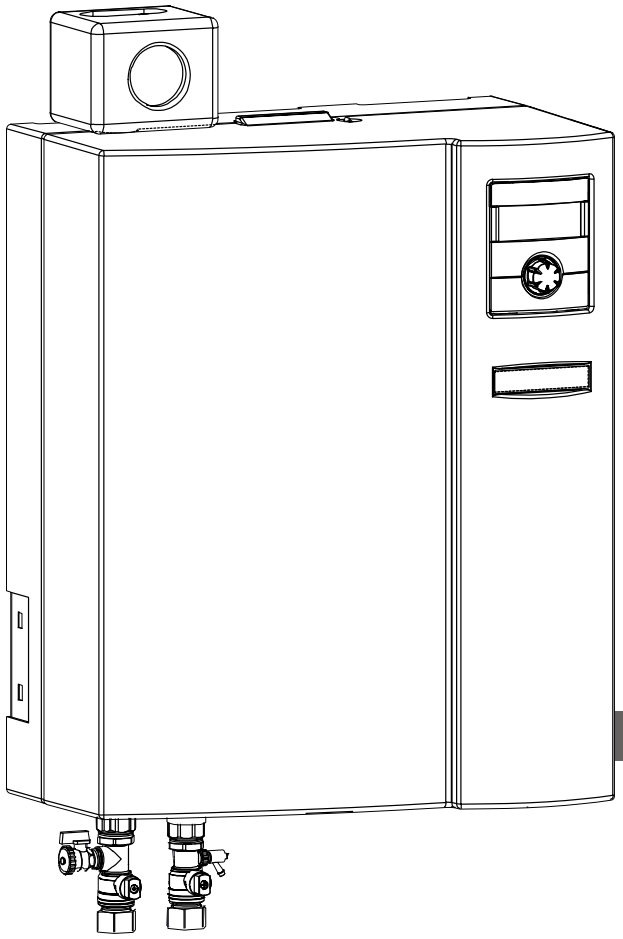
CREATE A BETTER CLIMATE



Accessory for
heat pumps

Operating Manual
Hydraulic module

UK

83059200iUK

Table of contents

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 expansion board (accessories)
- Log book

1.3 Symbols and markings

Identification of warnings

Symbol	Meaning
	Safety-relevant information. Warning of physical injuries.
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
- 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 safety 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.

► Qualified personnel with electrical training are the only people permitted to work on the electrics and electronics.

► Other work on the system should only be carried out by qualified specialists, such as:

- Heating engineers
- Plumbers

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 labels

► Observe safety labels 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 precipitates as 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

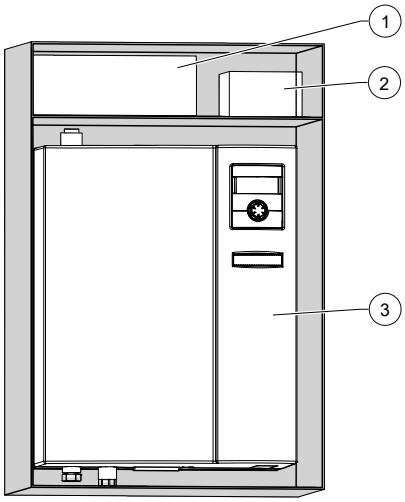
The generally accepted requirements for energy-conscious and environmentally-conscious operation of a heating system also apply to use of a heat pump. The most important measures include:

- No unnecessarily high flow temperature
- No unnecessarily high domestic hot water temperature (note and follow local regulations)
- 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

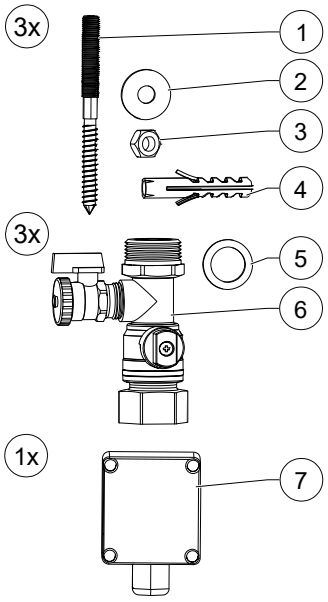
Wipe down the outside of the unit only using a damp cloth or cloth with mild cleaning product (washing-up liquid, neutral cleaning agent). Never use any harsh, abrasive, acid or chlorine-based cleaning products.

4 Scope of supply



1 Accessory package
2 Safety module
3 Hydraulic module

Accessory package:



1 Hanger bolts (M10) for wall mounting
2 Washers for wall mounting
3 Nuts (M10) for wall mounting
4 Plugs for wall mounting
5 Flat seals 1"
6 Ball valves
7 Outdoor sensor

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

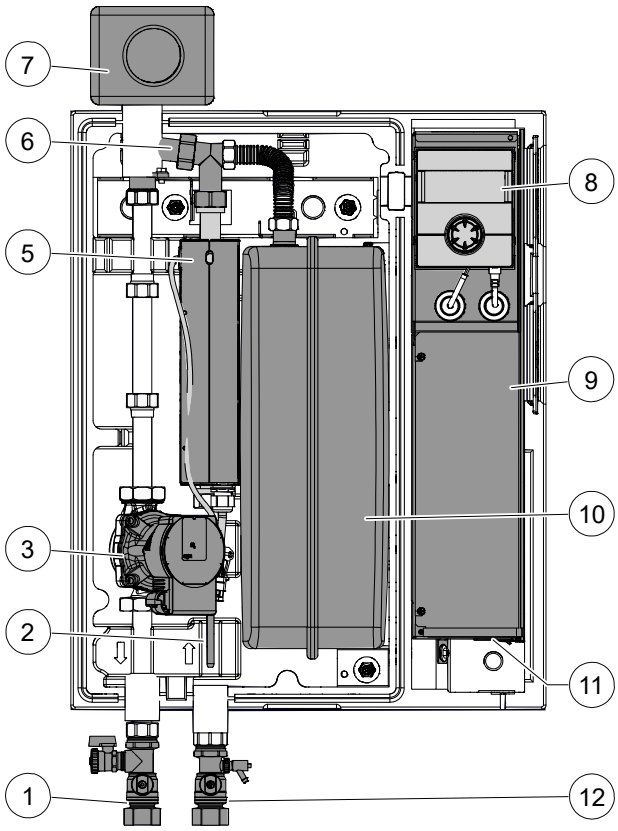
The following accessories are available for the unit through the manufacturer's local partner:

- Expansion board with various additional functions
- Room control panel for controlling the main functions from the living room
- Electrical connection kit EVS or EVS 8 (not for dual units)
- Domestic hot water tank
- Buffer tank

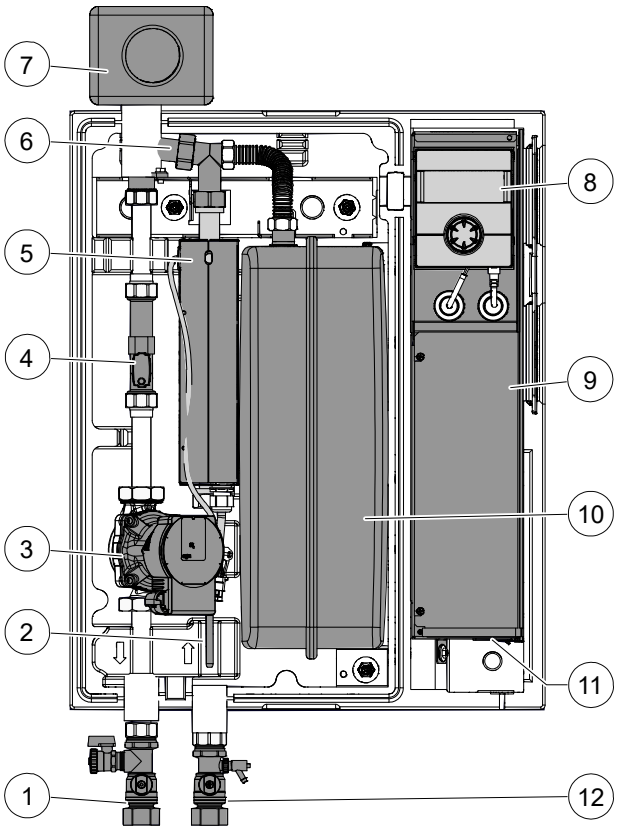
4.2 Components of the unit

Different variants of the hydraulic module are available:

HV… :



HDV… :



1	Heating circuit supply outlet shut-off ball valve with filling and drain tap *)
2	Supply sensor
3	Enery-efficient circulating pump heating circuit
4	Volumetric flow meter (only for HDV variants)
5	Electric heating element
6	Air separator
7	Heating circuit safety module (insulated) *)
8	Control panel
9	Electrical switch box
10	Expansion vessel
11	Sockets for the electrical connection kit EVS or EVS 8
12	Heating circuit supply inlet shut-off ball valve with drain tap (for H(D)V 12 with filling and drain tap) *)

*) 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.

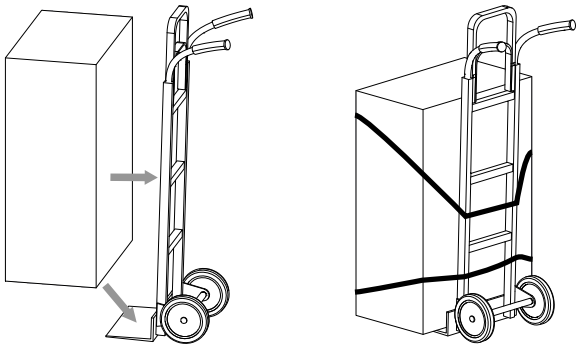
The hydraulic connections are not designed for mechanical loads.

► 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.

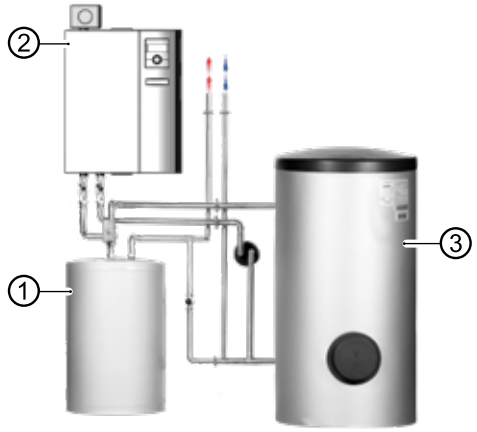
The installation area must be frost-free and dry. It must fulfil the relevant local regulations.

Observe safety and service clearances.

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

Mount the unit

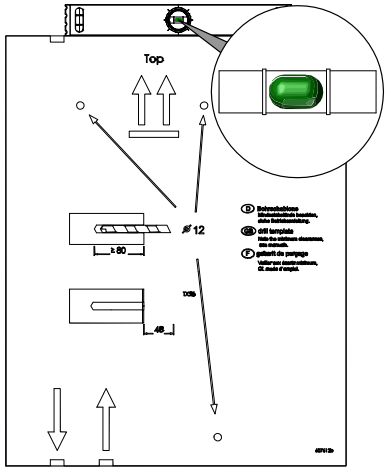
Example of installation:



1 Hydraulic module
2 Buffer tank
3 Domestic hot water tank

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

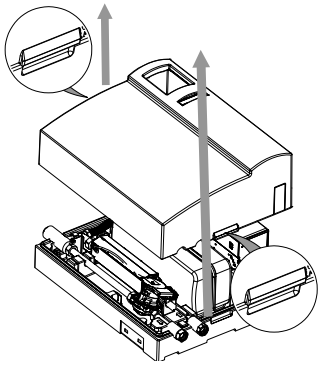
1. Align drill pattern, mark drill holes and drill. Observe the instructions on the drill pattern.



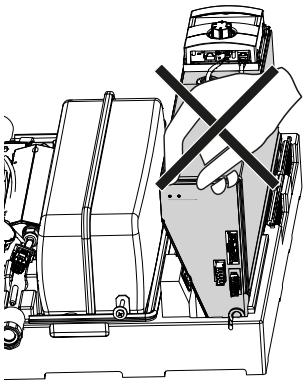
2. Insert the plugs and hanger bolts supplied into the holes drilled.
   The plugs supplied are only suitable for use with the following types of walls:
   - Concrete
   - Solid lightweight concrete blocks
   - Cavity block made of lightweight concrete
   - Cellular concrete
   - Prestressed concrete - hollow ceiling/floor slabs
   - Natural stone with dense, close-grained microstructure
   - 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.

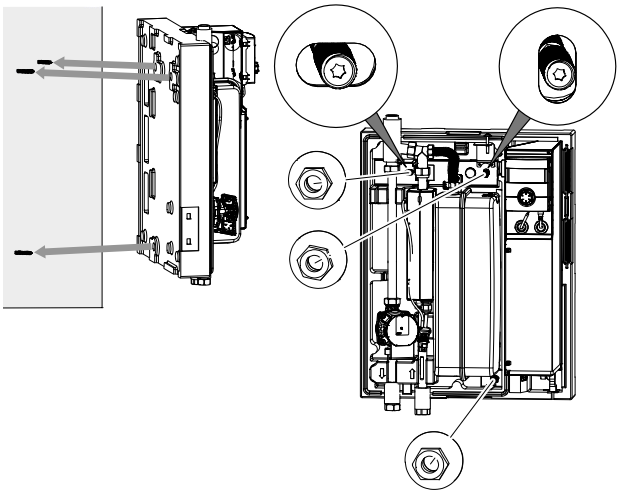
3. Take off the front hood.



