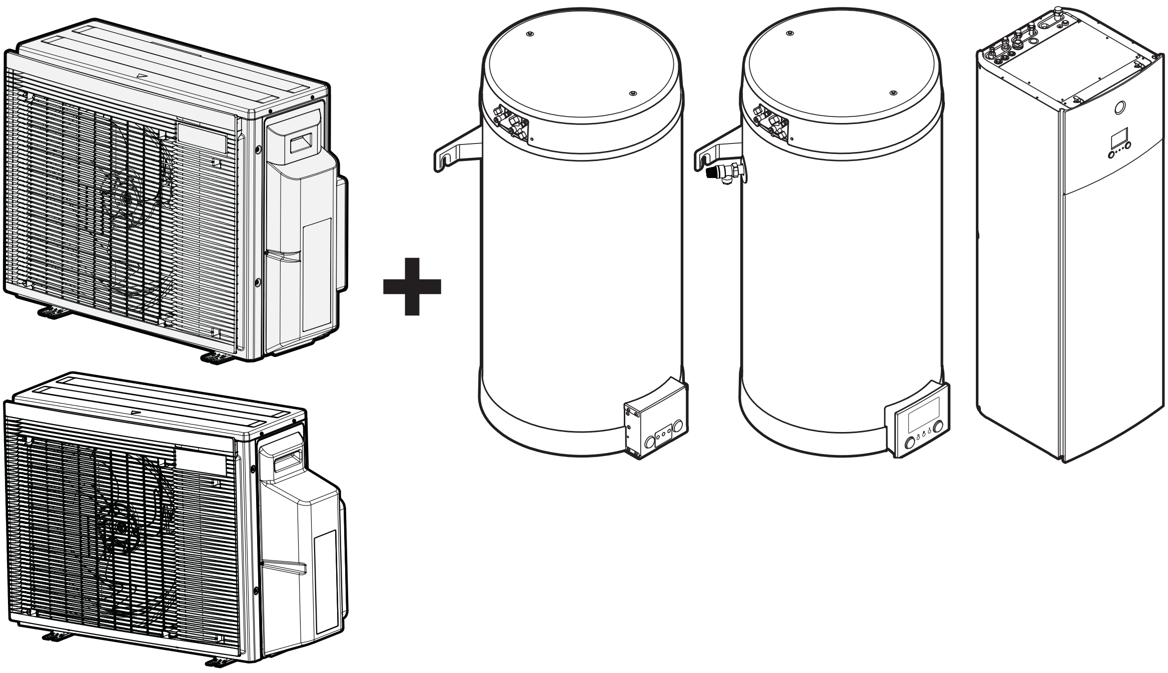
Service manual

R32 Multi Split + Domestic hot water tank



4MWXM52A2V1B
4MWXM52A2V1B9

5MWXM68A2V1B9
5MWXM90A2V1B9

EKHWET90B▲V3▼
EKHWET120B▲V3▼
EKHWETU120B▲V3▼

CKHWS180B▲V3▼
CKHWS230B▲V3▼
CKHWSU230B▲V3▼

▲= 1, 2, 3, ..., 9, A, B, C, ..., Z
▼= , , 1, 2, 3, ..., 9

Disclaimer

Version log

Version code	Description	Date
ESIE22-05	Document release	July 2022
ESIE22-05A	See below	December 2022

The following updates have been applied to the Service Manual:
- Outdoor unit models 4MWXM52A2V1B9 added.

Version code	Description	Date
ESIE22-05B	See below	September 2024

The following updates have been applied to the Service Manual:
- Domestic hot water tank model EKHWETU120BAV3 added.

Version code	Description	Date
ESIE22-05C	See below	March 2025

The following updates have been applied to the Service Manual:
- Outdoor unit models 5MWXM68+90A2V1B9 added.
- Domestic hot water tank models CKHWS180+230BJV3 and CKHWSU230BJV3 added.

Table of Contents

1 Safety precautions

The precautions described in this document cover very important topics, follow them carefully.

All activities described in the service manual must be performed by an authorized person.

If you are NOT sure how to install, operate or service the unit, contact your dealer.

In accordance with the applicable legislation, it might be necessary to provide a logbook with the product containing at least:

information on maintenance, repair work, results of tests, stand-by periods, …

Also, at least, following information must be provided at an accessible place at the product:

- Instructions for shutting down the system in case of an emergency
- Name and address of fire department, police and hospital
- Name, address and day and night telephone numbers for obtaining service

In Europe, EN378 provides the necessary guidance for this logbook.

1.1 Meaning of warnings and symbols

DANGER

Indicates a situation that results in death or serious injury.

DANGER: RISK OF ELECTROCUTION

Indicates a situation that could result in electrocution.

DANGER: RISK OF BURNING/SCALDING

Indicates a situation that could result in burning/scalding because of extreme hot or cold temperatures.

DANGER: RISK OF EXPLOSION

Indicates a situation that could result in explosion.

WARNING

Indicates a situation that could result in death or serious injury.

WARNING: FLAMMABLE MATERIAL

CAUTION

Indicates a situation that could result in minor or moderate injury.

NOTICE

Indicates a situation that could result in equipment or property damage.

> **INFORMATION**
> Indicates useful tips or additional information.

1.2 Dangers

> **DANGER: RISK OF BURNING/SCALDING**
> - Do NOT touch the refrigerant piping, water piping or internal parts during and immediately after operation. It could be too hot or too cold. Give it time to return to normal temperature. If you MUST touch it, wear protective gloves.
> - Do NOT touch any accidental leaking refrigerant.

> **DANGER: RISK OF ELECTROCUTION**
> - Turn OFF all power supply before removing the switch box cover, connecting electrical wiring or touching electrical parts.
> - Where applicable, stop the equipment's operation first and allow (refrigerant) pressure to equalize, before turning OFF the power.
> - Disconnect the power supply for more than 10 minutes, and measure the voltage at the terminals of main circuit capacitors or electrical components before servicing. The voltage MUST be less than 50 V DC before you can touch electrical components. For the location of the terminals, see the wiring diagram. If the measured voltage is still higher than 50 V DC, discharge the capacitors in a safe manner by using a dedicated capacitor discharge pen to avoid possibility of sparking.
> - Do NOT touch electrical components with wet hands.
> - Do NOT leave the unit unattended when the service cover is removed.
> - Protect electric components from getting wet while the service cover is opened.

1.3 Warnings

> **WARNING**
> Improper installation or attachment of equipment or accessories could result in electrical shock, short-circuit, leaks, fire or other damage to the equipment. ONLY use accessories, optional equipment and spare parts made or approved by Daikin unless otherwise specified.

> **WARNING**
> Do NOT apply any permanent inductive or capacitance loads to the circuit without ensuring that this will NOT exceed the permissible voltage and current permitted for the equipment in use.

WARNING

If a fault exists that could compromise safety, Do NOT connect electrical supply to the circuit until it is satisfactorily dealt with. If the fault CANNOT be corrected immediately but it is necessary to continue operation, an adequate temporary solution MUST be used. This MUST be reported to the owner of the equipment so all parties are advised.

Initial safety checks MUST include that:

- capacitors are discharged: this MUST be done in a safe manner to avoid possibility of sparking,
- NO live electrical components and wiring are exposed while charging, recovering or purging the system.

WARNING

Make sure that the refrigerating piping and components are installed in a position where they are unlikely to be exposed to any corroding substance.

WARNING

Make sure installation, testing and applied materials comply with applicable legislation (on top of the instructions described in the Daikin documentation).

WARNING

Make sure the work site environment is clean and safe to work in. Beware of spilled fluids, like water, oil or other substances.

Protect bystanders from injury and property from possible damage cause by service works.

WARNING

If any work is to be conducted on the refrigerating equipment or any associated parts which involves brazing, an appropriate dry powder or CO_2 fire extinguisher MUST be present.

When charging the unit, an appropriate dry powder or CO_2 fire extinguisher MUST be present.

WARNING

No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, MUST be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs MUST be displayed.

WARNING

Tear apart and throw away plastic packaging bags so that nobody, especially children, can play with them. **Possible consequence:** suffocation.

WARNING

During tests, NEVER pressurise the product with a pressure higher than the maximum allowable pressure (as indicated on the nameplate of the unit).

WARNING

For indoor installations: Make sure the total refrigerant charge is in accordance with the room size in which the unit is installed: please consult the detailed instructions on charging and allowed room sizes in the installation manual.

WARNING

- NEVER mix different refrigerants or allow air to enter the refrigerant system.
- NEVER charge recovered refrigerant from another unit. Use recovered refrigerant only on the same unit where it was recovered from, or have it recycled at a certified facility.

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.

WARNING

ALWAYS recover the refrigerant. Do NOT release them directly into the environment. Use a vacuum pump to evacuate the installation.

WARNING

Removal of refrigerant MUST be according to the following:

When breaking into the refrigerant circuit to make repairs, be sure to remove the refrigerant from the system first. The refrigerant charge MUST be recovered into the correct recovery cylinders.

WARNING

Take sufficient precautions in case of refrigerant leakage. If refrigerant gas leaks, ventilate the area immediately. Possible risks:

- Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency.
- Toxic gas might be produced if refrigerant gas comes into contact with fire.

WARNING

- Under no circumstances, potential sources of ignition SHALL be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) MUST NOT be used.
- Ensure that the detector is NOT a potential source of ignition and is suitable for the detection of R32.
- If a leak is suspected, all naked flames MUST be removed or extinguished.
- Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine MUST be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant MUST be recovered from the system, or isolated (by means of shut-off valves) in a part of the system remote from the leak.
- Only use the electronic leak tester for R32. The old flame leak tester CANNOT be used on a system with HFC refrigerant because there is no chlorine component in the refrigerant. In case of R32 (HFC) refrigerant, any flame in contact with (leaking) refrigerant is extremely dangerous.

WARNING

- In order to prevent oxygen deficiency and R32 combustion, keep the room well-ventilated for a healthy work environment. Do NOT work in a confined space. If a refrigerant leak is detected in a confined room or an inadequately ventilated location, do NOT start the work until the area has been ventilated appropriately.
- If the work area is NOT located in the open air, make sure the work area is adequately ventilated before breaking into the system or conducting any brazing. The ventilation MUST continue to operate during the period that the work is carried out to prevent accumulation of refrigerant in the work area. The ventilation should safely disperse any released refrigerant and preferably ventilate to the open air.

WARNING

Ensure that no external live wiring is exposed while charging, recovering or purging the system. Sparks created when live wiring is short-circuited might ignite the refrigerant if it is leaked into the room while charging, recovering or purging the system.

WARNING

Ensure that the unit is properly earthed prior to conducting maintenance or service or charging the system with refrigerant. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earthing may cause electrical shock.

WARNING

- ONLY use copper wires.
- Make sure the field wiring complies with the national wiring regulations.
- All field wiring MUST be performed in accordance with the wiring diagram supplied with the product.
- NEVER squeeze bundled cables and make sure they do NOT come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections.
- Make sure to install earth wiring. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock.
- Make sure to use a dedicated power circuit. NEVER use a power supply shared by another appliance.
- Make sure to install the required fuses or circuit breakers.
- Make sure to install an earth leakage protector. Failure to do so may cause electrical shock or fire.
- When installing the earth leakage protector, make sure it is compatible with the inverter (resistant to high frequency electric noise) to avoid unnecessary opening of the earth leakage protector.

WARNING

Make sure the markings on the unit remain visible and legible after inspection or repair work. Markings and signs that are illegible shall be corrected.

WARNING

- After finishing the electrical work, confirm that each electrical component and terminal inside the switch box is connected securely.
- Make sure all covers are closed before starting up the unit.

WARNING

- For indoor installations: The area MUST be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.
- For indoor installations: Prior to and during work, the area MUST be checked with an appropriate refrigerant detector capable of detecting R32 refrigerant, to ensure a work environment free of refrigerant.

WARNING

- Equipment MUST be labelled stating that it has been de-commissioned and emptied of refrigerant.
- The label MUST be dated and signed.
- For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

WARNING

Before carrying out refrigerant recovery procedure, it is essential that the technician is completely familiar with the equipment and all its details. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample MUST be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

- Become familiar with the equipment and its operation.
- Isolate system electrically.
- Ensure that mechanical handling equipment is available, if required, for handling refrigerant cylinders.
- Ensure that all personal protective equipment is available and is used correctly.
- Ensure that the recovery process is supervised at all times by a competent person.
- Ensure that recovery equipment and cylinders are conform to the appropriate standards.
- If a vacuum is NOT possible, make a manifold so that refrigerant can be removed from various parts of the system.
- Make sure that cylinder is situated on the scales before recovery takes place.
- Start the recovery machine and operate in accordance with instructions.
- Do NOT overfill cylinders (no more than 60% volume liquid charge).
- Do NOT exceed the maximum working pressure of the cylinder, NOT even temporarily.
- When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed.
- Recovered refrigerant MUST NOT be charged into another refrigerating system unless it has been cleaned and checked.

WARNING

All maintenance staff and others working in the local area MUST be instructed on the nature of work being carried out.

WARNING

Provide adequate measures to prevent that the unit can be used as a shelter by small animals. Small animals that make contact with electrical parts can cause malfunctions, smoke or fire.

WARNING

Prior to start working on systems containing flammable refrigerant, safety checks are necessary to ensure that the risk of ignition is minimised. Therefore, some instructions should be followed.

Please refer to the service manual for more information.

WARNING

- In case refrigerant recovery is required, use the appropriate service ports.
- If applicable for your unit, use the appropriate recovery mode or field setting to smoothly recover the refrigerant.
- ONLY use leak free hoses, couplings and manifolds in good working condition.
- ONLY use recovery cylinders designated and labelled to recover R32. Note that thread connection to the cylinder is counter clock.
- Always use a calibrated scale in good condition prior and during the refrigerant recovery process to determine the weight of the recovered refrigerant into the external refrigerant cylinder.
- Read the operation instructions of the recovery unit prior to connecting the recovery unit. Verify the recovery unit is suited for R32 refrigerant, check that it is in good working condition, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- Do NOT overfill the refrigerant cylinder, confirm with the supplier of the refrigerant cylinder about maximum filling ratio if NOT mentioned on the refrigerant cylinder itself. Generally the maximum filling amount should be limited to 60% of the maximum volume of the cylinder.
- Do NOT exceed the maximum working pressure of the refrigerant cylinder, NOT even temporarily.
- When the cylinders have been filled correctly, and the refrigerant recovery process is completed, make sure that the cylinders and the equipment are removed from site promptly and all stop valves on the equipment are (kept) closed.
- The recovered refrigerant MUST be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do NOT mix refrigerants in recovery units and especially NOT in cylinders.
- Recovered refrigerant MUST NOT be charged into another refrigerant system unless it has been cleaned and checked.

WARNING

If compressor is to be removed, ensure that the compressor has been evacuated to an acceptable level to make sure that flammable refrigerant does NOT remain within the lubricant. The evacuation process MUST be carried out prior to returning the compressor to the supplier. During the refrigerant recovery, confirm that the crankcase heater of the compressor body is energized to accelerate this process. When oil is drained from a system, it MUST be carried out safely.

WARNING

Make sure the ventilation machinery and outlets are operating adequately and are NOT obstructed.

1.4 Cautions

CAUTION

Wear adequate personal protective equipment (protective gloves, safety glasses,...) when installing, maintaining or servicing the system.

CAUTION

To avoid injury, do NOT touch the air inlet or aluminium fins of the unit.

CAUTION

- Do NOT place any objects or equipment on top of the unit.
- Do NOT sit, climb or stand on the unit.

1.5 Notices

NOTICE

- Make sure water quality complies with EU directive 2020/2184.
- Check the system for leaks after each repair/modification of the water side.
- Check drainage system(s) after repairs.
- Be careful when tilting units as water may leak.

NOTICE

Make sure refrigerant piping installation complies with applicable legislation. In Europe, EN378 is the applicable standard.

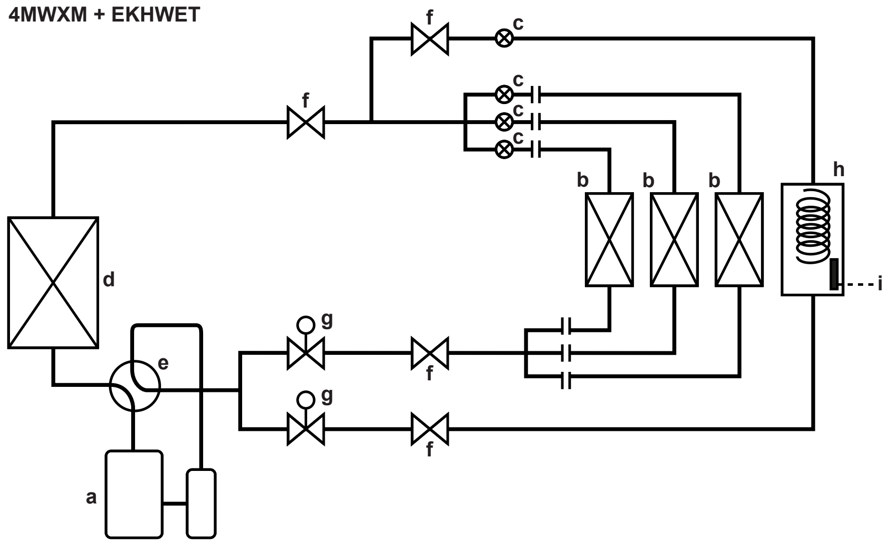
NOTICE

Make sure the field piping and connections are NOT subjected to stress.

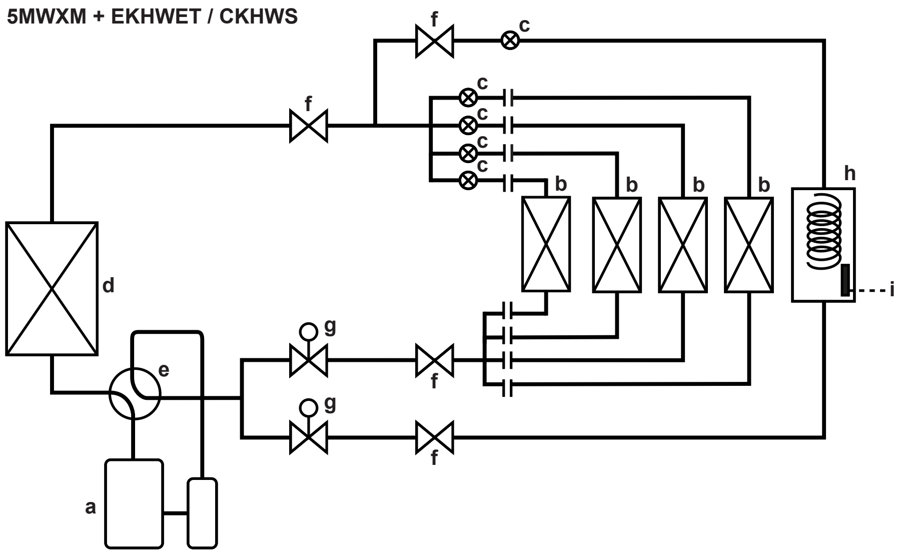
2 General operation

The Multi Split + domestic hot water tank is typically used for cooling or heating in residential applications and to provide domestic hot water via the tank.

The medium which is used to transfer the heat from inside to outside or vice versa, is refrigerant R32. If necessary, the tank CAN ALSO be heated by the booster heater (EKHWET tank) or backup heater (CKHWS tank).



a Compressor
b Indoor heat exchanger
c Expansion valve
d Outdoor heat exchanger
e 4-way valve
f Stop valves
g Solenoid valve
h Tank EKHWET (for domestic hot water)
i Booster heater



a Compressor
b Indoor heat exchanger
c Expansion valve
d Outdoor heat exchanger
e 4-way valve
f Stop valves
g Solenoid valve
h Tank EKHWET OR CKHWS (for domestic hot water)
i Backup heater

In case of cooling, the compressor builds up pressure and hence the temperature of the refrigerant is increased. The hot refrigerant is carried to the outdoor heat exchanger which will cool down the hot refrigerant by the fan.

The temperature of the refrigerant is further decreased by expansion through the expansion valve(s). The cold refrigerant flows into the indoor unit(s) and is capable of taking up heat again. This is enabled by a fan that sucks indoor air over the heat exchanger(s).

This refrigerant is then transported to the compressor where temperature is built up again and the cycle restarts.

For heating and providing domestic hot water, it's just the other way round.

Each indoor unit has its own dedicated expansion valve to control the amount of refrigerant flowing into their heat exchangers. This is defined by their own parameters (setpoint, air temperature, …).

The refrigerant flow to air conditioning indoor units and the domestic hot water tank CAN ALSO be controlled individually by two solenoid valves, depending on the demand, operation range, priority and the defrost operation, …

3 Troubleshooting

3.1 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.	**?**

WARNING

In case F3-00, there is possible risk of refrigerant leak. Contact your installer.

3.2 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.

3.3 To retrieve the error via the outdoor unit

Symbol	LED is...
☼	On
●	Off
◐	Flashing

Red LED[a]					Diagnosis
1	2	3	4	5	
●	●	●	●	●	Normal. ▪ Check the indoor unit.
☼	●	☼	☼	●	High-pressure protector worked or freeze-up in operating unit, or stand-by unit.
☼	●	☼	●	●	Overload relay worked or high discharge pipe temperature.
●	☼	☼	●	●	Faulty compressor start.

Red LED[a]					Diagnosis
1	2	3	4	5	
●	☼	●	☼	●	Input over-current.
☼	☼	●	●	●	Thermistor or CT abnormality.
☼	☼	●	☼	●	High temperature switch-box.
●	●	●	☼	●	High temperature at inverter circuit heat sink.
●	●	☼	●	●	Output over-current.
●	●	☼	☼	●	Refrigerant shortage.
☼	●	●	☼	●	Low voltage to main circuit or over voltage to main circuit.
☼	●	●	●	●	Reversing solenoid valve switching failure or high-pressure switching failure.
☼	☼	☼	●	●	Faulty outdoor unit PCB.
☼	☼	☼	☼	●	Fan motor fault.
●	☼	●	●	●	Wiring error check unfinished.

[a] The number of LEDs displayed depends on the number of rooms.

Green LED-A	Diagnosis
◐	Normal. ▪ Check the indoor unit.
☼	Turn the power OFF and back ON, and check the LED within approximately 3 minutes. If the LED is ON again, the outdoor unit PCB is faulty.
●	Power supply fault.

3.4 To reset the error code via outdoor unit

Prerequisite: Problem is solved.

1. Perform a power reset to reset the error code.

3.5 To perform a test run

> **INFORMATION**
>
> For DHW tank test run procedure, refer to installation manual of DHW tank unit.

Prerequisite: Power supply MUST be in the specified range.

Prerequisite: Test run operation may be done in cooling or heating mode.

Prerequisite: Test run should be done in accordance with the operation manual of the indoor unit to make sure that all functions and parts are working properly.

1. In cooling mode, select the lowest programmable temperature. In heating mode, select the highest programmable temperature.
2. Measure the temperature at the indoor unit inlet and outlet after running the unit for about 20 minutes. The difference should be more than 8°C (cooling) or 20°C (heating).

3. First check operation of each unit individually, then check simultaneous operation of all indoor units. Check both heating and cooling operation.
4. When test run is finished, set the temperature to a normal level. In cooling mode: 26~28°C, in heating mode: 20~24°C.

> **INFORMATION**
> - Test run can be disabled if necessary.
> - After the unit is turned OFF, it cannot be started again for 3 minutes.
> - When the test run is started in the heat mode right after turning the safety breaker on, in some cases no air will be output for about 15 minutes in order to protect the unit.
> - During cooling operation, frost may form on the gas stop valve or other parts. This is normal.

> **INFORMATION**
> - Even if the unit is turned OFF, it consumes electricity.
> - When the power turns back on after a power break, the previously selected mode will be resumed.

3.6 Error based troubleshooting

> **INFORMATION**
> For 4MWXM units, this system contains 4 refrigerant circuits: 3 circuits, each for 1 room with air conditioning indoor units and 1 circuit for the domestic hot water tank. For 5MWXM units, this system contains 5 refrigerant circuits: 4 circuits, each for 1 room with air conditioning indoor units and 1 circuit for the domestic hot water tank.
>
> Depending on which room (remote controller) or the domestic hot water tank (user interface / remote controller) raises the error, check the components of the specific refrigerant circuit.

> **INFORMATION**
> For other error codes like A5, C5 ... which are applicable to the air conditioning indoor units in the system, and which are NOT described in this service manual, please check with connected air conditioning indoor units service manuals.

3.6.1 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. Purge the water circuit. See "5.3 Water circuit" [▶ 270].

   Possible cause: Air in the water circuit.

2. Check the water flow. See "5.3 Water circuit" [▶ 270].

   Possible cause: Water flow is too low.

3 Check the water pressure. See "5.3 Water circuit" [▶ 270].

Possible cause: Water pressure is too low.

4 Clean the water filter. See "6 Maintenance" [▶ 280].

Possible cause: Faulty or dirty water filter.

5 Perform an electrical check of the water flow sensor. See "4.21 Water flow sensor" [▶ 239].

Possible cause: Faulty water flow sensor.

6 Perform a check of the water pump. See "4.23 Water pump" [▶ 247].

Possible cause: Faulty water pump.

7 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

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

3.6.2 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 Purge the water circuit. See "5.3 Water circuit" [▶ 270].

Possible cause: Air in the water circuit.

2 Check the water flow. See "5.3 Water circuit" [▶ 270].

Possible cause: Water flow is too low.

3 Check the water pressure. See "5.3 Water circuit" [▶ 270].

Possible cause: Water pressure is too low.

4 Clean the water filter. See "6 Maintenance" [▶ 280].

Possible cause: Faulty or dirty water filter.

5 Perform an electrical check of the water flow sensor. See "4.21 Water flow sensor" [▶ 239].

Possible cause: Faulty water flow sensor.

6 Perform a check of the water pump. See "4.23 Water pump" [▶ 247].

Possible cause: Faulty water pump.

7 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

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

3.6.3 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 backup heater thermistor. See "4.19 Thermistors" [▶ 211].

   Possible cause: Faulty outlet water after backup heater thermistor.

2. Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

   Possible cause: Faulty hydro PCB.

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

3.6.4 89-01 – Heat exchanger frozen

Trigger	Effect	Reset
Warning 89-02 or 89-03 occurred 3 times, with less than 30 minutes between each warning.	Unit will stop operating.	Manual reset via user interface.

Outdoor unit combined with CKHWS tank

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 "4.19 Thermistors" [▶ 211].

   Possible cause: Faulty inlet water thermistor.

2. Perform a check of the outlet water after heat exchanger thermistor. See "4.19 Thermistors" [▶ 211].

   Possible cause: Faulty outlet water after heat exchanger thermistor.

3. Perform a check of the refrigerant liquid thermistor. See "4.19 Thermistors" [▶ 211].

   Possible cause: Faulty refrigerant liquid thermistor.

4 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

5 Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

6 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Refrigerant overcharge.

7 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Clogged refrigerant circuit.

8 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▶ 257].

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

9 Check the water flow. See "5.3 Water circuit" [▶ 270].

Possible cause: Water flow is too low.

10 Check the water pressure. See "5.3 Water circuit" [▶ 270].

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.

Outdoor unit combined with EKHWET tank

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 "4.19 Thermistors" [▶ 211].

Possible cause: Faulty domestic hot water tank thermistor.

2 Perform a check of the refrigerant liquid thermistor. See "4.19 Thermistors" [▶ 211].

Possible cause: Faulty refrigerant liquid thermistor.

3 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

4 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Refrigerant overcharge.

5 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Clogged refrigerant circuit.

6 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▶ 257].

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.

3.6.5 89-02 – Heat exchanger frozen

Trigger	Effect	Reset
Condensing temperature <0°C.	Unit will stop operating.	Automatic reset.
Liquid refrigerant thermistor ≤0°C during domestic hot water.		

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 "4.1 4-way valve" [▶ 72].

Possible cause: Faulty 4-way valve.

2 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

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

3.6.6 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 "4.19 Thermistors" [▶ 211].

Possible cause: Faulty outlet water after heat exchanger thermistor.

2 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

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

3.6.7 8H-00 – Abnormal increase outlet water temperature

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 flow. See "5.3 Water circuit" [▸ 270].

Possible cause: Water flow is too low.

2 Perform a check of the outlet water after backup heater thermistor. See "4.19 Thermistors" [▸ 211].

Possible cause: Faulty outlet water after backup heater thermistor.

3 Check if the water circuit is clogged. See "5.3 Water circuit" [▸ 270].

Possible cause: Clogged water circuit.

4 Perform a check of the water pump. See "4.23 Water pump" [▸ 247].

Possible cause: Faulty water pump.

5 Perform a check of the backup heater contactor(s). See "4.2 Backup heater" [▸ 80].

Possible cause: Faulty backup heater contactor(s).

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

3.6.8 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 "4.11 Main PCB" [▸ 140].

Possible cause: Faulty main PCB.

2 Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▸ 253].

Possible cause:

- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

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

3.6.9 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.

- FOR DOMESTIC HOT WATER TANK EKHWET

1. Perform a check of the outdoor air thermistor. See "4.19 Thermistors" [▶ 211].

   Possible cause: Faulty ambient air thermistor.

2. Perform a check of the expansion valve. See "4.8 Expansion valve" [▶ 121].

   Possible cause: Faulty expansion valve.

3. Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▶ 257].

   Possible cause: Closed stop valve in the refrigerant circuit.

4. Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▶ 257].

   Possible cause: Clogged refrigerant circuit.

5. Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▶ 257].

   Possible cause: Refrigerant overcharge or shortage.

6. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▶ 257].

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

- FOR DOMESTIC HOT WATER TANK CKHWS

1. Check the water pressure. See "5.3 Water circuit" [▶ 270].

   Possible cause: Water pressure is too low.

2. Check the water flow. See "5.3 Water circuit" [▶ 270].

   Possible cause: Water flow is too low.

3. Purge the water circuit. See "5.3 Water circuit" [▶ 270].

   Possible cause: Air in the water circuit.

4. Perform a check of the outdoor air thermistor. See "4.19 Thermistors" [▶ 211].

Possible cause: Faulty ambient air thermistor.

5 Perform a check of the expansion valve. See "4.8 Expansion valve" [▸ 121].

Possible cause: Faulty expansion valve.

6 Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

7 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Clogged refrigerant circuit.

8 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Refrigerant overcharge or shortage.

9 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▸ 257].

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

- FOR AIR CONDITIONING INDOOR UNITS

1 Check for objects near the indoor unit that may block the airflow. Remove as needed.

Possible cause: Airflow of the indoor unit is blocked.

2 Clean the air filters of the indoor unit(s). See service manual of the respective indoor unit(s).

Possible cause: Faulty or clogged air filter.

3 Clean the indoor unit heat exchanger. See service manual of the specific indoor unit.

Possible cause: Dirty indoor unit heat exchanger.

4 Perform a check of the indoor unit heat exchanger thermistor. See service manual of the specific indoor unit.

Possible cause: Faulty indoor unit heat exchanger thermistor.

5 Perform a check of the indoor unit main PCB. See service manual of the specific indoor unit.

Possible cause: Faulty indoor unit main PCB.

6 Perform a check of the outdoor air thermistor. See "4.19 Thermistors" [▸ 211].

Possible cause: Faulty ambient air thermistor.

7 Perform a check of the expansion valve. See "4.8 Expansion valve" [▸ 121].

Possible cause: Faulty expansion valve.

8 Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

9 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Clogged refrigerant circuit.

10 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Refrigerant overcharge or shortage.

11 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▶ 257].

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.

3.6.10 AA-01 – Backup heater overheated

Trigger	Effect	Reset
Thermal protector is activated. Measured water temperature too high.	Unit will stop operating.	Power OFF the unit, perform manual reset of backup heater thermal protector and power unit back ON.

To solve the error code

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

1 Check the water pressure. See "5.3 Water circuit" [▶ 270].

Possible cause: Water pressure is too low.

2 Check the water flow. See "5.3 Water circuit" [▶ 270].

Possible cause: Water flow is too low.

3 Purge the water circuit. See "5.3 Water circuit" [▶ 270].

Possible cause: Air in the water circuit.

4 Perform a check of the backup heater thermal protector. See "4.3 Backup heater thermal protector" [▶ 88].

Possible cause: Faulty backup heater thermal protector.

5 Perform a check of the outlet water after backup heater thermistor. See "4.19 Thermistors" [▶ 211].

Possible cause: Faulty outlet water after backup heater thermistor.

6 Perform a check of the backup heater. See "4.2 Backup heater" [▶ 80].

Possible cause: Faulty backup heater.

7 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

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

3.6.11 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.

- FOR EKHWET UNITS:

1. Check the disinfection settings [2-00] to [2-04] and booster heater settings [4-03]. See "4.20 User interface" [▶ 226].

   Possible causes:
   - Incorrect disinfection setting(s),
   - Booster heater is restricted during disinfection.

- FOR CKHWS UNITS:

1. Check the disinfection settings [2-00] to [2-04]. See "4.20 User interface" [▶ 226].

   Possible causes:
   - Incorrect disinfection setting(s),

INFORMATION

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

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

Trigger	Effect	Reset
Domestic hot water heat-up time >24 hours.	Unit will switch to space heating/cooling for 3 hours.	Automatic reset after a domestic hot water heat-up time <24 hours.

CKHWS

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 "4.2 Backup heater" [▶ 80].

   Possible cause: Faulty backup heater.

2. Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▶ 253].

Possible cause:

- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

3 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

4 Check the installation for a leaking field installed domestic hot water tap. See "5.3 Water circuit" [▶ 270].

Possible cause: Leaking field installed domestic hot water tap.

5 Check the software and EEPROM version on the user interface and PCB. See "4.20 User interface" [▶ 226].

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

6 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.

EKHWET

To solve the error code

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

1 Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▶ 253].

Possible cause:

- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

2 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

3 Check the installation for a leaking field installed domestic hot water tap. See "5.3 Water circuit" [▶ 270].

Possible cause: Leaking field installed domestic hot water tap.

4 Check the settings of the booster heater [4‑03]. See "4.20 User interface" [▶ 226].

Possible cause: Backup heater NOT allowed.

5 Check the software and EEPROM version on the user interface and PCB. See "4.20 User interface" [▶ 226].

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

6 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.

3.6.13 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 "5.3 Water circuit" [▸ 270].

Possible cause: Water pressure is too low.

2 Check the water flow. See "5.3 Water circuit" [▸ 270].

Possible cause: Water flow is too low.

3 Purge the water circuit. See "5.3 Water circuit" [▸ 270].

Possible cause: Air in the water circuit.

4 Perform an electrical check of the water flow sensor. See "4.21 Water flow sensor" [▸ 239].

Possible cause: Faulty water flow sensor.

5 Check for the presence of an external source of vibration. See "5.4 External factors" [▸ 279].

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

6 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▸ 132].

Possible cause: Faulty hydro PCB.

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

3.6.14 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 "4.19 Thermistors" [▸ 211].

Possible cause: Faulty refrigerant liquid thermistor.

2 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▸ 132].

Possible cause: Faulty hydro PCB.

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

3.6.15 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 "4.11 Main PCB" [▸ 140].

Possible cause: Faulty main PCB.

2 Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▸ 253].

Possible cause:
- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

3 Perform a check of the outdoor unit fan motor. See "4.12 Outdoor unit fan motor" [▸ 160].

Possible cause: Faulty outdoor unit fan motor.

4 Perform a check of the compressor. See "4.6 Compressor" [▸ 103].

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.

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

Trigger	Effect	Reset
Discharge pressure too high.	Unit will stop operating.	Automatic reset when discharge pressure drops below reset value of pressure switch.

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 refrigerant circuit are open. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

2 Perform a check of the refrigerant pressure sensor. See "4.17 Refrigerant pressure sensor" [▶ 199].

Possible cause: Faulty refrigerant pressure sensor.

3 Perform a check of the high pressure switch. See "4.9 High pressure switch" [▶ 128].

Possible cause: Faulty high pressure switch.

4 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

5 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Refrigerant overcharge.

6 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▶ 257].

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

7 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Clogged refrigerant circuit.

8 Perform a check of the outdoor unit fan motor. See "4.12 Outdoor unit fan motor" [▸ 160].

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.

3.6.17 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 Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

2 Perform a check of the discharge pipe thermistor. See "4.19 Thermistors" [▸ 211].

Possible cause: Faulty discharge pipe thermistor or connector fault.

3 Perform a check of the outdoor unit fan motor. See "4.12 Outdoor unit fan motor" [▸ 160].

Possible cause: Faulty outdoor unit fan motor.

4 Perform a check of the compressor. See "4.6 Compressor" [▸ 103].

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

5 Perform a check of the expansion valve. See "4.8 Expansion valve" [▸ 121].

Possible cause: Faulty expansion valve.

6 For 5MWXM units ONLY: Perform a check of the PCB A2P. See "4.14 PCB A2P" [▸ 174].

Possible cause: Faulty PCB A2P.

7 Perform a check of the 4-way valve. See "4.1 4-way valve" [▸ 72].

Possible cause: Faulty 4-way valve.

8 Perform a check of the main PCB. See "4.11 Main PCB" [▸ 140].

Possible cause: Faulty main PCB.

9 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Refrigerant shortage.

10 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▸ 257].

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

11 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Clogged refrigerant circuit.

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

3.6.18 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 "4.19 Thermistors" [▶ 211].

Possible cause: Faulty discharge pipe thermistor or connector fault.

2 Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

3 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Clogged refrigerant circuit.

4 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Refrigerant overcharge or shortage.

5 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▶ 257].

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

6 Perform a check of the compressor. See "4.6 Compressor" [▶ 103].

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

7 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

8 Perform a check of the 4-way valve. See "4.1 4-way valve" [▶ 72].

Possible cause: Faulty 4-way valve.

9 Perform a check of the expansion valve. See "4.8 Expansion valve" [▶ 121].

Possible cause: Faulty expansion valve.

10 For 5MWXM units ONLY: Perform a check of the PCB A2P. See "4.14 PCB A2P" [▶ 174].

Possible cause: Faulty PCB A2P.

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

3.6.19 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 "4.12 Outdoor unit fan motor" [▶ 160].

Possible cause: Faulty outdoor unit fan motor.

2 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

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

3.6.20 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 "5.4 External factors" [▶ 279].

Possible cause: Outdoor temperature is out of operation range.

2 Perform a check of the compressor. See "4.6 Compressor" [▶ 103].

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

3 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

4 Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▶ 253].

Possible cause:
- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

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

3.6.21 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 "4.1 4-way valve" [▶ 72].

Possible cause: Faulty 4-way valve.

2 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

3 Perform a check of the room thermistor. See service manual of the specific indoor unit.

Possible cause: Faulty room thermistor.

4 Perform a check of the indoor unit main PCB. See service manual of the specific indoor unit.

Possible cause: Faulty indoor unit main PCB.

5 Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

6 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Clogged refrigerant circuit.

7 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Refrigerant overcharge or shortage.

8 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▶ 257].

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.

3.6.22 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 Perform a check of the domestic hot water tank thermistor. See "4.19 Thermistors" [▶ 211].

Possible cause: Faulty domestic hot water tank thermistor.

2 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

INFORMATION

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

3.6.23 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.

3.6.24 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 that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▸ 257].

   Possible cause: Closed stop valve in the refrigerant circuit.

2. Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▸ 257].

   Possible cause: Refrigerant overcharge or shortage.

3. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▸ 257].

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

4. Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▸ 257].

   Possible cause: Clogged refrigerant circuit.

5. Perform a check of the 4-way valve. See "4.1 4-way valve" [▸ 72].

   Possible cause: Faulty 4-way valve.

6. Perform a check of the expansion valve. See "4.8 Expansion valve" [▸ 121].

   Possible cause: Faulty expansion valve.

7. Perform a check of the main PCB. See "4.11 Main PCB" [▸ 140].

   Possible cause: Faulty main PCB.

8. For 5MWXM units ONLY: Perform a check of the PCB A2P. See "4.14 PCB A2P" [▸ 174].

   Possible cause: Faulty PCB A2P.

9. Perform a check of all refrigerant side thermistors. See "4.19 Thermistors" [▸ 211].

   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.

3.6.25 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 "6 Maintenance" [▶ 280].

Possible cause: Dirty outdoor heat exchanger.

2 Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

3 Perform a check of the heat exchanger thermistor. See "4.19 Thermistors" [▶ 211].

Possible cause: Faulty heat exchanger thermistor.

4 Perform a check of the expansion valve. See "4.8 Expansion valve" [▶ 121].

Possible cause: Faulty expansion valve.

5 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

6 For 5MWXM units ONLY: Perform a check of the PCB A2P. See "4.14 PCB A2P" [▶ 174].

Possible cause: Faulty PCB A2P.

7 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Refrigerant overcharge.

8 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▶ 257].

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

9 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Clogged refrigerant circuit.

10 Perform a check of the outdoor unit fan motor. See "4.12 Outdoor unit fan motor" [▶ 160].

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.

3.6.26 F8-00 – System shutdown due to compressor internal temperature abnormality

Trigger	Effect	Reset
Temperature discharge pipe thermistor exceeds the determined limit.	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 that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▶ 257].

   Possible cause: Closed stop valve in the refrigerant circuit.

2. Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▶ 257].

   Possible cause: Refrigerant overcharge.

3. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▶ 257].

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

4. Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▶ 257].

   Possible cause: Clogged refrigerant circuit.

5. Perform a check of the discharge pipe thermistor. See "4.19 Thermistors" [▶ 211].

   Possible cause: Faulty discharge pipe thermistor or connector fault.

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

3.6.27 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 "4.11 Main PCB" [▶ 140].

   Possible cause: Faulty main PCB.

2. Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▶ 253].

Possible cause:

- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

3 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.

4 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.

3.6.28 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 the high pressure switch. See "4.9 High pressure switch" [▶ 128].

Possible cause: Faulty high pressure switch.

2 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

3 Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▶ 253].

Possible cause:

- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

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

3.6.29 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 "4.6 Compressor" [▸ 103].

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

2. Perform a check of the main PCB. See "4.11 Main PCB" [▸ 140].

   Possible cause: Faulty main PCB.

3. Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▸ 257].

   Possible cause: Closed stop valve in the refrigerant circuit.

4. Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▸ 257].

   Possible cause: Clogged refrigerant circuit.

5. Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▸ 257].

   Possible cause: Refrigerant overcharge or shortage.

6. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▸ 257].

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

7. Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▸ 253].

   Possible cause:
   - Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
   - Power drop,
   - Short circuit.

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

3.6.30 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 "4.11 Main PCB" [▶ 140].

   Possible cause: Faulty main PCB.

2. Perform a check of the compressor. See "4.6 Compressor" [▶ 103].

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

3. Perform a check of the reactor. See "4.16 Reactor" [▶ 196].

   Possible cause: Faulty reactor.

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

3.6.31 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 "4.19 Thermistors" [▶ 211].

   Possible cause: Faulty ambient air thermistor.

2. Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

   Possible cause: Faulty main PCB.

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

3.6.32 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 "4.19 Thermistors" [▶ 211].

   Possible cause: Faulty domestic hot water tank thermistor.

2. Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

   Possible cause: Faulty hydro PCB.

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

3.6.33 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 "5.3 Water circuit" [▶ 270].

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

2. Check for leaks in the water circuit. See "5.3 Water circuit" [▶ 270].

   Possible cause: Leak in the water circuit.

3. Perform a check of the water pressure sensor. See "4.22 Water pressure sensor" [▶ 243].

   Possible cause: Faulty water pressure sensor.

4. Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

   Possible cause: Faulty hydro PCB.

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

3.6.34 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 "4.19 Thermistors" [▶ 211].

Possible cause: Faulty discharge pipe thermistor or connector fault.

2 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

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

3.6.35 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 "4.19 Thermistors" [▶ 211].

Possible cause: Faulty heat exchanger thermistor.

2 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

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

3.6.36 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 "4.19 Thermistors" [▸ 211].

Possible cause: Faulty refrigerant liquid thermistor.

- FOR 4MWXM UNITS:

1 Perform a check of the main PCB. See "4.11 Main PCB" [▸ 140].

Possible cause: Faulty main PCB.

- FOR 5MWXM UNITS:

1 Perform a check of the PCB A2P. See "4.14 PCB A2P" [▸ 174].

Possible cause: Faulty PCB A2P.

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

3.6.37 J9-00 – Malfunction of refrigerant gas thermistor

Trigger	Effect	Reset
Refrigerant gas 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 refrigerant gas thermistor. See "4.19 Thermistors" [▸ 211].

Possible cause: Faulty refrigerant gas thermistor or connector fault.

- FOR 4MWXM UNITS:

1 Perform a check of the main PCB. See "4.11 Main PCB" [▸ 140].

Possible cause: Faulty main PCB.

- FOR 5MWXM UNITS:

1 Perform a check of the PCB A2P. See "4.14 PCB A2P" [▸ 174].

Possible cause: Faulty PCB A2P.

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

3.6.38 JA-00 – Malfunction of high pressure sensor

Trigger	Effect	Reset
Refrigerant pressure sensor detects a value out of range (>4.5 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 "4.17 Refrigerant pressure sensor" [▸ 199].

   Possible cause: Faulty refrigerant pressure sensor.

2. Perform a check of the main PCB. See "4.11 Main PCB" [▸ 140].

   Possible cause: Faulty main PCB.

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

3.6.39 L1-00 – Outdoor unit: Main PCB abnormality

Trigger	Effect	Reset
Outdoor unit main PCB detects current/voltage errors.	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 "4.11 Main PCB" [▸ 140].

   Possible cause: Faulty main PCB.

2. Perform a check of the compressor. See "4.6 Compressor" [▸ 103].

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

3. Perform a check of the outdoor unit fan motor. See "4.12 Outdoor unit fan motor" [▸ 160].

   Possible cause: Faulty outdoor unit fan motor.

4. Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▸ 253].

   Possible cause:
   - Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
   - Power drop,
   - Short circuit.

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

3.6.40 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 main PCB. See "4.11 Main PCB" [▶ 140].

   Possible cause: Faulty main PCB.

2. Perform a check of the outdoor unit fan motor. See "4.12 Outdoor unit fan motor" [▶ 160].

   Possible cause: Faulty outdoor unit fan motor.

3. Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▶ 253].

   Possible cause:
   - Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
   - Power drop,
   - Short circuit.

4. Clean the outdoor heat exchanger. See "6 Maintenance" [▶ 280].

   Possible cause: Dirty outdoor heat exchanger.

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

3.6.41 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 "4.12 Outdoor unit fan motor" [▶ 160].

   Possible cause: Faulty outdoor unit fan motor.

2 Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▸ 253].

Possible cause:
- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

3 Perform a check of the main PCB. See "4.11 Main PCB" [▸ 140].

Possible cause: Faulty main PCB.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

4 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.

5 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.

3.6.42 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 that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

2 Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Clogged refrigerant circuit.

3 Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▸ 257].

Possible cause: Refrigerant overcharge or shortage.

4 Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▸ 257].

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

5 Perform a check of the main PCB. See "4.11 Main PCB" [▸ 140].

Possible cause: Faulty main PCB.

6 Perform a check of the compressor. See "4.6 Compressor" [▸ 103].

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

7 Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▸ 253].

Possible cause:

- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

8 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.

9 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.

3.6.43 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 main PCB. See "4.11 Main PCB" [▸ 140].

Possible cause: Faulty main PCB.

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

3.6.44 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 "4.19 Thermistors" [▸ 211].

   Possible cause: Faulty refrigerant side thermistor(s).

2. Perform a check of the refrigerant pressure sensor. See "4.17 Refrigerant pressure sensor" [▸ 199].

   Possible cause: Faulty refrigerant pressure sensor.

3. Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▸ 257].

   Possible cause: Closed stop valve in the refrigerant circuit.

4. Check if the refrigerant circuit is clogged. See "5.2 Refrigerant circuit" [▸ 257].

   Possible cause: Clogged refrigerant circuit.

5. Check if the refrigerant circuit is correctly charged. See "5.2 Refrigerant circuit" [▸ 257].

   Possible cause: Refrigerant shortage.

6. Check for the presence of non-condensables and/or humidity in the refrigerant circuit. See "5.2 Refrigerant circuit" [▸ 257].

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

7. Perform a check of the compressor. See "4.6 Compressor" [▸ 103].

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

8. Perform a check of the expansion valve. See "4.8 Expansion valve" [▸ 121].

   Possible cause: Faulty expansion valve.

9. 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 "5.2 Refrigerant circuit" [▸ 257].

   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.

3.6.45 U2-00 – Outdoor unit: Defect of power supply voltage

Trigger	Effect	Reset
There is no zero-cross detected in approximately 10 seconds (indoor unit PCB).	Unit will stop operating.	Power reset.
Abnormal voltage drop is detected by the DC voltage detection circuit.	Unit will stop operating.	Automatic restart after compressor stand-by of 3 minutes.
Abnormal voltage rise is detected by the overvoltage detection circuit.	Unit will stop operating.	Automatic restart after compressor stand-by of 3 minutes.

To solve the error code

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

1. Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▸ 253].

   Possible cause:
   - Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
   - Power drop,
   - Short circuit.

2. Perform a check of the compressor. See "4.6 Compressor" [▸ 103].

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

3. Perform a check of the outdoor unit fan motor. See "4.12 Outdoor unit fan motor" [▸ 160].

   Possible cause: Faulty outdoor unit fan motor.

4. Perform a check of the main PCB. See "4.11 Main PCB" [▸ 140].

   Possible cause: Faulty main PCB.

5. Wait until the compressor restarts.

   Possible cause:
   - Momentary drop of voltage,
   - Momentary power failure.

- FOR AIR CONDITIONING INDOOR UNITS

1. Perform a check of the indoor unit main PCB. See service manual of the specific indoor unit.

   Possible cause: Faulty indoor unit main PCB.

2 Perform a check of the indoor unit power PCB. See service manual of the specific indoor unit.

Possible cause: Faulty indoor unit power PCB.

- FOR DOMESTIC HOT WATER TANK

1 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

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

3.6.46 U3-00 – Check operation not executed or transmission error

Trigger	Effect	Reset
Failed wiring error check operation. See installation manual for more information about the wiring error check operation.	Unit will NOT start operating.	Shortly push SW3 (wiring error check switch).
Wiring issue between indoor unit and outdoor unit.		

To solve the error code

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

1 Check the voltage at the primary side of the safety breaker.

Possible cause: Incorrect voltage at primary side of safety breaker.

2 Check that the outdoor temperature is >5°C. The wiring error check function does NOT work if outside temperature is ≤5°C.

Possible cause: Outdoor temperature ≤5°C.

3 Check that all stop valves of the refrigerant circuit are open. See "5.2 Refrigerant circuit" [▶ 257].

Possible cause: Closed stop valve in the refrigerant circuit.

4 Check that the piping and wiring connections of the system are correctly installed. See "7.3 Piping diagram" [▶ 302] and "7.2 Wiring diagram" [▶ 287].

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.

3.6.47 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 compliant with the regulations. See "5.1 Electrical circuit" [▶ 253].

Possible cause:

- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

2 Perform a check of the power supply, connections, wiring,... between the outdoor unit, indoor unit and (separate) domestic hot water tank (if applicable). See "5.1 Electrical circuit" [▶ 253].

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

3 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

4 Perform a check of the outdoor unit fan motor. See "4.12 Outdoor unit fan motor" [▶ 160].

Possible cause: Faulty outdoor unit fan motor.

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).

- FOR AIR CONDITIONING INDOOR UNITS

1 Perform a check of the indoor unit main PCB. See service manual of the specific indoor unit.

Possible cause: Faulty indoor unit main PCB.

2 Perform a check of the indoor unit power PCB. See service manual of the specific indoor unit.

Possible cause: Faulty indoor unit power PCB.

3 Check if "standby electricity saving mode" is ON while an indoor unit that is NOT compatible with this mode is connected in the system. Turn "standby electricity saving mode" OFF as needed. See installation manual.

Possible cause: "Standby electricity saving mode" is ON, while an indoor unit that is NOT compatible with this mode is connected. Compatible indoor units: FTXM, FTXJ, FVXM, FTXA, CTXA, CTXM, CVXM, EKHWET, FTXP and CKHWS.

- FOR DOMESTIC HOT WATER TANK

1 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

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

3.6.48 U5-00 – Communication abnormality between indoor unit main PCB and remote controller

Trigger	Effect	Reset
Transmission abnormality between indoor unit main PCB and remote controller.	Unit will stop operating.	Auto reset.

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 remote controller. See Business Portal for more information.

Possible cause: Improper combination of indoor unit and remote controller.

2 Perform a check of the remote controller. See documentation of the specific remote controller for more information.

Possible cause: Faulty remote controller.

3 Perform a check of the indoor unit main PCB. See service manual of the airconditioning indoor unit.

Possible cause: Faulty indoor unit main PCB.

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

3.6.49 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 "4.11 Main PCB" [▸ 140].

Possible cause: Faulty main PCB.

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

3.6.50 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.

3.6.51 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.

3.6.52 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 "4.20 User interface" [▶ 226].

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 "4.20 User interface" [▶ 226].

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

3 Check if the unit user interface functions correctly. See "4.20 User interface" [▶ 226].

Possible cause: Faulty user interface on unit.

4 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

5 Check if the power supply is compliant with the regulations. See "5.1 Electrical circuit" [▶ 253].

Possible cause:

- Faulty or disturbance of the power supply (power supply MUST be within range of nominal operating voltage ±4%),
- Power drop,
- Short circuit.

INFORMATION

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

3.6.53 U8-09 – User interface software version / indoor unit compatibility error

Trigger	Effect	Reset
User interface software version NOT compatible with software of the hydro PCB (indoor unit).	Error screen will block main user interface application. Info button is active for more information on the malfunction.	Update software of the user interface. NO manual reset possible.

To solve the error code

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

1 Check the software and EEPROM version on the user interface and PCB. See "4.20 User interface" [▶ 226].

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

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

3.6.54 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 ONECTA 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.

3.6.55 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 (separate) domestic hot water tank (if applicable). See "5.1 Electrical circuit" [▶ 253].

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

3 Perform a check of the main PCB. See "4.11 Main PCB" [▶ 140].

Possible cause: Faulty main PCB.

- FOR AIR CONDITIONING INDOOR UNITS

1 Perform a check of the indoor unit main PCB. See service manual of the specific indoor unit.

Possible cause: Faulty indoor unit main PCB.

2 Perform a check of the indoor unit power PCB. See service manual of the specific indoor unit.

Possible cause: Faulty indoor unit power PCB.

3 Check if "standby electricity saving mode" is ON while an indoor unit that is NOT compatible with this mode is connected in the system. Turn "standby electricity saving mode" OFF as needed. See installation manual.

Possible cause: "Standby electricity saving mode" is ON, while an indoor unit that is NOT compatible with this mode is connected. Compatible indoor units: FTXM, FTXJ, FVXM, FTXA, CTXA, CTXM, CVXM, EKHWET, FTXP and CKHWS.

- FOR DOMESTIC HOT WATER TANK

1 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▶ 132].

Possible cause: Faulty hydro PCB.

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

3.6.56 UH-00 – Malfunction of system

Trigger	Effect	Reset
In case of connection with multi indoor units, when error UA, U0 or A5 occurs in other indoor unit.	Unit will stop operating.	Auto reset.

To solve the error code

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

1 Check all other indoor units for the following error codes. If found, see "3.6 Error based troubleshooting" [▸ 19] to solve the specific error.

- A5-00 – Outdoor unit: High pressure peak cut / freeze protection problem
- U0-00 – Outdoor unit: Shortage of refrigerant
- UA-00 – Indoor unit, outdoor unit mismatching problem

Possible cause: Error on other indoor unit.

- FOR AIR CONDITIONING INDOOR UNITS

1 Perform a check of the indoor unit main PCB. See service manual of the specific indoor unit.

Possible cause: Faulty indoor unit main PCB.

- FOR DOMESTIC HOT WATER TANK

1 Perform a check of the hydro PCB. See "4.10 Hydro PCB" [▸ 132].

Possible cause: Faulty hydro PCB.

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

3.7 Symptom based troubleshooting

3.7.1 Operation does not start

Check	Detail
When the operation lamp is off, there is a power failure. Check the power supply.	▪ Is the power supply breaker ON? ▪ Do other electrical appliances work? ▪ Is the rated voltage (± 10%) supplied? ▪ Check the insulation of the electric system.
Check the type of the indoor unit.	Is the indoor unit type compatible with the outdoor unit?
Check the transmission between indoor and outdoor.	▪ Connection wires.
Check the outdoor temperature.	▪ Heating operation cannot be used when the outdoor temperature is 18°C WB or higher. ▪ Cooling operation cannot be used when the outdoor temperature is below −10°C DB.
When the operation lamp blinks, there may be an error code, activating the protection device. Diagnose with remote controller indication.	See "3.6 Error based troubleshooting" [▸ 19].
Check the remote controller addresses.	Are the address settings for the remote controller and indoor unit correct?
Check the operation circuit.	▪ Is the thermal fuse blown? ▪ Are wire size and wire connections OK?
Check fan motor.	▪ Is the magnetic switch defective? ▪ Is the overcurrent relay defective?
Check compressor.	▪ Is the contact defective? ▪ Is the protection thermostat defective? ▪ Is the compressor itself defective?
Check remote controller.	▪ Are the batteries LOW? ▪ Are there incorrect settings?
If the tank does NOT start, check the malfunction or errors on user interface.	See "3.6 Error based troubleshooting" [▸ 19].

3.7.2 Domestic hot water temperature is not hot enough

Check	Detail
Check if the set temperature of the domestic hot water tank is appropriate.	▪ Thermostat OFF can be activated due to low temperature setting. ▪ Be aware of the schedule and weather dependent setting.
Check if the power wire of booster heater (EKHWET unit) OR backup heater (CKHWS unit) is connected.	There should be a separate power supply to the booster OR backup heater. Is the rated voltage supplied?
Check the booster heater (EKHWET unit) OR backup heater (CKHWS unit).	▪ Perform Actuator test run to check the functionality of booster OR backup heater. ▪ See "4.4 Booster heater" [▸ 93] OR "4.2 Backup heater" [▸ 80] for the checking and repair procedures.
Is there a shortage of refrigerant?	Conduct refrigerant collection and vacuum drying, and then add proper amount refrigerant.
▪ EKHWET unit: Is the domestic hot water tank heat exchanger clogged? ▪ CKHWS unit: Is the plate heat exchanger clogged?	Visual inspection of liquid and gas pipe coming of the domestic hot water tank.
Is there clogging before or after the expansion valve (capillary)?	▪ Check if there is a temperature difference before and after expansion valve (capillary). ▪ Check if the main valve unit of expansion valve operates (by noise, vibration).
Is the domestic hot water tank installed?	

3.7.3 Operation sometimes stops

Check	Detail
When the operation lamp is off, there is a power failure. Check the power supply.	▪ A power failure of 2 to 10 cycles stops air conditioner operation.
Check the outdoor temperature.	▪ Heating operation cannot be used when the outdoor temperature is 18°C WB or higher. ▪ Cooling operation cannot be used when the outdoor temperature is below −10°C DB.
When the operation lamp blinks, there may be an error code, activating the protection device. Diagnose with remote controller indication.	See "3.6 Error based troubleshooting" [▸ 19].

Check	Detail
If the tank does not start, check the malfunction or errors on the user interface.	See "3.6 Error based troubleshooting" [▶ 19].

3.7.4 Some air conditioning indoor units do not operate

Check	Detail
Check the type of the indoor units.	Is the indoor unit type compatible with the outdoor unit?
Check if the operation modes of the indoor units have conflict.	▪ Heating mode CANNOT be together with FAN* or Dry or Cooling mode in air conditioning indoor units. And vice versa. ▪ Other combinations of modes CAN be together in air conditioning indoor units. (e.g. Cooling and FAN, Cooling and Dry).
Check if there is a demand of domestic hot water on the tank.	▪ Cooling mode of air conditioning indoor units CANNOT be together with providing domestic hot water. ▪ You can change the priority setting to air conditioning indoor units via the user interface. Outdoor would work with air conditioning indoor units and booster heater would provide domestic hot water instead.

3.7.5 Operation starts but domestic hot water provided by the tank is not hot enough

Check	Detail
Check if there are any malfunctions or errors on user interface.	See "3.6 Error based troubleshooting" [▶ 19].
Check if the power wire of booster heater (EKHWET unit) OR backup heater (CKHWS unit) is connected.	There should be a separate power supply to the booster OR backup heater. Is the rated voltage supplied?
Check the booster heater (EKHWET unit) OR backup heater (CKHWS unit).	▪ Perform Actuator test run to check the functionality of booster OR backup heater. ▪ See "4.4 Booster heater" [▶ 93] OR "4.2 Backup heater" [▶ 80] for the checking and repair procedures.

Check	Detail
Check for piping and wiring errors in the connection between the indoor units and outdoor unit.	▪ Refrigerant piping is too long; is the length within specified range? ▪ Field piping is defective; is there a refrigerant leakage? ▪ Is there capacity loss over the condensor, saturation pressure or sound because of air mixed in to the circuit? ▪ Incorrect size of connection wiring. ▪ Is there a cross wiring? (e.g. Indoor unit A piping is with indoor unit C wiring).
Diagnose by service port pressure and operating current.	Check for refrigerant shortage.
Check if the set temperature of the domestic hot water tank is appropriate.	▪ Thermostat OFF can be activated due to low temperature setting. ▪ Be aware of the schedule and weather dependent setting.

3.7.6 Operation starts but the air conditioning indoor unit does not cool/heat

Check	Detail
Check the electrical power supply.	Is the rated voltage (± 10%) supplied?
Check for piping and wiring errors in the connection between the indoor units and outdoor unit.	▪ Refrigerant piping is too long; is the length within specified range? ▪ Field piping is defective; is there a refrigerant leakage? ▪ Is there capacity loss over the condensor, saturation pressure or sound because of air mixed in to the circuit? ▪ Incorrect size of connection wiring. ▪ Is there a cross wiring? (e.g. Indoor unit A piping is with indoor unit C wiring).
When the operation lamp blinks, there may be a thermistor detection error code, activating the protection device.	▪ Check the resistance of all thermistors. ▪ Check the connection of all thermistors. ▪ Is there a malfunction in the room temperature thermistor or outdoor temperature thermistor?
Check for faulty operation of the electronic expansion valve.	Set the unit to cooling operation, and check the temperature of the liquid pipe to see if the electronic expansion valve works.
Diagnose by service port pressure and operating current.	Check for refrigerant shortage.

Check	Detail
Check if the set temperature is appropriate.	thermostat "off" can be activated, set the appropriate temperature.
Check the type of the indoor and outdoor units.	Is the indoor unit type compatible with the outdoor unit?
Check the air filter.	Is the air filter clean?
Check the installation conditions (specified in the installation manual).	▪ Does the installed model has sufficient capacity? ▪ Is there a short circuit air flow caused by insufficient installation space?
Check the outdoor temperature.	▪ Heating operation cannot be used when the outdoor temperature is 18°C WB or higher. ▪ Cooling operation cannot be used when the outdoor temperature is below −10°C DB.

3.7.7 Operating noise and vibrations

Check	Detail
Check the installation conditions (specified in the installation manual).	▪ Use general vibration prevention where needed. ▪ If the mounting wall is too thin, you must use cushion material or rubber, or change the installation place. ▪ Refrigerant piping is too short; is the length within specified range? ▪ Due to bad installation or general conditions there may be deformation of the unit. ▪ Are all the screws installed and tightened properly? ▪ Is all piping secured, fixed and supported by inserting a cushion material where needed? ▪ Install piping weights or correct by hand if any piping is in contact with other parts. ▪ Is the fan in contact with other parts? If so separate the fan from the other parts.
Check refrigerant charge.	▪ Is the unit filled with the specified refrigerant volume? ▪ Is there a flushing noise, due to refrigerant shortage? ▪ Is there air in the system?

Check	Detail
Check the expansion valve.	If a passing sound is heard from the pressure reducing valve, apply sound insulation sheets of putty to reduce the valve noise.

3.7.8 Abnormal high pressure

In cooling mode

Check item	Detail
Does the outdoor unit fan run normally?	Visual inspection
Is the outdoor unit heat exchanger clogged?	Visual inspection
Is there clogging before or after the expansion valve (capillary)?	▪ Check if there is a temperature difference before and after expansion valve (capillary). ▪ Check if the main valve unit of expansion valve operates (by noise, vibration).
Is the High Pressure Switch normal?	Check continuity by using a tester.
Is the outdoor unit installed under such conditions that short circuit easily occurs?	Visual inspection
Is the piping length ≤5 m?	Visual inspection
Does air enter the refrigerant system?	Conduct refrigerant collection and vacuum drying, and then add proper amount refrigerant.
Is the refrigerant overcharged?	Conduct refrigerant collection and vacuum drying, and then add proper amount refrigerant.

In heating mode

Check item	Detail
Does the indoor unit fan run normally?	Visual inspection
Is the indoor unit heat exchanger clogged?	Visual inspection
Is the indoor unit installed under such conditions that short circuit easily occurs?	Visual inspection
Is there clogging before or after the expansion valve (capillary)?	▪ Check if there is a temperature difference before and after expansion valve (capillary). ▪ Check if the main valve unit of expansion valve operates (by noise, vibration).
Is the High Pressure Switch normal?	Check continuity by using a tester.

