	Current transfo
TC (A2P)	Signal transmission circuit
V1D~V4D (A1P)	Diode
V1R (A1P)	IGBT power module
V2R (A1P)	Diode module
V1T~V3T (A1P)	Insulated Gate Bipolar Transistor (IGBT)
X1M, X2M	Terminal strip
Y1E	Electronic expansion valve (main)
Y3E	Electronic expansion valve (injection)
Y1S	Solenoid valve (4-way valve)
Y2S	Solenoid valve (low pressure bypass)

Y3S	Solenoid valve (hot gas bypass)
Y4S	Solenoid valve (liquid injection)
Z1C~Z11C	Noise filter (ferrite core)
Z1F~Z6F (A1P, A2P)	Noise filter

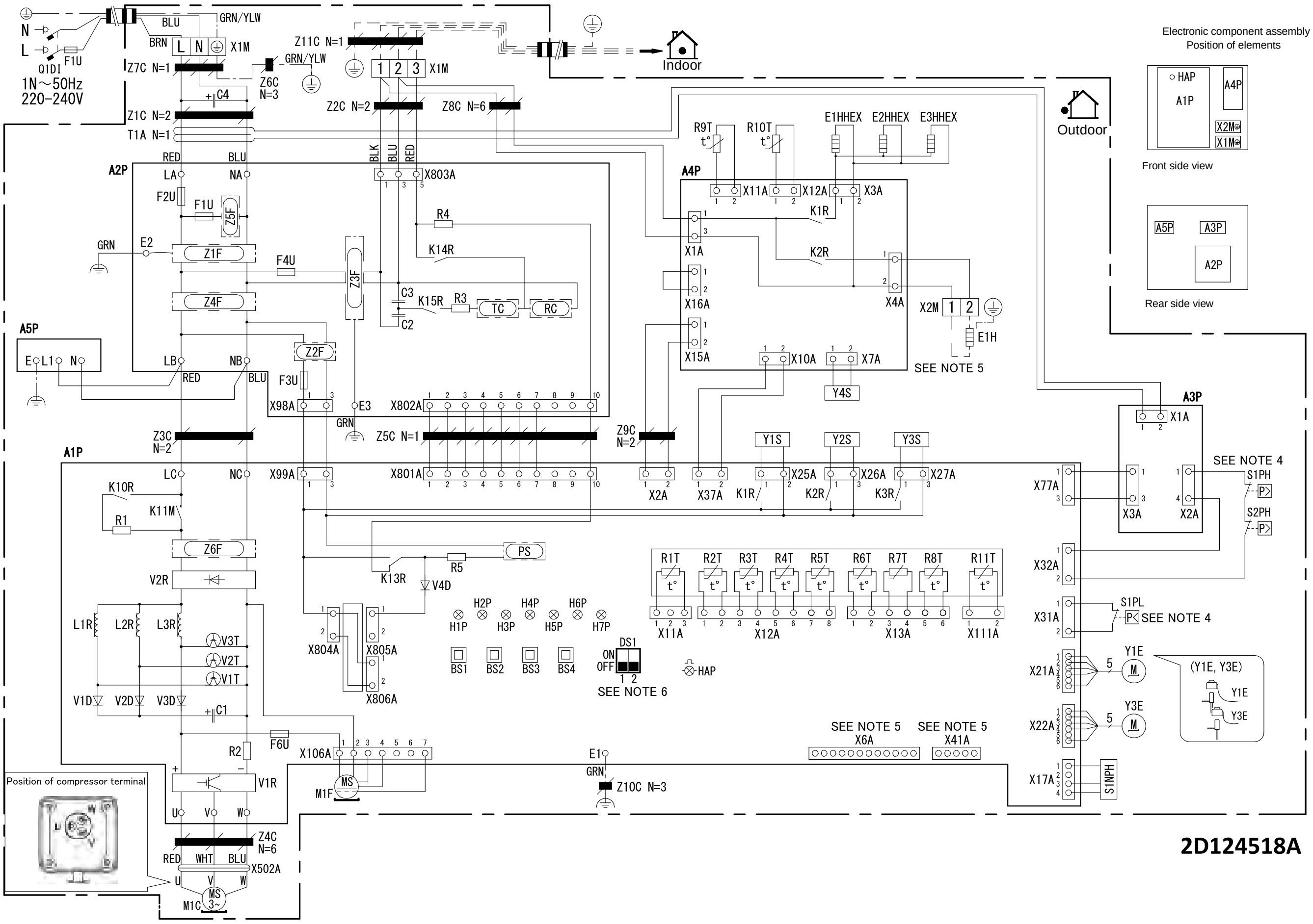
Legend in case of W1 models:

A1P	Printed circuit board (main)
A2P	Printed circuit board (noise filter)
A3P	Printed circuit board (leakage current)
A4P	Printed circuit board (ACS)
A5P	Printed circuit board (inverter)
BS1~BS4 (A1P)	Push button switch
C1~C3 (A2P)	Capacitor
DS1 (A1P)	DIP switch
E1H	Drain tube heater (field supply)
E1HHEX	Plate heat exchanger heater
F1U	Field fuse (field supply)
F1U~F7U (A1P, A2P)	Fuse
H1P~H7P (A1P)	Light-emitting diode (service monitor is orange)
HAP (A1P, A2P)	Light-emitting diode (service monitor is green)
K1R (A1P)	Magnetic relay (Y1S)
K1R (A2P)	Magnetic relay
K1R (A4P)	Magnetic relay (E1HHEX)
K2R (A1P)	Magnetic relay (Y2S)
K2R (A4P)	Magnetic relay (E1H)
K3R (A1P)	Magnetic relay (Y3S)
K4R (A1P)	Magnetic relay (E1HC)
K2M, K11M (A2P)	Magnetic contactor
L1R~L4R	Reactor
M1C	Compressor motor
M1F	Fan motor
PS (A2P)	Switching power supply
Q1DI	Earth leakage circuit breaker (30 mA) (field supply)
R1, R2 (A2P)	Resistor
R1T	Thermistor (outdoor air)
R2T	Thermistor (compressor discharge)
R3T	Thermistor (compressor suction)
R4T	Thermistor (air heat exchanger, distributor)
R5T	Thermistor (air heat exchanger, middle)

R6T	Thermistor (refrigerant liquid)
R7T	Thermistor (compressor shell)
R8T	Thermistor (compressor port)
R9T	Thermistor (entering water)
R10T	Thermistor (leaving water)
R11T	Thermistor (fin)
S1NPH	High pressure sensor
S1PH, S2PH	High pressure switch
S1PL	Low pressure switch
T1A	Current transfo
V1R, V2R (A2P)	IGBT power module
V3R (A2P)	Diode module
X1M, X2M	Terminal strip
Y1E	Electronic expansion valve (main)
Y3E	Electronic expansion valve (injection)
Y1S	Solenoid valve (4-way valve)
Y2S	Solenoid valve (low pressure bypass)
Y3S	Solenoid valve (hot gas bypass)
Y4S	Solenoid valve (liquid injection)
Z1C~Z10C	Noise filter (ferrite core)
Z1F~Z4F (A1P, A3P)	Noise filter

Single phase outdoor unit

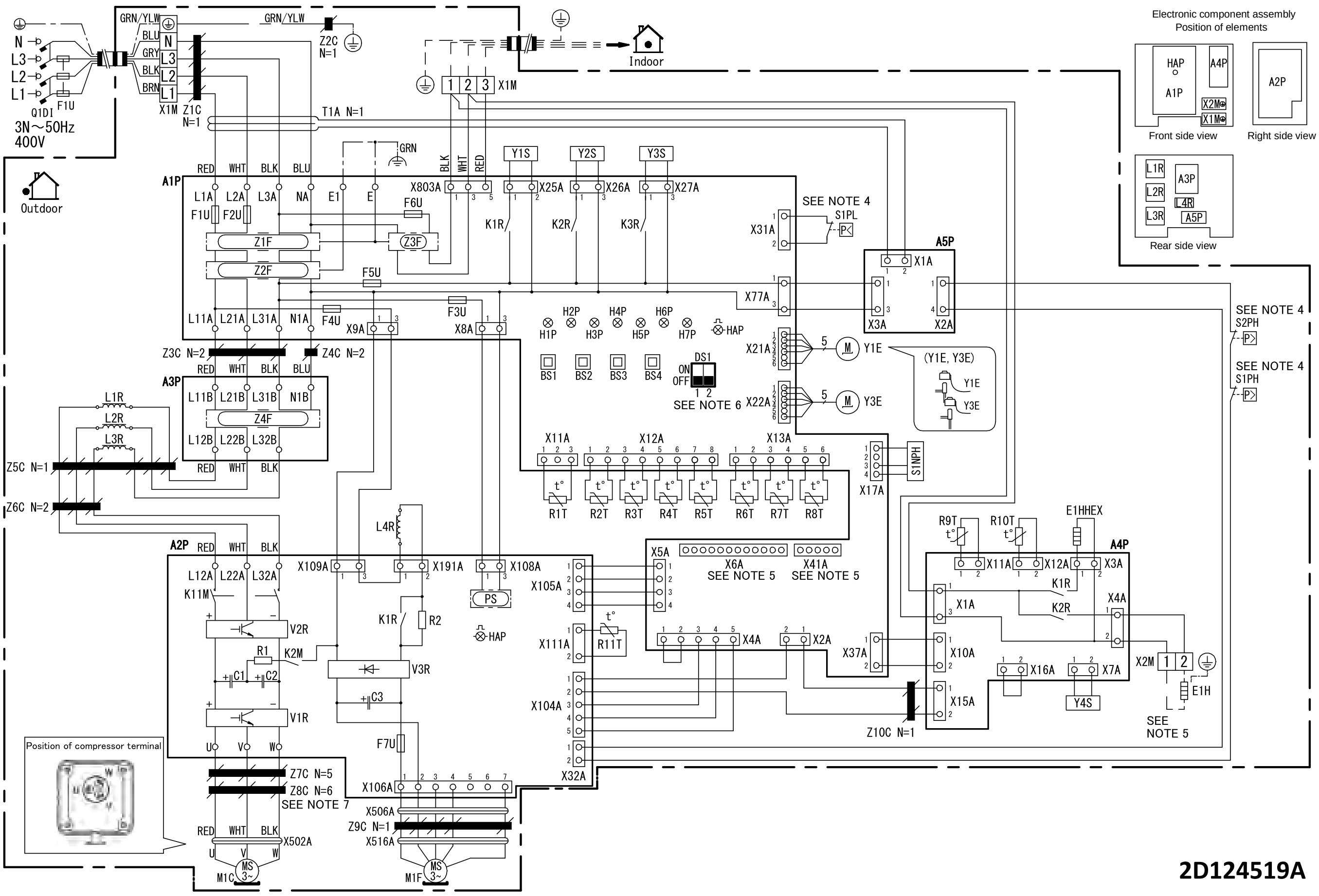
> **INFORMATION**
>
> The diagrams shown in this manual may be incorrect due to changes/updates to the unit. Correct diagrams are supplied with the unit and can also be found in the technical data book.



2D124518A

Three phase outdoor unit

> **INFORMATION**
>
> The diagrams shown in this manual may be incorrect due to changes/updates to the unit. Correct diagrams are supplied with the unit and can also be found in the technical data book.



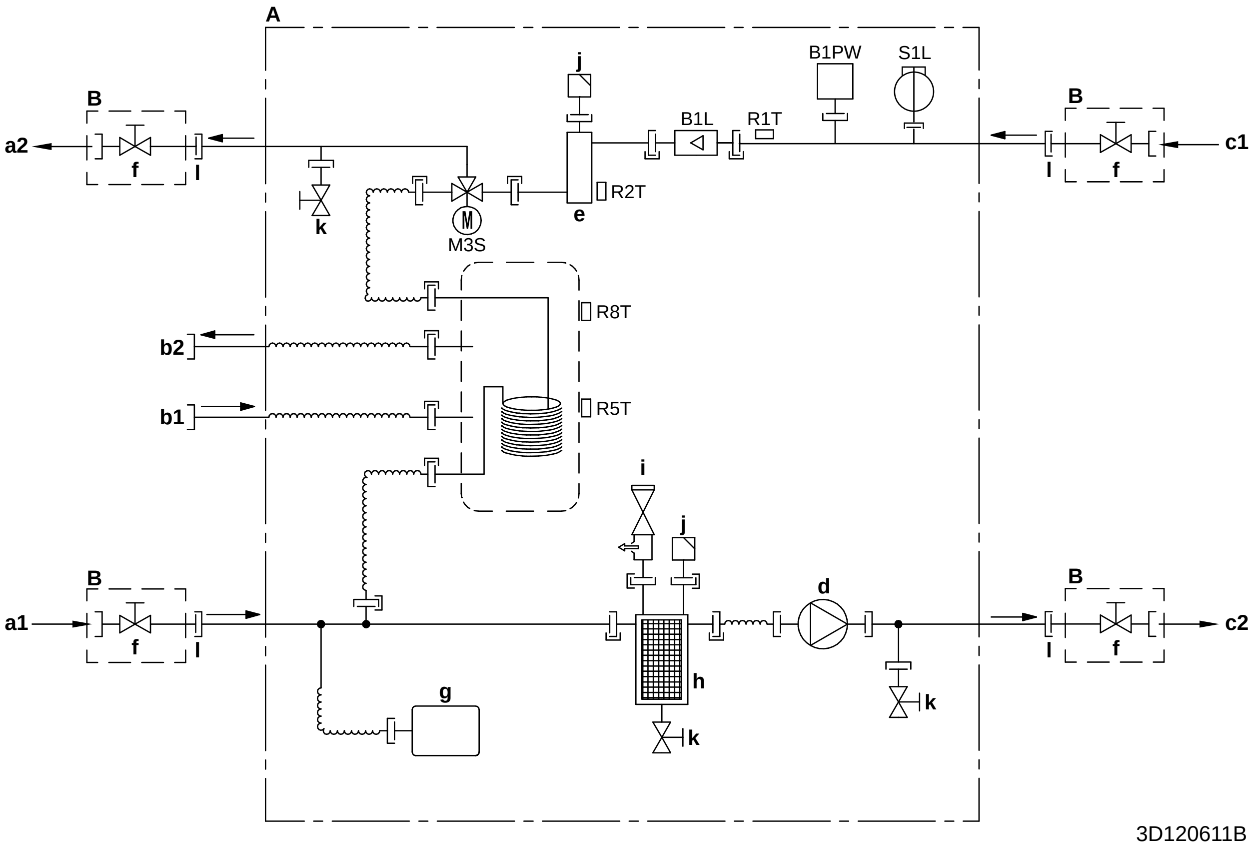
2D124519A

6.3 Piping diagram

6.3.1 Piping diagram: Indoor unit – Floor standing

INFORMATION

The diagrams shown in this manual may be incorrect due to changes/updates to the unit. Correct diagrams are supplied with the unit and can also be found in the technical data book.

