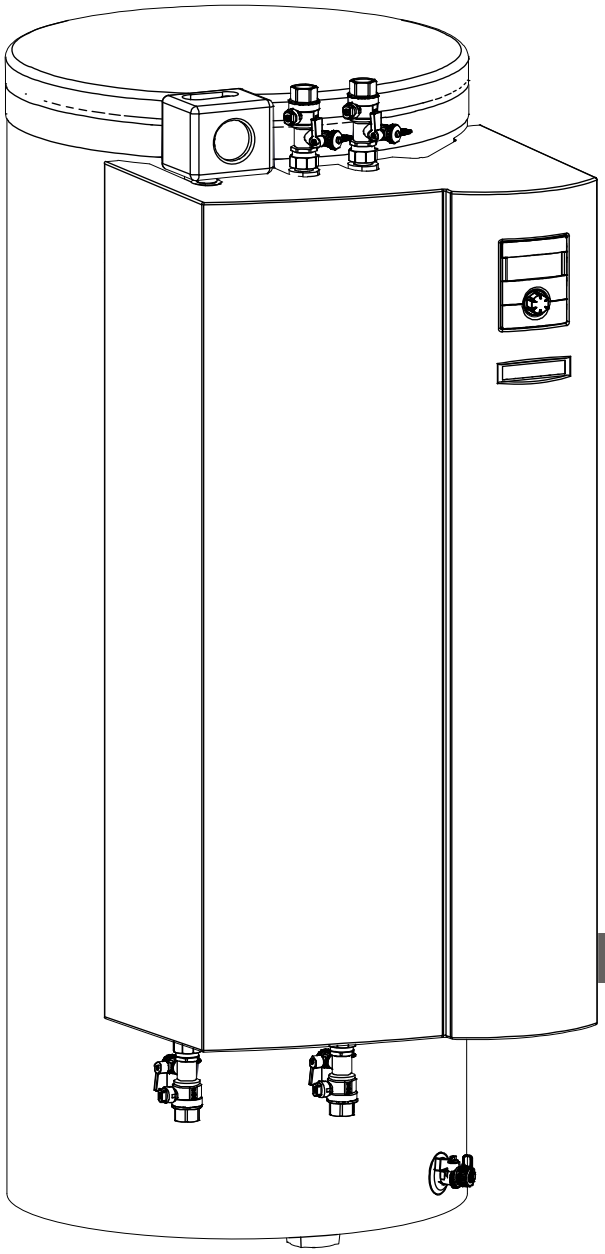
ait DEUTSCHLAND

CREATE A BETTER CLIMATE



Accessories for
heat pumps

Operating Manual
Hydraulic Station

UK

83059300jUK

Table of contents

1 About this operating manual

This operating manual is part of the device.

► Before working on or with the device, 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 device and hand over to the new owner if the device changes hands.

► If you have any questions or anything is unclear, ask the local partner of the manufacturer or the factory's customer service.

► Note and follow all reference documents.

1.1 Validity

This operating manual exclusively refers to the device identified by the nameplate(→ “Nameplate“, page 7).

1.2 Reference documents

The following documents contain additional information 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 device 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 device when it is in flawless 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

► Proper use includes complying with the operating conditions (→ „Technical data / Scope of supply“, from page 19) and the operating manual and noting and following the reference documents.

► When using the local regulations note: laws, standards, guidelines, directives.

All other uses of the device 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

Electric shock

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

► Disconnect the device from power supply.

► Protect the device 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 according to the given requirements, there is a risk that the following damage and faults will occur:

- Malfunctions 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 device.

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 device 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:

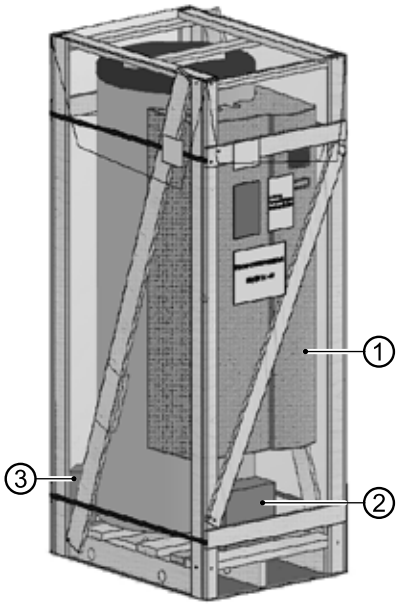
- No unnecessarily high flow temperature
- No unnecessarily high domestic hot water temperature (note and follow local regulations)
- Do not open windows with just a gap or tilt open (continuous ventilation), but instead open wide for a short time (shock ventilation)
- Always ensure that the controller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

3.2 Care

Wipe down the outside of the device only using a damp cloth or cloth with mild cleaning product (washing up liquid, neutral cleaning product). Do not use any harsh, abrasive, acid or chlorine-based cleaning products.