Check item	Detail
Is the minimum piping length respected?	Visual inspection
Does air enter the refrigerant system?	Conduct refrigerant collection and vacuum drying, and then add proper amount refrigerant.
Is the refrigerant overcharged?	Conduct refrigerant collection and vacuum drying, and then add proper amount refrigerant.

In domestic hot water mode

Check item	Detail
Is the water volume in the domestic hot water tank normal?	Check "To fill the domestic hot water tank" in the installer reference guide.
▪ EKHWET unit: Is the domestic hot water tank heat exchanger clogged? ▪ CKHWS unit: Is the plate heat exchanger clogged?	Visual inspection of liquid and gas pipe coming of the domestic hot water tank.
Is the indoor unit installed under such conditions that short circuit easily occurs?	Visual inspection
Is there clogging before or after the expansion valve (capillary)?	▪ Check if there is a temperature difference before and after expansion valve (capillary). ▪ Check if the main valve unit of expansion valve operates (by noise, vibration).
Is the High Pressure Switch normal?	Check continuity by using a tester.
Is the minimum piping length respected?	Visual inspection
Does air enter the refrigerant system?	Conduct refrigerant collection and vacuum drying, and then add proper amount refrigerant.
Is the refrigerant overcharged?	Conduct refrigerant collection and vacuum drying, and then add proper amount refrigerant.

3.7.9 Abnormal low pressure

Abnormally low pressure level is mostly caused by the evaporator side. The following contents are provided based on field checking of service engineer. Further, the number is listed in the order of degree of influence.

In cooling mode

Check item	Detail
Does the indoor unit fan run normally?	Visual inspection
Is the indoor unit heat exchanger clogged?	Visual inspection

Check item	Detail
Is the indoor unit installed under such conditions that short circuit easily occurs?	Visual inspection
Is there clogging before or after the expansion valve (capillary)?	▪ Check if there is a temperature difference before and after expansion valve (capillary). ▪ Check if the main valve unit of expansion valve operates (by noise, vibration).
Is the check valve (if applicable) clogged?	Check if there is a temperature difference before and after check valve. If YES, the check valve is clogged.
Is there a shortage of refrigerant?	Conduct refrigerant collection and vacuum drying, and then add proper amount refrigerant.

In heating mode or domestic hot water mode

Check item	Detail
Does the outdoor unit fan run normally?	Visual inspection
Is the outdoor unit heat exchanger clogged?	Visual inspection
Is there clogging before or after the expansion valve (capillary)?	▪ Check if there is a temperature difference before and after expansion valve (capillary). ▪ Check if the main valve unit of expansion valve operates (by noise, vibration).
Is the check valve (if applicable) clogged?	Check if there is a temperature difference before and after check valve. If YES, the check valve is clogged.
Is the outdoor unit installed under such conditions that short circuit easily occurs?	Visual inspection
Is there a shortage of refrigerant?	Conduct refrigerant collection and vacuum drying, and then add proper amount refrigerant.

3.7.10 Indoor fan starts operating but the compressor does not operate

Check	Detail
Check the power supply.	▪ Is the rated voltage (± 10%) supplied? ▪ Check the insulation of the electric system.
Check the thermistor.	▪ Connection with PCB. ▪ Output.

Check	Detail
Check PCB's HAP LED's (if applicable).	▪ if green led on the control PCB is not blinking, then the microprocessor is not working. ▪ if the green led on the main PCB is not blinking, then the microprocessor is not working. ▪ if first green LED on the service monitor PCB is not blinking, then the microprocessor is not working.
Check the magnetic switch.	
Check the power transistor.	
Check the compressor.	▪ Defective contact. ▪ Defective compressor. ▪ Defective protection thermostat.
Check the outdoor temperature.	▪ Heating operation cannot be used when the outdoor temperature is 18°C WB or higher. ▪ Cooling operation cannot be used when the outdoor temperature is below −10°C DB.

3.7.11 Operation starts and the unit stops immediately

Check	Detail
Check the power supply.	▪ Is the capacity of the safety breaker as specified? ▪ If the earth leakage breaker is too sensitive, then increase the set value of the earth leakage current of the breaker or replace the breaker. ▪ Is the circuit exclusive? ▪ Is the rated voltage (± 10%) supplied? ▪ Is there an incorrect size of connection wiring?
Check the refrigerant charge.	▪ Overcharge. ▪ Air in the system. ▪ Water in the system.
If air conditioning indoor unit stops, check the fan motor.	▪ Check the magnetic switch. ▪ Check the overcurrent relay.
Check the four way valve coil.	▪ Is there a short circuit? ▪ Is the four way valve coil broken?
Check the outdoor PCB.	▪ Is there a short circuit? ▪ Is the outdoor PCB broken?
Check the heat exchanger.	Soiled heat exchanger, obstruction.
If air conditioning indoor unit stops, check the airflow.	Soiled air filter, obstruction, installation space.

3.7.12 Operation stops, unit cannot start for a while

Check	Detail
Check if standby function is activated.	▪ Compressor delay timer is counting. ▪ Wait for minimum 3 minutes.
Check the power supply.	▪ Low voltage? ▪ Is the size of the power cable sufficient?
Check the refrigerant charge.	▪ Incorrect charge. ▪ Air in the system. ▪ Water in the system. ▪ Obstruction in the system.
Check compressor.	▪ Overcurrent relay. ▪ Protection thermostat.

3.7.13 Indoor unit discharges white mist

Check	Detail
Check installation conditions.	▪ Humid site. ▪ Dirty site. ▪ Oil mist.
Check installation conditions.	Dirty heat exchanger.
Air filter.	Dirty air filter.
Fan motor.	Defective fan motor.

3.7.14 Humidifying problem

Check	Detail
Check the installation conditions.	▪ Insufficient heat insulation of duct. ▪ Ceiling too high for the floor size. ▪ Short circuit air flow caused by insufficient installation space.
Check the installation.	▪ Is the proper humidification hose, specified by Daikin, used? ▪ Breakage or blockage of the humidification hose. ▪ Is the length of the humidification hose correct (within specified length)? ▪ Is setting correct for the humidification hose length?
Check the outdoor temperature and humidity.	In case of extremely low outdoor temperature or extremely low humidity, the air outlet must be set at the height of 1,8m.
Check the temperature setting.	Is the set temperature too high?
Check the ventilation timing.	Is the room ventilated too often?
Check the air filter.	Is the air filter clogged?

3.7.15 Swing flap does not operate

Symptom	Check	Detail
Swing flap does not operate	Check swing flap motor	Some functions can force the swing flap into a fixed position, although swing mode is selected on the remote controller. This is not a unit error, but a control function to prevent draft to the customer.
	Check indoor unit PCB	Connector connection

4 Components

> **CAUTION**
> When replacing a component ALWAYS make sure the correct spare part for your unit is installed.

4.1 4-way valve

4.1.1 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.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▸ 180].

1 If applicable, remove the insulation from the 4-way valve.

> **DANGER: RISK OF BURNING/SCALDING**
> The coil gets hot while energized. Wait for it to cool down.

2 Verify that the coil 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 "4.1.1 Checking procedures" [▸ 72].
No	Fix or replace the 4-way valve coil, see "4.1.2 Repair procedures" [▸ 75].

To perform an electrical check of the 4-way valve

1 First perform a mechanical check of the 4-way valve, see "4.1.1 Checking procedures" [▸ 72].

> **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 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:

Unit	Resistance
4MWXM	560 Ω ± 5%

Unit	Resistance
5MWXM	585 Ω ± 5%

Is the measured value correct?	Action
Yes	Continue with the next step.
No	Replace the 4-way valve coil, see "4.1.2 Repair procedures" [▶ 75].

4 Connect the 4-way valve connector to the appropriate PCB.

5 Turn ON the power using the respective circuit breaker.

6 Activate `Heating` or `Domestic hot water` operation via the user interface.

> **INFORMATION**
>
> When `Heating` operation is NOT possible due to too high outdoor temperature (see the databook on Business Portal for the temperature range of the operation modes), forced `Heating` operation CAN be activated via SW1 and the Cool/Heat selector on the service PCB.

7 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:

Unit	Voltage
4MWXM	12 V DC[a]
5MWXM	24 V DC

[a] Actual energize voltage is ±310 V DC.12 V DC is used to keep the coil energized.

8 De-activate `Heating` or `Domestic hot water` and activate `Cooling` operation via the user interface.

> **INFORMATION**
>
> When `Cooling` operation is NOT possible due to too low outdoor temperature (see the databook on Business Portal for the temperature range of the operation modes), forced `Cooling` operation CAN be activated via SW1 and the Cool/Heat selector on the service PCB.

9 Measure the voltage on the 4-way valve connection on the PCB.

Result: The measured voltage MUST be:

Unit	Voltage
4MWXM	0 V DC
5MWXM	<10 V DC

Are the measured voltages correct?	Action
Yes	Perform a position check of the 4-way valve, see "4.1.1 Checking procedures" [▶ 72].
No	Perform a check the main PCB, see "4.11 Main PCB" [▶ 140].

To perform a position check of the 4-way valve

1 First perform an electrical check of the 4-way valve, see "4.1.1 Checking procedures" [▶ 72].

2 Activate `Heating` or `Domestic hot water` operation via the user interface.

> **INFORMATION**
>
> When `Heating` operation is NOT possible due to too high outdoor temperature (see the databook on Business Portal for the temperature range of the operation modes), forced `Heating` operation CAN be activated via SW1 and the Cool/Heat selector on the service PCB.

> **INFORMATION**
>
> It is recommended to connect the service monitoring tool to the unit and verify the operation mode of the 4-way valve.

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. (See "7.3 Piping diagram" [▶ 302]).

> **INFORMATION**
>
> The flow through the 4-way valve is correct if the water temperature after the heat exchanger rises/drops when operating in `Heating` or `Domestic hot water`/`Cooling` mode.

Is the flow correct?	Action
Yes	Skip the next step of this 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 "4.1.2 Repair procedures" [▶ 75].
No	Leaks may be found in the refrigerant circuit. Perform a pressure test of the refrigerant circuit, see "5.2.1 Checking procedures" [▶ 257].

5 De-activate `Heating` or `Domestic hot water` and activate `Cooling` operation via the user interface.

> **INFORMATION**
>
> When `Cooling` operation is NOT possible due to too low outdoor temperature (see the databook on Business Portal for the temperature range of the operation modes), forced `Cooling` operation CAN be activated via SW1 and the Cool/Heat selector on the service PCB.

6 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 "7.3 Piping diagram" [▶ 302]).

> **INFORMATION**
>
> The flow through the 4-way valve is correct if the water temperature after the heat exchanger rises/drops when operating in `Heating` or `Domestic hot water`/`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 "4.1.2 Repair procedures" [▸ 75].

4.1.2 Repair procedures

To remove the 4-way valve coil

Prerequisite: Stop the unit operation via the user interface.

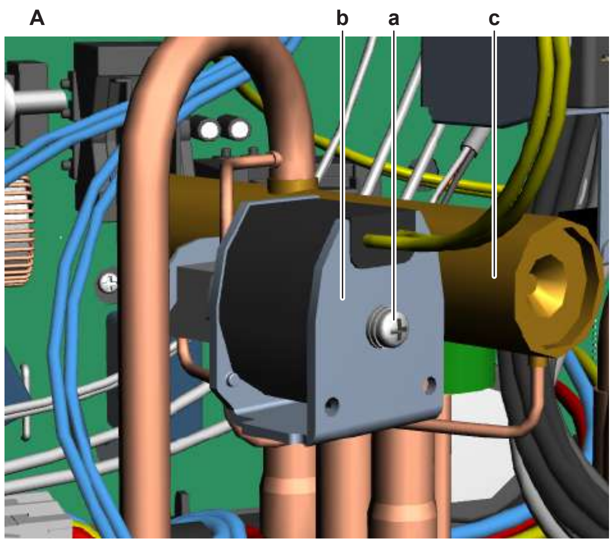
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▸ 180].

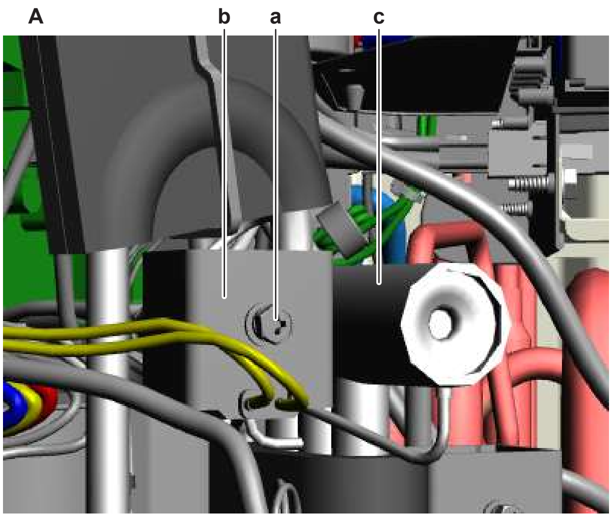
Prerequisite: If needed, remove any parts to create more space for the removal of the 4-way valve coil.

Prerequisite: If applicable, remove the insulation from the 4-way valve.

1 Remove the screw and remove the 4-way valve coil from the 4-way valve body.



A 4MWXM units
a Screw
b 4-way valve coil
c 4-way valve body



A 5MWXM units
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 "4.1.2 Repair procedures" [▶ 75].

To remove the 4-way valve body

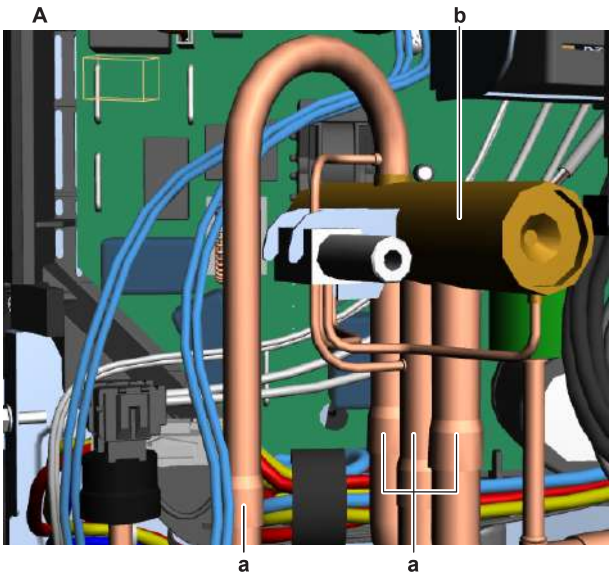
Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

1 Remove the 4-way valve coil from the 4-way valve body, see "4.1.2 Repair procedures" [▶ 75].

2 Remove and keep the putty (if installed) and the insulation (if installed) for re-use.

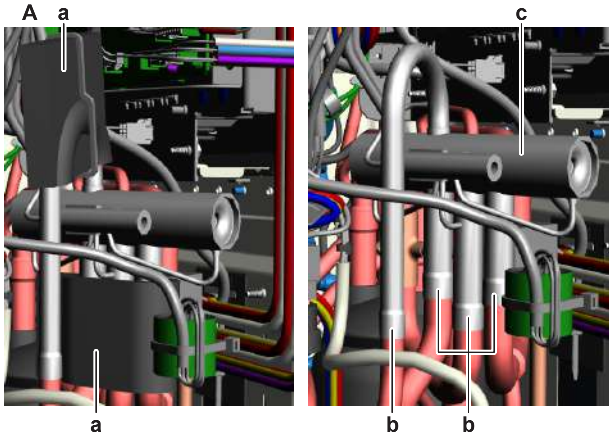
3 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa (2.9 PSI).

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 4MWXM units
a 4-way valve pipe

b 4-way valve



A 5MWXM units
a Putty
b 4-way valve pipe
c 4-way valve

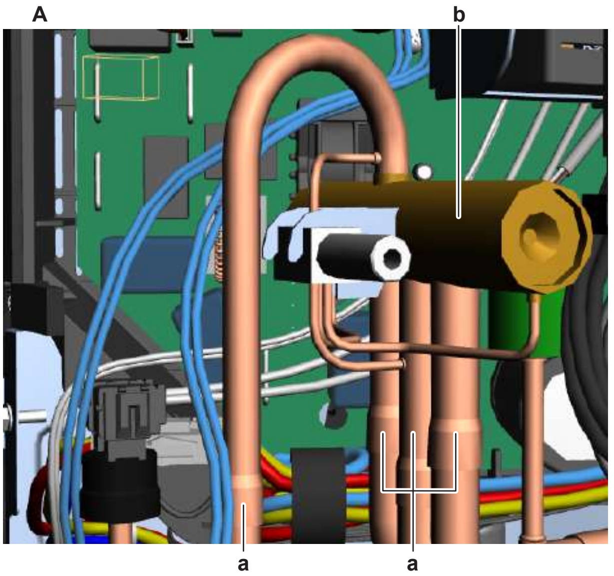
5. Stop the nitrogen supply when the piping has cooled down.
6. Remove the 4-way valve.

> **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.

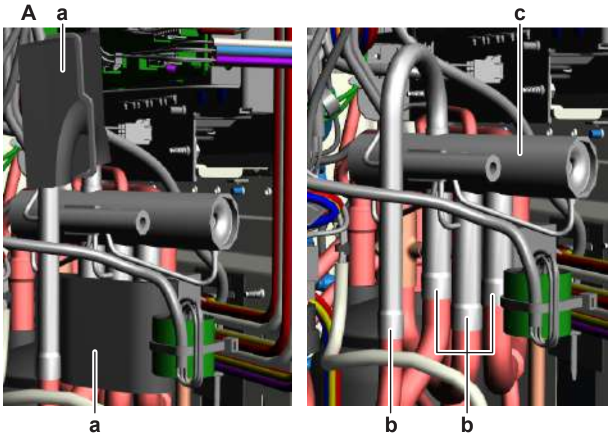
7. Install plugs or caps on the open pipe ends of the refrigerant piping to avoid dirt or impurities from entering the piping.
8. To install the 4-way valve body, see "4.1.2 Repair procedures" [▶ 75].

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 (2.9 PSI).
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 4MWXM units
a 4-way valve pipe
b 4-way valve



A 5MWXM units
a Putty
b 4-way valve pipe
c 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.

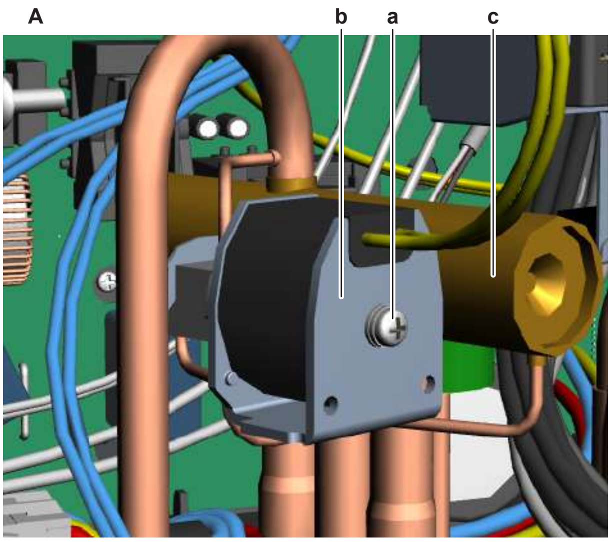
8 Install the 4-way valve coil on the 4-way valve body, see "4.1.2 Repair procedures" [▶ 75].

9 Perform a pressure test, see "5.2.1 Checking procedures" [▶ 257].

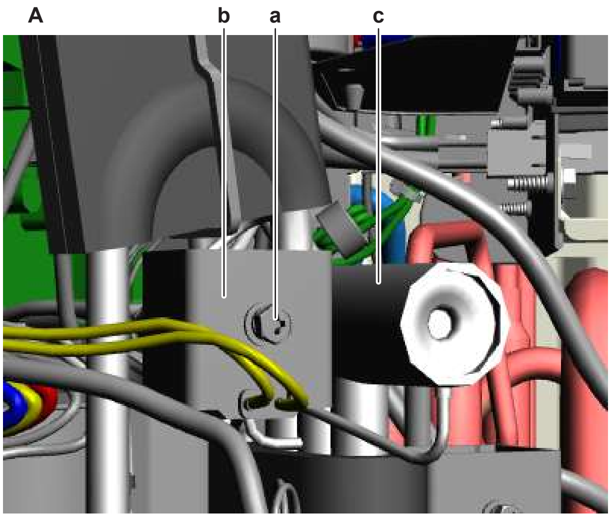
10 Add refrigerant to the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

To install the 4-way valve coil

1 Install the 4-way valve coil on the 4-way valve body.



A 4MWXM units
a Screw
b 4-way valve coil
c 4-way valve body



A 5MWXM units
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.
6. If applicable, install the insulation on the 4-way valve.

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.

4.2 Backup heater

4.2.1 Checking procedures

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

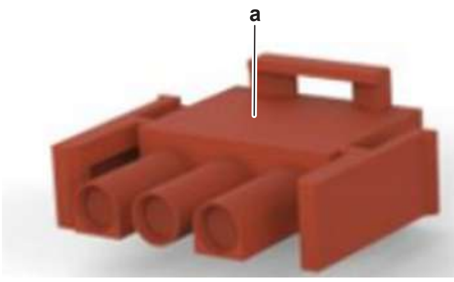
To perform a resistance check of the backup heater

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "4.15 Plate work" [▸ 180].
2. Unplug the connector X1H and measure the resistance between the pins 1-2.

   Result: The measured resistance MUST be approximately 35.3 Ω.



a Backup heater connector X1H

> **INFORMATION**
> See the "7.2 Wiring diagram" [▸ 287] for more detailed information.

Is the measured backup heater resistance correct?	Action
Yes	Return to "4.2.1 Checking procedures" [▸ 80] of the backup heater and continue with the next procedure.
No	Replace the backup heater, see "4.2.2 Repair procedures" [▸ 83].

To perform an insulation check of the backup heater

Prerequisite: First perform a resistance check of the backup heater, see "4.2.1 Checking procedures" [▸ 80].

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 Disconnect the backup heater connector X1H.

4 Connect the Megger ground test lead directly to the backup heater connector X1H: pin 3.

CAUTION

Do NOT connect the Megger ground test lead to any other ground wire.

5 Successively connect the other Megger test lead to the pins 1 and 2 of the disconnected connector X1H and measure the insulation resistances.

Result: The measured insulation resistance MUST be >3 MΩ.

Is the measured backup heater insulation resistance correct?	Action
Yes	Return to "4.2.1 Checking procedures" [▸ 80] of the backup heater and continue with the next procedure.
No	Replace the backup heater, see "4.2.2 Repair procedures" [▸ 83].

To perform an electrical check of the backup heater

Prerequisite: First perform an insulation check of the backup heater, see "4.2.1 Checking procedures" [▸ 80].

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 "4.3 Backup heater thermal protector" [▸ 88].

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 Check the status in the Actuators menu of the user interface. This MUST be:

- Backup heater: step 1 = ON

6 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 "4.2.2 Repair procedures" [▸ 83].
No	Return to "4.2.1 Checking procedures" [▸ 80] 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 "4.2.1 Checking procedures" [▶ 80].

1 Measure the power supply voltage between the following terminals of the backup heater contactor:

- K1M: 1-3
  The measured voltages 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 K1M, see "7.2 Wiring diagram" [▶ 287].
No	Adjust the power supply (source) of the backup heater.

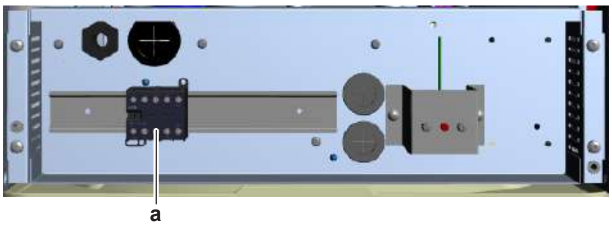
3 With the `Actuator test run` still active, activate backup heater: step 1.

4 Measure the voltage between the following terminals of the backup heater contactor.

- K1M: 2-4 / 1-3
  The measured voltages MUST be 230 V AC ± 10% (contacts closed).

5 Measure the operating voltage on the contactor.

Result: The measured operating voltage MUST be 230 V AC.



a Backup heater contactor K1M

Are the measured voltages of the backup heater contactor correct (contacts closed)?	Action
Yes	Continue with the next step.
No	Skip the next steps and continue with the operating voltage check of the contactor.

6 Deactivate backup heater: Step 1.

7 Measure the voltage between the following terminals of the backup heater contactor.

- K1M: 2-4
  The measured voltages MUST be 0 V AC (contacts open).

8 Measure the operating voltage on the contactor.

Result: The measured operating voltage MUST be: 0 V AC.

Are the measured voltages of the backup heater contactor correct (contacts open)?	Action
Yes	Return to "4.2.1 Checking procedures" [▶ 80] of the backup heater and continue with the next procedure.
No	Continue with the next step.

9 Check if the measured operating voltages are in line with the expected operating voltages.

Are the measured operating voltages correct?	Action
Yes	Replace the specific backup heater contactor(s), see "4.2.2 Repair procedures" [▶ 83].
No	Continue with the next step.

10 Check the operating voltage wiring between the backup heater contactor and the hydro PCB.

Is the operating voltage wiring correct?	Action
Yes	Perform a check of the hydro PCB, see "4.10.1 Checking procedures" [▶ 132].
No	Correct the operating voltage wiring between backup heater contactor and hydro PCB, see "7.2 Wiring diagram" [▶ 287].

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.

4.2.2 Repair procedures

To remove the backup heater

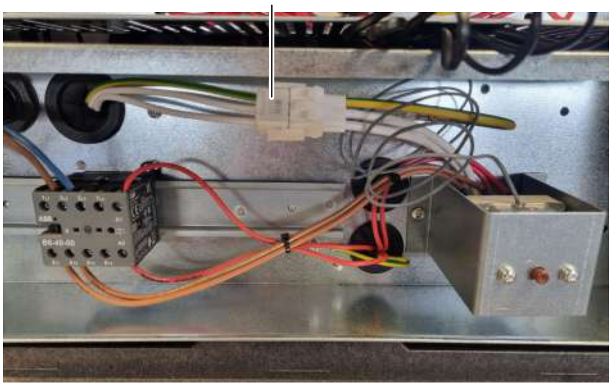
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Drain water from the water circuit, see "5.3.2 Repair procedures" [▶ 273].

2 Disconnect the backup heater connector X1H.



a Backup heater connector X1H

3 If needed, guide the backup heater wiring (and ground wire) out of the switch box (through the grommet).

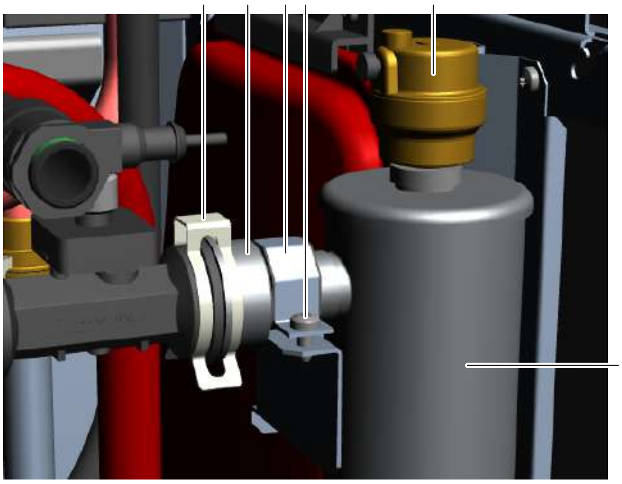
4 Lower the switch box, see "4.15 Plate work" [▶ 180].

5 Cut all tie straps that fix the backup heater harness.

6 Cut the tie strap(s) and remove the insulation from the backup heater.

7 Unscrew and remove the air purge valve from the backup heater. Keep for reuse.

8 Remove the screw from the pipe clamp.



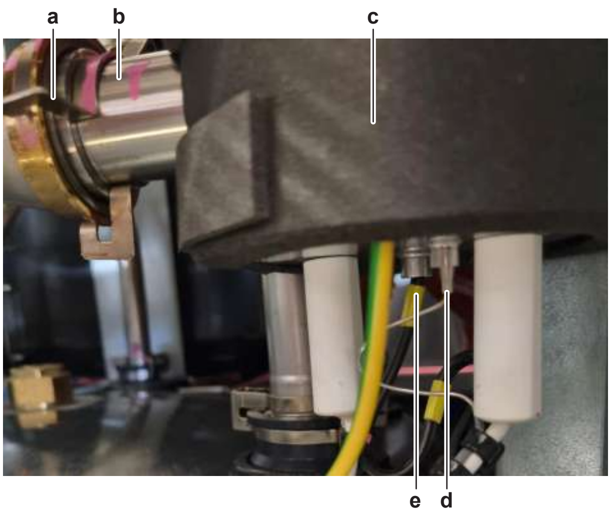
a Air purge valve
b Screw
c Pipe clamp
d Clip
e Upper backup heater coupling
f Backup heater

9 Remove the clip from the upper backup heater coupling.

10 Separate the upper backup heater coupling.

> **INFORMATION**
> Make sure that the O-ring stays in place.

11 Remove the clip from the lower backup heater coupling.



a Clip
b Lower backup heater coupling
c Backup heater
d Backup heater thermal protector sensor
e Outlet water after backup heater thermistor

12 Separate the lower backup heater coupling.

> **INFORMATION**
> Make sure that the O-ring stays in place.

13 Slightly lift the backup heater and at the bottom side, remove the backup heater thermal protector sensor and (outlet water after backup heater) thermistor from the backup heater.

14 Remove the backup heater from the unit.

15 To install the backup heater, see "4.2.2 Repair procedures" [▶ 83].

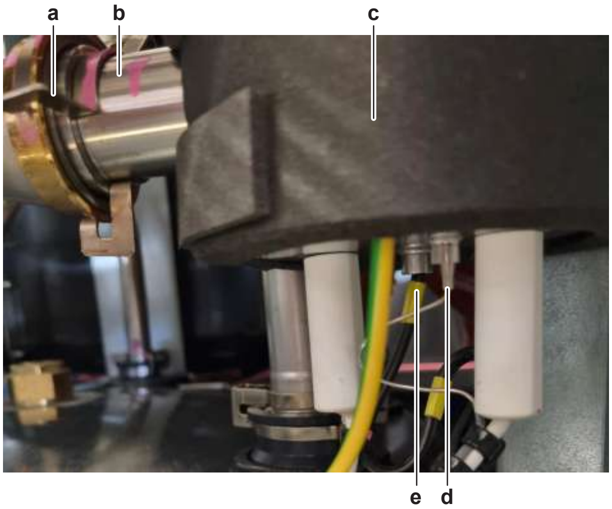
To install the backup heater

1 At the bottom of the backup heater, install the backup heater thermal protector sensor and (outlet water after backup heater) thermistor in the backup heater. Make sure they are correctly fitted in their holder.

2 Install the backup heater in the correct location.

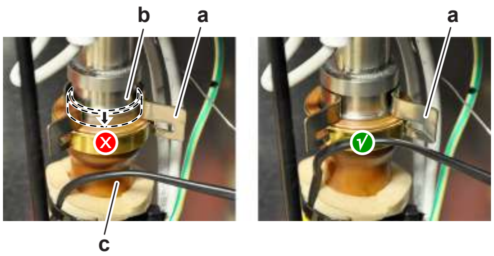
> **NOTICE**
> Check the condition of the O-rings and replace if needed. Apply water or silicon grease to the O-rings before installation.

3 Install the lower backup heater coupling and install the clip.



- **a** Clip
- **b** Lower backup heater coupling
- **c** Backup heater
- **d** Backup heater thermal protector sensor
- **e** Outlet water after backup heater thermistor

> **INFORMATION**
>
> Make sure that the back-up heater pipe is fully inserted in the back-up heater coupling.

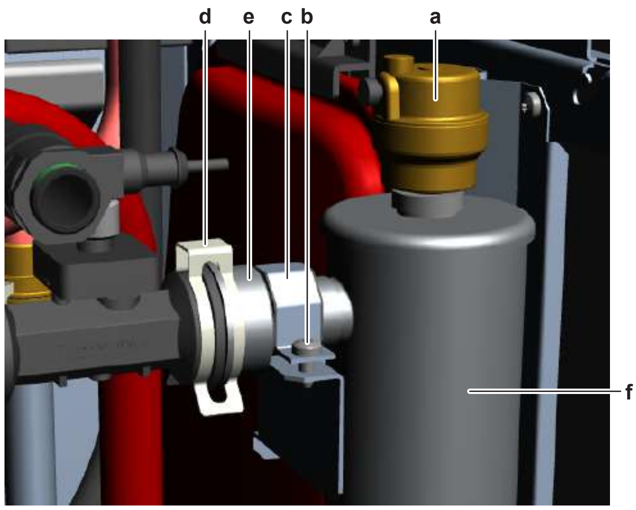


- **a** Clip
- **b** Backup heater pipe
- **c** Backup heater coupling

> **NOTICE**
>
> Check the condition of the O-rings and replace if needed. Apply water or silicon grease to the O-rings before installation.

4 Guide the upper backup heater pipe through the pipe clamp.

5 Install the upper backup heater coupling. Install the clip.



a	Air purge valve
b	Screw
c	Pipe clamp
d	Clip
e	Upper backup heater coupling
f	Backup heater

6 Install and tighten the screw on the pipe clamp.

7 If needed, route the backup heater wiring (and ground wire) inside the switch box (through the grommet).

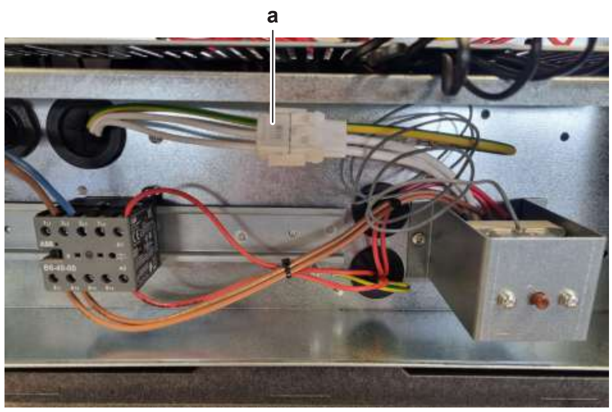
8 Fix the backup heater wiring using new tie straps.

9 Re-install the air purge valve on the backup heater.

10 Install and restore all insulation.

11 Lift and re-install the switch box in its original position.

12 Connect the backup heater connector X1H.



a Backup heater connector X1H

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 "5.3.2 Repair procedures" [▶ 273].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.2.1 Checking procedures" [▶ 80] 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 "4.15 Plate work" [▶ 180].

1. Disconnect the wiring from the backup heater contactor terminals.
2. Remove the screws (if applicable) and remove the backup heater contactor(s) from the switch box.
3. To install the backup heater contactor(s), see "4.2.2 Repair procedures" [▶ 83].

To install the backup heater contactor(s)

1. Install the backup heater contactor(s) in the switch box.
2. If applicable, install and tighten the screws to fix the backup heater contactor(s).
3. Connect the wiring to the correct backup heater contactor terminals.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.2.1 Checking procedures" [▶ 80] of the backup heater and continue with the next procedure.

4.3 Backup heater thermal protector

4.3.1 Checking procedures

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

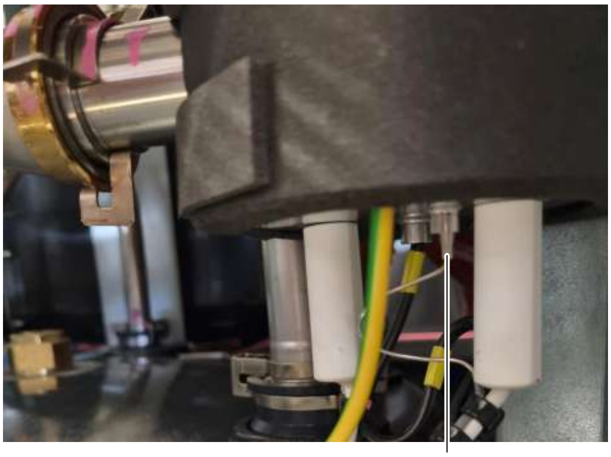
To perform a mechanical check of the backup heater thermal protector

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn off the respective circuit breaker of the unit and the backup heater.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1. If the backup heater thermal protector has tripped:
   - Sufficiently cool the sensor
   - Press the red button to reset the backup heater thermal protector



a Backup heater thermal protector sensor

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 (89°C for UK models).
5. Measure the temperature of the water. The backup heater thermal protector MUST trip at a temperature of approximately 95°C (89°C for UK models).

Does the backup heater thermal protector trip at correct temperature?	Action
Yes	Perform an electrical check of the backup heater thermal protector, see "4.3.1 Checking procedures" [▶ 88]
No	Replace the backup heater thermal protector, see "4.3.2 Repair procedures" [▶ 90].

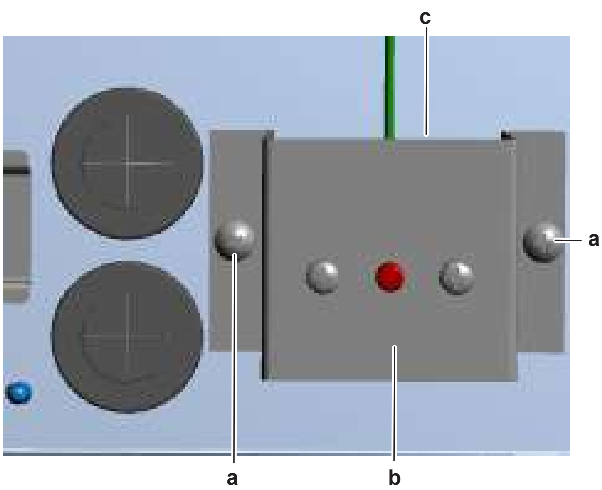
To perform an electrical check of the backup heater thermal protector

Prerequisite: First perform a mechanical check of the backup heater thermal protector, see "4.3.1 Checking procedures" [▶ 88].

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 21-22. 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 "4.3.2 Repair procedures" [▶ 90].

4.3.2 Repair procedures

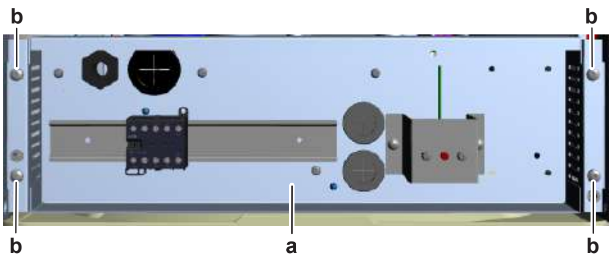
To remove the backup heater thermal protector

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "4.15 Plate work" [▶ 180].

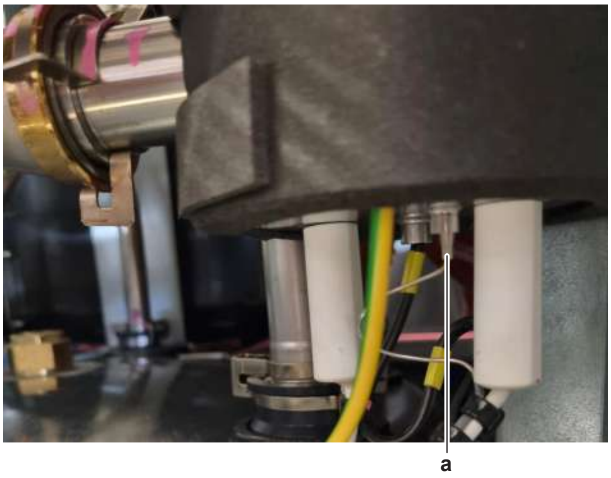
2 Remove the 4 screws that fix the installer switch box.



a Installer switch box
b Screw

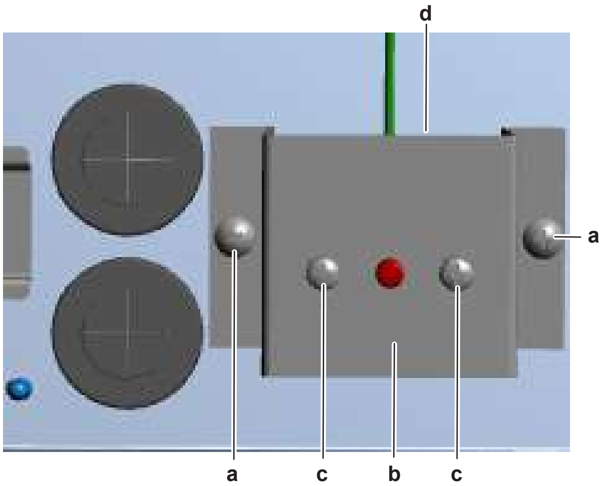
3 Tilt the installer switch box forward to create access to the bottom of the backup heater (where backup heater thermal protector sensor is installed).

4 Remove the backup heater thermal protector sensor from the backup heater.



a Backup heater thermal protector sensor

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.

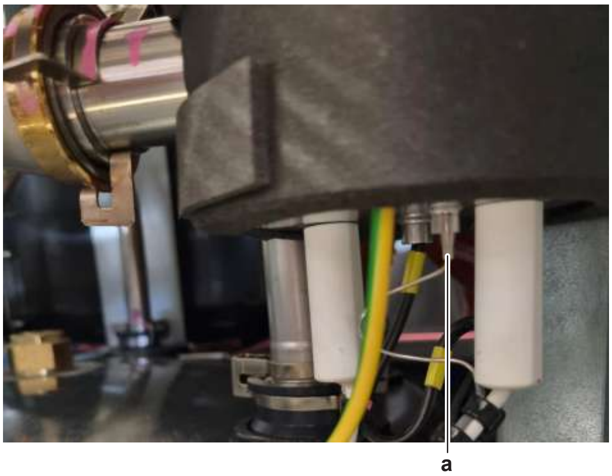
8 Remove the backup heater thermal protector and sensor from the unit.

9 To install the backup heater thermal protector, see "4.3.2 Repair procedures" [▶ 90].

To install the backup heater thermal protector

1 Route the backup heater thermal protector sensor and wiring through the grommet of the switch box.

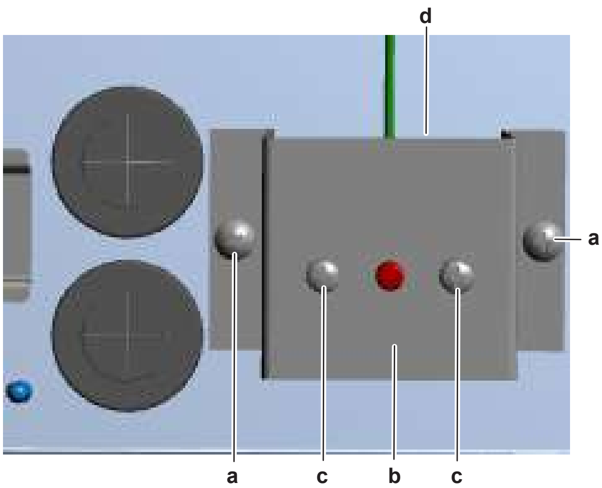
2 Insert the backup heater thermal protector sensor in the backup heater.



a Backup heater thermal protector sensor

3 Connect the wires to the wire terminals at the back of the backup heater thermal protector.

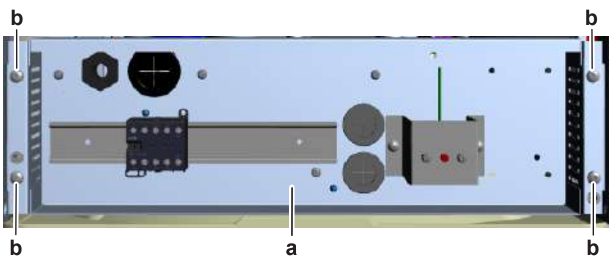
4 Install the backup heater thermal protector on the bracket. Install and tighten the 2 screws.



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.

4.4 Booster heater

4.4.1 Checking procedures

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

To perform a resistance check of the booster heater

Prerequisite: Stop the unit operation via the user interface.

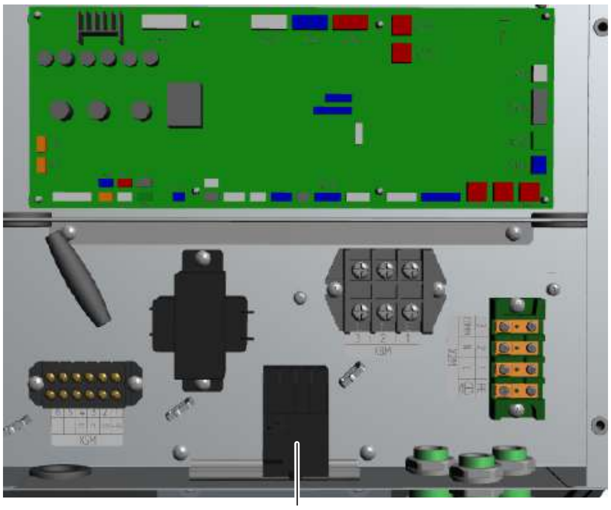
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Check that the booster heater thermal protector functions correctly. Reset if it has tripped. See "4.5 Booster heater thermal protector" [▶ 100].

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1. Disconnect the connectors of the booster heater thermal fuse and check if the fuse has blown (measure continuity). Replace the fuse as needed.
2. Measure the booster heater resistance between K3M/1 and K3M/3.

   Result: The measured resistance MUST be approximately 18 Ω.



a

a Booster heater contactor K3M

> **INFORMATION**
> See the "7.2 Wiring diagram" [▶ 287] for more detailed information.

> **INFORMATION**
> Make sure that the wiring between the booster heater contactor and the booster heater is properly connected and NOT damaged (check continuity), see "7.2 Wiring diagram" [▶ 287].

Is the measured booster heater resistance correct?	Action
Yes	Return to "4.4.1 Checking procedures" [▶ 93] of the booster heater and continue with the next procedure.
No	Replace the booster heater, see "4.4.2 Repair procedures" [▶ 97].

To perform an insulation check of the booster heater

Prerequisite: First perform a resistance check of the booster heater, see "4.4.1 Checking procedures" [▶ 93].

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 booster 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.

Terminals
K3M1-ground
K3M3-ground

Is the measured booster heater insulation resistance correct?	Action
Yes	Return to "4.4.1 Checking procedures" [▶ 93] of the booster heater and continue with the next procedure.
No	Replace the booster heater, see "4.4.2 Repair procedures" [▶ 97].

To perform an electrical check of the booster heater

Prerequisite: First perform an insulation check of the booster heater, see "4.4.1 Checking procedures" [▶ 93].

Prerequisite: Check the circuit breaker. Reset if it has tripped.

1 Turn ON the power of the unit.

> **INFORMATION**
> If the circuit breaker or the booster 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 Booster heater test.

5 Check the status in the Actuators menu of the user interface. This MUST be:

- Booster heater test = ON

6 Check if the field installed circuit breaker has tripped.

Did the fuse blow or did the field supplied circuit breaker of the booster heater trip?	Action
Yes	Replace the booster heater, see "4.4.2 Repair procedures" [▸ 97].
No	Return to "4.4.1 Checking procedures" [▸ 93] of the booster heater and continue with the next procedure.

To perform a check of the booster heater contactor(s)

Prerequisite: First perform an electrical check of the booster heater, see "4.4.1 Checking procedures" [▸ 93].

1 Measure the power supply voltage between the following terminals of the booster heater contactor:

- K3M: 2-4
  The measured voltages 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.

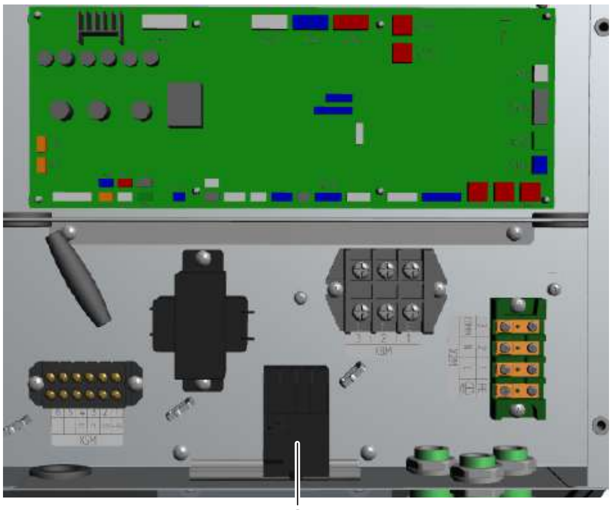
2 Check the power supply (source) of the booster heater.

Is the power supply (source) of the booster heater correct?	Action
Yes	Correct the wiring and/or components between the power supply (source) and the booster heater contactor K3M, see "7.2 Wiring diagram" [▸ 287].
No	Adjust the power supply (source) of the booster heater.

3 With the `Actuator test run` still active, activate booster heater test.

4 Measure the voltage between the following terminals of the booster heater contactor.

- K3M: 1-3 / 2-4
  The measured voltages MUST be 230 V AC ± 10% (contacts closed).



a Booster heater contactor K3M

Are the measured voltages of the booster heater contactor correct (contacts closed)?	Action
Yes	Continue with the next step.
No	Skip the next steps and continue with the operating voltage check of the contactor.

5 Deactivate booster heater test.

6 Measure the voltage between the following terminals of the booster heater contactor.

- K3M: 1-3
  The measured voltages MUST be 0 V AC (contacts open).

Are the measured voltages of the booster heater contactor correct (contacts open)?	Action
Yes	Return to "4.4.1 Checking procedures" [▶ 93] of the booster heater and continue with the next procedure.
No	Continue with the next step.

7 Measure the operating voltage on the contactor.

Result: The measured operating voltage MUST be:

- 230 V AC when the contacts should be closed.
- 0 V AC when the contacts should be open.

Is the measured operating voltage of the booster heater contactor correct?	Action
Yes	Replace the specific booster heater contactor(s), see "4.4.2 Repair procedures" [▶ 97].
No	Check for the reason of faulty operating voltage (wiring, faulty contact, ...), see "7.2 Wiring diagram" [▶ 287].

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.

4.4.2 Repair procedures

To remove the booster heater

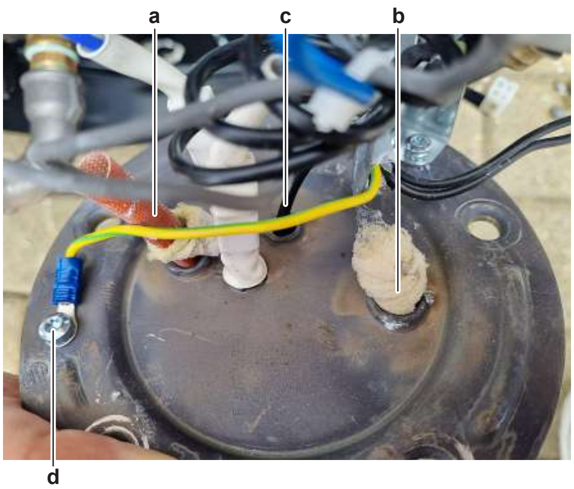
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn off the respective circuit breaker of the unit and the booster heater.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Disconnect the 2 Faston connectors from the booster heater.

2 Remove the thermal fuse from the booster heater (by pulling it out).



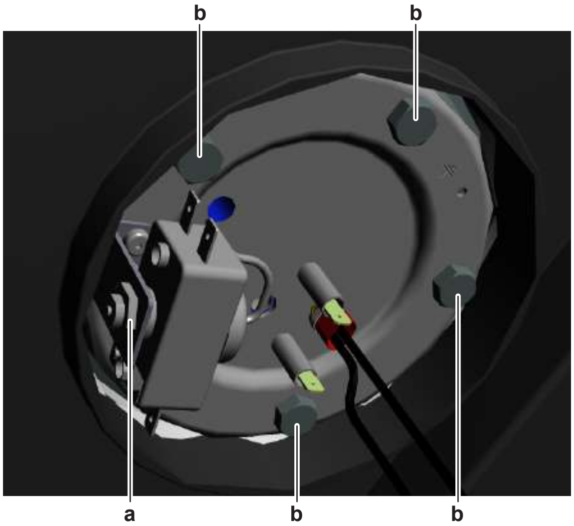
a Thermal fuse location
b Domestic hot water tank thermistor location
c Booster heater thermal protector sensor location
d Screw (ground wire)

3 Remove the domestic hot water tank thermistor from the booster heater (by pulling it out).

4 Remove the booster heater thermal protector sensor from the booster heater (by pulling it out).

5 Loosen and remove the nut and remove the booster heater thermal protector from the bracket.

.

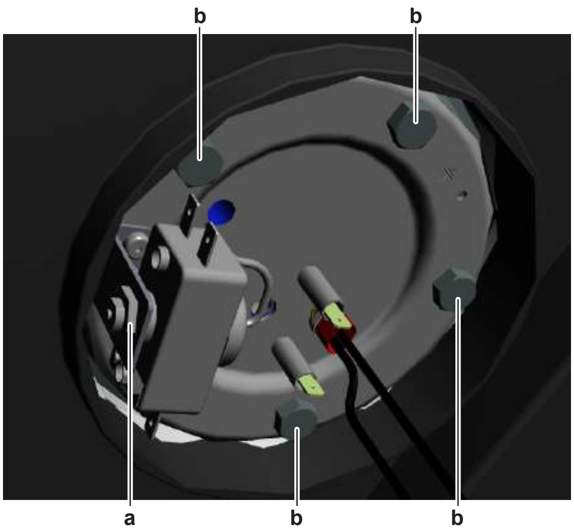


a Nut (booster heater thermal protector)
b Bolt (booster heater)

6. Loosen the screw and disconnect the ground wire from the booster heater.
7. Remove the 5 bolts and remove the booster heater from the bottom of the domestic hot water tank.
8. To install the booster heater, see "4.4.2 Repair procedures" [▸ 97].

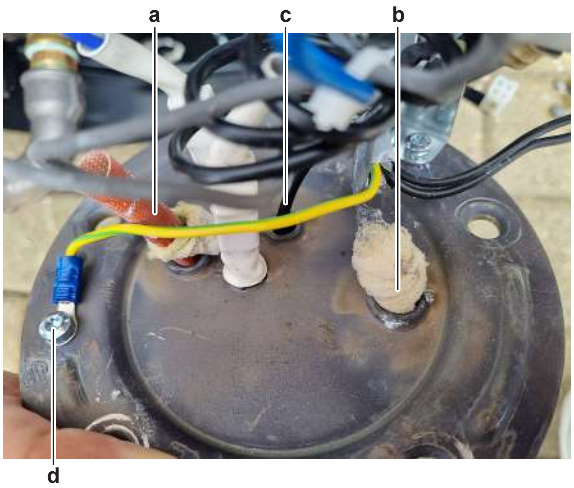
To install the booster heater

1. Install the booster heater in the correct location on the domestic hot water tank. ALWAYS install a new seal.
2. Install and tighten the 5 bolts to 10 N•m of torque to fix the booster heater.



a Nut (booster heater thermal protector)
b Bolt (booster heater)

3. Connect the ground wire to the booster heater. Install and tighten the screw.
4. Install the booster heater thermal protector on the bracket. Install and tighten the nut to fix the booster heater thermal protector to the bracket.
5. Carefully insert the booster heater thermal protector sensor in the appropriate tube of the booster heater. Make sure it is correctly installed.



a Thermal fuse location
b Domestic hot water tank thermistor location
c Booster heater thermal protector sensor location
d Screw (ground wire)

6 Carefully insert the domestic hot water tank thermistor in the appropriate tube of the booster heater. Make sure it is correctly installed.

7 Carefully insert the thermal fuse in the appropriate tube of the booster heater. Make sure it is correctly installed.

8 Connect the 2 Faston connectors to the booster heater.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.4.1 Checking procedures" [▶ 93] of the booster heater and continue with the next procedure.

To remove the booster heater contactor(s)

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn off the respective circuit breaker of the unit and the booster heater.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Disconnect the wiring from the booster heater contactor terminals.

2 Remove the screws and remove the booster heater contactor(s) from the switch box.

3 To install the booster heater contactor(s), see "4.4.2 Repair procedures" [▶ 97].

To install the booster heater contactor(s)

1 Install the booster heater contactor(s) in the switch box and fix them using the screws.

2 Connect the wiring to the correct booster heater contactor terminals.

Is the problem solved?	Action
Yes	No further actions required.

Is the problem solved?	Action
No	Return to "4.4.1 Checking procedures" [▶ 93] of the booster heater and continue with the next procedure.

4.5 Booster heater thermal protector

4.5.1 Checking procedures

INFORMATION

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

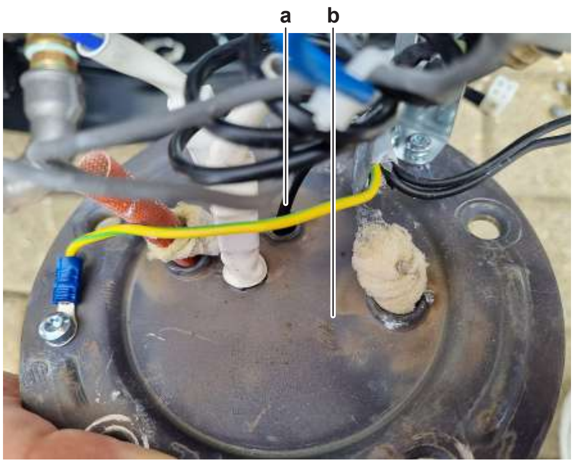
To perform a mechanical check of the booster heater thermal protector

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1. If the booster heater thermal protector has tripped:
   - Sufficiently cool the sensor (7 K)
   - Press the button to reset the booster heater thermal protector



a Booster heater thermal protector sensor
b Booster heater

2. Remove the booster heater thermal protector sensor from the booster heater.
3. Submerge the booster heater thermal protector sensor in water.

DANGER: RISK OF BURNING/SCALDING

4. Heat the water above 93°C.
5. Measure the temperature of the water. The booster heater thermal protector MUST trip at a temperature of 87~93°C.

Does the booster heater thermal protector trip at the correct temperature?	Action
Yes	Perform an electrical check of the booster heater thermal protector, see "4.5.1 Checking procedures" [▸ 100].
No	Replace the booster heater thermal protector, see "4.5.2 Repair procedures" [▸ 101].

To perform an electrical check of the booster heater thermal protector

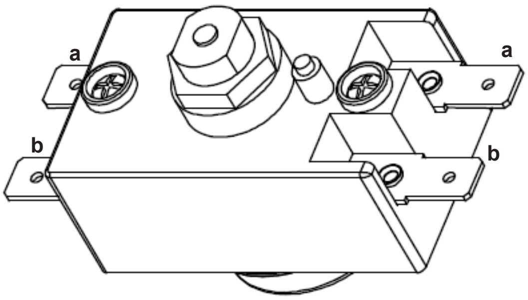
Prerequisite: First perform a mechanical check of the booster heater thermal protector, see "4.5.1 Checking procedures" [▸ 100].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Disconnect the wires from the backup heater thermal protector.
2. Measure the resistance between the indicated terminals of the booster heater thermal protector.

   Result: All contacts MUST be closed.



a Measure between these terminals
b Measure between these terminals

All measured contacts 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 "4.5.2 Repair procedures" [▸ 101].

4.5.2 Repair procedures

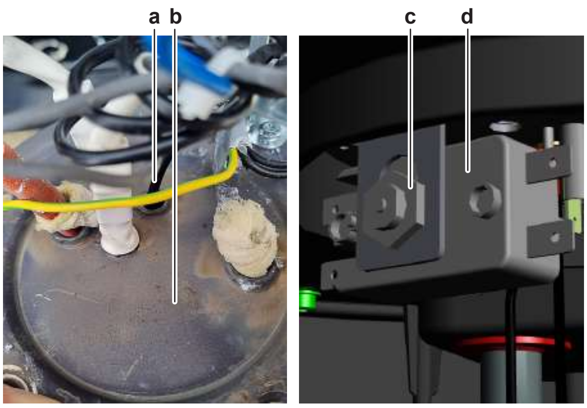
To remove the booster heater thermal protector

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn off the respective circuit breaker of the unit and the booster heater.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▸ 180].

1. Remove the booster heater thermal protector sensor from the booster heater (by pulling it out).



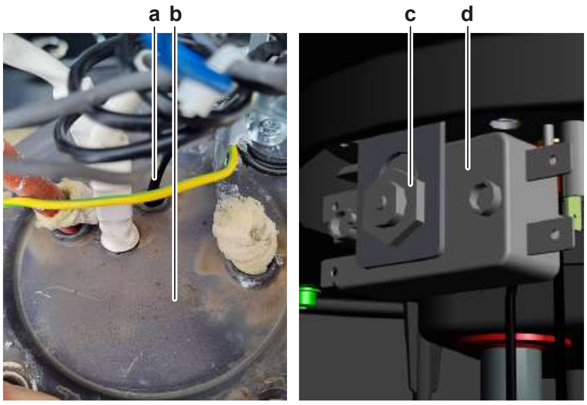
a Booster heater thermal protector sensor
b Booster heater
c Nut
d Booster heater thermal protector

2 Loosen and remove the nut and remove the booster heater thermal protector from the bracket.

3 To install the booster heater thermal protector, see "4.5.2 Repair procedures" [▶ 101].

To install the booster heater thermal protector

1 Install the booster heater thermal protector on the bracket. Install and tighten the nut to fix the booster heater thermal protector to the bracket.



a Booster heater thermal protector sensor
b Booster heater
c Nut
d Booster heater thermal protector

2 Carefully insert the booster heater thermal protector sensor in the appropriate tube of the booster heater. Make sure it is correctly installed.

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.

4.6 Compressor

4.6.1 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 "4.15 Plate work" [▸ 180].

1. Remove the compressor insulation, see To remove the compressor insulation.
2. Turn ON the power using the respective circuit breaker.
3. Start the unit operation via the user interface.

> **CAUTION**
> NEVER operate the compressor with the compressor wire terminals cover removed.

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. ALWAYS measure at the PCB side. 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 "4.6.2 Repair procedures" [▸ 108].
No	Perform an mechanical check of the compressor, see "4.6.1 Checking procedures" [▸ 103].

To perform a mechanical check of the compressor

Prerequisite: First perform an auditive check of the compressor, see "4.6.1 Checking procedures" [▸ 103].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Before proceeding:

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 "4.6.1 Checking procedures" [▶ 103].
No	Replace the compressor and/or damaged dampers, see "4.6.2 Repair procedures" [▶ 108].

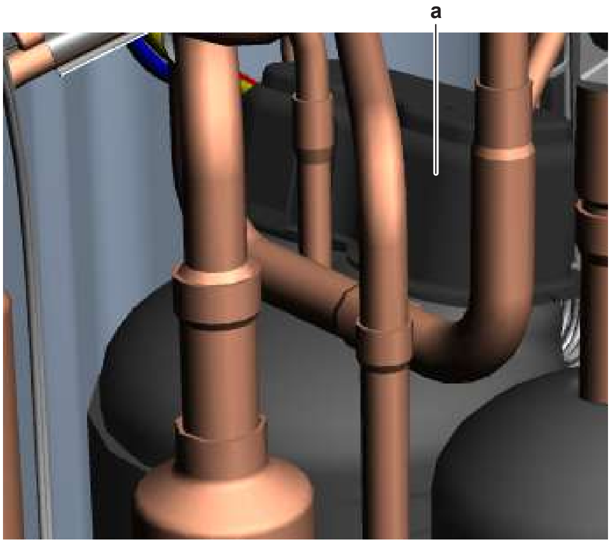
To perform an electrical check of the compressor

1 First perform a mechanical check of the compressor, see "4.6.1 Checking procedures" [▶ 103].

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.

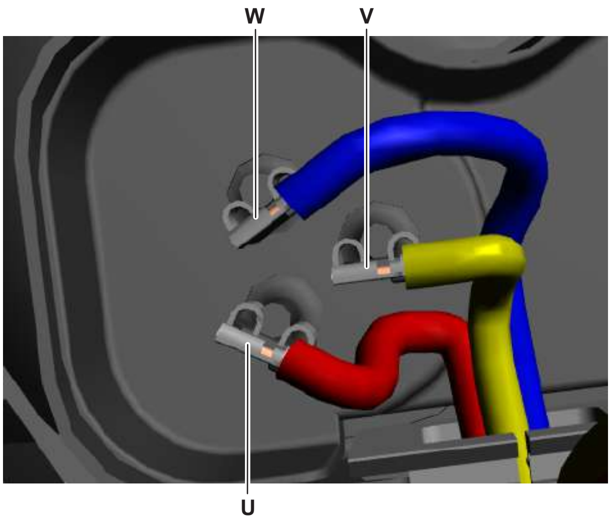


a Compressor wire terminals cover

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.



U Wire terminal U
V Wire terminal V
W Wire terminal W

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 subtracted from the measured winding resistance.

4 Measure the resistance between the compressor motor windings U-V, V-W and U-W.

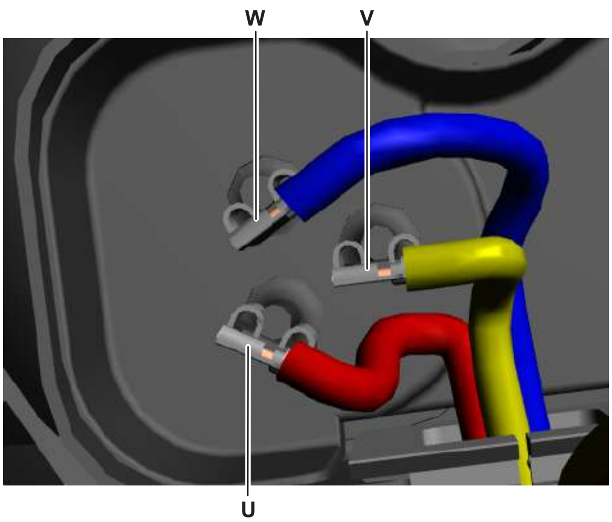
Result: All measurements MUST be approximately the same.