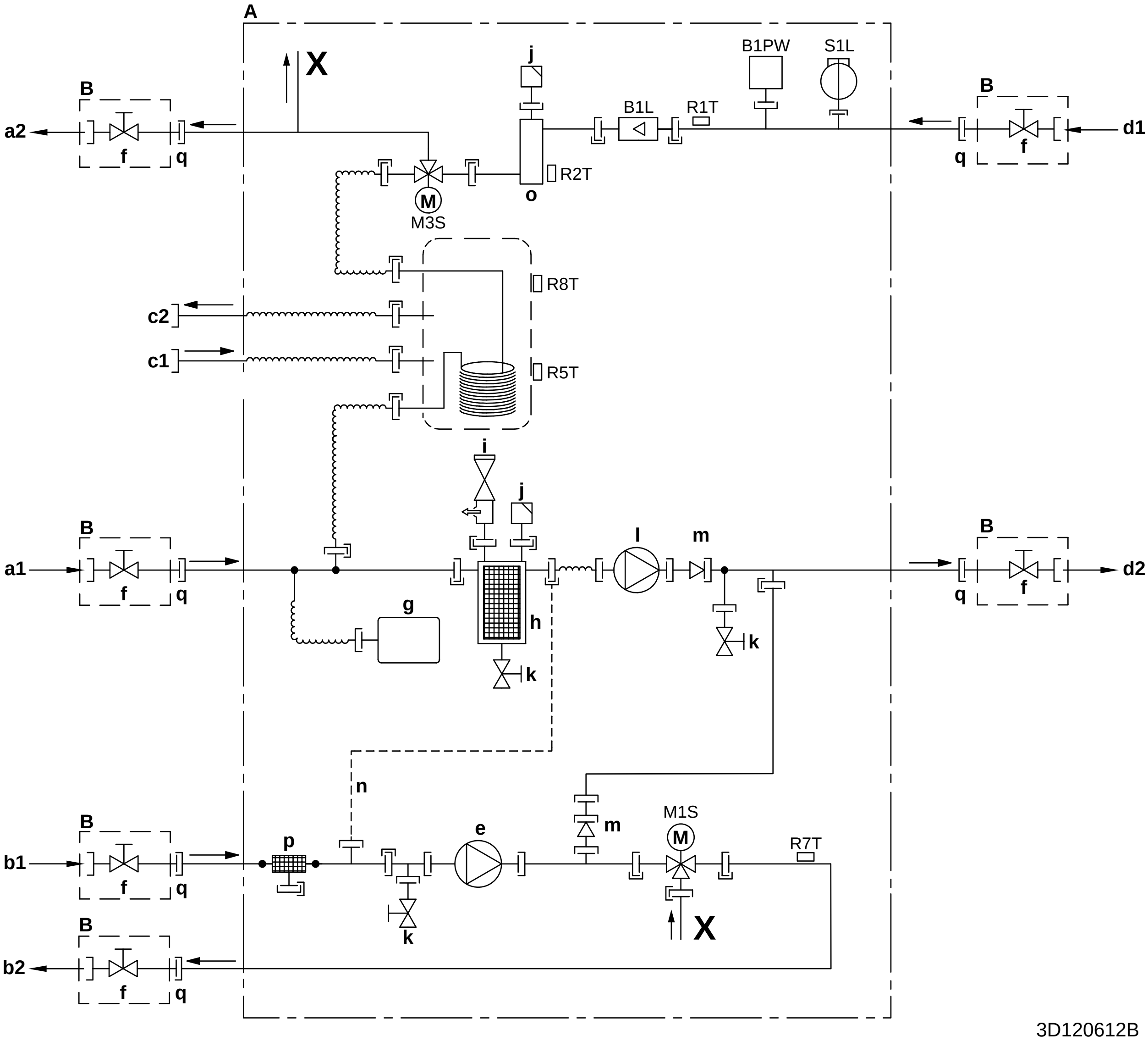


A	Indoor unit
B	Field installed
a1	Space heating/cooling – Water IN (screw connection, 1")
a2	Space heating/cooling – Water OUT (screw connection, 1")
b1	DHW – Cold water IN (screw connection, 3/4")
b2	DHW – Hot water OUT (screw connection, 3/4")
c1	Water IN from outdoor unit (screw connection, 1")
c2	Water OUT to outdoor unit (screw connection, 1")
d	Pump
e	Backup heater
f	Shut-off valve, male-female 1"
g	Expansion vessel
h	Magnetic filter/dirt separator
i	Safety valve
j	Air purge
k	Drain valve
l	Loose nut 1"
B1L	Flow sensor
B1PW	Space heating water pressure sensor
M3S	3-way valve (space heating/domestic hot water)
R1T	Thermistor (water IN)
R2T	Thermistor (backup heater – water OUT)
R5T, R8T	Thermistor (tank)
S1L	Flow switch
	Screw connection
	Flare connection
	Quick coupling
	Brazed connection

6.3.2 Piping diagram: Indoor unit – Bizone

INFORMATION

The diagrams shown in this manual may be incorrect due to changes/updates to the unit. Correct diagrams are supplied with the unit and can also be found in the technical data book.



- **A** Indoor unit
- **B** Field installed
- **a1** Space heating additional/direct zone – Water IN (screw connection, 1")
- **a2** Space heating additional/direct zone – Water OUT (screw connection, 1")
- **b1** Space heating main/mixed zone – Water IN (screw connection, 1")
- **b2** Space heating main/mixed zone – Water OUT (screw connection, 1")
- **c1** DHW – Cold water IN (screw connection, 3/4")
- **c2** DHW – Hot water OUT (screw connection, 3/4")
- **d1** Water IN from outdoor unit (screw connection, 1")
- **d2** Water OUT to outdoor unit (screw connection, 1")
- **e** Pump (main/mixed zone)
- **f** Shut-off valve, male-female 1"
- **g** Expansion vessel
- **h** Magnetic filter/dirt separator
- **i** Safety valve
- **m** Check valve
- **n** Capillary tube
- **o** Backup heater
- **p** Water filter (main/mixed zone)
- **q** Loose nut 1"
- **B1L** Flow sensor
- **B1PW** Space heating water pressure sensor
- **M1S** 3-way valve (mixing valve for the main/mixed zone)
- **M3S** 3-way valve (space heating/domestic hot water)
- **R1T** Thermistor (water IN)
- **R2T** Thermistor (backup heater – water OUT)
- **R5T, R8T** Thermistor (tank)
- **R7T** Thermistor (main/mixed zone – water OUT)
- **S1L** Flow switch

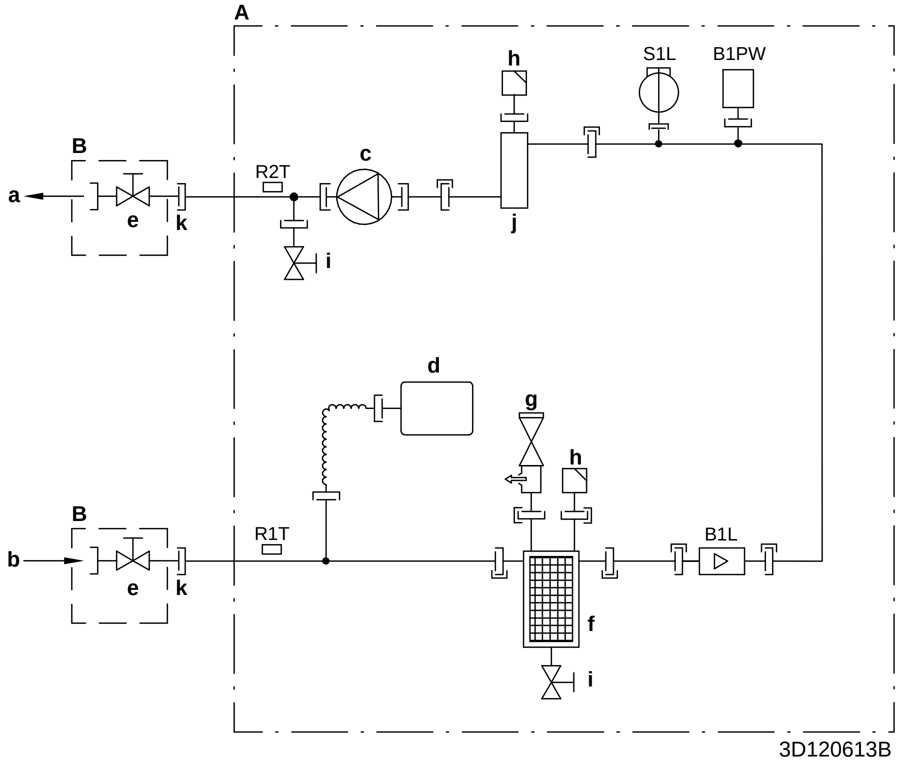
Screw connection

j Air purge
k Drain valve
l Pump (additional/direct zone)

Flare connection
Quick coupling
Brazed connection

6.3.3 Piping diagram: Indoor unit – Wall mounted

> **INFORMATION**
>
> The diagrams shown in this manual may be incorrect due to changes/updates to the unit. Correct diagrams are supplied with the unit and can also be found in the technical data book.

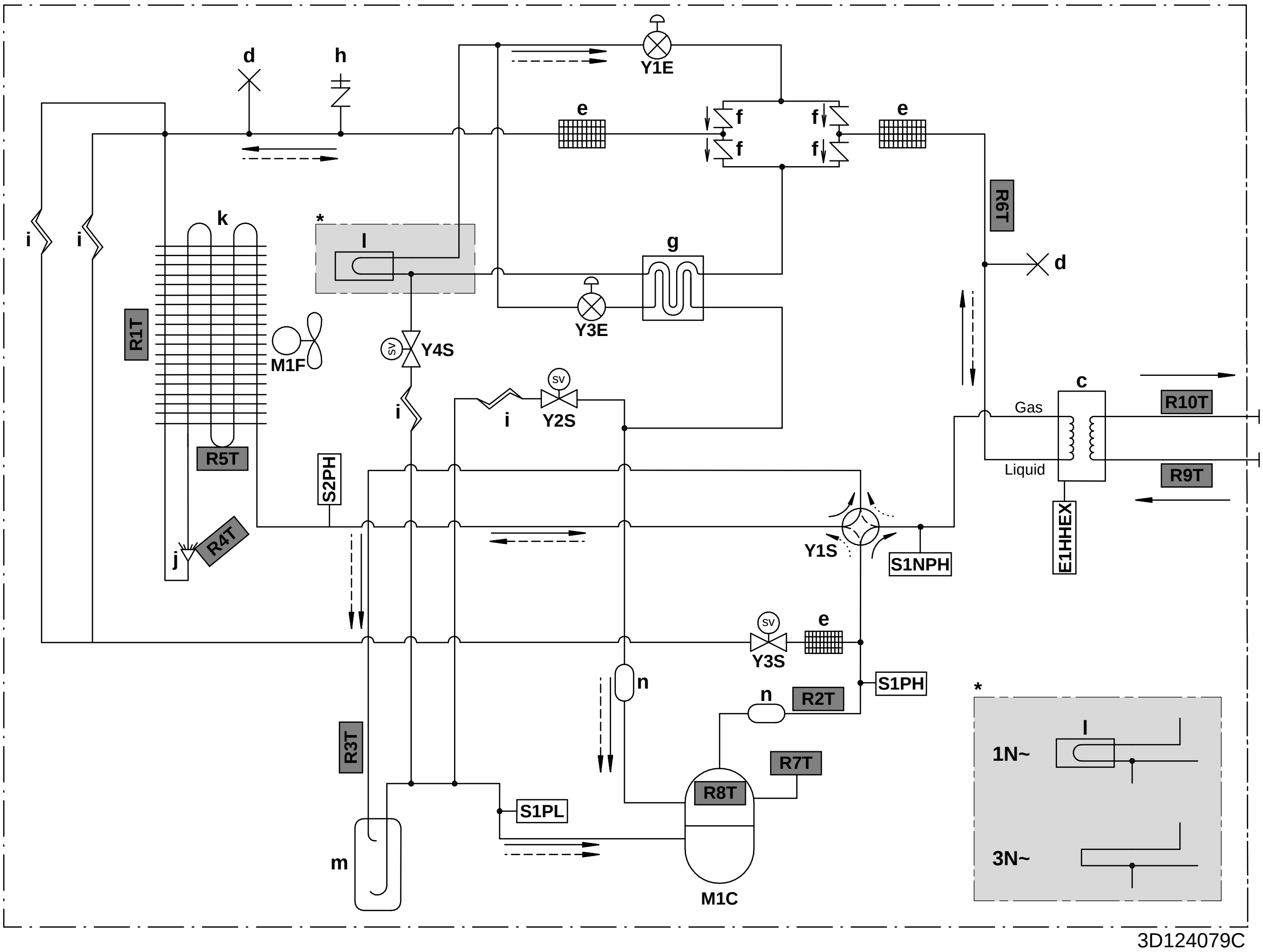


A	Indoor unit
B	Field installed
a	Space heating water OUT
b	Water IN connection
c	Pump
d	Expansion vessel
e	Shut-off valve, male-female 1"
f	Magnetic filter/dirt separator
g	Safety valve
h	Air purge
i	Drain valve
j	Backup heater
k	Loose nut 1"
B1L	Flow sensor
B1PW	Space heating water pressure sensor
R1T	Thermistor (water IN)
R2T	Thermistor (backup heater – water OUT)
S1L	Flow switch
	Screw connection
	Flare connection
	Quick coupling
	Brazed connection

6.3.4 Piping diagram: Outdoor unit

INFORMATION

The diagrams shown in this manual may be incorrect due to changes/updates to the unit. Correct diagrams are supplied with the unit and can also be found in the technical data book.

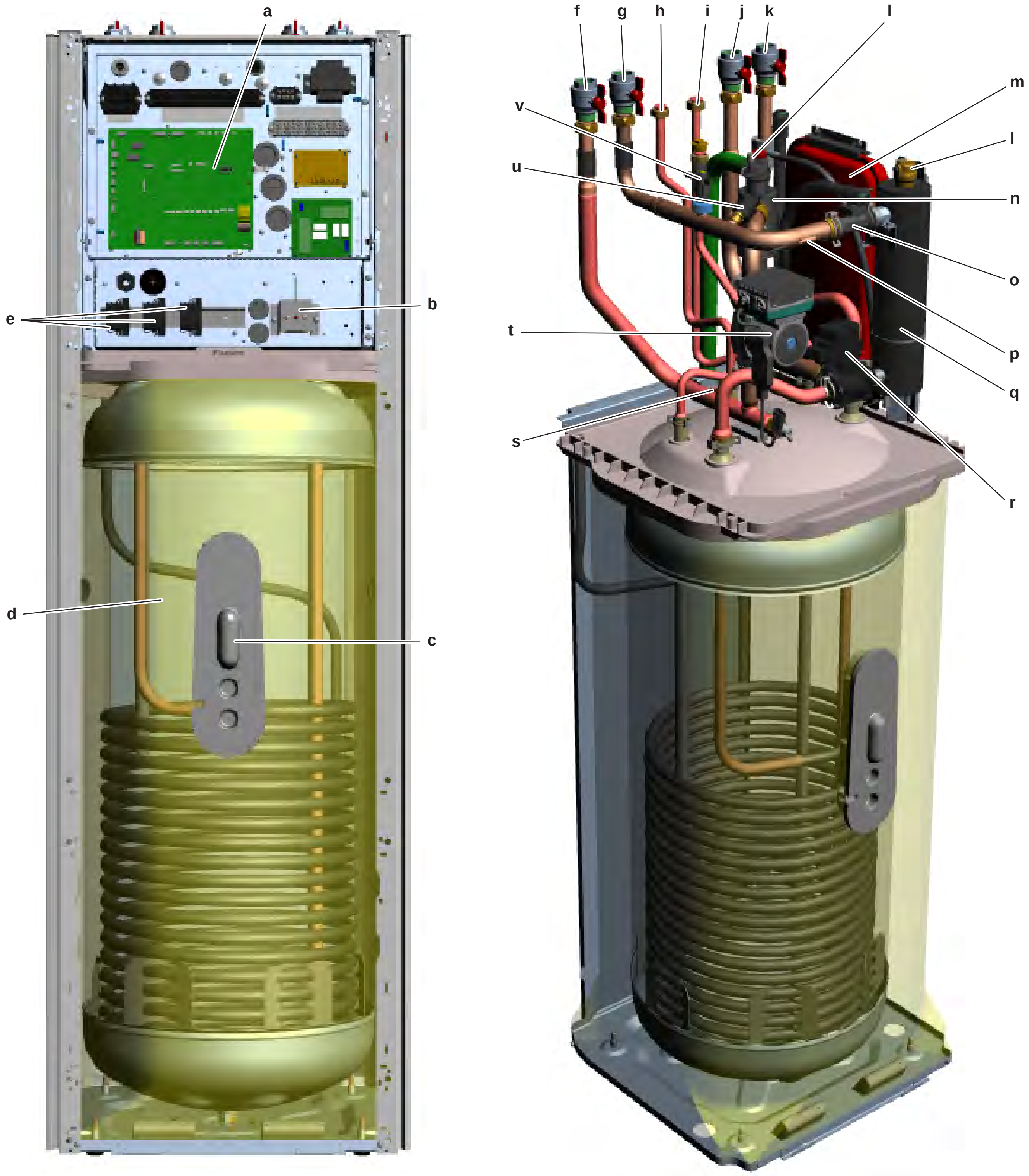


Gas	Gas		**Thermistors:**
Liquid	Liquid	**R1T**	Outdoor air
a	Water IN (screw connection, male, 1")	**R2T**	Compressor discharge
b	Water OUT (screw connection, male, 1")	**R3T**	Compressor suction
c	Plate heat exchanger	**R4T**	Air heat exchanger, distributor
d	Pinched pipe	**R5T**	Air heat exchanger, middle
e	Refrigerant filter	**R6T**	Refrigerant liquid
f	One-way valve	**R7T**	Compressor shell
g	Economiser heat exchanger	**R8T**	Compressor port
h	Service port 5/16" flare	**R9T**	Entering water
i	Capillary tube	**R10T**	Leaving water
j	Distributor		
k	Air heat exchanger		**Refrigerant flow:**
l	PCB cooling	⟶	Heating
m	Accumulator	--⟶	Cooling
n	Muffler		
E1HHEX	Plate heat exchanger heater		
M1C	Compressor		
M1F	Fan motor		
S1PH	High pressure switch (5.6 MPa)		
S2PH	High pressure switch (4.17 MPa)		
S1PL	Low pressure switch		
S1NPH	High pressure sensor		
Y1E	Electronic expansion valve (main)		
Y3E	Electronic expansion valve (injection)		

Y1S Solenoid valve (4-way valve)
Y2S Solenoid valve (low pressure bypass)
Y3S Solenoid valve (hot gas bypass)
Y4S Solenoid valve (liquid injection)

