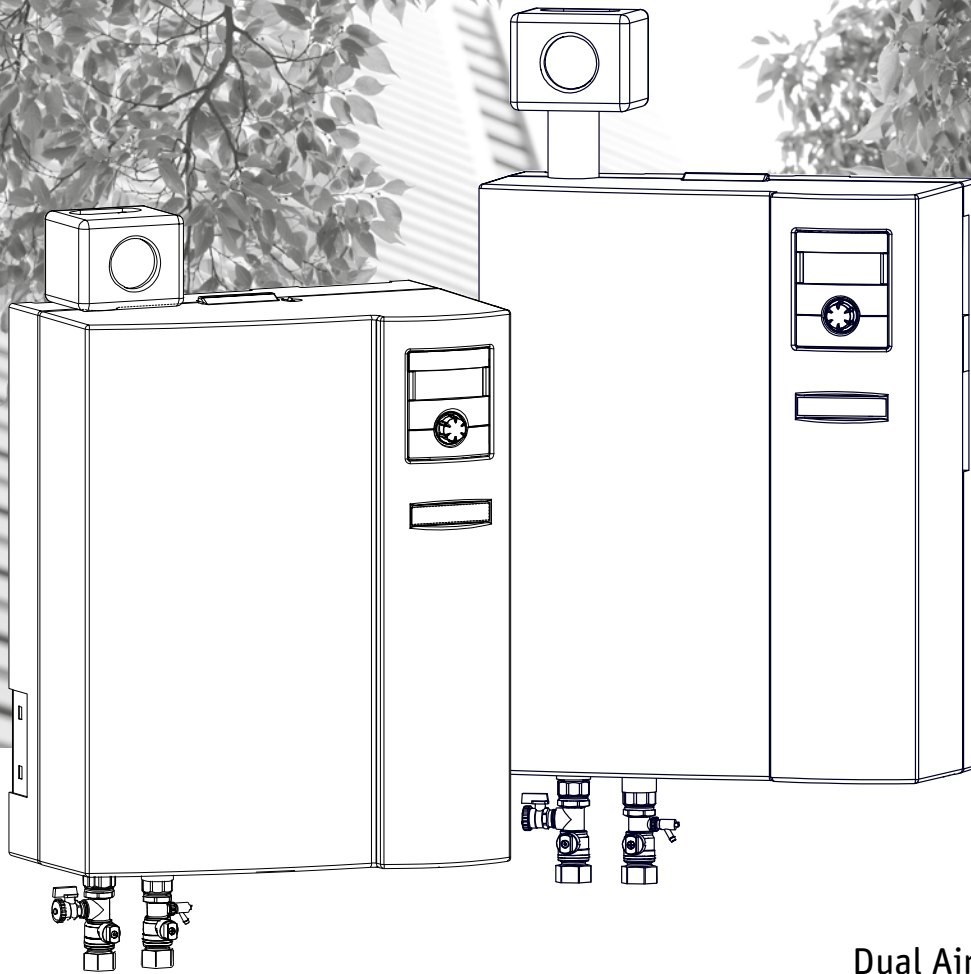
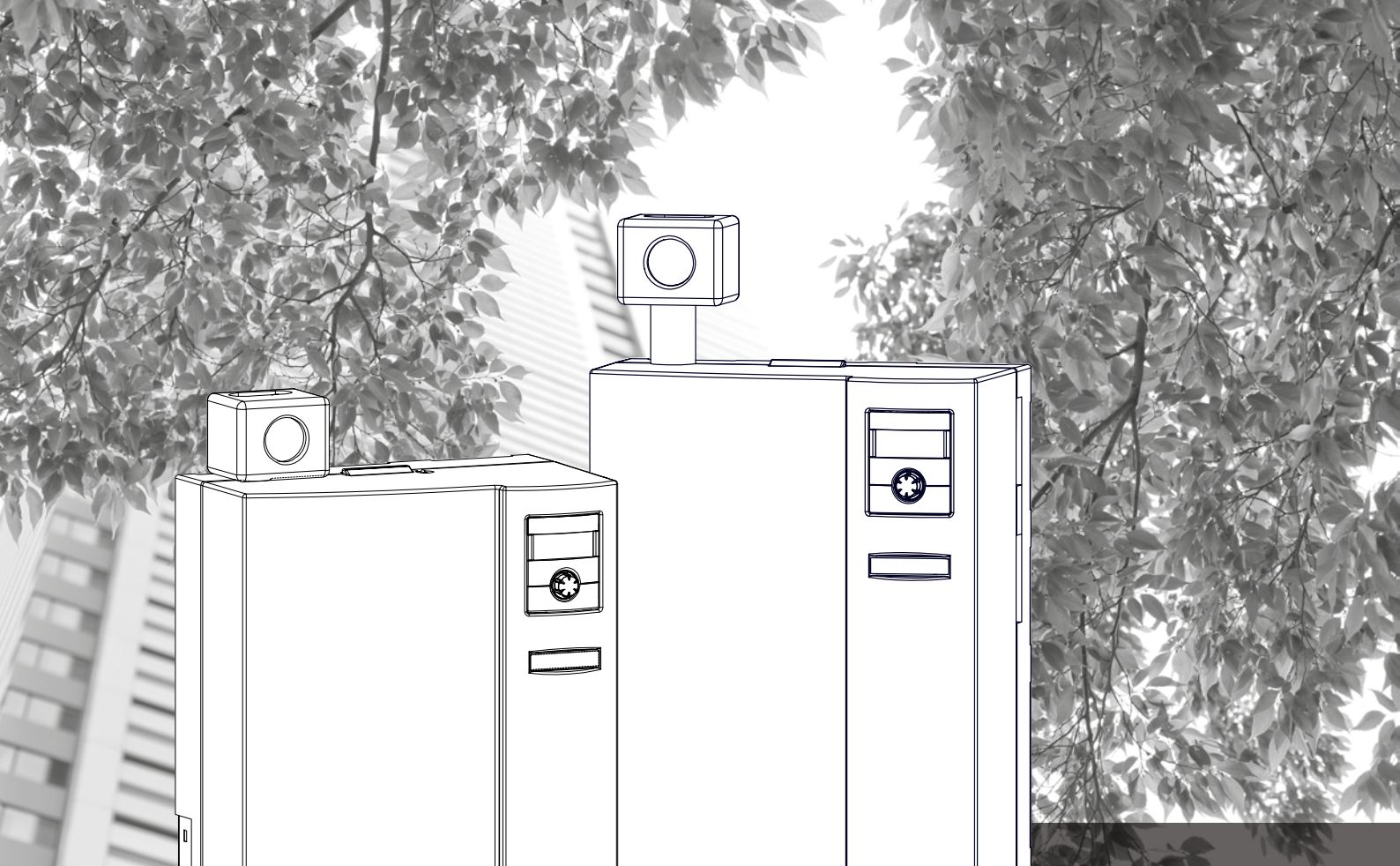


the better way to heat



Accessories for
Dual Air / Water Heat Pumps
Outdoor installation

Operating Manual

Hydraulic Module HMD 1/E

Hydraulic Module HMD 1/RE





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1 About this operating manual

This operating manual is part of the unit.

- ▶ Before working on or with the unit, read the operating manual carefully and follow it for all activities at all times, especially the warnings and safety instructions.
- ▶ Keep the operating manual to hand at the unit and pass on to the new owner if the unit changes hands.
- ▶ If you have any questions or anything is unclear, ask the manufacturer's local partner or the factory's customer service.
- ▶ Note and follow all reference documents.

1.1 Validity

This operating manual refers solely to the unit identified by the nameplate (→ "Nameplate", page 8).

1.2 Reference documents

The following documents contain additional information with regard to this operating manual:

- Planning & design manual, hydraulic integration
- Operating manual of the heat pump
- Operating manual of the heating and heat pump controller
- Brief description of the heat pump controller
- Operating manual of the comfort board (accessories)

1.3 Symbols and markings

Identification of warnings

Symbol	Meaning
	Safety-relevant information. Warning of physical injuries.
	Safety-relevant information. Warning of physical injuries. Flammable materials / flammable (primary) refrigerant
	Safety-relevant information. Warning of physical injuries. Flammable materials / flammable (primary) refrigerant

Symbol	Meaning
	Safety-relevant information. Warning of physical injuries. Danger of fatal injury due to electric current.
DANGER	Indicates imminent danger resulting in severe injuries or death.
WARNING	Indicates a potentially dangerous situation, which can result in severe injuries or death.
CAUTION	Indicates a potentially dangerous situation, which can result in moderate or minor injuries.
IMPORTANT	Indicates a potentially dangerous situation, which can result in property damage.

Symbols in the document

Symbol	Meaning
	Information for qualified personnel
	Information for the owner/operator
✓	Requirement for action
▶	Procedural instructions: Single step action prompt
1., 2., 3., ...	Procedural instructions: Numbered step within a multi-step action prompt. Keep to the given order.
	Additional information, e.g. a tip on making work easier, information on standards
→	Reference to further information elsewhere in the operating manual or in another document
•	Listing
	Secure connections against twisting



1.4 Contact

Addresses for purchasing accessories, for service cases or for answers to questions about the unit and this operating manual can be found on the internet and are kept up-to-date:

- www.ait-deutschland.eu

2 Safety

Only use the unit if it is in proper technical condition and only use it as intended, safely and aware of the hazards, and follow this operating manual.

2.1 Intended use

The unit is designed for household use and is solely intended for the following purposes:

- Heating
- Cooling (reversible variant only)
- Domestic hot water preparation
- ▶ Intended use includes complying with the operating conditions (→ „Technical data / Scope of supply“, from page 20) as well as the operating manual and observing and following the reference documents.
- ▶ When using the local regulations note: laws, standards, guidelines, directives.

All other uses of the unit are not as intended.

2.2 Personnel qualifications

The operating manuals supplied with the product are intended for all users of the product.

The operation of the product via the heating and heat pump control and work on the product which is intended for end customers / operators is suitable for all age groups of persons who are able to understand the activities and the resulting consequences and can carry out the necessary activities.

Children and adults who are not experienced in handling the product and do not understand the necessary activities and the resulting consequences must be instructed and, if necessary, supervised by persons experienced in handling the product and who are responsible for safety.

Children must not play with the product.

The product may only be opened by qualified personnel.

All procedural instructions in this operating manual is solely directed at qualified, skilled personnel.

Only qualified, skilled personnel is able to carry out the work on the device safely and correctly. Interference by unqualified personnel can cause life-threatening injuries and damage to property.

- ▶ Ensure that the personnel are familiar with the local regulations, especially those on safe and hazard-aware working.
- ▶ Ensure that the personnel are qualified to handle flammable (primary) refrigerant.
- ▶ Work on the refrigerating circuit may only be carried out by qualified personnel with appropriate qualifications for refrigeration system installation.
- Work on the electrics and electronics may only be carried out by electrical technicians.
- Any other work on the system may only be carried out by qualified personnel (heating installer, plumbing installer).
- ▶ During the warranty and guarantee period, service work and repairs may only be carried out by personnel authorised by the manufacturer.

2.3 Personal protective equipment

During transport and work on the unit, there is a risk of cuts due to the sharp edges of the unit.

- ▶ Wear cut-resistant protective gloves.

During transport and work on the unit, there is a risk of foot injuries.

- ▶ Wear safety shoes.

When working on liquid-conveying lines, there is a risk of injury to the eyes due to leakage of liquids.

- ▶ Wear safety goggles.



2.4 Residual risks

Injuries caused by electric shock

Components in the unit are energised with life-threatening voltage. Before working on the unit:

- ▶ Disconnect unit from power supply.
- ▶ Secure unit against being switched back on again.

Existing earthing connections within housings or on mounting plates must not be altered. If this should nevertheless be necessary in the course of repair or assembly work:

- ▶ Restore earthing connections to their original condition after completion of the work.

Injuries caused by high temperatures

- ▶ Before working on the unit, let it cool down.

Safety instructions and warning symbols

- ▶ Observe the safety instructions and warning symbols on the packaging and on and in the unit.

2.5 Avoid damage to property

Improper action

Requirements for minimum scale and corrosion damage in hot water heating systems:

- Proper planning, design and commissioning
- Closed system with regard to corrosion
- Integration of an adequately dimensioned pressure maintaining device
- Use of demineralised heating water (VE water) or water corresponding to the VDI 2035 norm
- Regular servicing and maintenance

If a system is not planned, designed, started up and operated in accordance with the given requirements, then there is a risk that the following damage and faults will occur:

- Faults and the failure of components, e.g. pumps, valves
- Internal and external leaks, e.g. from heat exchangers
- Cross-section reduction and blockages in components, e.g. heat exchanger, pipes, pumps
- Material fatigue
- Gas bubbles and gas cushion formation (cavitation)

- Negative effect on heat transfer, e.g. formation of coatings, deposits, and associated noises, e.g. boiling noises, flow noises
- ▶ Note and follow the information in this operating manual for all work on and with the unit.

Unsuitable quality of the fill and make-up water in the heating circuit

The efficiency of the system and the service life of the heat generator and the heating components depend decisively on the quality of the heating water.

When the system is filled with untreated drinking water, calcium and magnesium precipitate as mineral scale. Lime scale deposits form on the heat transfer surfaces of the heating. The efficiency drops and energy costs rise. In extreme cases, the heat exchangers will be damaged.

- ▶ Fill the system with deionised heating water (VE water) or with water corresponding to the VDI 2035 norm only (low-salt operation of the system).

3 Operation and care



NOTE

The unit is operated via the control panel of the heating and heat pump controller (→ operating manual of the heating and heat pump controller).