Unit	Compressor	Winding resistance value (at temperature of 20°C)
4MWXM	M1C	1.114 Ω ± 5%
5MWXM	M1C	0.274 Ω ± 5%

Compressor motor winding measurements are correct?	Action
Yes	Continue with the next step.
No	Replace the compressor, see "4.6.2 Repair procedures" [▶ 108].

5 Measure the continuity of the U, V and W wires between the compressor and the PCB. If no continuity, correct as needed, see "7.2 Wiring diagram" [▶ 287].

6 Connect the Faston connectors to the compressor wire terminals U, V and W



U Wire terminal U
V Wire terminal V
W Wire terminal W

7 Install the compressor wire terminals cover.

8 Install the compressor insulation.

9 Turn ON the power using the respective circuit breaker.

10 Start the unit operation via the user interface.

CAUTION

NEVER operate the compressor with the compressor wire terminals cover removed.

11 Wait for – or create condition to operate the compressor.

12 Once the compressor operates, measure the U-V-W inverter voltages. ALWAYS measure at the PCB side.

Result: 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 "4 Components" [▶ 72].

13 While compressor is operating, measure the current in each phase U, V and W. ALWAYS measure at the PCB side.

Result: All measurements MUST be the same.

Compressor motor winding current measurements are correct?	Action
Yes	Perform an insulation check of the compressor, see "4.6.1 Checking procedures" [▸ 103].
No	Preventively replace the compressor, see "4.6.2 Repair procedures" [▸ 108].

To perform an insulation check of the compressor

Prerequisite: First perform an electrical check of the compressor, see "4.6.1 Checking procedures" [▸ 103].

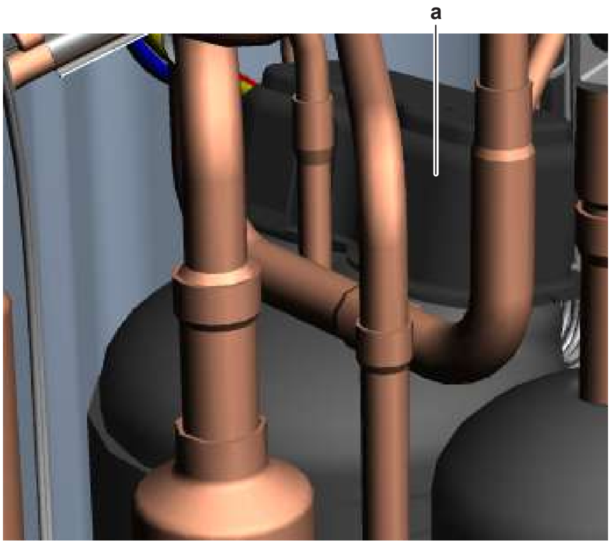
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Before proceeding:

> **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.

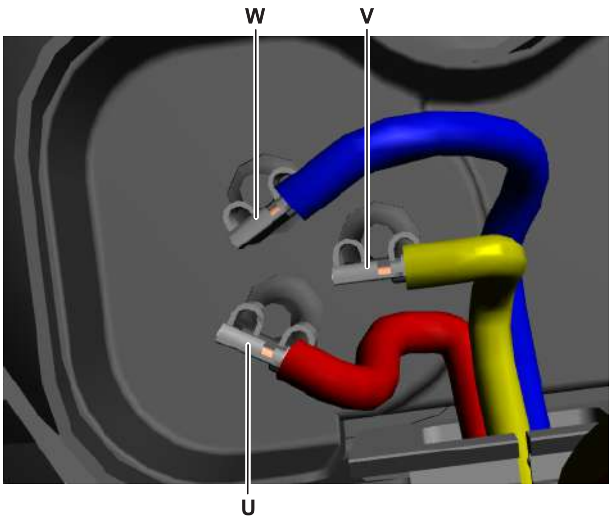
2 Remove the cover of the compressor wire terminals.



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.



U Wire terminal U
V Wire terminal V
W Wire terminal W

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.

6 If compressor is OK, completely assemble the compressor.

CAUTION

NEVER operate the compressor with the compressor wire terminals cover removed.

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 "4.6.2 Repair procedures" [▶ 108].

4.6.2 Repair procedures

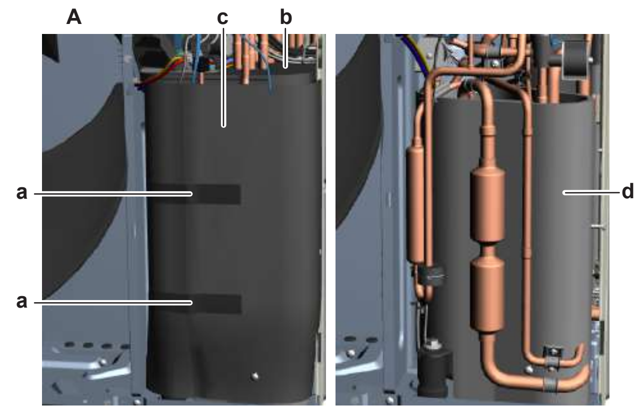
To remove the compressor insulation

Prerequisite: Stop the unit operation via the user interface.

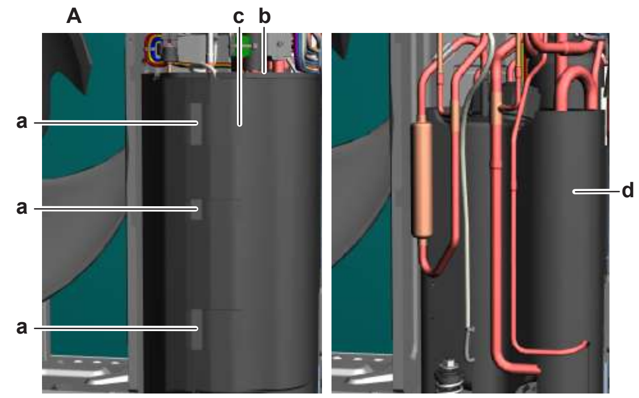
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Detach all the strips.



A 4MWXM units
a Strip
b Top insulation
c Outer body jacket
d Secondary (inner) body jacket



A 5MWXM units
a Strip
b Top insulation
c Outer body jacket
d Secondary (inner) body jacket

2 Open the body jacket.

3 Remove the top insulation from the compressor.

> **INFORMATION**
> Some units have multiple parts of top insulation. Remove ALL top insulation.

4 Open the secondary (inner) body jacket from the compressor.

5 Remove the body jackets from the compressor.

6 To install the compressor insulation, see "4.6.2 Repair procedures" [▸ 108].

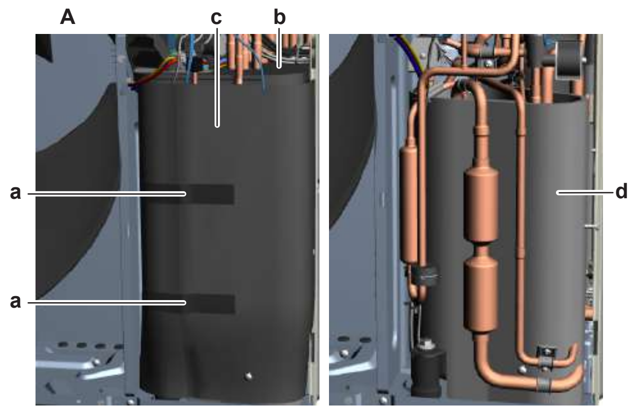
To install the compressor insulation

1 Install the secondary (inner) body jacket on the compressor.

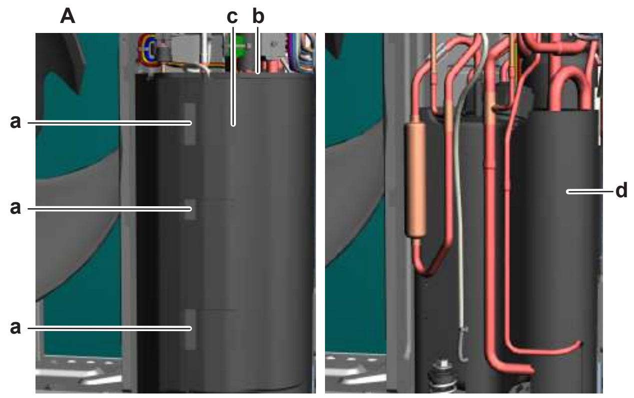
2 Route the compressor and the compressor thermal protector wiring out of the body jacket.

3 Install the top insulation on the compressor.

> **INFORMATION**
> Some units have multiple parts of top insulation. Install ALL top insulation.



A 4MWXM units
a Strip
b Top insulation
c Outer body jacket
d Secondary (inner) body jacket



A 5MWXM units
a Strip
b Top insulation
c Outer body jacket
d Secondary (inner) body jacket

4 Install the (outer) body jacket around the compressor.

5 Properly fit the top insulation in the body jacket.

6 Attach the strips.

> **INFORMATION**
> Make sure that the insulation nicely fits around the compressor.

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 "4.15 Plate work" [▶ 180].

Prerequisite: Remove the compressor insulation.

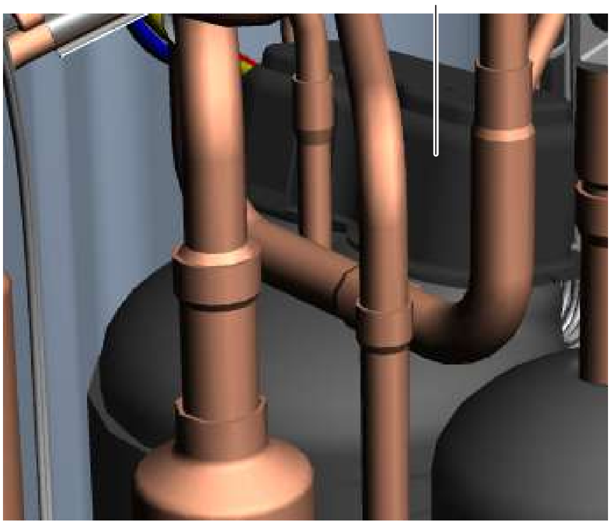
Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

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.

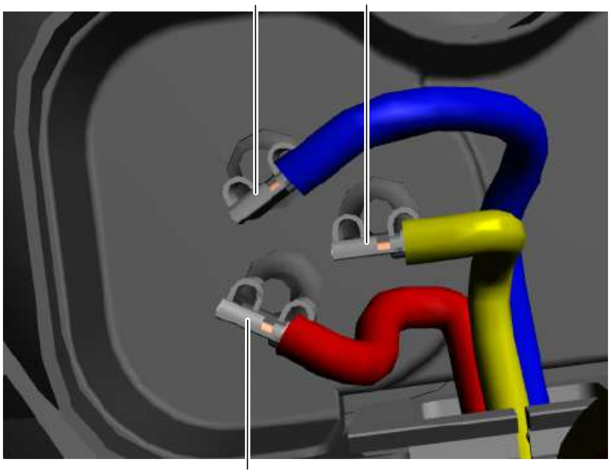


a Compressor wire terminals cover

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.



U Wire terminal U
V Wire terminal V
W Wire terminal W

4 If applicable, remove the screw and disconnect the ground wire from the compressor.

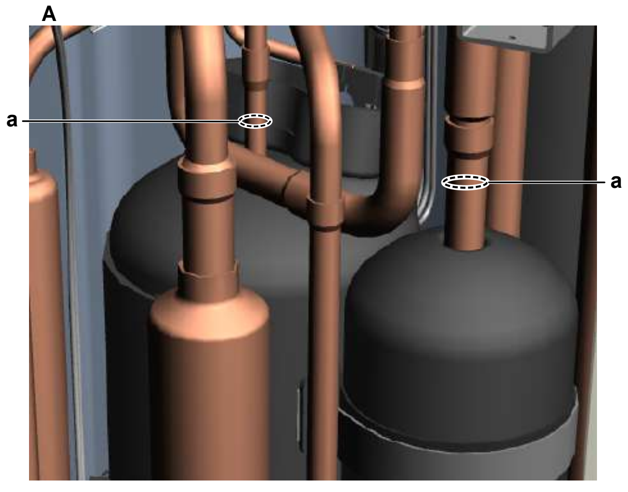
5 Remove the compressor thermal protector, see "To remove the compressor thermal protector" [▸ 119].

6 Remove the following thermistors from their holder:

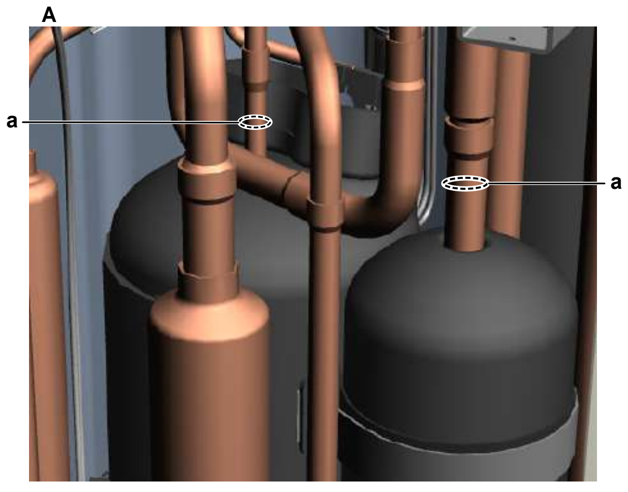
- Suction thermistor
- Discharge pipe thermistor
- Compressor body thermistor (if applicable)

7 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa (2.9 PSI).

8 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 4MWXM units
a Compressor pipe

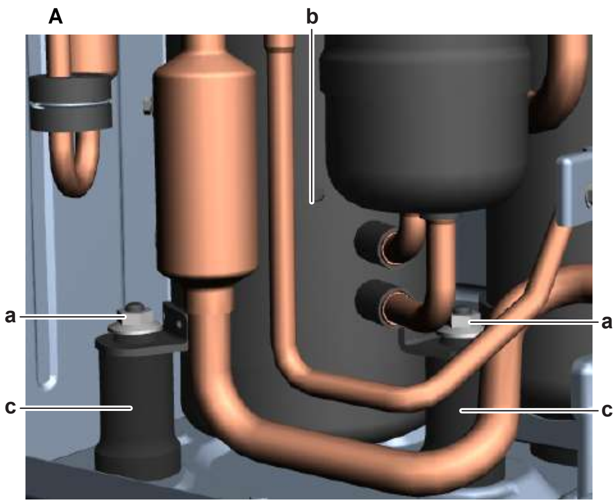


A 5MWXM units
a Compressor pipe

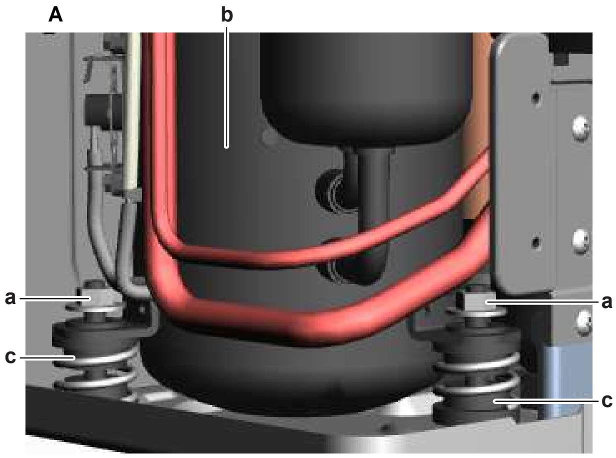
9 Stop the nitrogen supply when the piping has cooled down.

> **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.

10 Remove the nuts and bolts and remove the compressor from the unit.



A 4MWXM units
a Nut
b Compressor
c Damper



A 5MWXM units
a Nut
b Compressor
c Damper

11 Remove the 3 dampers from the compressor.

> **INFORMATION**
>
> The compressor dampers may look different.

12 Remove the bushings and keep them for re-use.

13 Install plugs or caps on the open pipe ends of the refrigerant piping to avoid dirt or impurities from entering the piping.

> **INFORMATION**
>
> If the pipes that were removed together with the compressor are NOT included in the spare part compressor and are NOT damaged, heat the brazing points and remove the pipes from the compressor to reuse them on the spare part compressor. It is ALSO possible to order and install new pipes on the spare part compressor.

14 To install the compressor, see "4.6.2 Repair procedures" [▶ 108].

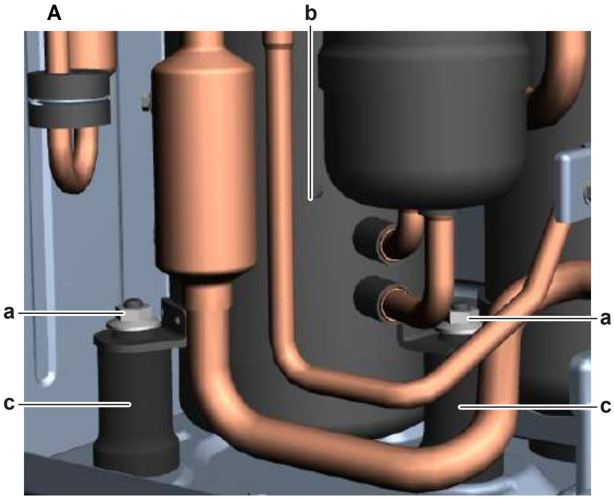
To install the compressor

> **INFORMATION**
>
> If the pipes that were removed together with the compressor are NOT included in the spare part compressor, install and solder the reused or new pipes to the spare part compressor before installing the compressor.

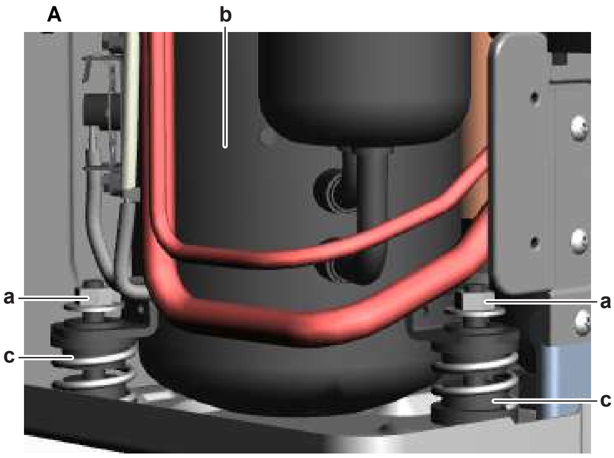
1. Check the state of the dampers. Replace if worn.
2. Install the 3 dampers in the correct location on the unit.
3. Remove the plugs or caps from the refrigerant piping and make sure they are clean.
4. Remove the caps from the compressor pipes (of the new compressor).

> **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 4MWXM units
a Nut
b Compressor
c Damper



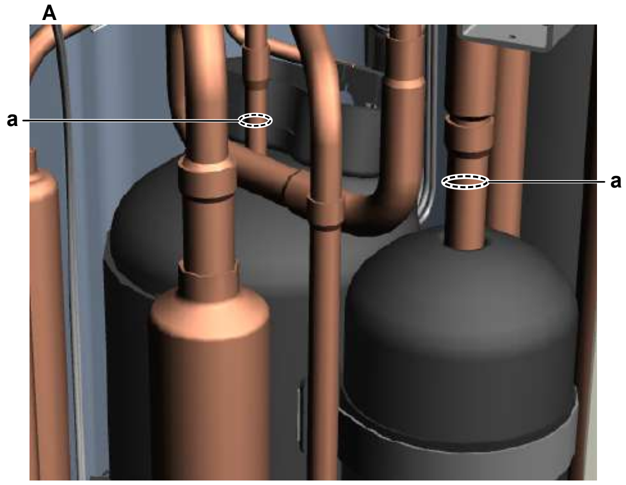
A 5MWXM units
a Nut
b Compressor

c Damper

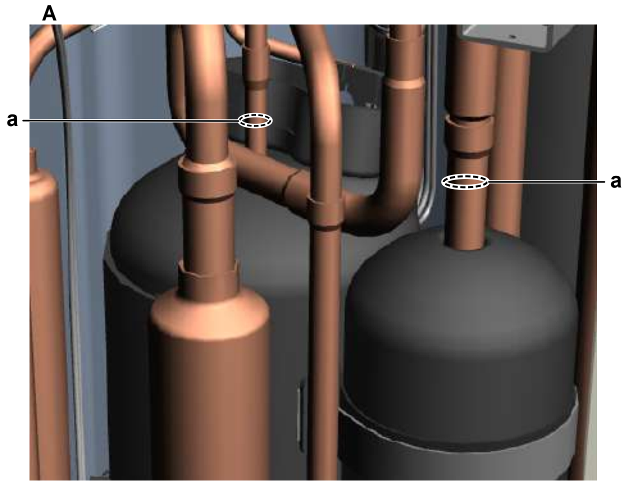
> **INFORMATION**
>
> The compressor dampers may look different.

7 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa (2.9 PSI).

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 4MWXM units
a Compressor pipe



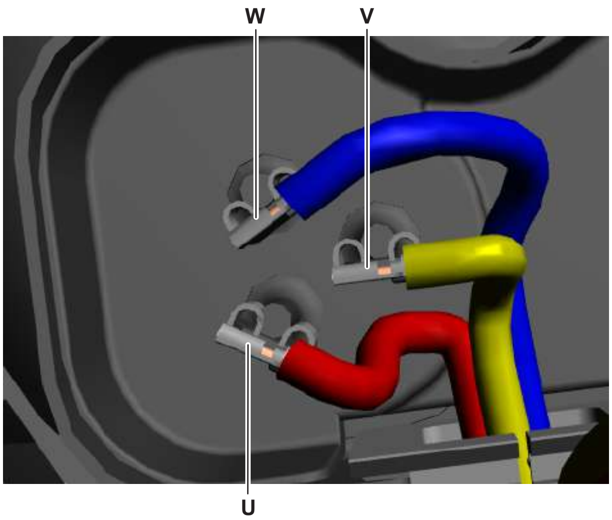
A 5MWXM units
a Compressor pipe

> **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.

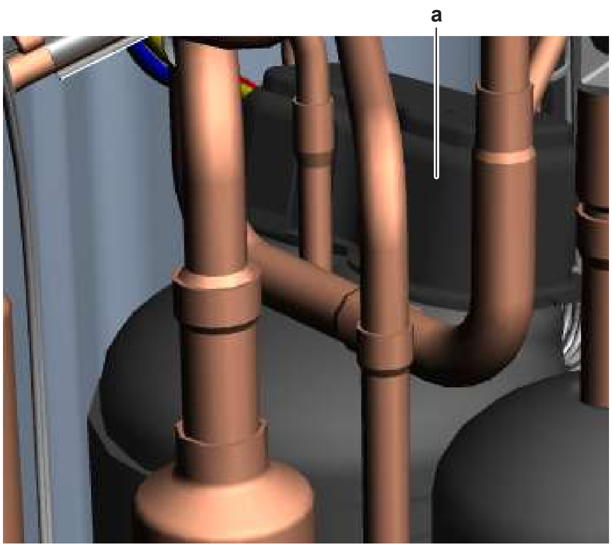
10 Install the compressor thermal protector, see "To install the compressor thermal protector" [▶ 120].

11 Connect the Faston connectors to the compressor wire terminals U, V and W



U Wire terminal U
V Wire terminal V
W Wire terminal W

12 Install the cover of the compressor wire terminals.



a Compressor wire terminals cover

13 If applicable, connect the ground wire to the compressor. Install and tighten the screw to fix the ground wire.

14 Install the following thermistors in their holder:

- Suction thermistor
- Discharge pipe thermistor
- Compressor body thermistor (if applicable)

15 Install the compressor insulation, see "4.6.2 Repair procedures" [▶ 108].

16 Perform a pressure test, see "5.2.1 Checking procedures" [▶ 257].

17 Add refrigerant to the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

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.

4.7 Compressor thermal protector

4.7.1 Checking procedures

To perform a mechanical check of the compressor thermal protector

4MWXM units

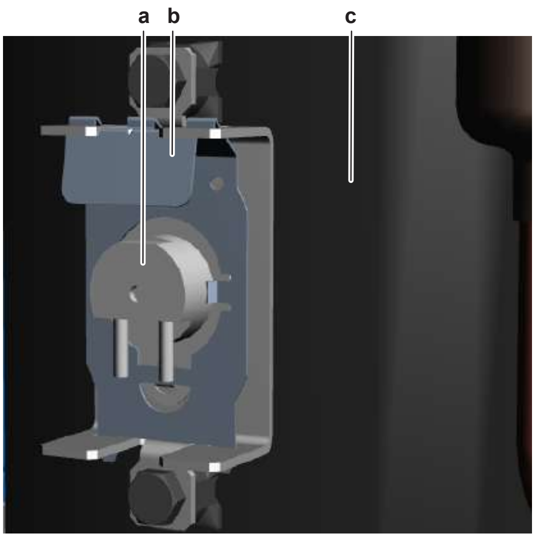
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

Prerequisite: Remove the compressor insulation. See To remove the compressor insulation.

1. Remove the compressor thermal protection with bracket from the compressor.



a Compressor thermal protector
b Bracket
c Compressor

2. If in doubt, measure the temperature of the compressor thermal protection.

   Result: The temperature MUST be below 85°C.

3. Using a hot air gun, carefully heat the compressor thermal protection to slightly above 123°C (compressor thermal protection trips at 117~123°C).
4. Disconnect the connector S40 from the main PCB and measure the resistance between pins 3-4.

   Result: The contact MUST be open (measured resistance = OL).

5. Let the compressor thermal protection cool down below 85°C (reset temperature is 85~105°C).
6. Again measure the resistance between the pins 3-4 of the connector S40.

   Result: The contact MUST be closed (measured resistance = 0 Ω).

Does the compressor thermal protector contact open and close at the correct temperature?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.

Does the compressor thermal protector contact open and close at the correct temperature?	Action
No	Replace the compressor thermal protector, see "4.7.2 Repair procedures" [▶ 119].

5MWXM

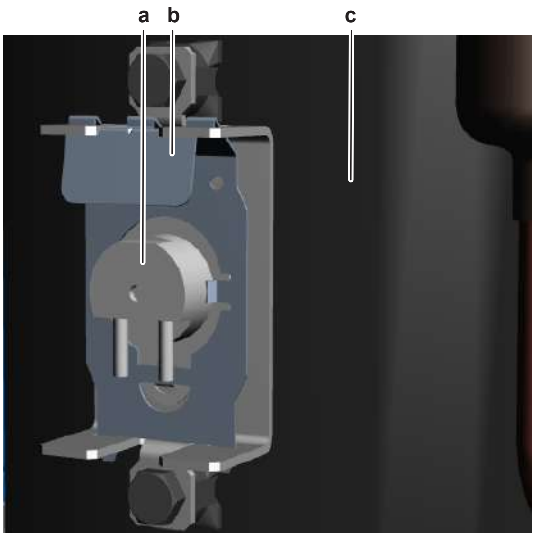
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

Prerequisite: Remove the compressor insulation. See To remove the compressor insulation.

1. Remove the compressor thermal protection with bracket from the compressor.



a Compressor thermal protector
b Bracket
c Compressor

2. If in doubt, measure the temperature of the compressor thermal protection.

   Result: The temperature MUST be below 104°C.

3. Using a hot air gun, carefully heat the compressor thermal protection to slightly above 132°C (compressor thermal protection trips at 126~132°C).

4. Disconnect the connector X820A from the main PCB and measure the resistance between pins 3-4.

   Result: The contact MUST be open (measured resistance = OL).

5. Let the compressor thermal protection cool down below 104°C (reset temperature is 104~116°C).

6. Again measure the resistance between the pins 3-4 of the connector X820A.

   Result: The contact MUST be closed (measured resistance = 0 Ω).

Does the compressor thermal protector contact open and close at the correct temperature?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Replace the compressor thermal protector, see "4.7.2 Repair procedures" [▶ 119].

4.7.2 Repair procedures

To remove the compressor thermal protector

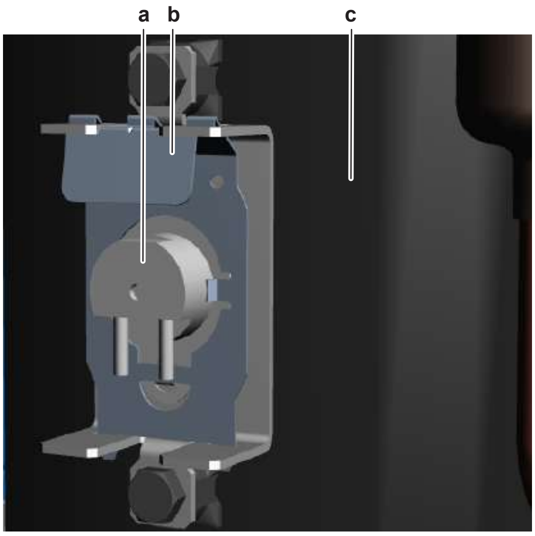
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

Prerequisite: Remove the compressor insulation. See To remove the compressor insulation.

1 Remove the compressor thermal protector with bracket from the compressor housing.



a Compressor thermal protector
b Bracket
c Compressor

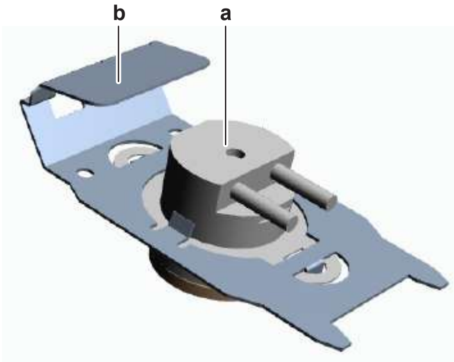
2 Disconnect the connector (S40 for 4MWXM units OR X820A for 5MWXM units) from the main PCB.

3 Disconnect the Faston connectors from the high pressure switch.

> **INFORMATION**
> As the compressor thermal protector and the high pressure switch are both wired to the same connector, the high pressure switch wiring harness needs to be replaced along with the compressor thermal protector.

4 Cut all tie straps that fix the high pressure switch wiring harness and the compressor thermal protector wiring harness.

5 Separate the compressor thermal protector and the compressor thermal protector bracket.

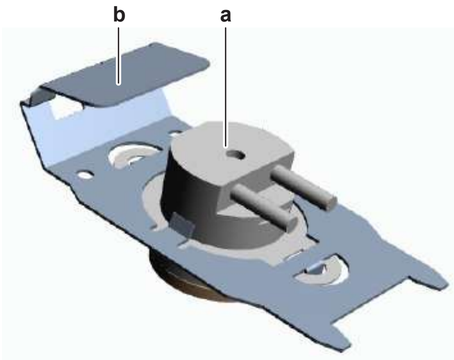


a Compressor thermal protector
b Bracket

6 To install the compressor thermal protector, see "4.6.2 Repair procedures" [▶ 108].

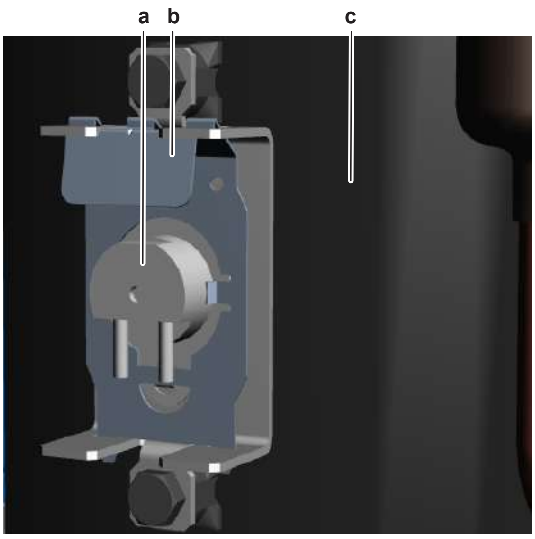
To install the compressor thermal protector

1 Install the compressor thermal protector on the compressor thermal protector bracket.



a Compressor thermal protector
b Bracket

2 Install the compressor thermal protector and bracket on the compressor housing.



a Compressor thermal protector
b Bracket
c Compressor

3 Connect the connector (S40 for 4MWXM units OR X820A for 5MWXM units) to the main PCB.

4 Route the high pressure switch wiring harness towards the high pressure switch and connect the Faston connectors.

> **INFORMATION**
> As the compressor thermal protector and the high pressure switch are both wired to the same connector, the high pressure switch wiring harness needs to be replaced along with the compressor thermal protector.

5 Install new tie straps to fix the high pressure switch wiring harness and the compressor thermal protector wiring harness.

6 Install the compressor insulation, see "4.6.2 Repair procedures" [▸ 108].

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.

4.8 Expansion valve

4.8.1 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 "4.8.1 Checking procedures" [▸ 121].

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▸ 180].

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 "4.8.2 Repair procedures" [▸ 125].

2 Remove the expansion valve coil from the expansion valve body, see "4.8.2 Repair procedures" [▸ 125].

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 correctly installed on 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 "4.8.1 Checking procedures" [▶ 121].
No	Replace the expansion valve body, see "4.8.2 Repair procedures" [▶ 125].

To perform an electrical check of the expansion valve

1. First perform a mechanical check of the expansion valve, see "4.8.1 Checking procedures" [▶ 121].
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.

- 4MWXM UNITS

Name	Symbol	Location (PCB)	Connector	Winding resistance
Main expansion valve (Room A)	Y1E	A1P (OU)	S20	46±3 Ω
Main expansion valve (Room B)	Y2E	A1P (OU)	S21	46±3 Ω
Main expansion valve (Room C)	Y3E	A1P (OU)	S22	46±3 Ω
Main expansion valve (Domestic hot water tank)	Y4E	A1P (OU)	S23	46±3 Ω

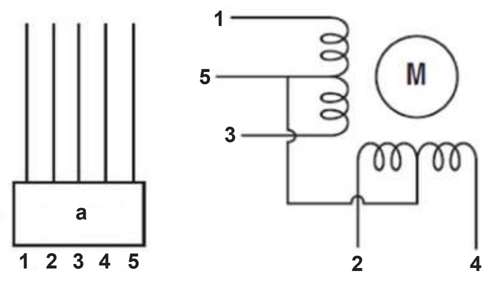
- 5MWXM UNITS

Name	Symbol	Location (PCB)	Connector	Winding resistance
Main expansion valve (Room A)	Y1E	A2P (OU)	X621A	46±3 Ω
Main expansion valve (Room B)	Y2E	A2P (OU)	X622A	46±3 Ω
Main expansion valve (Room C)	Y3E	A2P (OU)	X623A	46±3 Ω

Name	Symbol	Location (PCB)	Connector	Winding resistance
Main expansion valve (Room D)	Y4E	A2P (OU)	X624A	46±3 Ω
Main expansion valve (Domestic hot water tank)	Y5E	A2P (OU)	X625A	46±3 Ω

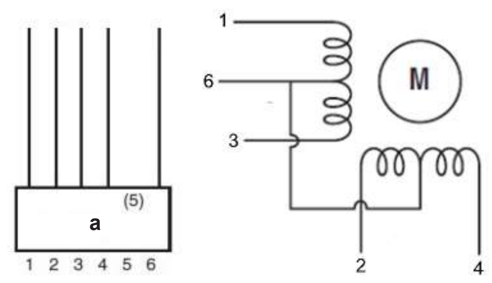
> **INFORMATION**
> Below are shown examples of the resistance measurements in which the common wire is connected to pin 5 or to pin 6 of the expansion valve coil connector. Connections may differ according to the type of expansion valve.

- 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 "4.8.1 Checking procedures" [▶ 121].
No	Replace the expansion valve coil, "4.8.2 Repair procedures" [▶ 125].

To perform an operation check of the expansion valve

Prerequisite: First perform an electrical check of the expansion valve, see "4.8.1 Checking procedures" [▶ 121].

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.

> **INFORMATION**
> Depending on which expansion valve (room, domestic hot water tank) you want to check, operate the appropriate unit(s).

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 (as their measurements control the operation of the expansion valve(s)).

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 "4.8.2 Repair procedures" [▶ 125].

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.

4.8.2 Repair procedures

To remove the expansion valve coil

Prerequisite: Stop the unit operation via the user interface.

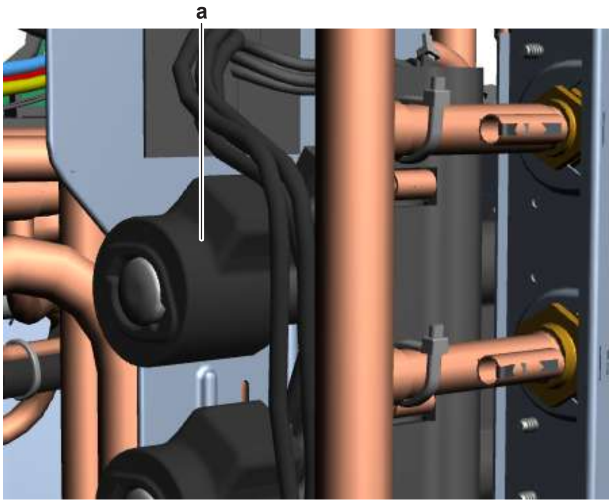
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 If needed, remove any parts or insulation to create more space for the removal.

2 Pull up 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.



a Expansion valve coil

3 Cut all tie straps that fix the expansion valve coil harness.

4 Disconnect the expansion valve coil connector from the appropriate PCB.

5 Remove the expansion valve coil (and harness) from the unit.

6 To install the expansion valve coil, see "4.8.2 Repair procedures" [▶ 125].

To remove the expansion valve body

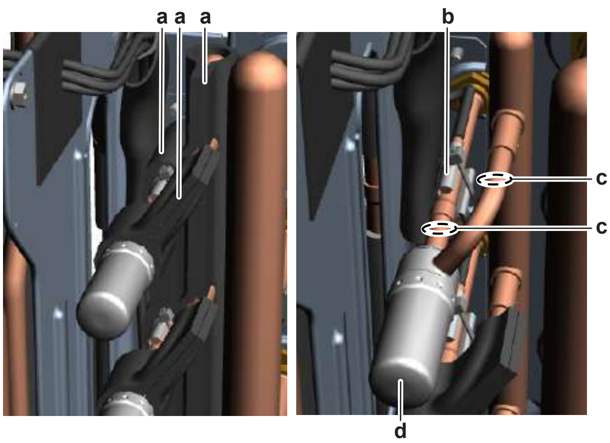
Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

Prerequisite: If needed, remove any parts or insulation to create more space for the removal.

1 Remove the expansion valve coil, see "4.8.2 Repair procedures" [▶ 125].

2 Remove the putty (if applicable). Keep for re-use

3 Remove the refrigerant liquid thermistor from its holder.



a Putty
b Refrigerant liquid thermistor
c Expansion valve pipe
d Expansion valve body

4 Using a valve magnet, open the expansion valve.

5 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa (2.9 PSI).

6 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.

7 Stop the nitrogen supply when the piping has cooled down.

8 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.

9 Install plugs or caps on the open pipe ends of the refrigerant piping to avoid dirt or impurities from entering the piping.

10 To install the expansion valve body, see "4.8.2 Repair procedures" [▸ 125].

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.

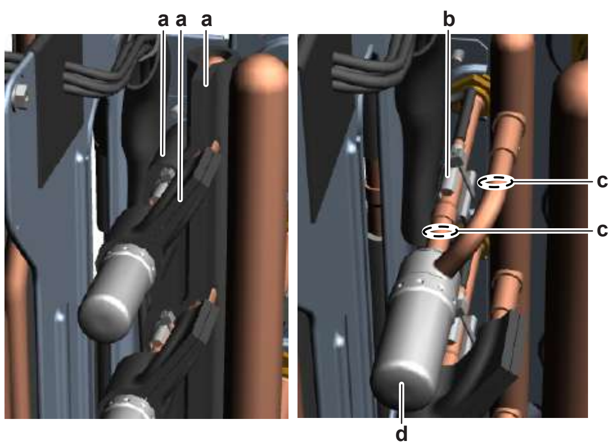
5 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa (2.9 PSI).

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** Putty
- **b** Refrigerant liquid thermistor
- **c** Expansion valve pipe
- **d** Expansion valve body

8 Reinstall the refrigerant liquid thermistor in its holder.

9 Reinstall the putty (if applicable).

10 To install the expansion valve coil, see "4.8.2 Repair procedures" [▶ 125].

11 Perform a pressure test, see "5.2.1 Checking procedures" [▶ 257].

12 Add refrigerant to the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

To install the expansion valve coil

1 Install the expansion valve coil on the expansion valve body.

> **INFORMATION**
> Turn the expansion valve coil 1/8 turn clockwise to lock it on the expansion valve body.

> **INFORMATION**
> The correct alignment of the expansion valve coil is ensured by dimples.

a Expansion valve coil
b Pipe

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 "4.8.1 Checking procedures" [▶ 121] of the expansion valve and continue with the next procedure.

4.9 High pressure switch

4.9.1 Checking procedures

To perform an electrical check of the high pressure switch

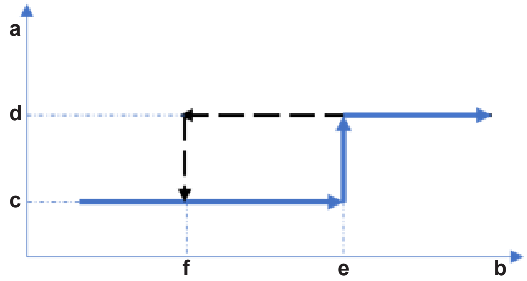
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Recuperate the refrigerant from the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

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 (MPa)
S1PH	4.03~4.15	3.05~3.35

3 Disconnect the Faston connectors from the high pressure switch.

> **INFORMATION**
>
> Measure the continuity of all wiring between the high pressure switch and the appropriate PCB. If NO continuity is measured, replace the compressor thermal protector (as the high pressure switch wiring is part of the compressor thermal protector), see "4.7.2 Repair procedures" [▶ 119].

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.

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	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 "4.9.2 Repair procedures" [▸ 130].

4.9.2 Repair procedures

To remove the high pressure switch

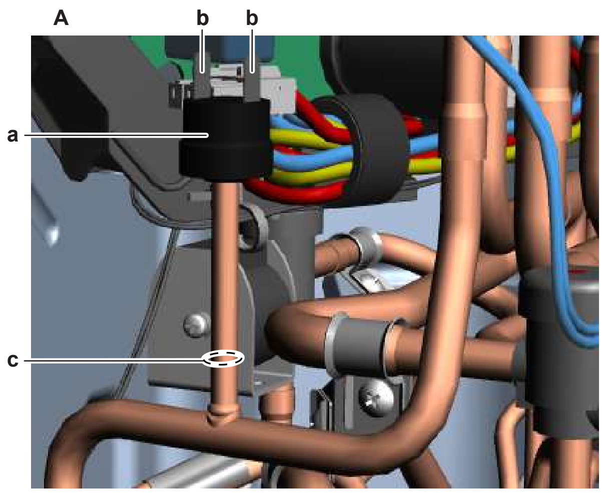
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

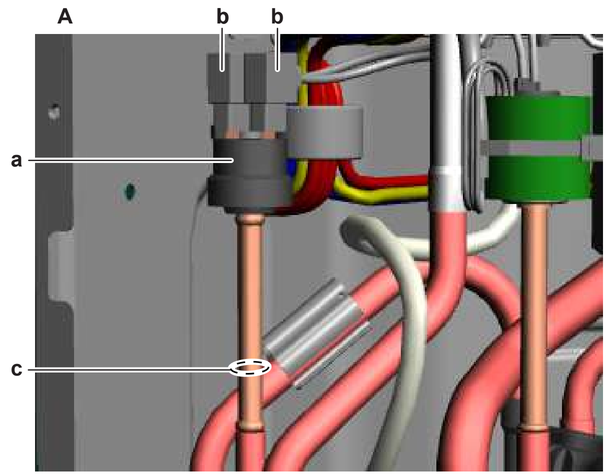
Prerequisite: Remove the required plate work, see "4.15 Plate work" [▸ 180].

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "5.2.2 Repair procedures" [▸ 262].

1. If needed, remove any parts or putty (if installed) to create more space for the removal of the high pressure switch.
2. Disconnect the Faston connectors from the high pressure switch.
3. Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa (2.9 PSI).
4. 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 4MWXM units
a High pressure switch
b Faston connector
c High pressure switch pipe



A 5MWXM units
a High pressure switch
b Faston connector
c High pressure switch pipe

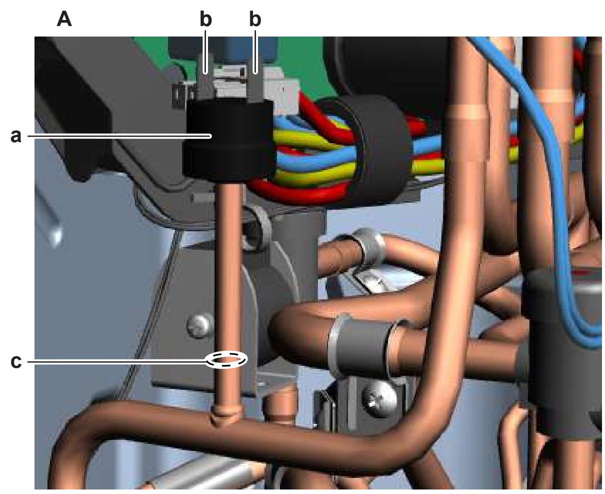
5. Stop the nitrogen supply when the piping has cooled down.
6. Remove the high pressure switch.

> **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.

7. Install a plug or cap on the refrigerant piping to avoid dirt or impurities from entering the piping.
8. To install the high pressure switch, see "4.9.2 Repair procedures" [▶ 130].

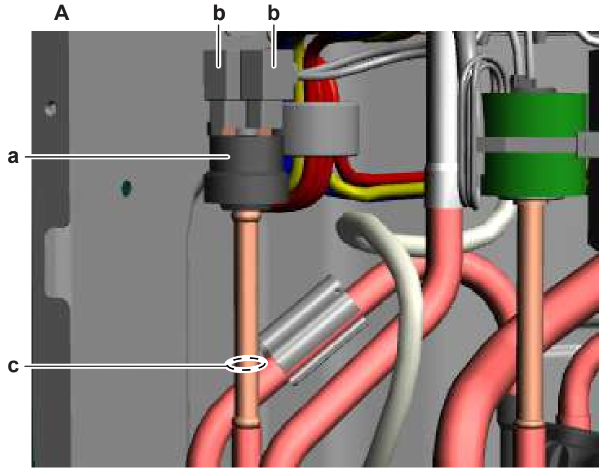
To install the high pressure switch

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 (2.9 PSI).
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 4MWXM units
a High pressure switch

b Faston connector
c High pressure switch pipe



A 5MWXM units
a High pressure switch
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 Install all removed parts or putty (as needed) that were removed for space creation purposes.

8 Perform a pressure test, see "5.2.1 Checking procedures" [▸ 257].

9 Add refrigerant to the refrigerant circuit, see "5.2.2 Repair procedures" [▸ 262].

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.

4.10 Hydro PCB

4.10.1 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.

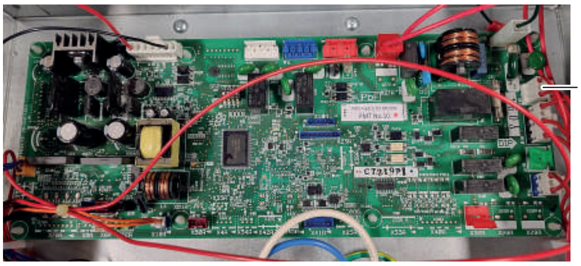
1 Remove the required plate work, see "4.15 Plate work" [▸ 180].

2 Turn ON the power of the unit.

3 Measure the voltage on the connector X1A on the PCB.

Result: The measured voltage MUST be 230 V AC.

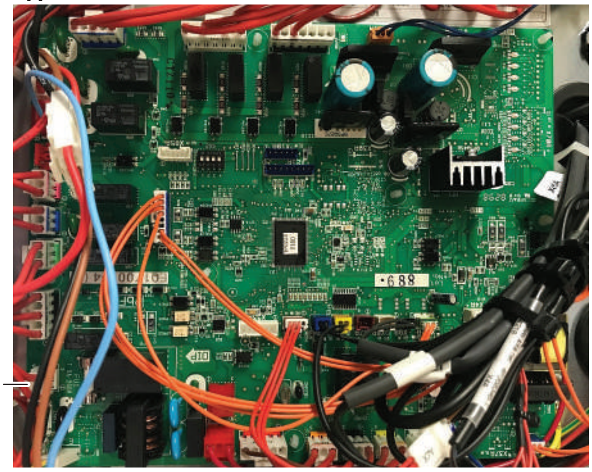
A



a

A EKHWET units
a Connector X1A

A



a

A CKHWS units
a Connector X1A

Is the measured voltage on the hydro PCB correct?	Action
Yes	Return to "4.10.1 Checking procedures" [▶ 132] of the hydro PCB and continue with the next procedure.
No	Continue with the next step.

4 Check the power supply to the unit, see "5.1.1 Checking procedures" [▶ 253].

- EKHWET UNITS

Does the unit receive power?	Action
Yes	Correct the wiring between the main power supply terminal and the hydro PCB, see "4.10.2 Repair procedures" [▶ 137].
No	Adjust the power supply to the unit, see "5.1.2 Repair procedures" [▶ 256].

- CKHWS UNITS

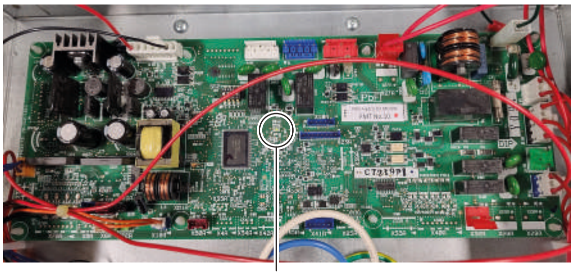
Is the power supply to the indoor unit correct?	Action
Yes	Correct the wiring between the power supply terminal of the indoor unit and the hydro PCB, see "4.10.2 Repair procedures" [▶ 137].
No	See "To check the power supply to the indoor unit" ("5.1.1 Checking procedures" [▶ 253]) for the next steps.

To check the HAP LED of the hydro PCB

Prerequisite: First check the power supply to the hydro PCB, see "4.10.1 Checking procedures" [▶ 132].

1 Locate the HAP LED on the hydro PCB.

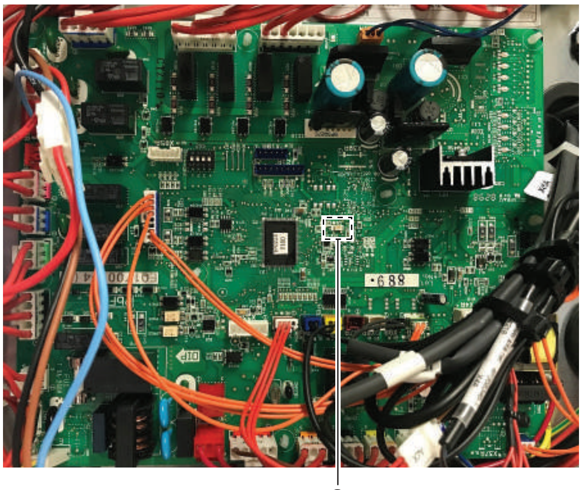
A



a

A EKHWET units
a HAP LED

A



a

A CKHWS units
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 "4.10.1 Checking procedures" [▶ 132] 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 "4.10.2 Repair procedures" [▶ 137]

To check if the correct spare part is installed

Prerequisite: First perform all earlier hydro PCB checks, see "4.10.1 Checking procedures" [▶ 132].

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 "4.10.1 Checking procedures" [▶ 132] of the hydro PCB and continue with the next procedure.
No	Replace the hydro PCB, see "4.10.2 Repair procedures" [▶ 137]

To check the wiring of the hydro PCB

Prerequisite: First perform all earlier hydro PCB checks, see "4.10.1 Checking procedures" [▶ 132].

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 "7.2 Wiring diagram" [▶ 287].

INFORMATION

Correct the wiring as needed.

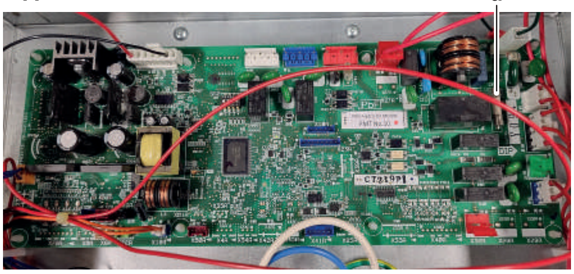
Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.10.1 Checking procedures" [▶ 132] of the hydro PCB and continue with the next procedure.

To check the fuse of the hydro PCB

Prerequisite: First perform all earlier hydro PCB checks, see "4.10.1 Checking procedures" [▶ 132].

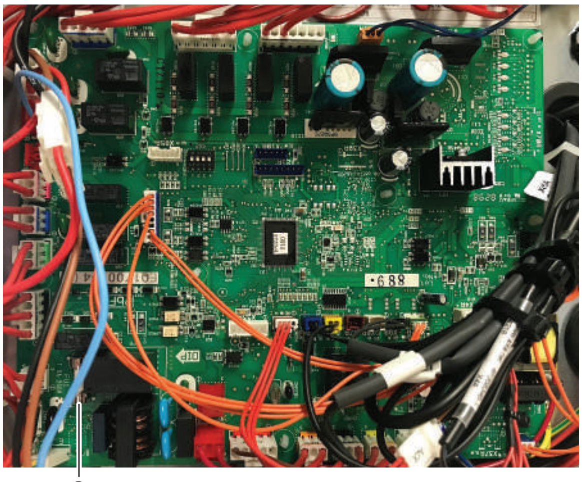
1 Measure the continuity of the fuse. If no continuity is measured, the fuse has blown.

A a



A EKHWET units
a Fuse F1U

A



a

A CKHWS units
a Fuse F1U

- EKHWET UNITS

Blown fuse on the hydro PCB?	Action
Yes	Replace the hydro PCB, see "4.10.2 Repair procedures" [▸ 137]
No	Return to "4.10.1 Checking procedures" [▸ 132] of the hydro PCB and continue with the next procedure.

- CKHWS UNITS

Blown fuse on the hydro PCB?	Action
Yes	Replace the blown fuse, see "4.10.2 Repair procedures" [▸ 137]
No	Return to "4.10.1 Checking procedures" [▸ 132] 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.

4.10.2 Repair procedures

To correct the wiring from the indoor unit 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 "4.15 Plate work" [▶ 180].
2. Make sure that all wires are firmly and correctly connected, see "7.2 Wiring diagram" [▶ 287].
3. Check the continuity of all wires.
4. Replace any damaged or broken wires.

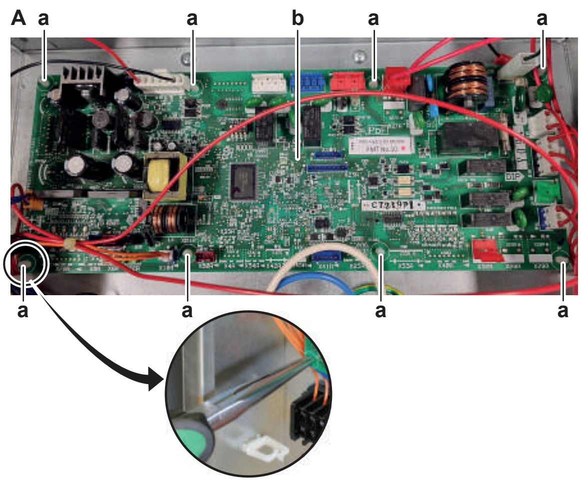
Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.10.1 Checking procedures" [▶ 132] of the hydro PCB and continue with the next procedure.

To remove the hydro PCB

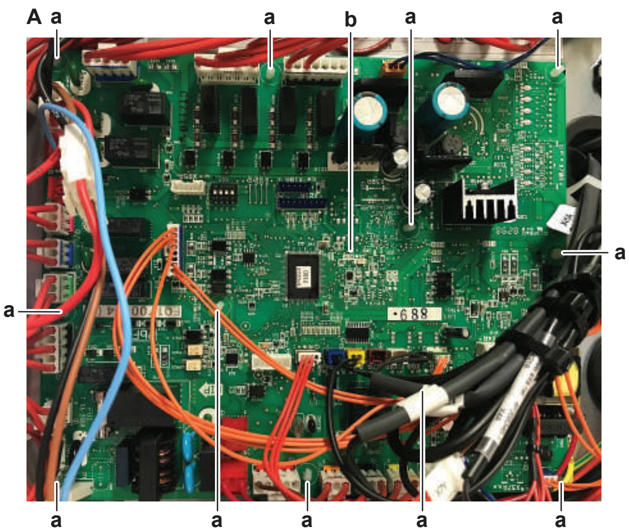
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "4.15 Plate work" [▶ 180].
2. Disconnect all connectors and the ground wire from the hydro PCB.
3. Carefully pull the hydro PCB and unlatch the PCB supports one by one using a small pliers.



A EKHWET units
a PCB support
b Hydro PCB



A CKHWS units
a PCB support
b Hydro PCB

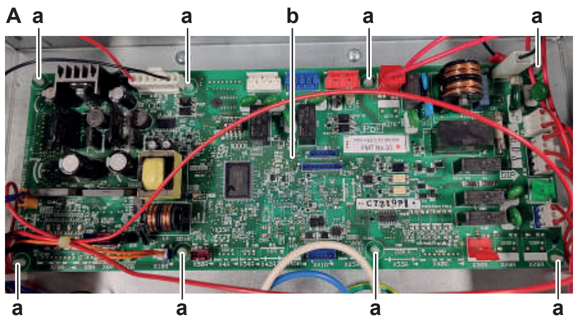
4 Remove the hydro PCB from the switch box.

5 To install the hydro PCB, see "4.10.2 Repair procedures" [▸ 137].

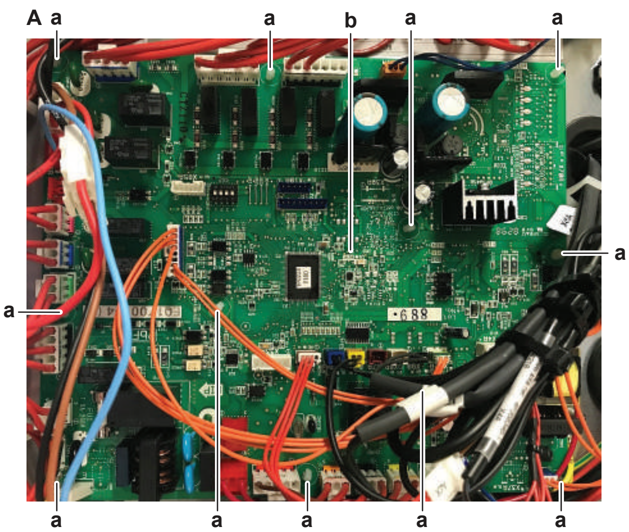
To install the hydro PCB

1 Install the hydro PCB in the correct location in the switch box.

2 Correctly install the hydro PCB on the PCB supports.



A EKHWET units
a PCB support
b Hydro PCB



A CKHWS units
a PCB support

b Hydro PCB

3 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 "7.2 Wiring diagram" [▸ 287].

> **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 "4.10.1 Checking procedures" [▸ 132] of the hydro PCB and continue with the next procedure.

To remove a fuse of the hydro PCB

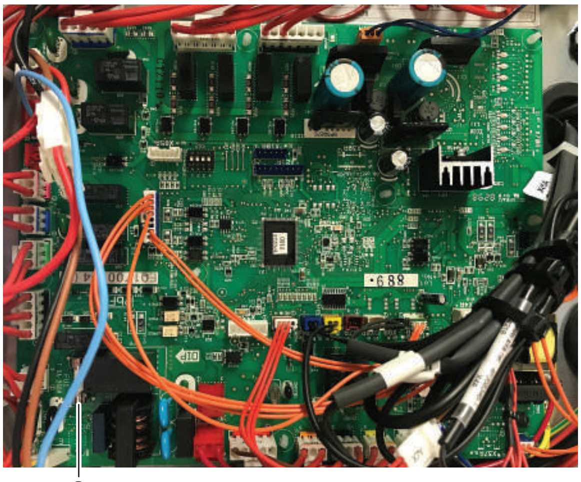
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "4.15 Plate work" [▸ 180].

2 Remove the fuse from the PCB.

A



a

A CKHWS units
a Fuse

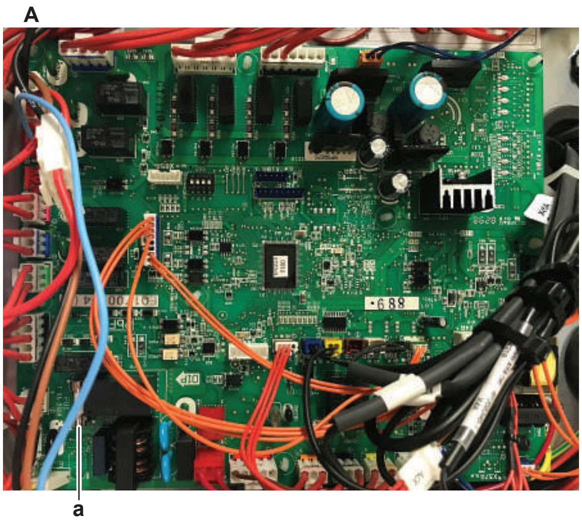
3 To install a fuse on the hydro PCB, see "4.10.2 Repair procedures" [▸ 137].

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.
> - Before replacing the fuse, check and eliminate the cause of the blown 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 CKHWS units
a Fuse

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.10.1 Checking procedures" [▶ 132] of the hydro PCB and continue with the next procedure.

4.11 Main PCB

4.11.1 Checking procedures

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

To perform a power check of the main PCB

4MWXM units

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1. Turn ON the power of the unit.
2. Measure the voltage between the brown and blue wires.

   Result: The measured voltage MUST be 230 V AC.

a Brown wire
b Blue wire

Is the measured voltage on the PCB correct?	Action
Yes	Return to "4.11.1 Checking procedures" [▶ 140] of the PCB and continue with the next procedure.
No	Continue with the next step.

3 Check the power supply to the unit, see "5.1.1 Checking procedures" [▶ 253].

Does the unit receive power?	Action
Yes	Replace the main PCB, see "4.11.2 Repair procedures" [▶ 154].
No	Adjust the power supply to the unit, see "5.1.2 Repair procedures" [▶ 256].

5MWXM

Prerequisite: Stop the unit operation via the user interface.

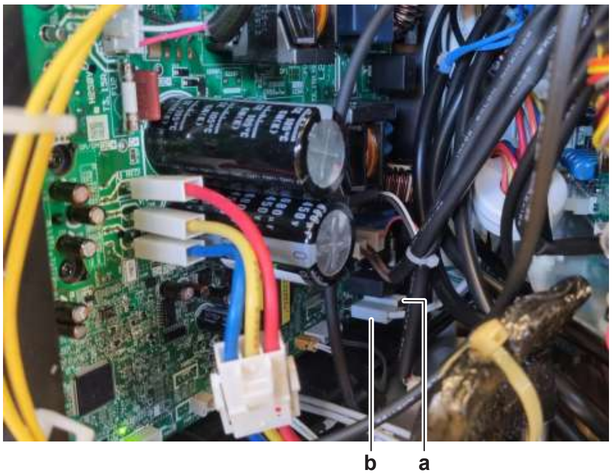
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Turn ON the power of the unit.

2 Measure the voltage between the Faston connectors of the black and white wires on the main PCB.

Result: The measured voltage MUST be 230 V AC.



a Faston connector for black wire
b Faston connector for white wire

Is the measured voltage on the PCB correct?	Action
Yes	Return to "4.11.1 Checking procedures" [▶ 140] of the PCB and continue with the next procedure.
No	Continue with the next step.

3 Check the power supply to the unit, see "5.1.1 Checking procedures" [▶ 253].

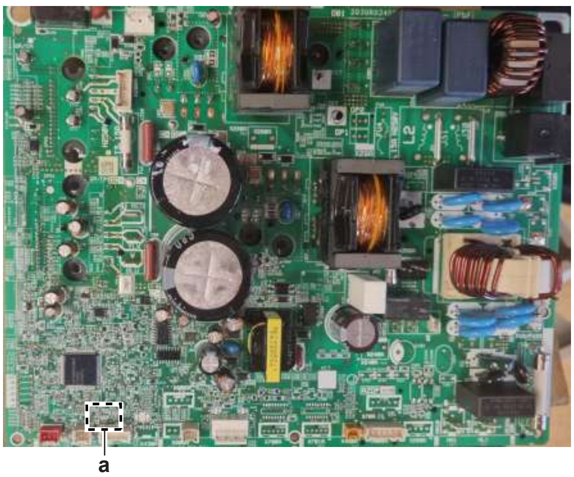
Does the unit receive power?	Action
Yes	Correct the wiring from the main power supply terminal to the main PCB, see "4.11.2 Repair procedures" [▶ 154].
No	Adjust the power supply to the unit, see "5.1.2 Repair procedures" [▶ 256].

To check the HAP LED of the main PCB

5MWXM

Prerequisite: First check the power supply to the main PCB, see "4.11.1 Checking procedures" [▶ 140].