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



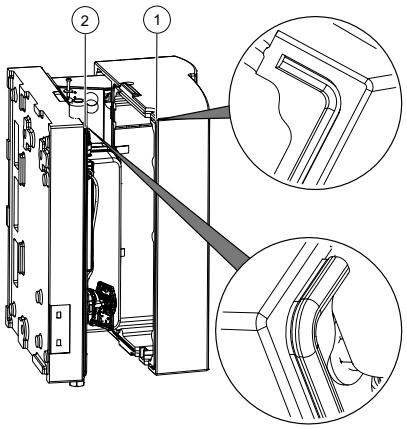
4. Mount the unit to the wall.



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

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

► Ensure that a sludge separator is installed in the hydraulic system.

► 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.

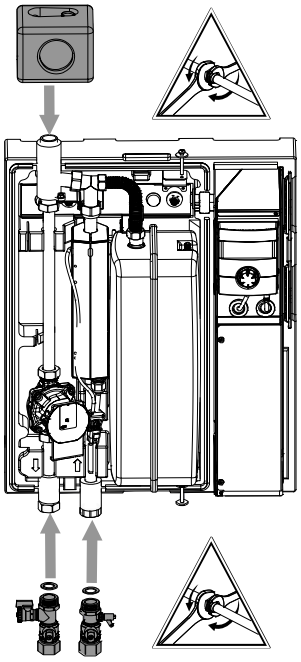
► Insert the vent at the highest point of the heating circuit.

► Take off the front hood.

6.1 Heating circuit

Safety module and shut-off ball valves

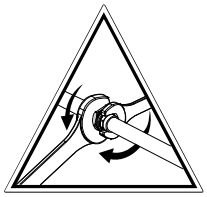
1. Take the safety module and the shut-off ball valves out of the accessory pack and fit them to the connections provided. Use seals from the accessory pack.



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!

► 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

→ Cable extension details see operating manual of the heat pump

Establish the electrical connections between the heat pump and the hydraulic module

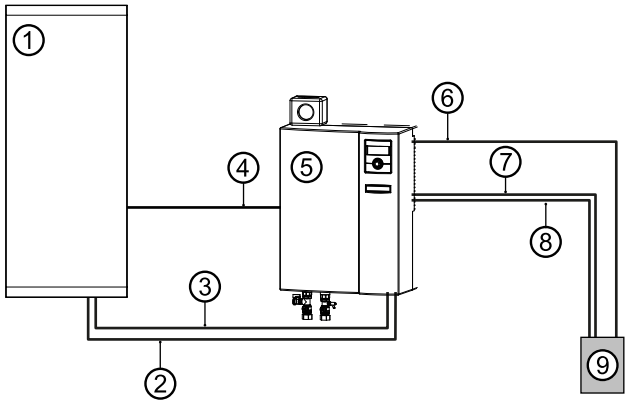
→ Operating manual of the heat pump

NOTE
For dual output-controlled heat pumps, the lines (8 m) are already connected to the heat pump.

7.2 Electrical connection

The electrical connection is established via the switch box.

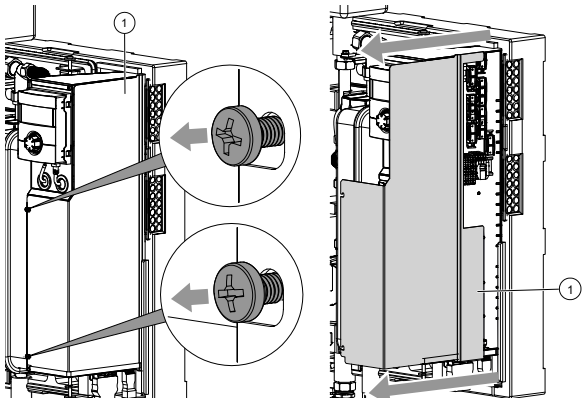
The hydraulic module is connected electrically on site according to the following scheme:



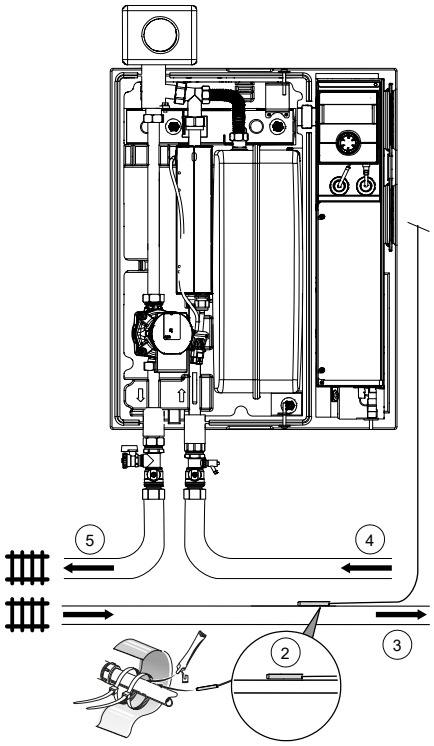
1 Heat pump
2 Load cable compressor (accessory: electrical connection kit EVS or EVS 8) *)
3 Bus cable (shielded) (accessory: electrical connection kit EVS or EVS 8) *)
4 Control voltage (for dual heat pump only)
5 Hydraulic module
6 Load line electric heating element
7 Control voltage
8 Load cable compressor
9 Sub-distribution

*) For dual heat pumps, the lines (8 m) and plugs are included in the scope of delivery.

1. Open the side cover (①) of the electrical switch box.



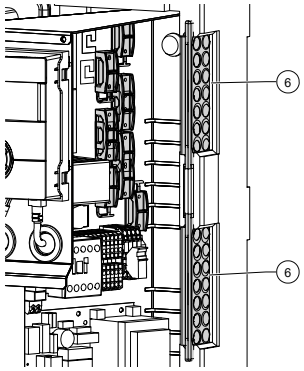
2. Fasten the return sensor (②) to the heat-conducting pipe of the return line leading to the heat pump (③) using cable ties and thermal compound.



2 Return sensor on hydraulic module
3 Return to heat pump
4 Supply from heat pump
5 Supply to heating circuit / domestic hot water tank

3. Lay the sensor cable to the hydraulic module.
4. Strip the control and sensor cable, of 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).

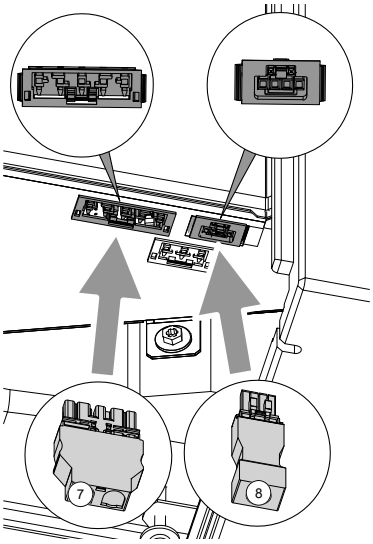
5. Feed the cables through the cable gommets (⑥) into the switch box.



6. Fit the connectors to the bus cable and power cable of the heat pump.

→ Operating manual of the heat pump

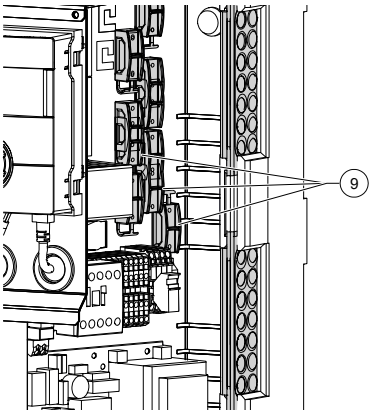
7. Insert the wired plugs of the heat pump power cable (⑦) and the bus cable (⑧) into the corresponding socket at the bottom of the electrical switch box.



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

→ “Terminal diagram” for the respective model, from page 26

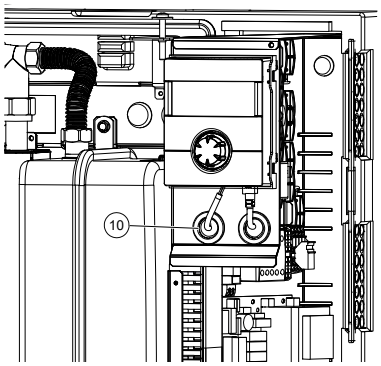
9. Insert all cables introduced into the switch box into the cable ducts in the switch box, route them through the strain reliefs (⑨) and screw them into the strain reliefs.

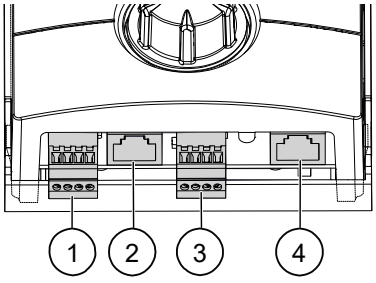


NOTE

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 (⑩, category 6, with RJ45 connector) through the electrical switch box and plug it to the corresponding socket of the control panel.

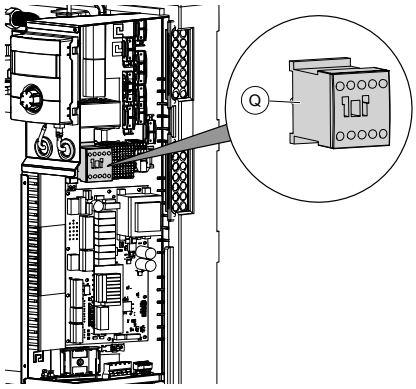




1 RS485 for connecting the room control unit RBE (accessory)
2 RJ45 for network cable connection
3 RS485 LIN bus cable connection to the control board
4 RJ45 connection Modbus cable to Modbus distributor.

NOTE

The electric heating element is connected at 9 kW (6kW) in the factory. At contactor Q, it is possible to select 6 kW (4kW) = 2 phase operation. Disconnect Q5/6 for this. Or 3kW (2kW) = 1 phase operation. Disconnect Q5/6 and Q5/4 for this. The values in brackets are for the 6kW heating element. Disconnected cables must be furnished with screw terminals. Only the phases cited above may be disconnected (safety temperature limiter).

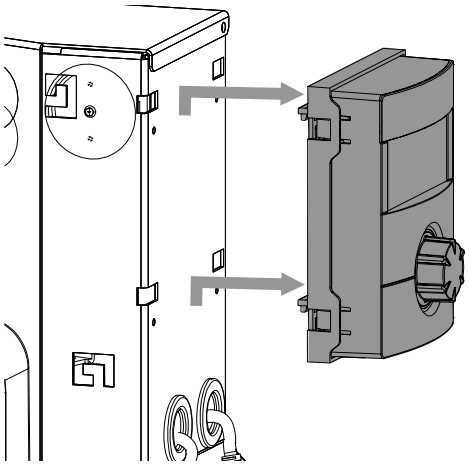


10. Close the electrical switch box by re-attaching the side cover.

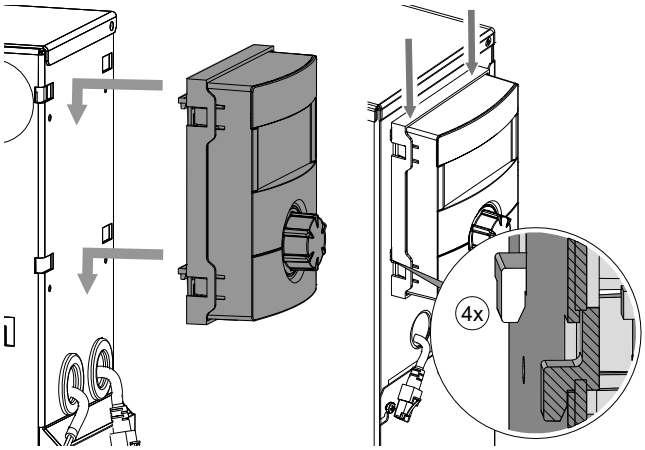
8 Control panel

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

1. Disconnect or unplug all connections at the bottom.
2. 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)
- Required pH value: 8.2 … 10;
  for aluminium materials:
  pH value: 8.2 … 8.5

► 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
- Ideal pH value due to self-alkalisation after filling the system

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

► Keep a system log for hot water heating systems in which relevant planning data is entered (VDI 2035).

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

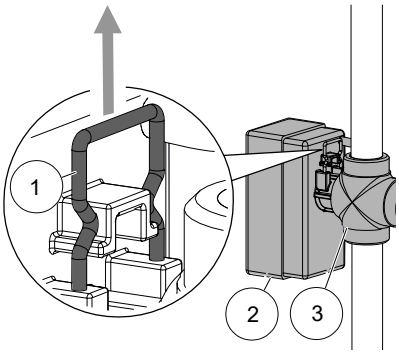
✓ Outlet pipe of the safety valve is connected.

► Ensure that the set pressure of the safety valve is not exceeded.

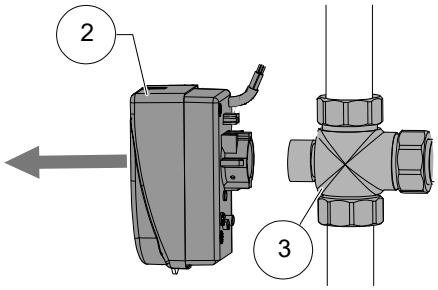
NOTE

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.

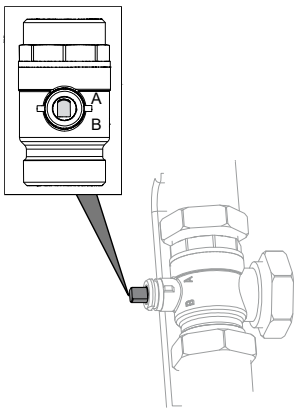
1. Vent the system at the highest point.
2. Pull off the U-clip (①) on the back of the valve motor (②) on the 3-way switching valve (③, accessory) upwards.