3.1 Energy and environmentally-conscious operation

The generally accepted requirements for energy-conscious and environmentally-conscious operation of a heating system also apply to use of a heat pump. The most important measures include:

- No unnecessarily high flow temperature
- No unnecessarily high domestic hot water temperature
- Do not open windows with just a gap or tilt open (continuous ventilation); instead, open wide for a short time (shock ventilation)
- Always ensure that the controller settings are correct



3.2 Care

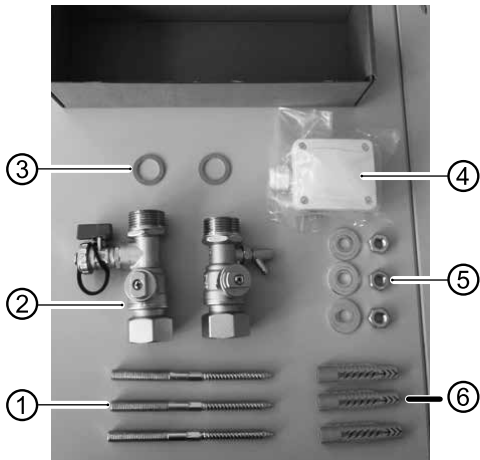
Wipe down the outside of the unit only using a damp cloth or cloth with mild cleaning product (washing-up liquid, neutral cleaning agent). Never use any harsh, abrasive, acid or chlorine-based cleaning products.

4 Scope of supply



- 1 Accessory package
- 2 Safety module
- 3 Hydraulic module

Accessory package:



- 1 Hanger bolts (M 10) for wall bracket (3x)
- 2 Ball valves (2x)
- 3 Flat gasket 1" (2x)
- 4 Outdoor sensor
- 5 Nuts (M 10), plain washers (3 each)
- 6 Anchors for wall bracket (3x)

Screws for strain relief (16x – not illustrated)

1. Inspect the delivery for outwardly visible signs of damage.
2. Inspect the scope of supply for completeness. Any defects or incorrect deliveries must be reported immediately.

4.1 Accessories

The following accessories are available for the unit through the manufacturer's local partner:

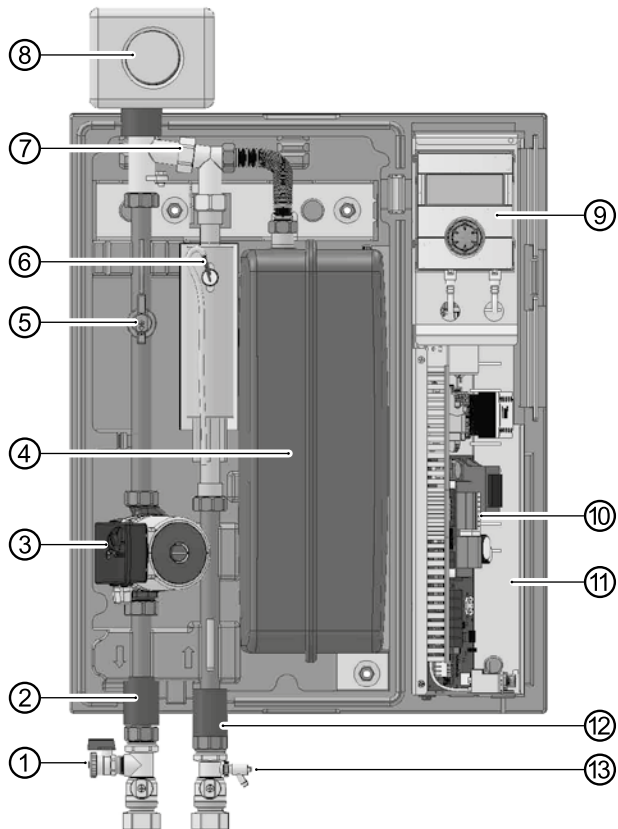
- Comfort board with various additional functions
- Room control panel for controlling the main functions from the living room
- Domestic hot water tank
- Buffer tank



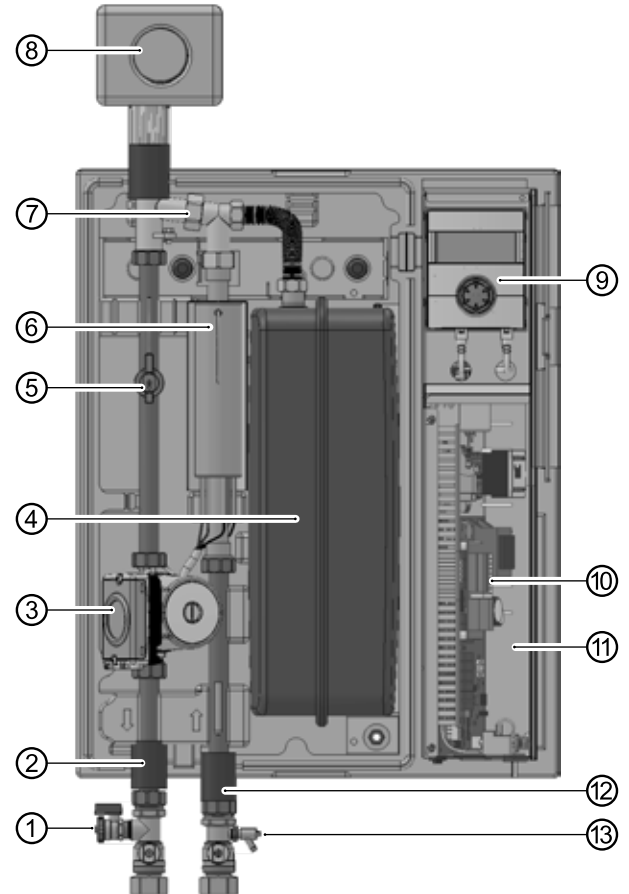
4.2 Components of the unit

Different variants of the hydraulic module are available:

HMD 1/E



HMD 1/RE



1	Shut-off ball valve with filling and drain tap *)
2	Heating water outlet (supply)
3	Energy-efficient circulating pump heating circuit
4	Expansion vessel
5	Volumetric flow meter
6	Electric heating element
7	Air separator
8	Heating circuit safety module (insulated) *)
9	Control panel
10	Comfort board (accessory)
11	Electrical switch box
12	Heating water inlet (supply)
13	Shut-off ball valve with drain tap and venting *)

*) to be mounted at the installation location



Nameplate

A nameplate is attached to the outside of the unit at the factory.

The nameplate contains the following information at the very top:

- Model, item number
- Serial number

The nameplate also contains an overview of the most important technical data.

5 Storage, transport, installation

5.1 Storage

- ▶ Store unit protected against:
 - Moisture/damp
 - Frost
 - Dust and dirt

5.2 Unpacking and transport

Notes on safe transport

The unit is heavy (refer to „Technical data / Scope of supply“, from page 20). There is a risk of injuries or damage to property if the unit falls down or overturns.

The hydraulic connections are not designed for mechanical loads.

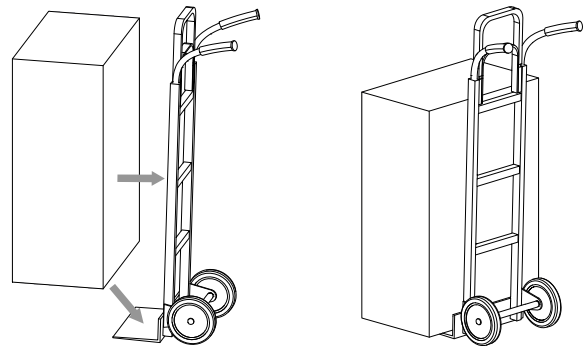
- ▶ Do not lift or transport the unit by the hydraulic connections.
- ▶ Transport the unit preferably with a handcart or by carrying.



NOTE

To prevent damage during transport, always transport the unit to final installation location in its original packaging.

5.2.1 Transport with handcart



5.2.2 Carrying the unit

- ▶ Carry the packed unit with 2 persons to the installation location.

5.2.3 Unpacking

1. Remove plastic films and cardboard. Ensure that you do not damage the unit.
2. Dispose of the transport and packaging material in an environmentally friendly way and in accordance with local regulations.



5.3 Installation

Installation location

IMPORTANT

Install the unit inside buildings only.

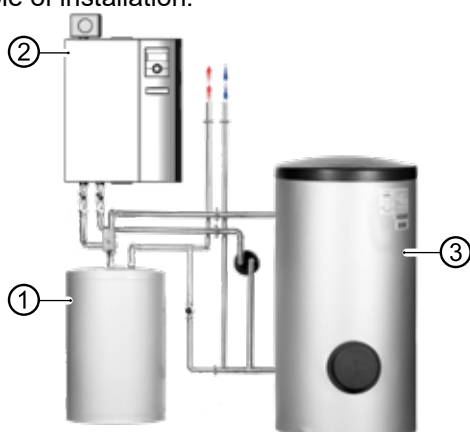
The installation area must be frost-free and dry. It must fulfil the relevant local regulations.

Observe safety and service clearances.

→ "Installation plans", page 25 and "Dimensioned drawings and drill patterns", from page 23

Mount the unit

Example of installation:

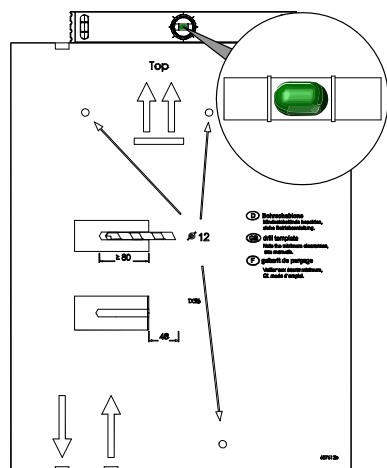


- 1 Buffer tank
- 2 Hydraulic module
- 3 Domestic hot water tank

IMPORTANT

The load-bearing capacity of the wall must be guaranteed.

1. Align drill pattern, mark drill holes and drill. Observe the instructions on the drill pattern.



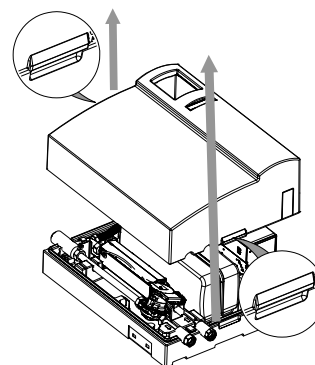
2. Insert the plugs and hanger bolts supplied into the holes drilled.

The plugs supplied are only suitable for use with the following types of walls:

- Concrete
- Solid lightweight concrete blocks
- Cavity block made of lightweight concrete
- Cellular concrete
- Prestressed concrete - hollow ceiling/floor slabs
- Natural stone with dense, close-grained micro-structure
- Solid calcium silicate blocks
- Perforated calcium silicate blocks
- Solid bricks
- Vertically perforated (honeycomb) bricks
- Hollow floors/ceilings made of clay bricks, concrete or similar
- Solid gypsum boards
- Gypsum boards and gypsum fibre boards
- Particle boards

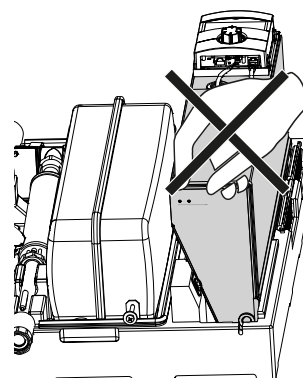
The board material must be dimensioned with sufficient thickness to ensure secure fixing. Appropriate fixing material must be provided on site for other types of wall constructions.

3. Take off the front hood.



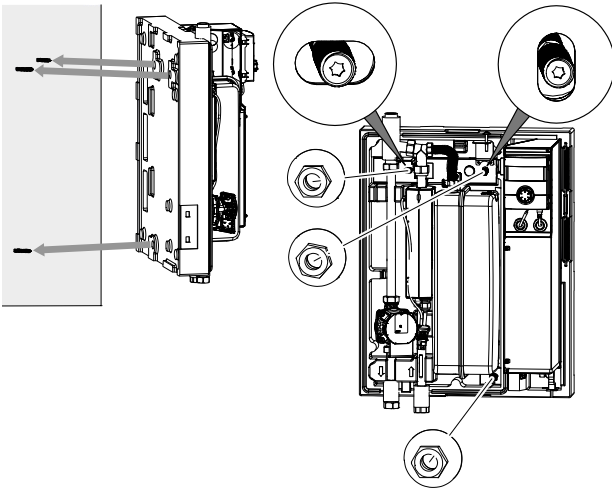
IMPORTANT

The unit must neither be lifted up nor transported by the switch box.





4. Mount the unit to the wall.

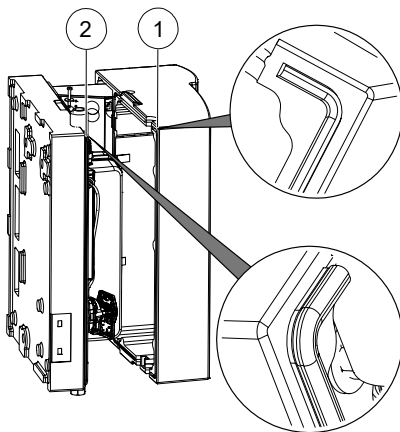


IMPORTANT

The gap between the unit and the wall helps back ventilation. It may not be sealed or closed off.

5. Lay cable glands at a distance of at least 2 cm from the unit.

- ▶ On the inside of the front hood, there is a circumferential groove (1). Lock the front hood to the groove in the tongue (2) on the rear panel.



6 Install the hydraulic connections



NOTE

The safety valve that is integrated or included in delivery has a tolerance of plus / minus 10% for the set pressure. If local regulations, laws, standards or directives require a smaller tolerance range, the safety valve must be replaced on site with a safety valve that meets the requirements.

IMPORTANT

Avoid open heating systems and / or heating systems that are not oxygen diffusion-tight. If this is not possible, a system separation must be installed.

Depending on the dimensioning of the heat exchanger and the additionally required circulation pump, the system separation worsens the energy efficiency of the system.

IMPORTANT

Dirt and deposits in the (existing) hydraulic system can cause damage to the heat pump.

- ▶ Ensure that a air / magnetic sludge separator is installed in the heating circuit.
- ▶ Rinse the hydraulic system thoroughly prior to establishing the hydraulic connection of the heat pump.

IMPORTANT

Damage to the copper pipes due to unacceptable loading!