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.

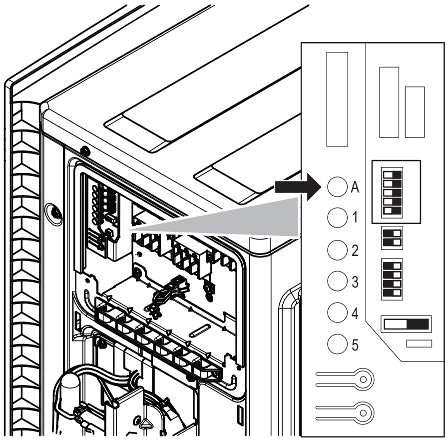
Does the HAP LED blink in regular intervals (1 second ON/1 second OFF)?	Action
Yes	Return to "4.11.1 Checking procedures" [▶ 140] of the main PCB and continue with the next procedure.
No	Replace the main PCB, see "4.11.2 Repair procedures" [▶ 154].

To perform an electrical check of the main PCB

4MWXM units

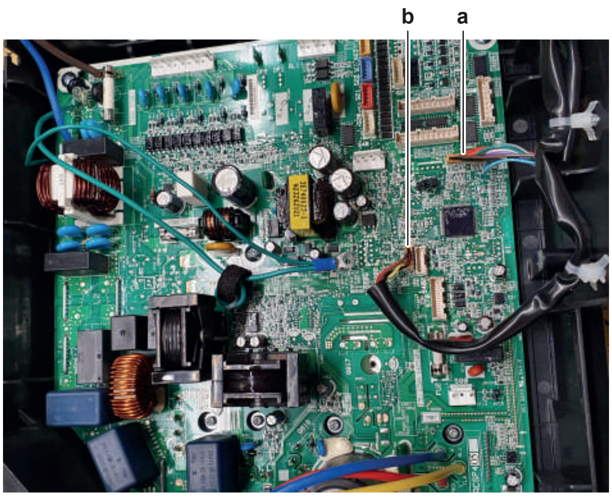
Prerequisite: First check the power supply to the main PCB, see "4.11.1 Checking procedures" [▶ 140].

1 The LED A of the service PCB acts as HAP LED for the main PCB. Locate the LED A on the service PCB.



Does the LED A blink in regular intervals (1 second ON/1 second OFF)?	Action
Yes	Return to "4.11.1 Checking procedures" [▶ 140] of the main PCB and continue with the next procedure.
No	Continue with the next step.

2 Check that the wiring harnesses are correctly connected to connectors S201 and S202 on the main PCB and connectors S501 and S502 on the service PCB. Check that the wiring is NOT damaged (continuity). Correct as needed.



a Connector S201 on main PCB
b Connector S202 on main PCB

3. If the wiring harness is found OK OR if after correction of the wiring harness, the problem is NOT solved, proceed with the following steps.
4. Measure the output voltage (= power supply for LEDs of the service PCB) between the pins 1-5 of the connector S202 on the main PCB.

   Result: The measured voltage MUST be 5 V DC.
5. Using a multimeter set to max. function, Measure the output voltage (= modulating voltage for LED A of the service PCB) between the pin 5 of the connector S202 and pin 11 of the connector S201 on the main PCB.

Result: Modulating voltage MUST be measured.

Is the measured output voltage on the main PCB correct?	Action
Yes	Replace the service PCB.
No	Replace the main PCB, see "4.11.2 Repair procedures" [▸ 154].

To check if the correct spare part is installed

Prerequisite: First perform all earlier main PCB checks, see "4.11.1 Checking procedures" [▸ 140].

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 "4.11.1 Checking procedures" [▸ 140] of the main PCB and continue with the next procedure.
No	Replace the main PCB, see "4.11.2 Repair procedures" [▸ 154].

To check the wiring of the main PCB

Prerequisite: First perform all earlier main PCB checks, see "4.11.1 Checking procedures" [▸ 140].

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 "7.2 Wiring diagram" [▸ 287].

> **INFORMATION**
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.11.1 Checking procedures" [▸ 140] of the PCB and continue with the next procedure.

To perform a check of the inverter functions of the main PCB

> **INFORMATION**
> The inverter PCB is integrated in the main PCB. To check the inverter functions of the main PCB, perform as described below.

Prerequisite: First perform all earlier main PCB checks, see "4.11.1 Checking procedures" [▸ 140].

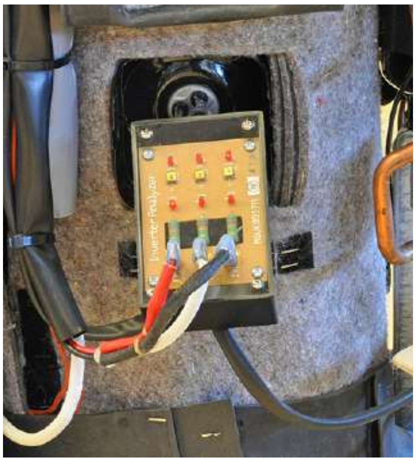
1. Remove the compressor insulation, see To remove the compressor insulation.

> **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.
3. Disconnect the wiring 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.

Connect the Faston connectors to the Inverter Analyzer (SPP number 2238609).



4 Turn ON the power of the unit.

5 Press the SW1 on the outdoor unit service PCB for 5 seconds to activate the inverter test:

CAUTION

Make sure that the Faston connectors are disconnected from the compressor wire terminals and connected to the Inverter Analyzer before starting the power transistor check operation. If NOT, power transistor check operation may damage the compressor.

INFORMATION

Wait for 3 minutes for the power transistor check operation to start.

6 All LED's on the Inverter Analyzer must lit.

7 Turn off the respective circuit breaker.

8 Wait a few minutes and confirm that the LED's of the Inverter Analyzer are off.

9 Disconnect the Inverter Analyzer from the Faston connectors.

10 Connect the Faston connectors to the wire terminals U, V and W of the compressor.

INFORMATION

Use the notes made during disconnection to connect the compressor wiring to the correct wire terminals of the compressor.

11 Install the compressor wiring terminals cover.

All LED's of the inverter analyzer are lit during inverter test?	Action
Yes	Return to "4.11.1 Checking procedures" [▸ 140] of the main PCB and continue with the next procedure.
No	Replace the main PCB, see "4.11.2 Repair procedures" [▸ 154].

To check the fuse of the main PCB

5MWXM

Prerequisite: First perform all earlier main PCB checks, see "4.11.1 Checking procedures" [▸ 140].

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

Blown fuse on the main PCB?	Action
Yes	Replace the main PCB, see "4.11.2 Repair procedures" [▸ 154].
No	Return to "4.11.1 Checking procedures" [▸ 140] of the main PCB and continue with the next procedure.

4MWXM units

Prerequisite: First perform all earlier main PCB checks, see "4.11.1 Checking procedures" [▸ 140].

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

For fuses F1U and F2U

Blown fuse on the main PCB?	Action
Yes	Replace the fuse, see "4.11.2 Repair procedures" [▶ 154].
No	Return to "4.11.1 Checking procedures" [▶ 140] of the main PCB and continue with the next procedure.

For fuse F3U

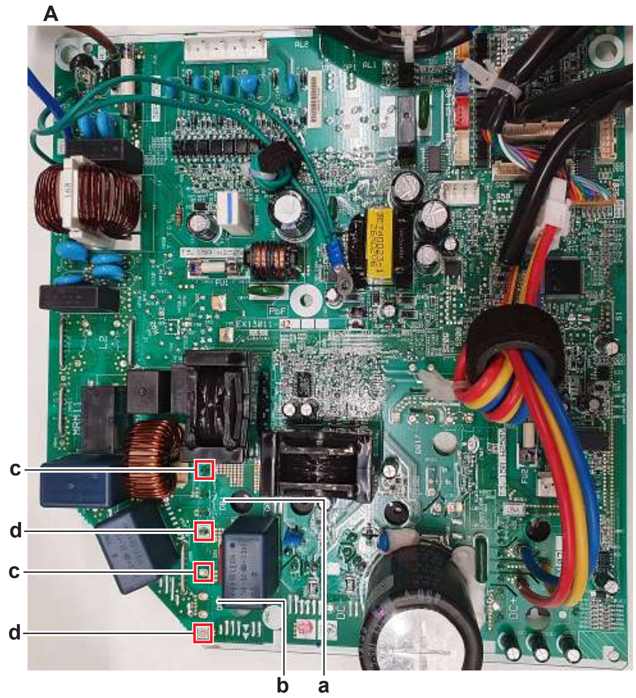
Blown fuse on the main PCB?	Action
Yes	Replace the main PCB, see "4.11.2 Repair procedures" [▶ 154].
No	Return to "4.11.1 Checking procedures" [▶ 140] of the main PCB and continue with the next procedure.

To check the rectifier voltage of the main PCB

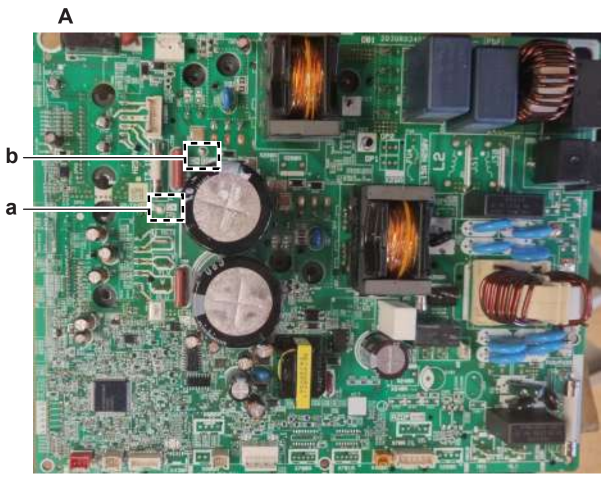
Prerequisite: First perform all earlier main PCB checks, see "4.11.1 Checking procedures" [▶ 140].

1. Turn ON the power of the unit.
2. Measure the voltage on the rectifier voltage check terminals (+ and –) on the main PCB.

   Result: The measured voltage MUST be approximately 300~350 V DC.



A 4MWXM units
a Diode module DB1
b Diode module DB2
c + terminal
d – terminal



A 5MWXM units
a + terminal
b – terminal

> **INFORMATION**
> When measuring on the front of the main PCB, make sure to locally remove (pinch) the protective varnish with the test leads of the multi meter.

Is the measured rectifier voltage correct?	Action
Yes	Perform a check of the power module, see "4.11.1 Checking procedures" [▶ 140].
No	Replace the main PCB, see "4.11.2 Repair procedures" [▶ 154].

To perform a diode module check

1 First check the rectifier voltage of the main PCB, see "4.11.1 Checking procedures" [▶ 140].

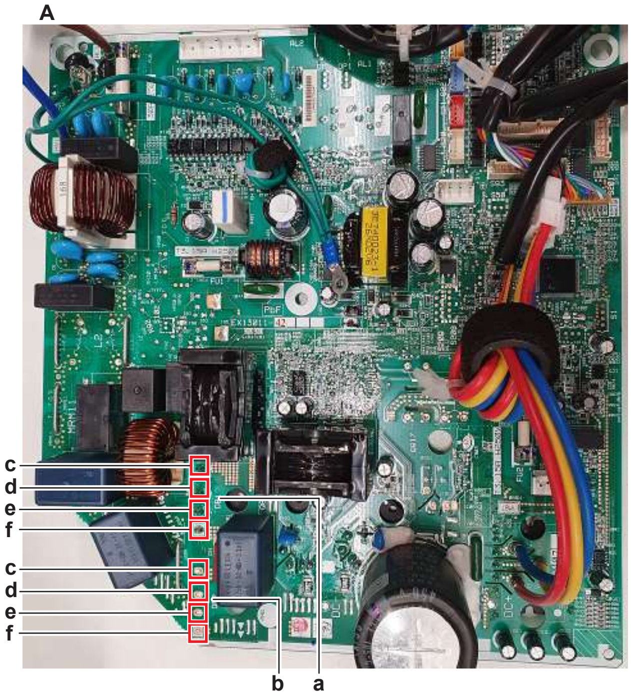
> **INFORMATION**
> If the rectifier voltage is OK, the diode module is OK. If rectifier voltage is NOT OK, replace the main PCB.
> Below procedure describes how to check the diode module itself.

Prerequisite: Stop the unit operation via the user interface.

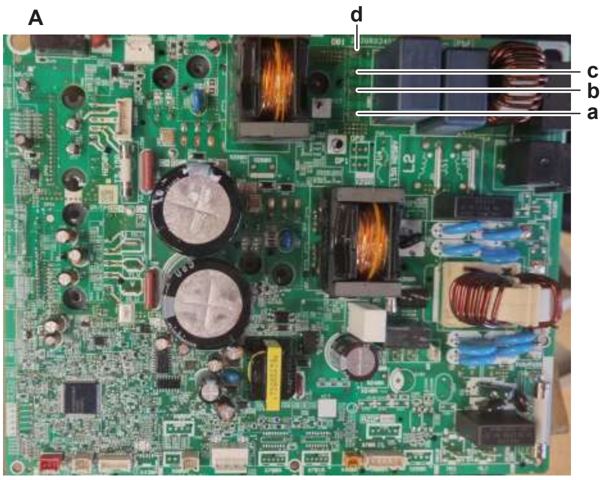
2 Turn OFF the respective circuit breaker.

> **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.

3 Check the diode module in reference with the image and the table below.



A 4MWXM units
a Diode module DB1
b Diode module DB2
c V DC out (+)
d V AC in
e V AC in
f V DC out (–)



A 5MWXM units
a V DC out (+)
b V AC in
c V AC in
d V DC out (–)

> **INFORMATION**
> When measuring on the front of the main PCB, make sure to locally remove (pinch) the protective varnish with the test leads of the multi meter.

VDC	Com	Ref	VDC	Com	Ref
d	b	0.51~0.52 V	b	d	O.L
b	a	0.51~0.52 V	a	b	O.L
d	c	0.51~0.52 V	c	d	O.L

VDC	Com	Ref	VDC	Com	Ref
c	a	0.51~0.52 V	a	c	O.L

4 If the diode module is NOT OK, replace the main PCB, see "4.11.2 Repair procedures" [▶ 154].

To perform a power module check

4MWXM units

Prerequisite: First check the rectifier voltage of the main PCB, see "4.11.1 Checking procedures" [▶ 140].

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.

Power module IPM1 for compressor

1 Disconnect the compressor connector.

2 Check the power module IPM1 in reference with the image and the table below.

a U
b V
c W
d DC+
e DC–

> **INFORMATION**
> When measuring on the front of the main PCB, make sure to locally remove (pinch) the protective varnish with the test leads of the multi meter.

VDC	Com	Ref	VDC	Com	Ref
U	DC+	0.501 V	DC+	U	O.L

VDC	Com	Ref	VDC	Com	Ref
V	DC+	0.501 V	DC+	V	O.L
W	DC+	0.501 V	DC+	W	O.L
DC–	U	0.501 V	U	DC–	O.L
DC–	V	0.501 V	V	DC–	O.L
DC–	W	0.501 V	W	DC–	O.L

Are the test results OK?	Action
Yes	Power module is OK. Return to "4.11.1 Checking procedures" [▸ 140] of the main PCB and continue with the next procedure.
No	Replace the main PCB, see "4.11.2 Repair procedures" [▸ 154].

5MWXM

Prerequisite: First check the rectifier voltage of the main PCB, see "4.11.1 Checking procedures" [▸ 140].

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.

Power module V2R for compressor

1 Disconnect the compressor Faston connectors from the main PCB.

2 Check the power module V2R in reference with the image and the table below.

a U
b V
c W
d DC+
e DC–

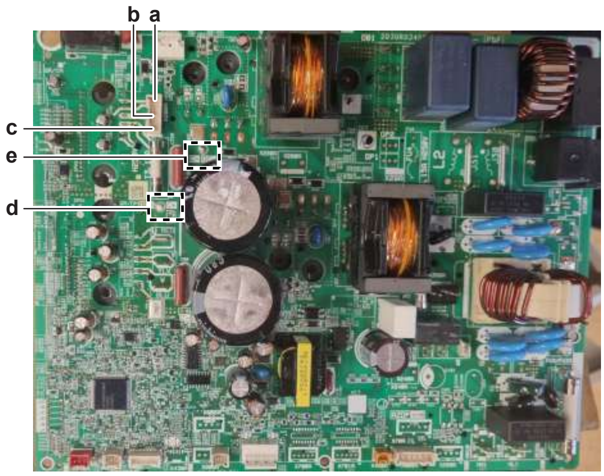
INFORMATION

When measuring on the front of the main PCB, make sure to locally remove (pinch) the protective varnish with the test leads of the multi meter.

VDC	Com	Ref	VDC	Com	Ref
U	DC+	0.501 V	DC+	U	O.L
V	DC+	0.501 V	DC+	V	O.L
W	DC+	0.501 V	DC+	W	O.L
DC–	U	0.501 V	U	DC–	O.L
DC–	V	0.501 V	V	DC–	O.L
DC–	W	0.501 V	W	DC–	O.L

Power module V3R for fan motor

1. Disconnect the fan motor connector from the main PCB.
2. Check the power module V3R in reference with the image and the table below.



a U
b V
c W
d DC+
e DC–

> **INFORMATION**
> When measuring on the front of the main PCB, make sure to locally remove (pinch) the protective varnish with the test leads of the multi meter.

VDC	Com	Ref	VDC	Com	Ref
U	DC+	0.501 V	DC+	U	O.L
V	DC+	0.501 V	DC+	V	O.L
W	DC+	0.501 V	DC+	W	O.L
DC–	U	0.501 V	U	DC–	O.L
DC–	V	0.501 V	V	DC–	O.L
DC–	W	0.501 V	W	DC–	O.L

Are the test results OK?	Action
Yes	Power module is OK. Return to "4.11.1 Checking procedures" [▸ 140] of the main PCB and continue with the next procedure.

Are the test results OK?	Action
No	Replace the main PCB, see "4.11.2 Repair procedures" [▶ 154].

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.

4.11.2 Repair procedures

To correct the wiring from the main power supply terminal to the main PCB

5MWXM

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "4.15 Plate work" [▶ 180].
2. Make sure that all wires are firmly and correctly connected, see "7.2 Wiring diagram" [▶ 287].
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 "4.11.1 Checking procedures" [▶ 140] of the PCB and continue with the next procedure.

To remove the main PCB

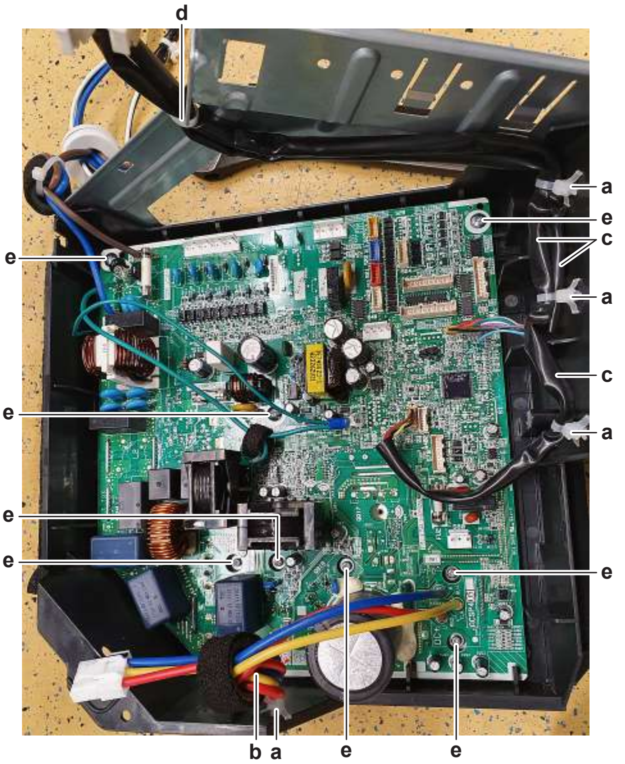
4MWXM units

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the switch box, see "4.15 Plate work" [▶ 180].

1. Unplug the fixation plugs and remove the compressor harness and wiring (for service PCB) from the switch box.



a Fixation plug
b Compressor wiring harness
c Wiring (for service PCB)
d Tie strap
e Screw (main PCB)

2. Cut the tie strap to remove the wiring (for service PCB) from the switch box.
3. Remove the screws from the main PCB.
4. Remove the main PCB from the switch box.
5. To install the main PCB, see "4.11.2 Repair procedures" [▶ 154].

5MWXM

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work (including the side plate), see "4.15 Plate work" [▶ 180].

1. Remove the top insulation from the switch box.
2. Remove the 3 screws that fix the wire terminal mounting plate (with the PCB A2P mounted on the back) to the switch box.

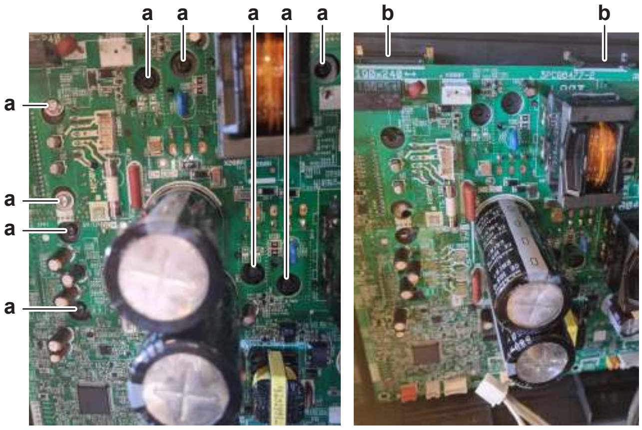
a Screw (wire terminal mounting plate)
b Screw (switch box)

3 Remove the screw that fixes the switch box to the partition plate.

4 Pull both parts of the switch box apart to create better access to the main PCB.

5 Disconnect all connectors and Faston connectors from the main PCB.

6 Remove the screws from the main PCB.



a Screw
b PCB retainer

7 Pull the 2 PCB retainers at the top to release the main PCB.

8 Remove the main PCB from the unit.

9 To install the main PCB, see "4.11.2 Repair procedures" [▸ 154].

To install the main PCB

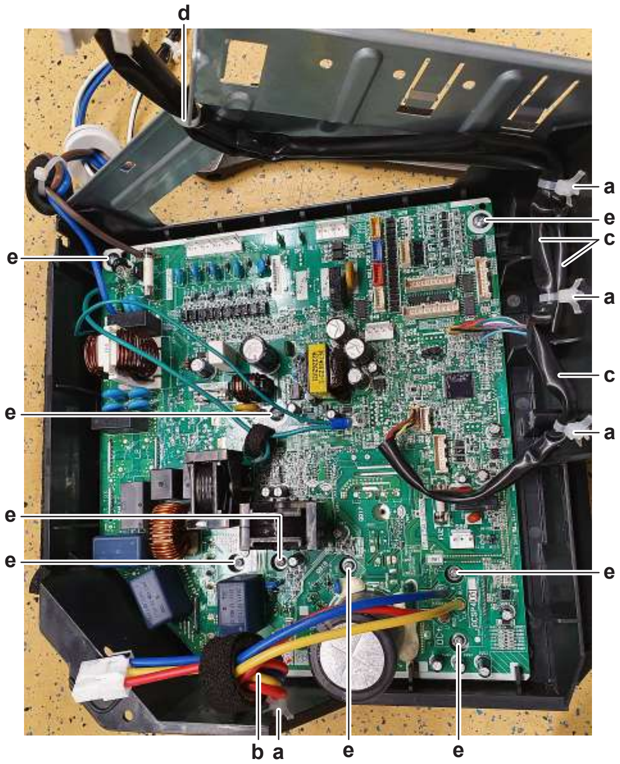
4MWXM units

1 Apply grease to the heat sink contact surface of the PCB. Distribute the grease as evenly as possible.

> **CAUTION**
> ALWAYS apply new grease on the heat sink contact surface. NOT doing so may cause the PCB to fail due to insufficient cooling.

2 Install the main PCB in the correct location in the switch box.

3 Install and tighten the screws.



a Fixation plug
b Compressor wiring harness
c Wiring (for service PCB)
d Tie strap
e Screw (main PCB)

4 Install the fixation plugs to fix the compressor harness and the wiring (for service PCB) to the switch box.

5 Install a new tie strap to fix the wiring (for service PCB) to the switch box.

6 Install the switch box, see "4.15 Plate work" [▸ 180].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.11.1 Checking procedures" [▸ 140] of the PCB and continue with the next procedure.

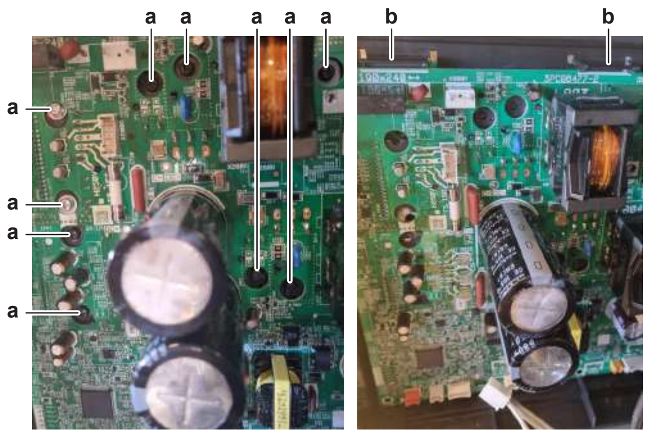
5MWXM

1 Apply grease to the heat sink contact surface of the PCB. Distribute the grease as evenly as possible.

> **CAUTION**
> ALWAYS apply new grease on the heat sink contact surface. NOT doing so may cause the PCB to fail due to insufficient cooling.

2 Install the main PCB in the correct location in the switch box. Ensure it is correctly fixed with the PCB retainers.

3 Install and tighten the screws to fix the main PCB.



a Screw
b PCB retainer

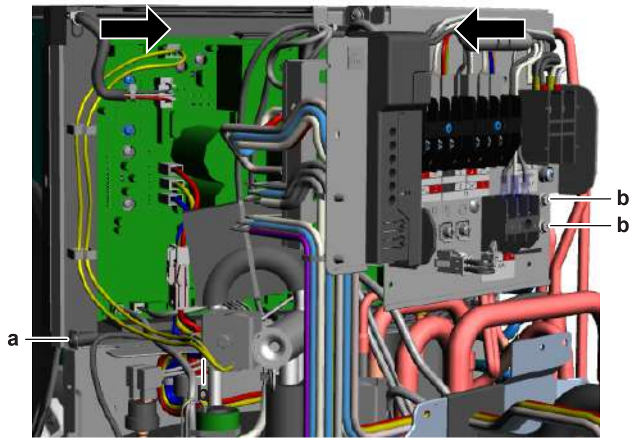
4 Connect all connectors and Faston connectors to the main PCB.

> **INFORMATION**
> Use the wiring diagram and connection diagram for correct installation of the connectors, see "7.2 Wiring diagram" [▶ 287].

> **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 Properly assemble both parts of the switch box. Make sure all wiring harnesses are properly routed.

6 Install and tighten the screw to fix the switch box to the partition plate.



a Screw (switch box)
b Screw (wire terminal mounting plate)

7 Install and tighten the 3 screws to fix the wire terminal mounting plate to the switch box.

8 Route the air thermistor (and wiring harness) to its original location.

9 Install the top insulation on the switch box.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.11.1 Checking procedures" [▶ 140] of the PCB and continue with the next procedure.

To remove a fuse of the main PCB

4MWXM units

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Remove the fuse from the PCB.

a Fuse F1U
b Fuse F2U

2 To install a fuse on the main PCB, see "4.11.2 Repair procedures" [▶ 154].

To install a fuse on the main PCB

4MWXM units

> **WARNING**
> - For continued protection against risk of fire, replace ONLY with same type and rating of fuse.
> - Before replacing the fuse, check and eliminate the cause of the blown 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 F1U
b Fuse F2U

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.11.1 Checking procedures" [▶ 140] of the PCB and continue with the next procedure.

4.12 Outdoor unit fan motor

4.12.1 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 "4.15 Plate work" [▶ 180].

1. If propeller fan blade touches the bell mouth, check if the fan motor is correctly mounted on its base, see "4.12.2 Repair procedures" [▶ 164].
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 "4.12.2 Repair procedures" [▶ 164].

Is the propeller fan blade assembly damaged?	Action
No	Perform a mechanical check of the fan motor assembly, see "4.12.1 Checking procedures" [▶ 160].

To perform a mechanical check of the fan motor assembly

Prerequisite: First perform a mechanical check of the propeller fan blade assembly, see "4.12.1 Checking procedures" [▶ 160].

1. Visually check:
   - For any burnt-out part or wire. If found, replace the fan motor, see "4.12.2 Repair procedures" [▶ 164].
   - 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 fan motor shaft bearing.

Is the fan motor shaft friction normal?	Action
Yes	Perform an electrical check of the fan motor assembly, see "4.12.1 Checking procedures" [▶ 160].
No	Replace the fan motor assembly, see "4.12.2 Repair procedures" [▶ 164].

To perform an electrical check of the fan motor assembly

1. First perform a mechanical check of the fan motor assembly, see "4.12.1 Checking procedures" [▶ 160].

> **INFORMATION**
> Check the 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)	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.

4MWXM units

> **INFORMATION**
> The fan motor connector MUST be plugged into the appropriate PCB.

1. Confirm via the service monitoring tool that the fan motor assembly receives an ON signal.
2. Turn OFF the unit via the user interface.

3 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.

4 Disconnect the fan motor connector S70 and measure the resistance on the connector pins shown below. The measured resistance MUST be:

VDC	Comm	Resistance
1	4	>1 MΩ
2	4	>100 kΩ
3	4	>100 Ω
7	4	>100 kΩ

INFORMATION

The measured resistance values may deviate from the listed values due to instability during the measurements.

Fan motor resistance measurements are correct?	Action
Yes	Continue with the next step.
No	Replace the fan motor, see "4.12.2 Repair procedures" [▶ 164].

5 Turn ON the power of the unit.

6 With the fan motor connector S70 disconnected from the main PCB, measure the voltage on the connector pins 4-7 (= fan motor power supply) on the main PCB.

Result: The voltage MUST be 200~390 V DC.

7 Measure the voltage on the connector pins 4-3 (= fan motor control) 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 "4.11.1 Checking procedures" [▶ 140].

8 Measure the voltage on the fan motor connector S70 pins 2-4 (= rotation command) on the PCB.

Result: The measured voltage should be 0~7.5 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 "4.11.1 Checking procedures" [▶ 140].
No	Continue with the next step.

9 Connect the 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.

10 Manually (slowly) rotate the fan blade propeller 1 turn and measure the voltage on the fan motor connector pins 1-4.

Result: 4 pulses MUST be measured.

Pulses are measured during fan blade propeller rotation?	Action
Yes	Perform a check of the main PCB, see "4.11.1 Checking procedures" [▶ 140].
No	Replace the fan motor, see "4.12.2 Repair procedures" [▶ 164].

5MWXM

> **INFORMATION**
> The fan motor connector MUST be plugged into the appropriate PCB.

1 Confirm via the service monitoring tool that the fan motor assembly receives an ON signal.

2 Turn OFF the unit via the user interface.

3 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.

4 Unplug the fan motor connector from the PCB and measure the resistance between the pins 1-3, 1-5, and 3-5 of the fan motor connector.

Result: All measurements MUST be:

Unit	Resistance (at 20°C)
4MWXM	20.6~22.8 Ω
5MWXM	17.1~18.9 Ω

> **INFORMATION**
> Winding resistance values above are given for reference. You should NOT be reading a value in kΩ or a short-circuit. Make sure that the propeller fan blade does NOT rotate, as this could affect resistance measurements.

5 Set the Megger voltage to 500 V DC or 1000 V DC.

6 Measure the insulation resistance for the motor terminals. Measurements between each phase and fan motor body (e.g. axle) MUST be >1000 MΩ.

Are the measured resistance values correct?	Action
Yes	Perform a check of the main PCB, see "4.11 Main PCB" [▶ 140].
No	Replace the fan motor, see "4.12.2 Repair procedures" [▶ 164].

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.

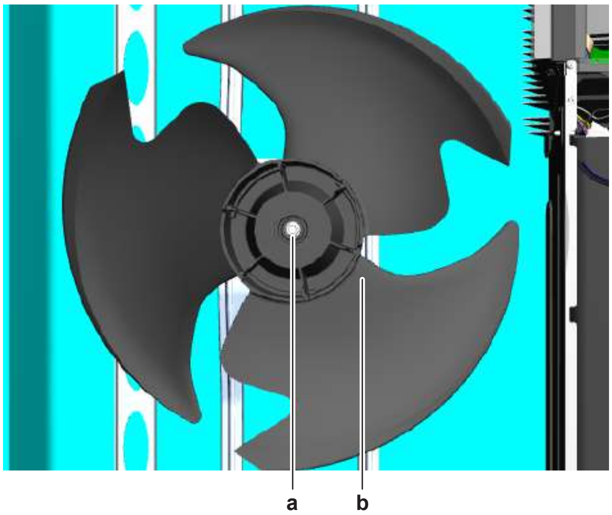
4.12.2 Repair procedures

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 "4.15 Plate work" [▶ 180].
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 fan motor assembly.

INFORMATION

Use a pulley remover if the propeller cannot be removed manually.

4. To install the propeller fan blade assembly, see "4.12.2 Repair procedures" [▶ 164].

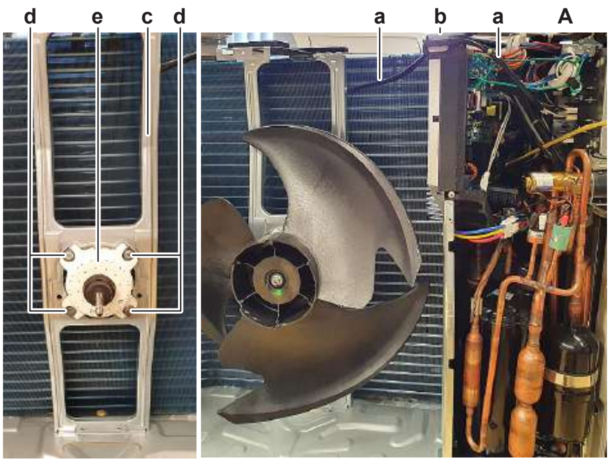
To remove the fan motor assembly

1. Remove the propeller fan blade assembly from the fan motor assembly, see "4.12.2 Repair procedures" [▶ 164].

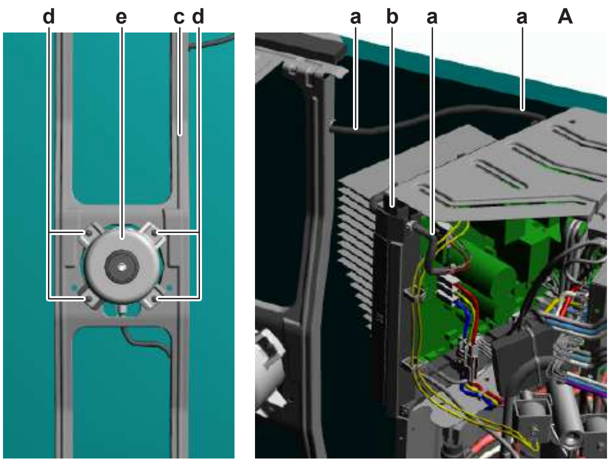
DANGER: RISK OF ELECTROCUTION

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 fan motor connector from the main PCB.
3. Detach the fan motor harness from the switch box.



A 4MWXM units
a Fan motor harness
b Switch box
c Fan motor bracket
d Screw
e Fan motor assy

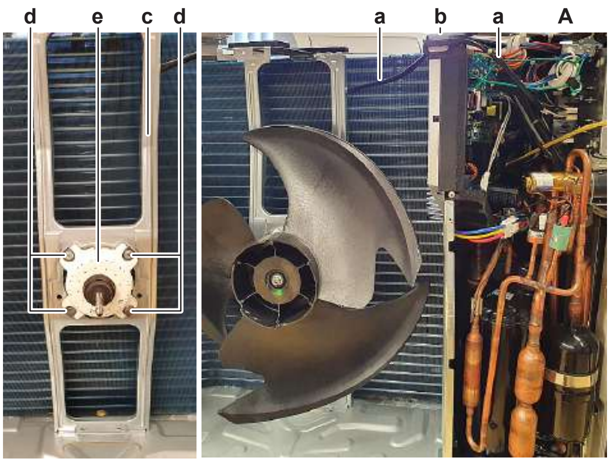


A 5MWXM units
a Fan motor harness
b Switch box
c Fan motor bracket
d Screw
e Fan motor assy

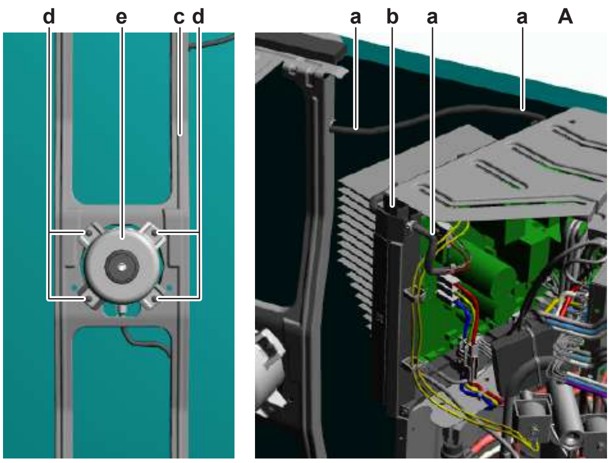
4. Slightly bend the harness retainers (at the back of the fan motor bracket) to detach the fan motor harness.
5. Remove the 4 screws that fix the fan motor assembly.
6. Remove the fan motor assembly from the unit.
7. To install the fan motor assembly, see "4.12.2 Repair procedures" [▶ 164].

To install the fan motor assembly

1. Install the fan motor assembly in the correct location.
2. Fix the fan motor assembly to the unit by tightening the screws.



A 4MWXM units
a Fan motor harness
b Switch box
c Fan motor bracket
d Screw
e Fan motor assy



A 5MWXM units
a Fan motor harness
b Switch box
c Fan motor bracket
d Screw
e Fan motor assy

3 Route the fan motor harness through the harness retainers (at the back of the fan motor bracket) and bend the harness retainers to attach the fan motor harness.

4 Attach the fan motor harness to the switch box.

5 Connect the fan motor connector to the connector on the main PCB.

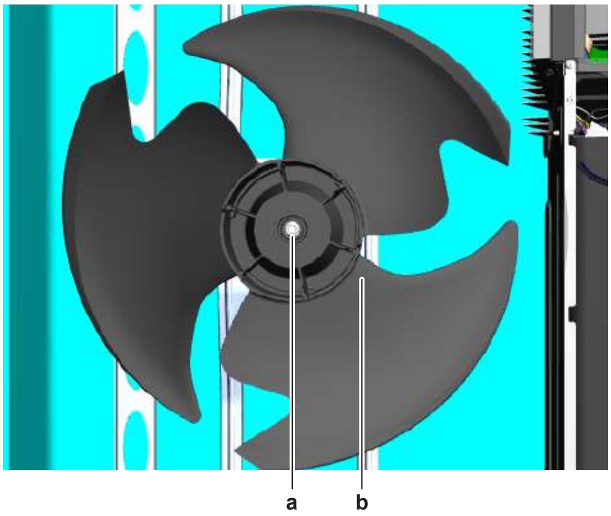
6 Install the propeller fan blade assembly, see "4.12.2 Repair procedures" [▶ 164].

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 "4.12.1 Checking procedures" [▶ 160] of the outdoor unit fan motor and continue with the next procedure.

4.13 Outdoor unit heat exchanger

4.13.1 Checking procedures

To perform a mechanical check of the outdoor unit heat exchanger

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Visually check:

- For any signs of damage or corrosion. Replace the heat exchanger as needed, see "4.13.2 Repair procedures" [▶ 168].
- For bended air fins. Straighten as needed.

2 Check the heat exchanger for leaks. Use soap test method.

CAUTION

Do NOT use soap containing Chlorine or Sulfide as this may result in corrosion of the copper piping.

Any leaks found?	Action
Yes	Replace the outdoor unit heat exchanger, see "4.13.2 Repair procedures" [▶ 168].
No	Heat exchanger is OK. Return to the troubleshooting of the specific error and continue with the next step.

4.13.2 Repair procedures

To remove the outdoor unit heat exchanger

4MWXM units

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

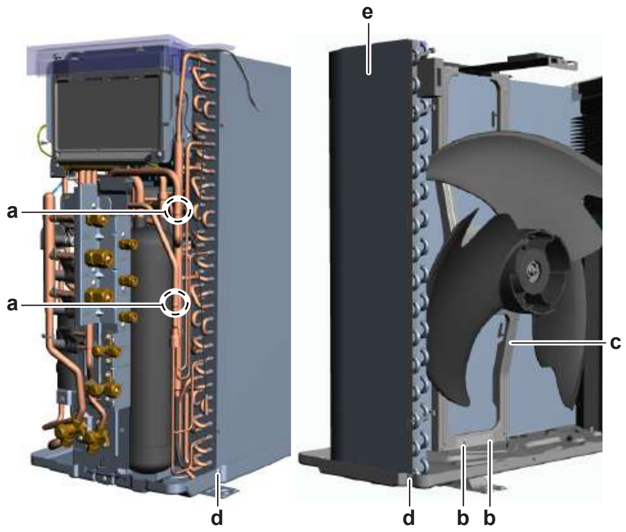
Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

1. If needed, remove any parts to create more space for the removal of the heat exchanger.
2. Remove the putty and insulation from the appropriate piping.
3. Remove the heat exchanger thermistor and air thermistor from their holder.
4. Remove the screws and remove the guard nets from the unit.

a Heat exchanger thermistor
b Outdoor air thermistor
c Guard net
d Screw
e Support plate

5. Remove the 2 screws and remove the support plate.
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 heat exchanger pipes. Heat the brazing point of the heat exchanger pipes using an oxygen acetylene torch and remove the heat exchanger pipes from the refrigerant pipes using pliers.



a Heat exchanger pipe
b Screw (fan motor mounting bracket)
c Fan motor mounting bracket
d Screw (heat exchanger)
e Heat exchanger

8. 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.

9. Install plugs or caps on the open pipe ends to avoid dirt or impurities from entering the piping.
10. Disconnect the fan motor connector from the main PCB.
11. Slightly bend the harness retainers and detach the fan motor harness from the switch box.
12. Carefully remove the 2 screws from the fan motor mounting bracket while supporting it. Remove the fan motor mounting bracket (with fan motor and propeller fan blade installed) from the unit.
13. Remove the 2 screws that fix the heat exchanger to the bottom plate of the unit.
14. Remove the heat exchanger from the unit.
15. To install the outdoor unit heat exchanger, see "4.13.2 Repair procedures" [▶ 168].

5MWXM

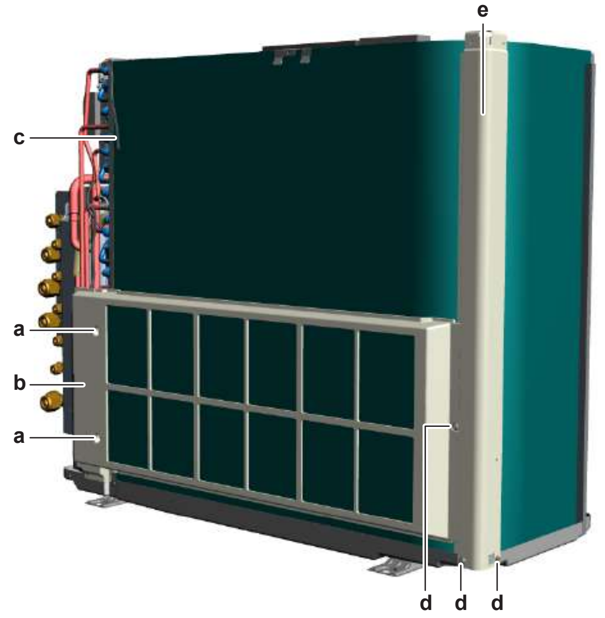
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

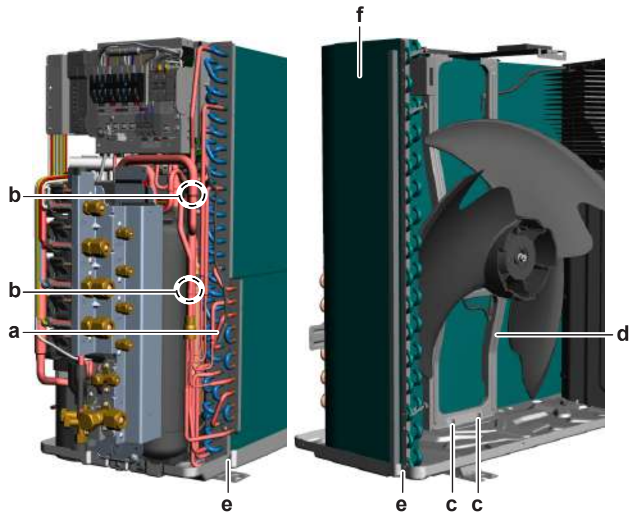
Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

1. If needed, remove any parts to create more space for the removal of the heat exchanger.
2. Remove the 2 screws that fix the suction grille at the back side of the unit.



a Screw (suction grille)
b Suction grille
c Outdoor air thermistor
d Screw (support plate)
e Support plate

3. Carefully pull the suction grille and unhook it from the support plate to remove it from the unit.
4. Remove the putty and insulation from the appropriate piping.
5. Remove the heat exchanger thermistor and air thermistor from their holder.
6. Remove the 3 screws and remove the support plate.
7. Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.
8. Wrap a wet rag around the components near the heat exchanger pipes. Heat the brazing point of the heat exchanger pipes using an oxygen acetylene torch and remove the heat exchanger pipes from the refrigerant pipes using pliers.



a Heat exchanger thermistor
b Heat exchanger pipe
c Screw (fan motor mounting bracket)
d Fan motor mounting bracket
e Screw (heat exchanger)
f Heat exchanger

9 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.

10 Install plugs or caps on the open pipe ends to avoid dirt or impurities from entering the piping.

11 Disconnect the fan motor connector from the main PCB.

12 Detach the fan motor harness from the switch box.

13 Carefully remove the 2 screws from the fan motor mounting bracket while supporting it. Remove the fan motor mounting bracket (with fan motor and propeller fan blade installed) from the unit.

14 Remove the 2 screws that fix the heat exchanger to the bottom plate of the unit.

15 Remove the heat exchanger from the unit.

16 To install the outdoor unit heat exchanger, see "4.13.2 Repair procedures" [▶ 168].

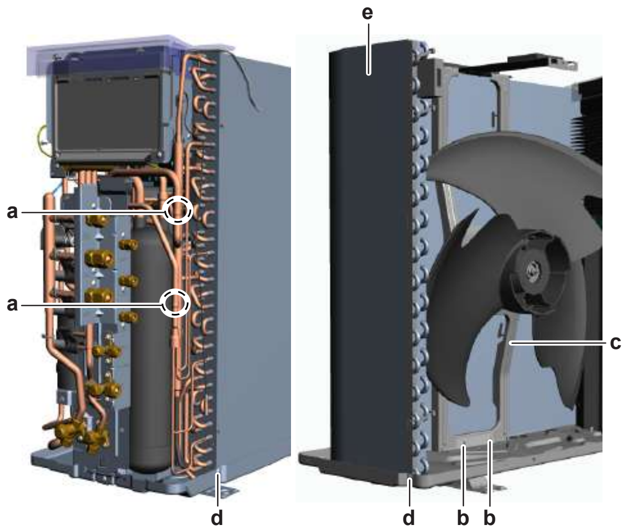
To install the outdoor unit heat exchanger

4MWXM units

1 Remove the plugs or caps from the refrigerant piping and make sure they are clean.

2 Install the heat exchanger in the correct location on the bottom plate. Make sure to correctly insert the pipe ends in the pipe expansions.

3 Install and tighten the 2 screws to fix the heat exchanger to the bottom plate.



a Heat exchanger pipe
b Screw (fan motor mounting bracket)
c Fan motor mounting bracket
d Screw (heat exchanger)
e Heat exchanger

4 Carefully install the fan motor mounting bracket (with fan motor and propeller fan blade installed) in the correct location. Install and tighten the 2 screws to fix the fan motor mounting bracket.

5 Route the fan motor harness through the harness retainers and bend the harness retainers to attach the fan motor harness to the switch box.

6 Connect the fan motor connector to the connector on the main PCB.

7 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

8 Wrap a wet rag around the components near the heat exchanger and solder the heat exchanger pipes to the refrigerant pipes.

9 After soldering is done, stop the nitrogen supply after the component has cooled-down.

10 Install the support plate. Install and tighten the 2 screws to fix the support plate.

a Heat exchanger thermistor
b Outdoor air thermistor
c Guard net
d Screw
e Support plate

11 Install the guard nets. Install and tighten the screws to fix the guard nets.

12 Install the heat exchanger thermistor and air thermistor in their holder.

13 Install the putty and insulation on the appropriate piping.

14 Perform a pressure test, see "5.2.1 Checking procedures" [▶ 257].

15 Add refrigerant to the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

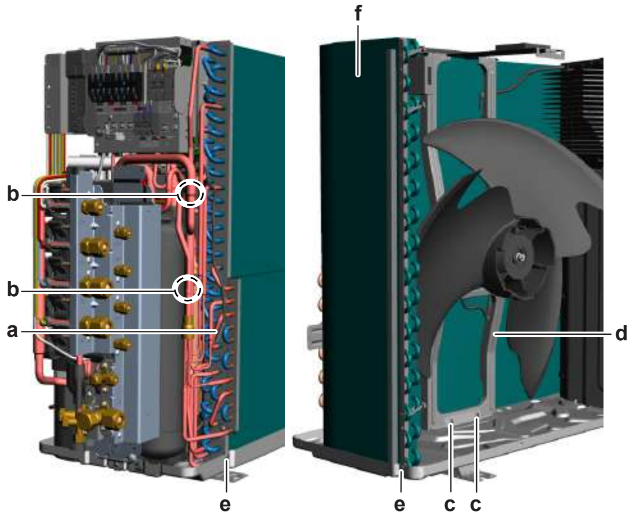
Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

5MWXM

1 Remove the plugs or caps from the refrigerant piping and make sure they are clean.

2 Install the heat exchanger in the correct location on the bottom plate. Make sure to correctly insert the pipe ends in the pipe expansions.

3 Install and tighten the 2 screws to fix the heat exchanger to the bottom plate.



a Heat exchanger thermistor
b Heat exchanger pipe
c Screw (fan motor mounting bracket)
d Fan motor mounting bracket
e Screw (heat exchanger)
f Heat exchanger

4 Carefully install the fan motor mounting bracket (with fan motor and propeller fan blade installed) in the correct location. Install and tighten the 2 screws to fix the fan motor mounting bracket.

5 Route the fan motor harness through the harness retainers to attach the fan motor harness to the switch box.

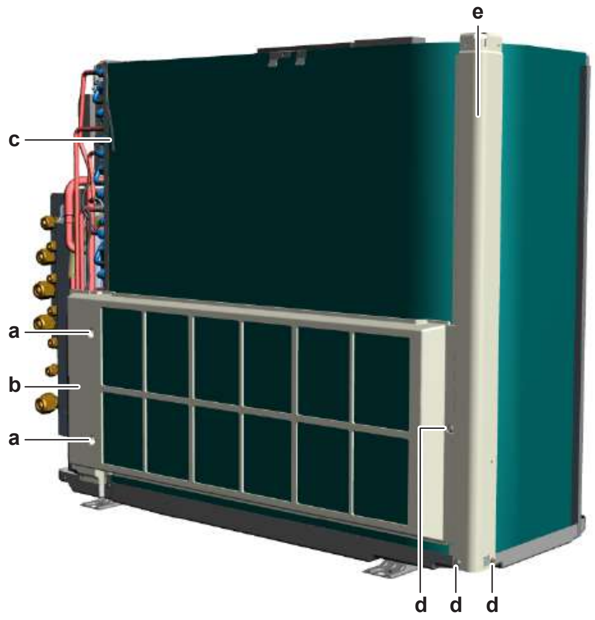
6 Connect the fan motor connector to the connector on the main PCB.

7 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa.

8 Wrap a wet rag around the components near the heat exchanger and solder the heat exchanger pipes to the refrigerant pipes.

9 After soldering is done, stop the nitrogen supply after the component has cooled-down.

10 Install the support plate. Install and tighten the 3 screws to fix the support plate.



a Screw (suction grille)
b Suction grille
c Outdoor air thermistor
d Screw (support plate)
e Support plate

11 Install the heat exchanger thermistor and air thermistor in their holder.

12 Install the putty and insulation on the appropriate piping.

13 Insert the hooks of the suction grille in the appropriate slots of the support plate. Ensure they are correctly fitted.

14 Carefully install the suction grille in the correct location at the back side of the unit.

15 Install and tighten the 2 screws to fix the suction grille.

16 Perform a pressure test, see "5.2.1 Checking procedures" [▶ 257].

17 Add refrigerant to the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

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.

4.14 PCB A2P

4.14.1 Checking procedures

INFORMATION

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

To perform a power check of the PCB A2P

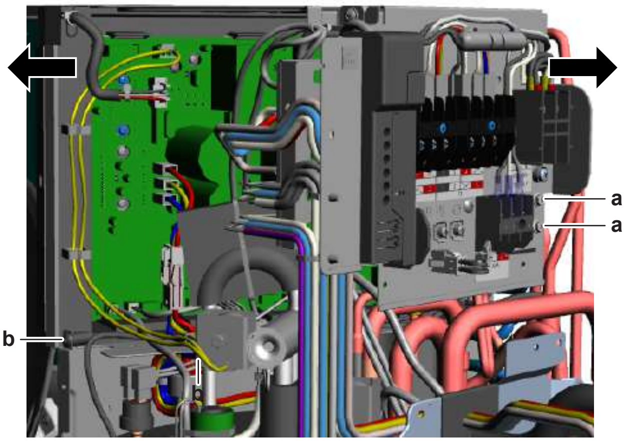
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work (including the side plate, but leave power wiring connected), see "4.15 Plate work" [▶ 180].

2 Remove the top insulation from the switch box.

3 Remove the 3 screws that fix the wire terminal mounting plate (with the PCB A2P mounted on the back) to the switch box.



a Screw (wire terminal mounting plate)
b Screw (switch box)

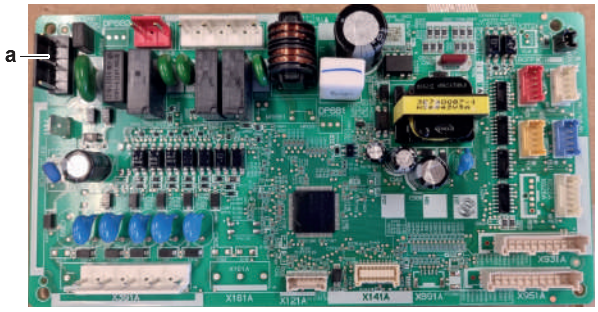
4 Remove the screw that fixes the switch box to the partition plate.

5 Pull both parts of the switch box apart to create better access to the PCB A2P.

6 Turn ON the power of the unit.

7 Measure the voltage between the pins 5-3 of connector X1A on the PCB A2P.

Result: The measured voltage MUST be 230 V AC.



a Connector X1A

Is the measured voltage on the PCB A2P correct?	Action
Yes	Return to "4.14.1 Checking procedures" [▶ 174] of the PCB A2P and continue with the next procedure.
No	Continue with the next step.

8 Measure the output voltage between the pins 1-3 of connector X300A on the main PCB.

Result: The measured voltage MUST be 230 V AC.

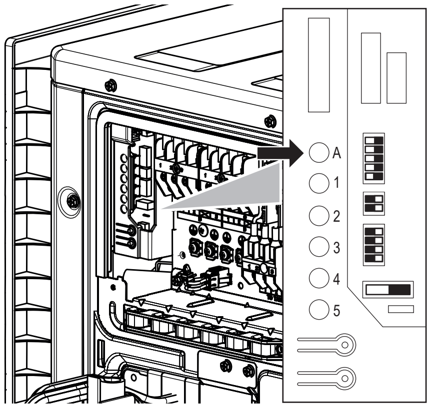
Is the measured output voltage on the main PCB correct?	Action
Yes	Correct the wiring between the main PCB and the PCB A2P, see "5.1.2 Repair procedures" [▶ 256].

Is the measured output voltage on the main PCB correct?	Action
No	Perform a check of the main PCB, see "4.11.1 Checking procedures" [▸ 140].

To perform an electrical check of the PCB A2P

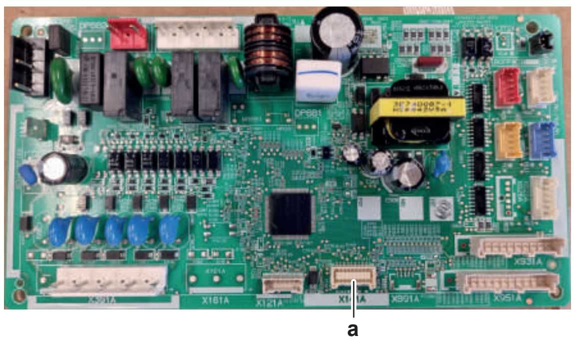
Prerequisite: First perform a power check of the PCB A2P, see "4.14.1 Checking procedures" [▸ 174].

1 The LED A of the service PCB acts as HAP LED for the PCB A2P. Locate the LED A on the service PCB.



Does the LED A blink in regular intervals (1 second ON/1 second OFF)?	Action
Yes	Return to "4.14.1 Checking procedures" [▸ 174] of the PCB A2P and continue with the next procedure.
No	Continue with the next step.

2 Check that the wiring harness is correctly connected to connector X141A on the PCB A2P and connectors S501 and S502 on the service PCB. Check that the wiring is NOT damaged (continuity). Correct as needed.



a Connector X141A on PCB A2P

3 If the wiring harness is found OK OR if after correction of the wiring harness, the problem is NOT solved, proceed with the following steps.

4 Measure the output voltage (= power supply for LEDs of the service PCB) between the pins 1-5 of the connector X141A on the PCB A2P.

Result: The measured voltage MUST be 5 V DC.

5 Using a multimeter set to max. function, Measure the output voltage (= modulating voltage for LED A of the service PCB) between the pins 5-8 of the connector X141A on the PCB A2P.

Result: Modulating voltage MUST be measured.

Is the measured output voltage on the PCB A2P correct?	Action
Yes	Replace the service PCB.
No	Replace the PCB A2P, see "4.14.2 Repair procedures" [▸ 178].

To check if the correct spare part is installed

Prerequisite: First perform all earlier checks of the PCB A2P, see "4.14.1 Checking procedures" [▸ 174].

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 PCB A2P installed?	Action
Yes	Return to "4.14.1 Checking procedures" [▸ 174] of the PCB A2P and continue with the next procedure.
No	Replace the PCB A2P, see "4.14.2 Repair procedures" [▸ 178].

To check the wiring of the PCB A2P

Prerequisite: First perform all earlier checks of the PCB A2P, see "4.14.1 Checking procedures" [▸ 174].

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 "7.2 Wiring diagram" [▸ 287].

> **INFORMATION**
>
> Correct the wiring as needed.

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.14.1 Checking procedures" [▸ 174] of the PCB A2P 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.

4.14.2 Repair procedures

To remove the PCB A2P

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work (including the side plate), see "4.15 Plate work" [▶ 180].

1 Remove the top insulation from the switch box.

2 Remove the 3 screws that fix the wire terminal mounting plate (with the PCB A2P mounted on the back) to the switch box.

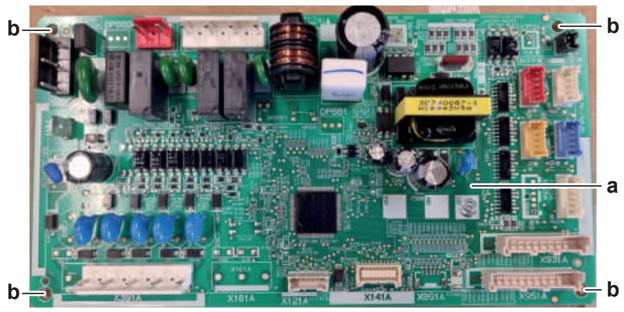
a Screw (wire terminal mounting plate)
b Screw (switch box)

3 Remove the screw that fixes the switch box to the partition plate.

4 Pull both parts of the switch box apart to create better access to the PCB A2P.

5 Disconnect ALL connectors from the PCB A2P.

6 Carefully pull the PCB at the side and unlatch all PCB supports one by one using small pliers.



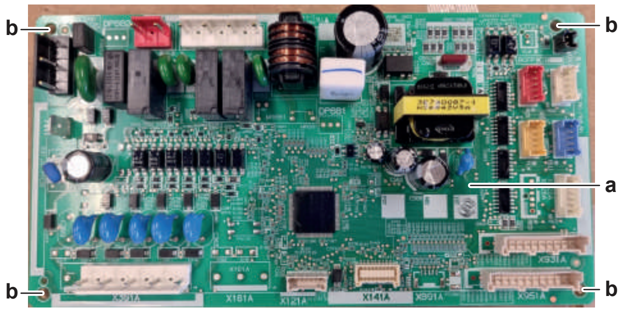
a PCB A2P
b PCB support location

7 Remove the PCB A2P from the unit.

8 To install the PCB A2P, see "4.14.2 Repair procedures" [▶ 178].

To install the PCB A2P

1. Install the PCB A2P in the correct location in the unit.
2. Correctly install the PCB on the PCB supports.



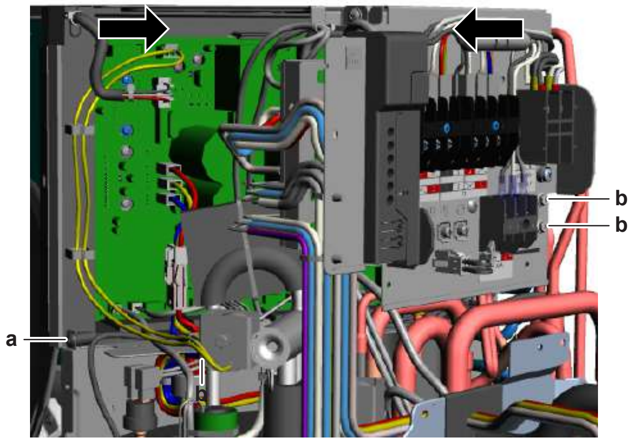
a PCB A2P
b PCB support location

3. Connect all connectors to the PCB A2P.

> **INFORMATION**
> Use the wiring diagram and connection diagram for correct installation of the connectors, see "7.2 Wiring diagram" [▸ 287].

> **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. Properly assemble both parts of the switch box. Make sure all wiring harnesses are properly routed.
5. Install and tighten the screw to fix the switch box to the partition plate.



a Screw (switch box)
b Screw (wire terminal mounting plate)

6. Install and tighten the 3 screws to fix the wire terminal mounting plate to the switch box.
7. Route the air thermistor (and wiring harness) to its original location.
8. Install the top insulation on the switch box.

Is the problem solved?	Action
Yes	No further actions required.

Is the problem solved?	Action
No	Return to "4.14.1 Checking procedures" [▶ 174] of the PCB A2P and continue with the next procedure.

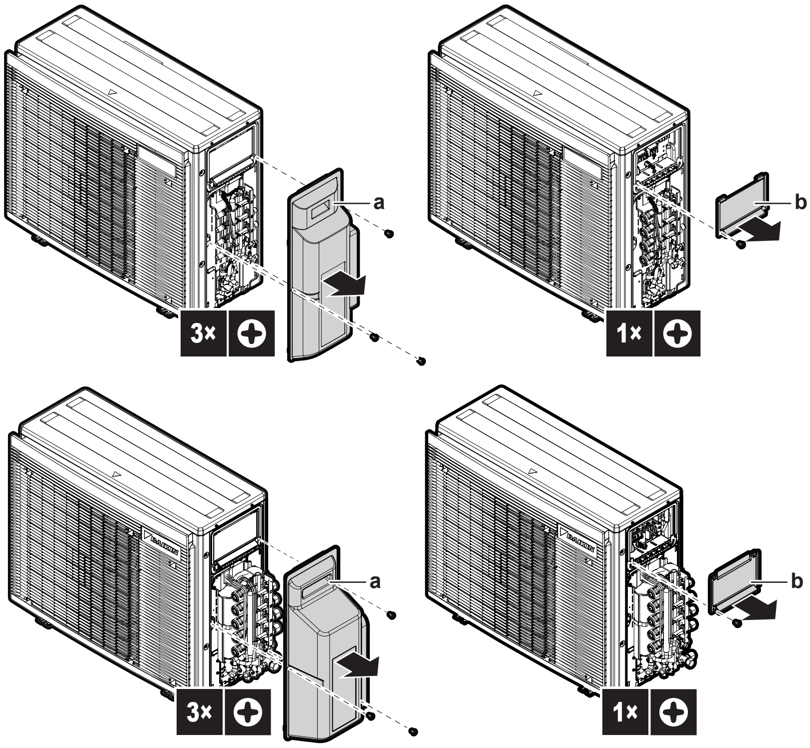
4.15 Plate work

4.15.1 Outdoor unit

To remove the refrigerant connection cover

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING/SCALDING



To remove the top plate

INFORMATION

This procedure is just an example and may differ on some details for your actual unit.