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

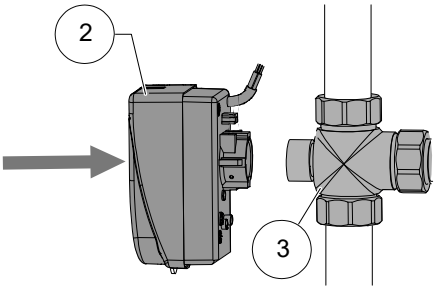


4. Turn the spindle of the 3-way switching valve so that the rounded side of the spindle points in the direction of marking A of the connections of the 3-way switching valve.

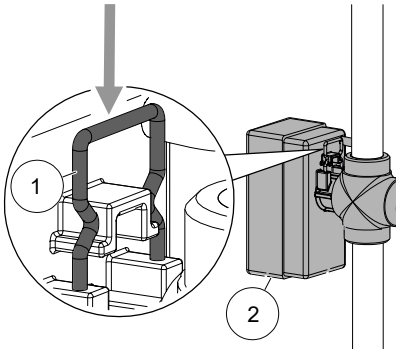


5. Flush the domestic hot water charging circuit for approx. 1 minute.
6. Turn the spindle so that the rounded side of the spindle points in the direction of marking B of the connections of the 3-way switching valve.
7. Flush heating circuit thoroughly, until no more air is discharged.

8. Position the valve motor (②) on the 3-way switching valve (③).

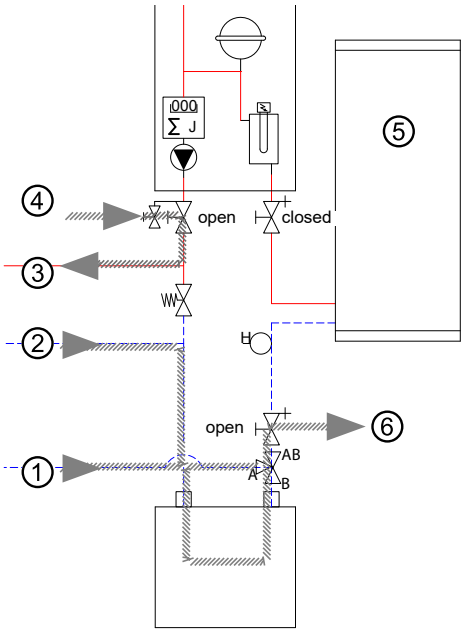


9. Insert the U-clip (①) into the back of the valve motor (②).



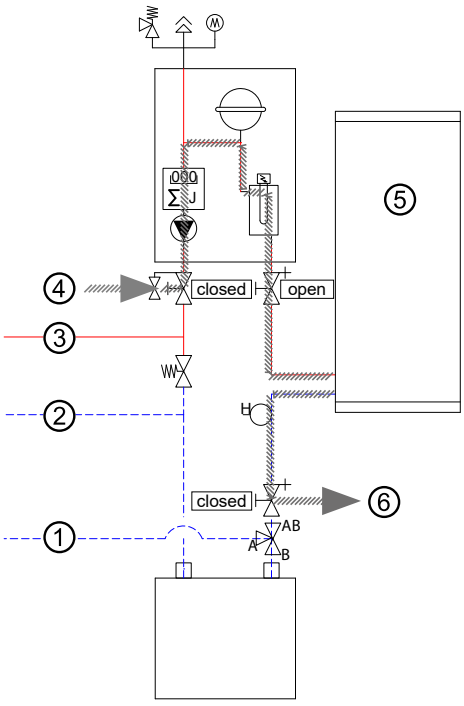
10. Ensure that the U-clip has latched into position correctly:
    - ✓ Valve motor sits securely on the 3-way switching valve.
    - ✓ Both prongs of the U-clip sit on the lug.
    - ✓ The tips of the U-clip are not visible more than approx. 2 mm.

Example for integration of storage tank in series:



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 for integration of storage tank in series:



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.

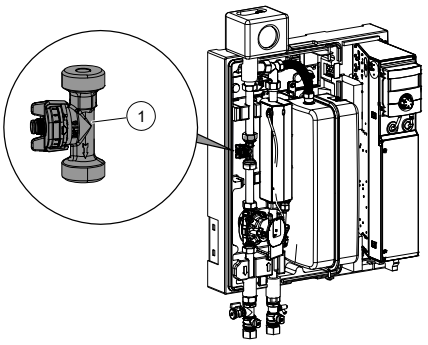
11 Overflow valve

→ Operating manual of the heat pump

12 Volumetric flow meter / heat meter

(only with HDV variants)

The volumetric flow meter / heat meter (①) integrated in HDV units 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 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 Faults

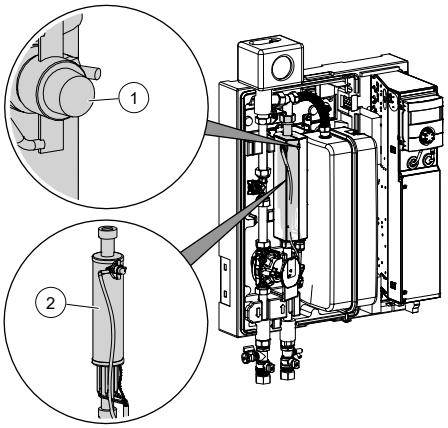
► Read out the cause of the fault via the diagnostics program of the heating and heat pump controller.

► 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.

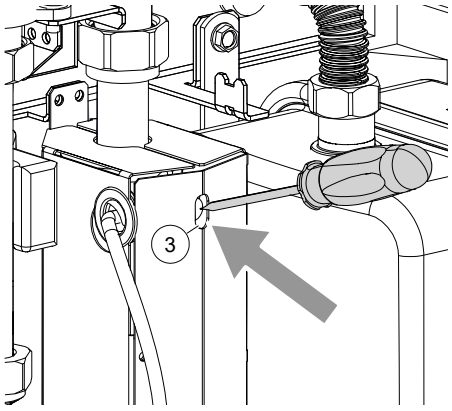
14.1 Unlock safety temperature limiter

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 (①) in the centre of the safety temperature limiter (②) has tripped (located underneath the cover).



► If the reset button (①) has tripped, press it again using a small screwdriver (③).



► If the safety temperature limiter trips again, contact the local partner of the manufacturer or the factory‘s customer service.

15 Dismantling and disposal

15.1 Dismantling

► Separate components by their materials.

15.2 Disposal and recycling

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

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 in accordance with local regulations.

Accessories for heat pump type				HV 9-1/3	HV 12-3
Air/water 8 kW output-controlled | Air/water 12 kW output-controlled			• yes – no	• | –	• | •
Air/water dual output-controlled			• yes – no	– | –	– | –
Air/water 7 kW to 8 kW output-controlled | Air/water 10 kW to 18 kW		Outdoor installation	• yes – no	– | –	– | –
Air/water 9 kW to 14 kW RX		Outdoor installation	• yes – no	– | –	– | –
Air/water dual		Outdoor installation	• yes – no	– | –	– | –
Air/water dual RX		Outdoor installation	• yes – no	– | –	– | –
Installation location					
Room temperature	min. | max.		°C	5 | 35	5 | 35
Relative humidity			%	60	60
Sound					
Sound pressure level at 1 m distance	inside		dB(A)	36	36
Sound power level	inside		dB(A)	44	44
Heating circuit					
Flow rate: minimum | maximum (see heat pump for pipe dimensioning)			l/h | l/h	600 | 1200	600 | 1900
Free pressing | Pressure loss | Flow rate			bar | bar | l/h	0,7 | – | 1200	0,6 | – | 1900
Max. allowable operating pressure			bar	3	3
Circulation pump control range	min. | max.		l/h	600 ı 1200	600 ı 1900
General unit data					
Total weight			kg	25	40
Weight of individual components			kg | kg | kg	– | – | –	– | – | –
Electrics					
Voltage code | all-pole fuse protection for heat pump *)**)	1 phase		… | A	1~N/PE/230V/50Hz | B16	1~N/PE/230V/50Hz | B16
Voltage code | all-pole fuse protection for heat pump *)**)	3 phases		… | A	– | –	3~N/PE/400V/50Hz ı B16
Voltage code | Control voltage fuse protection **)			… | A	1~N/PE/230V/50Hz | B10	1~N/PE/230V/50Hz | B10
Voltage code | Electric heating element fuse protection **)	1 phase		… | A	1~N/PE/230V/50Hz | B32	– | –
Voltage code | Electric heating element fuse protection **)	3 phases		… | A	3~N/PE/400V/50Hz | B10	3~N/PE/400V/50Hz | B16
Degree of protection			IP	20	20
Zmax			Ω	–	–
Residual current circuit breaker	if required		type	B	B
Electric heating element output	3 | 2 | 1 phase		kW | kW | kW	6 | 4 | 2	9 | 6 | 3
Circulation pump power consumption, heating circuit	min. | max.		W	4 | 75	4 | 75
Other unit information					
Safety valve Heating circuit | Response pressure		included in scope of supply: • yes – no | bar		• | 3	• | 3
Buffer tank | Volume		included in scope of supply: • yes – no | l		– | –	– | –
Diaphragm expansion vessel Heating circuit | Volume | Prepressure		incl. in scope of supply: • yes – no | l | bar		• | 12 | 1.5	• | 13 | 1.0
Overflow valve | Changeover valve, heating -Domestic hot water		integrated: • yes – no		– | –	– | –
Vibration decoupling, Heating circuit | Heat source		included in scope of supply or integrated: • yes – no		–	–
Controller | Heat quantity recording | Extension board		included in scope of supply or integrated: • yes – no		• | • | –	• | • | –

*) compressor only, **) note local regulations I Index: i

813318b 813319b

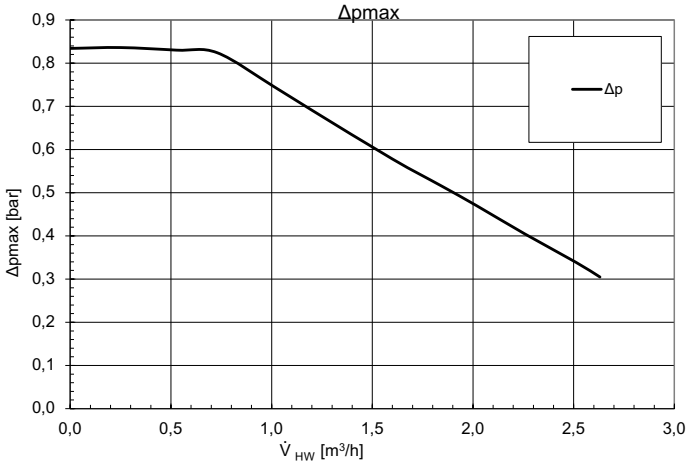
Accessories for heat pump type				HDV 9-1/3	HDV 12-3
Air/water 8 kW output-controlled | Air/water 12 kW output-controlled			• yes – no	– | –	– | –
Air/water dual output-controlled			• yes – no	•	•
Air/water 7 kW to 8 kW output-controlled | Air/water 10 kW to 18 kW		Outdoor installation	• yes – no	– | –	– | –
Air/water 9 kW to 14 kW RX		Outdoor installation	• yes – no	–	–
Air/water dual		Outdoor installation	• yes – no	–	–
Air/water dual RX		Outdoor installation	• yes – no	–	–
Installation location					
Room temperature	min. | max.		°C	5 | 35	5 | 35
Relative humidity			%	60	60
Sound					
Sound pressure level at 1 m distance	inside		dB(A)	33	33
Sound power level	inside		dB(A)	46	46
Heating circuit					
Flow rate: minimum | maximum (see heat pump for pipe dimensioning)			l/h | l/h	700 | 1600	700 | 1600
Free pressing | Pressure loss | Flow rate			bar | bar | l/h	0.7 | – | 1150	0.83 | – | 1150
Max. allowable operating pressure			bar	3	3
Circulation pump control range	min. | max.		l/h	600 ı 1200	600 ı 1900
General unit data					
Total weight			kg	25	40
Weight of individual components			kg | kg | kg	– | – | –	– | – | –
Electrics					
Voltage code | all-pole fuse protection for heat pump *)**)	1 phase		… | A	1~N/PE/230V/50Hz | B16	1~N/PE/230V/50Hz | B16
Voltage code | all-pole fuse protection for heat pump *)**)	3 phases		… | A	– | –	– | –
Voltage code | Control voltage fuse protection **)			… | A	1~N/PE/230V/50Hz | B16	1~N/PE/230V/50Hz | B16
Voltage code | Electric heating element fuse protection **)	1 phase		… | A	1~N/PE/230V/50Hz | B25	– | –
Voltage code | Electric heating element fuse protection **)	3 phases		… | A	3~N/PE/400V/50Hz | B10	3~N/PE/400V/50Hz | B16
Degree of protection			IP	20	20
Zmax			Ω	–	–
Residual current circuit breaker	if required		type	B	B
Electric heating element output	3 | 2 | 1 phase		kW | kW | kW	6 | 4 | 2	9 | 6 | 3
Circulation pump power consumption, heating circuit	min. | max.		W	4 | 75	10 | 150
Other unit information					
Safety valve Heating circuit | Response pressure		included in scope of supply: • yes – no | bar		• | 3	• | 3
Buffer tank | Volume		included in scope of supply: • yes – no | l		– | –	– | –
Diaphragm expansion vessel Heating circuit | Volume | Prepressure		incl. in scope of supply: • yes – no | l | bar		• | 12 | 1.5	• | 13 | 1.0
Overflow valve | Changeover valve, heating -Domestic hot water		integrated: • yes – no		– | –	– | –
Vibration decoupling, Heating circuit | Heat source		included in scope of supply or integrated: • yes – no		–	–
Controller | Heat quantity recording | Extension board		included in scope of supply or integrated: • yes – no		• | • | –	• | • | –