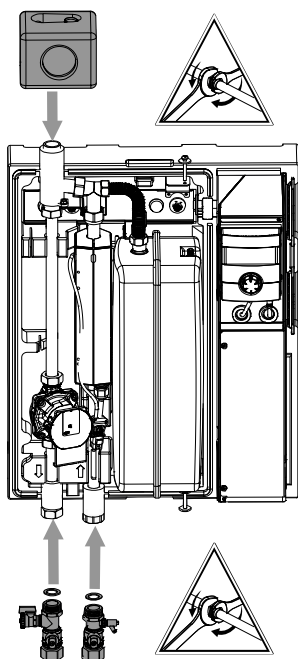
- ▶ Secure all connections against twisting.
- ✓ Cross-sections and lengths of the pipes for the heating circuit are adequately dimensioned. In doing so, always that the connection pipework between the heat pump and hydraulic module are also taken into account
- ✓ The free pressing of the recirculating pump produces at least the minimum throughput required for the unit type (refer to "Free pressing", page 22).
- ▶ Route all hydraulic connections as fixed piping and attach them via a fixed point to the wall or ceiling at a maximum distance of 20 cm from the centre of the respective unit connection.
- ▶ Insert the vent at the highest point of the heating circuit.
- ▶ Take off the front hood.



6.1 Heating circuit

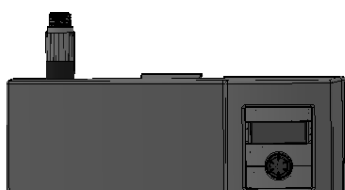
Safety module and shut-off ball valves

1. Take the safety module and the shut-off ball valves out of the accessory pack and fit them to the connections provided. Use seals from the accessory pack.

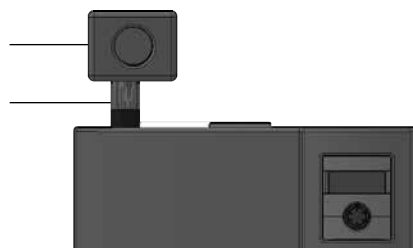


Safety module For reversible variant:

- 1.1. Mount thread covers on the hanger bolts.
- 1.2. Screw adapter with safety component onto hydraulic module.



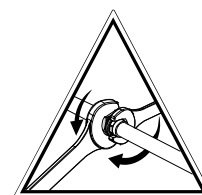
- 1.3. Following the leak test, use insulation included in the scope of supply to insulate adapter and safety component.



2. Lay the safety discharge of the safety valve into the drain via a funnel waste trap according to the relevant standards and guidelines.
It is essential that the safety discharge is connected

Heating water inlet and outlet

1. Establish hydraulic connection to the unit.
2. Establish hydraulic connection to the heating circuit / domestic hot water tank.



→ Position of the connections: „Dimensioned drawings and drill patterns“, from page 23

6.2 Expansion vessel

The expansion vessel for the heating circuit is integrated. Always check whether the size of the expansion vessel is large enough for the system. If necessary, an additional expansion vessel must be installed on site in accordance with the relevant standards and guidelines.



NOTE

The admission pressure of the expansion vessel must be adjusted to the system (approx. 0.5 bar less than the system filling pressure) in accordance with the calculation to the relevant standards (EN 12828).



7 Electrical installation

7.1 Connect the electrical cables

IMPORTANT

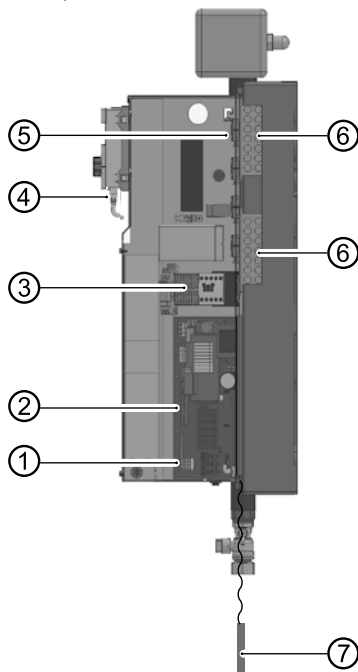
Irreparable damage to the compressor due to wrong rotating field (only applies to units with 400V connection).

- Ensure that there is a clockwise rotating field for the compressor load infeed.

Basic information on the electrical connection

- The specifications of the local energy supply company may apply to electrical connections
- Fit the power supply for the heat pump with an all-pole circuit breaker with at least 3 mm contact spacing (per IEC 60947-2)
- Note the level of the tripping current
- Comply with the electromagnetic compatibility regulations (EMC regulations)
- Lay unshielded power supply cables and shielded cables (bus cable) sufficiently far apart (> 100 mm)
- Maximum line length: 30m

Example: HMD 1/E



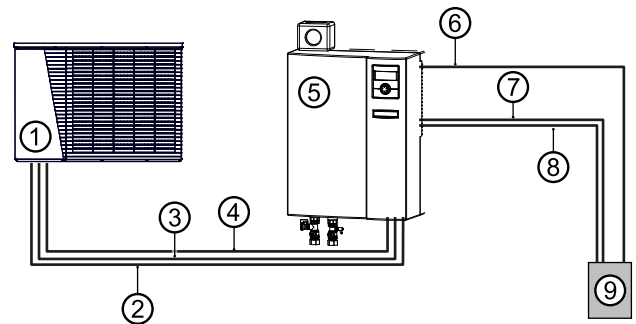
- 1 Terminal strip, external sensors
- 2 230 V inputs
- 3 Control voltage
- 4 Bus cable connection
- 5 Terminal strip, power supply cable
- Heat pump
- Heating element

- 6 Cable routing
- 7 Return flow sensor

7.2 Electrical connection

The electrical connection between the heat pump and hydraulic module is made using the 3 pre-installed cables on the heat pump.

The hydraulic module is connected electrically on site according to the following scheme:



- 1 Heat pump
- 2 Load cable compressor
- 3 Control voltage
- 4 LIN-Bus (shielded)
- 5 Hydraulic module
- 6 Load line electric heating element
- 7 Control voltage
- 8 Load cable compressor
- 9 Sub-distribution

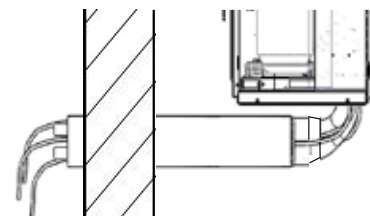
1. Lay empty conduits from the heat pump to the inside of the building and seal the empty conduits on the unit side. Or use the wall duct (accessory).



NOTE

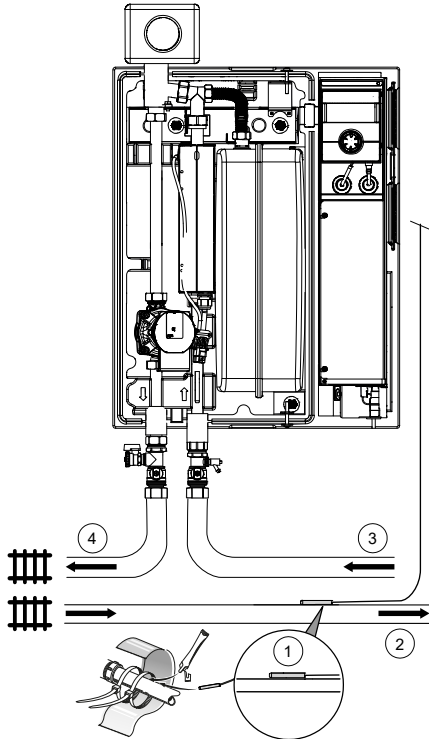
If the wall duct is used, the necessary distance from adjacent conduits and cables is ensured.

2. Feed the three connection cables from the heat pump through the empty conduits or through the three ducts of the wall duct. Use lubricant.



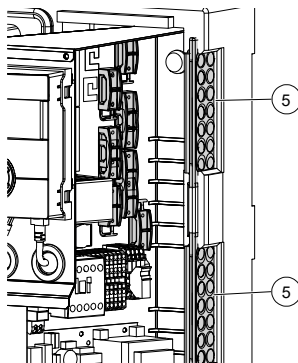


- Fasten the return sensor (①) to the heat-conducting pipe of the return line leading to the heat pump (②) using cable ties and thermal compound.

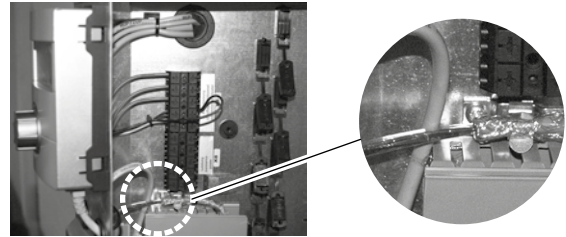


- Return sensor on hydraulic module
- Return to heat pump
- Supply from heat pump
- Supply to heating circuit / domestic hot water tank

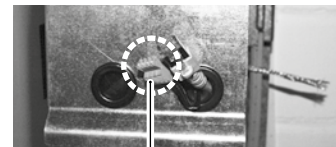
- Lay the sensor cable to the hydraulic module.
- Strip the load, control and sensor cable, the cable for the EVU blocking time as well as the cables of external loads before feeding them into the switch box (stripping length of each of the individual wires: 6 mm).
- Feed the cables through the cable grommets (⑤) into the switch box.



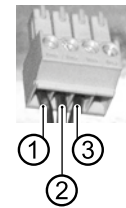
- Push the shielding of the stripped bus cable backwards over the cable sheath.
- Insert the end of the insulated cable with the shield into the shield terminal.



- Feed the end with the individual cores through one of the two grommets.

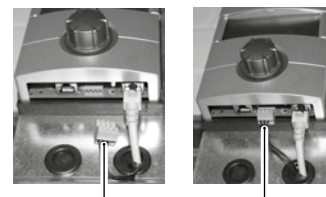


Core assignment:



- 12 V
- LIN
- GND

- Pull off the green bus connector from the bottom of the control element and connect the cable as shown in the terminal diagram, then re-attach the connector to the control element.



- Make further electrical connections in accordance with the terminal diagram.

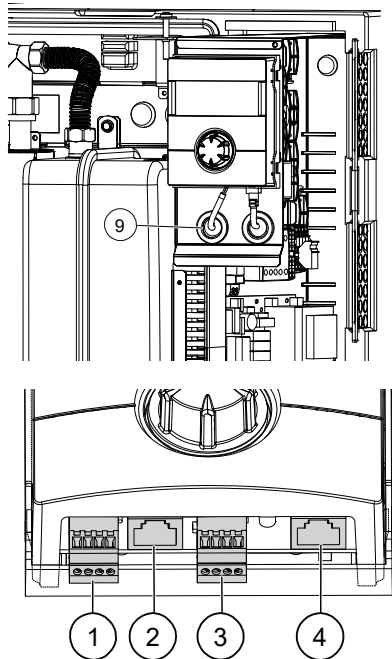
→ "Terminal diagram", page 30



NOTE

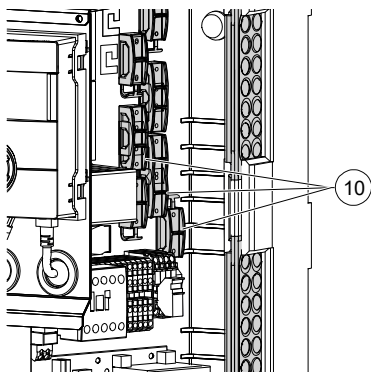
The control panel of the heating and heat pump controller can be connected to a computer or network using a suitable network cable, enabling the heating and heat pump controller to be controlled remotely from there.

If such a connection is desired, route a shielded network cable (⑨, category 6, with RJ45 connector) through the electrical switch box and plug it to the corresponding socket of the control panel.



- 1 RS485 for connecting the room control unit RBE (accessory)
- 2 RJ45 for network cable connection
- 3 RS485 LIN bus cable connection to the control board
- 4 RJ45 connection Modbus cable to Modbus distributor.

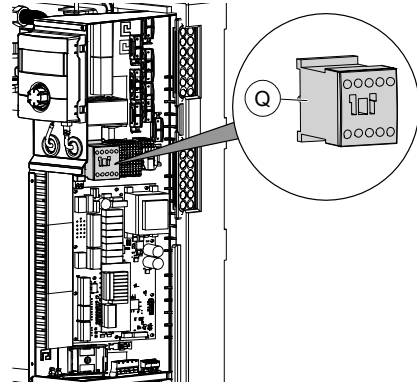
12. Insert all cables introduced into the switch box into the cable ducts in the switch box, route them through the strain reliefs (⑩) and screw them into the strain reliefs.



NOTE

The integrated electric heating element is connected at 6kW in the factory. At contactor Q, it is possible to select 4kW = 2 phase operation. Disconnect Q5/6 for this. Or 2kW = 1 phase operation. Disconnect Q5/6 and Q5/4 for this.

Disconnected cables must be furnished with screw terminals. Only the phases cited above may be disconnected (safety temperature limiter).



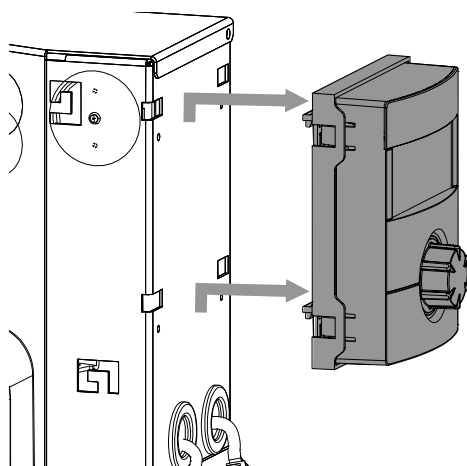
13. Close the electrical switch box by re-attaching the side cover.



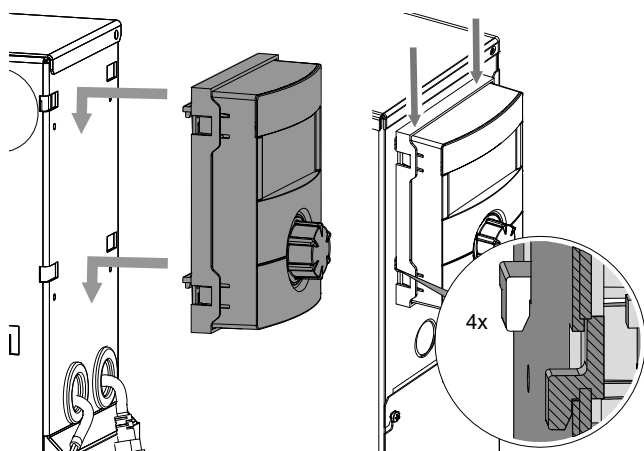
8 Control panel

The control panel is pre-assembled at the factory. If the control panel needs to be removed for any reason:

1. Take off the front hood.
2. Disconnect or unplug all connections at the bottom.
3. Lift off the control panel.



Reattaching the control panel:



9 Flushing, filling and venting

9.1 Heating water quality



NOTE

For detailed information refer, among other things, to the VDI Guidelines 2035 “Vermeidung von Schäden in Warmwasserheizanlagen” (preventing damage in hot water heating systems).