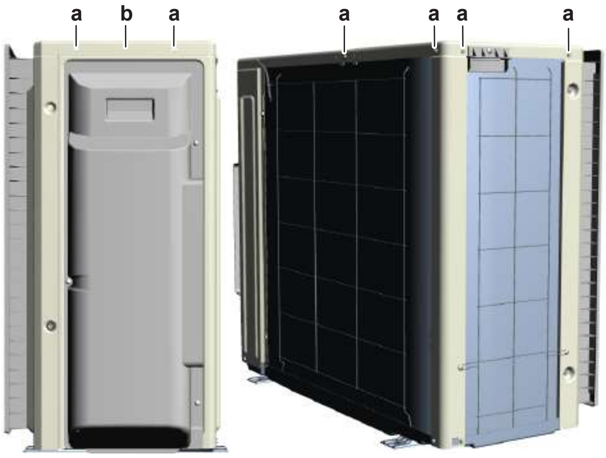
Prerequisite: Stop the unit operation via the user interface.

1 Turn OFF the respective circuit breaker.

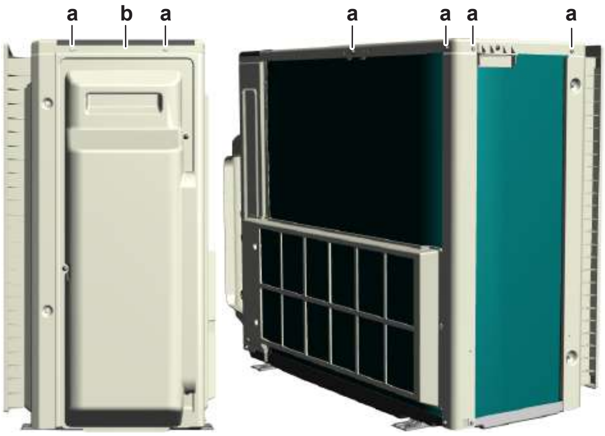
DANGER: RISK OF ELECTROCUTION

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 Loosen and remove the screws that fix the top plate.



a Screw
b Top plate



a Screw
b Top plate

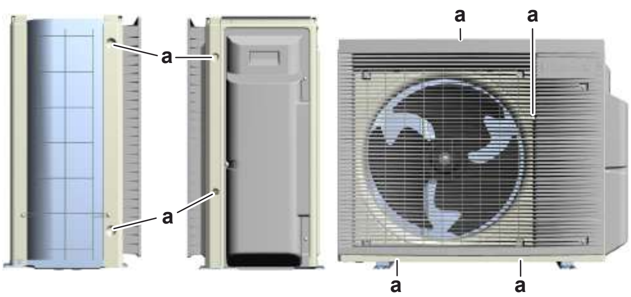
3 Remove the top plate.

To remove the front plate

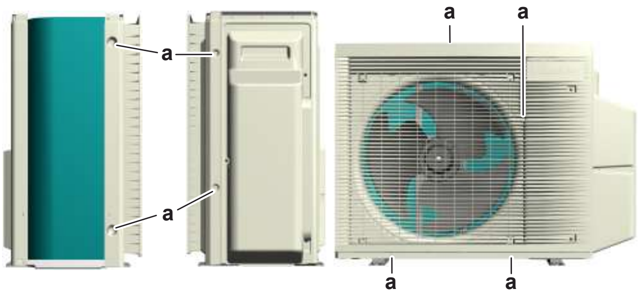
> **INFORMATION**
> This procedure is just an example and may differ on some details for your actual unit.

Prerequisite: Remove the top plate, see "4.15 Plate work" [▶ 180].

1 Loosen and remove the screws that fix the front plate.



a Screw



a Screw

2 Remove the front plate.

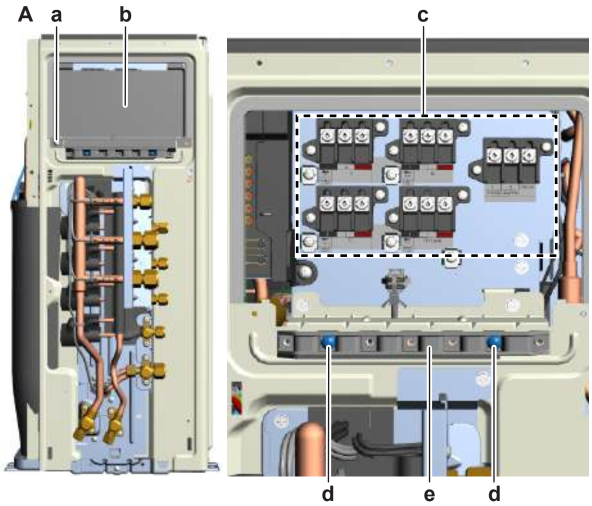
To remove the side plate

Prerequisite: Stop the unit operation via the user interface.

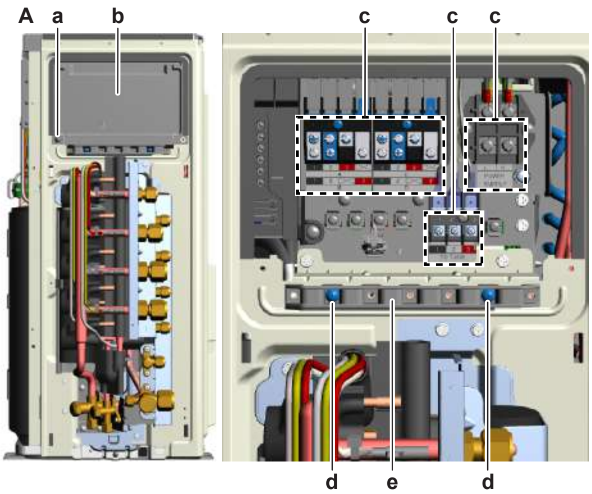
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the refrigerant connection cover, top plate and front plate, see "4.15 Plate work" [▶ 180].

1 Remove the screw that fixes the terminal protection plate and remove the plate.



A 4MWXM units
a Screw (terminal protection plate)
b Terminal protection plate
c Wire terminals
d Screw (wire clamp)
e Wire clamp



A 5MWXM units
a Screw (terminal protection plate)
b Terminal protection plate
c Wire terminals
d Screw (wire clamp)
e Wire clamp

2 Disconnect all electrical wiring from the wire terminals. The number of wire terminals (for power supply towards indoor units) differs depending on the unit.

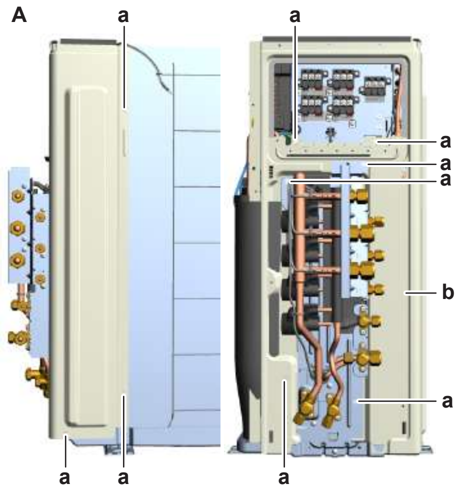
3 Disconnect all ground wires.

4 Remove the 2 screws that fix the wire clamp.

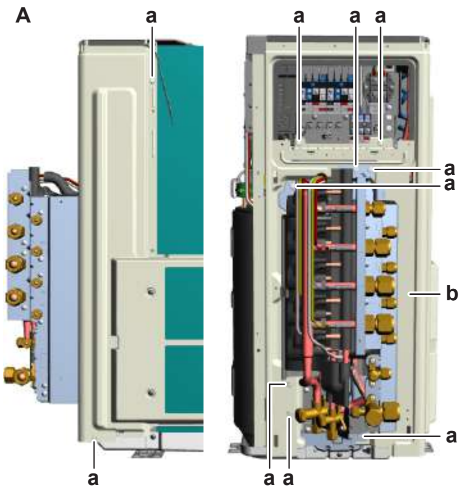
5 Remove the wire clamp.

6 Detach the air thermistor from the guard net (if applicable) and the side plate.

7 Remove the screws that fix the right side plate assembly.



A 4MWXM units
a Screw (side plate)
b Side plate



A 5MWXM units
a Screw (side plate)
b Side plate

8 Remove the side plate assembly.

> **INFORMATION**
> Re-connect the power supply wiring as needed to operate the unit with the side plate removed (e.g. component check).

To remove the switch box

4MWXM units

Prerequisite: Stop the unit operation via the user interface.

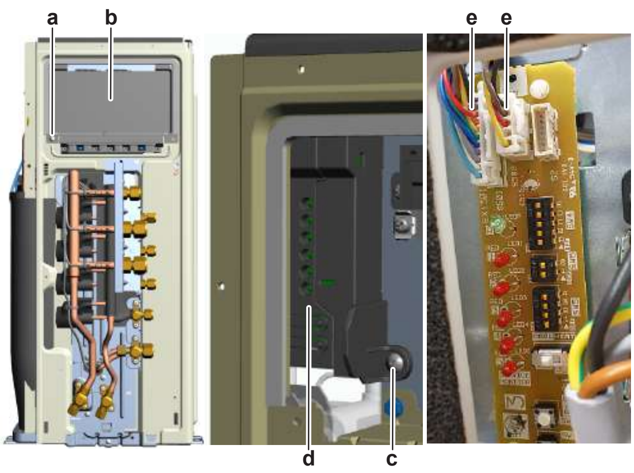
Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "4.15 Plate work" [▶ 180].

> **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 top insulation from the switch box.

3 Remove the screw that fixes the terminal protection plate and remove the plate.

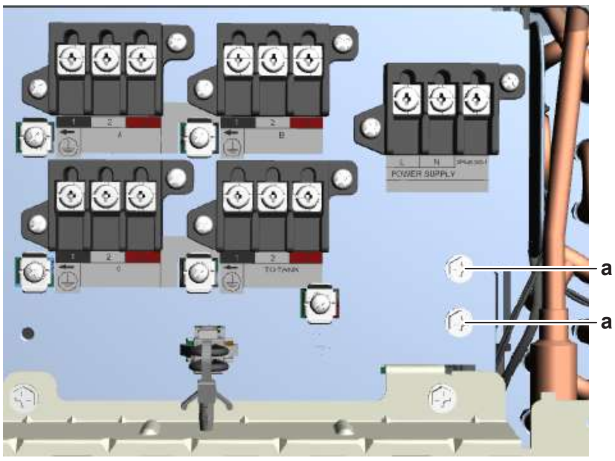


a Screw (terminal protection plate)
b Terminal protection plate
c Screw (service PCB cover)
d Service PCB cover
e Connector

4 Remove the screw from the service PCB cover and remove the service PCB cover.

5 Disconnect the 2 connectors from the service PCB.

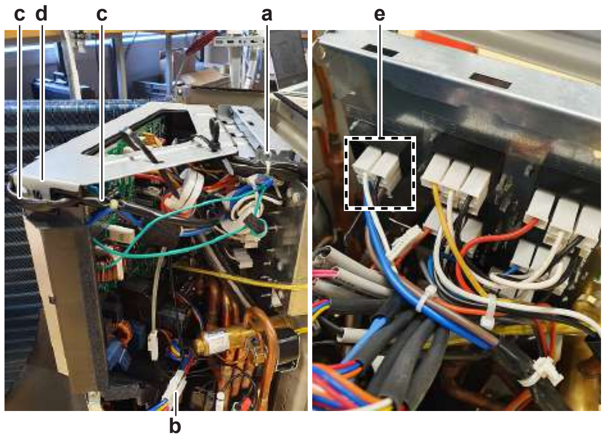
6 Remove the 2 screws from the terminal mounting plate.



a Screw (terminal mounting plate)

7 Remove the screw that fixes the terminal mounting plate to the upper side of the switch box.

8 Disconnect the compressor harness connector.



- **a** Screw (terminal mounting plate)
- **b** Compressor harness connector
- **c** Fan motor harness
- **d** Switch box
- **e** Faston connectors on X1M

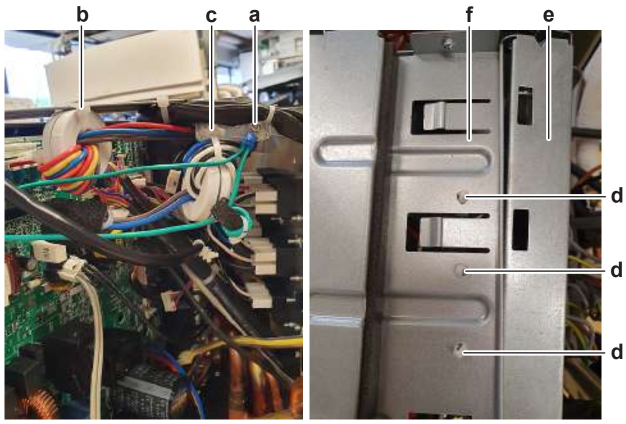
9 Disconnect all connectors (except the wiring towards the service PCB) and Faston connectors from the main PCB.

10 Remove the fan motor harness from the switch box.

11 Disconnect the 4 Faston connectors from the back side of the wiring terminal X1M.

12 Disconnect the other end (Faston connectors) of the black and white wiring that was disconnected from wiring terminal X1M (and routed through the ferrite core) from the back side of the appropriate wiring terminal.

13 Remove the screw and disconnect the ground wiring from the switch box.



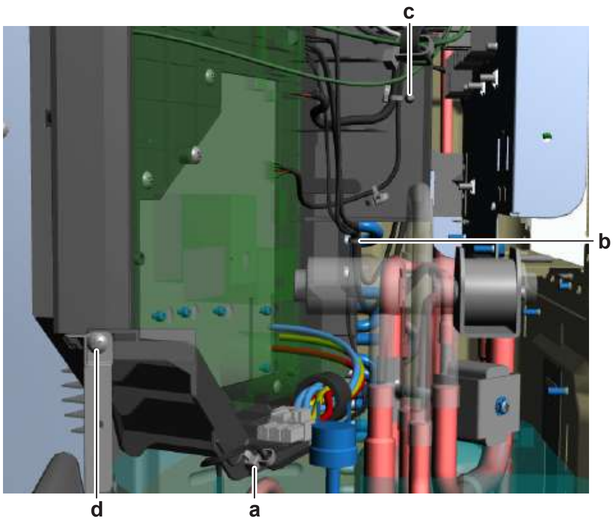
- **a** Screw (ground wiring)
- **b** Tie strap
- **c** Fixation plug (ferrite core)
- **d** Fixation plug (wiring harness)
- **e** Terminal mounting plate
- **f** Switch box

14 Cut the tie strap that fixes the ferrite core to the switch box.

15 Unplug the fixation to remove the ferrite core from the switch box.

16 Unplug the 3 fixation plugs that fix the wiring harness to the upper side of the switch box. Separate the terminal mounting plate from the switch box (upper side) as needed to create easier access to the fixation plugs.

17 Remove the fixation plug that fixes discharge thermistor harness to the switch box.



a Fixation plug (discharge thermistor harness)
b Tie strap (thermistor harnesses)
c Fixation plug (outdoor air thermistor and heat exchanger harnesses)
d Screw (switch box)

18 Cut the tie strap that fixes the thermistor harnesses to the switch box.

19 Remove the fixation plug that fixes outdoor air thermistor and heat exchanger thermistor harnesses to the switch box.

20 Remove the screw from the switch box.

21 Remove the switch box from the unit.

22 To install the switch box, see "4.15 Plate work" [▶ 180].

5MWXM

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work (including the side plate), see "4.15 Plate work" [▶ 180].

> **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 top insulation from the switch box.

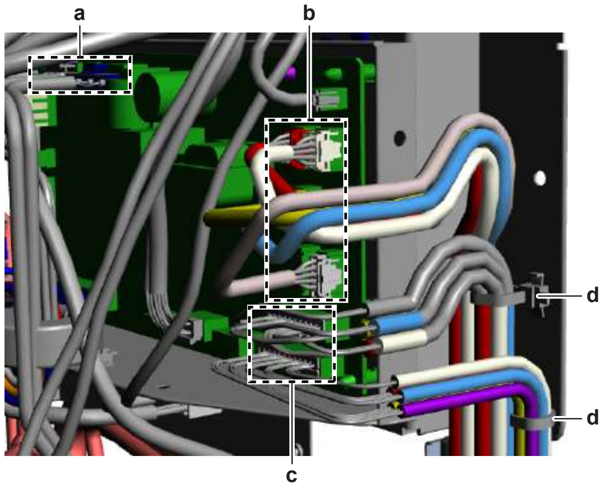
3 Remove the 3 screws that fix the wire terminal mounting plate (with the PCB A2P mounted on the back) to the switch box.

a Screw (wire terminal mounting plate)
b Screw (switch box)

4 Remove the screw that fixes the switch box to the partition plate.

5 Pull both parts of the switch box apart to create better access to both PCB’s.

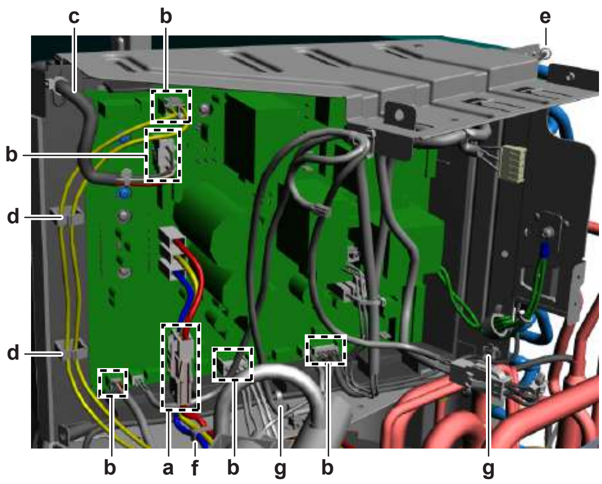
6 Disconnect the solenoid valve, expansion valve and thermistor connectors from the PCB A2P.



a Solenoid valve connectors
b Expansion valve connectors
c Thermistor connectors
d Fixation plug (thermistor wiring harness)

7 Unplug the 2 fixation plugs that fix the thermistors wiring harnesses to the back side of the wire terminal mounting plate.

8 Disconnect the compressor connector.



a Compressor connector
b Connectors (to be disconnected from main PCB)
c Fan motor wiring harness
d Cable clamp
e Air thermistor
f Fixation plug (compressor wiring harness)
g Fixation plug (thermistors wiring harness)

9 Disconnect the indicated connectors from the main PCB.

10 Route the fan motor wiring harness out of the harness retainers at the top side of the switch box and detach it from the switch box.

11 Route the 4-way valve wiring harness out of the cable clamps.

12 Completely detach the air thermistor from the switch box.

13 Unplug the 3 fixation plugs that fix the compressor and thermistors wiring harnesses to the switch box.

14 Carefully remove the complete switch box (both parts), including the wire terminal mounting plate, from the unit.

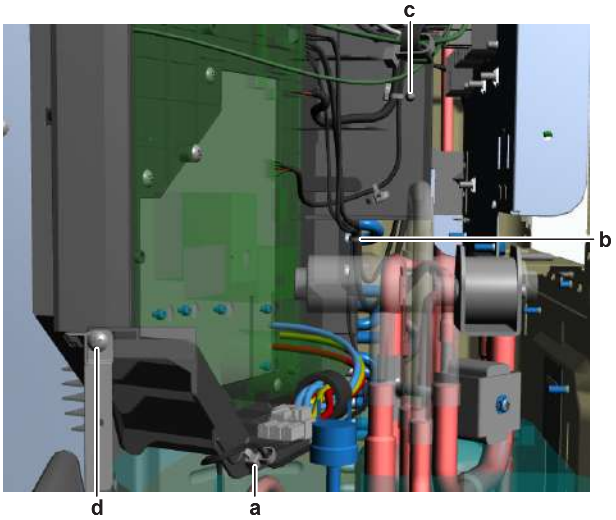
15 To install the switch box, see "4.15 Plate work" [▶ 180].

To install the switch box

4MWXM units

1 Install the switch box in the correct location on the unit.

2 Install and tighten the screw to fix the switch box.



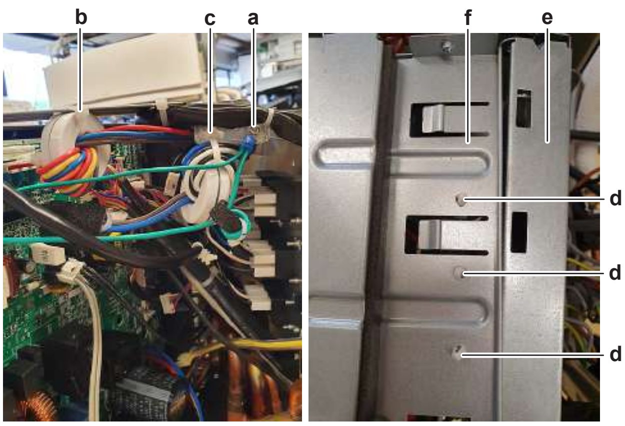
a Fixation plug (discharge thermistor harness)
b Tie strap (thermistor harnesses)
c Fixation plug (outdoor air thermistor and heat exchanger harnesses)
d Screw (switch box)

3 Install the fixation plug to fix the discharge thermistor harness to the switch box.

4 Install the fixation plug to fix the outdoor air thermistor and heat exchanger thermistors harnesses to the switch box.

5 Install a new tie strap to fix the thermistor harnesses to the switch box.

6 Connect the ground wiring to the switch box. Install and tighten the screw.



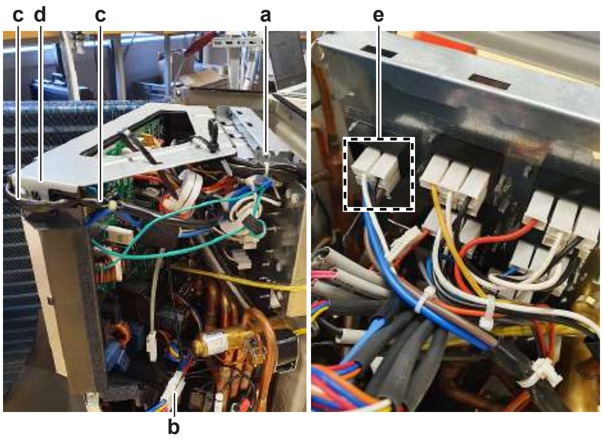
a Screw (ground wiring)
b Tie strap
c Fixation plug (ferrite core)
d Fixation plug (wiring harness)
e Terminal mounting plate
f Switch box

7 Install the fixation plug to fix the ferrite core to the switch box.

8 Connect the other ferrite core to the switch box using a new tie strap.

9 Install the 3 fixation plugs to fix the wiring harness to the upper side of the switch box. When done, correctly install the terminal mounting plate on the upper side of the switch box.

10 Connect the 4 Faston connectors to the back side of the wiring terminal X1M.



a Screw (terminal mounting plate)
b Compressor harness connector
c Fan motor harness
d Switch box
e Faston connectors on X1M

11 Connect the other end (Faston connectors) of the black and white wiring that was connected to wiring terminal X1M (and routed through the ferrite core) to the back side of the appropriate wiring terminal.

12 Install and tighten the screw to fix the terminal mounting plate to the upper side of the switch box.

13 Route the fan motor harness through the retainers on the switch box and connect the fan motor harness to the main PCB.

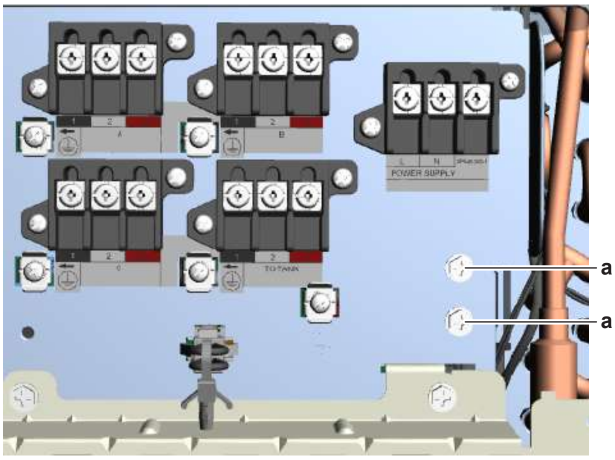
14 Connect the compressor wiring harness.

15 Connect all connectors and Faston connectors to the main PCB.

WARNING

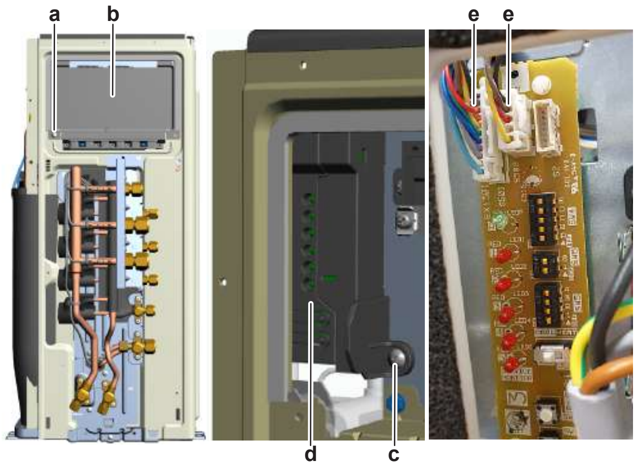
When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

16 Install and tighten the 2 screws to fix the terminal mounting plate to the switch box.



a Screw (terminal mounting plate)

17 Connect the 2 wiring harness connectors to the service PCB.



a Screw (terminal protection plate)
b Terminal protection plate
c Screw (service PCB cover)
d Service PCB cover
e Connector

18 Install the service PCB cover. Install and tighten the screw to fix the cover.

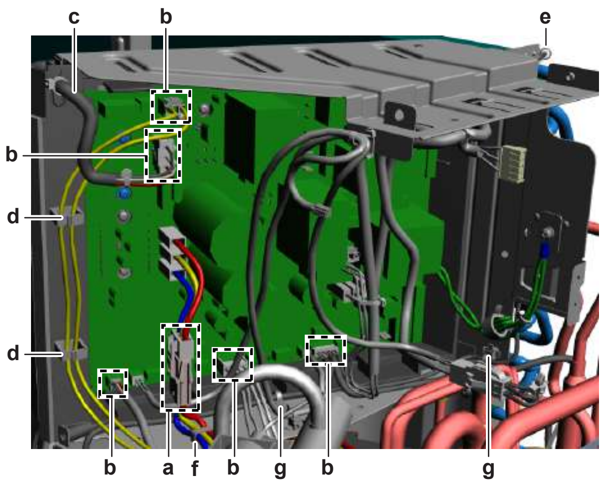
19 Install the terminal protection plate. Install and tighten the screw to fix the plate.

20 Install the top insulation on the switch box.

5MWXM

1 Install the switch box (both parts), including the wire terminal mounting plate in the correct location on the unit.

2 Route the 4-way valve wiring harness tough the cable clamps on the switch box.



a Compressor connector
b Connectors (to be disconnected from main PCB)
c Fan motor wiring harness
d Cable clamp
e Air thermistor
f Fixation plug (compressor wiring harness)
g Fixation plug (thermistors wiring harness)

3 Route the fan motor wiring harness through the appropriate harness retainers at the top side of the switch box.

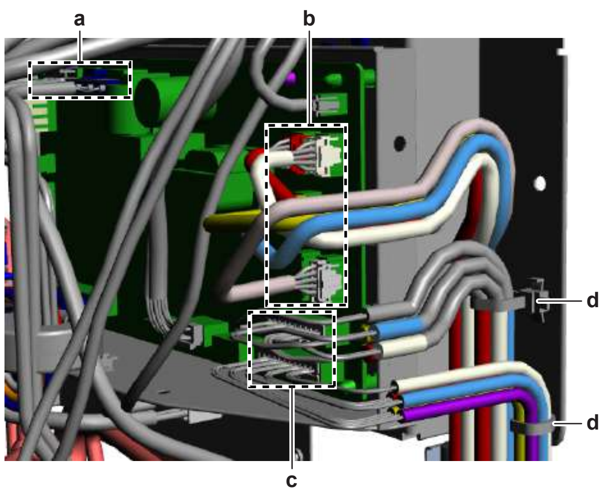
4 Connect the indicated (wiring harness) connectors to the main PCB.

> **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 the compressor connector.

6 Install the 3 fixation plugs to fix the compressor and thermistors wiring harnesses to the switch box.

7 Connect the solenoid valve, expansion valve and thermistor (wiring harness) connectors to the PCB A2P.



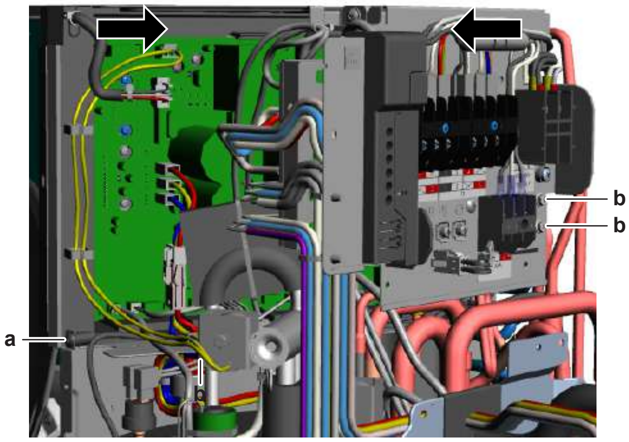
a Solenoid valve connectors
b Expansion valve connectors
c Thermistor connectors
d Fixation plug (thermistor wiring harness)

> **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.

8 Install the 2 fixation plugs to fix the thermistors wiring harnesses to the back side of the wire terminal mounting plate.

9 Properly assemble both parts of the switch box. Make sure all wiring harnesses are properly routed.

10 Install and tighten the screw to fix the switch box to the partition plate.



a Screw (switch box)
b Screw (wire terminal mounting plate)

11 Install and tighten the 3 screws to fix the wire terminal mounting plate to the switch box.

12 Route the air thermistor (and wiring harness) to its original location.

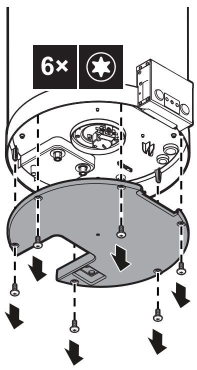
13 Install the top insulation on the switch box.

4.15.2 Indoor unit

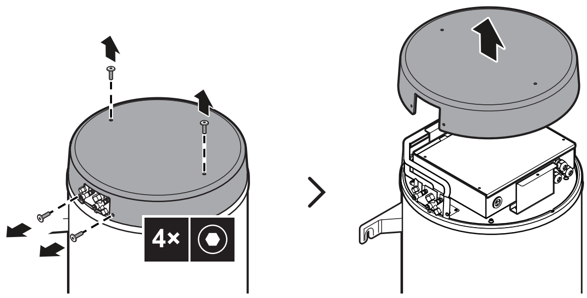
To open the indoor unit

EKHWET

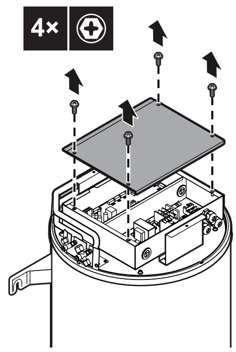
1 Remove the bottom cover.



2 Remove the top cover.

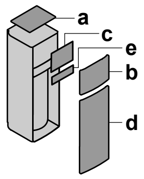


3 Remove the switch box cover.



CKHWS

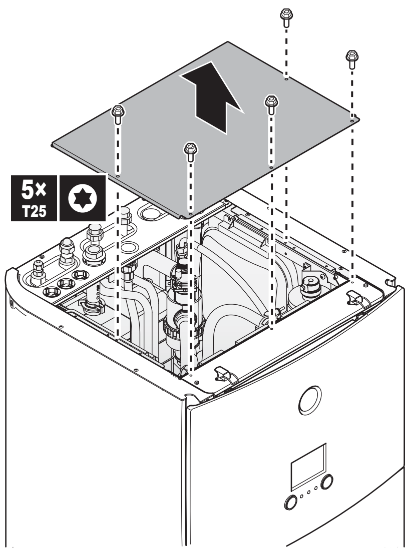
- OVERVIEW



a Top panel
b User interface panel
c Switch box cover
d Front panel
e High voltage switch box cover

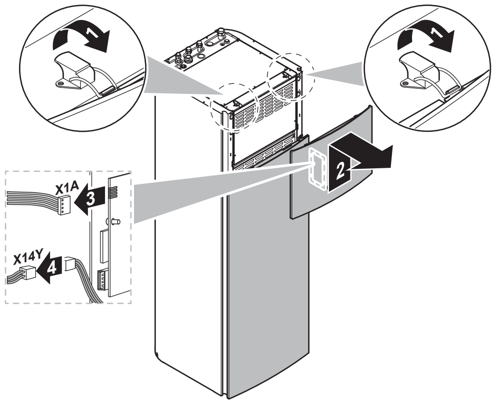
- OPEN

1 Remove the top panel

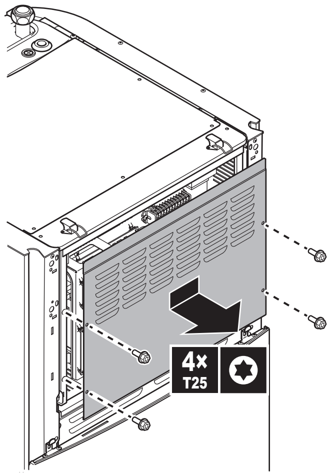


2 Remove the user interface panel. Open the hinges at the top and slide the top panel upwards.

> **NOTICE**
>
> If you remove the user interface panel, also disconnect the cables from the back of the user interface panel to prevent damage.

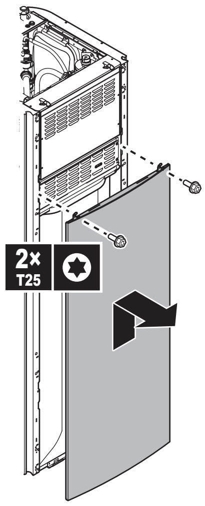


3 Remove the switch box cover.

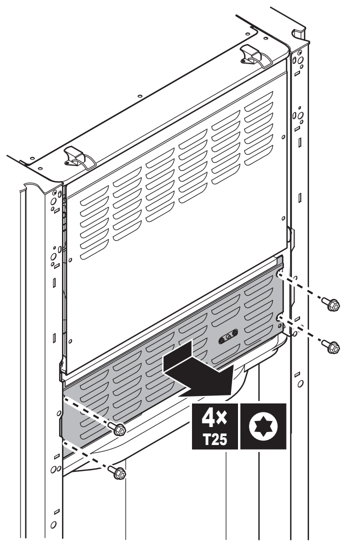


4 If necessary, remove the front plate. This is, for example, necessary in the following cases:

- To lower the switch box
- 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.

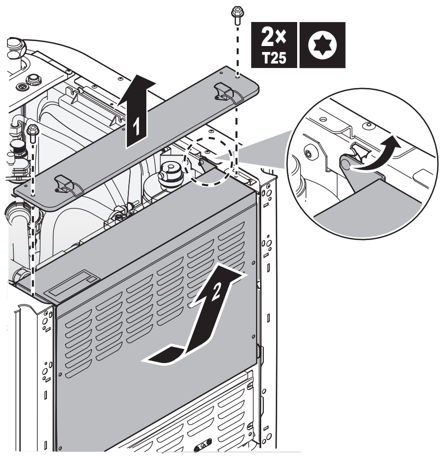


To lower the switch box

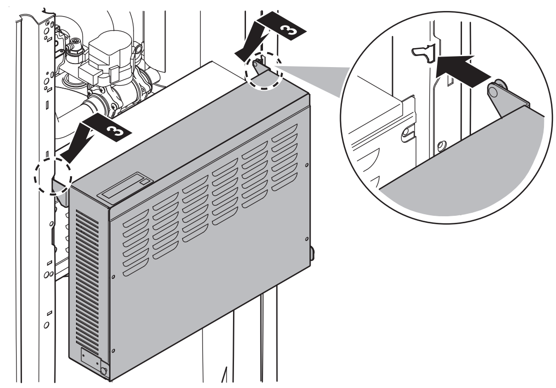
During the installation, you will need access to the inside of the indoor unit. To have easier front access, hang the switch box outside the unit, over the high voltage switch box cover.

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. Hang the switch box in front of the high voltage switch box cover. Use the 2 hinges located lower on the unit.



4.16 Reactor

4.16.1 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 "4.15 Plate work" [▶ 180].

> **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 reactor for any damage or burnt-out components. If any damage is found, replace the reactor, see "4.16.2 Repair procedures" [▶ 199].

4MWXM units

1 Check that the reactors are firmly installed on the main PCB.

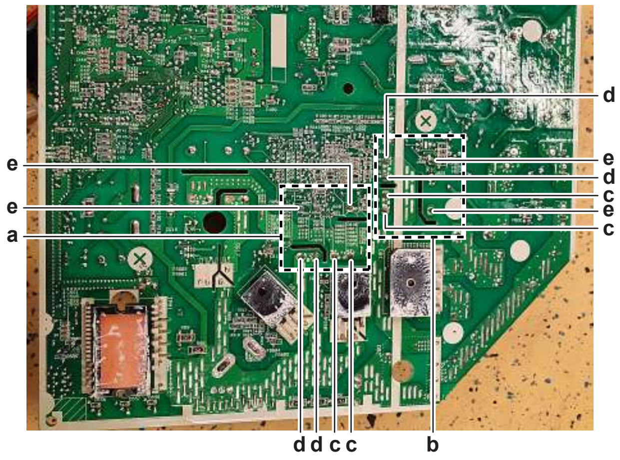
a Reactor L803
b Reactor L804

2 Remove the main PCB, see "4.11.2 Repair procedures" [▶ 154]. The reactor measuring points are ONLY reachable on the back side of the main PCB.

3 Measure the resistance of the reactor using a low ohm multi meter.

Result: The resistance MUST be as follows:

Measuring points	Resistance
c-d	20~30 mΩ
e	152~228 mΩ



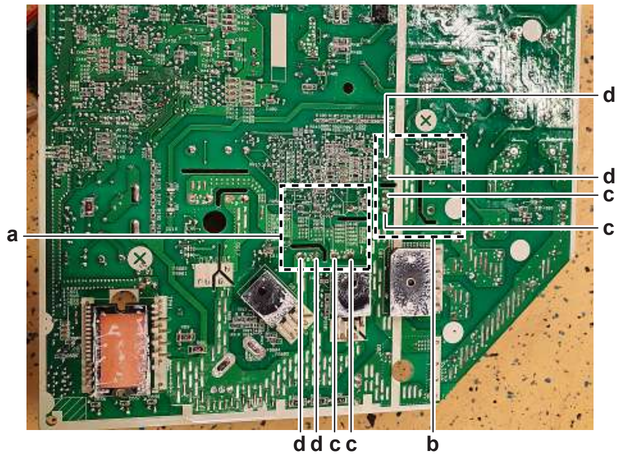
a	L803
b	L804
c	Measuring point
d	Measuring point
e	Measuring point

Is the resistance measurement correct?	Action
Yes	Proceed with the next step.
No	Replace the reactor, see "4.16.2 Repair procedures" [▶ 199].

4 Measure the inductance of the reactor using an LCR meter.

Result: The inductance MUST be as follows:

Measuring points	Resistance
c-d	88.5~101.5 µH

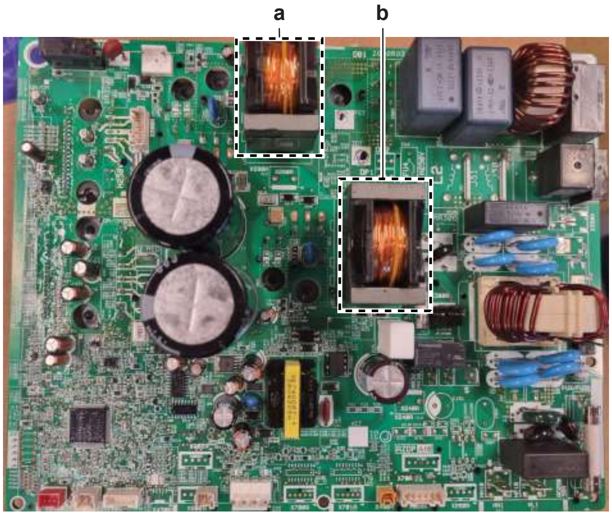


a	L803
b	L804
c	Measuring point
d	Measuring point

Is the inductance measurement correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next step.
No	Replace the reactor, see "4.16.2 Repair procedures" [▶ 199].

5MWXM

1 Check that the reactors are firmly installed on the main PCB.



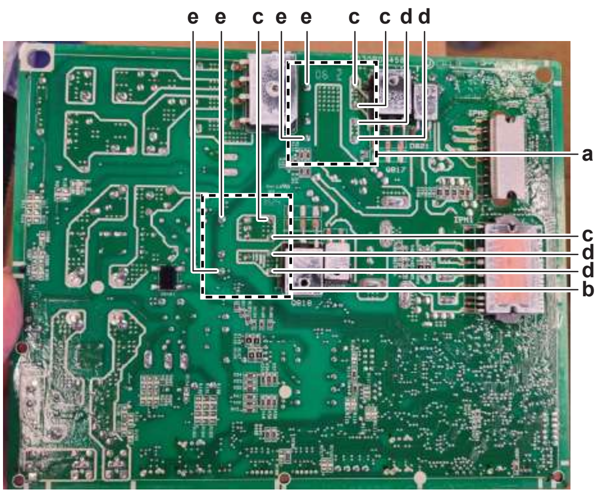
a Reactor L803
b Reactor L804

2 Remove the main PCB, see "4.11.2 Repair procedures" [▶ 154]. The reactor measuring points are ONLY reachable on the back side of the main PCB.

3 Measure the resistance of the reactor using a low ohm multi meter.

Result: The resistance MUST be as follows:

Measuring points	Resistance
c-d	10~15 mΩ
e	75~125 mΩ



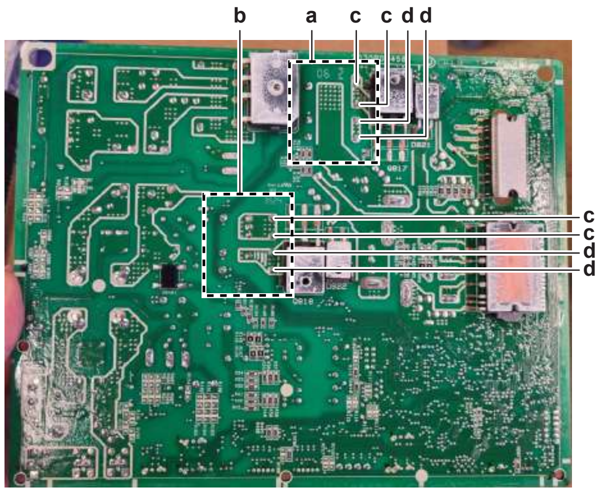
a L803
b L804
c Measuring point
d Measuring point
e Measuring point

Is the resistance measurement correct?	Action
Yes	Proceed with the next step.
No	Replace the reactor, see "4.16.2 Repair procedures" [▶ 199].

4 Measure the inductance of the reactor using an LCR meter.

Result: The inductance MUST be as follows:

Measuring points	Resistance
c-d	48.4~55.6 µH



a L803
b L804
c Measuring point
d Measuring point

Is the inductance measurement correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next step.
No	Replace the reactor, see "4.16.2 Repair procedures" [▶ 199].

4.16.2 Repair procedures

As the reactors are part of the main PCB, replace the complete main PCB. See "4.11 Main PCB" [▶ 140].

4.17 Refrigerant pressure sensor

4.17.1 Checking procedures

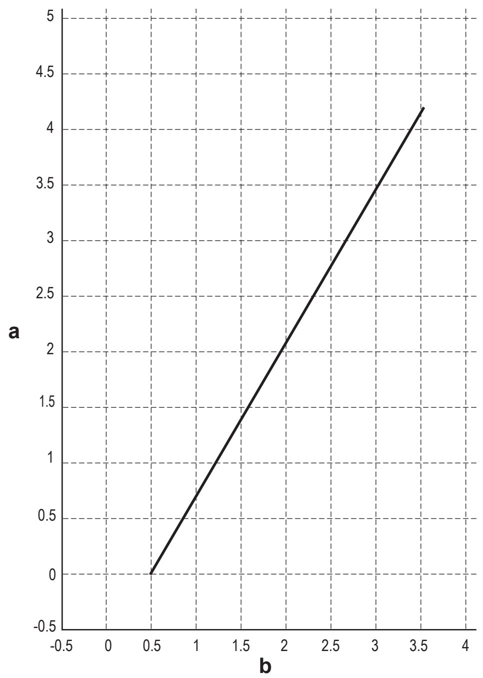
To perform an electrical check of the refrigerant pressure sensor

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1. Connect a pressure gauge to the gas service port.
2. Turn ON the power of the unit.
3. Start the unit operation and let it operate for a while in stable conditions.
4. Read the pressure from the pressure gauge.
5. 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	0.01
0.6	0.15
0.7	0.29
0.8	0.42
0.9	0.56
1.0	0.70
1.1	0.84
1.2	0.98
1.3	1.11
1.4	1.25
1.5	1.39
1.6	1.53
1.7	1.67
1.8	1.80
1.9	1.94
2.0	2.08
2.1	2.22
2.2	2.36
2.3	2.49
2.4	2.63
2.5	2.77
2.6	2.91

V (DC)	Detected pressure MPa
2.7	3.05
2.8	3.18
2.9	3.32
3.0	3.46
3.1	3.60
3.2	3.74
3.3	3.87
3.4	4.01
3.5	4.15
3.6	4.29

INFORMATION

The sensor connector MUST be plugged into the appropriate PCB.

6 For 4MWXM units: Measure the voltage on connector S60: pins 1–3 (= refrigerant pressure sensor output signal) on the main PCB.

7 For 5MWXM units: Measure the voltage on connector X840A: pins 2–3 (= refrigerant pressure sensor output signal) on the main PCB.

8 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.

9 For 4MWXM units: Unplug the refrigerant pressure sensor connector S60 and measure the voltage (power supply) between pins 3–4 on main PCB.

10 For 5MWXM units: Unplug the refrigerant pressure sensor connector X840A and measure the voltage (power supply) between pins 1–3 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 "4.17.2 Repair procedures" [▶ 202].
No	Perform a check of the main PCB, see "4.11 Main PCB" [▶ 140].

4.17.2 Repair procedures

To remove the refrigerant pressure sensor

Prerequisite: Stop the unit operation via the user interface.

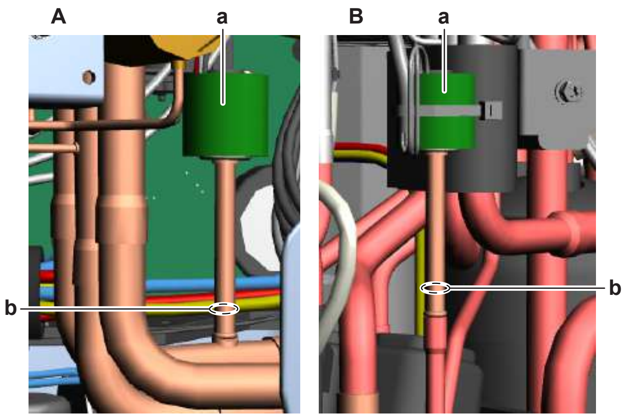
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

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 (2.9 PSI).
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 4MWXM units
B 5MWXM units
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.

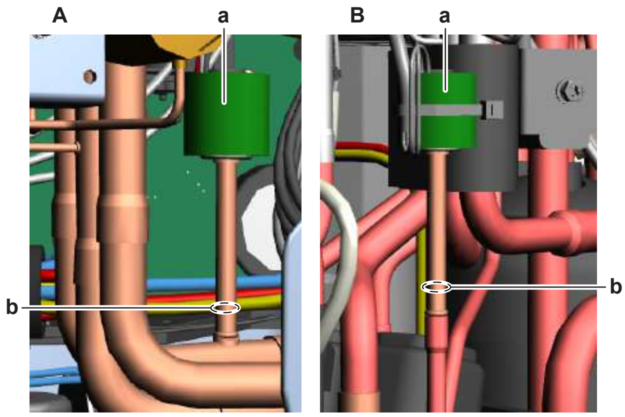
7. Install a plug or cap on the refrigerant piping to avoid dirt or impurities from entering the piping.
8. To install the refrigerant pressure sensor, see "4.17.2 Repair procedures" [▶ 202].

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 (2.9 PSI).

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 4MWXM units
B 5MWXM units
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 "5.2.1 Checking procedures" [▶ 257].

10 Add refrigerant to the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

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.

4.18 Solenoid valve

4.18.1 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 "4.15 Plate work" [▶ 180].

1. Verify that the coil screw is firmly fixing the coil to the valve body.
2. Check coil and coil wires if any damage or burst is present.
3. Visually check:
   - For oil drops around the solenoid valve. Locate and fix as needed.
   - Pipes for signs of damage. Replace pipes as needed.

Is the solenoid valve coil firmly fixed and not visually damaged?	Action
Yes	Perform an electrical check of the solenoid valve, see "4.18.1 Checking procedures" [▶ 203].
No	Fix or replace the solenoid valve coil, see "4.18.2 Repair procedures" [▶ 206].

To perform an electrical check of the solenoid valve

Prerequisite: First perform a mechanical check of the solenoid valve, see "4.18.1 Checking procedures" [▶ 203].

1. Unplug the solenoid valve Faston connectors from the appropriate PCB.
2. Measure the resistance of the solenoid valve coil.

   Result: The measured value MUST be:

- 4MWXM UNITS

Name	Symbol	Location (PCB)	Connector	Winding resistance
Solenoid valve – air conditioning	Y2S	A1P (OU)	AL1-AL2	1.127~1.407 kΩ
Solenoid valve - domestic hot water	Y3S	A1P (OU)	DP1-DP2	1.127~1.407 kΩ

- 5MWXM UNITS

Name	Symbol	Location (PCB)	Connector	Winding resistance
Solenoid valve – Defrost bypass	Y2S	A2P (OU)	X684A: 1-3	2.128~2.352 kΩ
Solenoid valve – air conditioning	Y3S	A2P (OU)	X682A: 1-3	1.235~1.365 kΩ
Solenoid valve - domestic hot water	Y4S	A2P (OU)	X682A: 5-7	1.235~1.365 kΩ

Is the measured value correct?	Action
Yes	Continue with the next step.

Is the measured value correct?	Action
No	Replace the solenoid valve coil, see "4.18.2 Repair procedures" [▸ 206].

3 Re-connect the solenoid valve Faston connectors 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.

7 With the unit operating, check the solenoid valve status using the service monitoring tool.

> **INFORMATION**
>
> The solenoid valve for air conditioning indoor units is triggered open when 1 or more air conditioning units are operating (Heating or Cooling).
>
> The solenoid valve for domestic hot water tank is triggered open when the tank provides domestic hot water through the heat pump. Turn OFF ALL air conditioning indoor units and let the domestic hot water tank operate to make sure the heat pump compressor is providing heat specifically to the domestic hot water tank.
>
> The solenoid valve for Defrost bypass (5MWXM units ONLY) is triggered open when Defrost operation is active.

8 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 closed
- 230 V AC when the solenoid valve is triggered open

9 Wait for the solenoid valve to open or close and again measure the voltage (power supply) as described above.

- 4MWXM UNITS

Are the measured voltages correct?	Action
Yes	Perform an operation check of the solenoid valve, see "4.18.1 Checking procedures" [▸ 203].
No	Perform a check of the main PCB, see "4.11 Main PCB" [▸ 140].

- 5MWXM UNITS

Are the measured voltages correct?	Action
Yes	Perform an operation check of the solenoid valve, see "4.18.1 Checking procedures" [▸ 203].
No	Perform a check of the PCB A2P, see "4.14.1 Checking procedures" [▸ 174].

To perform an operation check of the solenoid valve

Prerequisite: First perform an electrical check of the solenoid valve, see "4.18.1 Checking procedures" [▸ 203].

1 With the unit operating, check the solenoid valve status using the service monitoring tool.

> **INFORMATION**
>
> The solenoid valve for air conditioning indoor units is triggered open when 1 or more air conditioning units are operating (Heating or Cooling).
>
> The solenoid valve for domestic hot water tank is triggered open when the tank provides domestic hot water through the heat pump. Turn OFF ALL air conditioning indoor units and let the domestic hot water tank operate to make sure the heat pump compressor is providing heat specifically to the domestic hot water tank.
>
> The solenoid valve for Defrost bypass (5MWXM units ONLY) is triggered open when Defrost operation is active.

2. When the solenoid valve is closed according to the service monitoring tool, check the inlet and outlet of the valve with a contact thermometer or use a valve stethoscope to see if refrigerant flows through the solenoid valve. Check that the valve is NOT bleeding.

   Result: There MUST be NO flow through the solenoid valve.

3. When the solenoid valve is open according to the service monitoring tool, check the inlet and outlet of the valve with a contact thermometer or use a valve stethoscope to see if refrigerant flows through the solenoid valve.

   Result: Refrigerant MUST flow through the solenoid valve.

4. Wait for the solenoid valve to open or close 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 "4.18.2 Repair procedures" [▶ 206].

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.

4.18.2 Repair procedures

To remove the solenoid valve coil

> **INFORMATION**
>
> For 5MWXM units ONLY: As the solenoid valve coils Y3S and Y4S share the same wiring harness (same connector on the PCB), they need to be replaced together (1 spare part).

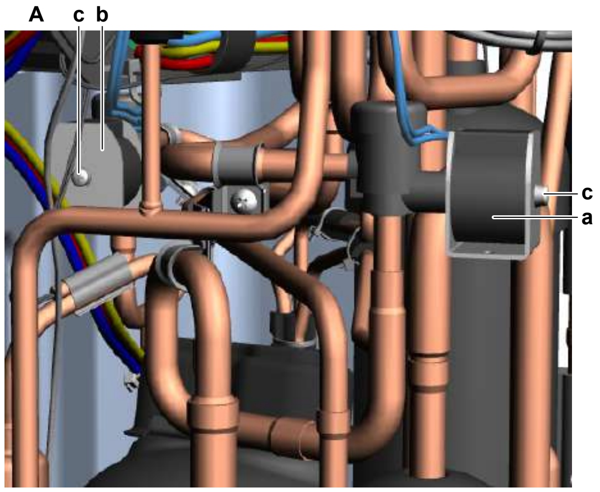
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

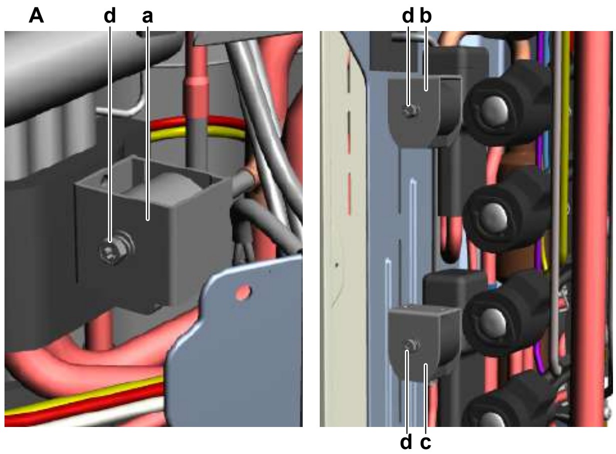
Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

Prerequisite: If needed, remove any parts or insulation to create more space for the removal.

1 Remove the screw that fixes the solenoid valve coil to the solenoid valve body.



A 4MWXM units
a Solenoid valve coil (Y2S)
b Solenoid valve coil (Y3S)
c Screw



A 5MWXM units
a Solenoid valve coil (Y2S)
b Solenoid valve coil (Y3S)
c Solenoid valve coil (Y4S)
d Screw

2 Remove the solenoid valve coil from the solenoid valve body.

3 Disconnect the solenoid valve Faston connectors (4MWXM units) OR solenoid valve connector (5MWXM units) from the appropriate PCB.

4 Cut all tie straps that fix the solenoid valve harness.

5 To install the solenoid valve coil, see "4.18.2 Repair procedures" [▶ 206].

To remove the solenoid valve body

Prerequisite: Recuperate the refrigerant from the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

Prerequisite: If needed, remove any parts or insulation to create more space for the removal.

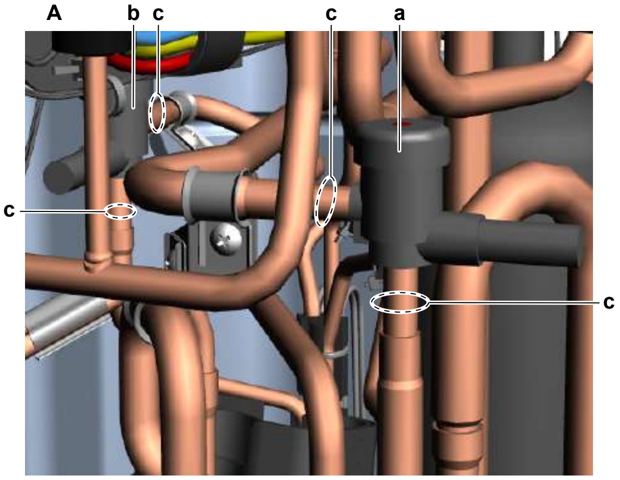
1 Remove the solenoid valve coil, see "4.18.2 Repair procedures" [▶ 206].

2 Remove the insulation from the solenoid valve pipes (if applicable). Keep for reuse.

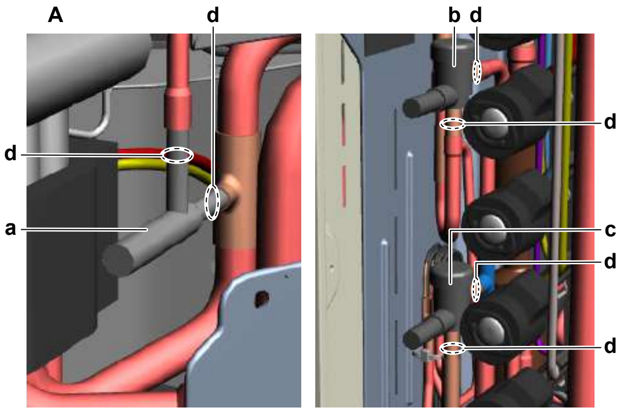
3 Using a valve magnet, open the solenoid valve.

4 Supply nitrogen to the refrigerant circuit. The nitrogen pressure MUST NOT exceed 0.02 MPa (2.9 PSI).

5 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 4MWXM units
a Solenoid valve body Y2S
b Solenoid valve body Y3S
c Pipe



A 5MWXM units
a Solenoid valve body Y2S
b Solenoid valve body Y3S
c Solenoid valve body Y4S
d Pipe

6 Stop the nitrogen supply when the piping has cooled down.

7 Remove the solenoid valve body.

INFORMATION

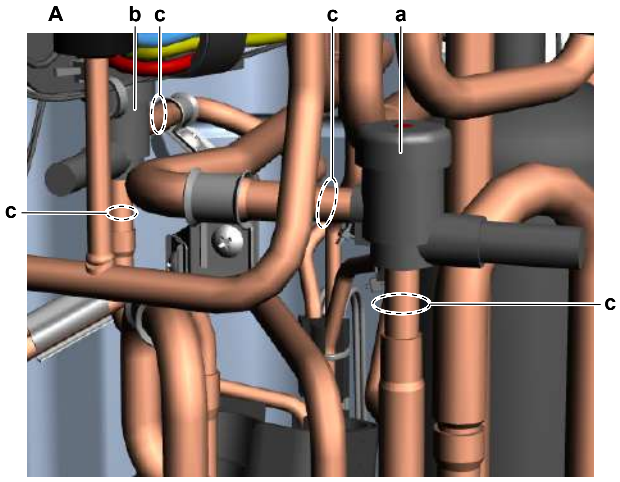
It is ALSO possible to cut the component pipe(s) using a pipe cutter. Make sure to remove the remaining component pipe end(s) from the refrigerant pipes by heating the brazing point(s) of the component pipe(s) using an oxygen acetylene torch.

8 Install plugs or caps on the open pipe ends of the refrigerant piping to avoid dirt or impurities from entering the piping.

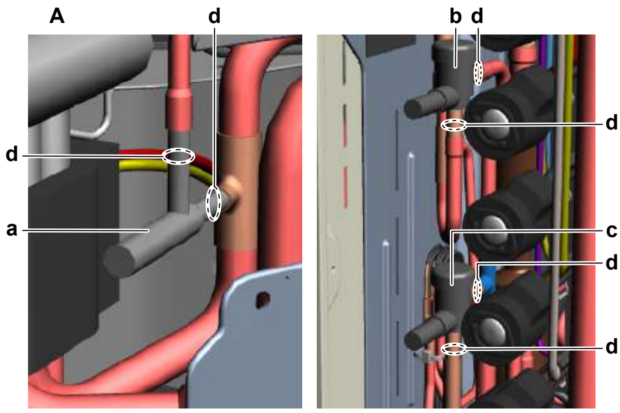
9 To install the solenoid valve body, see "4.18.2 Repair procedures" [▶ 206].

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 (2.9 PSI).
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 4MWXM units
a Solenoid valve body Y2S
b Solenoid valve body Y3S
c Pipe



A 5MWXM units
a Solenoid valve body Y2S
b Solenoid valve body Y3S
c Solenoid valve body Y4S
d 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 Install the insulation in the original location on the oil return valve pipes (if applicable).

9 Install the solenoid valve coil, see "4.18.2 Repair procedures" [▸ 206].

10 Perform a pressure test, see "5.2.1 Checking procedures" [▸ 257].

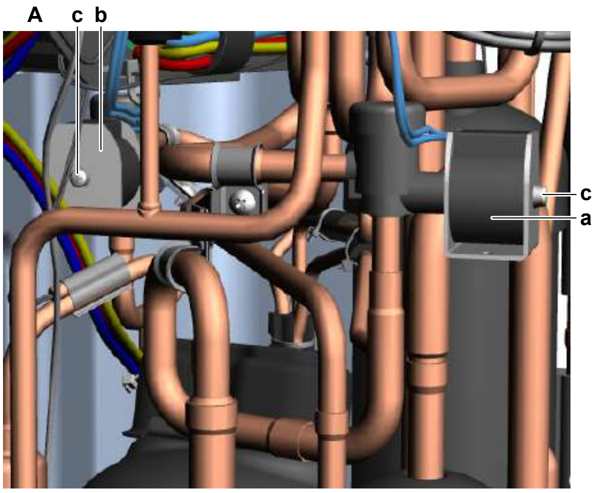
11 Add refrigerant to the refrigerant circuit, see "5.2.2 Repair procedures" [▸ 262].

To install the solenoid valve coil

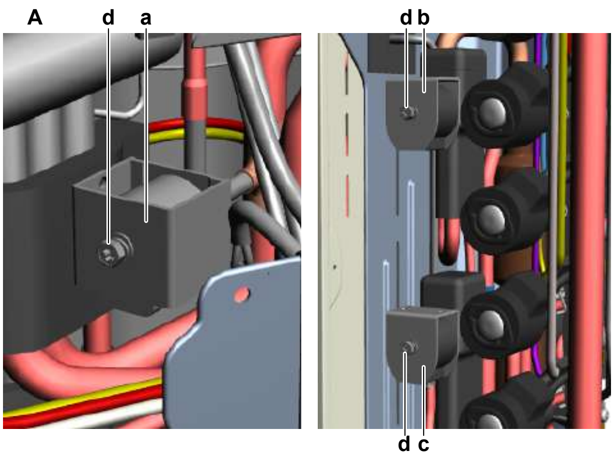
> **INFORMATION**
>
> For 5MWXM units ONLY: As the solenoid valve coils Y3S and Y4S share the same wiring harness (same connector on the PCB), they need to be replaced together (1 spare part).

1 Correctly install the solenoid valve coil on the solenoid valve body.

2 Install and tighten the screw to fix the solenoid valve coil to the solenoid valve body.



A 4MWXM units
a Solenoid valve coil (Y2S)
b Solenoid valve coil (Y3S)
c Screw



A 5MWXM units
a Solenoid valve coil (Y2S)
b Solenoid valve coil (Y3S)
c Solenoid valve coil (Y4S)
d Screw

3 Route the solenoid valve harness towards the switch box.

4 Connect the solenoid valve Faston connectors (4MWXM units) OR solenoid valve connector (5MWXM units) 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 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 "4.18.1 Checking procedures" [▶ 203] of the solenoid valve and continue with the next procedure.

4.19 Thermistors

4.19.1 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 "4.15 Plate work" [▶ 180].

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" [▶ 211].
No	Correctly install the thermistor, see "Repair procedures" [▶ 216].

To perform an electrical check of the specific thermistor

1 First perform a mechanical check of the thermistor, see "Checking procedures" [▶ 211].

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.