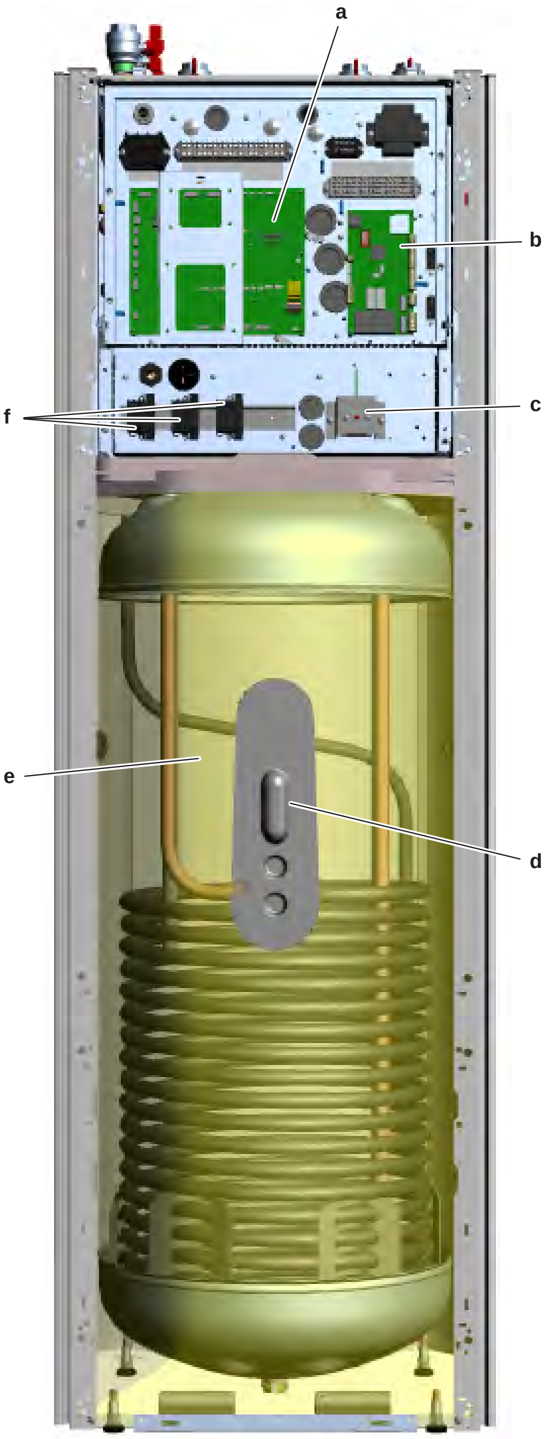
6.4 Component overview

6.4.1 Component overview: Indoor unit – Floor standing



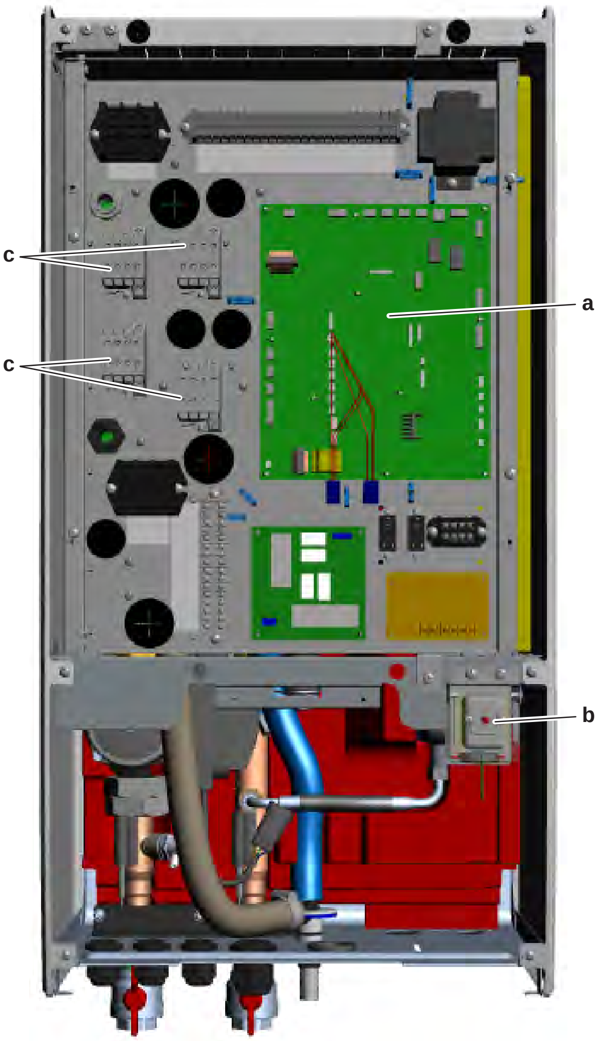
a	Hydro PCB		**l**	Air purge valve
b	Backup heater thermal protector		**m**	Expansion vessel
c	Domestic hot water tank thermistor R5T + R8T		**n**	Magnetic filter/dirt separator
d	Domestic hot water tank		**o**	Water flow sensor
e	Backup heater contactor		**p**	Inlet water thermistor R1T
f	Water out connection (to outdoor unit)		**q**	Backup heater
g	Water in connection (from outdoor unit)		**r**	3-way valve (YJS)
h	Domestic hot water outlet		**s**	Outlet water after backup heater thermistor R2T
i	Domestic hot water cold water supply		**t**	Water pump (main)
j	Space heating water outlet		**u**	Water pressure sensor
k	Space heating water inlet		**v**	Flow switch

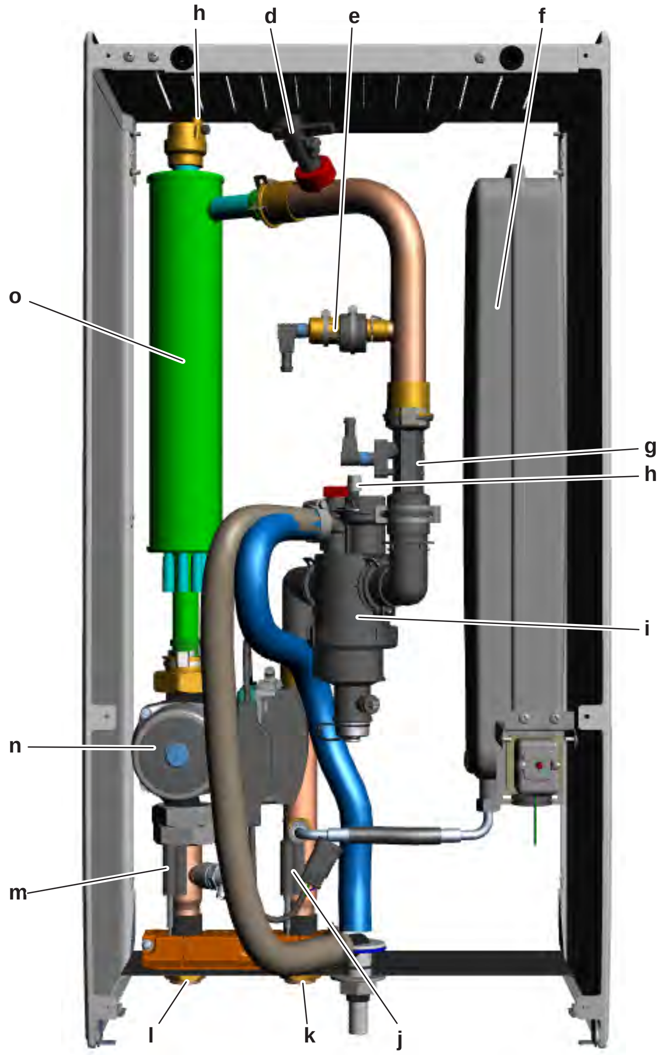
6.4.2 Component overview: Indoor unit – Bizone



- **a** Hydro PCB
- **b** Bizone PCB
- **c** Backup heater thermal protector
- **d** Domestic hot water tank thermistor R5T + R8T
- **e** Domestic hot water tank
- **f** Backup heater contactor
- **g** Water out connection (to outdoor unit)
- **h** Mixed zone cold water supply
- **i** Water in connection (from outdoor unit)
- **j** Mixed zone outlet
- **k** Domestic hot water outlet
- **l** Domestic hot water cold water supply
- **m** Space heating water outlet
- **n** Space heating water inlet
- **o** Air purge valve
- **p** Expansion vessel
- **q** Magnetic filter/dirt separator
- **r** Water flow sensor
- **s** Inlet water thermistor R1T
- **t** Backup heater (with outlet water thermistor R2T)
- **u** 3-way valve (YJS)
- **v** Water pump (bizone)
- **w** Water pump (main)
- **x** 3-way valve (ESBE)
- **y** Water filter
- **z** Outlet water thermistor bizone R7T
- **aa** Water pressure sensor
- **ab** Flow switch

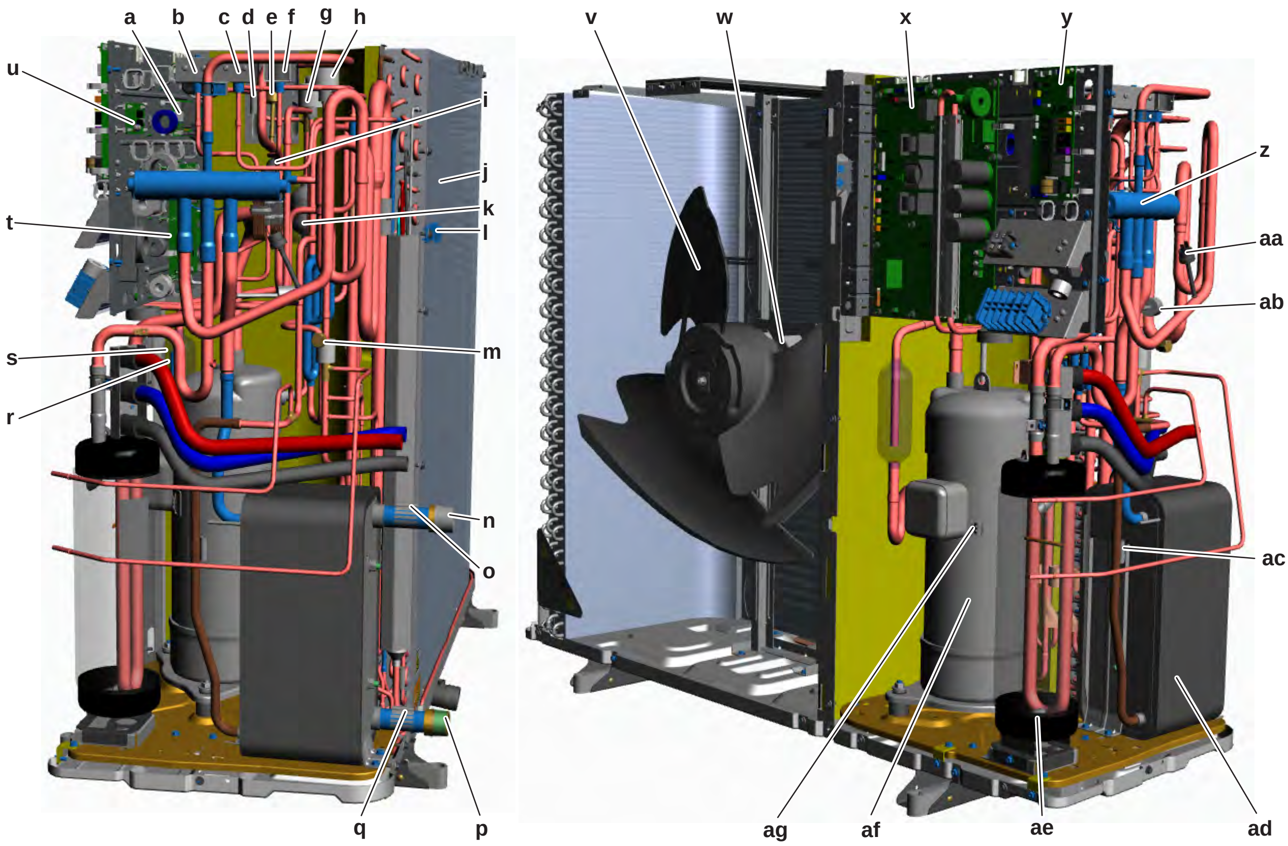
6.4.3 Component overview: Indoor unit – Wall mounted





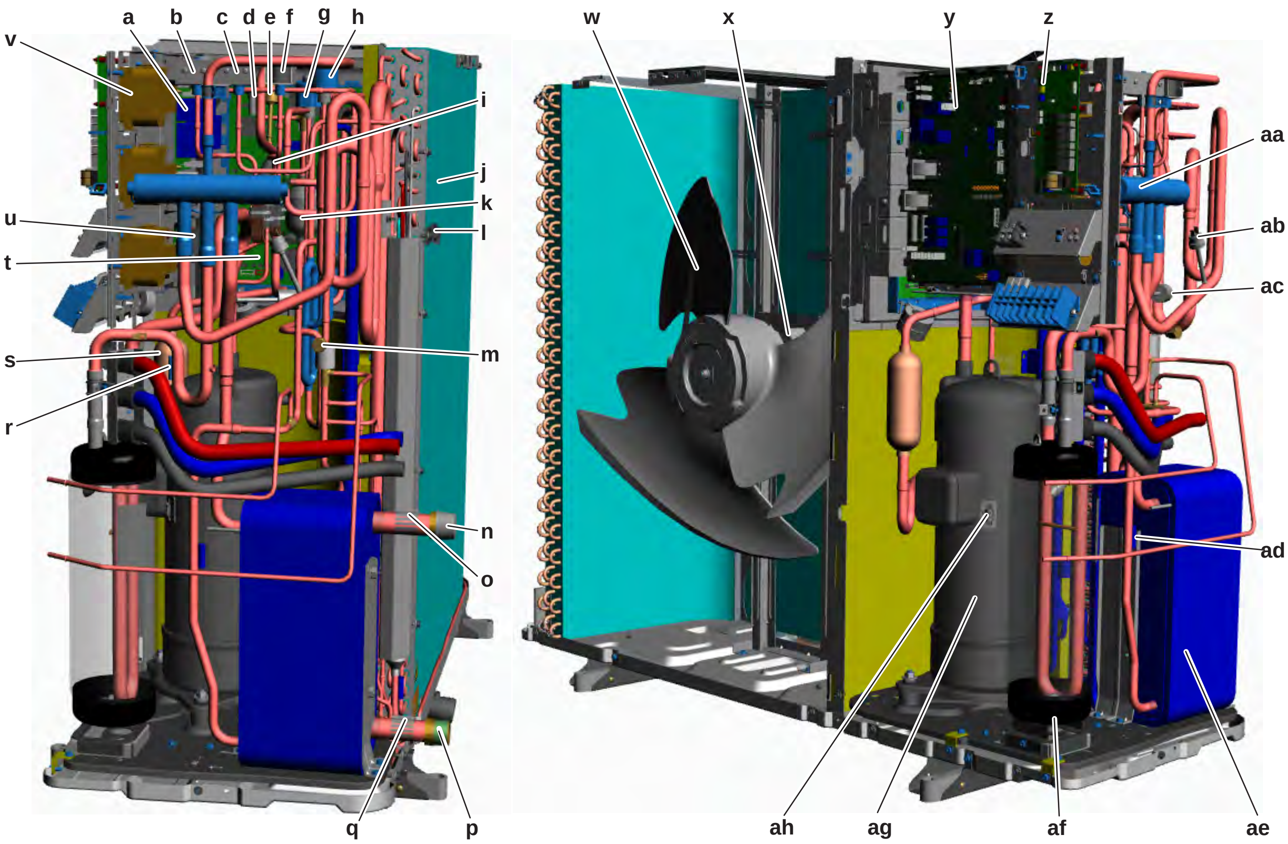
- **a** Hydro PCB
- **b** Backup heater thermal protector
- **c** Backup heater contactor
- **d** Flow switch
- **e** Water pressure sensor
- **f** Expansion vessel
- **g** Water flow sensor
- **h** Air purge valve
- **i** Magnetic filter/dirt separator
- **j** Inlet water thermistor R1T
- **k** Space heating water inlet
- **l** Space heating water outlet
- **m** Outlet water after backup heater thermistor R2T
- **n** Water pump (main)
- **o** Backup heater

6.4.4 Component overview: Outdoor unit – Single phase



a	Leakage current PCB
b	Solenoid valve Y2S (low pressure by-pass)
c	Solenoid valve Y3S (hot gas by-pass)
d	Discharge pipe thermistor R2T
e	High pressure switch S1PH
f	Solenoid valve Y4S (liquid injection)
g	Expansion valve Y1E (main)
h	Expansion valve Y3E (injection)
i	Low pressure switch S1PL
j	Heat exchanger
k	Muffler
l	Outdoor air thermistor R1T
m	Service port
n	Water outlet (to indoor unit)
o	Outlet water thermistor R10T
p	Water inlet (from indoor unit)
q	Inlet water thermistor R9T
r	Suction thermistor R3T
s	Muffler
t	Noise filter PCB
u	Flash PCB
v	Fan
w	Fan motor
x	Main + inverter PCB
y	ACS digital I/O PCB
z	4-way valve
aa	High pressure switch S2PH
ab	Refrigerant pressure sensor
ac	Refrigerant liquid thermistor R6T
ad	Heat exchanger
ae	Accumulator
af	Compressor
ag	Compressor shell thermistor R7T

6.4.5 Component overview: Outdoor unit – Three phase



a Noise filter PCB
b Solenoid valve Y2S (low pressure by-pass)
c Solenoid valve Y3S (hot gas by-pass)
d Discharge pipe thermistor R2T
e High pressure switch S1PH
f Solenoid valve Y4S (liquid injection)
g Expansion valve Y1E (main)
h Expansion valve Y3E (injection)
i Low pressure switch S1PL
j Heat exchanger
k Muffler
l Outdoor air thermistor R1T
m Service port
n Water outlet (to indoor unit)
o Outlet water thermistor R10T
p Water inlet (from indoor unit)
q Inlet water thermistor R9T
r Suction thermistor R3T
s Muffler
t Inverter PCB
u Noise filter PCB
v Reactor
w Fan
x Fan motor
y Main + inverter PCB
z ACS digital I/O PCB
aa 4-way valve
ab High pressure switch S2PH
ac Refrigerant pressure sensor
ad Refrigerant liquid thermistor R6T
ae Heat exchanger
af Accumulator
ag Compressor
ah Compressor shell thermistor R7T

6.5 Field information report

See next page.