1. Ensure that the pH-value of the heating water is between 8.2 – 10, for aluminium materials between 8.2 – 9. Ideally, the pH value should already be in the required range after filling. After 6 weeks at the latest, it must have adjusted to the required range.
2. Ensure that the electrical conductivity is $< 100 \mu\text{S/cm}$.



NOTE

If the required water quality is not achieved, consult a company specialising in the treatment of heating water.

3. Fill the system with deionised heating water (VE water) or with water corresponding to the VDI 2035 norm only (low-salt operation of the system).

Advantages of low-salt operation:

- Low corrosion-promoting properties
- No formation of mineral scale
- Ideal for closed heating circuits

4. Keep a system log for hot water heating systems in which relevant planning data and the water quality are entered (VDI 2035).

9.2 Flush and fill the heating and domestic hot water charging circuit

- ✓ Outlet pipe of the safety valve is connected.
- ▶ Ensure that the set pressure of the safety valve is not exceeded.

IMPORTANT

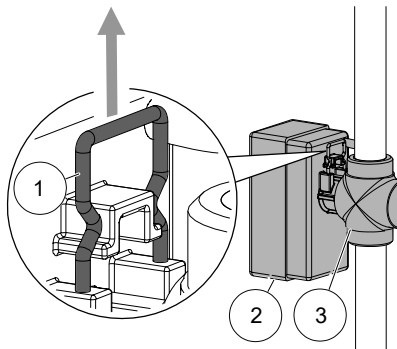
Flush the heating circuit only in its flow direction.



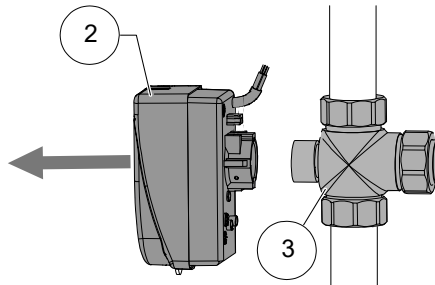
NOTE

The venting program on the controller can also be used to support the flushing and venting process. It is possible to control individual recirculating pumps and even the changeover valve through the venting programme. As a result it is not necessary to remove the valve motor.

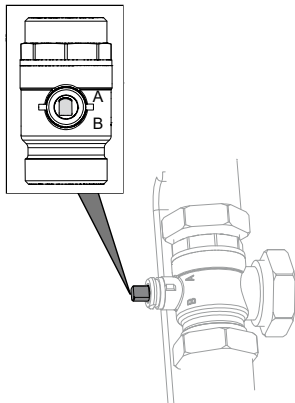
1. Vent the system at the highest point.
2. Pull off the U-clip (①) on the back of the valve motor (②) on the 3-way switching valve (③, accessory) upwards.



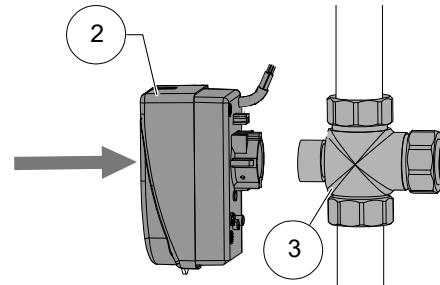
3. Carefully pull the valve motor (②) forward from the 3-way switching valve (③).



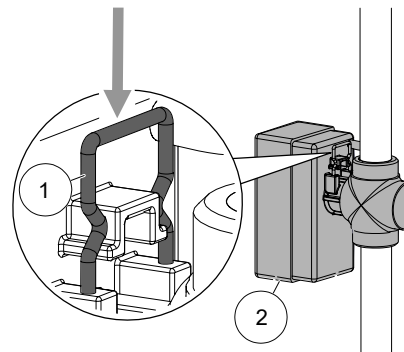
4. Turn the spindle of the 3-way switching valve so that the rounded side of the spindle points in the direction of marking A of the connections of the 3-way switching valve.



5. Flush the domestic hot water charging circuit for approx. 1 minute.
6. Turn the spindle so that the rounded side of the spindle points in the direction of marking B of the connections of the 3-way switching valve.
7. Flush heating circuit thoroughly, until no more air is discharged.
8. Position the valve motor (②) on the 3-way switching valve (③).



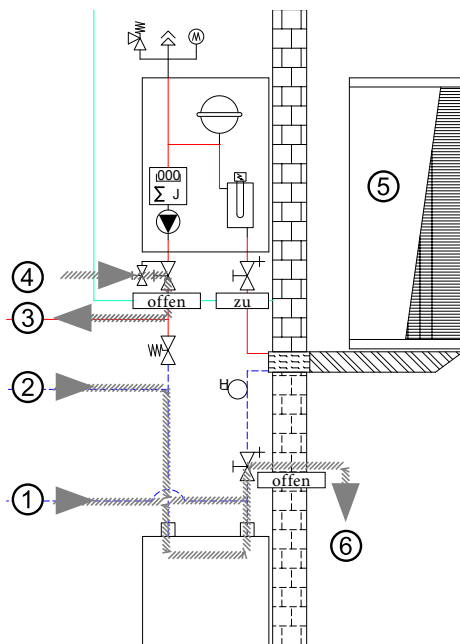
9. Insert the U-clip (①) into the back of the valve motor (②).



10. Ensure that the U-clip has latched into position correctly:
 - ✓ Valve motor sits securely on the 3-way switching valve.
 - ✓ Both prongs of the U-clip sit on the lug.
 - ✓ The tips of the U-clip are not visible more than approx. 2 mm.

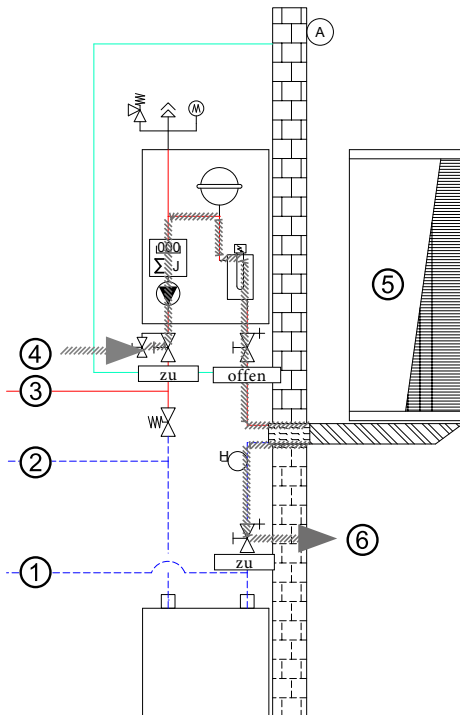


Example: Scheme heating variant



- 1 Return, domestic hot water
- 2 Return, hot water
- 3 Supply, hot water / domestic hot water
- 4 Filling stop cock
- 5 Heat pump
- 6 Drain

Example: Scheme heating variant



- 1 Return, domestic hot water
- 2 Return, hot water
- 3 Supply, hot water / domestic hot water
- 4 Filling stop cock
- 5 Heat pump
- 6 Drain

- 11. Swap the hoses at the filling and draining stop cocks and flush the condenser of the heat pump via the return.
 - 12. Open the additional vent valve at the condenser of the heat pump. Vent the condenser and then close the vent valve again when fully vented.
- → “Switching valve” operating manual

10 Insulate hydraulic connections

Insulate hydraulic lines in accordance with local regulations.

- 1. Open shut-off devices.
- 2. Perform a pressure test and inspect for leaks.
- 3. Insulate external piping on site.
- 4. Insulate all connections, fittings and pipes.
In (R) variant vapour diffusion tight

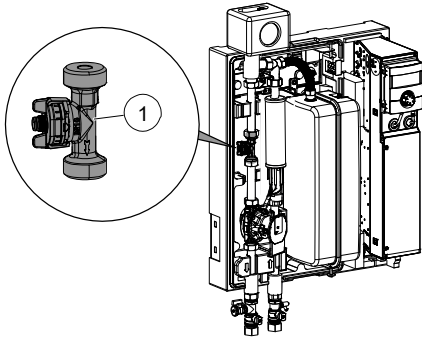
11 Overflow valve

→ Operating manual of the heat pump



12 Volumetric flow meter / heat meter

The volumetric flow meter / heat meter (①) integrated is used to measure the heat quantity generated by the heating system and made available for domestic hot water preparation and building heating.



The volumetric flow meter / heat meter measures flow and temperature difference in the charging circuit. The measuring ranges are set in the heating and heat pump controller. Measured values can be read out on the control panel display.

→ Operating manual of the heating and heat pump controller

13 Commissioning

→ Operating manual of the heating and heat pump controller

→ Operating manual of the heat pump

14 Maintenance



NOTE

We recommend that you sign a maintenance agreement with an accredited heating company.

14.1 Maintenance as required

- ▶ The components of the heating circuit (valves, expansion vessels, circulating pumps, filters, dirt traps) should be inspected or cleaned as needed, at the very least annually, by qualified personnel (heating or cooling system engineers).

14.2 Yearly maintenance

- ▶ Determine the quality of the heating water by analysis. In the event of deviations from the specifications, take suitable measures without delay.
- ▶ Check all installed dirt traps for dirt and clean them if necessary.

15 Faults

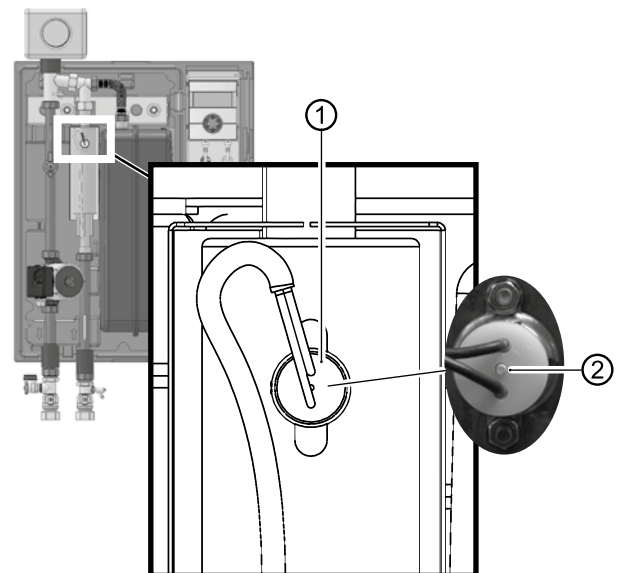
- ▶ Read out the cause of the fault via the diagnostics program of the heating and heat pump controller.
- ▶ Contact the local partner of the manufacturer or the factory's customer service. Have the fault message and unit number (refer to "Nameplate") to hand.

15.1 Unlock safety temperature limiter

A safety temperature limiter is installed in the electric heating element. If the heat pump fails or there is air in the system:

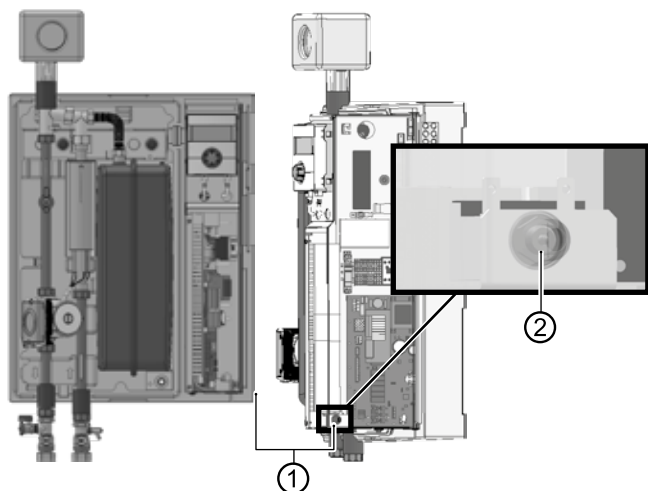
- ▶ Check whether the reset button (②) in the centre of the safety temperature limiter (①) has tripped.

HMD 1/E





HMD 1/RE

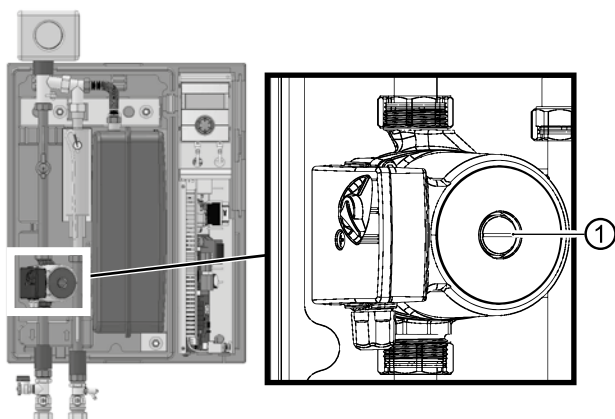


- ▶ If the reset button (2) has tripped, press it again.
- ▶ If the safety temperature limiter trips again, contact the local partner of the manufacturer or the factory's customer service.

15.2 Manually unblock the circulating pumps

Circulating pumps can block due to sediments or longer standstill periods. This blockage can be removed manually.

1. Undo deflating screw (1) in the middle of the circulation pump of the heat source.



2. Insert a screwdriver into the opening and release the blocked shaft in the direction of rotation of the circulating pump.
3. Reinsert and tighten the deflating screw (1).

16 Dismantling and disposal

16.1 Dismantling

- ▶ Separate components by their materials.

16.2 Disposal and recycling

- ▶ Recycle or ensure proper disposal of unit components and packaging materials in accordance with local regulations.

16.2.1 Buffer (standby) battery

1. Use a screwdriver to push out the buffer battery on the processor board of the control panel.
2. Dispose of the buffer battery (type: CR2032, Lithium) in accordance with local regulations.