- 4MWXM UNITS

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Air thermistor	R1T	A1P (O/U)	S90:1-2	-	A
Heat exchanger thermistor	R2T	A1P (O/U)	S90:3-4	-	A
Discharge pipe thermistor	R3T	A1P (O/U)	S90:5-6	-	A
Refrigerant liquid thermistor – Room A	R4T	A1P (O/U)	S93:1-2	-	A
Refrigerant liquid thermistor – Room B	R5T	A1P (O/U)	S93:3-4	-	A
Refrigerant liquid thermistor – Room C	R6T	A1P (O/U)	S93:5-6	-	A
Refrigerant liquid thermistor – Domestic hot water tank	R7T	A1P (O/U)	S93:7-8	-	A
Refrigerant gas thermistor – Room A	R9T	A1P (O/U)	S92:1-2	-	A
Refrigerant gas thermistor – Room B	R10T	A1P (O/U)	S92:3-4	-	A
Refrigerant gas thermistor – Room C	R11T	A1P (O/U)	S92:5-6	-	A

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Refrigerant gas thermistor – Domestic hot water tank	R12T	A1P (O/U)	S92:7-8	-	A

- 5MWXM UNITS

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Air thermistor	R5T	A2P (O/U)	X900A:1-2	-	A
Heat exchanger thermistor	R4T	A2P (O/U)	X900A:3-4	-	A
Discharge pipe thermistor	R3T	A2P (O/U)	X900A:5-6	-	A
Refrigerant liquid thermistor – Room A	R6T	A2P (O/U)	X951A:1-2	-	A
Refrigerant liquid thermistor – Room B	R7T	A2P (O/U)	X951A:3-4	-	A
Refrigerant liquid thermistor – Room C	R8T	A2P (O/U)	X951A:5-6	-	A
Refrigerant liquid thermistor – Room D	R9T	A2P (O/U)	X951A:7-8	-	A
Refrigerant liquid thermistor – Domestic hot water tank	R10T	A2P (O/U)	X951A:9-10	-	A
Refrigerant gas thermistor – Room A	R11T	A2P (O/U)	X931A:1-2	-	A

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Refrigerant gas thermistor – Room B	R12T	A2P (O/U)	X931A:3-4	-	A
Refrigerant gas thermistor – Room C	R13T	A2P (O/U)	X931A:5-6	-	A
Refrigerant gas thermistor – Room D	R14T	A2P (O/U)	X931A:7-8	-	A
Refrigerant gas thermistor – Domestic hot water tank	R15T	A2P (O/U)	X931A:9-10	-	A

- INDOOR UNITS

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Refrigerant liquid thermistor	R3T	A1P (I/U)	X7A: 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		

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 S90 pin 1-2:
  Measured resistance: 21.80 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" [▶ 216].

Repair procedures

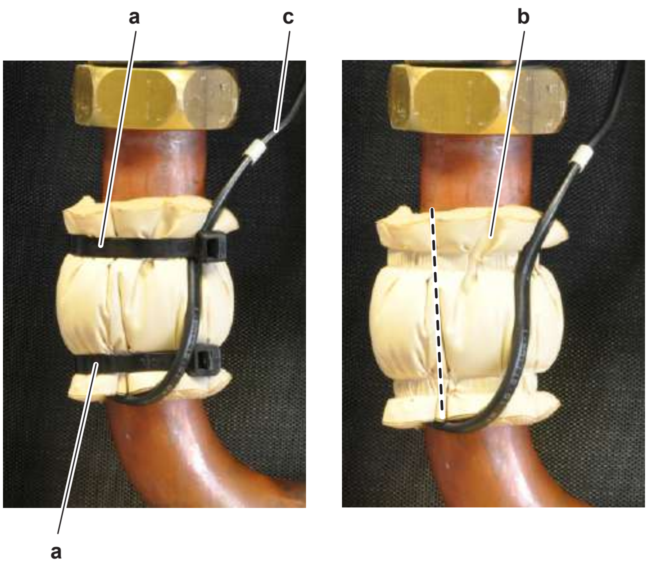
To remove the thermistor

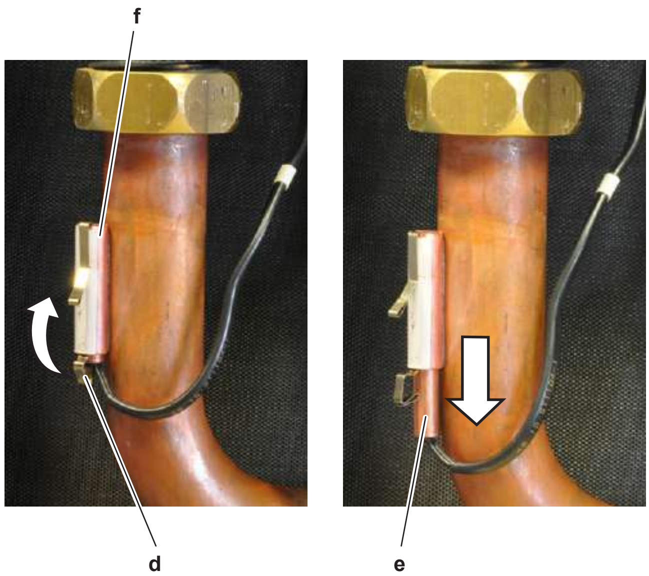
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1. Locate the thermistor that needs to be removed.
2. Remove the thermistor as follows:
   - For outdoor unit air (ambient) thermistor:
     Remove the thermistor from the heat exchanger grille recess.
     Remove the protection tube.
   - 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 "7.2 Wiring diagram" [▶ 287]. 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:

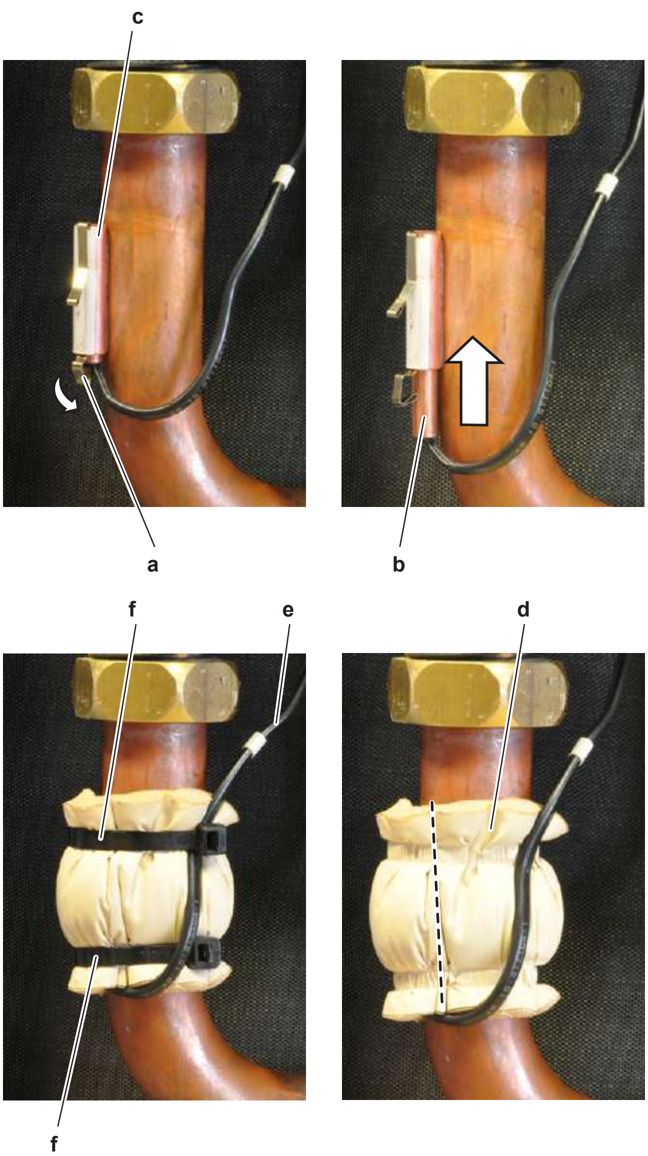
- Remove all other thermistors wired to the connector from their thermistor holder,
- Cut all tie straps that fix the thermistor wiring harness,
- Disconnect the thermistor connector,
- Remove the complete set of thermistors.

6 To install the thermistor, see "Repair procedures" [▶ 216].

To install the thermistor

1 Install the thermistor as follows:

- For air (ambient) thermistor:
  Insert the thermistor in the protection tube.
  Correctly install the thermistor in the heat exchanger grille recess.
- 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 "7.2 Wiring diagram" [▶ 287]. 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.

4.19.2 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 "4.15 Plate work" [▶ 180].
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?	Action
Yes	Perform an electrical check of the specific thermistor, see "Checking procedures" [▶ 219].
No	Correctly install the thermistor, see "Repair procedures" [▶ 222].

To perform an electrical check of the specific thermistor

1 First perform a mechanical check of the thermistor, see "Checking procedures" [▶ 219].
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.

- EKHWET UNIT

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Domestic hot water tank thermistor	R5T	Hydro (I/U)	X9A: 1-2	–	A

- CKHWS UNIT

Name	Symbol	Location (PCB)	Connector (pins)	Inter-mediate connector (pins)	Reference (table)
Outlet water after heat exchanger thermistor	R1T	Hydro (I/U)	X5A: 1-2	–	A
Outlet water after backup heater thermistor	R2T	Hydro (I/U)	X6A: 1-2	–	A
Inlet water thermistor	R4T	Hydro (I/U)	X8A: 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

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

T °C	kΩ	T °C	kΩ	T °C	kΩ	T °C	kΩ
–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		

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. R5T 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 X9A pin 1-2:
  Measured resistance: 21.80 kΩ,
- Measured resistance value is inside the range. R5T 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 "7.2 Wiring diagram" [▸ 287] to determine if the specific thermistor is either:
>
> - Directly connected to the PCB
> - Connected to an intermediate connector or terminal 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" [▸ 222].

- FOR THERMISTORS CONNECTED TO AN INTERMEDIATE CONNECTOR OR TERMINAL

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.

1 Disconnect the thermistor from the intermediate connector or terminal and measure the resistance of the thermistor (between the appropriate thermistor wires or 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 or terminal, see "7.2 Wiring diagram" [▸ 287].
No	Replace the specific thermistor, see "Repair procedures" [▸ 222].

Repair procedures

To remove the thermistor

EKHWET

Prerequisite: Stop the unit operation via the user interface.

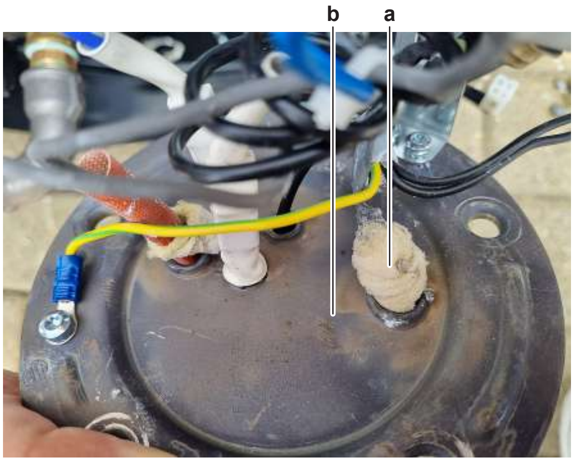
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▸ 180].

1 Locate the thermistor that needs to be removed.

2 At the bottom side of the domestic hot water tank, remove the insulation at the domestic hot water tank thermistor insertion point on the booster heater.

3 Remove the domestic hot water tank thermistor from the booster heater (by pulling it out).



a Domestic hot water tank thermistor location
b Booster heater

4 At the top side of the domestic hot water tank, carefully pull the domestic hot water tank thermistor and wiring harness out of the tube that goes through the tank.

5 Disconnect the thermistor wiring harness connector from the hydro PCB.

6 Route the thermistor wiring harness out of the switch box (through the grommets) and remove the thermistor and wiring harness.

7 To install the thermistor, see "Repair procedures" [▶ 222].

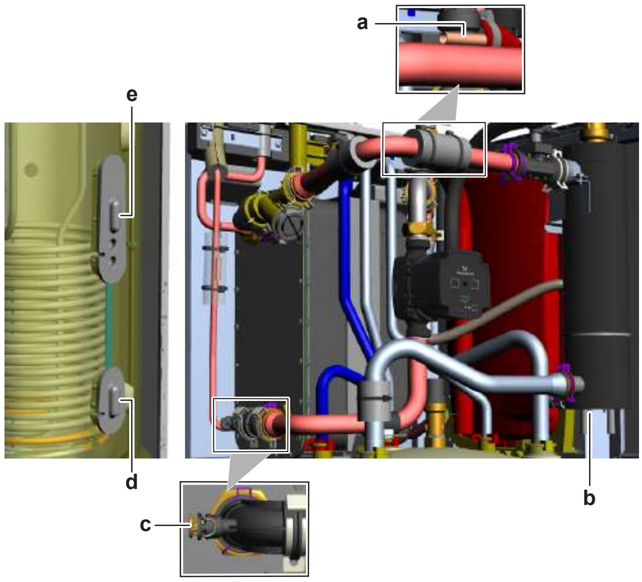
CKHWS

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Locate the thermistor that needs to be removed.



a Outlet water after heat exchanger thermistor R1T
b Outlet water after backup heater thermistor R2T
c Inlet water thermistor R4T
d Domestic hot water tank thermistor R5T
e Domestic hot water tank thermistor (TOP) R8T

2 Remove the thermistor from its holder. Cut any tie straps and/or remove any insulation as needed.

3 Cut ALL tie straps that fix the thermistor wiring harness.

> **INFORMATION**
>
> See the overview of the thermistors at the start of the electrical check procedure and the "7.2 Wiring diagram" [▶ 287] 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, disconnect the thermistor connector from the intermediate connector. If directly connected to the PCB, disconnect the thermistor connector from the PCB.

5 Remove the thermistor.

6 To install the thermistor, see "Repair procedures" [▶ 222].

To install the thermistor

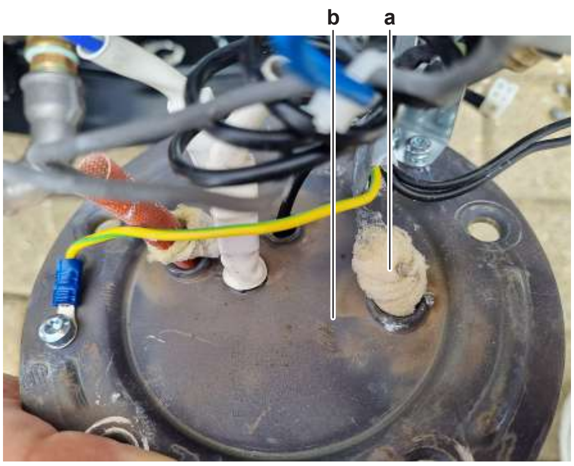
EKHWET

1 Route the domestic hot water tank thermistor wiring harness (connector side) through the appropriate grommets inside the switch box.

2 Connect the thermistor wiring harness connector to the hydro PCB.

3 Route the domestic hot water tank thermistor and wiring harness through the appropriate tube, from the top side to the bottom side of the domestic hot water tank.

4 Carefully insert the domestic hot water tank thermistor in the appropriate tube of the booster heater. Make sure it is correctly installed.



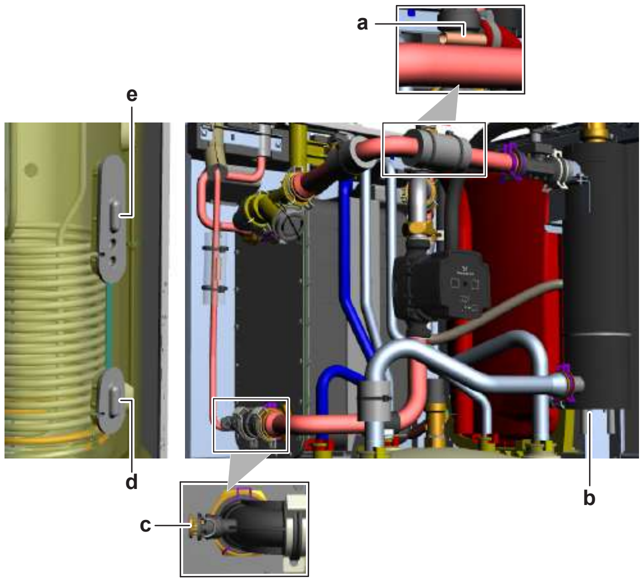
a Domestic hot water tank thermistor location
b Booster heater

5 Install new insulation at the thermistor insertion point on the booster heater.

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.

CKHWS

1 Properly install the thermistor in its holder. Make sure the thermistor is correctly fitted and fixed (if applicable).



- **a** Outlet water after heat exchanger thermistor R1T
- **b** Outlet water after backup heater thermistor R2T
- **c** Inlet water thermistor R4T
- **d** Domestic hot water tank thermistor R5T
- **e** Domestic hot water tank thermistor (TOP) R8T

2 If applicable, properly install the insulation and/or new tie straps.

> **INFORMATION**
>
> See the overview of the thermistors at the start of the electrical check procedure and the "7.2 Wiring diagram" [▸ 287] to determine if the specific thermistor is either:
>
> - Directly connected to the PCB
> - Connected to an intermediate connector which is connected to the PCB

3 If connected to an intermediate connector, connect the thermistor connector to the intermediate connector. If directly connected to the PCB, route the thermistor wiring harness inside the switch box (through the appropriate hole) and 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.

4 Install new tie straps to fix the thermistor wiring harness 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.

4.20 User interface

4.20.1 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

CKHWS

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 "4.15 Plate work" [▶ 180]. 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" [▶ 226].
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.

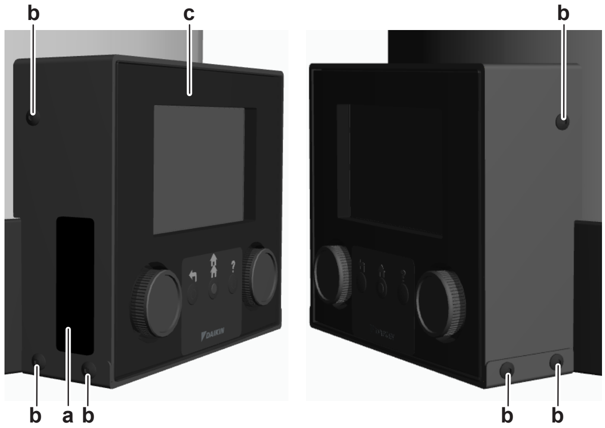
Is the measured voltage correct?	Action
Yes	Correct the wiring between the hydro PCB and the user interface, see "7.2 Wiring diagram" [▶ 287].
No	Perform a check of the hydro PCB, see "4.10.1 Checking procedures" [▶ 132].

EKHWET

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the 6 screws to dismantle the frame.



a Grey rubber cover
b Screw
c User interface (MMI)

2 Open the grey rubber cover and remove WLAN cartridge from the user interface (MMI).

3 Carefully pull the complete user interface to the front and remove it from the domestic hot water tank. Leave the wiring harness connected to the user interface.

4 Turn ON the power to the unit.

5 On the back side of the user interface, measure the voltage on the connector X1B pins 1-2.

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" [▶ 226].
No	Continue with the next step.

6 Measure the voltage on the connector X25A 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 "7.2 Wiring diagram" [▶ 287].
No	Perform a check of the hydro PCB, see "4.10.1 Checking procedures" [▶ 132].

To check the correct functioning of the user interface

Prerequisite: First perform a power check of the user interface, see "Checking procedures" [▶ 226].

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" [▶ 230].

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" [▶ 230].

Is the communication wiring correct?	Action
Yes	Replace the relevant part of the user interface, see "Repair procedures" [▶ 230].
No	Correct the wiring between the user interface and the unit PCB, see "7.2 Wiring diagram" [▶ 287].

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" [▶ 230].

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" [▶ 230].

To check the communication wiring between the user interface and the unit PCB

CKHWS

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 "4.15 Plate work" [▶ 180]. 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 "7.2 Wiring diagram" [▶ 287].
3. Check the continuity of all wires.
4. Replace any damaged or broken wires.

> **INFORMATION**
> Correct the wiring as needed.

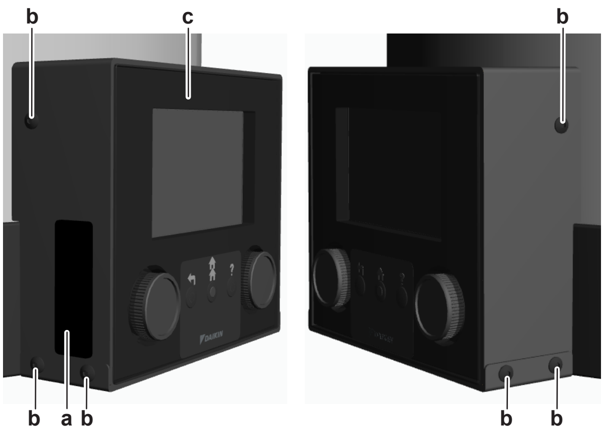
Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

EKHWET

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the 6 screws to dismantle the frame.



a Grey rubber cover
b Screw
c User interface (MMI)

2. Open the grey rubber cover and remove WLAN cartridge from the user interface (MMI).
3. Carefully pull the complete user interface to the front and remove it from the domestic hot water tank. Leave the wiring harness connected to the user interface.
4. Make sure that all wires between the user interface connector X1B (on the back side of the user interface) and the connector X18A on the hydro PCB are firmly and correctly connected, see "7.2 Wiring diagram" [▶ 287].
5. Check the continuity of all wires.
6. 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

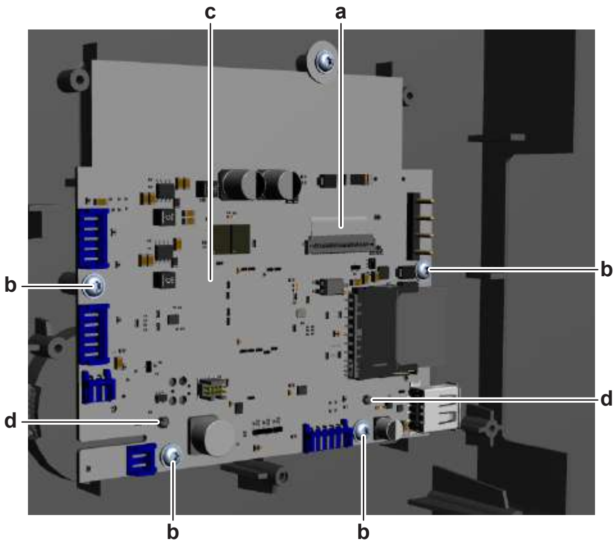
CKHWS

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 "4.15 Plate work" [▶ 180].
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.

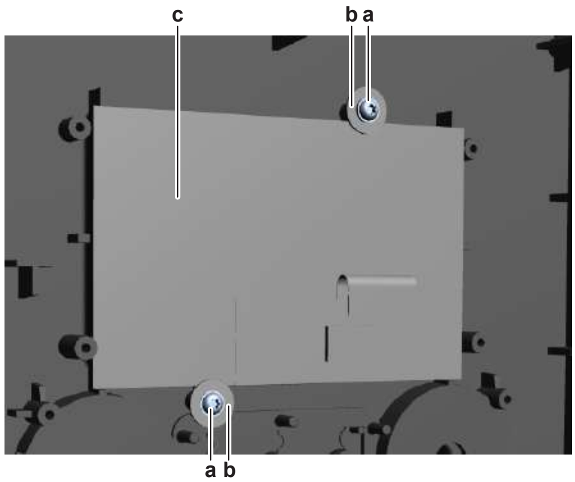
6 Carefully pull the user interface display PCB and unlatch the PCB supports one by one using a small pliers.

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" [▶ 230].

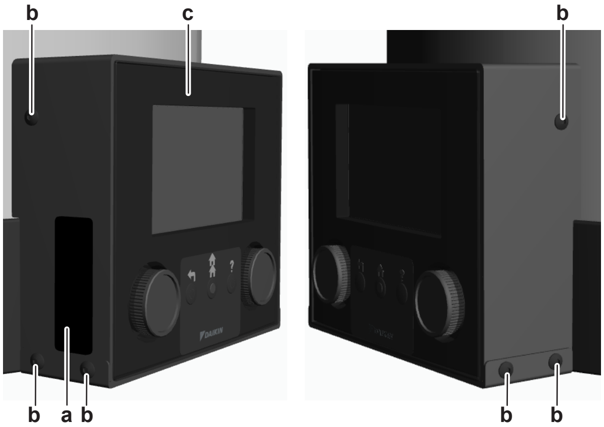
EKHWET

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 6 screws to dismantle the frame.



a Grey rubber cover
b Screw
c User interface (MMI)

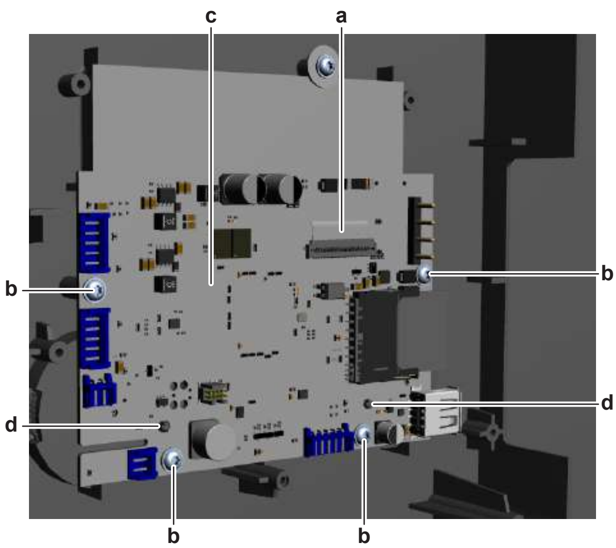
2 Open the grey rubber cover and remove WLAN cartridge from the user interface (MMI).

3 Squeeze the top and bottom of the user interface back cover to separate the user interface back cover and front panel.

4 Disconnect the user interface wiring harness connector from the user interface front panel.

5 Remove the user interface front panel from the domestic hot water tank.

6 Disconnect all wire connectors from the user interface main PCB.



a Display connector
b Screw
c User interface main PCB
d PCB support

7 Disconnect the display connector from the user interface main PCB.

8 Remove the 4 screws from the user interface main PCB.

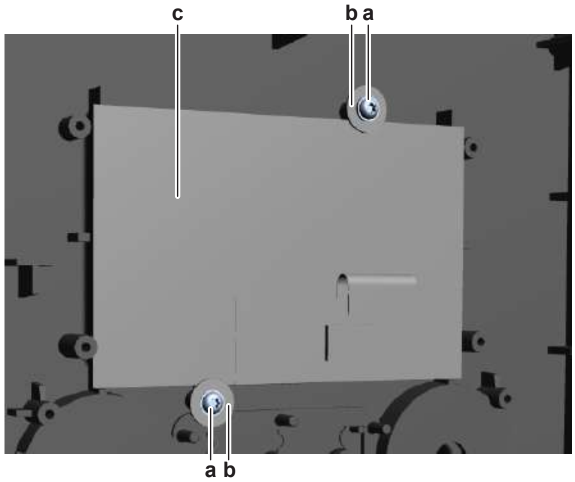
9 Carefully pull the user interface display PCB and unlatch the PCB supports one by one using a small pliers.

10 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

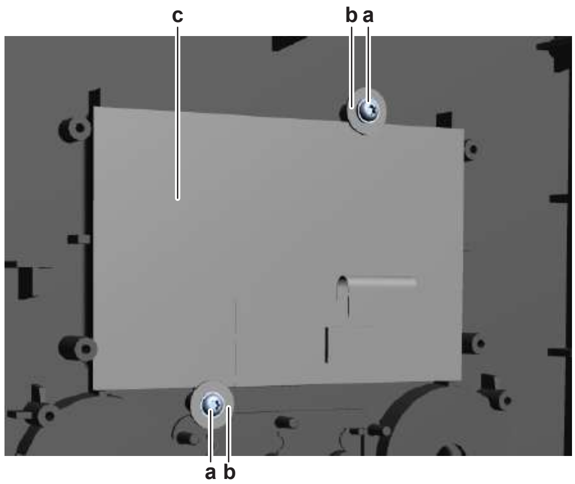
2. Carefully pull and remove the display from the user interface panel.
3. To install the user interface, see "Repair procedures" [▶ 230].

To install the user interface

CKHWS

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.

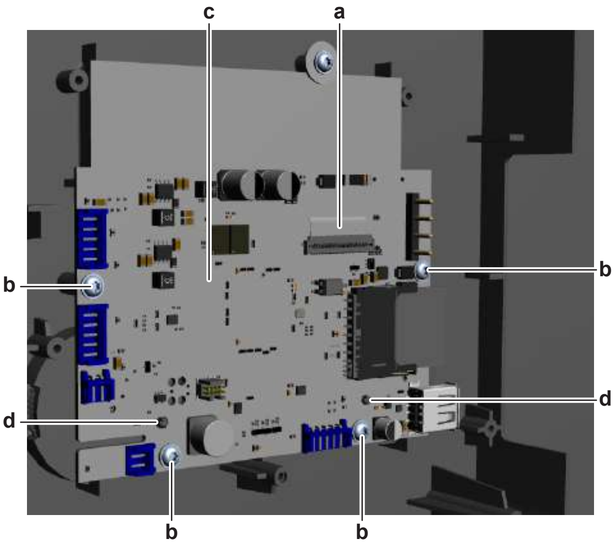
TO INSTALL THE USER INTERFACE MAIN PCB

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.

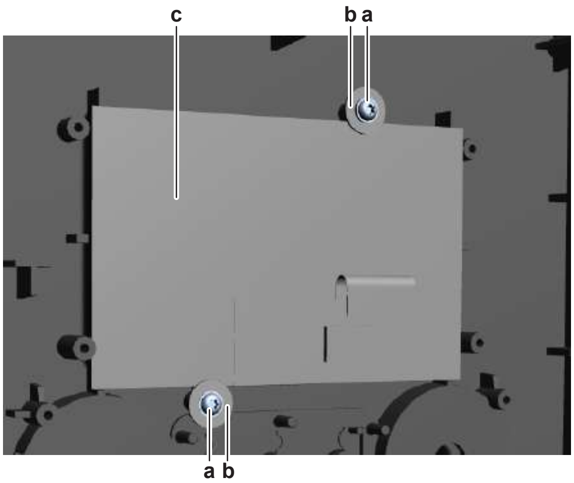
6 Install the cover and fix it using the 4 screws.

7 Install the user interface panel on the unit.

EKHWET

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.

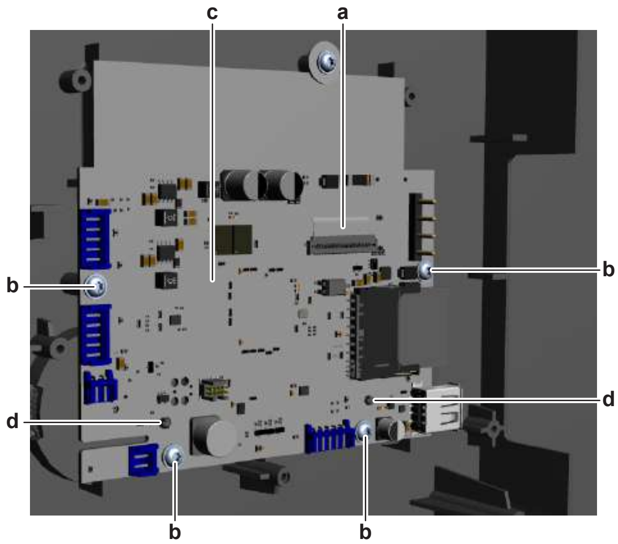
TO INSTALL THE USER INTERFACE MAIN PCB

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.

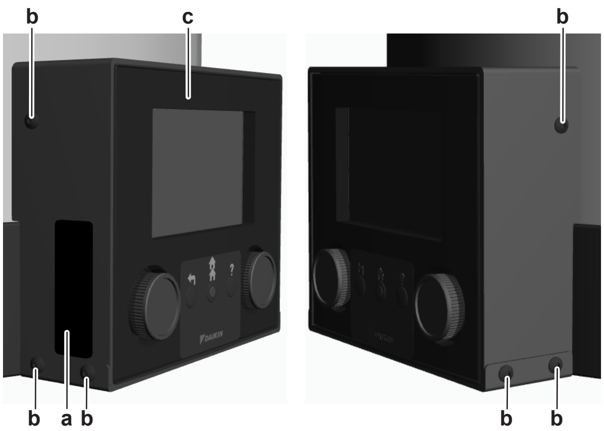
> **WARNING**
> When reconnecting a connector to the PCB, make sure to connect it on the correct location and do NOT apply force, as this may damage the connector or connector pins of the PCB.

5 Connect all wire connectors to the user interface main PCB.

6 Connect the user interface wiring harness connector to the user interface front panel.

7 Carefully assemble the user interface back cover and front panel. Make sure the user interface wiring harness is correctly routed through the hole in the back cover.

8 Install the user interface in the correct location on the domestic hot water tank.



a Grey rubber cover
b Screw
c User interface (MMI)

9 Install the frame. Install and tighten the 6 screws to fix the frame.

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.

4.20.2 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" [▸ 238].

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" [▸ 238].
No	Correct the wiring between the remote controller and the unit PCB, see "7.2 Wiring diagram" [▸ 287].

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" [▸ 238].

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" [▸ 238].

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 "7.2 Wiring diagram" [▸ 287].
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 install the user interface, see "Repair procedures" [▸ 238].

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.

4.21 Water flow sensor

4.21.1 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 "4.15 Plate work" [▶ 180].

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]x0.3)−1.2

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.

Do the measured and calculated water flow match?	Action
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 "4.10.1 Checking procedures" [▶ 132].

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 "4.21.2 Repair procedures" [▶ 240].
No	Replace the water flow sensor harness, see "4.21.2 Repair procedures" [▶ 240].

4.21.2 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 "4.15 Plate work" [▶ 180].

1. Disconnect the connector from the water flow sensor.
2. Disconnect the other end of the wiring harness from the hydro PCB.
3. Cut all tie straps that fix the wiring harness, and remove the wiring harness from the unit.
4. To install the water flow sensor wiring harness, see "4.21.2 Repair procedures" [▶ 240].

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

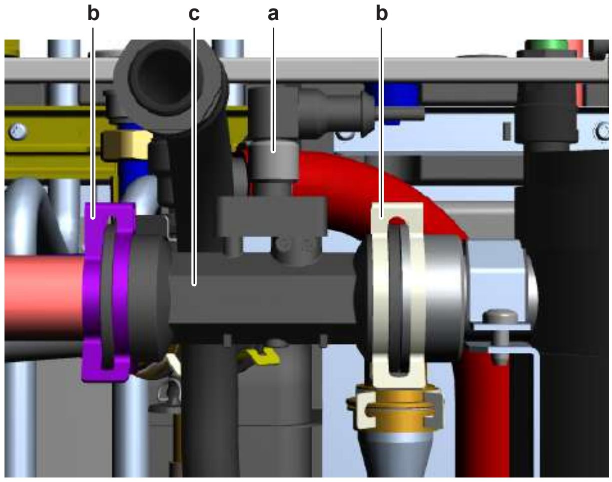
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

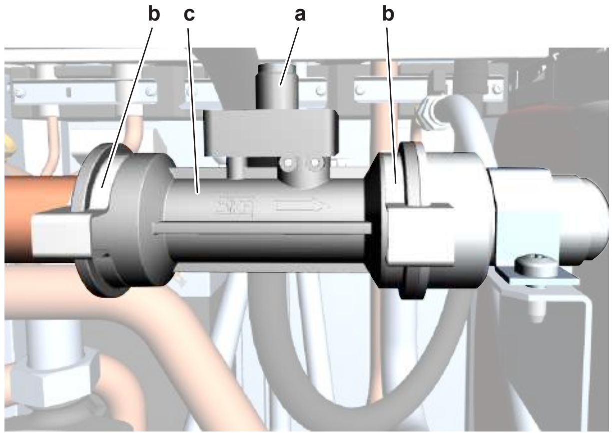
1 Remove the required plate work, see "4.15 Plate work" [▸ 180].

2 Drain the water circuit, see "5.3.2 Repair procedures" [▸ 273].

3 Loosen the water flow sensor connector nut.



a Water flow sensor connector nut
b Clip
c Water flow sensor



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 "4.21.2 Repair procedures" [▸ 240].

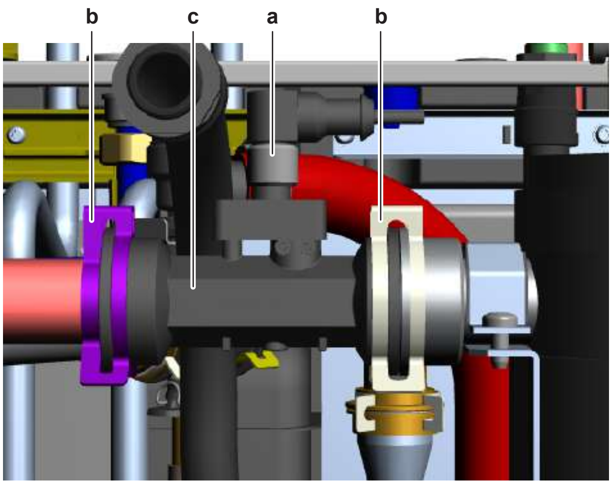
To install the water flow sensor

> **NOTICE**
> Check the condition of the O-rings and replace if needed. Apply water or silicon grease to the O-rings before installation.

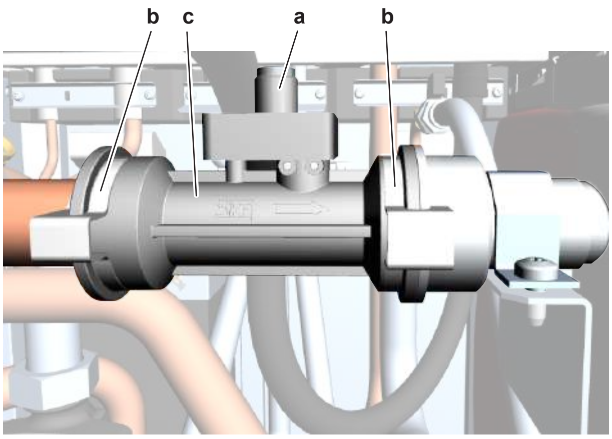
1 Mount the O-rings on the water flow sensor.

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



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 "5.3.2 Repair procedures" [▶ 273].

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.

4.22 Water pressure sensor

4.22.1 Checking procedures

To perform an electrical check of the water pressure sensor

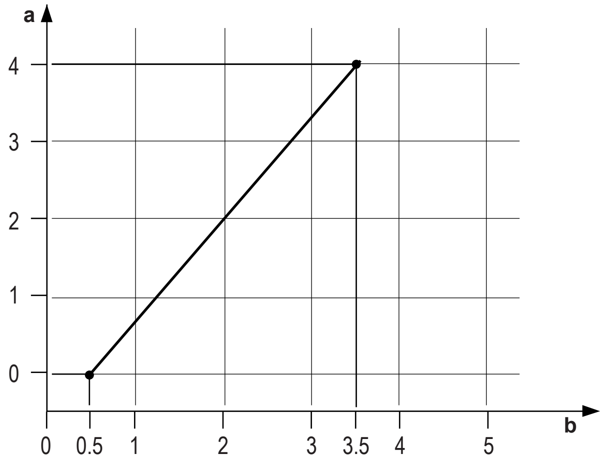
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

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

V DC	Detected pressure (bar)
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
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 "7.2 Wiring diagram" [▶ 287].
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 "7.2 Wiring diagram" [▶ 287].
No	Perform a check of the hydro PCB, see "4.10.1 Checking procedures" [▶ 132].

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 "4.22.2 Repair procedures" [▶ 245].
No	Replace the water pressure sensor harness, see "4.22.2 Repair procedures" [▶ 245].

4.22.2 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 "4.15 Plate work" [▶ 180].

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 "4.22.2 Repair procedures" [▶ 245].

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.

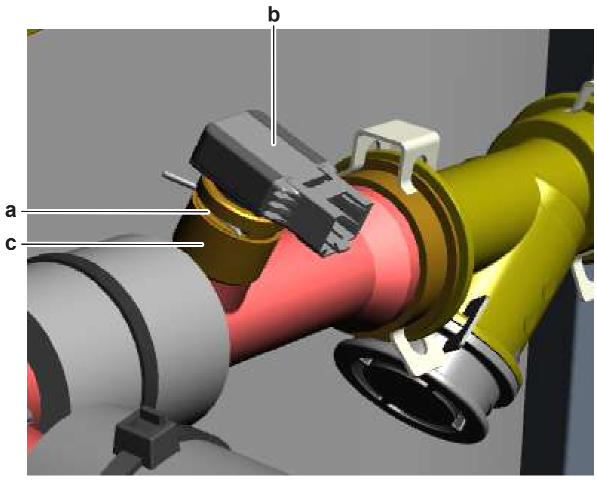
Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Drain water from the water circuit, see "5.3.2 Repair procedures" [▶ 273].

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 Clip
b Water pressure sensor
c Coupling piece

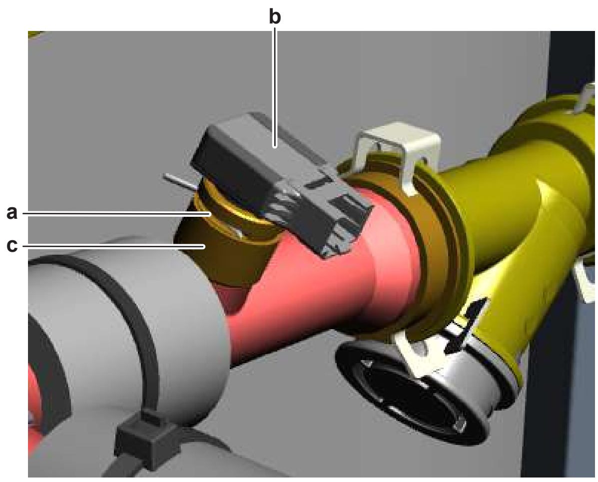
4 Push the water pressure sensor to release and remove it from the coupling piece. Remove the O-ring.

5 To install the water pressure sensor, see "4.22.2 Repair procedures" [▶ 245].

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 Clip
b Water pressure sensor
c 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 "5.3.2 Repair procedures" [▶ 273].

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.

4.23 Water pump

4.23.1 Checking procedures

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

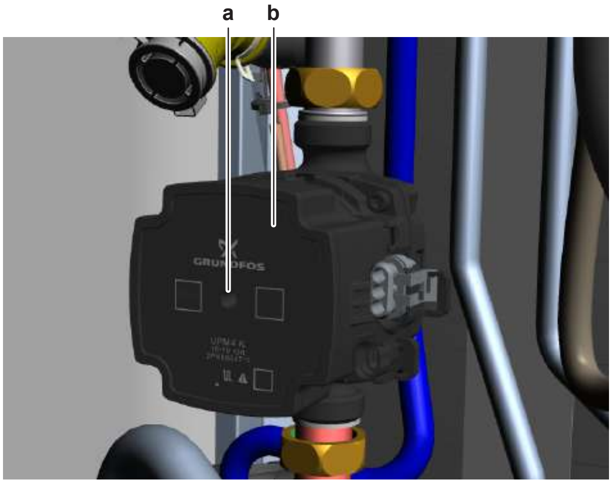
To perform a mechanical check of the water pump

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Insert a crosshead 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 Hole
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 "4.23.1 Checking procedures" [▶ 247].
No	Continue with the next step.

2 Remove the water pump, see "4.23.2 Repair procedures" [▶ 250].

3 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 "4.23.2 Repair procedures" [▶ 250].
No	Replace the water pump, see "4.23.2 Repair procedures" [▶ 250].

To perform an electrical check of the water pump

1 First perform a mechanical check of the water pump, see "4.23.1 Checking procedures" [▶ 247].

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.

8 Unplug the power supply connector from the water pump.

9 Turn ON the power of the unit.

Activate the water pump.

10 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.

11 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.

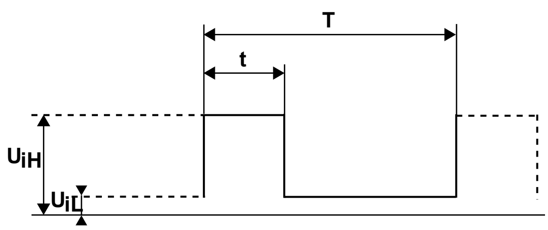
Is the measured voltage correct?	Action
Yes	Replace the power supply wiring harness between the water pump and the hydro PCB, see "4.23.2 Repair procedures" [▶ 250].
No	Perform a check of the hydro PCB, see "4.10.1 Checking procedures" [▶ 132].

12 Connect the power supply connector to the water pump.

13 Unplug the PWM signal connector from the water pump.

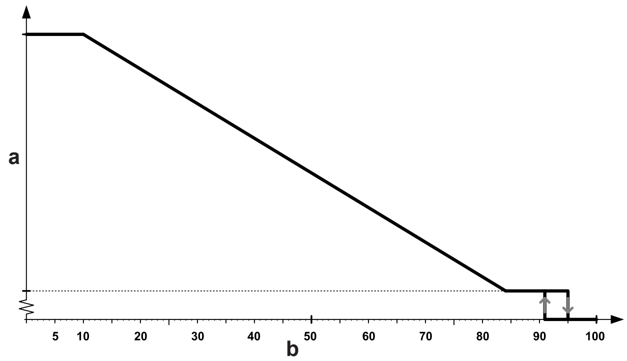
14 Remove the cap from the PWM signal connector and measure the PWM signal between the PWM-GND.

- 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 "4.23.2 Repair procedures" [▶ 250].
No	Continue with the next step.

15 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	Replace the PWM signal harness between the water pump and the hydro PCB, see "4.23.2 Repair procedures" [▶ 250].
No	Perform a check of the hydro PCB, see "4.10.1 Checking procedures" [▶ 132].

4.23.2 Repair procedures

To remove impurities from the water pump

Prerequisite: Remove the water pump, see "4.23.2 Repair procedures" [▶ 250].

1 Remove any impurities or objects that may block the water pump.

2 Install the water pump, see "4.23.2 Repair procedures" [▶ 250].

Is the problem solved?	Action
Yes	No further actions required.
No	Return to "4.23.1 Checking procedures" [▶ 247] of the water pump and continue with the next procedure.

To remove the water pump

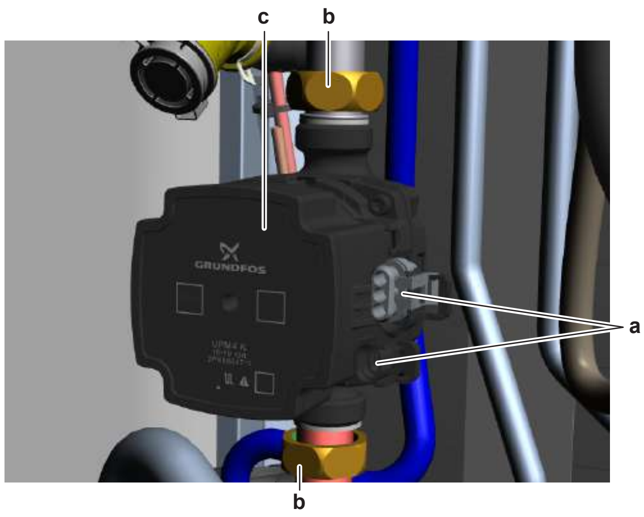
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Drain water from the water circuit, see "5.3.2 Repair procedures" [▶ 273].

2 Disconnect the connectors from the water pump motor.



a Connector
b Nut
c Water pump

3 Unscrew the upper and lower nuts that fix the water pump to the water circuit pipes.

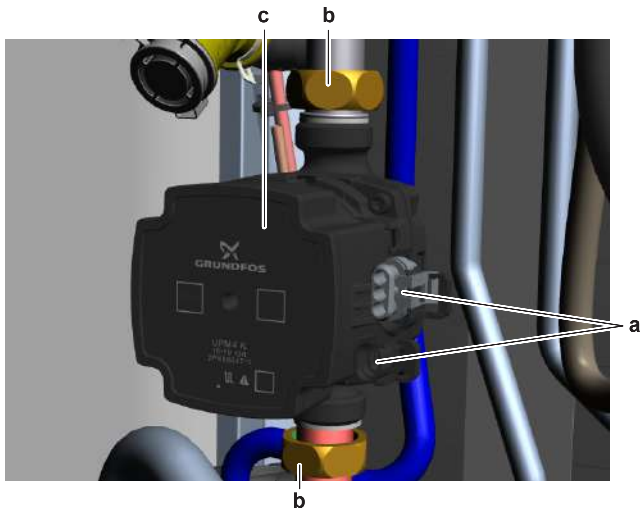
> **CAUTION**
> Use a counterforce when unscrewing or tightening the nuts to make sure NOT to damage the piping.

4 Remove the water pump.

5 To install the water pump, see "4.23.2 Repair procedures" [▶ 250].

To install the water pump

1 Install the water pump in the correct location.



a Connector
b Nut
c Water pump

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 "5.3.2 Repair procedures" [▸ 273].

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 "4.15 Plate work" [▸ 180].

1 Disconnect the appropriate connector (power supply connector and/or PWM signal connector) from the water pump.

2 Disconnect the other end of the wiring harness from the appropriate connector:

- X16A on hydro PCB for power supply wiring harness
- X25A on hydro PCB for PWM signal wiring harness

3 Cut all tie straps that fix the wiring harness, and remove the wiring harness from the unit.

4 To install the water pump appropriate wiring harness, see "4.23.2 Repair procedures" [▸ 250].

To install the water pump wiring harness

1 Connect the wiring harness to the appropriate connector:

- X16A on hydro PCB for power supply wiring harness
- X25A on hydro PCB 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.

5 Third party components

5.1 Electrical circuit

5.1.1 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 "4.15 Plate work" [▸ 180].

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.
4. Measure the voltage between L and N on the 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	Adjust the power supply, see "5.1.2 Repair procedures" [▸ 256].

To check the power supply to the indoor unit

EKHWET units

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1. Remove the required plate work, see "4.15 Plate work" [▸ 180].
2. Check that the power supply cables and earth connection are firmly fixed to the indoor unit power supply terminal X2M.
3. 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.
4. Turn ON the power using the respective circuit breaker.
5. Measure the voltage between terminal 1 and 2 on the indoor unit power supply terminal X2M.

   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.

Is the measured voltage (power supply) correct?	Action
No	Continue with the next step.

6 Check the power supply to the unit, see "5.1.1 Checking procedures" [▶ 253].

Does the unit receive power?	Action
Yes	Correct the wiring from the main power supply terminal to the indoor unit power supply terminal, see "5.1.2 Repair procedures" [▶ 256].
No	Adjust the power supply to the unit, see "5.1.2 Repair procedures" [▶ 256].

CKHWS units

- NORMAL 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 "4.15 Plate work" [▶ 180].

2 Check that the power supply cables and earth connection are firmly fixed to the indoor unit power supply terminal X1M.

3 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.

4 Turn ON the power using the respective circuit breaker.

5 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.

6 Check the power supply to the unit, see "5.1.1 Checking procedures" [▶ 253].

Does the unit receive power?	Action
Yes	Correct the wiring from the main power supply terminal to the indoor unit power supply terminal, see "5.1.2 Repair procedures" [▶ 256].
No	Adjust the power supply to the unit, see "5.1.2 Repair procedures" [▶ 256].

- NORMAL kWh RATE POWER SUPPLY (SEPARATE POWER SUPPLY)

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

1 Remove the required plate work, see "4.15 Plate work" [▶ 180].

2 Check that the power supply cables and earth connection are firmly fixed to the indoor unit power supply terminal X2M.

3 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.

4 Turn ON the power using the respective circuit breaker.

5 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 "5.1.2 Repair procedures" [▶ 256].

To check if the power supply is compliant with the regulations

1 Check that the power source is in line with the requirements described in the databook.

Is the power supply compliant with the regulations?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Adjust the power supply, see "5.1.2 Repair procedures" [▶ 256].

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 "7.2 Wiring diagram" [▶ 287].

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.

5.1.2 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 "4.15 Plate work" [▶ 180].

1. Make sure that all wires are firmly and correctly connected, see "7.2 Wiring diagram" [▶ 287].
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 "4.15 Plate work" [▶ 180].

1. Make sure that all wires are firmly and correctly connected, see "7.2 Wiring diagram" [▶ 287].
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.

5.2 Refrigerant circuit

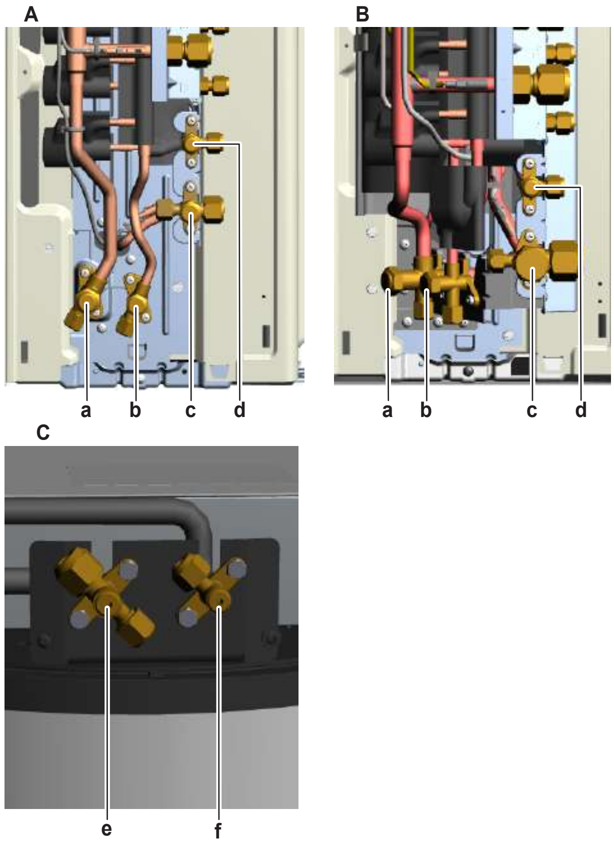
5.2.1 Checking procedures

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

To check if the stop valves are open

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Remove the caps.



A Outdoor unit 4MWXM
B Outdoor unit 5MWXM
C Domestic hot water tank EKHWET
a Main gas stop valve (with service port)
b Main liquid stop valve (with service port)
c Gas stop valve (with service port) – Domestic hot water tank refrigerant circuit
d Liquid stop valve – Domestic hot water tank refrigerant circuit
e Gas stop valve
f Liquid stop valve

2 Check if the stop valves are completely open.

The refrigerant circuit stop valves are open?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Open the stop valves of the refrigerant circuit, see "5.2.2 Repair procedures" [▶ 262].

To check if the refrigerant circuit is clogged

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. Check that all field piping is done according to the refrigeration practice and installation manual:
   - Correct piping diameters
   - Piping distance limits are followed
   - NO pipes are squeezed
   - NO short radius bends
3. On the outdoor unit, connect a manometer to the service ports of the main liquid stop valve and main gas stop valve.
4. Turn ON the power of the unit.
5. Activate `Heating` operation of the air conditioning indoor units via the user interface.
6. Read the pressure on the high and low pressure gauges. If there is a significant difference between high and low pressure, the refrigerant circuit might be clogged.
7. On the refrigerant liquid piping (between the air conditioning indoor unit 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).

8. Stop the unit operation via the user interface.
9. Turn OFF the respective circuit breaker.
10. Wait for the refrigerant to reach the outdoor temperature.
11. On the outdoor unit, connect a manometer to the service ports of the main liquid stop valve and gas stop valve (domestic hot water tank refrigerant circuit).
12. Turn ON the power of the unit.
13. Activate domestic hot water operation.
14. Read the pressure on the high and low pressure gauges. If there is a significant difference between high and low pressure, the refrigerant circuit might be clogged.

15 On the refrigerant liquid piping (between the domestic hot water tank 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 "5.2.2 Repair procedures" [▶ 262].
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.

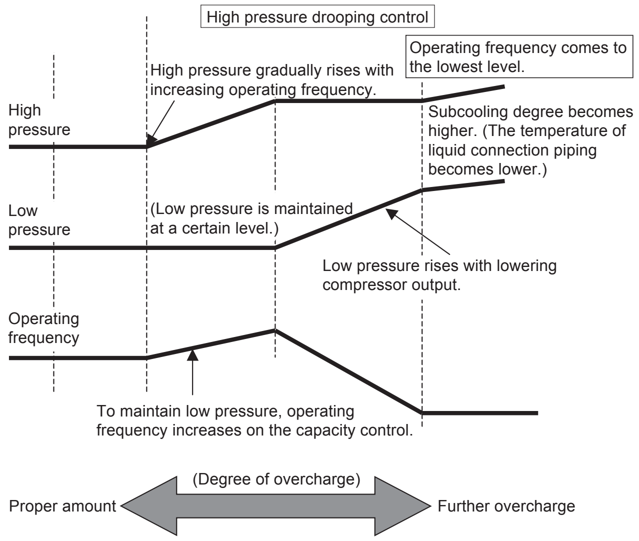
Refrigerant overcharge diagnosis

1 High pressure rises. Consequently, overload control is conducted to cause insufficient cooling capacity.

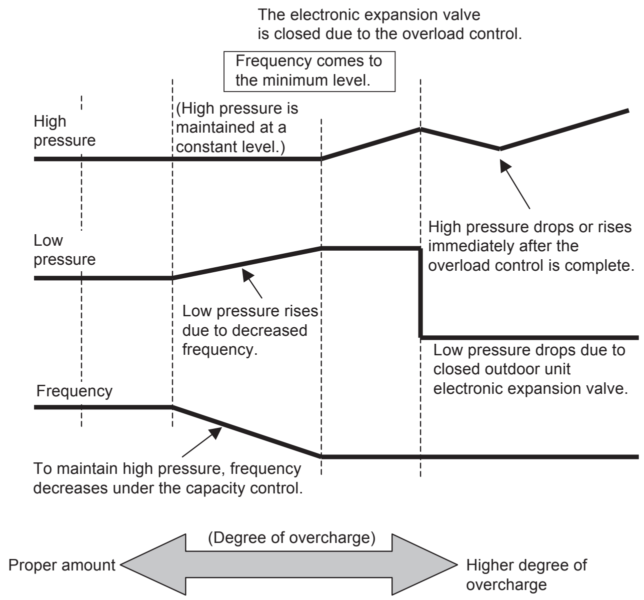
2 The superheated degree of suction gas lowers (or the wet operation is performed). Consequently, the compressor consumes more power and is noisy (before over-current relay trips).

3 The subcooling degree of refrigerant in liquid form rises (values >4~5K are NOT normal).

Cooling



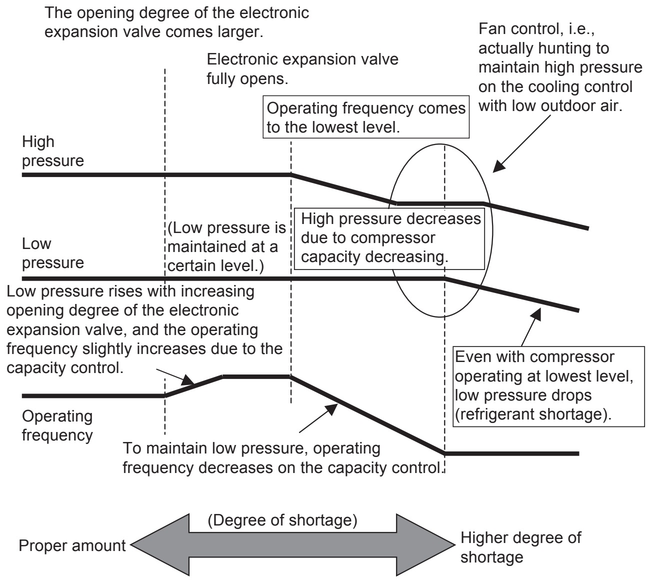
Heating



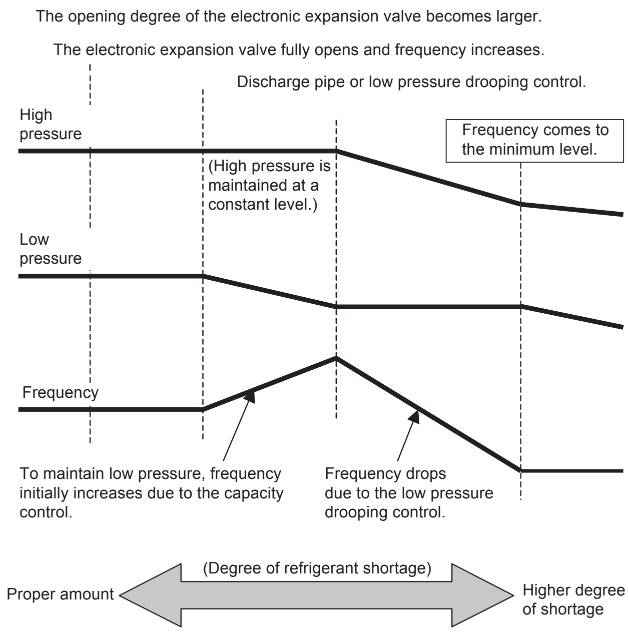
Refrigerant shortage diagnosis

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.
No	Add or recuperate refrigerant until correctly charged, see "5.2.2 Repair procedures" [▶ 262].

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 "5.2.2 Repair procedures" [▶ 262].
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.

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 "5.2.2 Repair procedures" [▶ 262].

To check if the refrigerant field piping is compliant with the regulations

1 Check if the refrigerant field piping is compliant with the regulations. Adjust as needed. See installation manual for field piping specifications.

2 ONLY for CKHWS tank: Check that the chimney is not clogged, see "6 Maintenance" [▶ 280].

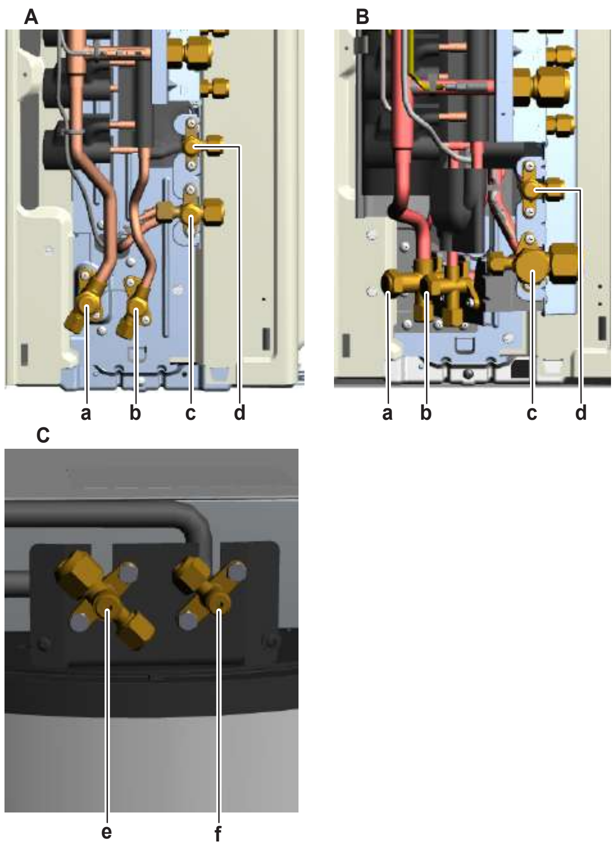
Is the problem solved?	Action
Yes	No further actions required.
No	Return to the troubleshooting of the specific error and continue with the next procedure.

5.2.2 Repair procedures

To open the stop valves of the refrigerant circuit

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1 Remove the caps.



A Outdoor unit 4MWXM
B Outdoor unit 5MWXM
C Domestic hot water tank EKHWET
a Main gas stop valve (with service port)
b Main liquid stop valve (with service port)
c Gas stop valve (with service port) – Domestic hot water tank refrigerant circuit
d Liquid stop valve – Domestic hot water tank refrigerant circuit
e Gas stop valve
f Liquid stop valve

2 Completely open the stop valves by screwing the stop valve screw counterclockwise.

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 clogged/leaking part of the refrigerant circuit

1 See the correct procedure for the component that needs to be repaired. See also "Repair information" [▸ 268] 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 Necessary tools:

Service tool		Remark
	Refrigerant recovery unit	Compatible with the refrigerant to be recovered
	Scale	Read-out / 10 grams
	Manifold	Compatible with the refrigerant to be recovered
	Flexible hoses	Compatible with the refrigerant to be recovered
	Recovery cylinder	Compatible with the refrigerant to be recovered
	Vacuum pump	2-stage, equipped with solenoid valve

To recuperate the refrigerant from the complete system

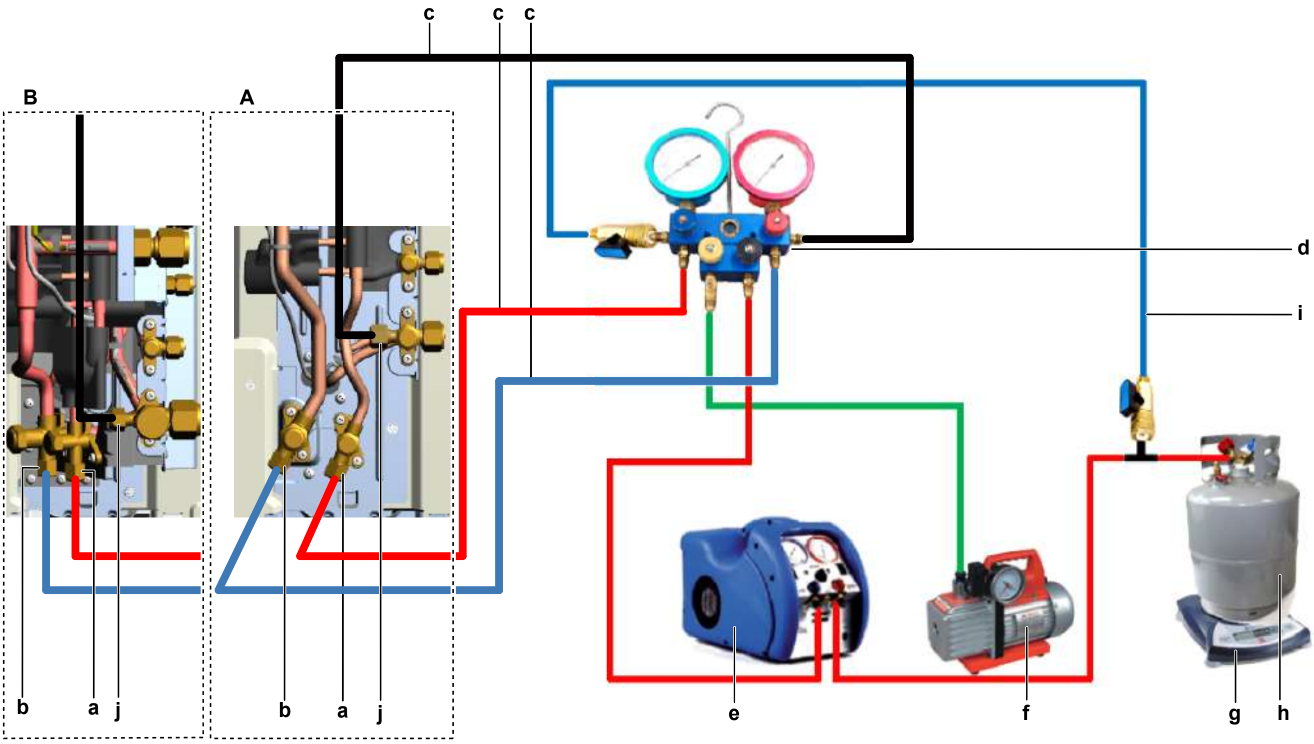
1 Manually open all expansion valves and solenoid valves.