In case a problem occurred on the unit which could not be resolved by using the content of this service manual or in case you have a problem which could be resolved but of which the manufacturer should be notified, we advise you to contact your distributor.
To facilitate the investigation, additional information is required. Please fill out the following form before contacting your distributor.

FIELD INFORMATION REPORT

Key person information	
Name:	Company name:
Your contact details Phone number:	E-mail address:
Site address:	
Your reference:	Date of visit:

Claim information	
Title:	
Problem description:	
Error code:	Trouble date:
Problem frequency:	
Investigation steps done:	
Insert picture of the trouble.	
Current situation (solved, not solved,…):	
Countermeasures taken:	
Comments and proposals:	
Part available for return (if applicable):	

Application information
Application (house, apartment, office,…):
New project or reimbursement:
Heat emitters (radiators / under floor heating / fan coils /…):
Hydraulic layout (simple schematic):

Unit / Installation information	
Model name:	Serial number:
Installation / commissioning date:	Software version hydro PCB A1P
	Software version hydro PCB A5P
Software version user interface:	Software version outdoor PCB:
Minimum water volume:	Maximum water volume:
Brine composition and mixture:	
Brine freeze up temperature:	
Space heating control (leaving water temperature, room thermostat, external room thermostat):	
Space heating setpoint:	
Domestic hot water control (reheat only, schedule only, reheat + schedule):	
Domestic hot water setpoint:	

Provide pictures of the field settings overview (viewable on the user interface).

6.6 Service tools

1 For an overview of the available service tools, check the Daikin Business Portal (authentication required).

2 Go to the tab After-sales support on the left navigation pane and select Technical support.

3 Click the button Service tools. An overview of the available service tools for the different products is shown. Also additional information on the service tools (instruction, latest software) can be found here.

6.7 Field settings

See next page.

Field settings table

[8.7.5] = ... **0F41**

Applicable indoor units

ETBH16EF6V
ETBH16EF9W
ETBX16EF6V
ETBX16EF9W
ETVH16S18EA6V
ETVH16S23EA6V
ETVH16S18EA9W
ETVH16S23EA9W
ETVX16S18EA6V
ETVX16S23EA6V
ETVX16S18EA9W
ETVX16S23EA9W
ETVH16SU18EA6V
ETVH16SU23EA6V

Notes

(*1) *6V
(*2) *9W
(*3) ETB*
(*4) ETV*
(*5) *X*
(*6) *H*
(*7) *SU*

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
Room						
└ Antifrost						
1.4.1	[2-06]	Activation	R/W	0: Disabled **1: Enabled**		
1.4.2	[2-05]	Room setpoint	R/W	4~16°C, step: 1°C **8°C**		
└ Setpoint range						
1.5.1	[3-07]	Heating minimum	R/W	12~18°C, step: 1°C **12°C**		
1.5.2	[3-06]	Heating maximum	R/W	18~30°C, step: 1°C **30°C**		
1.5.3	[3-09]	Cooling minimum	R/W	15~25°C, step: 1°C **15°C**		
1.5.4	[3-08]	Cooling maximum	R/W	25~35°C, step: 1°C **35°C**		
Room						
1.6	[2-09]	Room sensor offset	R/W	-5~5°C, step: 0,5°C **0°C**		
1.7	[2-0A]	Room sensor offset	R/W	-5~5°C, step: 0,5°C **0°C**		
└ Room comfort setpoint						
1.9.1	[9-0A]	Heating comfort setpoint	R/W	[3-07]～[3-06]°C, step: 0,5°C **23°C**		
1.9.2	[9-0B]	Cooling comfort setpoint	R/W	[3-09]～[3-08]°C, step: 0,5°C **23°C**		
Main zone						
2.4		Setpoint mode		0: Fixed 1: WD heating, fixed cooling **2: Weather dependent**		
└ Heating WD curve						
2.5	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
2.5	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
2.5	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00], step: 1°C [2-0C]=0 **35°C** [2-0C]=1 **45°C** [2-0C]=2 **65°C**		
2.5	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C [2-0C]=0 **25°C** [2-0C]=1 **35°C** [2-0C]=2 **35°C**		
└ Cooling WD curve						
2.6	[1-06]	Low ambient temp. for LWT main zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C**		
2.6	[1-07]	High ambient temp. for LWT main zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		
2.6	[1-08]	Leaving water value for low ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **22°C**		
2.6	[1-09]	Leaving water value for high ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C [2-0C]=0 **18°C** [2-0C]=1 **7°C** [2-0C]=2 **18°C**		
Main zone						
2.7	[2-0C]	Emitter type	R/W	**0: Underfloor heating** 1: Fancoil unit 2: Radiator		
└ Setpoint range						
2.8.1	[9-01]	Heating minimum	R/W	15~37°C, step: 1°C **25°C**		
2.8.2	[9-00]	Heating maximum	R/W	[2-0C]=2: 37~70, step: 1°C 70**°C** 37~68, step: 1°C **(*7)** **68°C** [2-0C]≠2: 37~55, step: 1°C **55°C**		
2.8.3	[9-03]	Cooling minimum	R/W	5~18°C, step: 1°C **7°C**		
2.8.4	[9-02]	Cooling maximum	R/W	18~22°C, step: 1°C **22°C**		
Main zone						
2.9	[C-07]	Control	R/W	**0: LWT control** 1: Ext RT control 2: RT control		
2.A	[C-05]	Thermostat type	R/W	0: - 1: 1 contact **2: 2 contacts**		
└ Delta T						
2.B.1	[1-0B]	Delta T heating	R/W	3~10°C, step: 1°C [2-0C] ≠ 2 (Radiator) **5°C** [2-0C] = 2 (Radiator) **10°C**		
2.B.2	[1-0D]	Delta T cooling	R/W	3~10°C, step: 1°C **5°C**		
└ Modulation						
2.C.1	[8-05]	Modulation	R/W	**0: No** 1: Yes		

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value: Date	Value
2.C.2	[8-06]	Max modulation	R/W	0~10°C, step: 1°C **5°C**		
	└ Shut off valve					
2.D.1	[F-0B]	During thermo	R/W	**0: No** 1: Yes		
2.D.2	[F-0C]	During cooling	R/W	0: No **1: Yes**		
Main zone						
2.E		WD curve type	R/W	0: 2-points **1: Slope-Offset**		**1**
Additional zone						
3.4		Setpoint mode		0: Fixed 1: WD heating, fixed cooling **2: Weather dependent**		
	└ Heating WD curve					
3.5	[0-00]	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~min(45,[9-06])°C, step: 1°C **35°C**		
3.5	[0-01]	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~[9-06]°C, step: 1°C **65°C**		
3.5	[0-02]	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
3.5	[0-03]	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
	└ Cooling WD curve					
3.6	[0-04]	Leaving water value for high ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C [2-0C]=0 **18°C** [2-0C]=1 **7°C** [2-0C]=2 **18°C**		
3.6	[0-05]	Leaving water value for low ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **22°C**		
3.6	[0-06]	High ambient temp. for LWT add zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		
3.6	[0-07]	Low ambient temp. for LWT add zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C**		
Additional zone						
3.7	[2-0D]	Emitter type	R/O	0: Underfloor heating 1: Fancoil unit **2: Radiator**		
	└ Setpoint range					
3.8.1	[9-05]	Heating minimum	R/W	15~37°C, step: 1°C **25°C**		
3.8.2	[9-06]	Heating maximum	R/W	[2-0D]=2: 37~70, step: 1°C 70**°C** 37~68, step 1°C **(*7)** **68°C** [2-0D]≠2: 37~55, step: 1°C **55°C**		
3.8.3	[9-07]	Cooling minimum	R/W	5~18°C, step: 1°C **7°C**		
3.8.4	[9-08]	Cooling maximum	R/W	18~22°C, step: 1°C **22°C**		
Additional zone						
3.A	[C-06]	Thermostat type	R/W	0: - 1: 1 contact **2: 2 contacts**		
	└ Delta T					
3.B.1	[1-0C]	Delta T heating	R/W	3~10°C, step: 1°C **10°C**		
3.B.2	[1-0E]	Delta T cooling	R/W	3~10°C, step: 1°C **5°C**		
Additional zone						
3.C		WD curve type	R/O	0: 2-points **1: Slope-Offset**		
Space heating / cooling						
	└ Operation range					
4.3.1	[4-02]	Space heating OFF temp	R/W	14~35°C, step: 1°C **35°C**		
4.3.2	[F-01]	Space cooling OFF temp	R/W	10~35°C, step: 1°C **20°C**		
Space heating / cooling						
4.4	[7-02]	Number of zones	R/W	**0: 1 LWT zone** 1: 2 LWT zones		
4.5	[F-0D]	Pump operation mode	R/W	0: Continuous **1: Sample** 2: Request		
4.6	[E-02]	Unit type	R/W (*5) R/O (*6)	**0: Reversible (*5)** **1: Heating only (*6)**		
4.7	[9-0D]	Pump speed limitation	R/W	0~8, step:1 0 : No limitation 1~4 : 90~60% pump speed 5~8 : 90~60% pump speed during sampling **6**		
Space heating / cooling						
4.9	[F-00]	Pump outside range	R/W	**0: Restricted** 1: Allowed		
4.A	[D-03]	Increase around 0°C	R/W	0: No **1: increase 2°C, span 4°C** 2: increase 4°C, span 4°C 3: increase 2°C, span 8°C 4: increase 4°C, span 8°C		

(*1) *6V_(*2) *9W_
(*3) ETB*_(*4) ETV*_
(*5) *X*_(*6) *H*_(*7) *SU*

(#) Only applicable in Swedish language.

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
4.B	[9-04]	Overshoot	R/W	1~4°C, step: 1°C **1°C**		
4.C	[2-06]	Antifrost	R/W	0: Disabled **1: Enabled**		
Tank						
5.2	[6-0A]	Comfort setpoint	R/W	30~[6-0E]°C, step: 1°C **60°C**		
5.3	[6-0B]	Eco setpoint	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
5.4	[6-0C]	Reheat setpoint	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
5.6	[6-0D]	Heat up mode	R/W	0: Reheat only **1: Reheat + sched.** 2: Scheduled only		
└─ Disinfection						
5.7.1	[2-01]	Activation	R/W	0: No **1: Yes**		
5.7.2	[2-00]	Operation day	R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday **5: Friday** 6: Saturday 7: Sunday		
5.7.3	[2-02]	Start time	R/W	0~23 hour, step: 1 hour **1**		
5.7.4	[2-03]	Tank setpoint	R/W	[E-07]≠1 : 55~75°C, step: 5°C **70°C** [E-07]=1 : 60°C **60°C**		
5.7.5	[2-04]	Duration	R/W	[E-07]≠1: 5~60 min, step: 5 min **10 min** [E-07]=1: 40~60 min, step: 5 min **40 min**		
Tank						
5.8	[6-0E]	Maximum	R/W	(*3) [E-07]=0 or 7: 40~ 60°C, step: 1°C **60°C** (*3) [E-07]=3 or 5 or 8: 40~80°C, step: 1°C **80°C** (*4) : 40~65°C, step: 1°C **65°C**		
5.9	[6-00]	Hysteresis	R/W	2~40°C, step: 1°C **8°C**		
5.A	[6-08]	Reheat hysteresis	R/W	2~20°C, step: 1°C **10°C**		
5.B		Setpoint mode	R/W	**0: Fixed** 1: Weather dependent		
└─ WD curve						
5.C	[0-0B]	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **55°C**		
5.C	[0-0C]	Leaving water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C **60°C**		
5.C	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **15°C**		
5.C	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
Tank						
5.D	[6-01]	Margin	R/W	0~10°C, step: 1°C **2°C**		
5.E		WD curve type	R/O	0: 2-points **1: Slope-Offset**		
User settings └─ Quiet						
7.4.1		Activation	R/W	**0: OFF** 1: Manual 2: Automatic		
7.4.3		Level	R/W	**0: Quiet** 1: More Quiet 2: Most Quiet		
└─ Electricity price						
7.5.1		High	R/W	0,00~990/kWh **1/kWh**		
7.5.2		Medium	R/W	0,00~990/kWh **1/kWh**		
7.5.3		Low	R/W	0,00~990/kWh **1/kWh**		
User settings						
7.6		Gas price	R/W	0,00~990/kWh 0,00~290/MBtu **1,0/kWh**		
Installer settings └─ Configuration wizard └─ System						
9.1.3.2	[E-03]	BUH type	R/O	**3: 6V (*1)** **4: 9W (*2)**		
9.1.3.3	[E-05] [E-06] [E-07]	Domestic hot water	R/W	**No DHW (*3)** EKHW, small volume (*3) **Integrated (*4)** EKHW, big volume (*3) EKHWP (*3) 3rd party, small coil (*3) 3rd party, big coil (*3)		

(#) Only applicable in Swedish language.

(*1) *6V_(*2) *9W_
(*3) ETB*_(*4) ETV*_
(*5) *X*_(*6) *H*_(*7) *SU*

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
9.1.3.4	[4-06]	Emergency	R/W	0: Manual 1: Automatic 2: Auto red SH/ DHW ON **3: Auto red SH/ DHW OFF** 4: Auto normal SH/ DHW OFF		
9.1.3.5	[7-02]	Number of zones	R/W	**0: Single zone** 1: Dual zone		
9.1.3.6	[E-0D]	Glycol Filled system	R/W	**0: No** 1: Yes		
9.1.3.7	[6-02]	BSH capacity (*3)	R/W	0~10kW, step: 0,2kW **3kW (*3)** **0kW (*4)**		
9.1.3.8	[C-02]	Bivalent	R/W	**0: No** 1: Bivalent		
		└ Backup heater				
9.1.4.1	[5-0D]	Voltage	R/W (*1) R/O (*2)	**0: 230V, 1~ (*1)** 1: 230V, 3~ (*1) **2: 400V, 3~ (*2)**		
9.1.4.2	[4-0A]	Configuration	R/W	0: 1 **1: 1/1+2 (*1) (*2)** 2: 1/2 3: 1/2 + 1/1+2 in emergency		
9.1.4.3	[6-03]	Capacity step 1	R/W	0~10kW, step: 0,2kW 2**kW (*1)** **3kW (*2)**		
9.1.4.4	[6-04]	Additional capacity step 2	R/W	0~10kW, step: 0,2kW **4kW (*1)** **6kW (*2)**		
		└ Main zone				
9.1.5.1	[2-0C]	Emitter type	R/W	**0: Underfloor heating** 1: Fancoil unit 2: Radiator		
9.1.5.2	[C-07]	Control	R/W	**0: LWT control** 1: Ext RT control 2: RT control		
9.1.5.3		Setpoint mode	R/W	0: Fixed 1: WD heating, fixed cooling **2: Weather dependent**		
9.1.5.4		Schedule	R/W	**0: No** 1: Yes		
9.1.5.5		WD curve type	R/W	0: 2-points **1: Slope-Offset**		
9.1.6	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
9.1.6	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.1.6	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00], step: 1°C [2-0C]=0 **35°C** [2-0C]=1 **45°C** [2-0C]=2 65°C		
9.1.6	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C [2-0C]=0 **25°C** [2-0C]=1 **35°C** [2-0C]=2 **35°C**		
9.1.7	[1-06]	Low ambient temp. for LWT main zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C**		
9.1.7	[1-07]	High ambient temp. for LWT main zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		
9.1.7	[1-08]	Leaving water value for low ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **22°C**		
9.1.7	[1-09]	Leaving water value for high ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C [2-0C]=0 **18°C** [2-0C]=1 **7°C** [2-0C]=2 **18°C**		
		└ Additional zone				
9.1.8.1	[2-0D]	Emitter type	R/W	0: Underfloor heating 1: Fancoil unit **2: Radiator**		
9.1.8.3		Setpoint mode	R/W	0: Fixed 1: WD heating, fixed cooling **2: Weather dependent**		
9.1.8.4		Schedule	R/W	**0: No** 1: Yes		
9.1.9	[0-00]	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~min(45,[9-06])°C, step: 1°C **35°C**		
9.1.9	[0-01]	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~[9-06]°C, step: 1°C **65°C**		
9.1.9	[0-02]	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.1.9	[0-03]	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
9.1.A	[0-04]	Leaving water value for high ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C [2-0C]=0 **18°C** [2-0C]=1 **7°C** [2-0C]=2 **18°C**		
9.1.A	[0-05]	Leaving water value for low ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **22°C**		
9.1.A	[0-06]	High ambient temp. for LWT add zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		