Technical data / Scope of supply

HMD 1/E

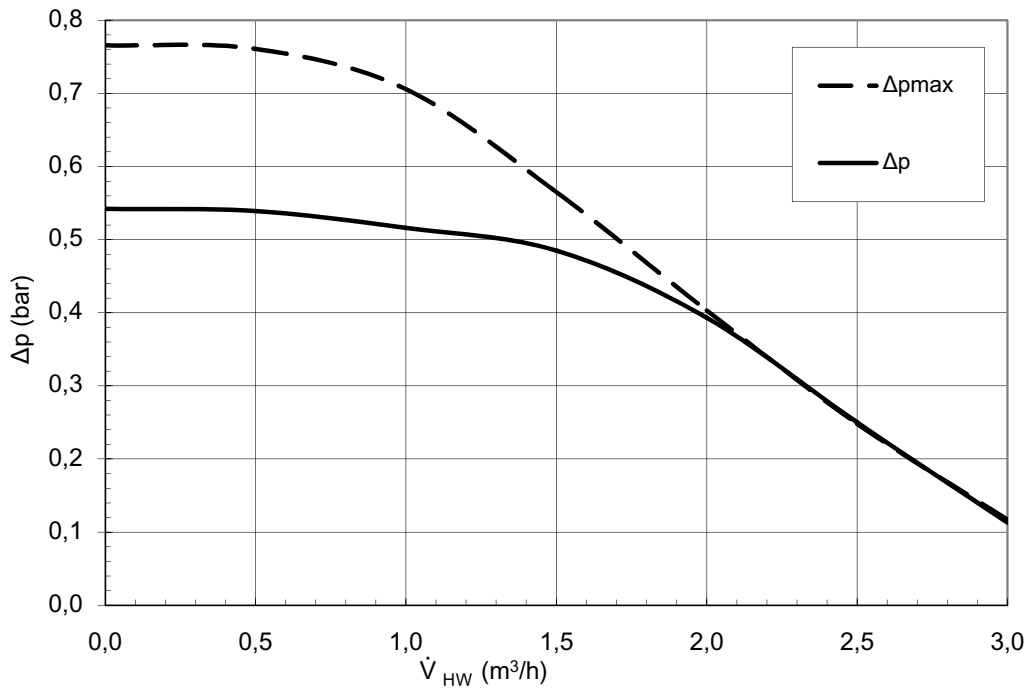
Unit designation	HMD 1/E		
Accessory for heat pump model			
LWD 50A - LWD 90A LWD 50ARX - LWD 70ARX	• applicable — not applicable		• —
Functionally necessary	• applicable — not applicable		•
Installation location			
Indoors Outdoors	• applicable — not applicable		• —
Maximum indoor temperature		°C	—
Maximum relative humidity		%	—
Conformity		CE	•
Heating circuit			
Heating circuit efficiency pump	integrated: • yes — no		•
Heating circuit free compression Δp (factory setting) Maximum free compression Δp_{max} Volume flow	bar bar l/h	0,46 0,54 1600	
Volume flow: minimum flow rate maximum flow rate	l/h	900 2000	
max. permissible operating pressure	bar	3	
Integrated expansion vessel Volume Initial pressure	• yes — no l bar		• 12 1,5
Buffer tank	integrated: • yes — no		—
Heat metering and/or flow rate display	integrated: • yes — no		•
General unit data			
Housing dimensions (Height Width Depth)	mm mm mm	695 550 330	
Total weight	kg	25	
Connections			
Heating water inlet (forward flow)	...	R 1" internal	
Hot water outflow (forward flow)	...	R 1" internal	
Electrics			
Voltage code three-phase circuit breaker heat pump **)	... A	3~/N/PE/400V/50Hz C16	
Voltage code circuit breaker control voltage **)	... A	1~/N/PE/230V/50Hz B16	
Voltage code circuit breaker electric heating element **)	... A	3~/N/PE/400V/50Hz B10	
Protection type	IP	20	
Output electric heating element 3 2 1 phase	kW kW kW	6 4 2	
Heating circuit pump: maximum power consumption current consumption	kW A	0,07 0,31	
Safety equipment			
Safety assembly heating circuit Safety assembly heat source	in scope of delivery: • yes — no		• —
Heating and heat pump regulator	in scope of delivery: • yes — no		•
Overflow valve	integrated: • yes — no		—
**) comply with local regulations			813305b



HMD 1/RE

Technical data / Scope of supply

Unit designation	HMD1/RE		
Accessory for heat pump model			
LWD 50A - LWD 90A LWD 50ARX - LWD 70ARX	• applicable — not applicable	— •	
Functionally necessary	• applicable — not applicable	•	
Installation location			
Indoors Outdoors	• applicable — not applicable	• —	
Maximum indoor temperature	°C	35	
Maximum relative humidity	%	60	
Conformity	CE	•	
Heating circuit			
Heating circuit efficiency pump	integrated: • yes — no	•	
Heating circuit free compression Δp (factory setting) Maximum free compression Δp_{max} Volume flow	bar bar l/h	0,46 0,54 1600	
Volume flow: minimum flow rate maximum flow rate	l/h	900 2000	
max. permissible operating pressure	bar	3	
Integrated expansion vessel Volume Initial pressure	• yes — no bar	• 12 1,5	
Buffer tank	integrated: • yes — no	—	
Heat metering and/or flow rate display	integrated: • yes — no	•	
General unit data			
Housing dimensions (Height Width Depth)	mm mm mm	695 550 330	
Total weight	kg	25	
Connections			
Heating water inlet (forward flow)	...	R 1" internal	
Hot water outflow (forward flow)	...	R 1" internal	
Electrics			
Voltage code three-phase circuit breaker heat pump **)	... A	3~/N/PE/400V/50Hz C16	
Voltage code circuit breaker control voltage **)	... A	1~/N/PE/230V/50Hz B16	
Voltage code circuit breaker electric heating element **)	... A	3~/N/PE/400V/50Hz B10	
Protection type	IP	20	
Output electric heating element 3 2 1 phase	kW kW kW	6 4 2	
Heating circuit pump: maximum power consumption current consumption	kW A	0,07 0,31	
Safety equipment			
Safety assembly heating circuit Safety assembly heat source	in scope of delivery: • yes — no	• —	
Heating and heat pump regulator	in scope of delivery: • yes — no	•	
Overflow valve	integrated: • yes — no	—	
**)) comply with local regulations			813308



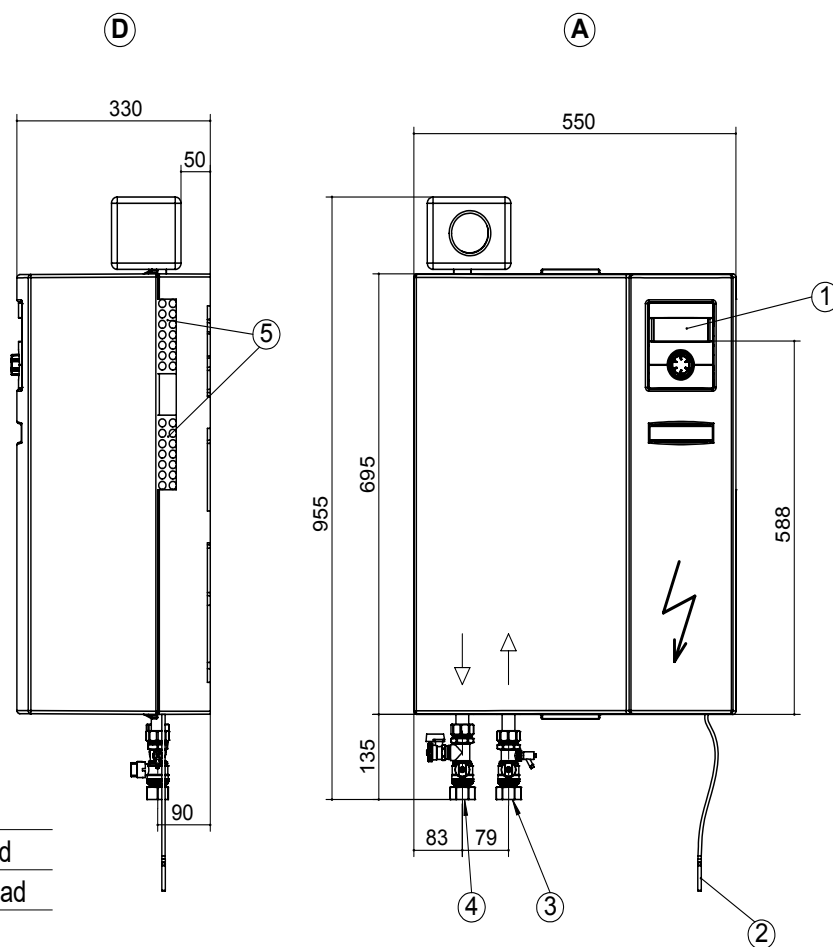
Keys: UK812031

\dot{V}_{HW}	Volumetric flow of hot water
Δp	Free compression (factory setting)
Δp_{max}	Maximum free pressing



HMD 1/E

Dimensioned drawings



Keys: UK819396

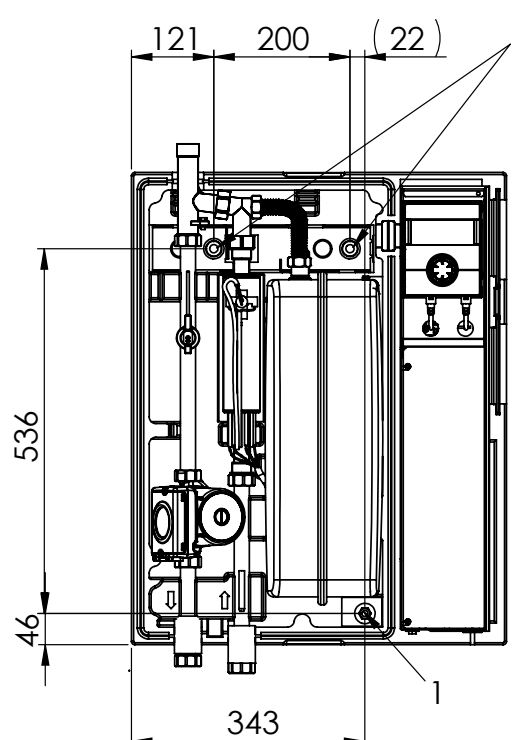
All dimensions in mm.

Pos.	Name
A	Front view
D	Side view from right
1	Control panel
2	Return flow sensor approx. 5.5m from unit
3	Heating water inlet (supply) Rp 1" internal thread
4	Heating water outlet (supply) Rp 1" internal thread

5 Penetrations for electric/sensor cables

The hydraulic module is installed in the heating flow!

Drill pattern



Keys: UK819403a

All dimensions in mm. Spacing for drill pattern.

Pos.	Name
1	Drill hole Ø12 for plug (incl. accessory package)

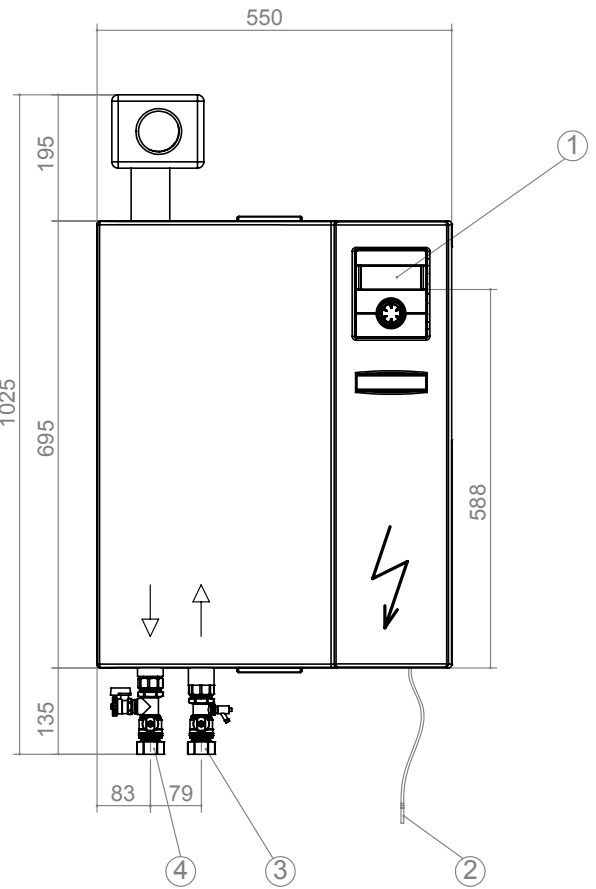
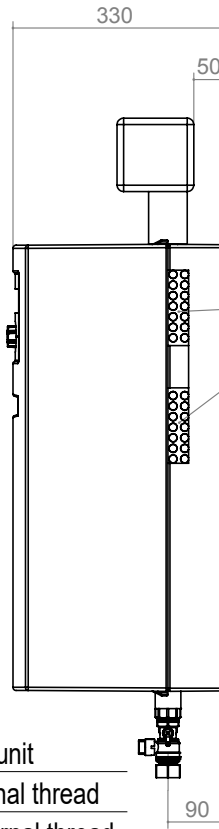


Dimensioned drawings

HMD 1/RE

(D)

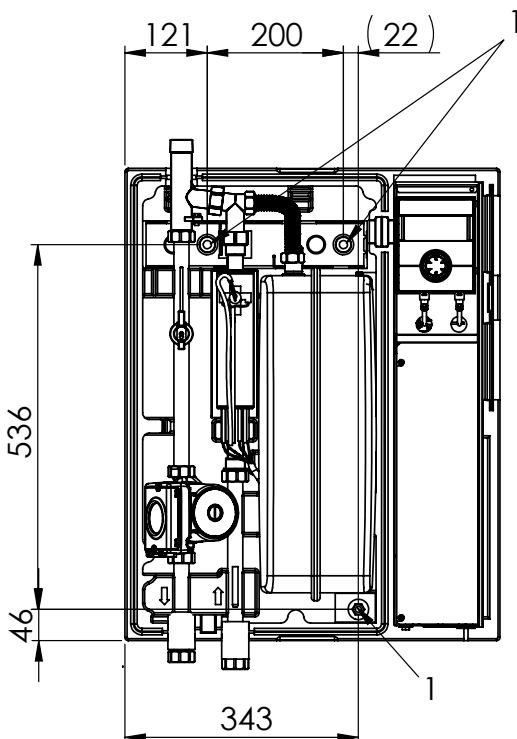
(A)



Keys: UK819412a
All dimensions in mm.