*) compressor only, **) note local regulations ı Index: i

813322b 813323c

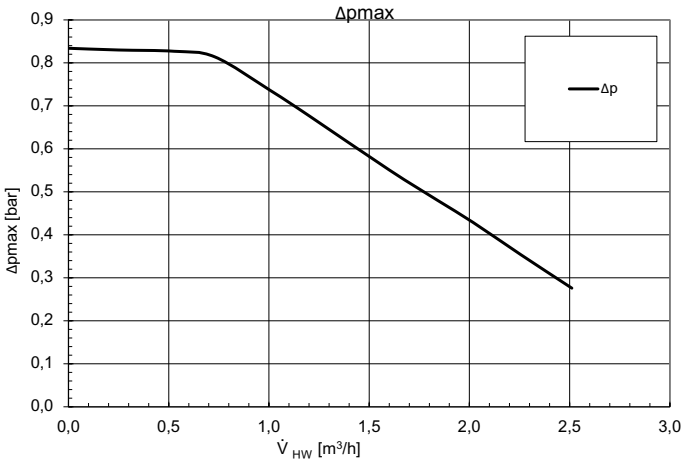
Free pressing

HV9-1/3



823282

HDV9-1/3

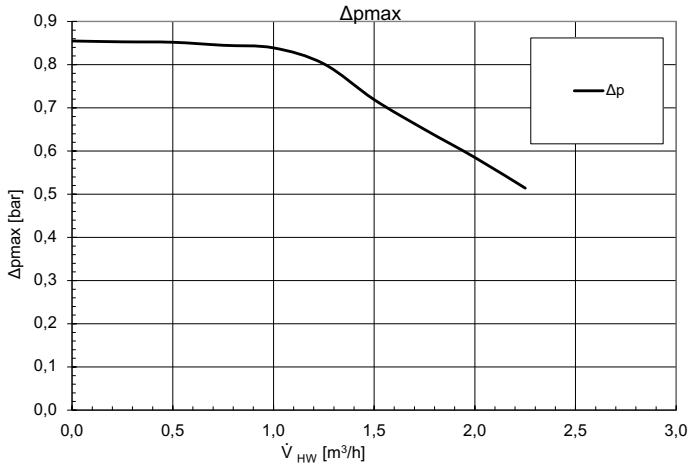


823286

Keys: UK823282 / UK823286

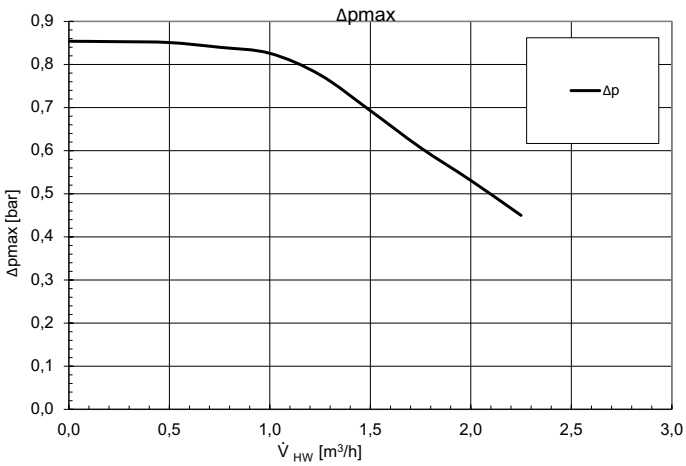
$\dot{V}_{HW}$	Volumetric flow of hot water
Δpmax	Maximum free pressing

HV 12-3



823283

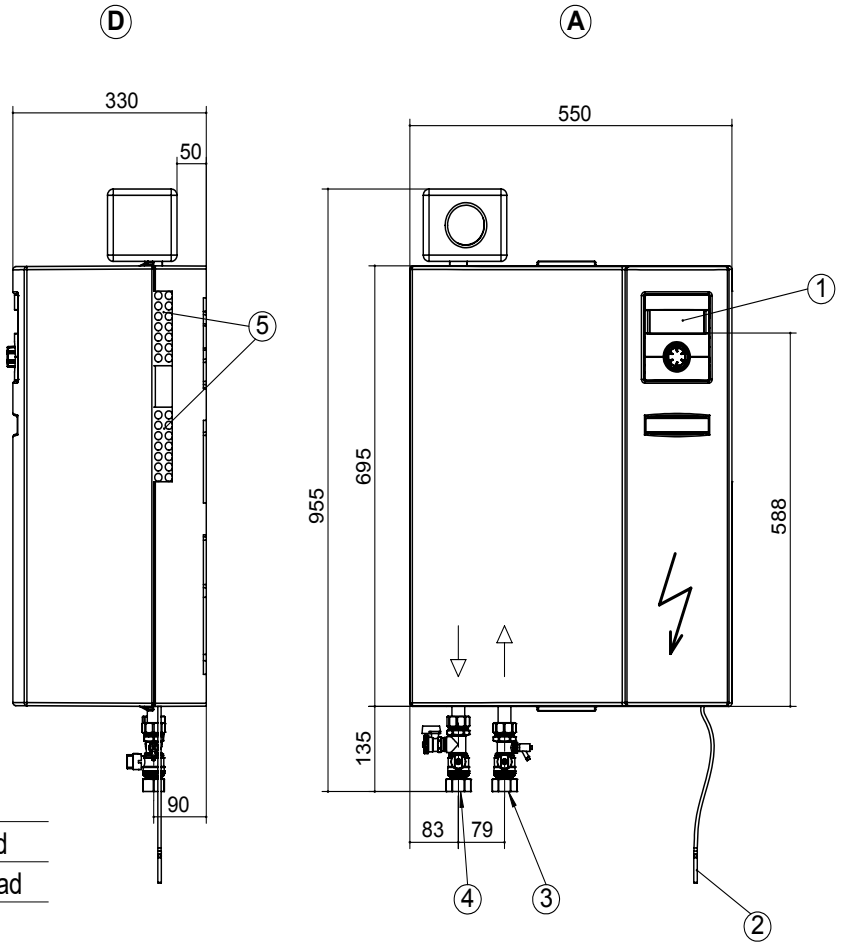
HDV 12-3



823287

Keys: UK823283 / UK823287

$\dot{V}_{HW}$	Volumetric flow of hot water
Δpmax	Maximum free pressing

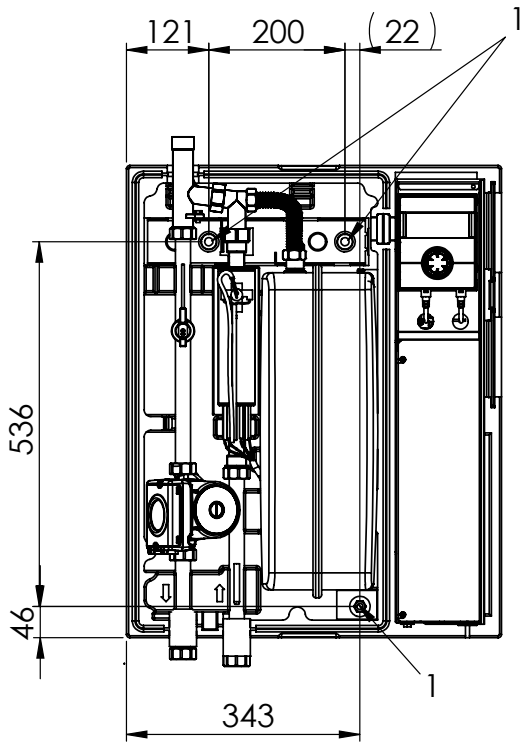


Keys: UK819396
All dimensions in mm.

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

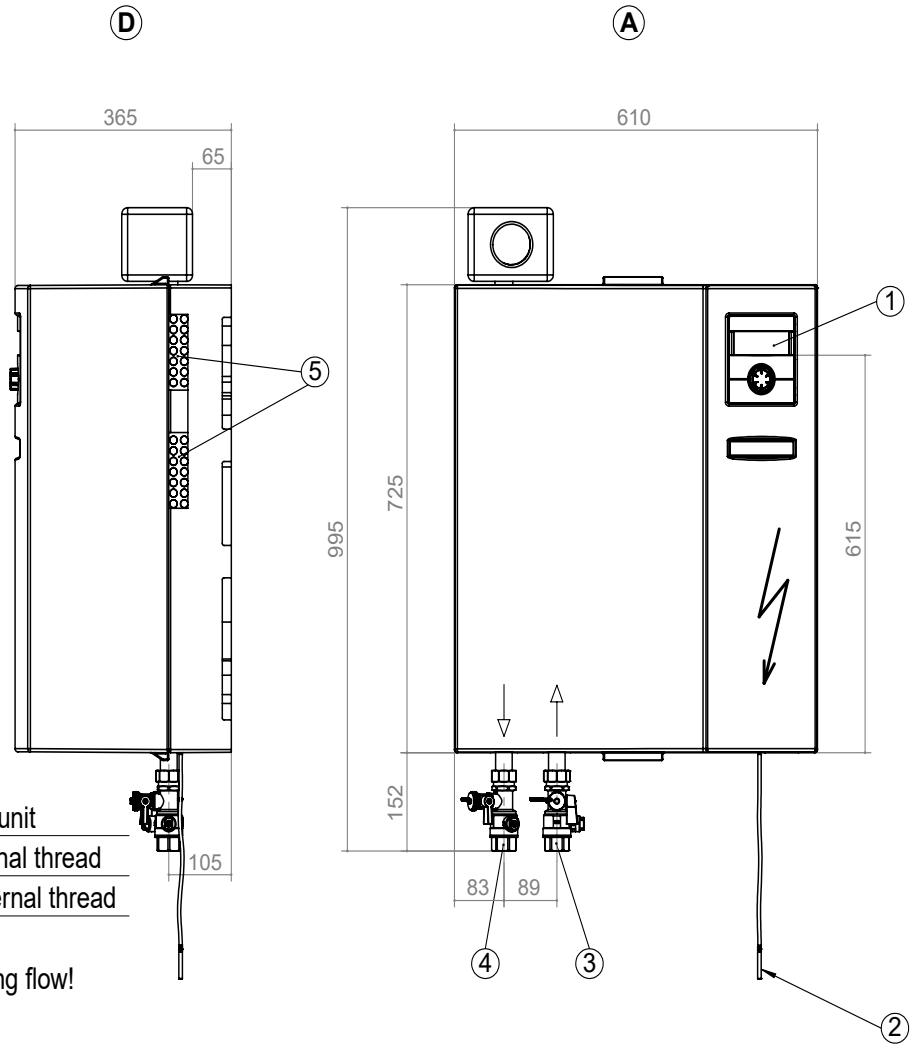
The hydraulic module is installed in the heating flow!

Drill pattern



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

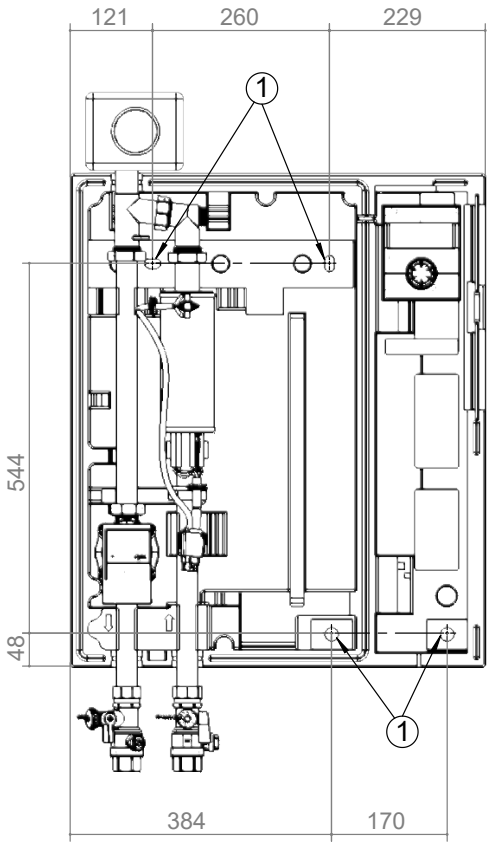
Pos.	Name
1	Drill hole Ø12 for plug (incl. accessory package)



Keys: UK819487
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!