(*1) *6V_(*2) *9W_
(*3) ETB*_(*4) ETV*_
(*5) *X*_(*6) *H*_(*7) *SU*

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Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
9.1.A	[0-07]	Low ambient temp. for LWT add zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C**		
		└ Tank				
9.1.B.1	[6-0D]	Heat up mode	R/W	0: Reheat only **1: Reheat + sched.** 2: Scheduled only		
9.1.B.2	[6-0A]	Comfort setpoint	R/W	30~[6-0E]°C, step: 1°C **60°C**		
9.1.B.3	[6-0B]	Eco setpoint	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
9.1.B.4	[6-0C]	Reheat setpoint	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
9.1.B.5	[6-08]	Reheat hysteresis	R/W	2~20°C, step: 1°C **10°C**		
	└ Domestic hot water					
9.2.1	[E-05] [E-06] [E-07]	Domestic hot water	R/W	**No DHW (*3)** EKHW, small volume (*3) **Integrated (*4)** EKHW, big volume (*3) EKHWP (*3) 3rd party, small coil (*3) 3rd party, big coil (*3)		
9.2.2	[D-02]	DHW pump	R/W	**0: No DHW pump** 1: Instant hot water 2: Disinfection 3: Circulation 4: Circulation and disinfection		
9.2.4	[D-07]	Solar	R/W	**0: No** 1: Yes		
	└ Back up heater					
9.3.1	[E-03]	BUH type	R/O	**3: 6V (*1)** **4: 9W (*2)**		
9.3.2	[5-0D]	Voltage	R/W (*1) R/O (*2)	**0: 230V, 1~ (*1)** 1: 230V, 3~ (*1) **2: 400V, 3~ (*2)**		
9.3.3	[4-0A]	Configuration	R/W	**1: 1/1+2 (*1) (*2)** 2: 1/2 3: 1/2 + 1/1+2 in emergency		
9.3.4	[6-03]	Capacity step 1	R/W	0~10kW, step: 0,2kW **2kW (*1)** **3kW (*2)**		
9.3.5	[6-04]	Additional capacity step 2	R/W	0~10kW, step: 0,2kW **4kW (*1)** **6kW (*2)**		
9.3.6	[5-00]	Equilibrium: Deactivate backup heater (or external backup heat source in case of a	R/W	0: No **1: Yes**		
9.3.7	[5-01]	Equilibrium temperature	R/W	-15~35°C, step: 1°C **0°C**		
9.3.8	[4-00]	Operation	R/W	0: Disabled **1: Enabled** 2: Only DHW		
	└ Booster heater					
9.4.1	[6-02]	Capacity	R/W	0~10kW, step: 0,2kW **3kW (*3)** **0kW (*4)**		
9.4.3	[8-03]	BSH eco timer	R/W	20~95 min, step: 5 min **50 min**		
9.4.4	[4-03]	Operation	R/W	0: Restricted 1: Allowed 2: Overlap **3: Compressor off** 4: Legionella only		
	└ Emergency					
9.5.1	[4-06]	Emergency	R/W	0: Manual 1: Automatic 2: Auto red SH/ DHW ON **3: Auto red SH/ DHW OFF** 4: Auto normal SH/ DHW OFF		
9.5.2	[7-06]	Compressor forced OFF	R/W	**0: Disabled** 1: Enabled		
	└ Balancing					
9.6.1	[5-02]	Space heating priority	R/W	**0: Disabled** 1: Enabled		
9.6.2	[5-03]	Priority temperature	R/W	-15~35°C, step: 1°C **0°C**		
9.6.3	[5-04]	Offset BSH setpoint	R/W	0~20°C, step: 1°C **10°C**		
9.6.4	[8-02]	Anti-recycle timer	R/W	0~10 hour, step: 0,5 hour **0,5 hour [E-07]=1** **3 hour [E-07]≠1**		
9.6.5	[8-00]	Minimum running timer	R/W	0~20 min, step 1 min **1 min**		
9.6.6	[8-01]	Maximum running timer	R/W	5~95 min, step: 5 min **30 min**		
9.6.7	[8-04]	Additional timer	R/W	0~95 min, step: 5 min **95 min**		
Installer settings						
9.7	[4-04]	Water pipe freeze prevention	R/W	**0: Intermittent** 1: Continuous 2: Off		
	└ Benefit kWh power supply					
9.8.2	[D-00]	Allow heater	R/W	**0: None** 1: BSH only 2: BUH only 3: All heaters		
9.8.3	[D-05]	Allow pump	R/W	0: Forced off **1: As normal**		
9.8.4	[D-01]	Benefit kWh power supply	R/W	**0: No** 1: Active open 2: Active closed 3: Smart Grid		

(*1) *6V_(*2) *9W_
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Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.8.6		Allow electric heaters	R/W	0: No **1: Yes**		
9.8.7		Enable Room buffering	R/W	**0: No** 1: Yes		
9.8.8		Limit setting kW	R/W	0~20 kW, step: 0,5 kW **20 kW**		
	└ Power consumption control					
9.9.1	[4-08]	Power consumption control	R/W	**0: No limitation** 1: Continuous 2: Digital inputs		
9.9.2	[4-09]	Type	R/W	0: Current **1: Power**		
9.9.3	[5-05]	Limit	R/W	0~50 A, step: 1 A **50 A**		
9.9.4	[5-05]	Limit 1	R/W	0~50 A, step: 1 A **50 A**		
9.9.5	[5-06]	Limit 2	R/W	0~50 A, step: 1 A **50 A**		
9.9.6	[5-07]	Limit 3	R/W	0~50 A, step: 1 A **50 A**		
9.9.7	[5-08]	Limit 4	R/W	0~50 A, step: 1 A **50 A**		
9.9.8	[5-09]	Limit	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.9.9	[5-09]	Limit 1	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.9.A	[5-0A]	Limit 2	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.9.B	[5-0B]	Limit 3	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.9.C	[5-0C]	Limit 4	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.9.D	[4-01]	Priority heater		**0: None** 1: BSH 2: BUH		
9.9.F	[7-07]	BBR16 activation (#)	R/W	**0: Disabled** 1: Enabled		
	└ Energy metering					
9.A.1	[D-08]	Electricity meter 1	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
9.A.2	[D-09]	Electricity meter 2 / PV meter	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh 6: 100 pulse/kWh (PV meter) 7: 1000 pulse/kWh (PV meter)		
	└ Sensors					
9.B.1	[C-08]	External sensor	R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
9.B.2	[2-0B]	Ext. amb. sensor offset	R/W	-5~5°C, step: 0,5°C **0°C**		
9.B.3	[1-0A]	Averaging time	R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
	└ Bivalent					
9.C.1	[C-02]	Bivalent	R/W	**0: No** 1: Bivalent		
9.C.2	[7-05]	Boiler efficiency	R/W	**0: Very high** 1: High 2: Medium 3: Low 4: Very low		
9.C.3	[C-03]	Temperature	R/W	-25~25°C, step: 1°C **0°C**		
9.C.4	[C-04]	Hysteresis	R/W	2~10°C, step 1°C **3°C**		
Installer settings						
9.D	[C-09]	Alarm output	R/W	**0: Normally open** 1: Normally closed		
9.E	[3-00]	Auto restart	R/W	0: No **1: Yes**		
9.F	[E-08]	Power saving function	R/W	0: disabled **1: Enabled**		
9.G		Disable protections	R/W	0: No **1: Yes**		
	└ Overview field settings					
9.I	[0-00]	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~min(45,[9-06])°C, step: 1°C **35°C**		
9.I	[0-01]	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~[9-06]°C, step: 1°C **65°C**		
9.I	[0-02]	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.I	[0-03]	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
9.I	[0-04]	Leaving water value for high ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C [2-0C]=0 **18°C** [2-0C]=1 **7°C** [2-0C]=2 **18°C**		
9.I	[0-05]	Leaving water value for low ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **22°C**		

(*1) *6V_(*2) *9W_
(*3) ETB*_(*4) ETV*_
(*5) *X*_(*6) *H*_(*7) *SU*

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Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.I	[0-06]	High ambient temp. for LWT add zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		
9.I	[0-07]	Low ambient temp. for LWT add zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C**		
9.I	[0-0B]	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **55°C**		
9.I	[0-0C]	Leaving water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C **60°C**		
9.I	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.I	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
9.I	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
9.I	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.I	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00], step: 1°C [2-0C]=0 **35°C** [2-0C]=1 **45°C** [2-0C]=2 **65°C**		
9.I	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C [2-0C]=0 **25°C** [2-0C]=1 **35°C** [2-0C]=2 **35°C**		
9.I	[1-04]	Weather dependent cooling of the main leaving water temperature zone.	R/W	0: Disabled **1: Enabled**		
9.I	[1-05]	Weather dependent cooling of the additional leaving water temperature zone	R/W	0: Disabled **1: Enabled**		
9.I	[1-06]	Low ambient temp. for LWT main zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C**		
9.I	[1-07]	High ambient temp. for LWT main zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		
9.I	[1-08]	Leaving water value for low ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **22°C**		
9.I	[1-09]	Leaving water value for high ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C [2-0C]=0 **18°C** [2-0C]=1 **7°C** [2-0C]=2 **18°C**		
9.I	[1-0A]	What is the averaging time for the outdoor temp?	R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
9.I	[1-0B]	What is the desired delta T in heating for the main zone?	R/W	3~10°C, step: 1°C [2-0C] ≠ 2 (Radiator) **5°C** [2-0C] = 2 (Radiator) **10°C**		
9.I	[1-0C]	What is the desired delta T in heating for the additional zone?	R/W	3~10°C, step: 1°C **10°C**		
9.I	[1-0D]	What is the desired delta T in cooling for the main zone?	R/W	3~10°C, step: 1°C **5°C**		
9.I	[1-0E]	What is the desired delta T in cooling for the additional zone?	R/W	3~10°C, step: 1°C **5°C**		
9.I	[2-00]	When should the disinfection function be executed?	R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday **5: Friday** 6: Saturday 7: Sunday		
9.I	[2-01]	Should the disinfection function be executed?	R/W	0: No **1: Yes**		
9.I	[2-02]	When should the disinfection function start?	R/W	0~23 hour, step: 1 hour **1**		
9.I	[2-03]	What is the disinfection target temperature?	R/W	[E-07]≠1 : 55~75°C, step: 5°C **70°C** [E-07]=1 : 60°C **60°C**		
9.I	[2-04]	How long must the tank temperature be maintained?	R/W	[E-07]≠1: 5~60 min, step: 5 min **10 min** [E-07]=1: 40~60 min, step: 5 min **40 min**		
9.I	[2-05]	Room antifrost temperature	R/W	4~16°C, step: 1°C **8°C**		
9.I	[2-06]	Room frost protection	R/W	0: Disabled **1: Enabled**		
9.I	[2-09]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
9.I	[2-0A]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
9.I	[2-0B]	What is the required offset on the measured outdoor temp.?	R/W	-5~5°C, step: 0,5°C **0°C**		
9.I	[2-0C]	What emitter type is connected to the main LWT zone?	R/W	**0: Underfloor heating** 1: Fancoil unit 2: Radiator		
9.I	[2-0D]	What emitter type is connected to the additional LWT zone?	R/W	0: Underfloor heating 1: Fancoil unit **2: Radiator**		
9.I	[2-0E]	What is the maximum allowed current over the heatpump ?	R/W	20~50 A, step: 1 A **50 A**		

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
9.I	[3-00]	Is auto restart of the unit allowed?	R/W	0: No **1: Yes**		
9.I	[3-01]	--		**0**		
9.I	[3-02]	--		**1**		
9.I	[3-03]	--		**4**		
9.I	[3-04]	--		**2**		
9.I	[3-05]	--		**1**		
9.I	[3-06]	What is the maximum desired room temperature in heating?	R/W	18~30°C, step: 1°C **30°C**		
9.I	[3-07]	What is the mimimum desired room temperature in heating?	R/W	12~18°C, step: 1°C **12°C**		
9.I	[3-08]	What is the maximum desired room temperature in cooling?	R/W	25~35°C, step: 1°C **35°C**		
9.I	[3-09]	What is the minimum desired room temperature in cooling?	R/W	15~25°C, step: ~~0,5~~ 1°C **15°C**		
9.I	[4-00]	What is the BUH operation mode?	R/W	0: Disabled **1: Enabled** 2: Only DHW		
9.I	[4-01]	Which electric heater has priority?	R/W	**0: None** 1: BSH 2: BUH		
9.I	[4-02]	Below which outdoor temperature is heating allowed?	R/W	14~35°C, step: 1°C **35°C**		
9.I	[4-03]	Operation permission of the booster heater.	R/W	0: Restricted 1: Allowed 2: Overlap **3: Compressor off** 4: Legionella only		
9.I	[4-04]	Water pipe freeze prevention	R/W	**0: Intermittent** 1: Continuous 2: Off		
9.I	[4-05]	--		**0**		
9.I	[4-06]	Emergency	R/W	0: Manual 1: Automatic 2: Auto red SH/ DHW ON **3: Auto red SH/ DHW OFF** 4: Auto normal SH/ DHW OFF		
9.I	[4-07]	--		**6**		
9.I	[4-08]	Which power limitation mode is required on the system?	R/W	**0: No limitation** 1: Continuous 2: Digital inputs		
9.I	[4-09]	Which power limitation type is required?	R/W	0: Current **1: Power**		
9.I	[4-0A]	Backup heater configuration	R/W	**1: 1/1+2 (*1) (*2)** 2: 1/2 3: 1/2 + 1/1+2 in emergency		
9.I	[4-0B]	Automatic cooling/heating changeover hysteresis.	R/W	1~10°C, step: 0,5°C **1°C**		
9.I	[4-0D]	Automatic cooling/heating changeover offset.	R/W	1~10°C, step: 0,5°C **3°C**		
9.I	[4-0E]	--		**6**		
9.I	[5-00]	Equilibrium: Deactivate backup heater (or external backup heat source in case of a bivalent system) above the equilibrium temperature for space heating?	R/W	0: No **1: Yes**		
9.I	[5-01]	What is the equilibrium temperature for the building?	R/W	-15~35°C, step: 1°C **0°C**		
9.I	[5-02]	Space heating priority.	R/W	**0: Disabled** 1: Enabled		
9.I	[5-03]	Space heating priority temperature.	R/W	-15~35°C, step: 1°C **0°C**		
9.I	[5-04]	Set point correction for domestic hot water temperature.	R/W	0~20°C, step: 1°C **10°C**		
9.I	[5-05]	What is the requested limit for DI1?	R/W	0~50 A, step: 1 A **50 A**		
9.I	[5-06]	What is the requested limit for DI2?	R/W	0~50 A, step: 1 A **50 A**		
9.I	[5-07]	What is the requested limit for DI3?	R/W	0~50 A, step: 1 A **50 A**		
9.I	[5-08]	What is the requested limit for DI4?	R/W	0~50 A, step: 1 A **50 A**		
9.I	[5-09]	What is the requested limit for DI1?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.I	[5-0A]	What is the requested limit for DI2?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.I	[5-0B]	What is the requested limit for DI3?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.I	[5-0C]	What is the requested limit for DI4?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.I	[5-0D]	Backup heater voltage	R/W (*1) R/O (*2)	**0: 230V, 1~ (*1)** 1: 230V, 3~ (*1) **2: 400V, 3~ (*2)**		
9.I	[5-0E]	--		**1**		
9.I	[6-00]	The temperature difference determining the heat pump ON temperature.	R/W	2~40°C, step: 1°C **8°C**		
9.I	[6-01]	The temperature difference determining the heat pump OFF temperature.	R/W	0~10°C, step: 1°C **2°C**		
9.I	[6-02]	What is the capacity of the booster heater?	R/W	0~10kW, step: 0,2kW **3kW (*3)** **0kW (*4)**		
9.I	[6-03]	What is the capacity of the backup heater step 1?	R/W	0~10kW, step: 0,2kW **2kW (*1)** **3kW (*2)**		
9.I	[6-04]	What is the capacity of the backup heater step 2?	R/W	0~10kW, step: 0,2kW **4kW (*1)** **6kW (*2)**		
9.I	[6-05]	--		**0**		
9.I	[6-06]	--		**0**		
9.I	[6-07]	--		0		
9.I	[6-08]	What is the hysteresis to be used in reheat mode?	R/W	**2~20°C, step: 1°C** **10°C**		

(*1) *6V_(*2) *9W_
(*3) ETB*_(*4) ETV*_
(*5) *X*_(*6) *H*_(*7) *SU*

(#) Only applicable in Swedish language.