Pos.	Name
A	Front view
D	Side view from right
1	Control panel
2	Return flow sensor approx. 5.5m from unit
3	Heating water inlet (supply) Rp 1" internal thread
4	Heating water outlet (supply) Rp 1" internal thread
5	Penetrations for electric/sensor cables

The hydraulic module is installed in the heating flow!



Drill pattern

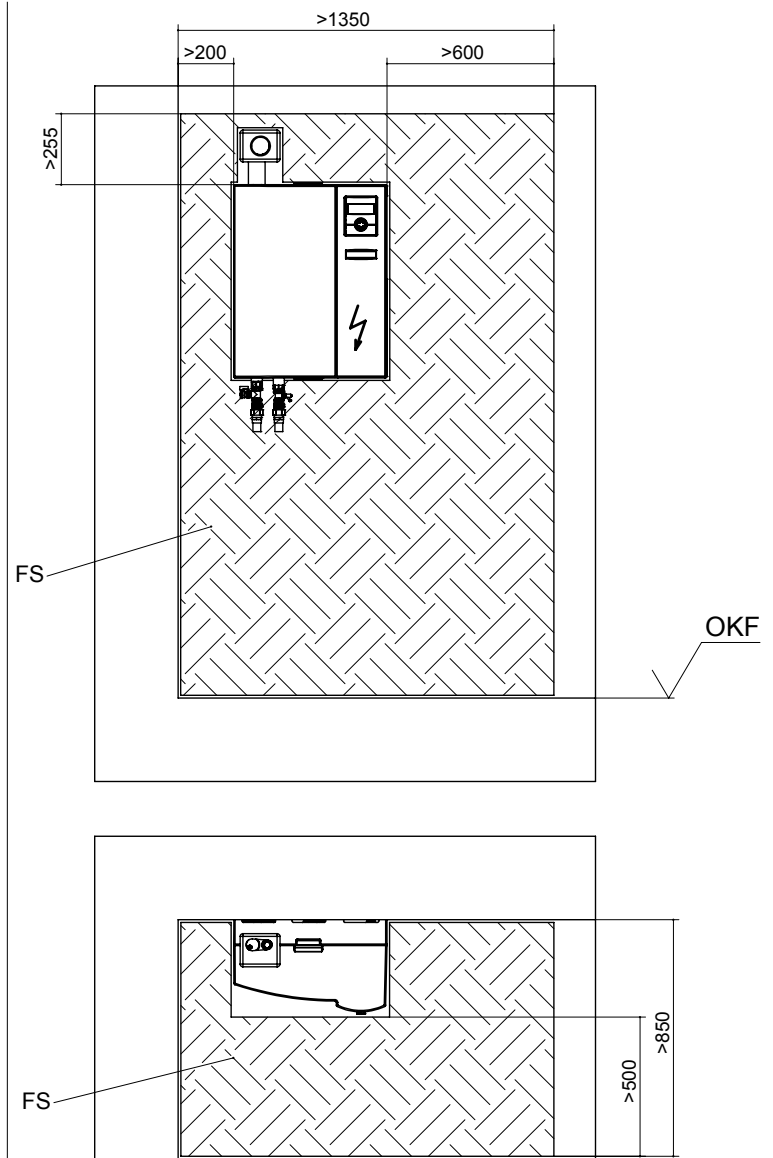
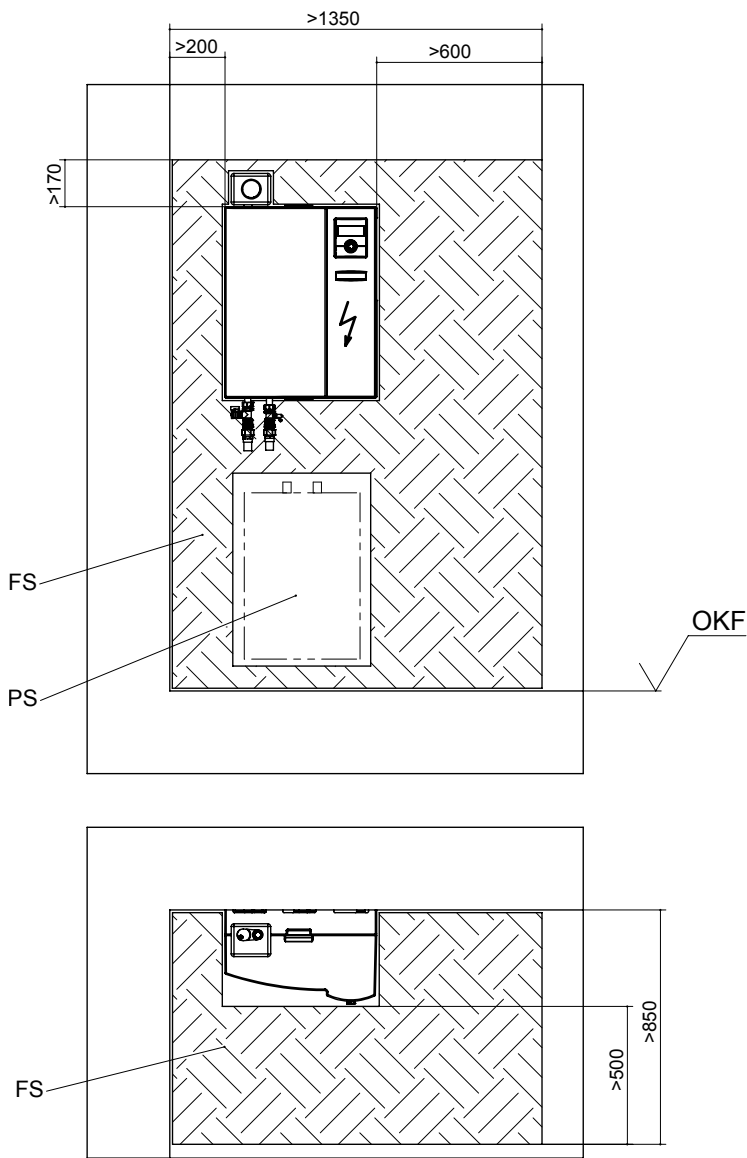
Keys: UK819403a
All dimensions in mm. Spacing for drill pattern.

Pos.	Name
1	Drill hole Ø12 for plug (incl. accessory package)



Installation plan HMD 1/E

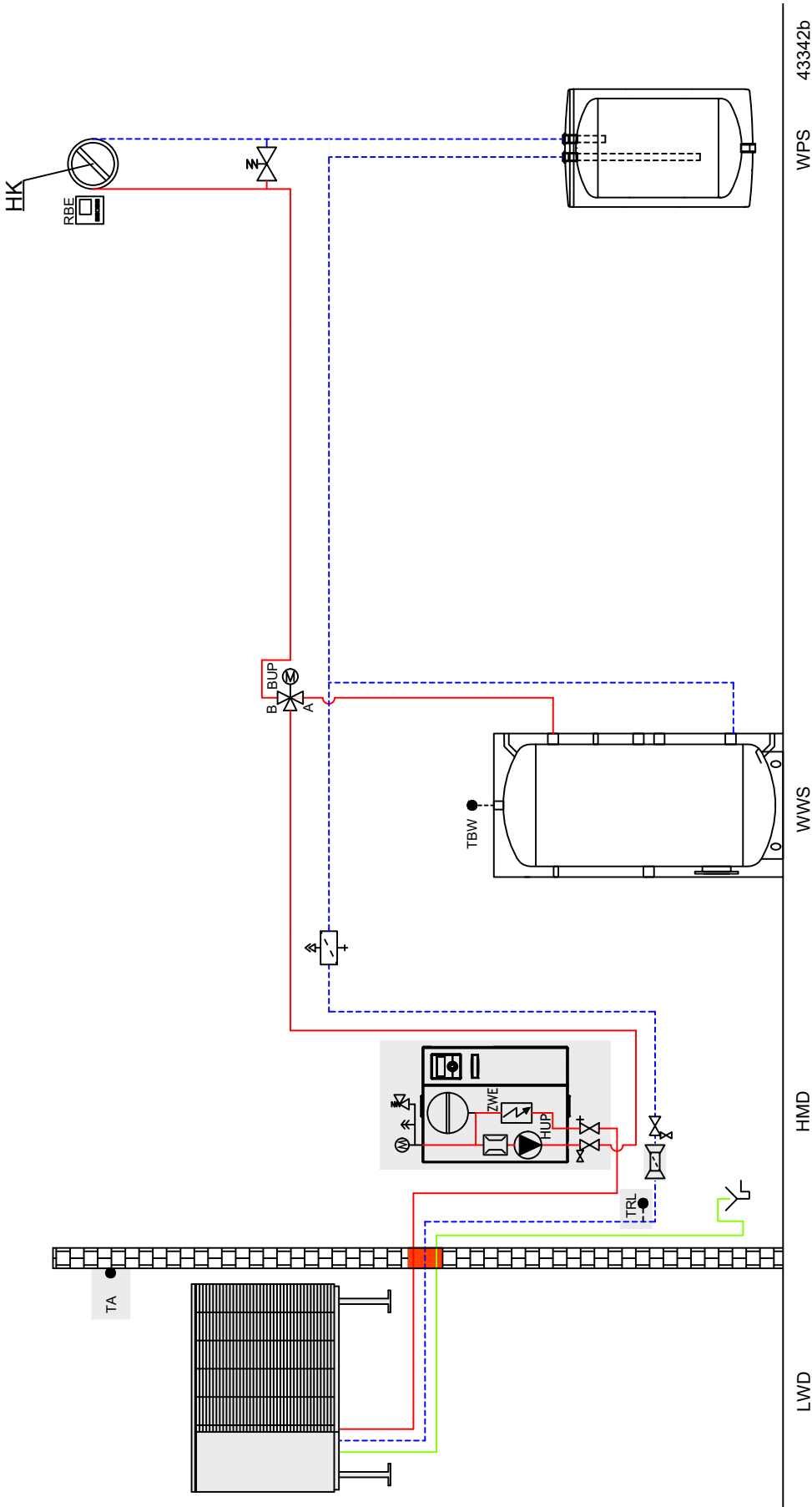
Installation plan HMD 1/RE



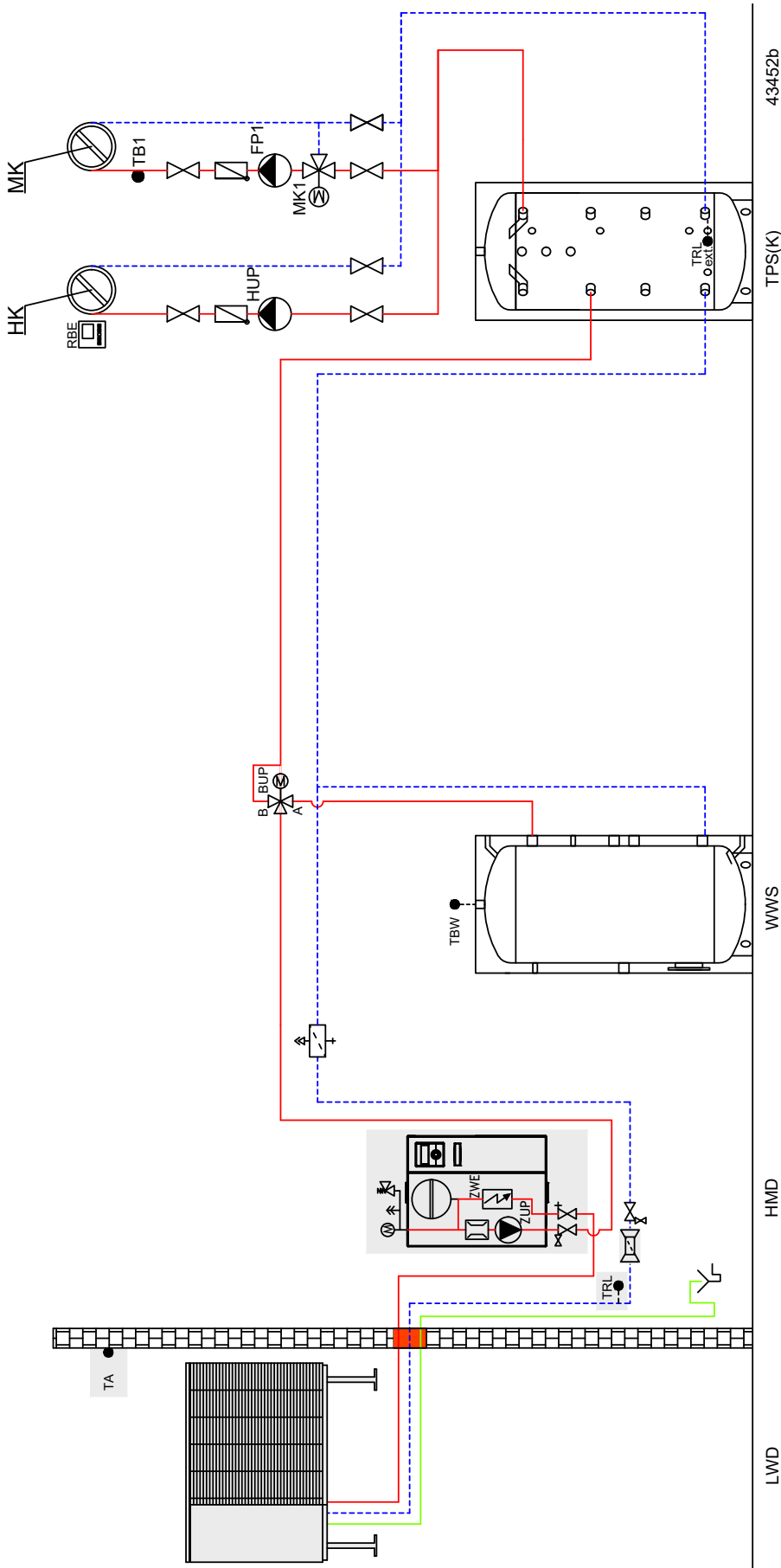
Keys: UK819398 / 819413a

All dimensions in mm.