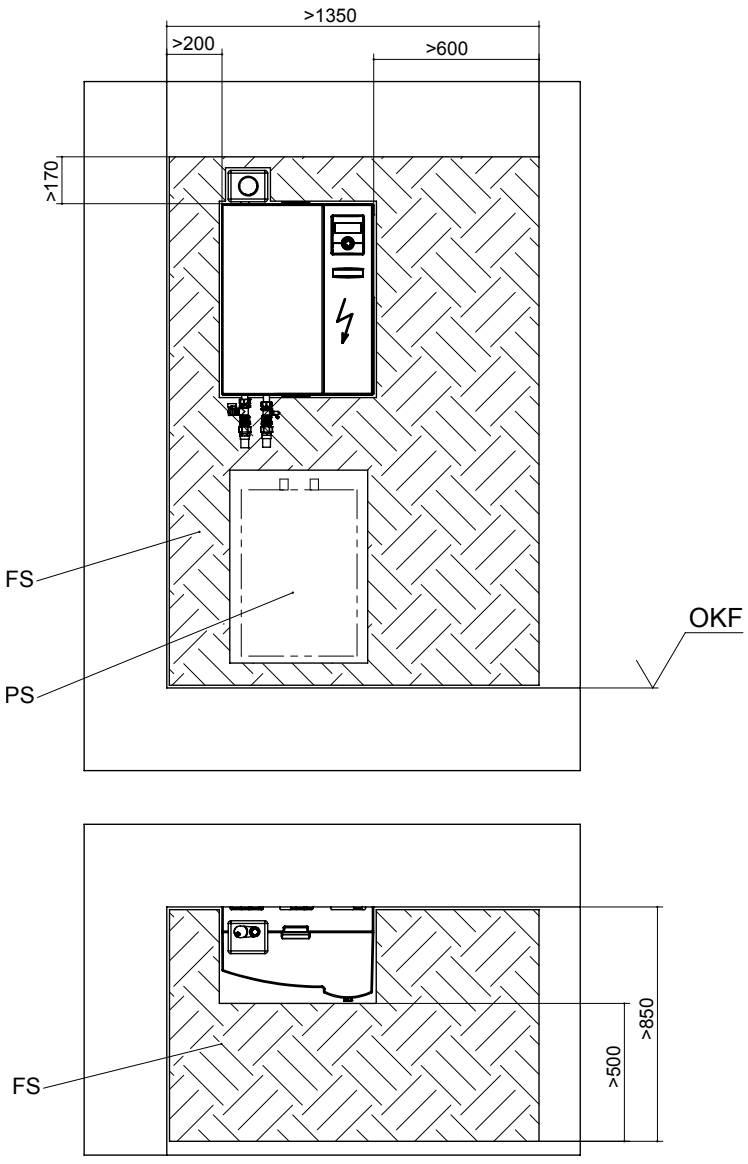


Drill pattern

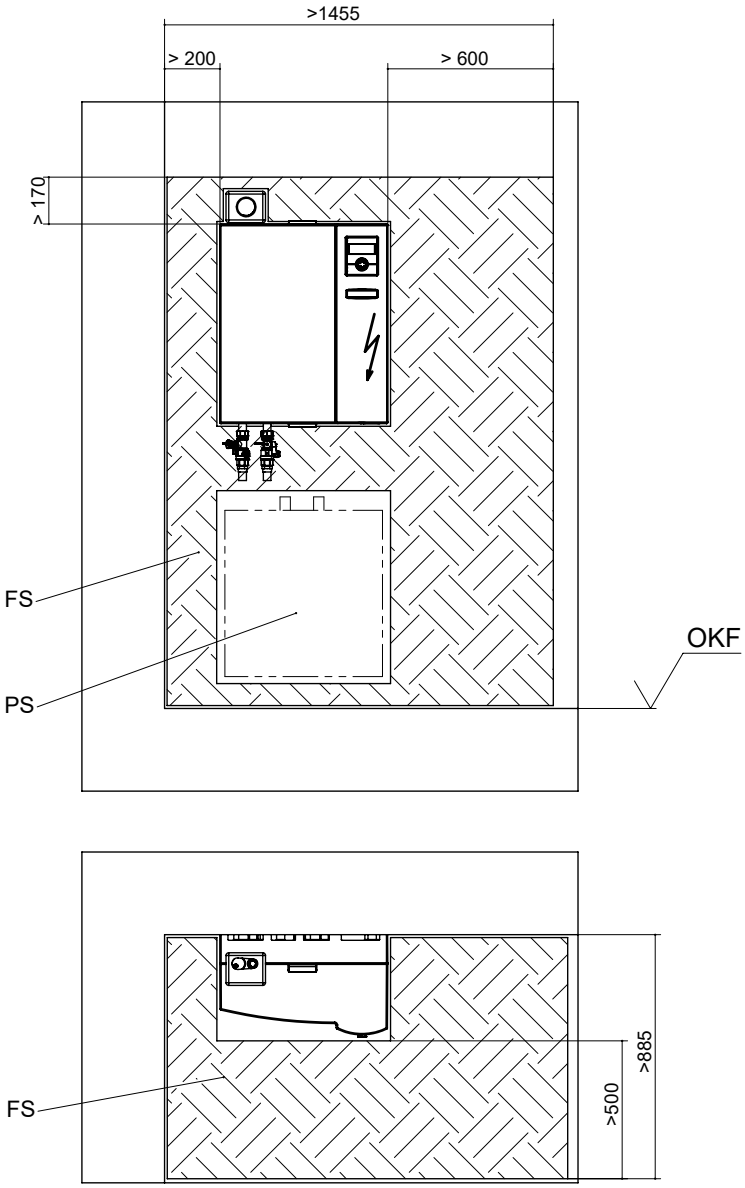
Keys: UK819493
All dimensions in mm. Spacing for drill pattern.

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

Installation plan H(D)V 9-1/3



Installation plan H(D)V 12-3

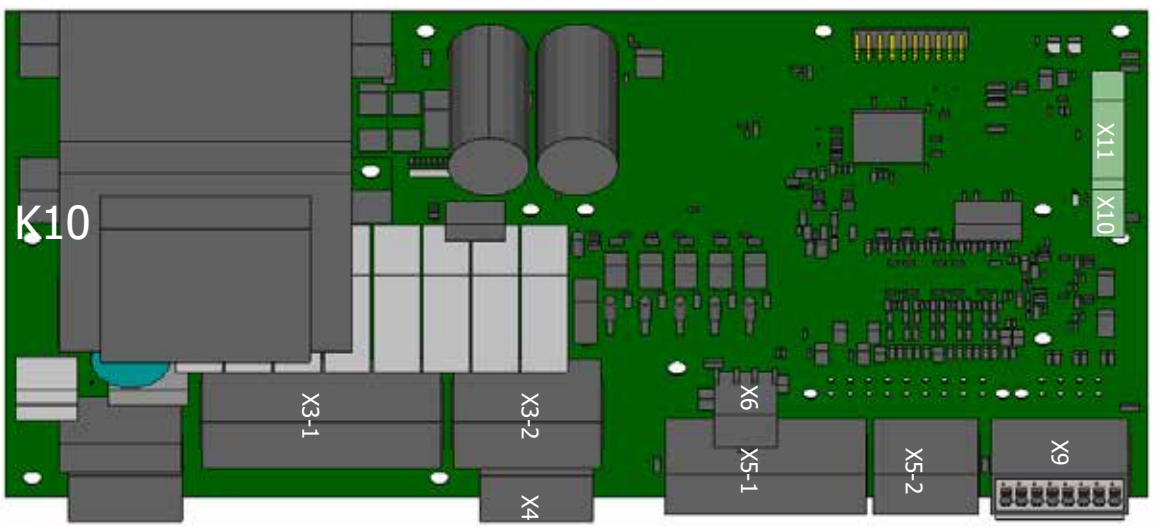


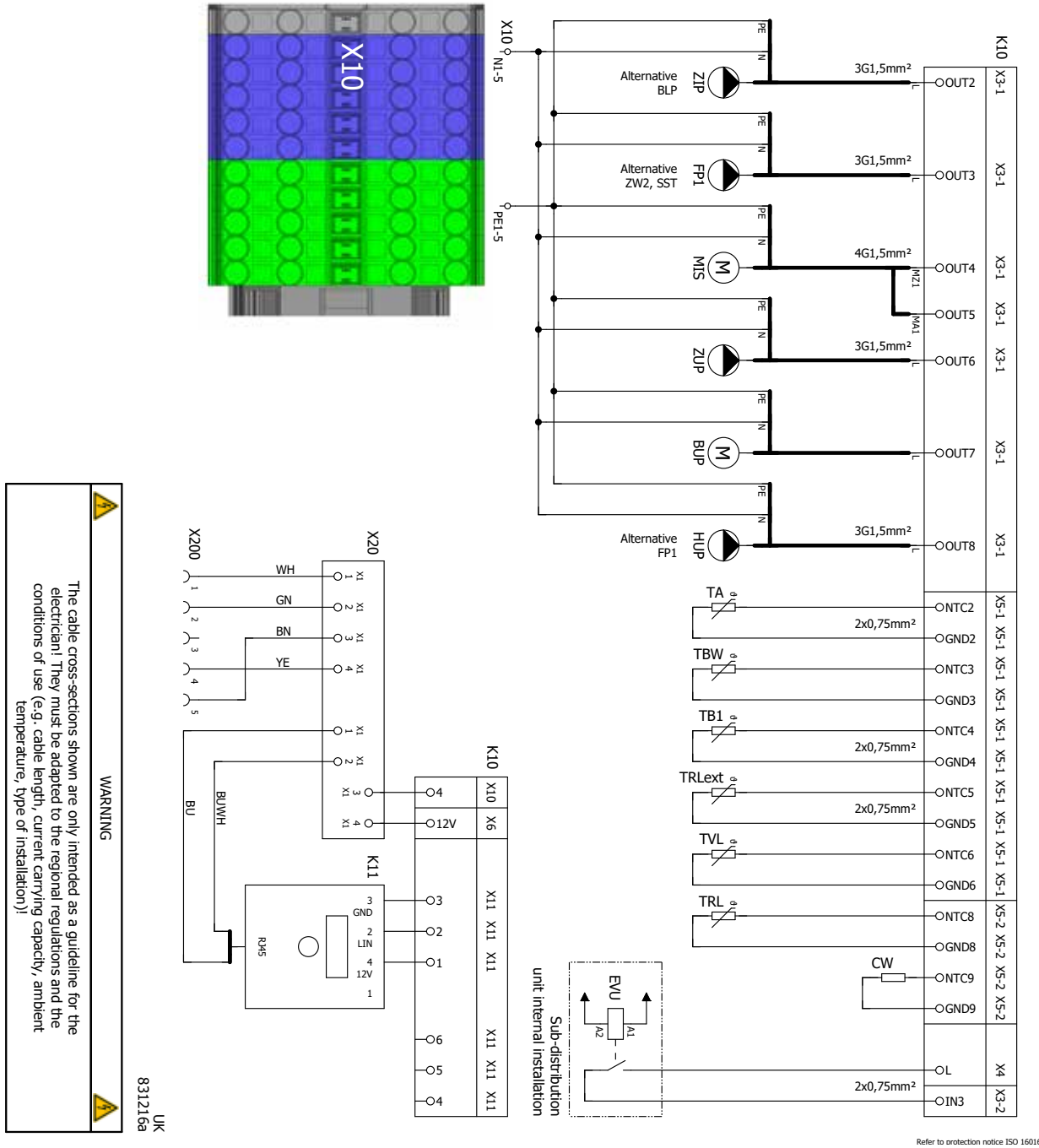
Keys: UK819398 / 819488
All dimensions in mm.