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.I	[6-09]	--		**0**		
9.I	[6-0A]	What is the desired comfort storage temperature?	R/W	30~[6-0E]°C, step: 1°C **60°C**		
9.I	[6-0B]	What is the desired eco storage temperature?	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
9.I	[6-0C]	What is the desired reheat temperature?	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
9.I	[6-0D]	What is the desired DHW production type?	R/W	0: Reheat only **1: Reheat + sched.** 2: Scheduled only		
9.I	[6-0E]	What is the maximum temperature setpoint?	R/W	(*3) [E-07]=0 or 7: 40~ 60°C, step: 1°C **60°C** (*3) [E-07]=3 or 5 or 8: 40~80°C, step: 1°C **80°C** (*4) : 40~65°C, step: 1°C **65°C**		
9.I	[7-00]	Domestic hot water booster heater overshoot temperature.	R/W	0~4°C, step: 1°C **0°C**		
9.I	[7-01]	Domestic hot water booster heater hysteresis.	R/W	2~40°C, step: 1°C **2°C**		
9.I	[7-02]	How many leaving water temperature zones are there?	R/W	**0: 1 LWT zone** 1: 2 LWT zones		
9.I	[7-03]	--		**2.5**		
9.I	[7-04]	--		**0**		
9.I	[7-05]	Boiler efficiency	R/W	**0: Very high** 1: High 2: Medium 3: Low 4: Very low		
9.I	[7-06]	Compressor forced OFF	R/W	**0: Disabled** 1: Enabled		
9.I	[7-07]	BBR16 activation (#)	R/W	**0: Disabled** 1: Enabled		
9.I	[7-09]	--		**20**		
9.I	[7-0A]	Additional zone fixed pump PWM, in case a bizone kit is installed.	R/W	20~95%, step 5% **95%**		
9.I	[7-0B]	Main zone fixed pump PWM, in case a bizone kit is installed.	R/W	20~95%, step 5% **95%**		
9.I	[7-0C]	Time needed by the mixing valve to turn from one side to the other, in case a bizone kit is installed.	R/W	20~300 seconds, step 5 sec **125 seconds**		
9.I	[8-00]	Minimum running time for domestic hot water operation.	R/W	0~20 min, step 1 min **1 min**		
9.I	[8-01]	Maximum running time for domestic hot water operation.	R/W	5~95 min, step: 5 min **30 min**		
9.I	[8-02]	Anti-recycling time.	R/W	0~10 hour, step: 0,5 hour **0,5 hour [E-07]=1** **3 hour [E-07]≠1**		
9.I	[8-03]	Booster heater delay timer.	R/W	20~95 min, step: 5 min **50 min**		
9.I	[8-04]	Additional running time for the maximum running time.	R/W	0~95 min, step: 5 min **95 min**		
9.I	[8-05]	Allow modulation of the LWT to control the room temp?	R/W	**0: No** 1: Yes		
9.I	[8-06]	Leaving water temperature maximum modulation.	R/W	0~10°C, step: 1°C **5°C**		
9.I	[8-07]	What is the desired comfort main LWT in cooling?	R/W	[9-03]~[9-02], step: 1°C **18°C**		
9.I	[8-08]	What is the desired eco main LWT in cooling?	R/W	[9-03]~[9-02], step: 1°C **20°C**		
9.I	[8-09]	What is the desired comfort main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **35°C**		
9.I	[8-0A]	What is the desired eco main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **33°C**		
9.I	[8-0B]	--		**13**		
9.I	[8-0C]	--		**10**		
9.I	[8-0D]	--		**16**		
9.I	[9-00]	What is the maximum desired LWT for main zone in heating?	R/W	[2-0C]=2: 37~70, step: 1°C 70**°C** 37~68, step: 1°C **(*7)** **68°C** [2-0C]≠2: 37~55, step: 1°C **55°C**		
9.I	[9-01]	What is the mimimum desired LWT for main zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
9.I	[9-02]	What is the maximum desired LWT for main zone in cooling?	R/W	18~22°C, step: 1°C **22°C**		
9.I	[9-03]	What is the mimimum desired LWT for main zone in cooling?	R/W	5~18°C, step: 1°C **7°C**		
9.I	[9-04]	Leaving water temperature overshoot temperature.	R/W	1~4°C, step: 1°C **1°C**		
9.I	[9-05]	What is the mimimum desired LWT for add. zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
9.I	[9-06]	What is the maximum desired LWT for add. zone in heating?	R/W	[2-0D]=2: 37~70, step: 1°C 70**°C** 37~68, step 1°C **(*7)** **68°C** [2-0D]≠2: 37~55, step: 1°C **55°C**		
9.I	[9-07]	What is the mimimum desired LWT for add. zone in cooling?	R/W	5~18°C, step: 1°C **7°C**		
9.I	[9-08]	What is the maximum desired LWT for add. zone in cooling?	R/W	18~22°C, step: 1°C **22°C**		
9.I	[9-09]	What is the allowed LWT undershoot during cooling start-up?	R/W	1~18°C, step: 1°C **18°C**		

(#) Only applicable in Swedish language.

(*1) *6V_(*2) *9W_
(*3) ETB*_(*4) ETV*_
(*5) *X*_(*6) *H*_(*7) *SU*

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value: Date	Value
9.I	[9-0A]	What is the room buffering temperature in heating?	R/W	[3-07]~[3-06]°C, step: 0,5°C **23°C**		
9.I	[9-0B]	What is the room buffering temperature in Cooling?	R/W	[3-09]~[3-08]°C, step: 0,5°C **23°C**		
9.I	[9-0C]	Room temperature hysteresis.	R/W	1~6°C, step: 0,5°C **1 °C**		
9.I	[9-0D]	Pump speed limitation	R/W	0~8, step:1 0 : No limitation 1~4 : 90~60% pump speed 5~8 : 90~60% pump speed during sampling **6**		
9.I	[9-0E]	--		**6**		
9.I	[C-00]	Domestic heating water priority.	R/W	0: Solar priority **1: Heat pump priority**		
9.I	[C-01]	--		**0**		
9.I	[C-02]	Is an external backup heat source connected?	R/W	**0: No** 1: Bivalent		
9.I	[C-03]	Bivalent activation temperature.	R/W	-25~25°C, step: 1°C **0°C**		
9.I	[C-04]	Bivalent hysteresis temperature.	R/W	2~10°C, step 1°C **3°C**		
9.I	[C-05]	What is the thermo request contact type for the main zone?	R/W	0: - 1: 1 contact **2: 2 contacts**		
9.I	[C-06]	What is the thermo request contact type for the add. zone?	R/W	0: - 1: 1 contact **2: 2 contacts**		
9.I	[C-07]	What is the unit control method in space operation?	R/W	**0: LWT control** 1: Ext RT control 2: RT control		
9.I	[C-08]	Which type of external sensor is installed?	R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
9.I	[C-09]	What is the required alarm output contact type?	R/W	**0: Normally open** 1: Normally closed		
9.I	[C-0A]	--		**0**		
9.I	[C-0B]	--		**0**		
9.I	[C-0C]	--		**0**		
9.I	[C-0D]	--		**0**		
9.I	[C-0E]	--		**0**		
9.I	[D-00]	Which heaters are permitted if prefer. kWh rate PS is cut?	R/W	**0: None** 1: BSH only 2: BUH only 3: All heaters		
9.I	[D-01]	Contact type of preferential kWh rate PS installation?	R/W	**0: No** 1: Active open 2: Active closed 3: Smart Grid		
9.I	[D-02]	Which type of DHW pump is installed?	R/W	**0: No DHW pump** 1: Instant hot water 2: Disinfection 3: Circulation 4: Circulation and disinfection		
9.I	[D-03]	Leaving water temperature compensation around 0°C.	R/W	0: No **1: increase 2°C, span 4°C** 2: increase 4°C, span 4°C 3: increase 2°C, span 8°C 4: increase 4°C, span 8°C		
9.I	[D-04]	Is a demand PCB connected?	R/W	**0: No** 1: Pwr consmp ctrl		
9.I	[D-05]	Is the pump allowed to run if prefer. kWh rate PS is cut?	R/W	0: Forced off **1: As normal**		
9.I	[D-07]	Is a solar kit connected?	R/W	**0: No** 1: Yes		
9.I	[D-08]	Is an external kWh meter used for power measurement?	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
9.I	[D-09]	Is an external kWh meter used for power measurement, kWh meter used for smart grid or a gas meter for hybrid unit?	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh 6: 100 pulse/kWh (PV meter) 7: 1000 pulse/kWh (PV meter) 8: 1 pulse/m³ (gas meter) 9: 10 pulses/m³ (gas meter) 10: 100 pulses/m³ (gas meter)		
9.I	[D-0A]	--		**0**		
9.I	[D-0B]	--		**2**		
9.I	[D-0C]	--		**0**		
9.I	[D-0D]	--		**0**		
9.I	[D-0E]	--		**0**		
9.I	[E-00]	Which type of unit is installed?	R/O	0~5 **0: LT split**		
9.I	[E-01]	Which type of compressor is installed?	R/O	**1**		
9.I	[E-02]	What is the indoor unit software type?	R/W (*5) R/O (*6)	**0: Reversible (*5)** **1: Heating only (*6)**		
9.I	[E-03]	What is the number of backup heater steps?	R/O	**3: 6V (*1)** **4: 9W (*2)**		
9.I	[E-04]	Is the power saving function available on the outdoor unit?	R/O	0: No **1: Yes**		
9.I	[E-05]	Can the system prepare domestic hot water?	R/W	**0: No (*3)** **1: Yes (*4)**		
9.I	[E-06]	--		**1**		

(*1) *6V_(*2) *9W_
(*3) ETB*_(*4) ETV*_
(*5) *X*_(*6) *H*_(*7) *SU*

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Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
9.I	[E-07]	What kind of DHW tank is installed?	R/W	0~8 **0: EKHW, small volume (*3)** **1: Integrated (*4)** 3: EKHW, large volume 5: EKHWP (*3) 7: Third party tank, small coil 8: Third party tank, large coil		
9.I	[E-08]	Power saving function for outdoor unit.	R/W	0: disabled **1: Enabled**		
9.I	[E-09]	--		**1**		
9.I	[E-0B]	Is a bi-zone kit installed?	R/W	**0: not installed** 1: - 2: Bizone kit installed		
9.I	[E-0C]	What bizone system type is installed?	R/W	**0: Without hydraulic separator / no direct pump** 1: With hydraulic separator / no direct pump 2: With hydraulic separator / with direct pump		
9.I	[E-0D]	Is the system filled with glycol ?	R/W	**0: No** 1: Yes		
9.I	[E-0E]	--		**0**		
9.I	[F-00]	Pump operation allowed outside range.	R/W	**0: Disabled** 1: Enabled		
9.I	[F-01]	Above which outdoor temperature is cooling allowed?	R/W	10~35°C, step: 1°C **20°C**		
9.I	[F-02]	--		**3**		
9.I	[F-03]	--		**5**		
9.I	[F-04]	--		**0**		
9.I	[F-05]	--		**0**		
9.I	[F-09]	Pump operation during flow abnormality.	R/W	**0: Disabled** 1: Enabled		
9.I	[F-0A]	--		**0**		
9.I	[F-0B]	Close shut-off valve during thermo OFF?	R/W	**0: No** 1: Yes		
9.I	[F-0C]	Close shut-off valve during cooling?	R/W	0: No **1: Yes**		
9.I	[F-0D]	What is the pump operation mode?	R/W	0: Continuous **1: Sample** 2: Request		
Bi-zone kit settings						
9.P.1	[E-0B]	Bi-zone kit installed	R/W	**0: not installed** 1: - 2: Bizone kit installed		
9.P.2	[E-0C]	Bi-zone system type	R/W	**0: Without hydraulic separator / no direct pump** 1: With hydraulic separator / no direct pump 2: With hydraulic separator / with direct pump		
9.P.3	[7-0A]	Add zone pump fixed PWM	R/W	20~95%, step 5% **95%**		
9.P.4	[7-0B]	Main zone pump fixed PWM	R/W	20~95%, step 5% **95%**		
9.P.5	[7-0C]	Mixing valve turning time	R/W	20~300 sec, step 5 sec **125 sec**		

Field settings table

[8.7.5] = ... **0F41**

Applicable indoor units

ETVZ16S18EA6V
ETVZ16S23EA6V
ETVZ16S18EA9W
ETVZ16S23EA9W

Notes

(*1) *6V
(*2) *9W
(*3) + EKHVCONV4

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
Room └ Antifrost						
1.4.1	[2-06]	Activation	R/W	0: Disabled **1: Enabled**		
1.4.2	[2-05]	Room setpoint	R/W	4~16°C, step: 1°C **8°C**		
└ Setpoint range						
1.5.1	[3-07]	Heating minimum	R/W	12~18°C, step: 1°C **12°C**		
1.5.2	[3-06]	Heating maximum	R/W	18~30°C, step: 1°C **30°C**		
1.5.3	[3-09]	Cooling minimum	R/W	15~25°C, step: 1°C **15°C**		
1.5.4	[3-08]	Cooling maximum	R/W	25~35°C, step: 1°C **35°C**		
Room						
1.6	[2-09]	Room sensor offset	R/W	-5~5°C, step: 0,5°C **0°C**		
1.7	[2-0A]	Room sensor offset	R/W	-5~5°C, step: 0,5°C **0°C**		
└ Room comfort setpoint						
1.9.1	[9-0A]	Heating comfort setpoint	R/W	[3-07]～[3-06]°C, step: 0,5°C **23°C**		
1.9.2	[9-0B]	Cooling comfort setpoint	R/W	[3-09]～[3-08]°C, step: 0,5°C **23°C**		
Main zone						
2.4		Setpoint mode		0: Fixed 1: WD heating, fixed cooling(*3) **2: Weather dependent**		
└ Heating WD curve						
2.5	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
2.5	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
2.5	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00], step: 1°C [2-0C]=0 **35°C** [2-0C]=1 **45°C** [2-0C]=2 **65°C**		
2.5	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C [2-0C]=0 **25°C** [2-0C]=1 **35°C** [2-0C]=2 **35°C**		
└ Cooling WD curve						
2.6	[1-06]	Low ambient temp. for LWT main zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C(*3)**		
2.6	[1-07]	High ambient temp. for LWT main zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C(*3)**		
2.6	[1-08]	Leaving water value for low ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **22°C(*3)**		
2.6	[1-09]	Leaving water value for high ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C [2-0C]=0 **18°C(*3)** [2-0C]=1 **7°C(*3)** [2-0C]=2 **18°C(*3)**		
Main zone						
2.7	[2-0C]	Emitter type	R/W	**0: Underfloor heating** 1: Fancoil unit 2: Radiator		
└ Setpoint range						
2.8.1	[9-01]	Heating minimum	R/W	15~37°C, step: 1°C **25°C**		
2.8.2	[9-00]	Heating maximum	R/W	[2-0C]=2: 37~70, step: 1°C 70**°C** [2-0C]≠2: 37~55, step: 1°C **55°C**		
2.8.3	[9-03]	Cooling minimum	R/W	5~18°C, step: 1°C **7°C(*3)**		
2.8.4	[9-02]	Cooling maximum	R/W	18~22°C, step: 1°C **22°C(*3)**		
Main zone						
2.9	[C-07]	Control	R/W	**0: LWT control** 1: Ext RT control 2: RT control		
2.A	[C-05]	Thermostat type	R/W	0: - 1: 1 contact **2: 2 contacts**		
└ Delta T						
2.B.1	[1-0B]	Delta T heating	R/W	3~10°C, step: 1°C [2-0C] ≠ 2 (Radiator) **5°C** [2-0C] = 2 (Radiator) **10°C**		
2.B.2	[1-0D]	Delta T cooling	R/W	3~10°C, step: 1°C **5°C(*3)**		
└ Modulation						
2.C.1	[8-05]	Modulation	R/W	**0: No** 1: Yes		
2.C.2	[8-06]	Max modulation	R/W	0~10°C, step: 1°C **5°C**		

(*1) *6V_
(*2) *9W_
(#) Only applicable in Swedish language.
(*3) + EKHVCONV4

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
└ Shut off valve						
2.D.1	[F-0B]	During thermo	R/W	**0: No** 1: Yes		
2.D.2	[F-0C]	During cooling	R/W	0: No **1: Yes(*3)**		
Main zone						
2.E		WD curve type	R/W	0: 2-points **1: Slope-Offset**		
Additional zone						
3.4		Setpoint mode		0: Fixed 1: WD heating, fixed cooling(*3) **2: Weather dependent**		
└ Heating WD curve						
3.5	[0-00]	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~min(45,[9-06])°C, step: 1°C **35°C**		
3.5	[0-01]	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~[9-06]°C, step: 1°C **65°C**		
3.5	[0-02]	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
3.5	[0-03]	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
└ Cooling WD curve						
3.6	[0-04]	Leaving water value for high ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C [2-0C]=0 **18°C(*3)** [2-0C]=1 **7°C(*3)** [2-0C]=2 **18°C(*3)**		
3.6	[0-05]	Leaving water value for low ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **22°C(*3)**		
3.6	[0-06]	High ambient temp. for LWT add zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C(*3)**		
3.6	[0-07]	Low ambient temp. for LWT add zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C(*3)**		
Additional zone						
3.7	[2-0D]	Emitter type	R/O	0: Underfloor heating 1: Fancoil unit **2: Radiator**		
└ Setpoint range						
3.8.1	[9-05]	Heating minimum	R/W	15~37°C, step: 1°C **25°C**		
3.8.2	[9-06]	Heating maximum	R/W	[2-0D]=2: 37~70, step: 1°C 70**°C** [2-0D]≠2: 37~55, step: 1°C **55°C**		
3.8.3	[9-07]	Cooling minimum	R/W	5~18°C, step: 1°C **7°C(*3)**		
3.8.4	[9-08]	Cooling maximum	R/W	18~22°C, step: 1°C **22°C(*3)**		
Additional zone						
3.A	[C-06]	Thermostat type	R/W	0: - 1: 1 contact **2: 2 contacts**		
└ Delta T						
3.B.1	[1-0C]	Delta T heating	R/W	3~10°C, step: 1°C **10°C**		
3.B.2	[1-0E]	Delta T cooling	R/W	3~10°C, step: 1°C **5°C(*3)**		
Additional zone						
3.C		WD curve type	R/O	0: 2-points **1: Slope-Offset**		
Space heating / cooling └ Operation range						
4.3.1	[4-02]	Space heating OFF temp	R/W	14~35°C, step: 1°C **35°C**		
4.3.2	[F-01]	Space cooling OFF temp	R/W	10~35°C, step: 1°C **20°C(*3)**		
Space heating / cooling						
4.4	[7-02]	Number of zones	R/W	0: 1 LWT zone **1: 2 LWT zones**		
4.5	[F-0D]	Pump operation mode	R/W	0: Continuous **1: Sample** 2: Request		
4.6	[E-02]	Unit type	R/W (*3) R/O	0: Reversible (*3) **1: Heating only**		
└ Pump limitation						
4.8.1	[9-0E]	Pump speed limitation main zone	R/W	0~8, step:1 0 : No limitation 1~4 : 90~60% pump speed 5~8 : 90-60% pump speed during sampling **6**		
4.8.2	[9-0D]	Pump speed limitation additional zone	R/W	0~8, step:1 0 : No limitation 1~4 : 90~60% pump speed 5~8 : 90-60% pump speed during sampling **6**		
Space heating / cooling						
4.9	[F-00]	Pump outside range	R/W	**0: Restricted** 1: Allowed		
4.A	[D-03]	Increase around 0°C	R/W	0: No **1: increase 2°C, span 4°C** 2: increase 4°C, span 4°C 3: increase 2°C, span 8°C 4: increase 4°C, span 8°C		

(*1) *6V_
(*2) *9W_
(*3) + EKHVCONV4

(#) Only applicable in Swedish language.