2 Setup a vacuum line between recovery unit discharge and the recovery bottle. Without this additional setup, the discharge line from the recovery device to the refrigerant cylinder would not have been vacuumed.

3 Connect the vacuum pump, manifold, recovery unit, and refrigerant recovery cylinder to the service ports of the refrigerant circuit as shown below. Make sure all stop valves of the system are open.

INFORMATION

To recuperate the refrigerant from the indoor units circuit ONLY, close the main liquid and gas stop valves of the outdoor unit.



A Outdoor unit 4MWXM
B Outdoor unit 5MWXM
a Main liquid service port (O/U)
b Main gas service port (O/U)
c Flexible hose
d Manifold
e Recovery unit
f Vacuum pump
g Scale
h Recovery cylinder
i Vacuum setup
j Gas service port – domestic hot water refrigerant circuit (O/U)

4 To add refrigerant, see "5.2.2 Repair procedures" [▸ 262].

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 from the outdoor unit + air conditioning indoor units

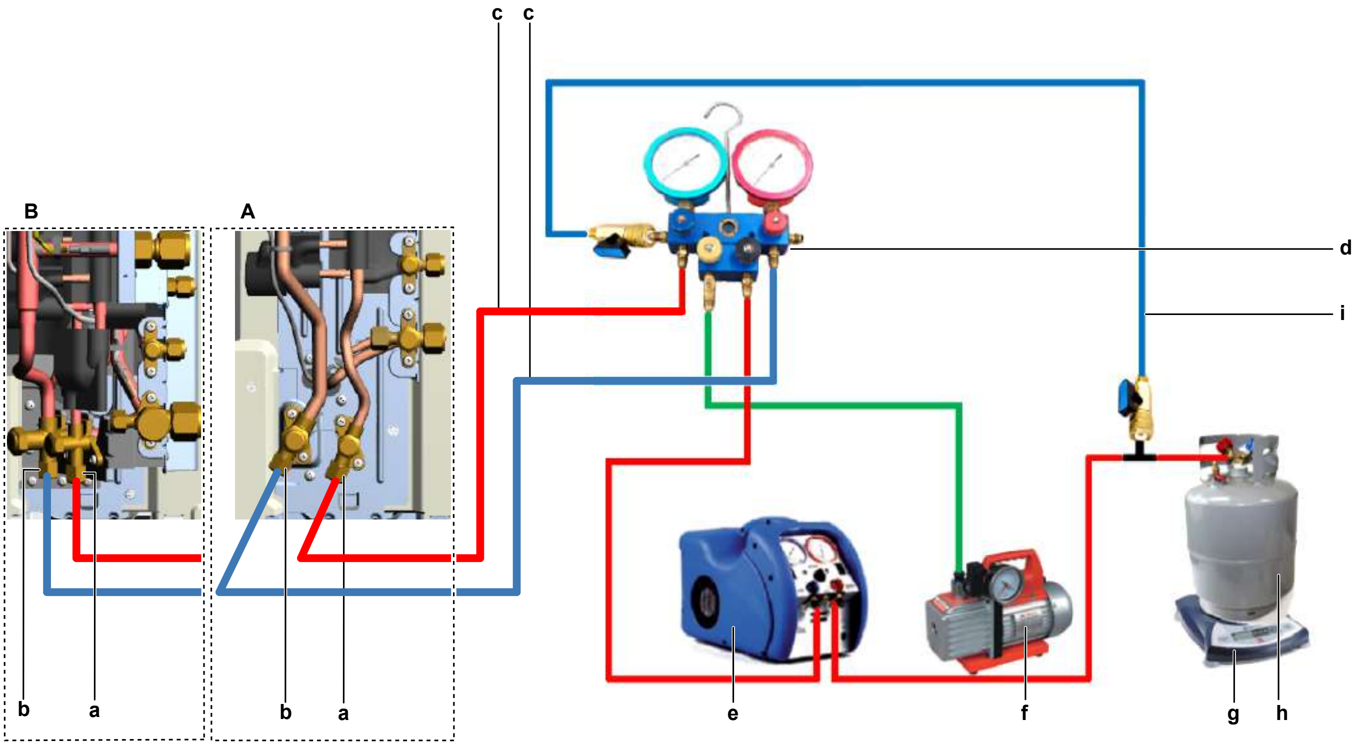
1 Manually open all expansion valves and solenoid valves.

2 Setup a vacuum line between recovery unit discharge and the recovery bottle. Without this additional setup, the discharge line from the recovery device to the refrigerant cylinder would not have been vacuumed.

3 Connect the vacuum pump, manifold, recovery unit, and refrigerant recovery cylinder to the service ports of the refrigerant circuit as shown below. Make sure the domestic hot water circuit liquid and gas stop valves (on the outdoor unit) are closed. All other stop valves of the outdoor unit and air conditioning indoor units MUST be open.

INFORMATION

To recuperate the refrigerant from the indoor units circuit ONLY, close the main liquid and gas stop valves of the outdoor unit.



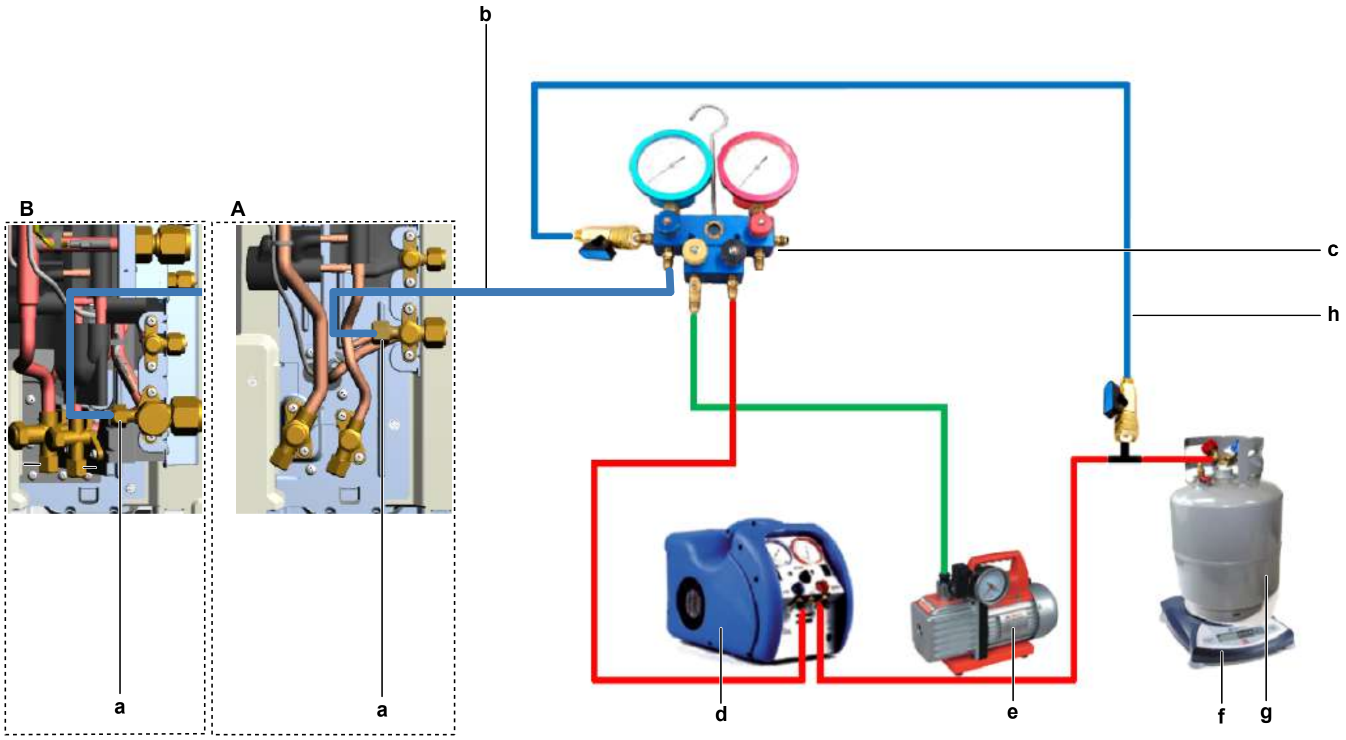
- **A** Outdoor unit 4MWXM
- **B** Outdoor unit 5MWXM
- **a** Main liquid service port (O/U)
- **b** Main gas service port (O/U)
- **c** Flexible hose
- **d** Manifold
- **e** Recovery unit
- **f** Vacuum pump
- **g** Scale
- **h** Recovery cylinder
- **i** Vacuum setup

4 To add refrigerant, see "5.2.2 Repair procedures" [▸ 262].

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 from the domestic hot water tank

1. Setup a vacuum line between recovery unit discharge and the recovery bottle. Without this additional setup, the discharge line from the recovery device to the refrigerant cylinder would not have been vacuumed.
2. Connect the vacuum pump, manifold, recovery unit, and refrigerant recovery cylinder to the service ports of the refrigerant circuit as shown below. Make sure ALL stop valves on the outdoor unit are closed. For EKHWET units: The stop valves of the domestic hot water tank MUST be open.



A Outdoor unit 4MWXM
B Outdoor unit 5MWXM
a Gas service port – domestic hot water refrigerant circuit (O/U)
b Flexible hose
c Manifold
d Recovery unit
e Vacuum pump
f Scale
g Recovery cylinder
h Vacuum setup

3. To add refrigerant, see "5.2.2 Repair procedures" [▶ 262].

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.

Is the problem solved?	Action
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:
  - When using an electronic vacuum gauge with an absolute pressure readout, a pressure of minimal 2000 micron / 2 Torr / 266 Pa MUST be reached. This pressure should stay stable for 30 minutes when vacuum pump is NOT running. If vacuum pressure CANNOT be held, most likely there is still moisture in the system. Again run the vacuum pump for 1~2 hours to a pressure (absolute pressure readout) lower than 2000 micron / 2 torr / 266 Pa. If target pressure CANNOT be reached, again check for leaks.
  - 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 "4.15 Plate work" [▶ 180].
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%).

Refrigerant circuit vacuuming - general advice

The effectiveness of the vacuum drying depends on many factors. Besides following the correct procedures and using equipment that is well maintained, the ambient conditions at which the vacuum is done MUST be considered. If there is moisture in the refrigerant and the ambient temperature is lower, the vacuum pressure that MUST be reached to allow the evaporation of the moisture will need to be lower. In some cases the vacuum pump may NOT be able to achieve these pressures. If possible, heat the locations where moisture is expected.

As a general target, the values below CAN be used as reference to achieve a proper vacuum on the unit:

- Absolute pressure below 270 Pa MUST be reached. The time needed for the pressure to lower is also depending on the moisture amount. If it takes very long or it is hard to reach the pressure, this MIGHT be an indication of moisture presence, so the vacuum pump will need to run longer.
- After stopping the vacuum pump, the absolute pressure MUST be kept below 270 Pa for at least 30 minutes, without a significant increase of pressure. If pressure increases significantly, this is an indication of the presence of moisture in the system.
- If multiple vacuum cycles need to be performed, break the vacuum between the cycles using dry nitrogen.

Depending on the site conditions, as mentioned above, lower pressure values MIGHT be needed to allow the boiling of the moisture in the system. The table below shows the boiling point of water for different absolute pressures.

Pressure (absolute)		Boiling point
Micron / Torr	**Mbar / Pa**	**°C**
760000 / 760	1013 / 101325	100
50000 / 50	66 / 6666	38
10000 / 10	13 / 1333	11
2000 / 2	2.6 / 266	–10
1000 / 1	1.33 / 133	–18
500 / 0.5	0.66 / 66	–24

5.3 Water circuit

5.3.1 Checking procedures

To check the water pressure

This procedure applies to the heating circuit for domestic hot water of the CKHWS tank.

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 "5.3.2 Repair procedures" [▶ 273].

To check the water flow

This procedure applies to the heating circuit for domestic hot water of the CKHWS tank.

Conditions: Make sure all operation is disabled. Go to [C]: `Operation` and turn off `Tank` operation.

1	Set the user permission level to Installer.	—
2	Go to [A.2]: `Commissioning` > `Actuator test run`.	
3	Select `Pump`.	
4	Select OK to confirm. **Result:** The actuator test run starts.	
5	Read out the `Flow rate`[a] to reach the minimum required flow rate + 2 l/min.	—

[a] During pump test run, the unit can operate below the minimum required flow rate.

If operation is...	Then the minimum required flow rate is...
Domestic hot water production/defrost	22 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.

1 Check the water pressure, see "5.3.1 Checking procedures" [▶ 270].

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 "5.3.2 Repair procedures" [▶ 273].

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.
No	Open the specific valve(s) of the water circuit, see "5.3.2 Repair procedures" [▶ 273].

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 "5.3.2 Repair procedures" [▶ 273].
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 and inside the unit and check for leaks.

A leak was found in the installation?	Action
Yes	Repair the leak in the installation, see "5.3.2 Repair procedures" [▶ 273].

A leak was found in the installation?	Action
No	Return to the troubleshooting of the specific error and continue with the next procedure.

To check if the water circuit is clogged

This procedure applies to the heating circuit for domestic hot water of the CKHWS tank.

1. Turn ON the power of the unit.
2. Activate `DHW` operation via the user interface.
3. Wait for the system to run at a more or less stable condition.
4. On the water circuit piping, using a contact thermometer, measure the temperature before and after every position with a potential risk for clogging. If a big temperature difference is measured, 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
> - ...

Temperature drop found?	Action
Yes	Replace the clogged part, see "5.3.2 Repair procedures" [▶ 273].
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 "5.3.2 Repair procedures" [▶ 273].

To check the water volume in the domestic hot water tank

1. Check if the water volume in the domestic hot water tank is within the required specifications. See installation manual of the domestic hot water tank.

Is the water volume in the domestic hot water tank correct?	Action
Yes	Return to the troubleshooting of the specific error and continue with the next procedure.
No	Add water to the domestic hot water tank, see "5.3.2 Repair procedures" [▶ 273].

5.3.2 Repair procedures

To drain the domestic hot water tank

EKHWET

DANGER: RISK OF BURNING/SCALDING

The water in the tank can be very hot.

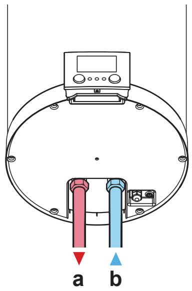
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Close the cold water supply.

Prerequisite: Open all the hot water tapping points to allow air to enter the system.

1. Remove the water inlet connection, the water will flow out of the tank.



a DHW – hot water OUT (screw connection, ½”)
b DHW – cold water IN (screw connection, ½”)

CKHWS180+230

DANGER: RISK OF BURNING/SCALDING

The water in the tank can be very hot.

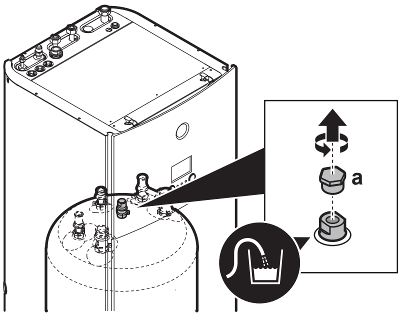
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Close the cold water supply.

Prerequisite: Open all the hot water tapping points to allow air to enter the system.

1. Remove the top panel, the user interface panel and the front panel.
2. Lower the switch box.
3. Remove the stop from the access point to the tank.
4. Use a drain hose and a pump to drain the tank via the access point.



a Access point to tank

CKHWSU230

> **DANGER: RISK OF BURNING/SCALDING**
>
> The water in the tank can be very hot.

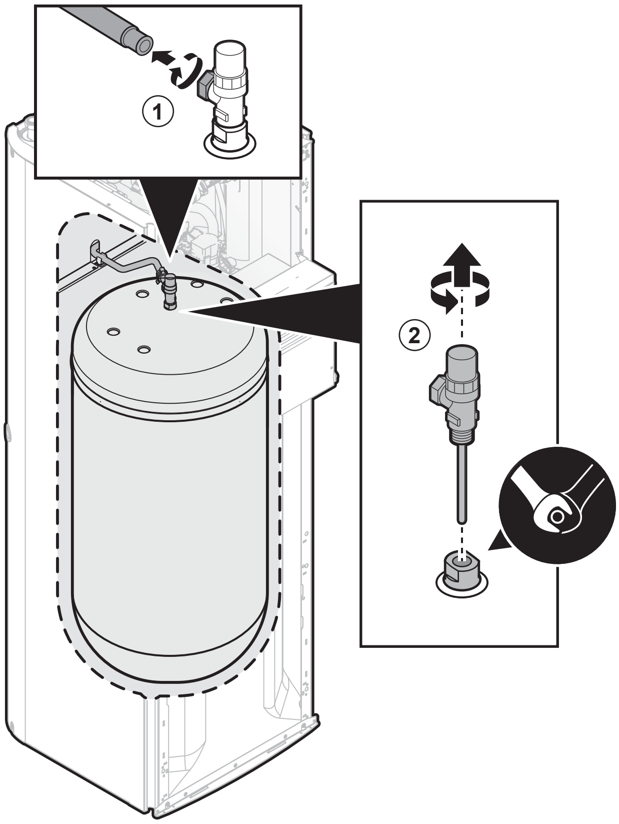
Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Close the cold water supply.

Prerequisite: Open all the hot water tapping points to allow air to enter the system.

1. Remove the top panel.
2. Remove the user interface panel.
3. Lower the switchbox.
4. Remove the tube from the temperature and pressure relief valve that is located on top of the tank.
5. Remove the temperature and pressure relief valve from the tank.
6. Use a drain hose and a pump to drain the tank via the access point.



7 Tightening torques for installation:

Item	Tightening torque
Tube connection	30 N•m
Temperature and pressure relief valve	40 N•m

To fill the domestic hot water tank

1. Open ALL hot water taps in order to purge air from the system pipe work.
2. Open the cold water supply stop valve to add water.
3. After all air is purged, close ALL hot water taps.
4. Once water volume in the domestic hot water tank is correct, close the cold water supply stop valve.
5. Check for leaks.
6. Manually operate the field installed pressure relief valve to ensure a free water flow through the discharge pipe.

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

This procedure applies to the heating circuit for domestic hot water of the CKHWS tank.

INFORMATION

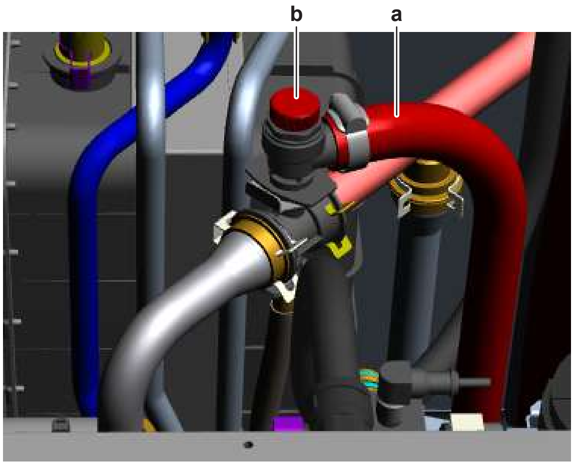
This procedure partially drains the water circuit, sufficient for component replacement.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

1. Close the stop valves of the water circuit.
2. Standard, a drain hose is installed on the safety valve of the water circuit. 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 Drain hose
b Safety valve

3 To add water to the water circuit, see "5.3.2 Repair procedures" [▶ 273].

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

This procedure applies to the heating circuit for domestic hot water of the CKHWS tank.

Prerequisite: Stop the unit operation via the user interface.

Prerequisite: Turn OFF the respective circuit breaker.

Prerequisite: Remove the required plate work, see "4.15 Plate work" [▶ 180].

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 "5.3.2 Repair procedures" [▶ 273].

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 purge the water circuit

This procedure applies to the heating circuit for domestic hot water of the CKHWS tank.

When the air purge function is running, the pump operates without actual operation of the unit and the removal of air in the water circuit will start.

NOTICE

Before starting the air purge, open the safety valve and check if the circuit is sufficiently filled with water. Only if water escapes the valve after opening it, you can start the air purge procedure.

Purging the air from the system should consist of:

1 Performing a manual air purge: You can set the pump speed to low or high. Air purge must be performed for tank (domestic hot water) circuits.

2 Performing an automatic air purge: The unit automatically changes the pump speed of the domestic hot water circuit.

INFORMATION

Start by performing a manual air purge. When almost all the air is removed, perform an automatic air purge. If necessary, repeat performing the automatic air purge until you are sure that all air is removed from the system. During air purge function, pump speed limitation [9-0D] is NOT applicable.

The air purge function automatically stops after 30 minutes.

To perform a manual air purge

Conditions: Make sure all operation is disabled. Go to [C]: `Operation` and turn off `Tank` operation.

1	Set the user permission level to `Installer`.	—
2	Go to [A.3]: `Commissioning` > `Air purge`.	
3	In the menu, set `Type` = `Manual`.	
4	Select `Start air purge`.	
5	Select OK to confirm. **Result:** The air purge starts. It stops automatically when ready.	
6	During manual operation: ▪ You can change the pump speed. ▪ You must change the circuit. To change these settings during the air purge, open the menu and go to [A.3.1.5]: `Settings`.	
	▪ Scroll to `Circuit` and set it to `Tank`.	
	▪ Scroll to `Pump speed` and set it to `Low`/`High`.	
7	To stop the air purge manually:	—
	1 Open the menu and go to `Stop air purge`.	
	2 Select OK to confirm.	

To perform an automatic air purge

Conditions: Make sure all operation is disabled. Go to [C]: `Operation` and turn off `Tank` operation.

1	Set the user permission level to `Installer`.	—
2	Go to [A.3]: `Commissioning` > `Air purge`.	
3	In the menu, set `Type` = `Automatic`.	
4	Select `Start air purge`.	
5	Select OK to confirm. **Result:** The air purge starts. It stops automatically when done.	
6	To stop the air purge manually:	—
	1 In the menu, go to `Stop air purge`.	
	2 Select OK to confirm.	

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 replace the clogged part of the water circuit

This procedure applies to the heating circuit for domestic hot water of the CKHWS tank.

1. See the correct procedure for the component that needs to be repaired.

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.

5.4 External factors

5.4.1 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 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.

6 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.

6.1 To clean the outdoor unit heat exchanger

1 Straighten the air 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 air fins of the outdoor unit heat exchanger during the cleaning process.

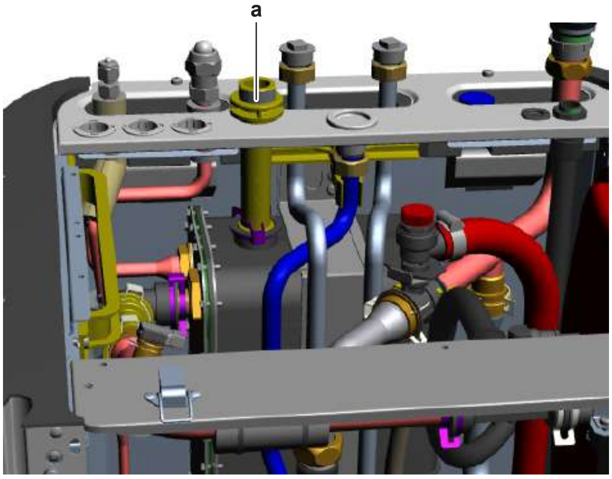
Do NOT use a high-pressure washer.

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.

6.2 To check that the chimney is not clogged or damaged

1 Visually inspect the chimney for any signs of damage. Replace as needed.

2 Check if the chimney is clogged. Clean as needed.



a Chimney

3 In case the chimney pipe is extended or exhausted to outside the building, also check the pipe extension for clogging or any signs of damage. Clean or replace 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.

6.3 Yearly maintenance

6.3.1 Yearly maintenance indoor unit: overview

EKHWET units

- Pressure relief valve of the domestic hot water tank
- Switch box
- Booster heater of the domestic hot water tank
- Anode
- Pressure reducing valve of the domestic hot water tank kit

CKHWS units

- Water pressure
- Strainer
- Water pressure relief valve
- Relief valve hose
- Pressure relief valve of the domestic hot water tank
- Switch box
- Descaling
- Chemical disinfection
- Pressure reducing valve of the domestic hot water tank kit
- Temperature and pressure relief valve

6.3.2 Yearly maintenance indoor unit: instructions

- EKHWET UNITS

Pressure relief valve of the domestic hot water tank (on unit or field supply)

Open the valve.

CAUTION

Water coming out of the valve may be very hot.

- Check if nothing blocks the water in the valve or in between piping. The water flow coming from the relief valve must be high enough.
- Check if the water coming out of the relief valve is clean. If it contains debris or dirt:
  - Open the valve until the discharged water does not contain debris or dirt anymore.
  - Flush and clean the complete tank, including the piping between the relief valve and cold water inlet.

To make sure this water originates from the tank, check after a tank heat up cycle.

> **INFORMATION**
> It is recommended to perform this maintenance more than once a year.

Switch box

- Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring.
- Using an ohmmeter, check if contactor K3M operates correctly. All contacts of this contactor must be in open position when the power is turned OFF.

> **WARNING**
> If the internal wiring is damaged, it has to be replaced by the manufacturer, its service agent or similarly qualified persons.

Booster heater of the domestic hot water tank

It is recommended to remove lime buildup on the booster heater to extend its life span, especially in regions with hard water. To do so, drain the domestic hot water tank, remove the booster heater from the domestic hot water tank and immerse in a bucket (or similar) with lime-removing product for 24 hours.

> **NOTICE**
> The booster heater sealing must be replaced after every check. Tighten the booster heater screws to 10 N•m of torque.

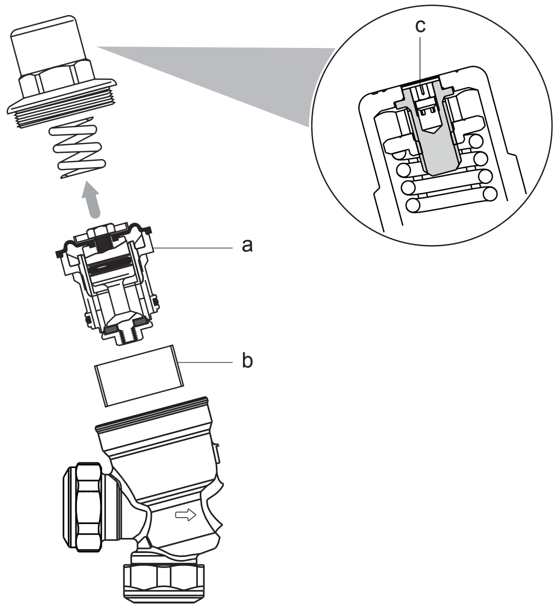
Anode

To check the integrity of the magnesium anode drain the domestic hot water tank, remove the booster heater from the domestic hot water tank and check the anode. If corrosion affects more than 2/3 of the anode surface, please replace it.

> **NOTICE**
> The booster heater sealing must be replaced after every check. Tighten the booster heater screws to 10 N•m of torque.

Pressure reducing valve (ONLY for UK models)

Depending on local water conditions, annual inspection of the integral line strainer, pressure reducing valve cartridge and seating may be necessary.



a Cartridge
b Strainer
c Calibration screw

1. Unscrew the plastic cover of the pressure reducing valve.
2. Extract the cartridge with the aid of long nosed pliers to grip the head of the set screw.
3. Remove the strainer element.
4. Clean the strainer element and cartridge under clean running water.
5. Replace if the strainer or cartridge are damaged.
6. Refit the strainer, cartridge and cover.
7. If the cartridge has been replaced, calibrate the pressure reducing valve:
   - Close the downstream isolating valve (field supply).
   - Install an Allen key on the calibration screw in the centre of the plastic cover. Rotate it clockwise to increase the outlet pressure and anticlockwise to reduce it.

- CKHWS UNITS

Water pressure

Keep water pressure above 1 bar. If it is lower, add water.

Strainer

Remove the clips on the bottom part to be able to reach the strainer:

- Remove the bottom part.
- Remove the strainer.
- Clean the strainer under clean running water.

Water pressure relief valve

Open the valve and check if it operates correctly. **The water may be very hot!**

Checkpoints are:

- The water flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.

- Dirty water coming out of the relief valve:
  - open the valve until the discharged water does NOT contain dirt anymore
  - flush the system

To make sure this water originates from the tank, check after a tank heat up cycle.

It is recommended to do this maintenance more frequently.

Pressure relief valve hose

Check whether the pressure relief valve hose is positioned appropriately to drain the water.

Pressure relief valve of the domestic hot water tank (on unit or field supply)

Open the valve.

CAUTION

Water coming out of the valve may be very hot.

- Check if nothing blocks the water in the valve or in between piping. The water flow coming from the relief valve must be high enough.
- Check if the water coming out of the relief valve is clean. If it contains debris or dirt:
  - Open the valve until the discharged water does not contain debris or dirt anymore.
  - Flush and clean the complete tank, including the piping between the relief valve and cold water inlet.

To make sure this water originates from the tank, check after a tank heat up cycle.

INFORMATION

It is recommended to perform this maintenance more than once a year.

Switch box

- Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring.
- Using an ohmmeter, check if contactors K1M, K2M, K3M and K5M (depending on your installation) operate correctly. All contacts of these contactors must be in open position when the power is turned OFF.

WARNING

If the internal wiring is damaged, it has to be replaced by the manufacturer, its service agent or similarly qualified persons.

Descaling

Depending on water quality and set temperature, scale can deposit on the heat exchanger inside the domestic hot water tank and can restrict heat transfer. For this reason, descaling of the heat exchanger may be required at certain intervals.

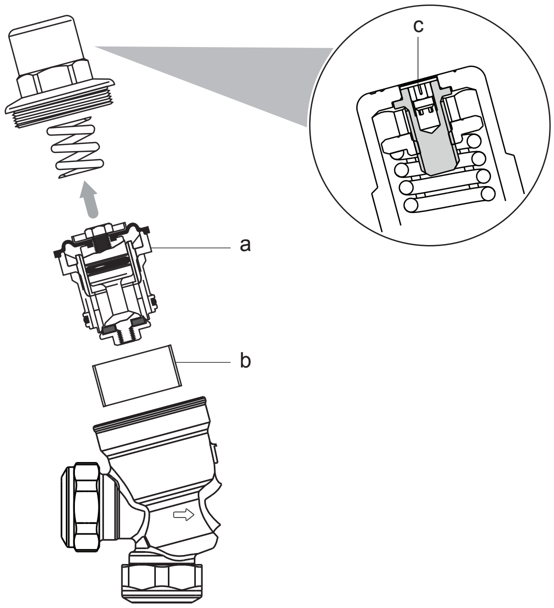
Chemical disinfection

If the applicable legislation requires a chemical disinfection in specific situations, involving the domestic hot water tank, please be aware that the domestic hot water tank is a stainless steel cylinder. We recommend to use a non-chloride based disinfectant approved for use with water intended for human consumption.

> **NOTICE**
> When using means for descaling or chemical disinfection, make sure water quality still complies with EU directive 2020/2184.

Pressure reducing valve

Depending on local water conditions, annual inspection of the integral line strainer, pressure reducing valve cartridge and seating may be necessary.



a Cartridge
b Strainer
c Calibration screw

1. Unscrew the plastic cover of the pressure reducing valve.
2. Extract the cartridge with the aid of long nosed pliers to grip the head of the set screw.
3. Remove the strainer element.
4. Clean the strainer element and cartridge under clean running water.
5. Replace if the strainer or cartridge are damaged.
6. Refit the strainer, cartridge and cover.
7. If the cartridge has been replaced, calibrate the pressure reducing valve:
   - Close the downstream isolating valve (field supply).
   - Install an Allen key on the calibration screw in the centre of the plastic cover. Rotate it clockwise to increase the outlet pressure and anticlockwise to reduce it.

Temperature and pressure relief valve

Check for correct operation of the temperature and pressure relief valve. Manually operate the temperature and pressure relief valve to ensure free water flow through discharge pipe. Turn knob left.

7 Technical data

7.1 Detailed information setting mode

7.1.1 Detailed information setting mode: Indoor unit

See the installer reference guide on business portal for more information.

7.1.2 Detailed information setting mode: Outdoor unit

See the installer reference guide on business portal for more information.

7.2 Wiring diagram

7.2.1 Wiring diagram: EKHWET tank

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.

Legend

A1P		Main PCB
F2B	#	Overcurrent fuse booster heater
FU1 (A1P)		Fuse (5 A 250 V for PCB)
K3M		Contactor booster heater
Q1DI	#	Earth leakage circuit breaker
TR1		Power supply transformer
X4M	#	Booster heater power supply terminal strip client
X8M		Booster heater power supply terminal strip
X*, X*A, X*B		Connector
X*M		Terminal strip

* Optional
\# Field supply

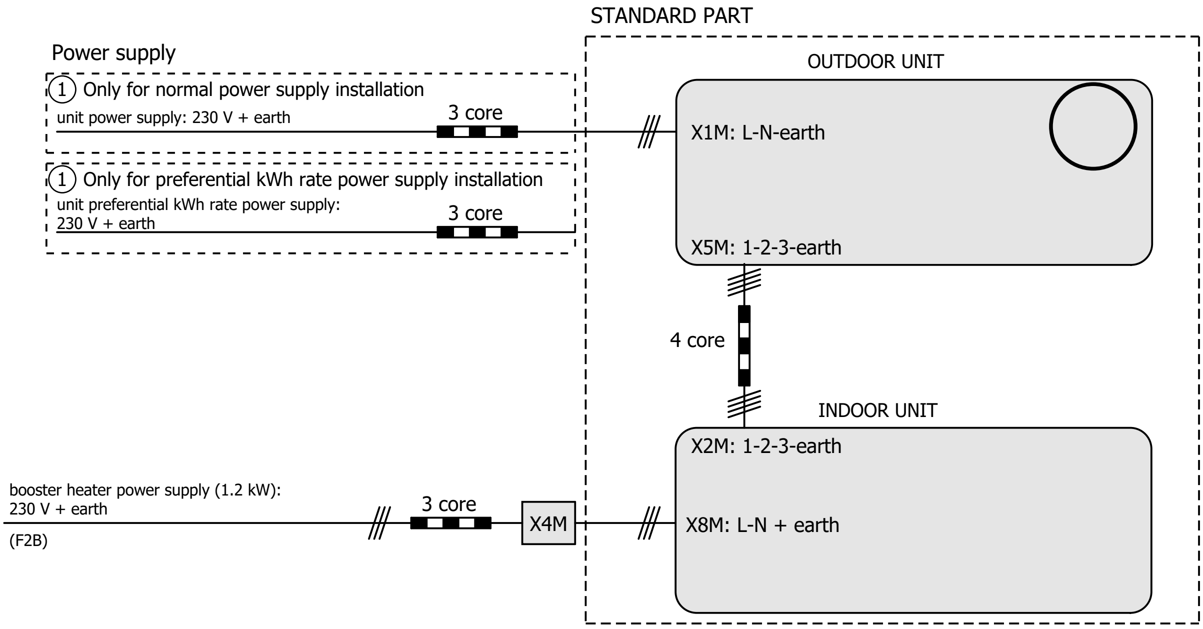
Translation of text on wiring diagram

English	Translation
(1) Connection diagram	(1) Connection diagram
Compressor switch box	Compressor switch box
Multi+DHW Tank switch box	Multi domestic hot water tank switch box
Indoor	Indoor
Outdoor	Outdoor
SWB	Switch box
(2) Legend	(2) Legend
A1P	Main PCB
F2B	Overcurrent fuse booster heater
FU1 (A1P)	fuse (5 A 250 V for PCB)
K3M	Contactor booster heater
Q1DI	Earth leakage circuit breaker
TR1	Power supply transformer
X4M	Booster heater power supply terminal strip client
X8M	Booster heater power supply terminal strip

X*, X*A, X*B	Connector
X*M	Terminal strip
(3) Notes	(3) Notes
X2M	Field wiring terminal for AC
X4M	Booster heater power supply terminal strip client
X5M	Field wiring terminal for AC (Outdoor)
X8M	Booster heater power supply terminal strip
—·—·—·—·	Earth wiring
- - - - - - -	Field supply
	Option
	Not mounted in switch box
	Wiring depending on model
	PCB
Note 1: Connection point of the power supply for the BSH should be foreseen outside the unit	Note 1: Connection point of the power supply for the booster heater should be foreseen outside the unit.
(4) Switch box layout	(4) Switch box layout
SWB	Switch box

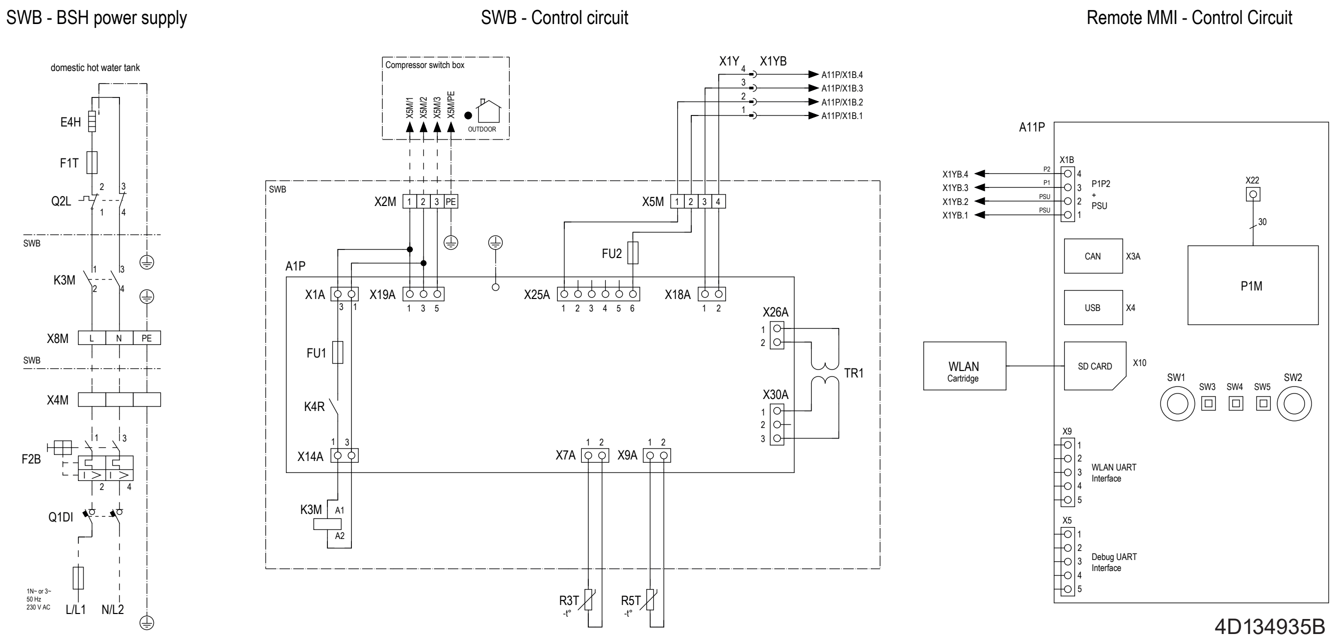
Electrical connection diagram

For more details, please check the unit wiring.



Wiring diagram

> **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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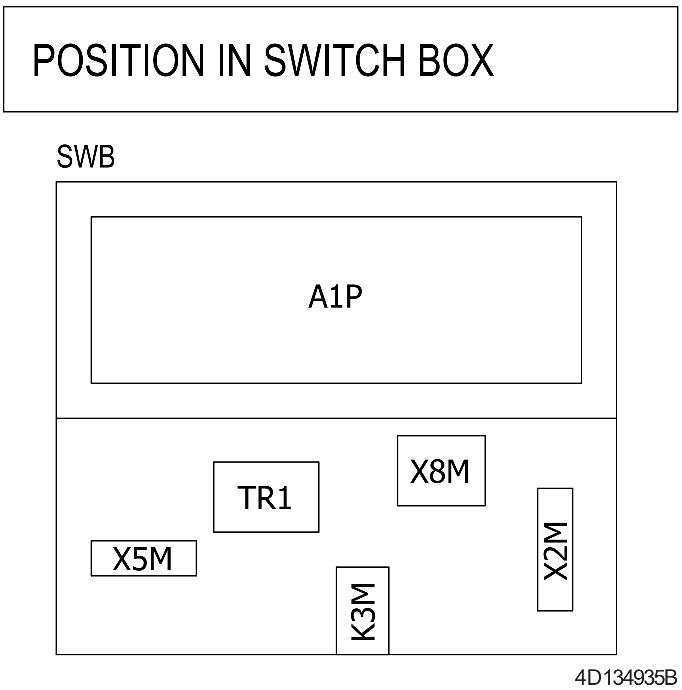
Switch box



7.2.2 Wiring diagram: CKHWS tank

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
—·—·—·—	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 should be foreseen outside the unit.	Note 1: Connection point of the power supply for the backup heater should be foreseen outside the unit.
Backup heater power supply	Backup heater power supply
☐ 3V (1N~, 230 V, 1.5 kW)	☐ 3V (1N~, 230 V, 1.5 kW)
User installed options	User installed options
☐ Remote user interface	☐ Remote user interface
☐ WLAN adapter module	☐ WLAN adapter module
☐ WLAN cartridge	☐ WLAN cartridge

Position in switch box

English	Translation
Position in switch box	Position in switch box

Legend

A1P		Main PCB
A11P		Main PCB of the MMI (= user interface of the indoor unit)
A14P	*	User interface PCB
A20P	*	WLAN module
F1B	#	Overcurrent fuse backup heater
F2B	#	Overcurrent fuse main
FU1 (A1P)		Fuse T 5 A 250 V for PCB

K1M		Contactor backup heater
M2P	#	Domestic hot water pump
Q1L		Thermal protector backup heater
Q*DI	#	Earth leakage circuit breaker
R1T (A14P)	*	Ambient sensor user interface
TR1		Power supply transformer
X6M	#	Backup heater power supply terminal strip
J*, X*, X*A, X*Y		Connector
X*M		Terminal strip

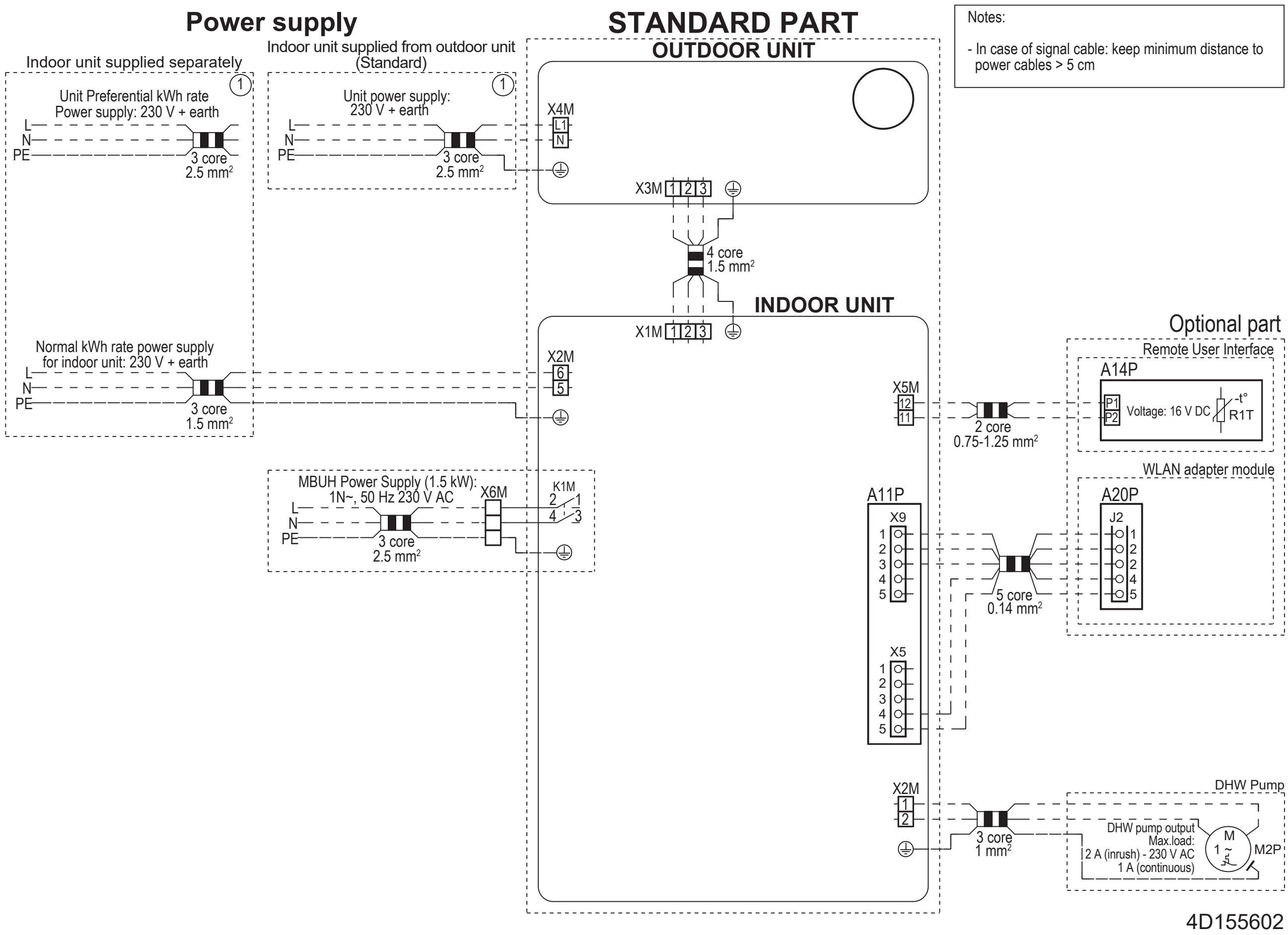
* Optional
\# Field supply

Translation of text on wiring diagram

English	Translation
(1) Main power connection	(1) Main power connection
2-pole fuse	2-pole fuse
Indoor unit supplied from outdoor (standard)	Indoor unit supplied from outdoor (standard)
Indoor unit supplied separately	Indoor unit supplied separately
Normal kWh rate power supply	Normal kWh rate power supply
Outdoor unit	Outdoor unit
(2) Backup heater power supply	(2) Backup heater power supply
2-pole fuse	2-pole fuse
Internal BUH	Internal backup heater
SWB	Switch box
(3) Options	(3) Options
Remote user interface	Remote user interface
SD card	Card slot for WLAN cartridge
SWB	Switch box
WLAN adapter module	WLAN adapter module
WLAN cartridge	WLAN cartridge
(4) Field supplied options	(4) Field supplied options
1 A (continuous)	1 A (continuous)
2 A (inrush) - 230 V AC	2 A (inrush) – 230 V AC
DHW pump	Domestic hot water pump
DHW pump output	Domestic hot water pump output
Max. load	Maximum load
SWB	Switch box

Electrical connection diagram

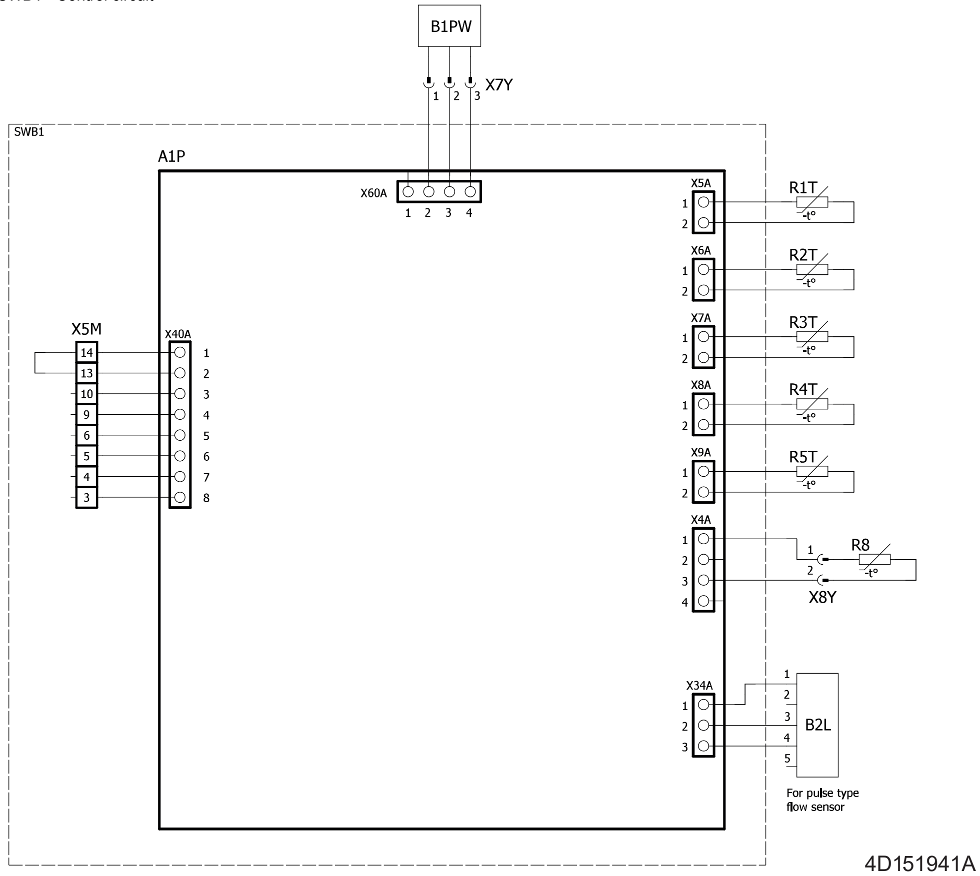
For more details, please check the unit wiring.



Wiring diagram

> **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.

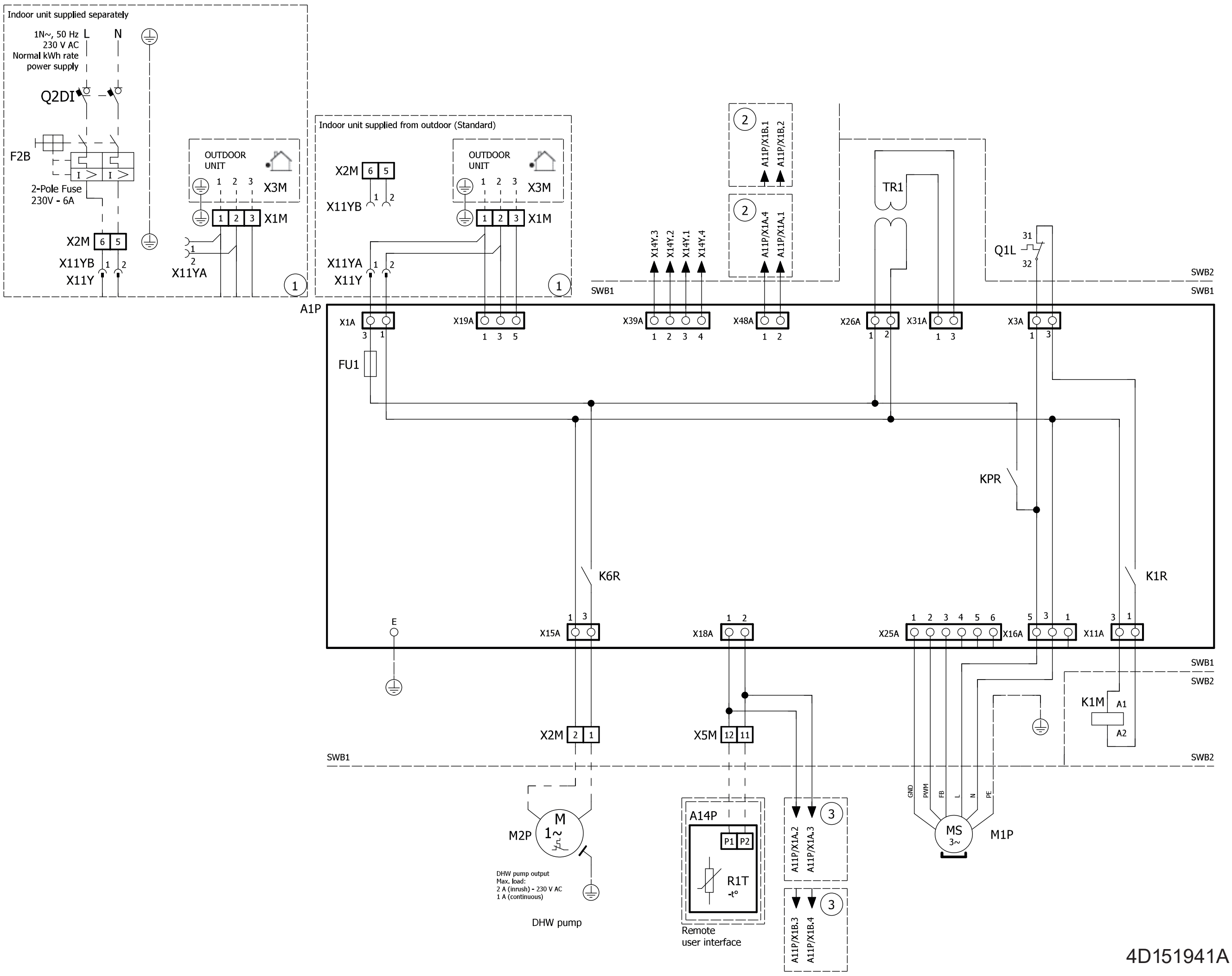
SWB1 - Control circuit



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.

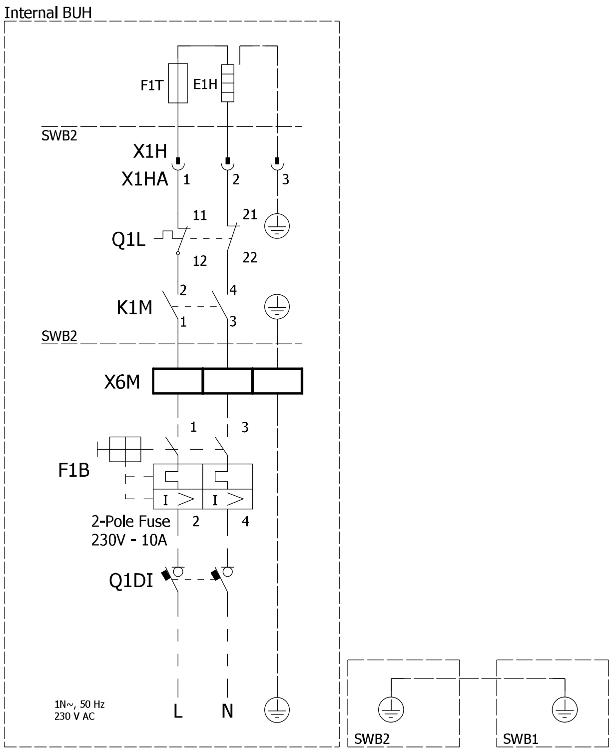
SWB1 - Control circuit



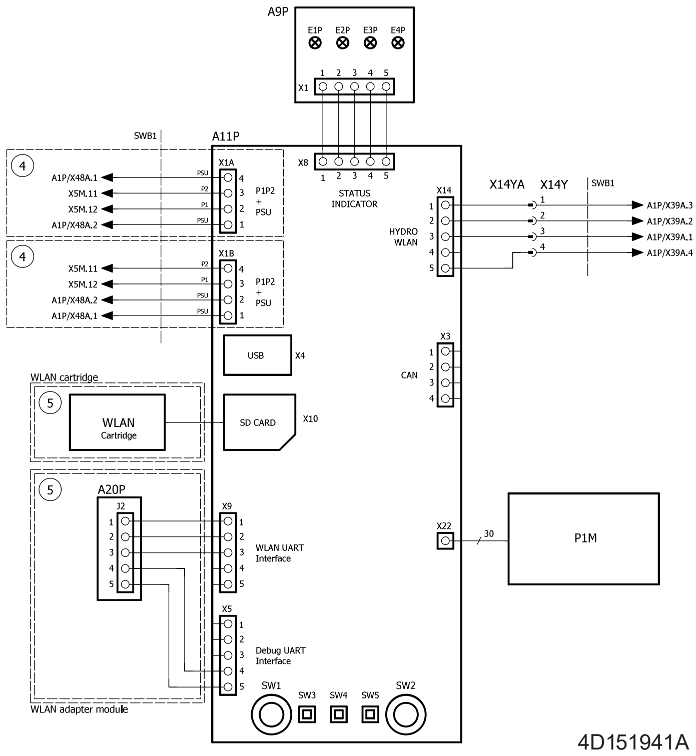
T

> **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.

SWB2 - BUH power supply



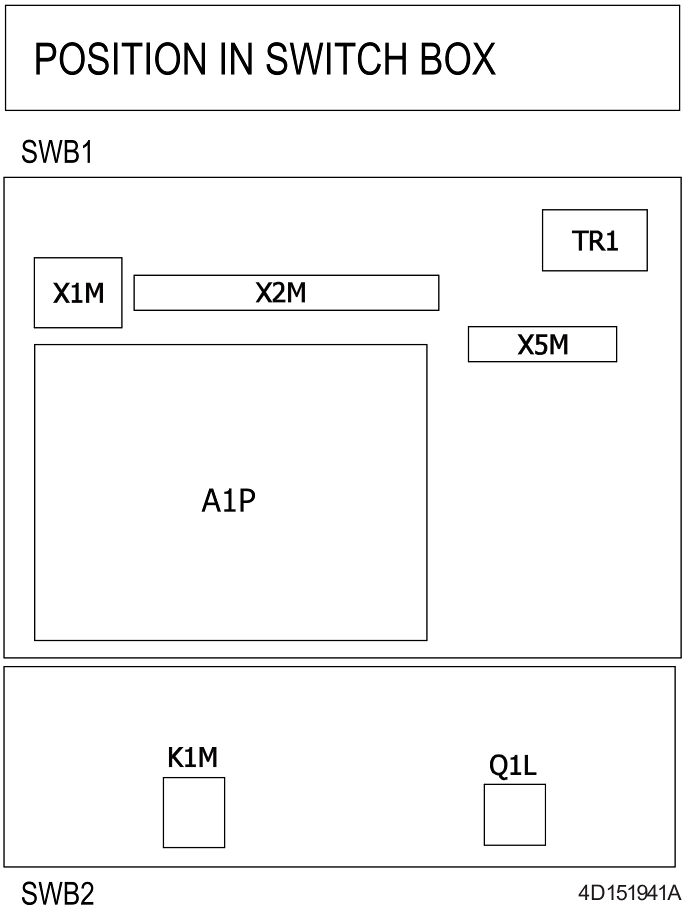
MMI - Control Circuit



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.

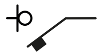
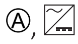
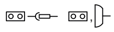
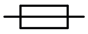
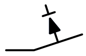
Switch box



7.2.3 Wiring diagram: Outdoor unit

Unified wiring diagram legend

For applied parts and numbering, refer to the wiring diagram on the unit. Part numbering is by Arabic numbers in ascending order for each part and is represented in the overview below by "*" in the part code.

Symbol	Meaning	Symbol	Meaning
	Circuit breaker		Protective earth
			Noiseless earth
			Protective earth (screw)
	Connection		Rectifier
	Connector		Relay connector
	Earth		Short-circuit connector
	Field wiring		Terminal
	Fuse		Terminal strip
	Indoor unit		Wire clamp
	Outdoor unit		Heater
	Residual current device		

Symbol	Colour	Symbol	Colour
BLK	Black	ORG	Orange
BLU	Blue	PNK	Pink
BRN	Brown	PRP, PPL	Purple
GRN	Green	RED	Red
GRY	Grey	WHT	White
SKY BLU	Sky blue	YLW	Yellow

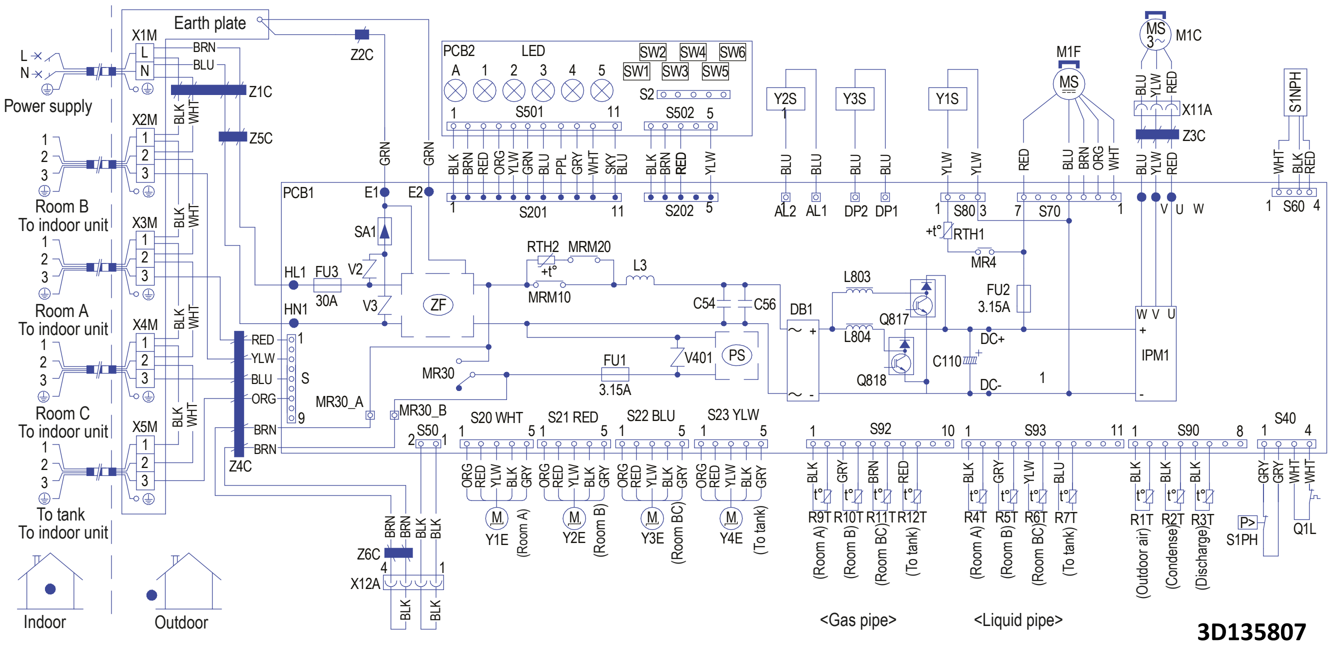
Symbol	Meaning
A*P	Printed circuit board
BS*	Pushbutton ON/OFF, operation switch
BZ, H*O	Buzzer
C*	Capacitor
AC*, CN*, E*, HA*, HE*, HL*, HN*, HR*, MR*_A, MR*_B, S*, U, V, W, X*A, K*R_*, NE	Connection, connector
D*, V*D	Diode
DB*	Diode bridge
DS*	DIP switch
E*H	Heater

Symbol	Meaning
FU*, F*U, (for characteristics, refer to PCB inside your unit)	Fuse
FG*	Connector (frame ground)
H*	Harness
H*P, LED*, V*L	Pilot lamp, light emitting diode
HAP	Light emitting diode (service monitor green)
HIGH VOLTAGE	High voltage
IES	Intelligent eye sensor
IPM*	Intelligent power module
K*R, KCR, KFR, KHuR, K*M	Magnetic relay
L	Live
L*	Coil
L*R	Reactor
M*	Stepper motor
M*C	Compressor motor
M*F	Fan motor
M*P	Drain pump motor
M*S	Swing motor
MR*, MRCW*, MRM*, MRN*	Magnetic relay
N	Neutral
n=*, N=*	Number of passes through ferrite core
PAM	Pulse-amplitude modulation
PCB*	Printed circuit board
PM*	Power module
PS	Switching power supply
PTC*	PTC thermistor
Q*	Insulated gate bipolar transistor (IGBT)
Q*C	Circuit breaker
Q*DI, KLM	Earth leak circuit breaker
Q*L	Overload protector
Q*M	Thermo switch
Q*R	Residual current device
R*	Resistor
R*T	Thermistor
RC	Receiver
S*C	Limit switch
S*L	Float switch

Symbol	Meaning
S*NG	Refrigerant leak detector
S*NPH	Pressure sensor (high)
S*NPL	Pressure sensor (low)
S*PH, HPS*	Pressure switch (high)
S*PL	Pressure switch (low)
S*T	Thermostat
S*RH	Humidity sensor
S*W, SW*	Operation switch
SA*, F1S	Surge arrester
SR*, WLU	Signal receiver
SS*	Selector switch
SHEET METAL	Terminal strip fixed plate
T*R	Transformer
TC, TRC	Transmitter
V*, R*V	Varistor
V*R	Diode bridge, Insulated-gate bipolar transistor (IGBT) power module
WRC	Wireless remote controller
X*	Terminal
X*M	Terminal strip (block)
Y*E	Electronic expansion valve coil
Y*R, Y*S	Reversing solenoid valve coil
Z*C	Ferrite core
ZF, Z*F	Noise filter

4MWXM

> **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.