4 Scope of supply

Example of scope of supply arrangement



1 Compact device (domestic hot water tank and buffer tank, without heat pump)
2 Accompanying parts package: safety module, pump ball valves, outdoor temperature sensor, adjustable feet
3 Accompanying parts package: control panel for the heating and heat pump controller

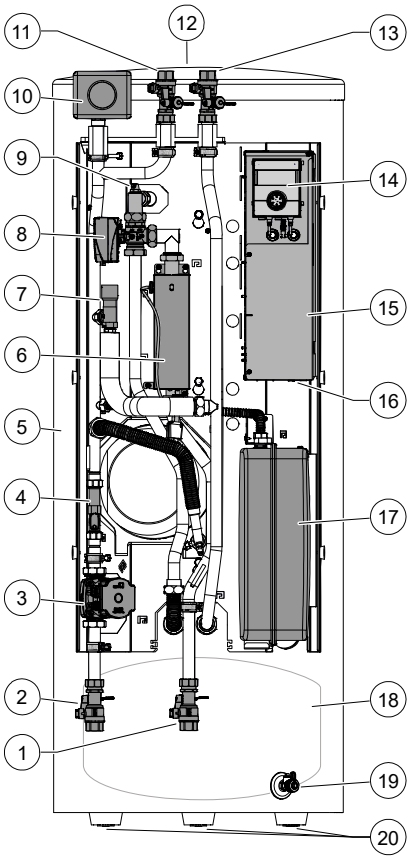
1. Inspect the delivery for outwardly visible signs of damage.
2. Inspect the scope of supply for completeness. Any defects or incorrect deliveries must be reported immediately.

4.1 Accessories

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

- Expansion circuit printed 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)

4.2 Components of the device



1 Shut-off valve with fill and drain tap (with drain tap only in the case of HS(D)V 9...) *)
2 Shut-off valve with fill and drain tap *)
3 Heating circuit recirculating pump (HUP)
4 Volumetric flow meter (only with HSDV variants)
5 Domestic hot water tank
6 Electric heating element behind shielding panel
7 Overflow valve
8 Switchover valve domestic hot water
9 Vent valve
10 Heating circuit safety module (insulated) *)
11 Shut-off ball valve hot heating water inlet (return) *)
12 Protection anode

13 Shut-off ball valve hot heating water outlet (supply) *)
14 Control panel *)
15 Switch box
16 Sockets for the electrical connection kit EVS or EVS 8
17 Expansion tank
18 Buffer tank
19 Draining off buffer tank
20 Adjustable feet *)

*) 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

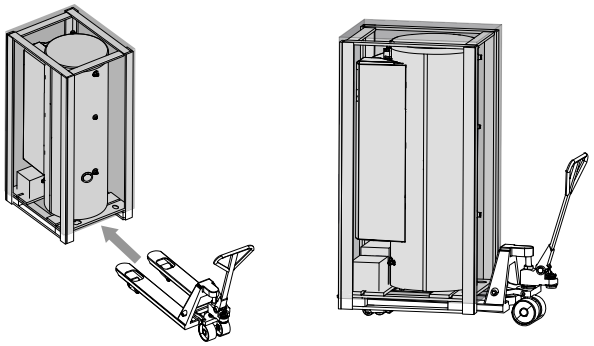
The device is heavy (→ „Technical data / Scope of supply“, from page 19). There is a risk of injuries or damage to property if the device falls or overturns.

The hydraulic connections are not designed for mechanical loads.

► Do not lift or transport the device by the hydraulic connections.

► Transport the device preferably with a pallet truck, alternatively with a handcart or by carrying.