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
4.B	[9-04]	Overshoot	R/W	1~4°C, step: 1°C **1°C**		
4.C	[2-06]	Antifrost	R/W	0: Disabled **1: Enabled**		
Tank						
5.2	[6-0A]	Comfort setpoint	R/W	30~[6-0E]°C, step: 1°C **60°C**		
5.3	[6-0B]	Eco setpoint	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
5.4	[6-0C]	Reheat setpoint	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
5.6	[6-0D]	Heat up mode	R/W	0: Reheat only **1: Reheat + sched.** 2: Scheduled only		
└ Disinfection						
5.7.1	[2-01]	Activation	R/W	0: No **1: Yes**		
5.7.2	[2-00]	Operation day	R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday **5: Friday** 6: Saturday 7: Sunday		
5.7.3	[2-02]	Start time	R/W	0~23 hour, step: 1 hour **1**		
5.7.4	[2-03]	Tank setpoint	R/W	**60°C**		
5.7.5	[2-04]	Duration	R/W	40~60 min, step: 5 min **40 min**		
Tank						
5.8	[6-0E]	Maximum	R/W	40~65°C, step: 1°C **65°C**		
5.9	[6-00]	Hysteresis	R/W	2~40°C, step: 1°C **8°C**		
5.A	[6-08]	Hysteresis	R/W	2~20°C, step: 1°C **10°C**		
5.B		Setpoint mode	R/W	**0: Fixed** 1: Weather dependent		
└ WD curve						
5.C	[0-0B]	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **55°C**		
5.C	[0-0C]	Leaving water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C **60°C**		
5.C	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **15°C**		
5.C	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
Tank						
5.D	[6-01]	Margin	R/W	0~10°C, step: 1°C **2°C**		
5.E		WD curve type	R/O	0: 2-points **1: Slope-Offset**		
User settings └ Quiet						
7.4.1		Activation	R/W	**0: OFF** 1: Manual 2: Automatic		
7.4.3		Level	R/W	**0: Quiet** 1: More Quiet 2: Most Quiet		
└ Electricity price						
7.5.1		High	R/W	0,00~990/kWh **1/kWh**		
7.5.2		Medium	R/W	0,00~990/kWh **1/kWh**		
7.5.3		Low	R/W	0,00~990/kWh **1/kWh**		
User settings						
7.6		Gas price	R/W	0,00~990/kWh 0,00~290/MBtu **1,0/kWh**		
Installer settings └ Configuration wizard └ System						
9.1.3.2	[E-03]	BUH type	R/O	**3: 6V (*1)** **4: 9W (*2)**		
9.1.3.3	[E-05] [E-06] [E-07]	Domestic hot water	R/O	**Integrated**		
9.1.3.4	[4-06]	Emergency	R/W	0: Manual 1: Automatic 2: Auto red SH/ DHW ON **3: Auto red SH/ DHW OFF** 4: Auto normal SH/ DHW OFF		
9.1.3.5	[7-02]	Number of zones	R/W	0: Single zone **1: Dual zone**		
9.1.3.6	[E-0D]	Glycol Filled system	R/W	**0: No** 1: Yes		
└ Backup heater						
9.1.4.1	[5-0D]	Voltage	R/W (*1) R/O (*2)	**0: 230V, 1~ (*1)** 1: 230V, 3~ (*1) **2: 400V, 3~ (*2)**		
9.1.4.2	[4-0A]	Configuration	R/W	0: 1 **1: 1/1+2 (*1) (*2)** 2: 1/2 3: 1/2 + 1/1+2 in emergency		
9.1.4.3	[6-03]	Capacity step 1	R/W	0~10kW, step: 0,2kW **2kW (*1)** **3kW (*2)**		

(*1) *6V_
(*2) *9W_
(*3) + EKHVCONV4

(#) Only applicable in Swedish language.

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
9.1.4.4	[6-04]	Additional capacity step 2	R/W	0~10kW, step: 0,2kW **4kW (*1)** **6kW (*2)**		
		└ Main zone				
9.1.5.1	[2-0C]	Emitter type	R/W	**0: Underfloor heating** 1: Fancoil unit 2: Radiator		
9.1.5.2	[C-07]	Control	R/W	**0: LWT control** 1: Ext RT control 2: RT control		
9.1.5.3		Setpoint mode	R/W	0: Fixed **2: Weather dependent**		
9.1.5.4		Schedule	R/W	**0: No** 1: Yes		
9.1.5.5		WD curve type	R/W	**0: 2-points** 1: Slope-Offset		
9.1.6	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
9.1.6	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.1.6	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00], step: 1°C <u>[2-0C]=0</u> **35°C** <u>[2-0C]=1</u> **45°C** <u>[2-0C]=2</u> **65°C**		
9.1.6	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C <u>[2-0C]=0</u> **25°C** [2-0C]=1 **35°C** [2-0C]=2 **35°C**		
9.1.7	[1-06]	Low ambient temp. for LWT main zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C(*3)**		
9.1.7	[1-07]	High ambient temp. for LWT main zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C(*3)**		
9.1.7	[1-08]	Leaving water value for low ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **22°C(*3)**		
9.1.7	[1-09]	Leaving water value for high ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C <u>[2-0C]=0</u> **18°C(*3)** <u>[2-0C]=1</u> **7°C(*3)** <u>[2-0C]=2</u> **18°C(*3)**		
		└ Additional zone				
9.1.8.1	[2-0D]	Emitter type	R/W	0: Underfloor heating 1: Fancoil unit **2: Radiator**		
9.1.8.3		Setpoint mode	R/W	0: Fixed 1: WD heating, fixed cooling(*3) **2: Weather dependent**		
9.1.8.4		Schedule	R/W	**0: No** 1: Yes		
9.1.9	[0-00]	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~min(45,[9-06])°C, step: 1°C **35°C**		
9.1.9	[0-01]	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~[9-06]°C, step: 1°C **65°C**		
9.1.9	[0-02]	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.1.9	[0-03]	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
9.1.A	[0-04]	Leaving water value for high ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C <u>[2-0C]=0</u> **18°C(*3)** <u>[2-0C]=1</u> **7°C(*3)** <u>[2-0C]=2</u> **18°C(*3)**		
9.1.A	[0-05]	Leaving water value for low ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **22°C(*3)**		
9.1.A	[0-06]	High ambient temp. for LWT add zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C(*3)**		
9.1.A	[0-07]	Low ambient temp. for LWT add zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C(*3)**		
		└ Tank				
9.1.B.1	[6-0D]	Heat up mode	R/W	0: Reheat only **1: Reheat + sched.** 2: Scheduled only		
9.1.B.2	[6-0A]	Comfort setpoint	R/W	30~[6-0E]°C, step: 1°C **60°C**		
9.1.B.3	[6-0B]	Eco setpoint	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
9.1.B.4	[6-0C]	Reheat setpoint	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
9.1.B.5	[6-08]	Reheat hysteresis	R/W	2~20°C, step: 1°C **10°C**		
	└ Domestic hot water					
9.2.1	[E-05] [E-06] [E-07]	Domestic hot water	R/O	**3: Integrated**		
9.2.2	[D-02]	DHW pump	R/W	**0: No DHW pump** 1: Instant hot water 2: Disinfection 3: Circulation 4: Circulation and disinfection		
9.2.4	[D-07]	Solar	R/W	**0: No** 1: Yes		

(*1) *6V_
(*2) *9W_
(*3) + EKHVCONV4

(#) Only applicable in Swedish language.

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
	└─ Back up heater					
9.3.1	[E-03]	BUH type	R/O	**3: 6V (*1)** **4: 9W (*2)**		
9.3.2	[5-0D]	Voltage	R/W (*1) R/O (*2)	**0: 230V, 1~ (*1)** 1: 230V, 3~ (*1) **2: 400V, 3~ (*2)**		
9.3.3	[4-0A]	Configuration	R/W	**1: 1/1+2 (*1) (*2)** 2: 1/2 3: 1/2 + 1/1+2 in emergency		
9.3.4	[6-03]	Capacity step 1	R/W	0~10kW, step: 0,2kW 2**kW (*1)** **3kW (*2)**		
9.3.5	[6-04]	Additional capacity step 2	R/W	0~10kW, step: 0,2kW **4kW (*1)** **6kW (*2)**		
9.3.6	[5-00]	Equilibrium: Deactivate backup heater (or external backup heat source in case of a bivalent system) above the equilibrium temperature for space heating?	R/W	0: No **1: Yes**		
9.3.7	[5-01]	Equilibrium temperature	R/W	-15~35°C, step: 1°C **0°C**		
9.3.8	[4-00]	Operation	R/W	0: Disabled **1: Enabled** 2: Only DHW		
	└─ Booster heater					
9.4.1	[6-02]	Capacity	R/W	0~10kW, step: 0,2kW 0**kW**		
9.4.3	[8-03]	BSH eco timer	R/W	20~95 min, step: 5 min **50 min**		
9.4.4	[4-03]	Operation	R/W	0: Restricted 1: Allowed 2: Overlap **3: Compressor off** 4: Legionella only		
	└─ Emergency					
9.5	[4-06]	Emergency	R/W	0: Manual 1: Automatic 2: Auto red SH/ DHW ON **3: Auto red SH/ DHW OFF** 4: Auto normal SH/ DHW OFF		
9.5.2	[7-06]	Compressor forced OFF	R/W	**0: Disabled** 1: Enabled		
	└─ Balancing					
9.6.1	[5-02]	Space heating priority	R/W	**0: Disabled** 1: Enabled		
9.6.2	[5-03]	Priority temperature	R/W	-15~35°C, step: 1°C **0°C**		
9.6.3	[5-04]	Offset BSH setpoint	R/W	0~20°C, step: 1°C **10°C**		
9.6.4	[8-02]	Anti-recycle timer	R/W	0~10 hour, step: 0,5 hour **0,5 hour**		
9.6.5	[8-00]	Minimum running timer	R/W	0~20 min, step 1 min **1 min**		
9.6.6	[8-01]	Maximum running timer	R/W	5~95 min, step: 5 min **30 min**		
9.6.7	[8-04]	Additional timer	R/W	0~95 min, step: 5 min **95 min**		
Installer settings						
9.7	[4-04]	Water pipe freeze prevention	R/W	**0: Intermittent** 1: Continuous 2: Off		
	└─ Benefit kWh power supply					
9.8.2	[D-00]	Allow heater	R/W	**0: None** 1: BSH only 2: BUH only 3: All heaters		
9.8.3	[D-05]	Allow pump	R/W	0: Forced off **1: As normal**		
9.8.4	[D-01]	Benefit kWh power supply	R/W	**0: No** 1: Active open 2: Active closed 3: Smart Grid		
9.8.6		Allow electric heaters	R/W	0: No **1: Yes**		
9.8.7		Enable Room buffering	R/W	**0: No** 1: Yes		
9.8.8		Limit setting kW	R/W	0~20 kW, step: 0,5 kW **20 kW**		
	└─ Power consumption control					
9.9.1	[4-08]	Power consumption control	R/W	**0: No limitation** 1: Continuous 2: Digital inputs		
9.9.2	[4-09]	Type	R/W	0: Current **1: Power**		
9.9.3	[5-05]	Limit	R/W	0~50 A, step: 1 A **50 A**		
9.9.4	[5-05]	Limit 1	R/W	0~50 A, step: 1 A **50 A**		
9.9.5	[5-06]	Limit 2	R/W	0~50 A, step: 1 A **50 A**		
9.9.6	[5-07]	Limit 3	R/W	0~50 A, step: 1 A **50 A**		
9.9.7	[5-08]	Limit 4	R/W	0~50 A, step: 1 A **50 A**		
9.9.8	[5-09]	Limit	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.9.9	[5-09]	Limit 1	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.9.A	[5-0A]	Limit 2	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.9.B	[5-0B]	Limit 3	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.9.C	[5-0C]	Limit 4	R/W	0~20 kW, step: 0,5 kW **20 kW**		

(*1) *6V_
(*2) *9W_
(*3) + EKHVCONV4

(#) Only applicable in Swedish language.

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.9.D	[4-01]	Priority heater		**0: None** 1: BSH 2: BUH		
9.9.F	[7-07]	BBR16 activation (#)	R/W	**0: Disabled** 1: Enabled		
└ Energy metering						
9.A.1	[D-08]	Electricity meter 1	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
9.A.2	[D-09]	Electricity meter 2 / PV meter	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh 6: 100 pulse/kWh (PV meter) 7: 1000 pulse/kWh (PV meter)		
└ Sensors						
9.B.1	[C-08]	External sensor	R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
9.B.2	[2-0B]	Ext. amb. sensor offset	R/W	-5~5°C, step: 0,5°C **0°C**		
9.B.3	[1-0A]	Averaging time	R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
└ Bivalent						
9.C.1	[C-02]	Bivalent	R/W	**0: No** 1: Bivalent		
9.C.2	[7-05]	Boiler efficiency	R/W	**0: Very high** 1: High 2: Medium 3: Low 4: Very low		
9.C.3	[C-03]	Temperature	R/W	-25~25°C, step: 1°C 0°C		
9.C.4	[C-04]	Hysteresis	R/W	2~10°C, step 1°C **3°C**		
Installer settings						
9.D	[C-09]	Alarm output	R/W	**0: Normally open** 1: Normally closed		
9.E	[3-00]	Auto restart	R/W	0: No **1: Yes**		
9.F	[E-08]	Power saving function	R/W	0: disabled **1: Enabled**		
9.G		Disable protections	R/W	0: No **1: Yes**		
└ Overview field settings						
9.I	[0-00]	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~min(45,[9-06])°C, step: 1°C **35°C**		
9.I	[0-01]	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~[9-06]°C, step: 1°C **65°C**		
9.I	[0-02]	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.I	[0-03]	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
9.I	[0-04]	Leaving water value for high ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C [2-0C]=0 **18°C(*3)** [2-0C]=1 **7°C(*3)** [2-0C]=2 **18°C(*3)**		
9.I	[0-05]	Leaving water value for low ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **22°C(*3)**		
9.I	[0-06]	High ambient temp. for LWT add zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C(*3)**		
9.I	[0-07]	Low ambient temp. for LWT add zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C(*3)**		
9.I	[0-0B]	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **55°C**		
9.I	[0-0C]	Leaving water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C **60°C**		
9.I	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.I	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
9.I	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
9.I	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
9.I	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00], step: 1°C [2-0C]=0 **35°C** [2-0C]=1 **45°C** [2-0C]=2 **65°C**		
9.I	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C [2-0C]=0 **25°C** [2-0C]=1 **35°C** [2-0C]=2 **35°C**		

(*1) *6V_
(*2) *9W_
(*3) + EKHVCONV4

(#) Only applicable in Swedish language.