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

Terminal diagram 1/2

HV…



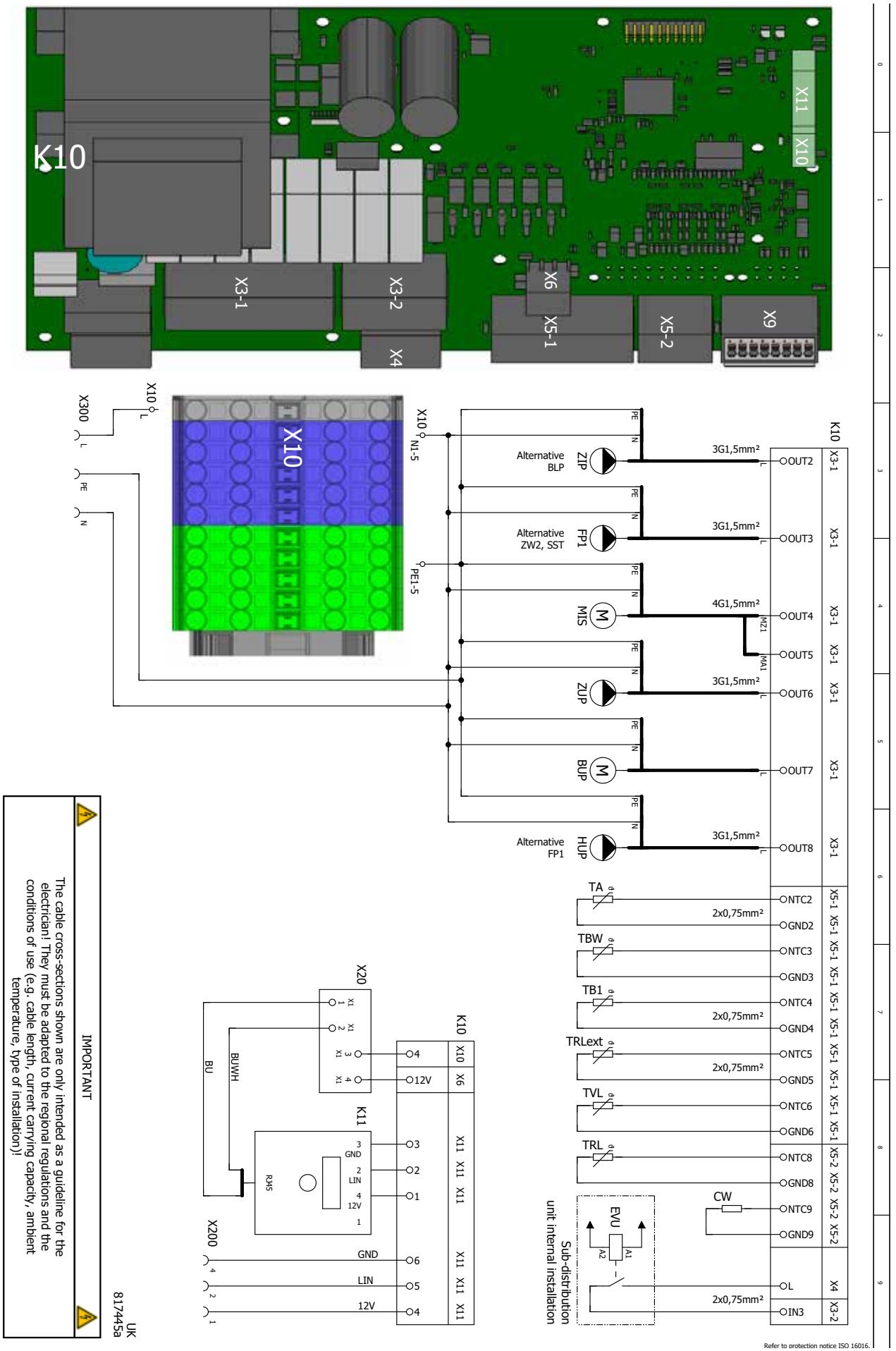


Terminal diagram 2/2

UK 831216a

Equipement	Description	Wired
BLP	Domestic hot water charging pump	X
BUP	Domestic hot water temperature sensor	
CW	Coding resistor	X
EVU	Energy supplier contact; closed on release; bridge if no blocking interval	
FP1	Pump for mixing circuit 1	
HUP	Heating circuit circulating pump	X
K10	Controller board; Attention: I-max = 6,3A/230VAC	
K11	Control unit	X
MIS (MA1)	Charge/discharge/mixer 1 open	
MIS (MZ1)	Charge/discharge/mixer 1 closed	
TA	Outdoor temperature sensor	
TB1	Sensor mixing circuit 1	
TBW	Domestic hot water sensor / thermostat	X
TRL	Return sensor	
TRLext.	External return sensor	X
TVL	Flow sensor	
VBO	Brine pump	X
X10	Power supply control	
X20	Terminal board, Modbus	X
X200	MOD-BUS	X
ZIP	circulation pump	X
ZUP	Auxiliary circulation pump	
ZW2/SST	Control signal of additional heat generator 2 (alternative is general malfunction)	

Refer to protection notice ISO 16016.


K10
X11
X10
X3-1
X3-2
X4
X6
X5-1
X5-2
X9
X300
X10
L
PE
N
PE1-5
N1-5
Alternative BLP
ZIP
Alternative ZW2, SST
FP1
MIS
ZUP
BUP
Alternative FP1
HUP
3G1,5mm²
4G1,5mm²
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7
OUT8
MZ1
MA1
TA
TBW
TB1
TRLext
TVL
TRL
CW
NTC2
GND2
NTC3
GND3
NTC4
GND4
NTC5
GND5
NTC6
GND6
NTC8
GND8
NTC9
GND9
2x0,75mm²
EVU
A1
A2
Sub-distribution unit internal installation
L
IN3
X4
X3-2
X5-1
X5-2
X20
X1
BU
BUWH
RJ45
K11
GND
LIN
12V
X200
X10
X6
X11
Refer to protection notice ISO 16016.
IMPORTANT
The cable cross-sections shown are only intended as a guideline for the electrician! They must be adapted to the regional regulations and the conditions of use (e.g. cable length, current carrying capacity, ambient temperature, type of installation)!
UK 817445a

UK 817445a

Equipement	Description	Wired
BLP	Domestic hot water charging pump	X
BUP	Domestic hot water temperature sensor	
CW	Coding resistor	X
EVU	Energy supplier contact; closed on release; bridge if no blocking interval	
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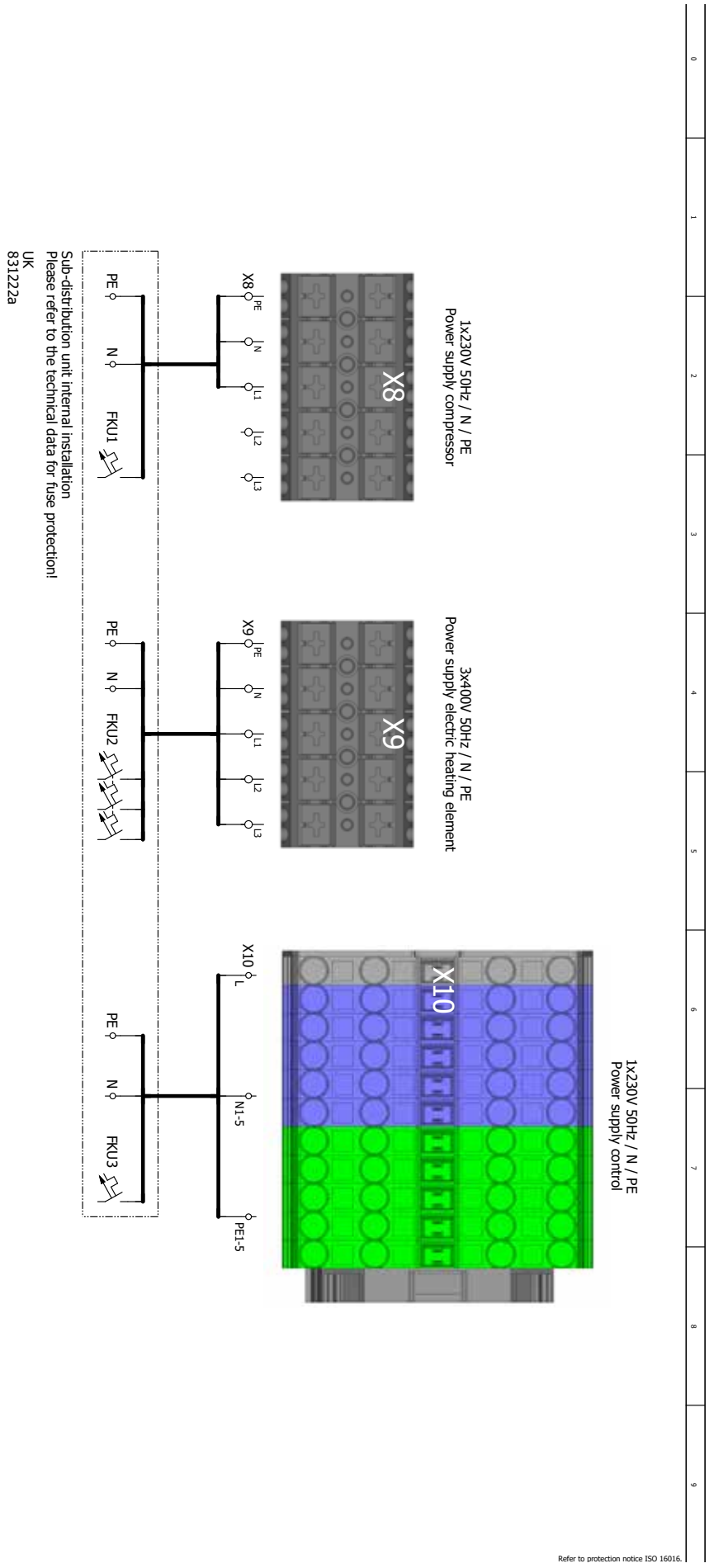
HUP	Heating circuit circulating pump	X
K10	Controller board; Attention: I-max = 6,3A/230VAC	
K11	Control unit	X
MIS (MA1)	Charge/discharge/mixer 1 open	
MIS (MZ1)	Charge/discharge/mixer 1 closed	
TA	Outdoor temperature sensor	
TB1	Sensor mixing circuit 1	
TBW	Domestic hot water sensor / thermostat	X
TRL	Return sensor	X
TRLext.	External return sensor	
TVL	Flow sensor	X
VBO	Brine pump	
X10	Power supply control	
X20	Terminal board, Modbus	X
X200	LIN-Bus	X
X300	Power supply controller 230V	X
ZIP	circulation pump	
ZUP	Auxiliary circulation pump	
ZW2/SST	Control signal of additional heat generator 2 (alternative is general malfunction)	

Refer to protection notice ISO 16016.

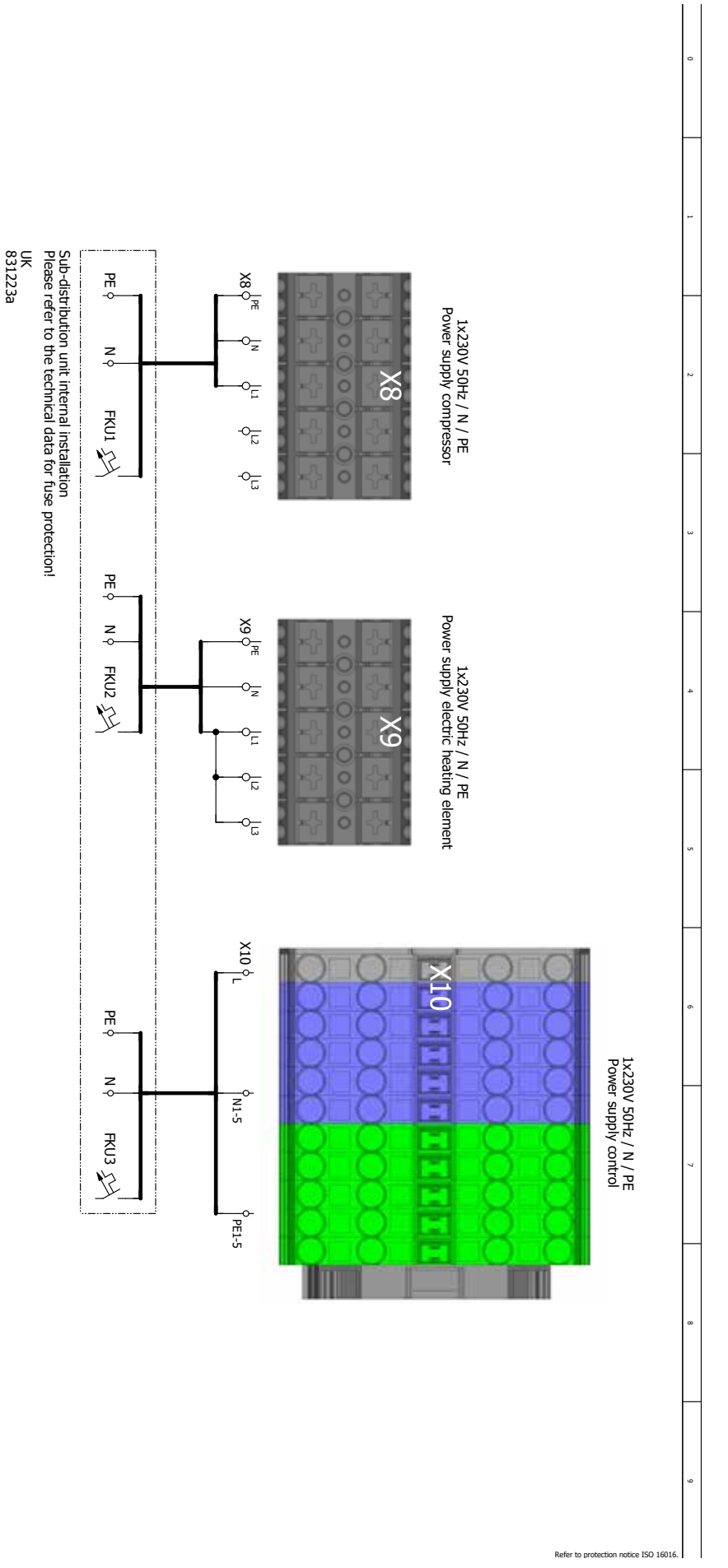
Terminal diagram, mains connection heat pump 1~230V + electric heating element 3~400V

H(D)V 9-1/3
H(D)V12-3



Equipement	Description
FKU1	Circuit breaker compressor
FKU2	Circuit breaker electric heating element
FKU3	Circuit breaker control
X8	Terminal for compressor
X9	Terminal for electric heating element
X10	Terminal for control