5.2.1 Transport with a pallet truck



Unpacking

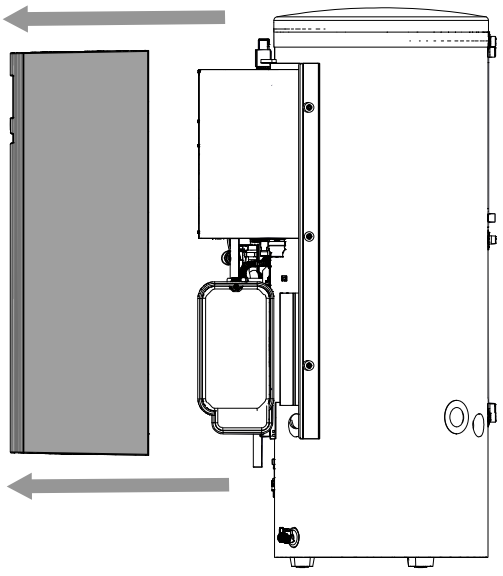
1. Remove plastic films. Ensure that you do not damage the device.
2. Dispose of the transport and packaging material in an environmentally friendly way and in accordance with local regulations.

If the device is to be carried, then it is recommended that the wooden pallet is not removed yet.

5.2.2 Making transport easier

In order to make the transport simpler and easier, the whole hydraulic system(including the controller with switch box) can be unscrewed beforehand.

1.



2. Disconnect the domestic hot water temperature sensor (TBW) inside the switch box and withdraw the sensor cable out of its grommet in the switch box.

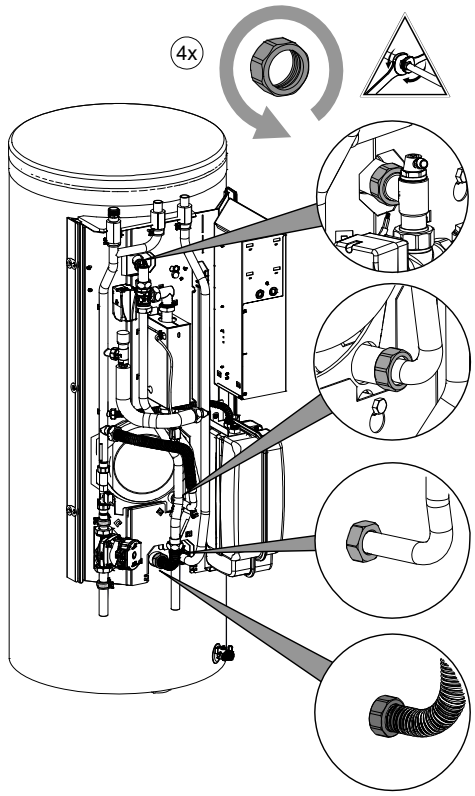
   Opening and closing the switch box:

→ “Open the side cover of the electrical switch box”, page 13

   Terminals for the domestic hot water temperature sensor:

→ „Terminal diagrams“, from page 26

3.



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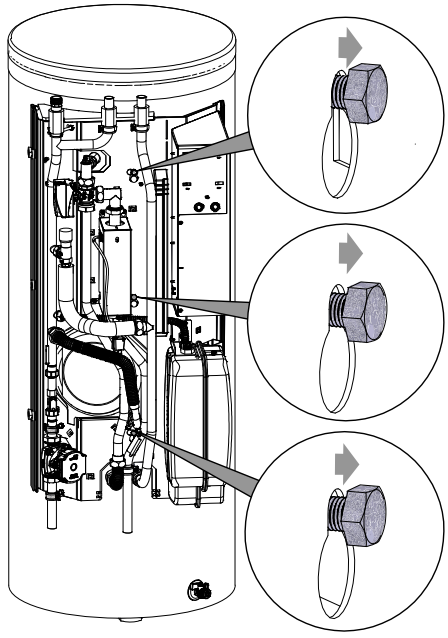

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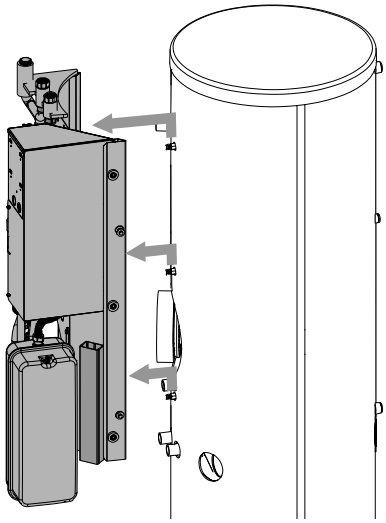