5MWXM

INFORMATION

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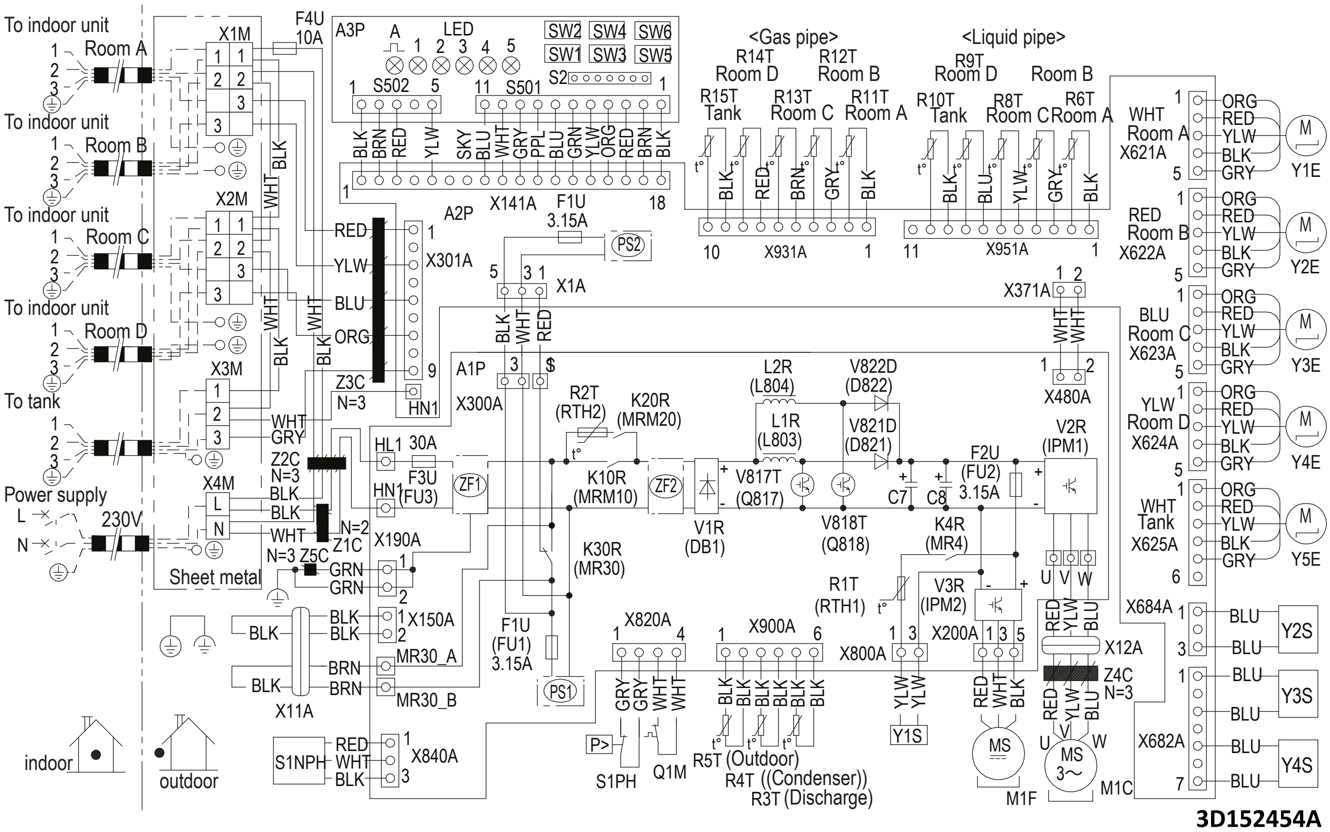
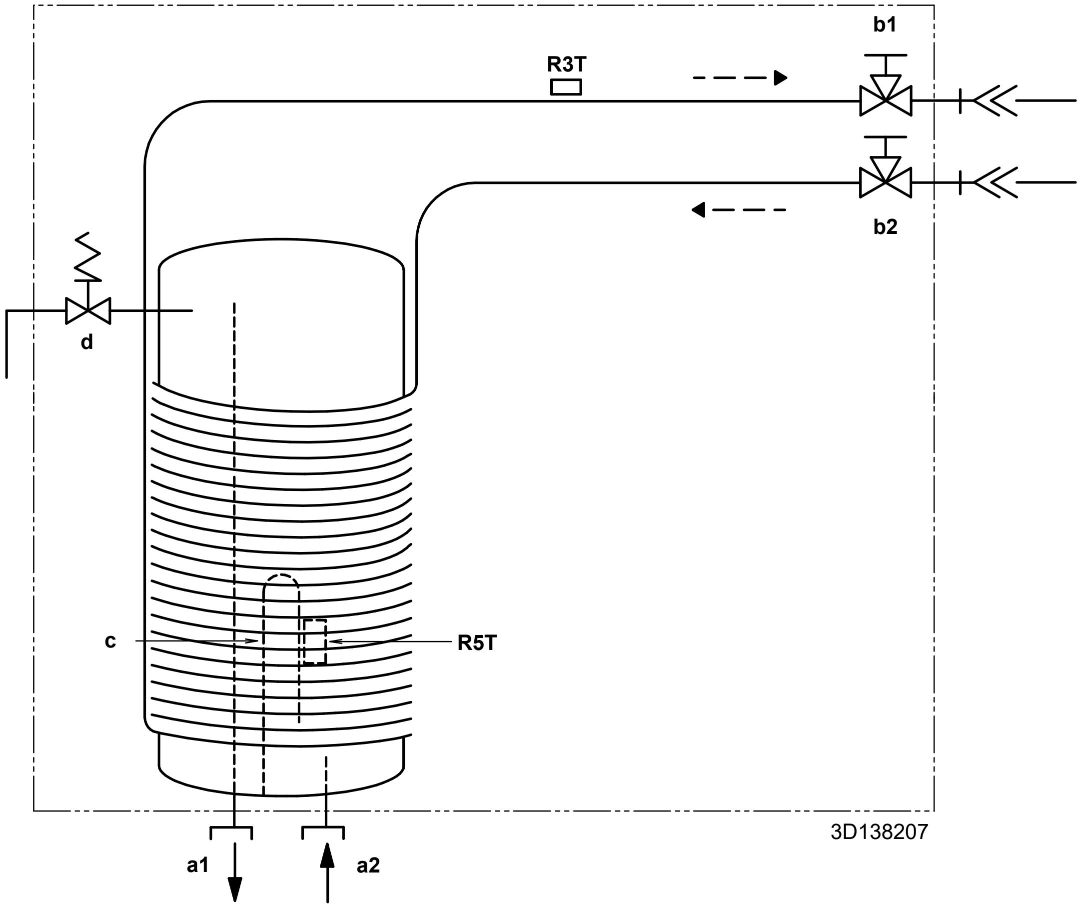


7.3 Piping diagram

7.3.1 Piping diagram: Indoor unit

EKHWET

> **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.



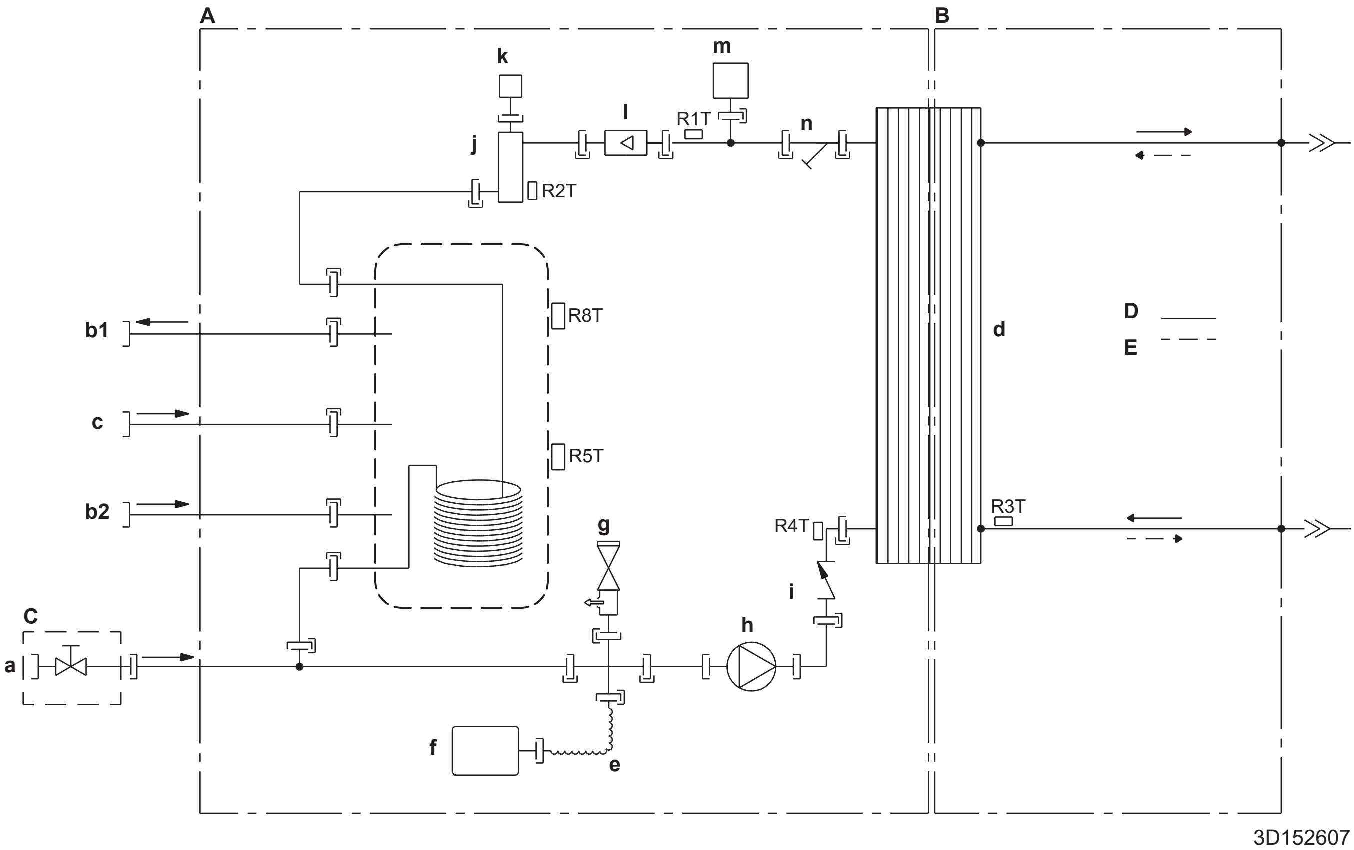
a1 Domestic hot water – hot water out
a2 Domestic hot water – cold water in
b1 Liquid stop valve
b2 Gas stop valve
c Booster heater
d Pressure and temperature relief valve (only for UK)

Thermistors:
R3T Thermistor heat exchanger – Liquid pipe
R5T Tank thermistor

CKHWS

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 Water side
B Refrigerant side
C Field installed
D Evaporator
E Condenser
a Filler pipe water inlet
b1 Domestic hot water: hot water out
b2 Domestic hot water: cold water in
c Recirculation connection
d Plate heat exchanger
e Flexible pipe
f Expansion vessel
g Safety valve
h Pump
i Check valve
j Backup heater
k Automatic air purge valve
l Flow sensor
m Water pressure sensor
n Filter

Thermistors
R1T Outlet water heat exchange thermistor
R2T Outlet water backup heater thermistor
R3T Thermistor (heat exchange, liquid pipe)
R4T Inlet water thermistor
R5T Tank thermistor
R8T Tank thermistor

7.3.2 Piping diagram: Outdoor unit

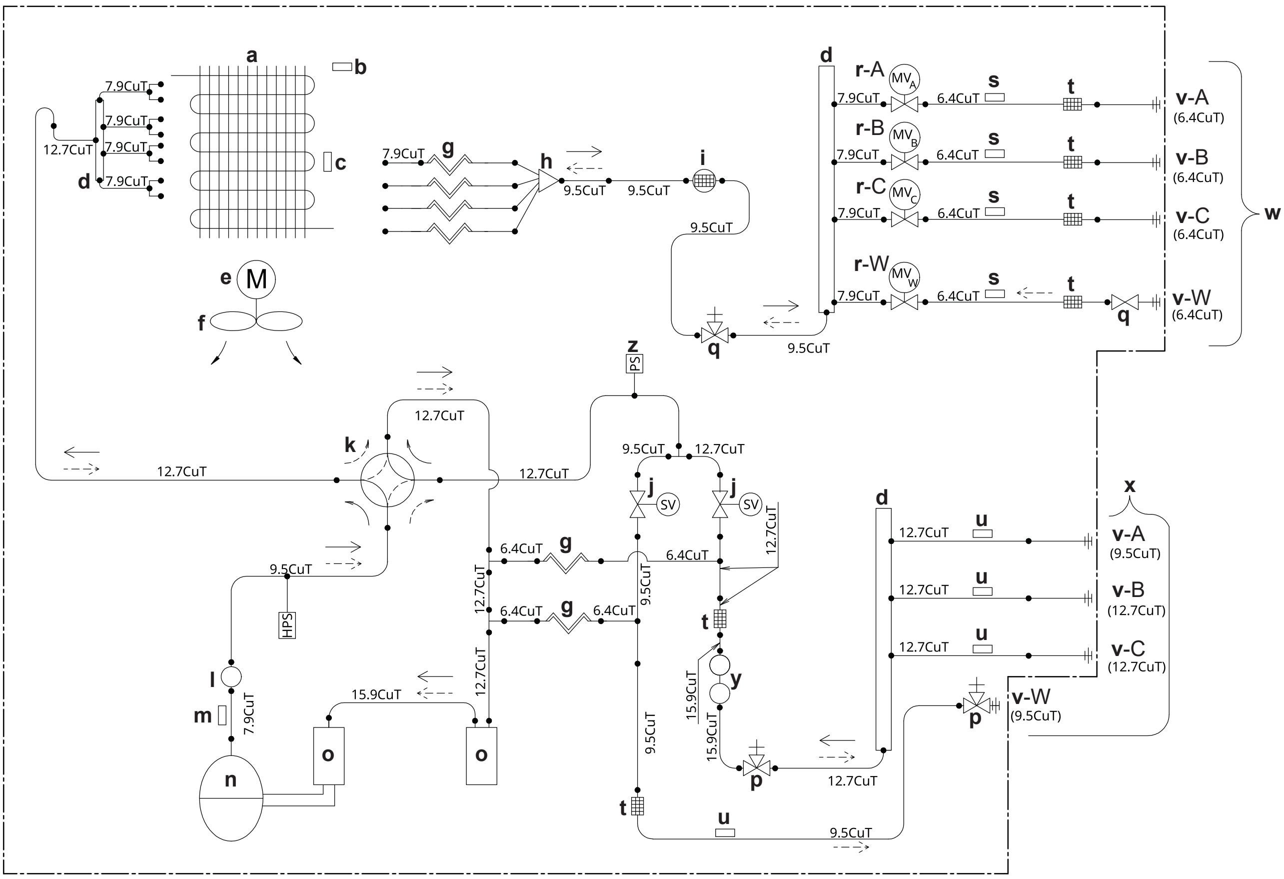
4MWXM

> **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.

Component PED category classification:

- High pressure switches: category IV
- Compressor: category II
- Accumulator: category II
- Other components: refer to PED article 4, paragraph 3

4MWXM52



a	Heat exchanger	**k**	4-way valve	**u**	Thermistor (gas)
b	Outdoor air temperature thermistor	**l**	Muffler	**v**	Room (A, B, C) and Domestic hot water tank (W)
c	Heat exchanger thermistor	**m**	Discharge pipe thermistor	**w**	Field piping – liquid
d	Refnet header	**n**	Compressor	**x**	Field piping – gas
e	Fan motor	**o**	Accumulator	**y**	Twin-branched muffler
f	Propeller fan	**p**	Gas stop valve	**z**	Pressure sensor
g	Capillary tube	**q**	Liquid stop valve		
h	Distributor	**r**	Electronic expansion valve	**HPS**	High pressure switch (automatic reset)
i	Muffler with filter	**s**	Thermistor (liquid)	→	Refrigerant flow: cooling
j	Solenoid valve	**t**	Filter	- - ->	Refrigerant flow: DX heating / DHW

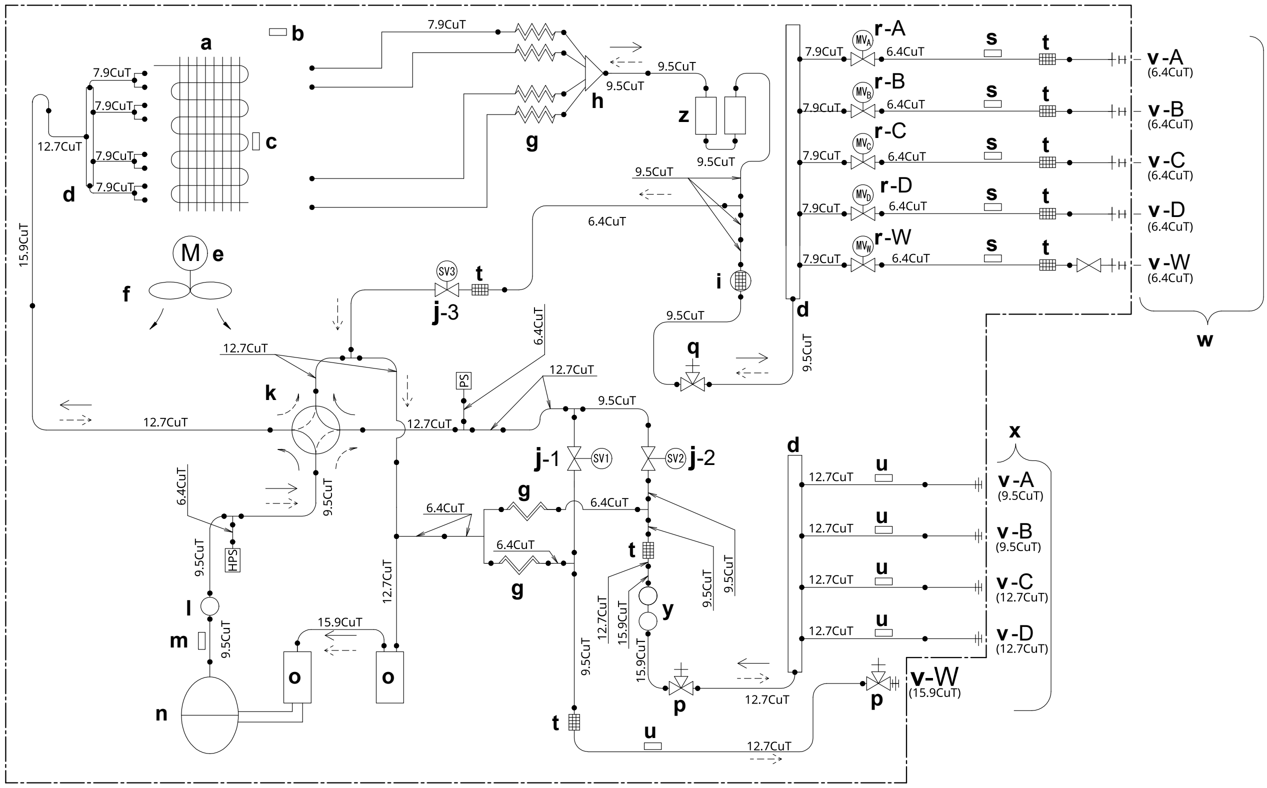
5MWXM

> **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.

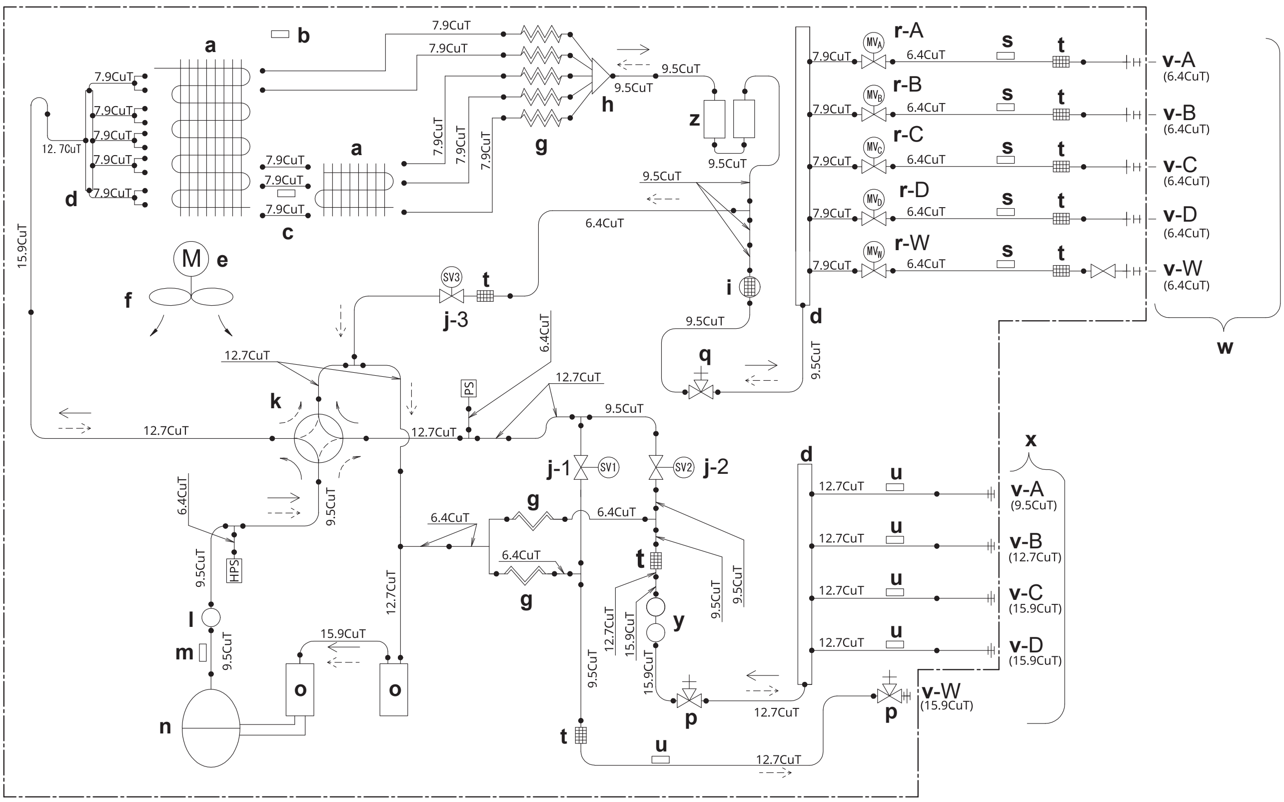
Component PED category classification:

- High pressure switches: category IV
- Compressor: category II
- Accumulator: category II
- Other components: refer to PED article 4, paragraph 3

5MWXM68



5MWXM90

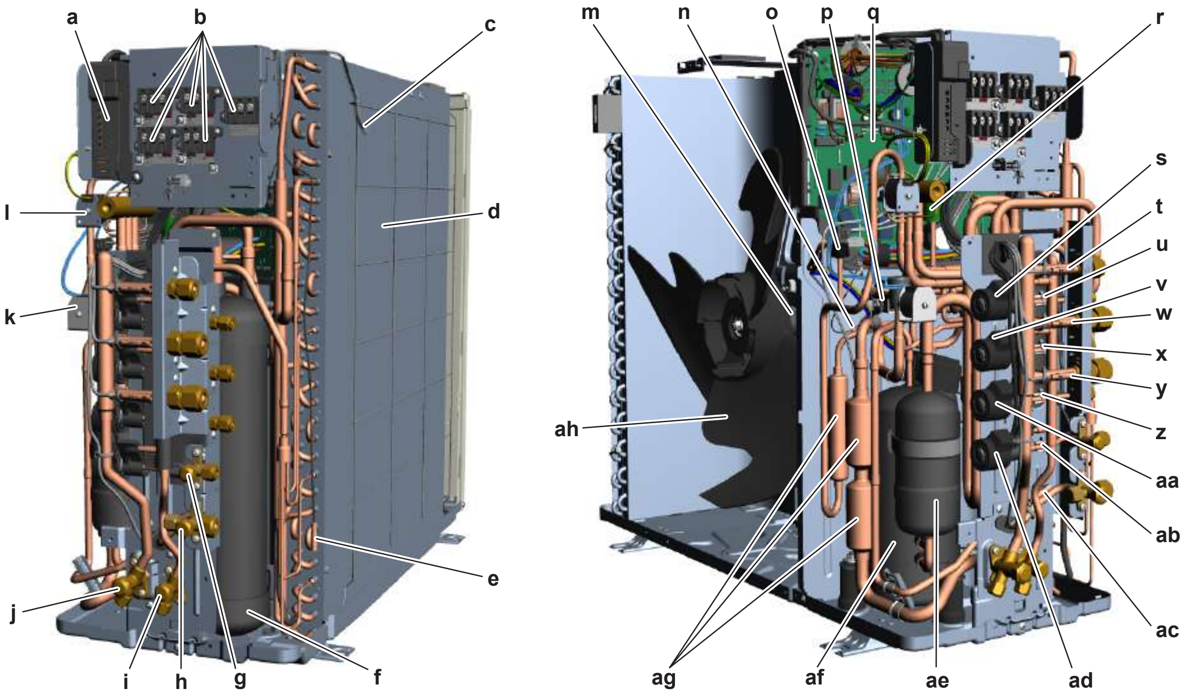


a	Heat exchanger	**k**	4-way valve	**u**	Thermistor (gas)
b	Outdoor air temperature thermistor	**l**	Muffler	**v**	Room (A, B, C, D) and Domestic hot water tank (W)
c	Heat exchanger thermistor	**m**	Discharge pipe thermistor	**w**	Field piping – liquid
d	Refnet header	**n**	Compressor	**x**	Field piping – gas
e	Fan motor	**o**	Accumulator	**y**	Twin-branched muffler
f	Propeller fan	**p**	Gas stop valve	**z**	Liquid reciver
g	Capillary tube	**q**	Liquid stop valve	**PS**	Pressure sensor
h	Distributor	**r**	Electronic expansion valve	**HPS**	High pressure switch (automatic reset)
i	Muffler with filter	**s**	Thermistor (liquid)	→	Refrigerant flow: cooling
j	Solenoid valve	**t**	Filter	- - ->	Refrigerant flow: DX heating / DHW

7.4 Component overview

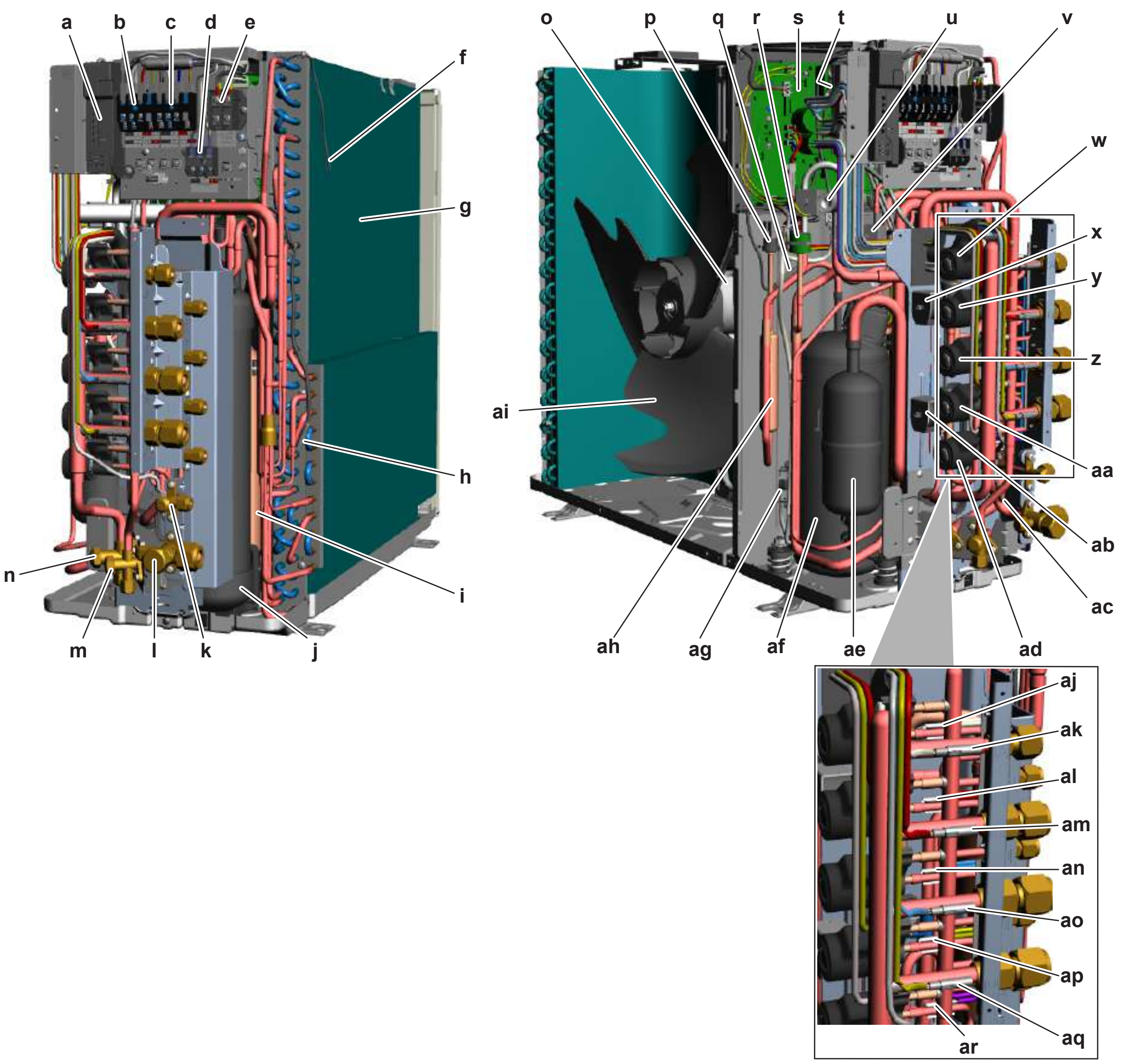
7.4.1 Component overview: Outdoor unit

4MWXM



- **a** Service PCB
- **b** Power supply terminals (X1M~X5M)
- **c** Outdoor air thermistor R1T
- **d** Heat exchanger
- **e** Heat exchanger thermistor R2T
- **f** Accumulator
- **g** Liquid stop valve – Domestic hot water tank refrigerant circuit
- **h** Gas stop valve (with service port) – Domestic hot water tank refrigerant circuit
- **i** Main gas stop valve (with service port)
- **j** Main liquid stop valve (with service port)
- **k** Solenoid valve – Air conditioning Y2S
- **l** 4-way valve Y1S
- **m** Fan motor M1F
- **n** Discharge pipe thermistor R3T
- **o** High pressure switch S1PH
- **p** Solenoid valve – Domestic hot water Y3S
- **q** Main PCB A1P
- **r** Refrigerant pressure sensor S1NPH
- **s** Expansion valve (Room A) Y1E
- **t** Refrigerant gas thermistor (Room A) R9T
- **u** Refrigerant liquid thermistor (Room A) R4T
- **v** Expansion valve (Room B) Y2E
- **w** Refrigerant gas thermistor (Room B) R10T
- **x** Refrigerant liquid thermistor (Room B) R5T
- **y** Refrigerant gas thermistor (Room C) R11T
- **z** Refrigerant liquid thermistor (Room C) R6T
- **aa** Expansion valve (Room C) Y3E
- **ab** Refrigerant liquid thermistor (Domestic hot water tank) R7T
- **ac** Refrigerant gas thermistor (Domestic hot water tank) R12T
- **ad** Expansion valve (Domestic hot water tank) Y4E
- **ae** Accumulator
- **af** Compressor M1C (with thermal protector Q1L)
- **ag** Muffler
- **ah** Fan

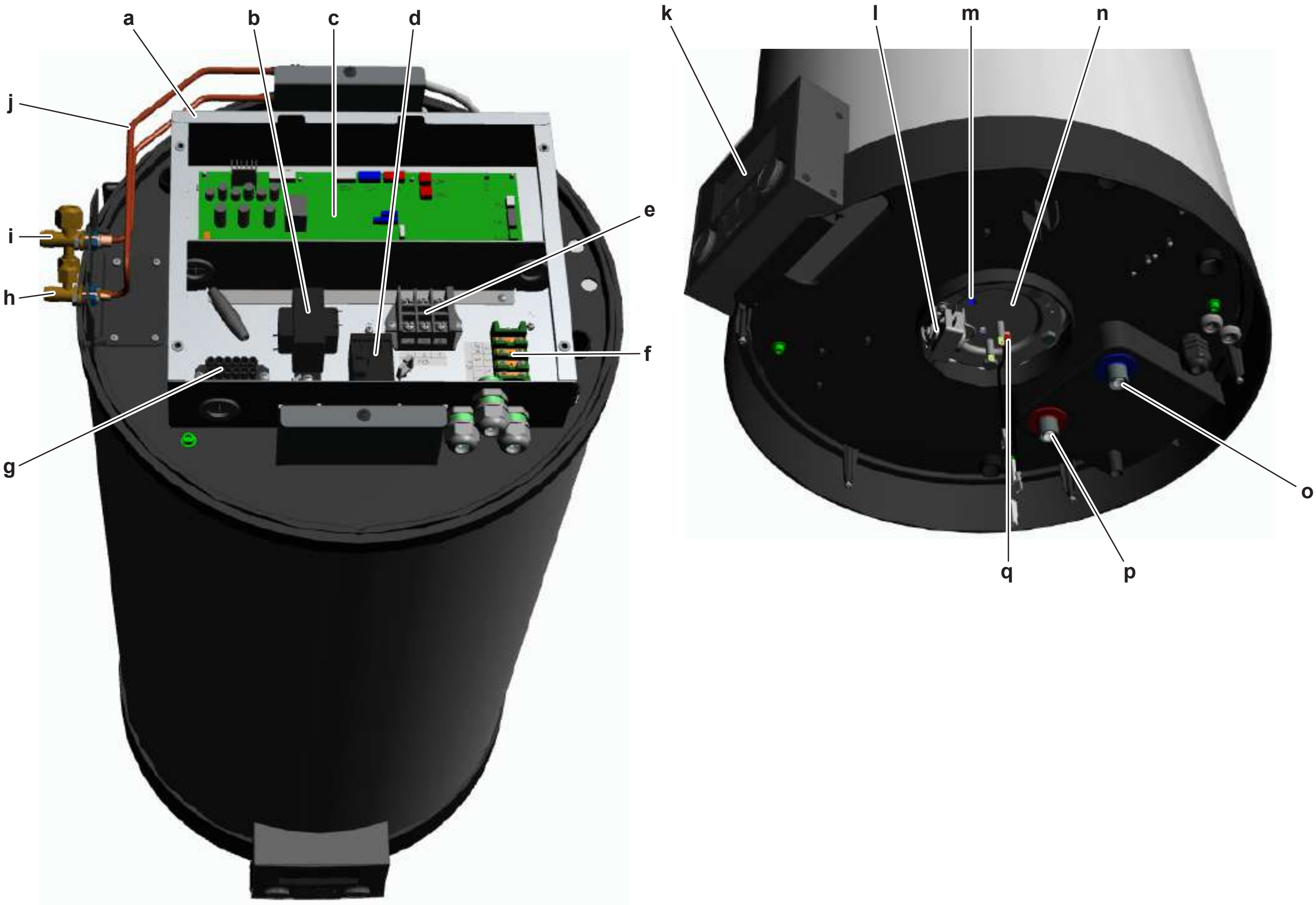
5MWXM



a Service PCB
b Power supply terminal X1M
c Power supply terminal X2M
d Power supply terminal X3M
e Power supply terminal X4M
f Outdoor air thermistor R5T
g Heat exchanger
h Heat exchanger thermistor R4T
i Liquid receiver
j Accumulator
k Liquid stop valve – Domestic hot water tank refrigerant circuit
l Gas stop valve (with service port) – Domestic hot water tank refrigerant circuit
m Main gas stop valve (with service port)
n Main liquid stop valve (with service port)
o Fan motor M1F
p High pressure switch S1PH
q Discharge pipe thermistor R3T
r Refrigerant pressure sensor S1NPH
s Main PCB A1P
t PCB A2P
u 4-way valve Y1S
v Solenoid valve – Defrost bypass Y2S
w Expansion valve (Room A) Y1E
x Solenoid valve – Air conditioning Y3S
y Expansion valve (Room B) Y2E
z Expansion valve (Room C) Y3E
aa Expansion valve (Room D) Y4E
ab Solenoid valve – Domestic hot water Y4S
ac Refrigerant gas thermistor (Domestic hot water tank) R15T
ad Expansion valve (Domestic hot water tank) Y5E
ae Accumulator
af Compressor M1C (with thermal protector Q1L)
ag Compressor thermal protector Q1M
ah Muffler
ai Fan
aj Refrigerant liquid thermistor (Room A) R6T
ak Refrigerant gas thermistor (Room A) R11T
al Refrigerant liquid thermistor (Room B) R7T
am Refrigerant gas thermistor (Room B) R12T
an Refrigerant liquid thermistor (Room C) R8T
ao Refrigerant gas thermistor (Room C) R13T
ap Refrigerant liquid thermistor (Room D) R9T
aq Refrigerant gas thermistor (Room D) R14T
ar Refrigerant liquid thermistor (Domestic hot water tank) R10T

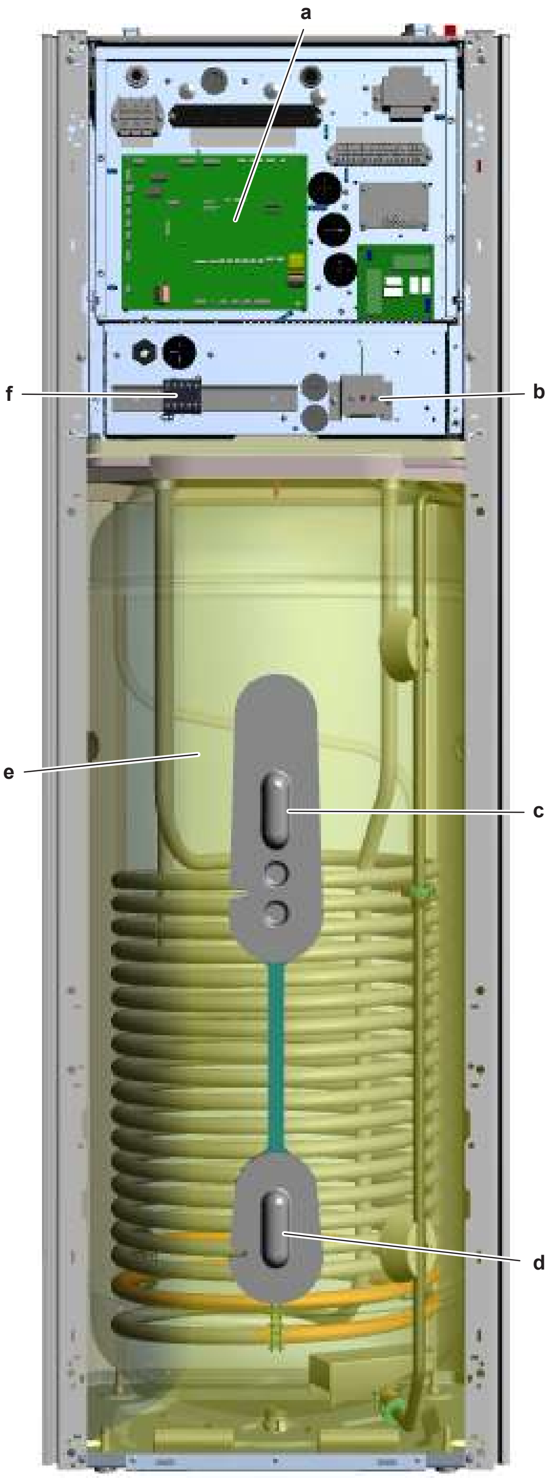
7.4.2 Component overview: Indoor unit

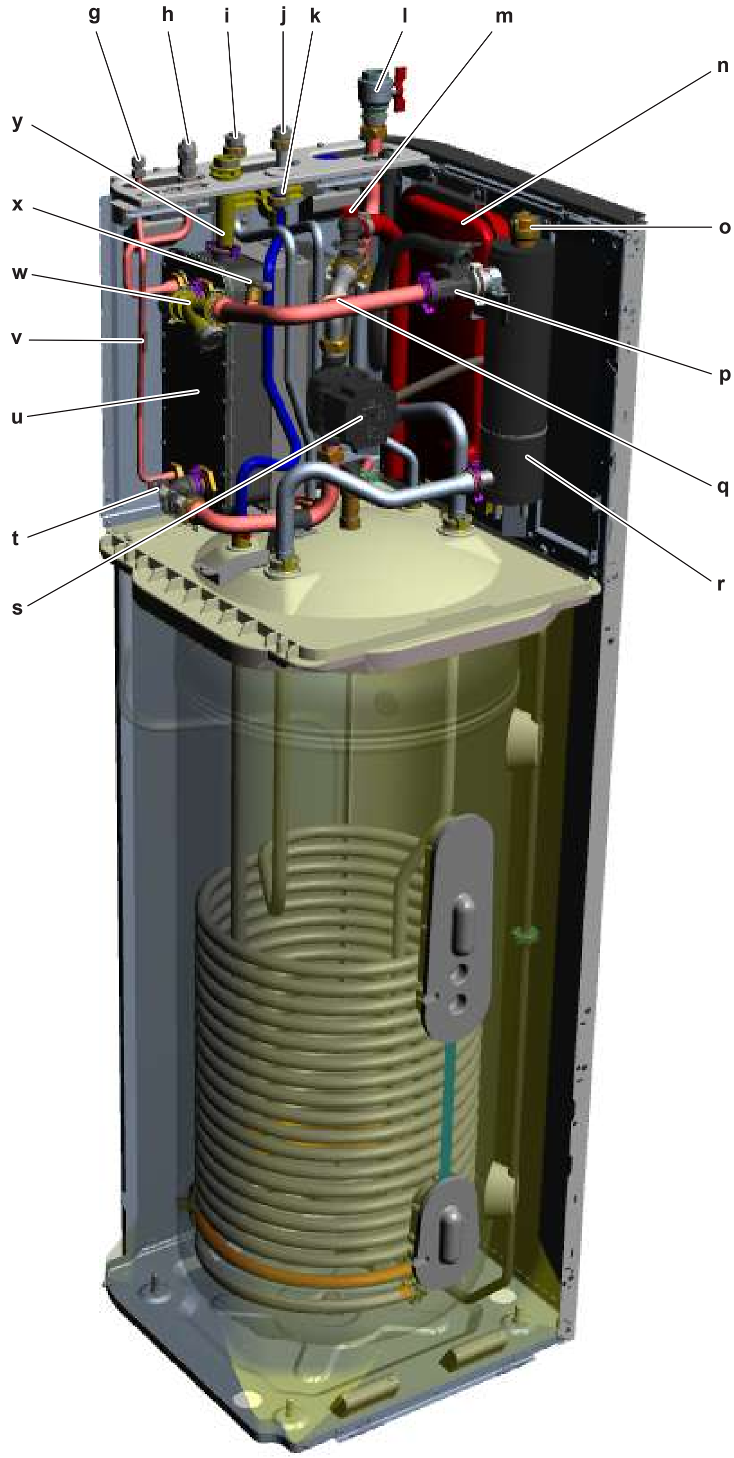
EKHWET



a	Switch bow		**j**	Liquid pipe with refrigerant liquid thermistor R3T
b	Power supply transformer TR1		**k**	User interface (MMI)
c	Hydro PCB A1P		**l**	Booster heater thermal protector Q2L
d	Booster heater contactor K3M		**m**	Domestic hot water tank thermistor R5T location
e	Booster heater power supply terminal X8M		**n**	Booster heater
f	Power supply terminal X2M		**o**	Domestic hot water – Cold water IN
g	Terminal X5M		**p**	Domestic hot water – Hot water OUT
h	Liquid stop valve		**q**	Booster heater thermal fuse F1T
i	Gas stop valve (with service port)			

CKHWS





- **a** Hydro PCB A1P
- **b** Backup heater thermal protector Q1L
- **c** Domestic hot water tank thermistor R8T
- **d** Domestic hot water tank thermistor R5T
- **e** Domestic hot water tank
- **f** Backup heater contactor K1M
- **g** Refrigerant liquid connection
- **h** Refrigerant gas connection
- **i** Domestic hot water outlet
- **j** Domestic hot water cold water supply
- **k** Recirculation connection
- **l** Filler pipe water inlet
- **m** Safety valve
- **n** Expansion vessel
- **o** Air purge valve
- **p** Water flow sensor B2L
- **q** Outlet water after heat exchanger thermistor R1T
- **r** Backup heater (with outlet water thermistor R2T)
- **s** Water pump M1S
- **t** Inlet water thermistor R4T
- **u** Plate type heat exchanger
- **v** Refrigerant liquid thermistor R3T
- **w** Water filter
- **x** Water pressure sensor B1PW
- **y** Chimney

7.5 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 main PCB:
Software version user interface:	Software version 2nd PCB (if applicable):
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).

7.6 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.

7.7 Field settings

7.7.1 Field settings: Indoor unit

Field settings

See next page.

Field settings table

Applicable indoor units

EKHWET90BAV3
EKHWET(U)120BAV3

Notes

(*1) EKHWET90+120
(*2) EKHWETU120

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
Tank						
5.2	[6-0A]	Comfort setpoint	R/W	30~[6-0E]°C, step: 1°C **50°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	55-max(55, 6-0E)~75°C, step: 1°C **(*1)** 55-max(55, 6-0E)~70°C, step: 1°C **(*2)** **70°C**		
5.7.5	[2-04]	Duration	R/W	5~60 min, step: 5 min **10 min**		
Tank						
5.8	[6-0E]	Maximum	R/W	40~75°C, step: 1°C **(*1)** 40~70°C, step: 1°C **(*2)** **75°C (*1)** **70°C (*2)**		
5.9	[6-00]	Hysteresis	R/W	2~20°C, step: 1°C **6°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]	Setting temperature water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **43°C**		
5.C	[0-0C]	Setting temperature water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C **50°C**		
5.C	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **25°C**		
5.C	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-15°C**		
Tank						
5.D	[6-01]	Margin	R/W	0~10°C, step: 1°C **2°C**		
5.F	[A-00]	Priority schedule	R/W	**0: DHW** 1: Air Conditioning		
5.G	[A-01]	Operation mode	R/W	**0: Efficient** 1: Quick		
5.H	[8-03]	Quick mode timer	R/W	Turbo: 10 min **Normal: 20 min** Economic: 30 min		
User settings └─ Quiet						
7.4.1		Mode	R/W	**0: OFF** 1: Manual 2: Automatic		
7.4.3		Level	R/W	**0: Quiet** 1: More Quiet 2: Most Quiet		
Installer settings └─ Configuration wizard └─ System						
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		
9.1.3.7	[6-02]	BSH capacity	R/W	0~10kW, step: 0,2kW **1.2kW**		
└─ 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 **50°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.6	[6-08]	Reheat hysteresis	R/W	2~20°C, step: 1°C **10°C**		
└─ Booster heater						
9.4.1	[6-02]	Capacity	R/W	0~10kW, step: 0,2kW **1.2kW**		
9.4.3	[8-03]	Quick mode timer	R/W	5~95 min, step: 5 min 2**0 min**		
9.4.4	[4-03]	Operation	R/W	0: Restricted **1: Allowed** 2: Overlap 3: Compressor off		
└─ Emergency						
9.5.1	[4-06]	Emergency	R/W	**0: Manual** 1: Automatic		
└─ Power consumption control						
9.9.1	[4-08]	Power consumption control	R/W	**0: No limitation** 1: Continuous		

(*1) EKHWET90+120
(*2) EKHWETU120

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.9.2	[4-09]	Type	R/W	0: Current **1: Power**		
9.9.3	[5-05]	Limit	R/W	12~50 A, step: 1 A **12 A**		
9.9.8	[5-09]	Limit	R/W	3~20 kW, step: 0,5 kW **3 kW**		
9.9.D	[4-01]	Priority heater	R/O	0: None **1: BSH** 2: BUH		
	└ Sensors					
9.B.3	[1-0A]	Averaging time	R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
Installer settings						
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	[0-0B]	Setting temperature water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **43°C**		
9.I	[0-0C]	Setting temperature water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C **50°C**		
9.I	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **25°C**		
9.I	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-15°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	[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	55~max(55, 6-0E), step: 1°C **70°C**		
9.I	[2-04]	How long must the tank temperature be maintained?	R/W	5~60 min, step: 5 min **10 min**		
9.I	[3-00]	Is auto restart of the unit allowed?	R/W	0: No **1: Yes**		
9.I	[4-01]	Which electric heater has priority?	R/O	0: None **1: BSH** 2: BUH		
9.I	[4-03]	Operation permission of the booster heater.	R/W	0: Restricted **1: Allowed** 2: Overlap 3: Compressor off		
9.I	[4-06]	Emergency	R/W	**0: Manual** 1: Automatic		
9.I	[4-08]	Which power limitation mode is required on the system?	R/W	**0: No limitation** 1: Continuous		
9.I	[4-09]	Which power limitation type is required?	R/W	0: Current **1: Power**		
9.I	[5-05]	What is the requested limit for DI1?	R/W	12~50 A, step: 1 A **12 A**		
9.I	[5-09]	What is the requested limit for DI1?	R/W	3~20 kW, step: 0,5 kW **3 kW**		
9.I	[6-00]	The temperature difference determining the heat pump ON temperature.	R/W	2~20°C, step: 1°C **6°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 **1.2kW**		
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	[6-0A]	What is the desired comfort storage temperature?	R/W	30~[6-0E]°C, step: 1°C **50°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 DHW temperature setpoint?	R/W	40~75°C, step: 1°C **(*1)** 40~70°C, step: 1°C **(*2)** **75°C (*1)** **70°C (*2)**		
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	[8-03]	Booster heater delay timer (or Quick mode timer).	R/W	5~95 min, step: 5 min 2**0 min**		
9.I	[A-00]	Which indoor unit operation is prioritized by outdoor unit?	R/W	**0: DHW** 1: Air Conditioning		
9.I	[A-01]	Which operation mode is used for domestic hot water production?	R/W	**0: Efficient** 1: Quick		

(*1) EKHWET90+120
(*2) EKHWETU120

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.I	[A-02]	--		**1**		
9.I	[A-03]	--		**0**		
9.I	[A-04]	--		**0**		
9.I	[B-00]	--		**0**		
9.I	[B-01]	--		**0**		
9.I	[B-02]	--		**0**		
9.I	[B-03]	--		**0**		
9.I	[B-04]	--		**0**		
9.I	[E-00]	Which type of unit is installed?	R/O	0~5 **4: DHWHP**		
9.I	[E-01]	Which type of compressor is installed?	R/O	**0**		
9.I	[E-02]	What is the indoor unit software type?	R/O	**1: Heating only**		
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 **1: Yes**		
9.I	[E-06]	Is a DHW tank installed in the system?	R/O	0: No **1: Yes**		
9.I	[E-07]	What kind of DHW tank is installed?	R/O	0~8 0: EKHW, small volume 1: Integrated **2: Tank with BSH** 3: EKHW, large volume 5: EKHWP 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	[F-0A]	--		**0**		

Field settings table

Applicable indoor units

CKHWS180BJV3
CKHWS230BJV3
CKHWSU230BJV3

Notes

(*1) *180*
(*2) *230*

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
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 **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 **0°C**		
5.F		Priority Schedule	R/W	**DHW** AC		
5.G	[A-01]	Operation mode	R/W	**0: Efficient** 1: Quick		
5.H	[8-03]	Quick mode timer	R/W	Turbo **Normal** Economic		
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		
Installer settings └ Configuration wizard └ System						
9.1.3.2	[E-03]	BUH type	R/O	**2: 1.5V**		
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(normal SH/DHW ON)		
└ Backup heater						
9.1.4.1	[5-0D]	Voltage	R/O	**0: 230 V, 1~**		
9.1.4.2	[4-0A]	Configuration	R/O	**0: 1**		
9.1.4.3	[6-03]	Capacity step 1	R/O	**1.5 kW**		
└ 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.6	[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	**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		
└ Back up heater						
9.3.1	[E-03]	BUH type	R/O	**2: 1.5V**		

(*1) *180*
(*2) *230*

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.3.2	[5-0D]	Voltage	R/O	**0: 230 V, 1~**		
9.3.3	[4-0A]	Configuration	R/O	**0: 1**		
9.3.4	[6-03]	Capacity step 1	R/O	**1.5 kW**		
└─ Emergency						
9.5.1	[4-06]	Emergency	R/W	**0: Manual** 1: Automatic(normal SH/DHW ON)		
9.5.2	[7-06]	Compressor forced off	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		
└─ Sensors						
9.B.3	[1-0A]	Averaging time	R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
Installer settings						
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	[0-0B]	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	[1-0A]	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	[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/O	60°C **60°C**		
9.I	[2-04]	How long must the tank temperature be maintained?	R/O	40~60 min, step: 5 min **40 min**		
9.I	[3-00]	Is auto restart of the unit allowed?	R/W	0: No **1: Yes**		
9.I	[3-0A]	What is the pump model?	R/O	**0: Pump model 0** 1: Pump model 1		
9.I	[4-04]	Water pipe freeze prevention	R/W	0: Continuous pump operation 1: Non continuous pump operation **2: OFF**		
9.I	[4-05]	--		**0**		
9.I	[4-06]	Emergency	R/W	**0: Manual** 1: Automatic(normal SH/DHW ON)		
9.I	[4-08]	Which power limitation mode is required on the system?	R/W	**0: No limitation** 1: Continuous		
9.I	[4-09]	Which power limitation type is required?	R/W	0: Current **1: Power**		
9.I	[4-0A]	Backup heater configuration	R/O	**0: 1**		
9.I	[5-05]	What is the requested limit in amps?	R/W	0~50 A, step: 1 A **50 A**		
9.I	[5-09]	What is the requested limit in kW?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
9.I	[5-0D]	Backup heater voltage	R/O	**0: 230 V, 1~**		
9.I	[5-0E]	BUH DHW thermo ON delay	R/W	0: Disable **1: Enable (variable delay HP dependent)** 2: Enable (fixed delay HP dependent)		
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 **0°C**		
9.I	[6-03]	What is the capacity of the backup heater step 1?	R/O	**1.5 kW**		
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	[6-0A]	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		

(*1) *180*
(*2) *230*

Field settings table

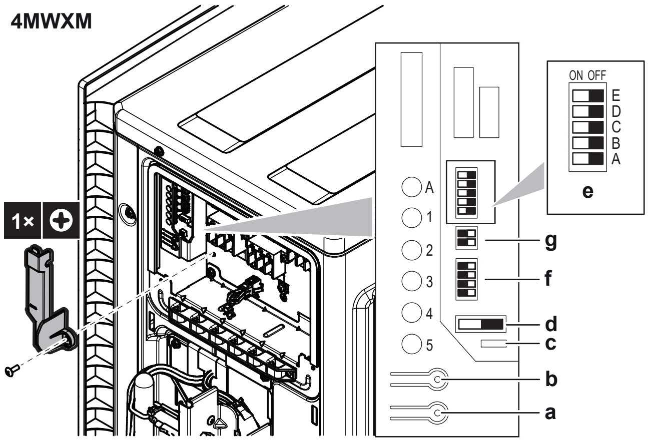
Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	Value
9.I	[6-0E]	What is the maximum DHW temperature setpoint?	R/W	40~65°C, step: 1°C **65°C**		
9.I	[7-06]	Compressor forced off	R/W	**0: Disabled** 1: Enabled		
9.I	[7-07]	BBR16 activation	R/W	**0: Disabled** 1: Enabled		
9.I	[7-08]	--	R/O	**0**		
9.I	[7-09]	What is the minimum pump speed during domestic hot water operation?	R/W	20~95%, step: 5% **20%**		
9.I	[8-03]	Quick mode timer	R/W	20~95 min, step: 5 min **20 min**		
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 80% pump speed during sampling**		
9.I	[9-0E]	--		**6**		
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-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-0A]	--		**0**		
9.I	[D-0B]	--		**2**		
9.I	[E-00]	--		**0**		
9.I	[E-01]	--		**0**		
9.I	[E-02]	--		**0**		
9.I	[E-03]	What is the number of backup heater steps?	R/O	**2: 1.5V**		
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	**1: Yes**		
9.I	[E-06]	Is a DHW tank installed in the system?	R/O	**1: Yes**		
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-0A]	Tank volume	R/O	**180 '(*1)** **230 (*2)**		
9.I	[E-0D]	Is glycol present in the system?	R/O	**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-0D]	--		**1**		

(*1) *180*
(*2) *230*

7.7.2 Field settings: Outdoor unit

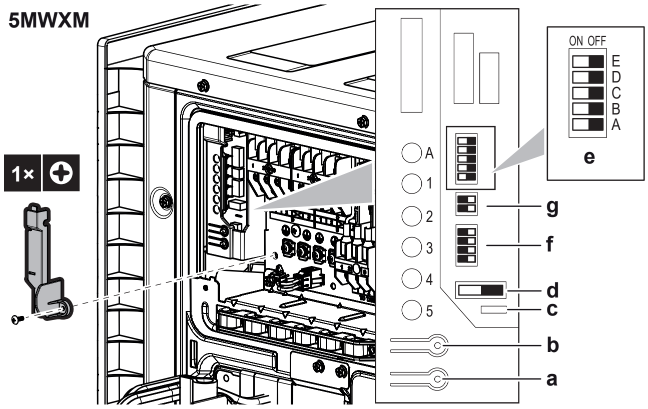
DIP switch settings

4MWXM



ON ON
OFF OFF
a SW1
b SW3
c J_DP jumper
d Cool/Heat selector
e SW4
f SW5
g SW6

5MWXM



ON ON
OFF OFF
a SW1
b SW3
c J_DP jumper
d Cool/Heat selector
e SW4
f SW5
g SW6

SW1	Forced operation. ▪ In combination with the cool/heat selector switch the unit can be started in cooling or heating. ▪ Is also used to activate the inverter checker mode.
SW3	Cross wiring check, see "To perform a wiring error check" [▶ 326] for more information.
J_DP jumper	Not used.
Cool/Heat selector	▪ Used in combination with SW1 ▪ MUST be set in cooling for pump down operation.

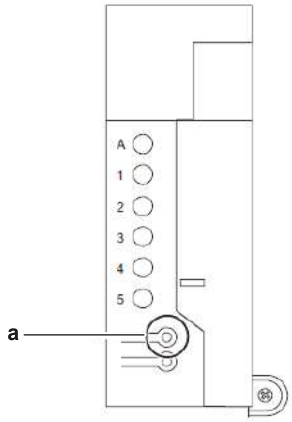
SW4	Priority room setting. **The priority room setting is ONLY applicable for an air conditioner indoor unit and ONLY one room can be set. It is NOT applicable for the domestic hot water tank.** The indoor unit for which priority room setting is applied takes priority in the following cases: **1. Operation mode priority** The operation mode of the indoor unit which is set for priority room setting takes priority. If the set indoor unit is operating, all other indoor units do NOT operate and enter standby mode, according to the operation mode of the set indoor unit. **2. Priority during high-power operation** If the indoor unit which is set for priority room settings is operating at high power, the capabilities of other indoor units will be somewhat reduced. Power supply gives priority to the indoor unit which is set for priority room setting. **3. Quiet operation priority** Setting the indoor unit to quiet operation will make the indoor unit run quietly. **Setting procedure** Slide the switch to the ON side for the switch that corresponds to the piping connected to the indoor unit to be set (in the image above, it is room A). Make sure to set ONLY 1 room.
SW5	SW5-1: Heat lock mode. This setting will force the unit to only operate in heating. SW5-2: Not used. SW5-3: Cold region setting for increased maximum Hz at low ambient. SW5-4: Cold region setting for defrost change.
SW6	SW6-1: Night quiet mode. The night quiet mode function reduces operating noise of the outdoor unit at night time. This function is useful if the customer is worried about the effects of the operating noises on the neighbours. SW6-2: NOT used.

To perform a wiring error check

> **INFORMATION**
>
> The wiring error check is ONLY applicable for air conditioner indoor units. It is NOT applicable for the domestic hot water tank. Domestic hot water tank wiring MUST be checked manually.

By performing a wiring error check, an automatic correction of the wiring error is possible.

Shortly press the wiring error check switch SW3 on the outdoor unit service PCB to start the wiring error check. The wiring error check switch will NOT function for 3 minutes after the circuit breaker is turned on; or if the outside air temperature is 5°C or less.



a Wiring error check switch SW3

Approximately 15 to 20 minutes after the switch is pressed, the errors in the connection wiring will be corrected.

Shortly press the wiring error check switch SW3 again to cancel the wiring error check. Wiring error check is NOT possible anymore after cancellation. Turn the circuit breaker OFF and ON again to restart wiring error check.

LED[a]	1	2	3	4	5	Message
Status	All flashing (simultaneously)					Automatic correction impossible
	Flashing (one after another)					Automatic correction completed
	One or more LEDs 1 to 4 are ON					Abnormal stop[b]

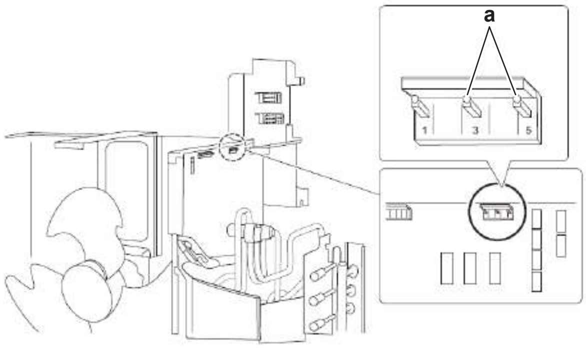
[a] The number of LEDs displayed depends on the number of rooms.
[b] See "3.3 To retrieve the error via the outdoor unit" [▶ 17] for more information.

After wiring error check operation is completed, LED indication will continue until ordinary operation starts. This is normal.

If self-correction is NOT possible, check the indoor unit wiring and piping in the usual manner.

To set cool mode lock

Short-circuit the pins 3 and 5 of the connector S15 to set the unit to cool ONLY.



a Connector S15: pins 3 and 5

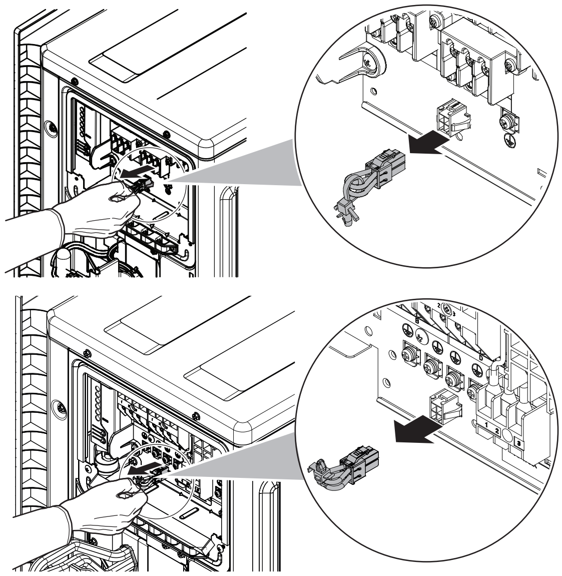
The following specifications apply to the connector housing and pins:

- ST products Housing: VHR-5N
- Pin: SVH-21T-1,1

To turn ON standby electricity saving function

Prerequisite: The main power supply MUST be turned OFF.

1. Remove the service cover.
2. Disconnect the selective standby electricity saving connector.



3. Turn ON the main power supply.

DAIKIN EUROPE N.V.
Zandvoordestraat 300, B-8400 Oostende, Belgium

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