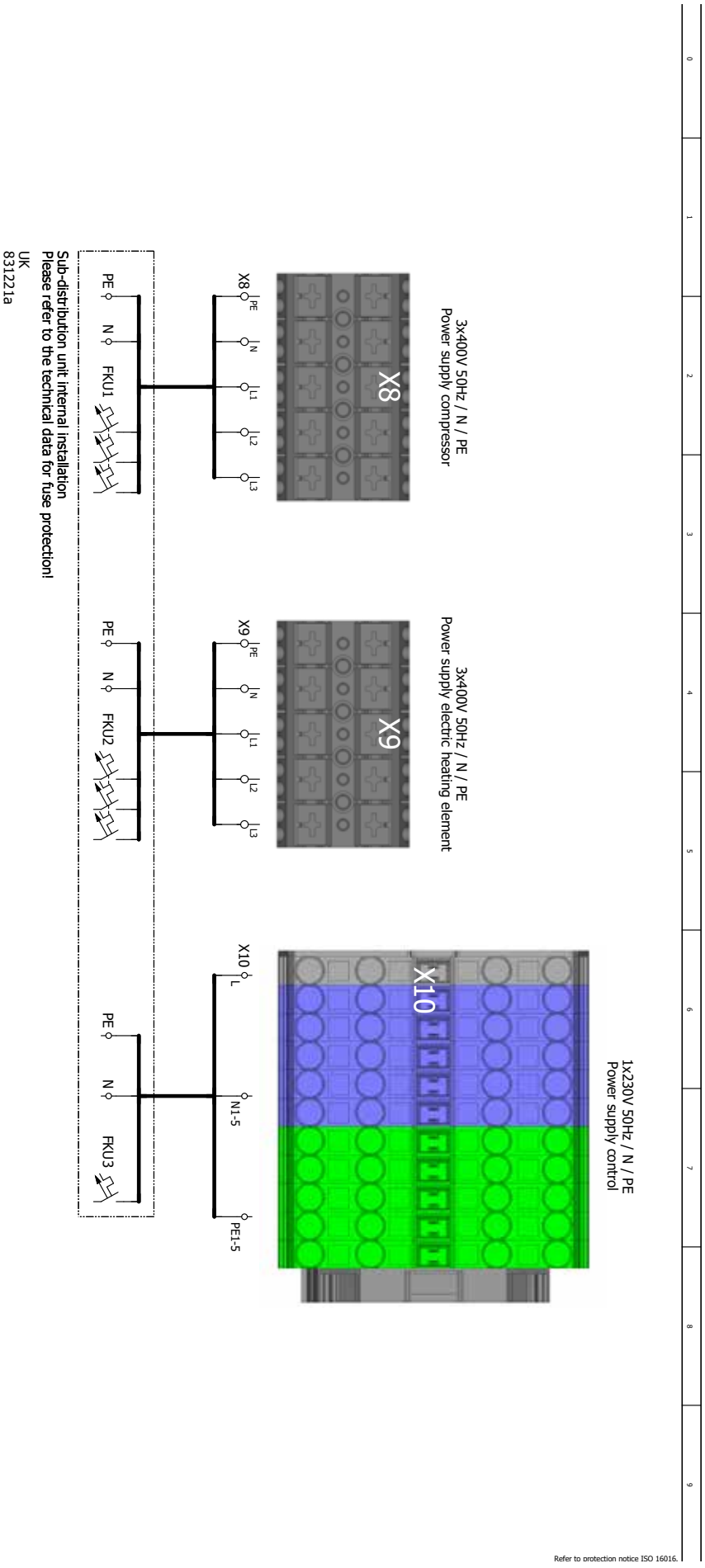
H(D)V 9-1/3 Terminal diagram, mains connection heat pump 1~230V + electric heating element 1~230V



Equipement	Description
FKU1	Circuit breaker compressor
FKU2	Circuit breaker electric heating element
FKU3	Circuit breaker control
X8	Terminal for compressor
X9	Terminal for electric heating element
X10	Terminal for control

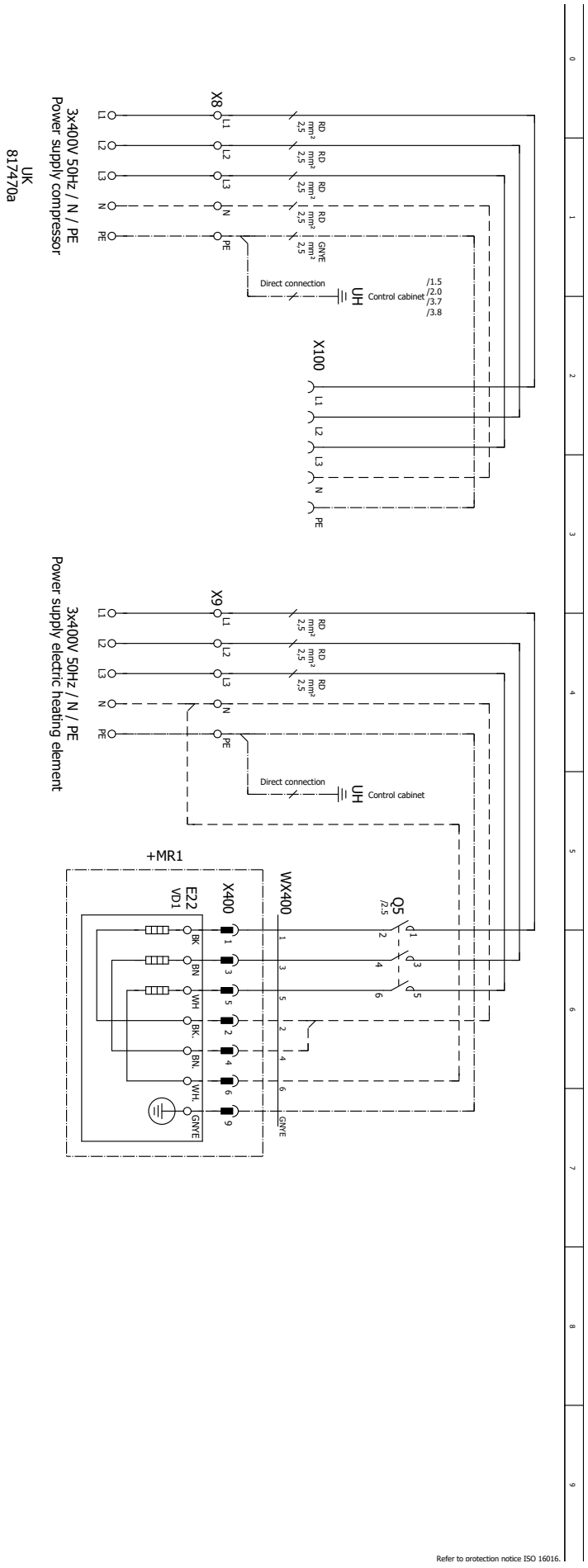
Terminal diagram, mains connection heat pump 3~400V + electric heating element 3~400V

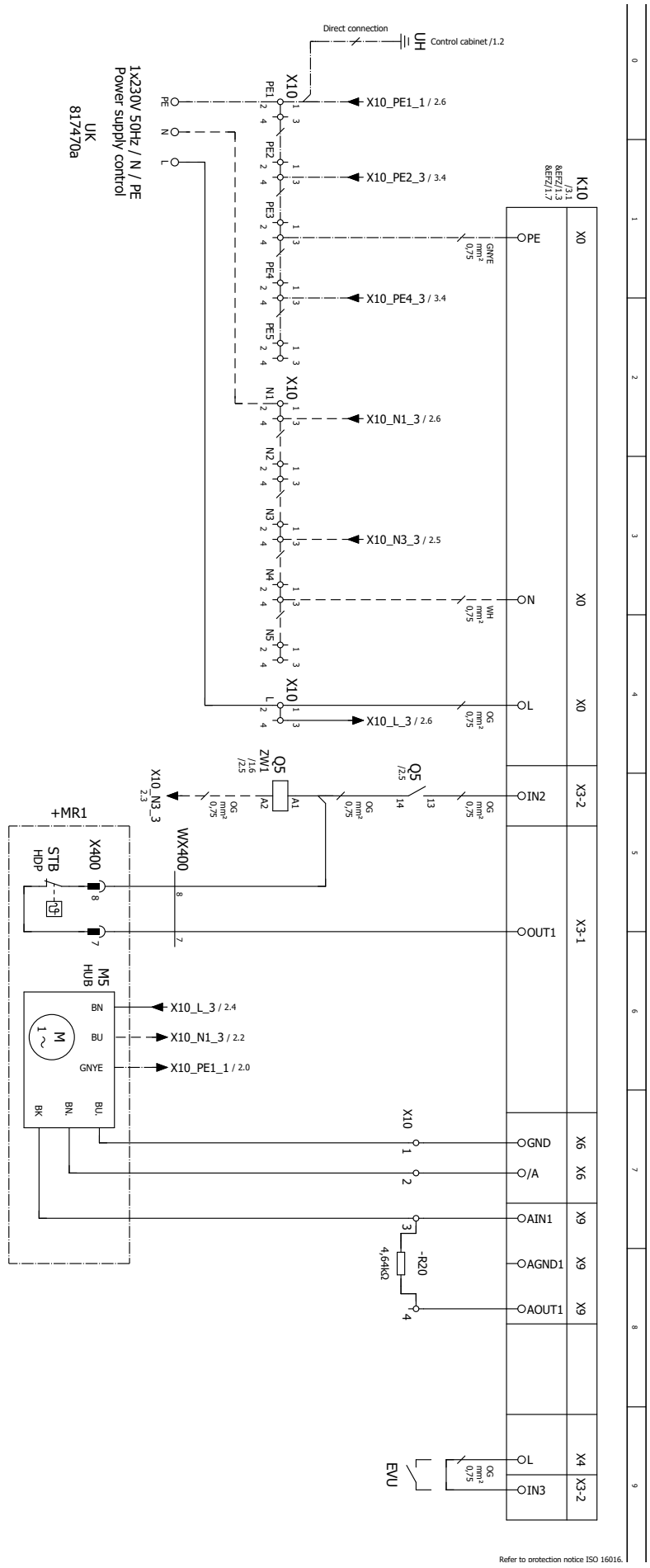
H(D)V 12-3



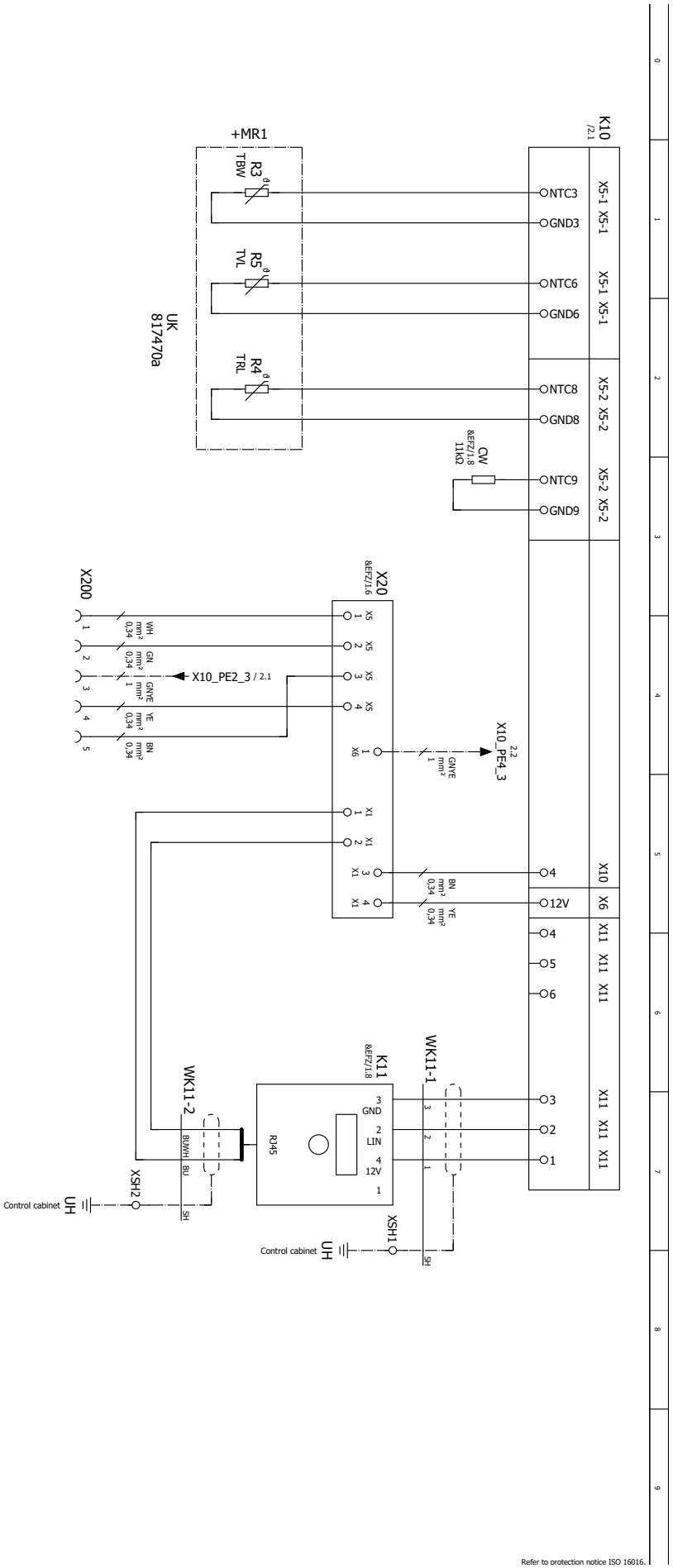
Equipement	Description
FKU1	Circuit breaker compressor
FKU2	Circuit breaker electric heating element
FKU3	Circuit breaker control
X8	Terminal for compressor
X9	Terminal for electric heating element
X10	Terminal for control