Pos.	Bezeichnung
FS	Free space for service purposes
OKF	Top edge of finished floor
PS	Free space for wall-hanging buffer tank possible



NOTE
This schematic diagram is an example of a system without shut-off and safety devices, and it does not replace the technical planning and design on site. All regional standards, laws and regulations must be observed. The pipe dimensions must be carefully planned and designed.



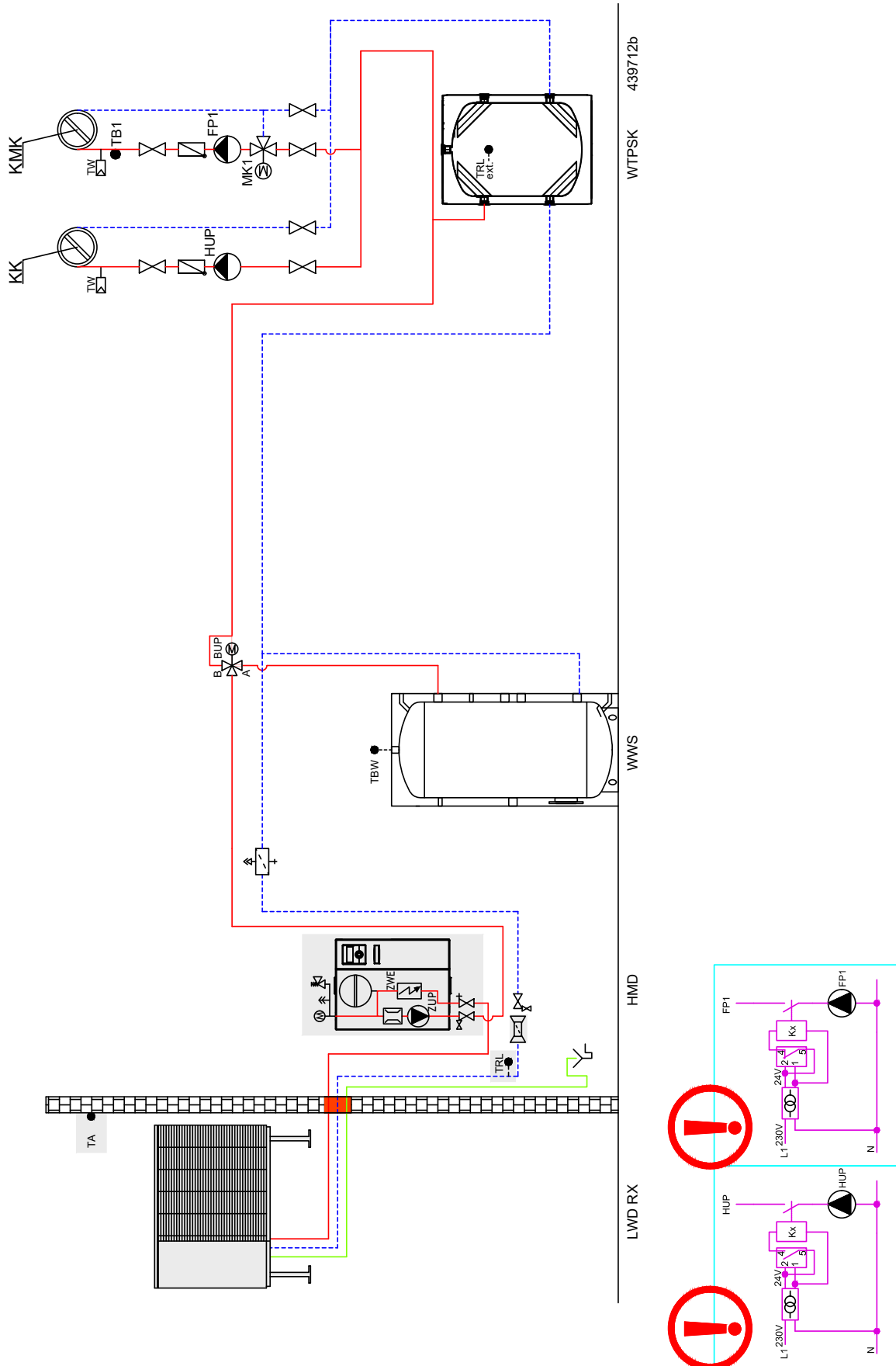
NOTE

This schematic diagram is an example of a system without shut-off and safety devices, and it does not replace the technical planning and design on site. All regional standards, laws and regulations must be observed. The pipe dimensions must be carefully planned and designed.

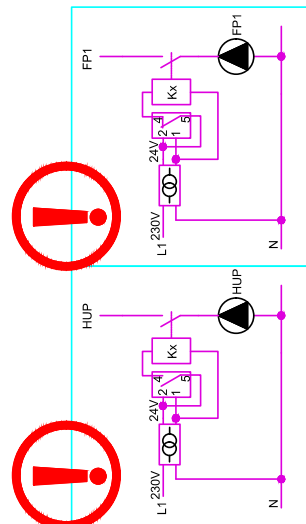


Unit variant R (cooling)

HMD 1/RE



NOTE
 This schematic diagram is an example of a system without shut-off and safety devices, and it does not replace the technical planning and design on site. All regional standards, laws and regulations must be observed.
 The pipe dimensions must be carefully planned and designed.





- Gas- or oil-boiler
- Wood boiler
- Brine pressure switch
- Swimming pool heat exchanger
- Separation heat exchanger / intermediate heat exchanger
- Solar domestic hot water tank
- Pipe lead-in
- Fresh water station (TWS)
- Room control unit
- Dew-point monitor
- Supply heat pump
- Circulation pump / switching valve domestic hot water
- Mixer circuit 1/2/3 (heating or cooling function)
- Circulation pump heating circuit
- Circulation pump / switching valve
- Feed circulating pump
- Circulation pump
- Domestic hot water charging pump
- Heat source circulation pump
- Outdoor temperature sensor
- Sensor domestic hot water
- Sensor mixer circuit
- Sensor external return
- Sensor return
- Flow sensor
- Sensor desuperheater
- Heating circuit
- Heating mixing circuit
- Cooling circuit
- Cooling mixing circuit
- Safety package primary
- Safety package secondary
- Circulation pump desuperheater
- Controls supplied by customer

- Vibration isolation
- Shut-off device and drainage
- Shut-off device with dirt trap
- Safety group
- Shut-off device
- Circulation pump
- Non return valve/ one way valve
- Overflow valve
- Membrane expansion vessel
- Second heat generator (ZWE)
- 3-way mixing valve / switching valve
- 4-way mixing valve / switching valve
- Dirt-trap (max. 0.6 mm mesh)
- Wall breakthrough
- Brine manifold
- Ground slinkies
- Ground collector
- Flow switch
- Groundwater spring pump with flow direction groundwater
- Buffer tank:
 - TPS Stratified storage tank
 - RPS Series buffer tank
 - TP SK Stratified storage tank (cooling)
 - WTPSK Stratified storage tank, wall-mounted (cooling)
- Multifunction tank
- Domestic hot water tank
- Volume flow meter
- Heat meter

- Switching valve domestic hot water / heating
- Switching valve cooling / heating
- Mixing valve additional heating
- Circulation pump
- Outdoor temperature sensor
- upper domestic hot water (displayed value)
- Sensor return
- Sensor domestic hot water
- Flow sensor cooling
- Temperature sensor, liquid state
- Flow temperature heating
- Return temperature heating / cooling
- Sensor heating boiler
- Room temperature sensor
- Flow heating
- Return heating / cooling
- Cold water
- Domestic hot water
- Circulation
- Flow cooling
- Liquid refrigerant
- Gaseous refrigerant
- Flow second heat generator
- Return second heat generator
- Terminal second heat generator
- Expansion board Split
- (not included in scope of delivery)

Split:
 QN10
 QN12
 QN11
 GP12
 BT1
 BT7
 BT3
 BT6
 BT15
 BT25
 BT71
 BT52
 BT50
 XL1
 XL2
 XL3
 XL4
 XL5
 XI10
 XL13
 XL14
 XL18
 XL19
 X2
 EP Split

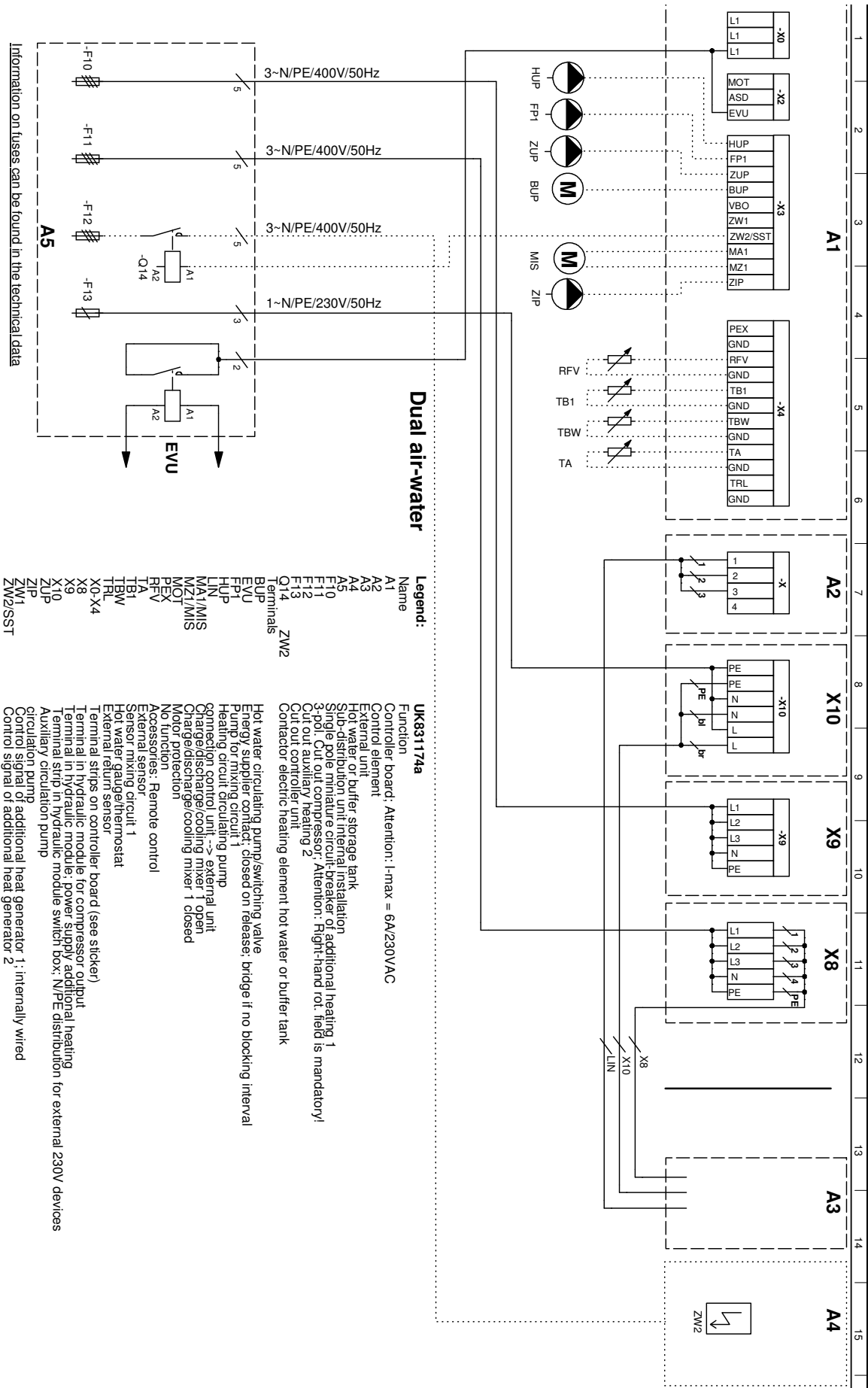
Controls supplied by customer / on-site components:
 Parts and components shown in the colour "grey" must be provided by the customer and also operated with a regulation provided by the customer.
 The temperature difference control SLP of the additional board is excepted from this.

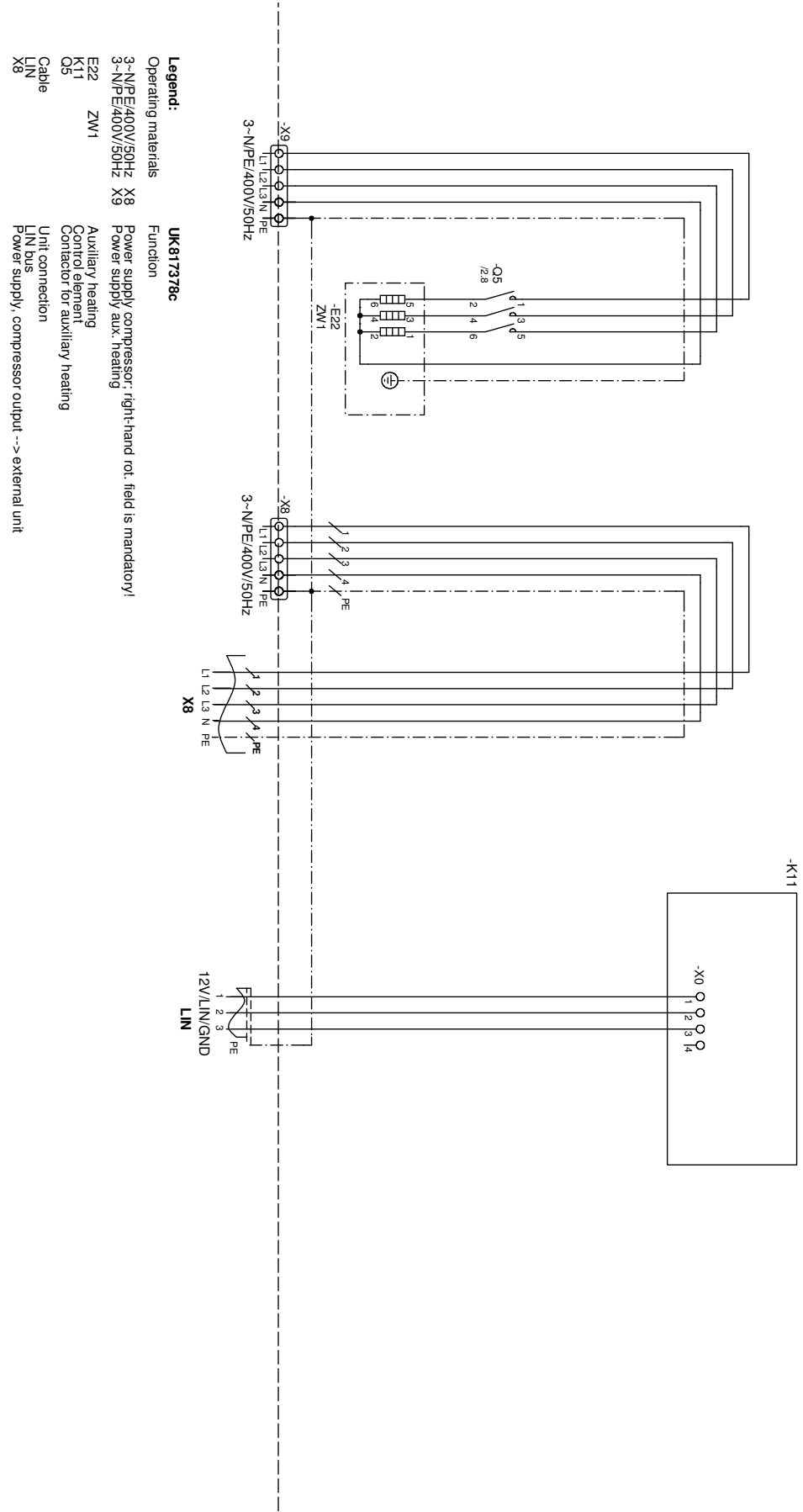
General:
 Pipes, fittings and fixtures must be designed and insulated in accordance with the current and valid standards, guidelines and recognised rules of technology (e.g.: vapour diffusion-tight insulation if the temperature falls below the dew point).