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.I	[1-04]	Weather dependent cooling of the main leaving water temperature zone.	R/W	0: Disabled **1: Enabled**		
9.I	[1-05]	Weather dependent cooling of the additional leaving water temperature zone	R/W	0: Disabled **1: Enabled**		
9.I	[1-06]	Low ambient temp. for LWT main zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C(*3)**		
9.I	[1-07]	High ambient temp. for LWT main zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C(*3)**		
9.I	[1-08]	Leaving water value for low ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **22°C(*3)**		
9.I	[1-09]	Leaving water value for high ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C [2-0C]=0 **18°C(*3)** [2-0C]=1 **7°C(*3)** [2-0C]=2 **18°C(*3)**		
9.I	[1-0A]	What is the averaging time for the outdoor temp?	R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
9.I	[1-0B]	What is the desired delta T in heating for the main zone?	R/W	3~10°C, step: 1°C [2-0C] ≠ 2 (Radiator) **5°C** [2-0C] = 2 (Radiator) **10°C**		
9.I	[1-0C]	What is the desired delta T in heating for the additional zone?	R/W	3~10°C, step: 1°C **10°C**		
9.I	[1-0D]	What is the desired delta T in cooling for the main zone?	R/W	3~10°C, step: 1°C **5°C(*3)**		
9.I	[1-0E]	What is the desired delta T in cooling for the additional zone?	R/W	3~10°C, step: 1°C **5°C(*3)**		
9.I	[2-00]	When should the disinfection function be executed?	R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday **5: Friday** 6: Saturday 7: Sunday		
9.I	[2-01]	Should the disinfection function be executed?	R/W	0: No **1: Yes**		
9.I	[2-02]	When should the disinfection function start?	R/W	0~23 hour, step: 1 hour **1**		
9.I	[2-03]	What is the disinfection target temperature?	R/W	**60°C**		
9.I	[2-04]	How long must the tank temperature be maintained?	R/W	40~60 min, step: 5 min **40 min**		
9.I	[2-05]	Room antifrost temperature	R/W	4~16°C, step: 1°C **8°C(*3)**		
9.I	[2-06]	Room frost protection	R/W	0: Disabled **1: Enabled**		
9.I	[2-09]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
9.I	[2-0A]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
9.I	[2-0B]	What is the required offset on the measured outdoor temp.?	R/W	-5~5°C, step: 0,5°C **0°C**		
9.I	[2-0C]	What emitter type is connected to the main LWT zone?	R/W	**0: Underfloor heating** 1: Fancoil unit 2: Radiator		
9.I	[2-0D]	What emitter type is connected to the additional LWT zone?	R/W	0: Underfloor heating 1: Fancoil unit **2: Radiator**		
9.I	[2-0E]	What is the maximum allowed current over the heatpump ?	R/W	20~50 A, step: 1 A **50 A**		
9.I	[3-00]	Is auto restart of the unit allowed?	R/W	0: No **1: Yes**		
9.I	[3-01]	--		**0**		
9.I	[3-02]	--		**1**		
9.I	[3-03]	--		**4**		
9.I	[3-04]	--		**2**		
9.I	[3-05]	--		**1**		
9.I	[3-06]	What is the maximum desired room temperature in heating?	R/W	18~30°C, step: 1°C **30°C**		
9.I	[3-07]	What is the mimimum desired room temperature in heating?	R/W	12~18°C, step: 1°C **12°C**		
9.I	[3-08]	What is the maximum desired room temperature in cooling?	R/W	25~35°C, step: 1°C **35°C**		
9.I	[3-09]	What is the minimum desired room temperature in cooling?	R/W	15~25°C, step: 1°C **15°C**		
9.I	[4-00]	What is the BUH operation mode?	R/W	0: Disabled **1: Enabled** 2: Only DHW		
9.I	[4-01]	Which electric heater has priority?	R/W	**0: None** 1: BSH 2: BUH		
9.I	[4-02]	Below which outdoor temperature is heating allowed?	R/W	14~35°C, step: 1°C **35°C**		
9.I	[4-03]	Operation permission of the booster heater.	R/W	0: Restricted 1: Allowed 2: Overlap **3: Compressor off** 4: Legionella only		
9.I	[4-04]	Water pipe freeze prevention	R/W	**0: Intermittent** 1: Continuous 2: Off		
9.I	[4-05]	--		**0**		

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.I	[4-06]	Emergency	R/W	0: Manual 1: Automatic 2: Auto red SH/ DHW ON **3: Auto red SH/ DHW OFF** 4: Auto normal SH/ DHW OFF		
9.I	[4-07]	--		**6**		
9.I	[4-08]	Which power limitation mode is required on the system?	R/W	**0: No limitation** 1: Continuous 2: Digital inputs		
9.I	[4-09]	Which power limitation type is required?	R/W	0: Current **1: Power**		
9.I	[4-0A]	Backup heater configuration	R/W	**1: 1/1+2 (*1) (*2)** 2: 1/2 3: 1/2 + 1/1+2 in emergency		
9.I	[4-0B]	Automatic cooling/heating changeover hysteresis.	R/W	1~10°C, step: 0,5°C **1°C(*3)**		
9.I	[4-0D]	Automatic cooling/heating changeover offset.	R/W	1~10°C, step: 0,5°C **3°C(*3)**		
9.I	[4-0E]	--		**6**		
9.I	[5-00]	Equilibrium: Deactivate backup heater (or external backup heat source in case of a bivalent system) above the equilibrium temperature for space heating?	R/W	0: No **1: Yes**		
9.I	[5-01]	What is the equilibrium temperature for the building?	R/W	-15~35°C, step: 1°C **0°C**		
9.I	[5-02]	Space heating priority.	R/W	**0: Disabled** 1: Enabled		
9.I	[5-03]	Space heating priority temperature.	R/W	-15~35°C, step: 1°C **0°C**		
9.I	[5-04]	Set point correction for domestic hot water temperature.	R/W	0~20°C, step: 1°C **10°C**		
9.I	[5-05]	What is the requested limit for DI1?	R/W	0~50 A, step: 1 A **50 A**		
9.I	[5-06]	What is the requested limit for DI2?	R/W	0~50 A, step: 1 A **50 A**		
9.I	[5-07]	What is the requested limit for DI3?	R/W	0~50 A, step: 1 A **50 A**		
9.I	[5-08]	What is the requested limit for DI4?	R/W	0~50 A, step: 1 A **50 A**		
9.I	[5-09]	What is the requested limit for DI1?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.I	[5-0A]	What is the requested limit for DI2?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.I	[5-0B]	What is the requested limit for DI3?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.I	[5-0C]	What is the requested limit for DI4?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.I	[5-0D]	Backup heater voltage	R/W (*1) R/O (*2)	**0: 230V, 1~ (*1)** 1: 230V, 3~ (*1) **2: 400V, 3~ (*2)**		
9.I	[5-0E]	--		**1**		
9.I	[6-00]	The temperature difference determining the heat pump ON temperature.	R/W	2~40°C, step: 1°C **8°C**		
9.I	[6-01]	The temperature difference determining the heat pump OFF temperature.	R/W	0~10°C, step: 1°C **2°C**		
9.I	[6-02]	What is the capacity of the booster heater?	R/W	0~10kW, step: 0,2kW 0**kW**		
9.I	[6-03]	What is the capacity of the backup heater step 1?	R/W	0~10kW, step: 0,2kW **2kW (*1)** **3kW (*2)**		
9.I	[6-04]	What is the capacity of the backup heater step 2?	R/W	0~10kW, step: 0,2kW **4kW (*1)** **6kW (*2)**		
9.I	[6-05]	--		**0**		
9.I	[6-06]	--		**0**		
9.I	[6-07]	--		0		
9.I	[6-08]	What is the hysteresis to be used in reheat mode?	R/W	**2~20°C, step: 1°C** **10°C**		
9.I	[6-09]	--		**0**		
9.I	[6-0A]	What is the desired comfort storage temperature?	R/W	30~[6-0E]°C, step: 1°C **60°C**		
9.I	[6-0B]	What is the desired eco storage temperature?	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
9.I	[6-0C]	What is the desired reheat temperature?	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
9.I	[6-0D]	What is the desired DHW production type?	R/W	0: Reheat only **1: Reheat + sched.** 2: Scheduled only		
9.I	[6-0E]	What is the maximum temperature setpoint?	R/W	40~65°C, step: 1°C **65°C**		
9.I	[7-00]	Domestic hot water booster heater overshoot temperature.	R/W	0~4°C, step: 1°C **0°C**		
9.I	[7-01]	Domestic hot water booster heater hysteresis.	R/W	2~40°C, step: 1°C **2°C**		
9.I	[7-02]	How many leaving water temperature zones are there?	R/W	0: 1 LWT zone **1: 2 LWT zones**		
9.I	[7-03]	--		**2.5**		
9.I	[7-04]	--		**0**		
9.I	[7-05]	Boiler efficiency	R/W	**0: Very high** 1: High 2: Medium 3: Low 4: Very low		
9.I	[7-06]	Compressor forced OFF	R/W	**0: Disabled** 1: Enabled		
9.I	[7-07]	BBR16 activation (#)	R/W	**0: Disabled** 1: Enabled		
9.I	[7-09]	--		**20**		
9.I	[7-0A]	--		**95**		
9.I	[7-0B]	--		**95**		

(*1) *6V_
(*2) *9W_
(*3) + EKHVCONV4

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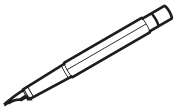
Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
9.I	[7-0C]	--		**60**		
9.I	[8-00]	Minimum running time for domestic hot water operation.	R/W	0~20 min, step 1 min **1 min**		
9.I	[8-01]	Maximum running time for domestic hot water operation.	R/W	5~95 min, step: 5 min **30 min**		
9.I	[8-02]	Anti-recycling time.	R/W	0~10 hour, step: 0,5 hour **0,5 hour**		
9.I	[8-03]	Booster heater delay timer.	R/W	20~95 min, step: 5 min **50 min**		
9.I	[8-04]	Additional running time for the maximum running time.	R/W	0~95 min, step: 5 min **95 min**		
9.I	[8-05]	Allow modulation of the LWT to control the room temp?	R/W	**0: No** 1: Yes		
9.I	[8-06]	Leaving water temperature maximum modulation.	R/W	0~10°C, step: 1°C **5°C**		
9.I	[8-07]	What is the desired comfort main LWT in cooling?	R/W	[9-03]~[9-02], step: 1°C **18°C(*3)**		
9.I	[8-08]	What is the desired eco main LWT in cooling?	R/W	[9-03]~[9-02], step: 1°C **20°C(*3)**		
9.I	[8-09]	What is the desired comfort main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **35°C**		
9.I	[8-0A]	What is the desired eco main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **33°C**		
9.I	[8-0B]	--		**13**		
9.I	[8-0C]	--		**10**		
9.I	[8-0D]	--		**16**		
9.I	[9-00]	What is the maximum desired LWT for main zone in heating?	R/W	[2-0C]=2: 37~70, step: 1°C 70**°C** [2-0C]≠2: 37~55, step: 1°C **55°C**		
9.I	[9-01]	What is the mimimum desired LWT for main zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
9.I	[9-02]	What is the maximum desired LWT for main zone in cooling?	R/W	18~22°C, step: 1°C **22°C(*3)**		
9.I	[9-03]	What is the mimimum desired LWT for main zone in cooling?	R/W	5~18°C, step: 1°C **7°C(*3)**		
9.I	[9-04]	Leaving water temperature overshoot temperature.	R/W	1~4°C, step: 1°C **1°C**		
9.I	[9-05]	What is the mimimum desired LWT for add. zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
9.I	[9-06]	What is the maximum desired LWT for add. zone in heating?	R/W	[2-0D]=2: 37~70, step: 1°C 70**°C** [2-0D]≠2: 37~55, step: 1°C **55°C**		
9.I	[9-07]	What is the mimimum desired LWT for add. zone in cooling?	R/W	5~18°C, step: 1°C **7°C(*3)**		
9.I	[9-08]	What is the maximum desired LWT for add. zone in cooling?	R/W	18~22°C, step: 1°C **22°C(*3)**		
9.I	[9-09]	What is the allowed LWT undershoot during cooling start-up?	R/W	1~18°C, step: 1°C **18°C**		
9.I	[9-0A]	What is the room buffering temperature in heating?	R/W	[3-07]～[3-06]°C, step: 0,5°C **23°C**		
9.I	[9-0B]	What is the room buffering temperature in Cooling?	R/W	[3-09]～[3-08]°C, step: 0,5°C **23°C**		
9.I	[9-0C]	Room temperature hysteresis.	R/W	1~6°C, step: 0,5°C **1 °C**		
9.I	[9-0D]	Pump speed limitation additional zone	R/W	0~8, step:1 0 : No limitation 1~4 : 90~60% pump speed 5~8 : 90~60% pump speed during sampling **6**		
9.I	[9-0E]	Pump speed limitation main zone	R/W	0~8, step:1 0 : No limitation 1~4 : 90~60% pump speed 5~8 : 90~60% pump speed during sampling **6**		
9.I	[C-00]	Domestic heating water priority.	R/O	0: Solar priority **1: Heat pump priority**		
9.I	[C-01]	--		**0**		
9.I	[C-02]	Is an external backup heat source connected?	R/W	**0: No** 1: Bivalent		
9.I	[C-03]	Bivalent activation temperature.	R/W	-25~25°C, step: 1°C **0°C**		
9.I	[C-04]	Bivalent hysteresis temperature.	R/W	2~10°C, step 1°C **3°C**		
9.I	[C-05]	What is the thermo request contact type for the main zone?	R/W	0: - 1: 1 contact **2: 2 contacts**		
9.I	[C-06]	What is the thermo request contact type for the add. zone?	R/W	0: - 1: 1 contact **2: 2 contacts**		
9.I	[C-07]	What is the unit control method in space operation?	R/W	**0: LWT control** 1: Ext RT control 2: RT control		
9.I	[C-08]	Which type of external sensor is installed?	R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
9.I	[C-09]	What is the required alarm output contact type?	R/W	**0: Normally open** 1: Normally closed		
9.I	[C-0A]	--		**0**		
9.I	[C-0B]	--		**0**		
9.I	[C-0C]	--		**0**		

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	 Value
9.I	[C-0D]	--		**0**		
9.I	[C-0E]	--		**0**		
9.I	[D-00]	Which heaters are permitted if prefer. kWh rate PS is cut?	R/W	**0: None** 1: BSH only 2: BUH only 3: All heaters		
9.I	[D-01]	Contact type of preferential kWh rate PS installation?	R/W	**0: No** 1: Active open 2: Active closed 3: Smart Grid		
9.I	[D-02]	Which type of DHW pump is installed?	R/W	**0: No DHW pump** 1: Instant hot water 2: Disinfection 3: Circulation 4: Circulation and disinfection		
9.I	[D-03]	Leaving water temperature compensation around 0°C.	R/W	0: No **1: increase 2°C, span 4°C** 2: increase 4°C, span 4°C 3: increase 2°C, span 8°C 4: increase 4°C, span 8°C		
9.I	[D-04]	Is a demand PCB connected?	R/W	**0: No** 1: Pwr consmp ctrl		
9.I	[D-05]	Is the pump allowed to run if prefer. kWh rate PS is cut?	R/W	0: Forced off **1: As normal**		
9.I	[D-07]	Is a solar kit connected?	R/O	**0: No**		
9.I	[D-08]	Is an external kWh meter used for power measurement?	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
9.I	[D-09]	Is an external kWh meter used for power measurement, kWh meter used for smart grid or a gas meter for hybrid unit?	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh 6: 100 pulse/kWh (PV meter) 7: 1000 pulse/kWh (PV meter) 8: 1 pulse/m³ (gas meter) 9: 10 pulses/m³ (gas meter) 10: 100 pulses/m³ (gas meter)		
9.I	[D-0A]	--		**0**		
9.I	[D-0B]	--		**2**		
9.I	[D-0C]	--		**0**		
9.I	[D-0D]	--		**0**		
9.I	[D-0E]	--		**0**		
9.I	[E-00]	Which type of unit is installed?	R/O	0~5 **0: LT split**		
9.I	[E-01]	Which type of compressor is installed?	R/O	**1**		
9.I	[E-02]	What is the indoor unit software type?	R/W (*3) R/O	0: Reversible (*3) **1: Heating only**		
9.I	[E-03]	What is the number of backup heater steps?	R/O	**3: 6V (*1)** **4: 9W (*2)**		
9.I	[E-04]	Is the power saving function available on the outdoor unit?	R/O	0: No **1: Yes**		
9.I	[E-05]	Can the system prepare domestic hot water?	R/O	0: No **1: Yes**		
9.I	[E-06]	--		**1**		
9.I	[E-07]	What kind of DHW tank is installed?	R/O	**1: Integrated**		
9.I	[E-08]	Power saving function for outdoor unit.	R/W	0: disabled **1: Enabled**		
9.I	[E-09]	--		**1**		
9.I	[E-0B]	Is a bi-zone kit installed?	R/O	**1: Yes**		
9.I	[E-0C]	--		**0**		
9.I	[E-0D]	Is the system filled with glycol ?	R/W	**0: No** 1: Yes		
9.I	[E-0E]	--		**0**		
9.I	[F-00]	Pump operation allowed outside range.	R/W	**0: Disabled** 1: Enabled		
9.I	[F-01]	--		**20**		
9.I	[F-02]	--		**3**		
9.I	[F-03]	--		**5**		
9.I	[F-04]	--		**0**		
9.I	[F-05]	--		**0**		
9.I	[F-09]	Pump operation during flow abnormality.	R/W	**0: Disabled** 1: Enabled		
9.I	[F-0A]	--		**0**		
9.I	[F-0B]	Close shut-off valve during thermo OFF?	R/W	**0: No** 1: Yes		
9.I	[F-0C]	Close shut-off valve during cooling?	R/W	0: No **1: Yes**		
9.I	[F-0D]	What is the pump operation mode?	R/W	0: Continuous **1: Sample** 2: Request		

(*1) *6V_
(*2) *9W_
(*3) + EKHVCONV4

(#) Only applicable in Swedish language.



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