Circuit diagram 1/4



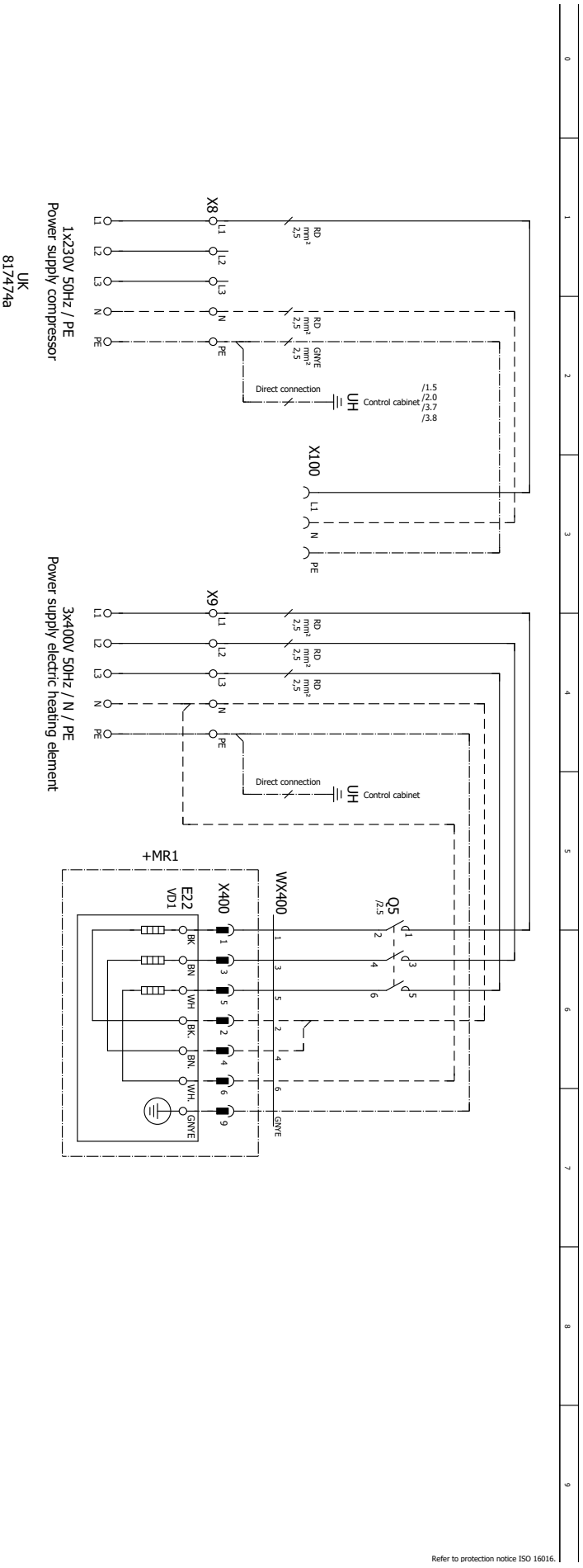

Direct connection
UH
Control cabinet /1.2
1x230V 50Hz / N / PE
Power supply control
UK
81747a
PE
N
L
X10
PE1
PE2
PE3
PE4
PE5
N1
N2
N3
N4
N5
X10_PE1_1 / 2.6
X10_PE2_3 / 3.4
X10_PE4_3 / 3.4
X10_N1_3 / 2.6
X10_N3_3 / 2.5
X10_L_3 / 2.6
K10
&EFZ/1.3
&EFZ/1.7
PE
N
L
X0
GNYE mm² 0,75
WH mm² 0,75
OG mm² 0,75
Q5
ZW1
/1.6
/2.5
A1
A2
13
14
/2.5
X10_N3_3
2.3
IN2
X3-2
+MR1
WX400
X400
STB
HDP
OUT1
X3-1
M5
HUB
BN
BU
GNYE
BK
BN.
BU.
X10_L_3 / 2.4
X10_N1_3 / 2.2
X10_PE1_1 / 2.0
GND
/A
AIN1
AGND1
AOUT1
X6
X9
-R20
4,64kΩ
EVU
IN3
X4
Refer to protection notice ISO 16016.

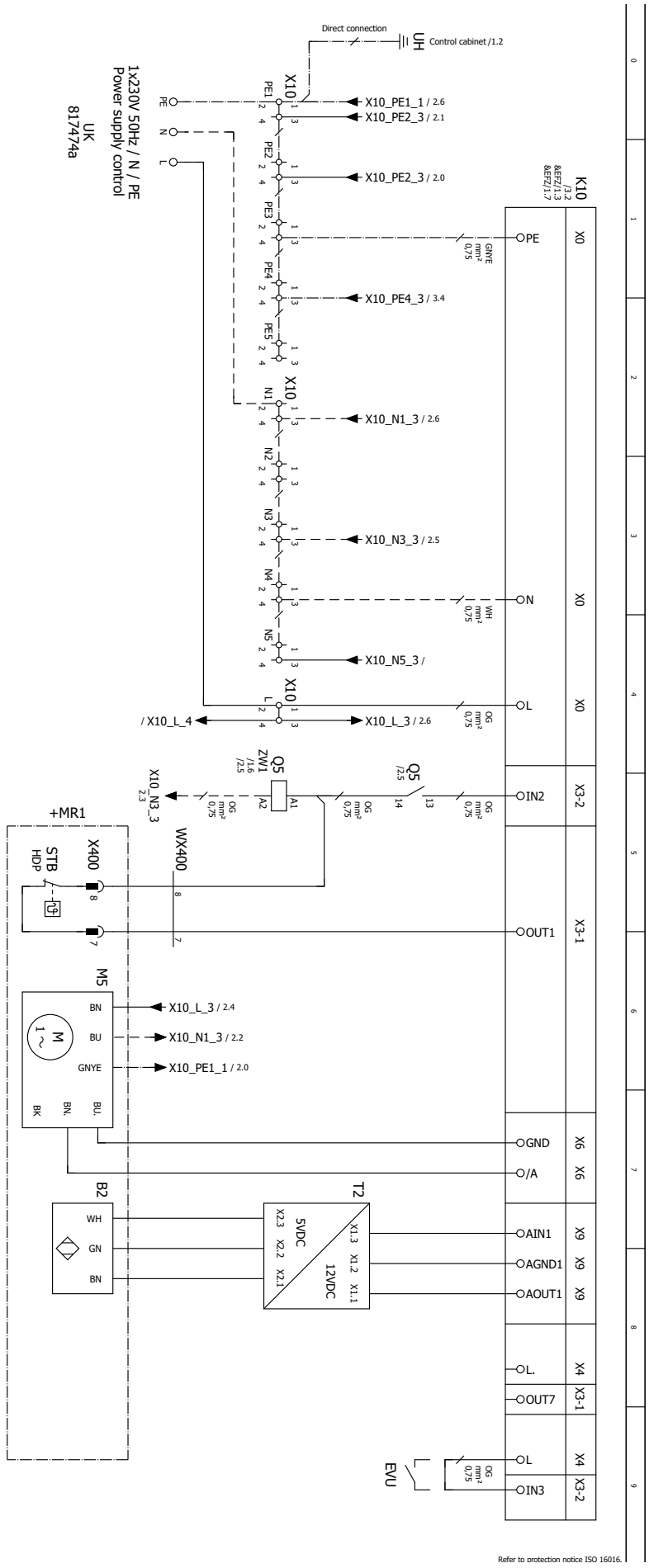
Circuit diagram 3/4

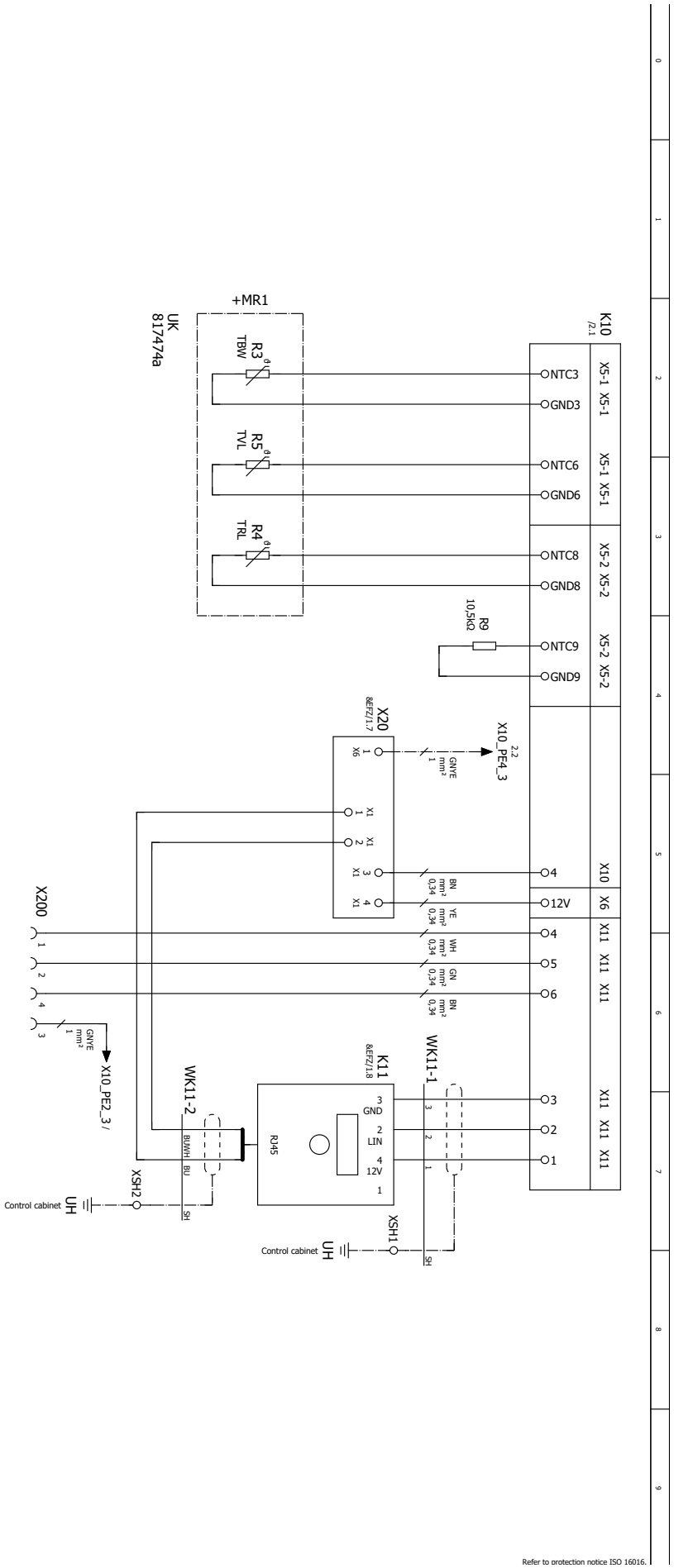


Connector Mod-Bus	Connector Mod-Bus
B2	Volumetric flow meter
E22	Electric heating element
EVU	Energy supplier contact; closed on release; bridge if no blocking interval
K10	Controller board; Attention: I-max = 6,3A/230VAC
K11	Control unit
M5	Heating pump
Q5	Contactor for Electric heating element
R3	Domestic hot water temperature sensor
R4	Return sensor
R5	Flow sensor
R9	Encoding resistor; HMD6LWD 10kOhm; HMD9LWD 11,0kOhm
STB	Temperature shutdown Electric heating element
WK11-1	Connection cable control unit
WK11-2	Connection cable control unit
WX400	Connection Electric heating element
X8	Power supply compressor
X9	Power supply electric heating element
X10	Power supply control
X20	Terminal board, Modbus
X100	Power supply WP
X200	MOD-BUS
X300	Power supply controller 230V
X400	Power supply electric heating element
XSE	Sensorcard
XSH	Shield clamp Control unit
+MR1	Machine room

Refer to protection notice ISO 16016.


1x230V 50Hz / PE
Power supply compressor
UK
81474a
X8
L1
L2
L3
N
PE
RD mm² 2,5
GNYE mm² 2,5
Direct connection
UH
Control cabinet
/1.5
/2.0
/3.7
/3.8
X100
3x400V 50Hz / N / PE
Power supply electric heating element
X9
+MR1
E22
VD1
X400
WX400
Q5
/2.5
BK
BN
WH
BK.
BN.
WH.
GNYE
Refer to protection notice ISO 16016.


Direct connection
UH Control cabinet /1.2
1x230V 50Hz / N / PE
Power supply control
UK
81747a
PE
N
L
X10
PE1
PE2
PE3
PE4
PE5
N1
N2
N3
N4
N5
X10_PE1_1 / 2.6
X10_PE2_3 / 2.1
X10_PE2_3 / 2.0
X10_PE4_3 / 3.4
X10_N1_3 / 2.6
X10_N3_3 / 2.5
X10_N5_3 /
/ X10_L_4
X10_L_3 / 2.6
K10
&EFZ/3.2
&EFZ/1.3
&EFZ/1.7
PE
N
L
X0
GNYE 0,75 mm²
WH 0,75 mm²
OG 0,75 mm²
Q5
ZW1
/1.6
/2.5
A1
A2
13
14
/2.5
X10_N3_3
2.3
IN2
X3-2
+MR1
WX400
X400
STB
HDP
OUT1
X3-1
M5
BN
BU
GNYE
BK
BN.
BU.
X10_L_3 / 2.4
X10_N1_3 / 2.2
X10_PE1_1 / 2.0
GND
/A
X6
B2
WH
GN
BN
T2
5VDC
12VDC
X2.3
X2.2
X2.1
X1.3
X1.2
X1.1
AIN1
AGND1
AOUT1
X9
L.
OUT7
X4
X3-1
EVU
L
IN3
X4
X3-2
Refer to protection notice ISO 16016.


+MR1
UK 817474a
R3 TBW
R5 TVL
R4 TRL
R9 10,5kΩ
K10
NTC3
GND3
NTC6
GND6
NTC8
GND8
NTC9
GND9
X10
X6
12V
X11
X20
X10_PE4_3
X200
X10_PE2_3
WK11-1
WK11-2
K11
RJ45
GND
LIN
12V
XSH1
XSH2
Control cabinet
Refer to protection notice ISO 16016.

Equipement	Description
B2	Volumetric flow meter
E22	Electric heating element
EVU	Energy supplier contact; closed on release; bridge if no blocking interval
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X200	LIN-Bus
X300	Power supply controller 230V
X400	Power supply electric heating element
XSE	Sensorcard
XSH	Shield clamp Control unit
+MR1	Machinery room

Refer to protection notice ISO 16016.

UK

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