Terminal diagram

LWD ... / HMD 1/(R)E

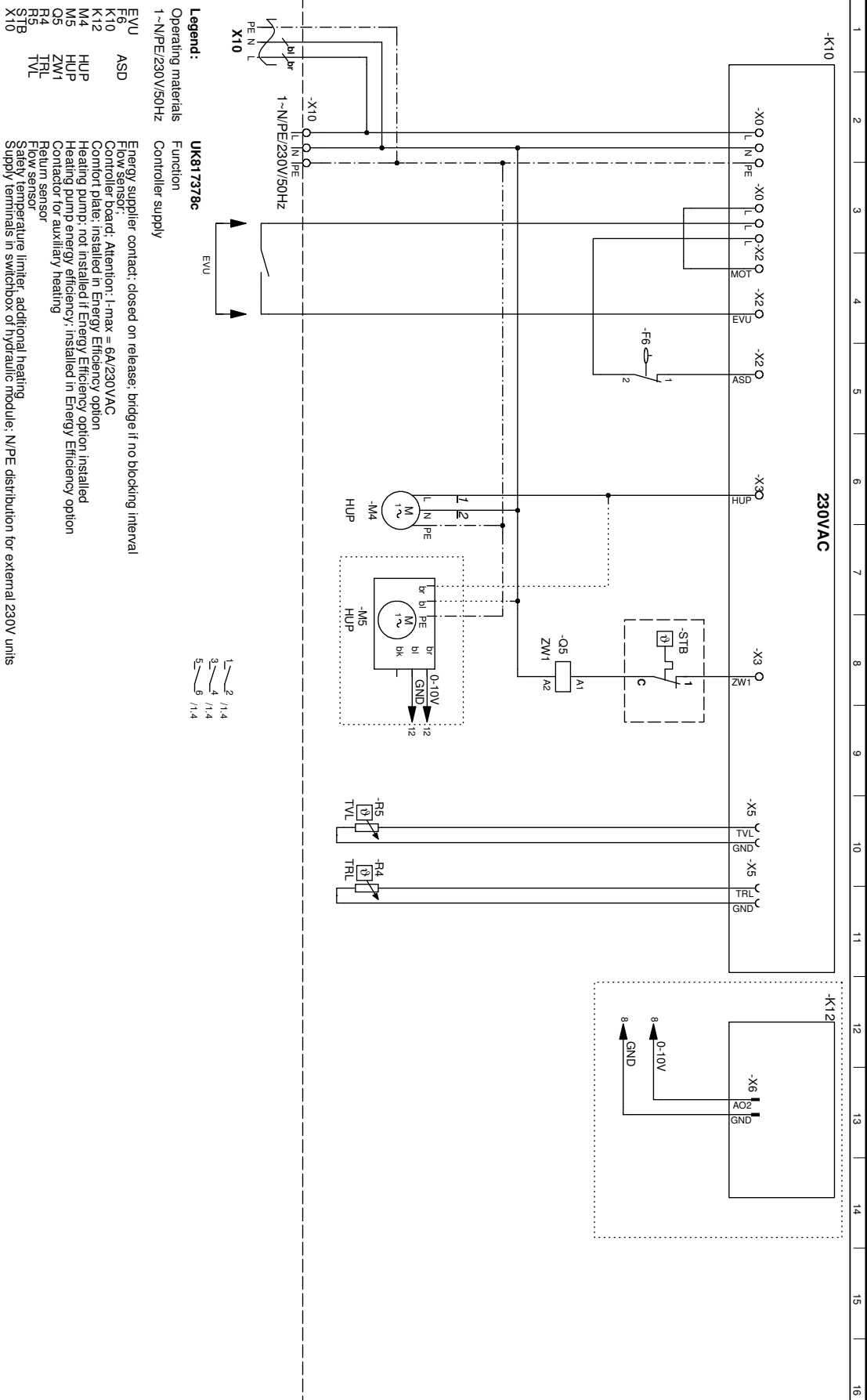


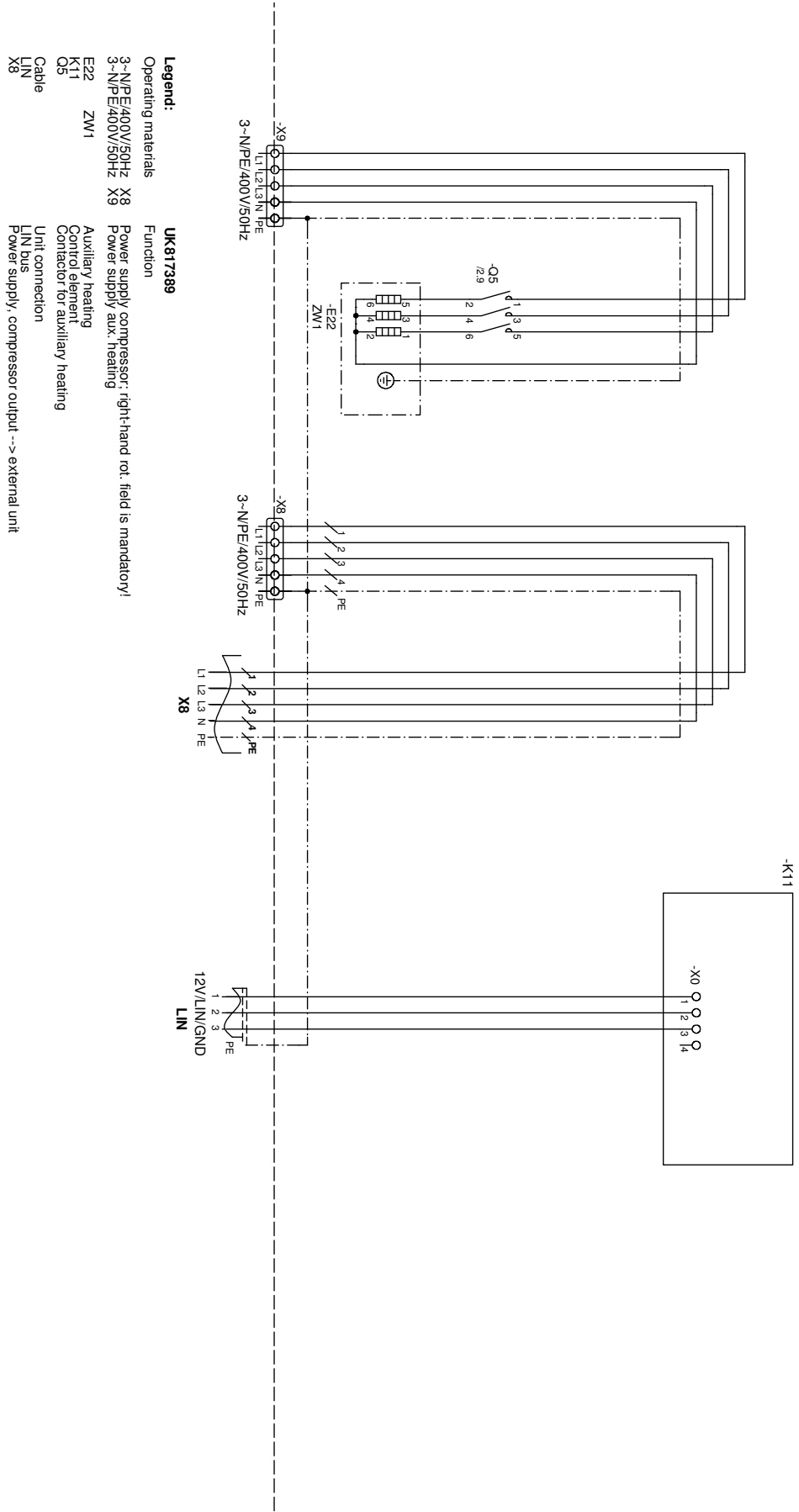




Circuit diagram 2/2

HMD 1/E



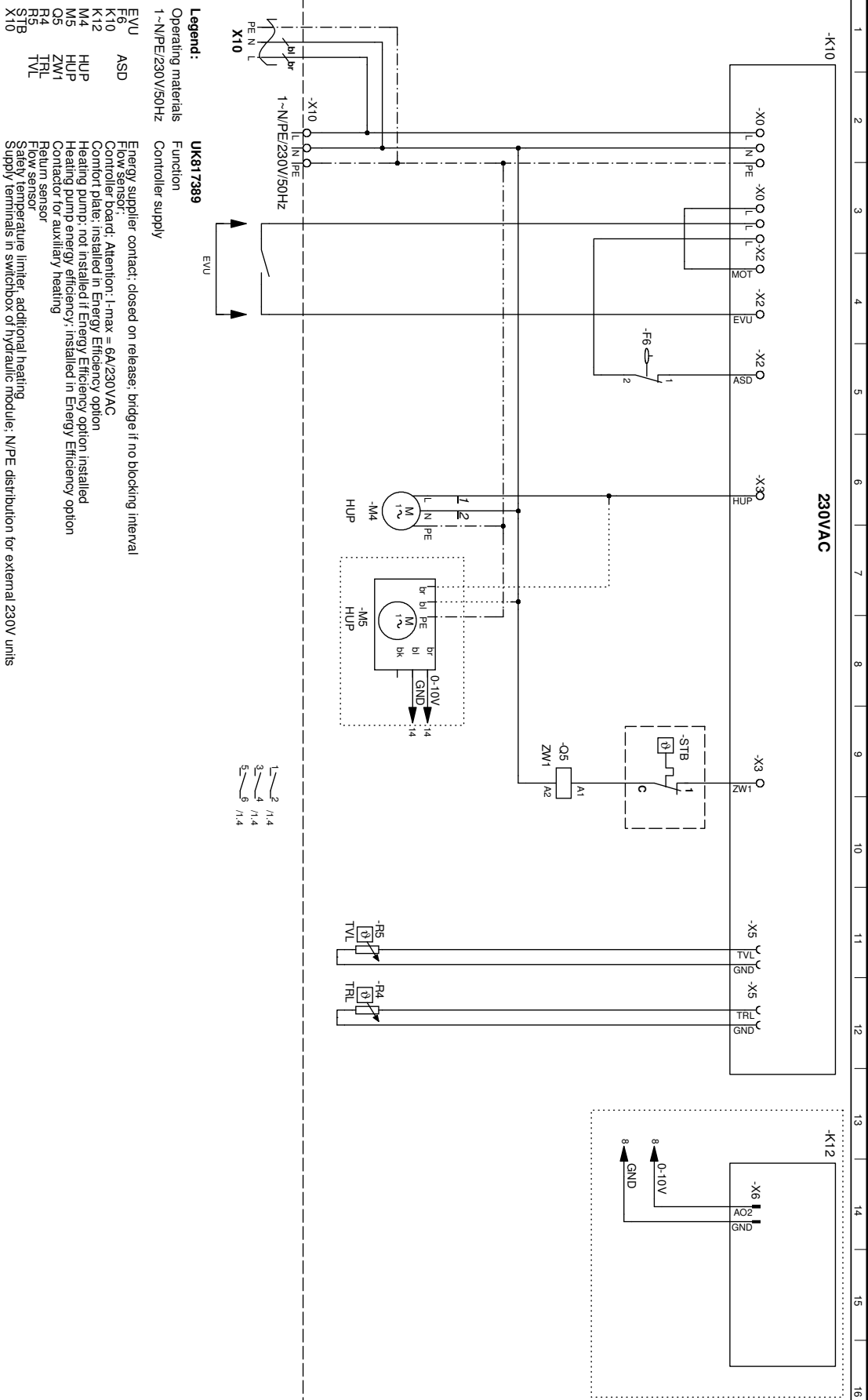


- Legend:**
- | | | |
|----------------------------|-----------------|--|
| Operating materials | UK817389 | Function |
| 3-N/PE/400V/50Hz X8 | | Power supply compressor: right-hand rot. field is mandatory! |
| 3-N/PE/400V/50Hz X9 | | Power supply aux. heating |
| E22 | ZW1 | Auxiliary heating |
| K11 | | Control element |
| Q5 | | Contactor for auxiliary heating |
| LIN | | Unit connection |
| Cable | | LIN bus |
| X8 | | Power supply, compressor output --> external unit |



Circuit diagram 2/2

HMD 1/RE







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