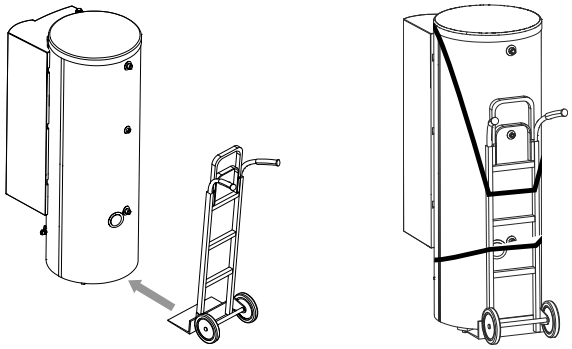
IMPORTANT

When lifting off the hydraulic system, withdraw the cable of the domestic hot water temperature sensor through its grommet in the support plate and place it behind the support plate. Be careful not to damage the cable.

6. Re-attach the hydraulics and hood after aligning the unit.

→ “5.3 Installation”, page 9

5.2.3 Transport with handcart



IMPORTANT

Do not damage the hydraulic connections on the rear of the unit, the hood on the hydraulics or the insulation for the domestic hot water tank and buffer tank.

5.2.4 Carrying the unit

In order to make it easier to carry, a T-piece with two double nipples can be fitted on the domestic hot water outlet. It is recommended that the wooden pallet is only removed after carrying is complete.

► Carry the unit to the installation site with 3 – 4 persons.

5.3 Installation

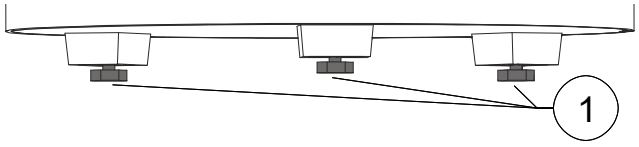
Installation site

IMPORTANT
Only ever install the device inside buildings.

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

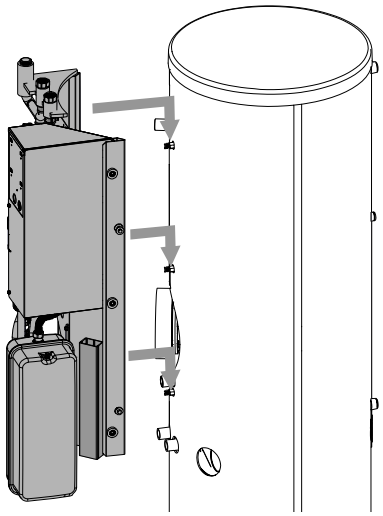
→ „Installation plans“, from page 24 and „Dimensioned drawings“, from page 22, for the respective model

1. Place the device on a stable and horizontal surface, preferably decoupled from structure-borne noise.
2. Tilt the device slowly and carefully to one side.
3. Secure the tilted device to ensure that it cannot tip back to its initial position.
4. Fit the adjustable feet (①) to all 3 feet.



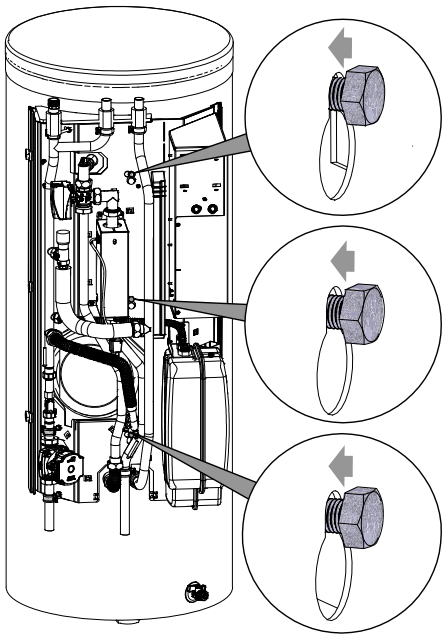
5. Tilt the device slowly and carefully back to its initial position.
6. Level out the 3 adjustable feet.
7. If the hydraulic system was dismantled for transport reasons, then it must be screwed back into place on the tank!

7.1.

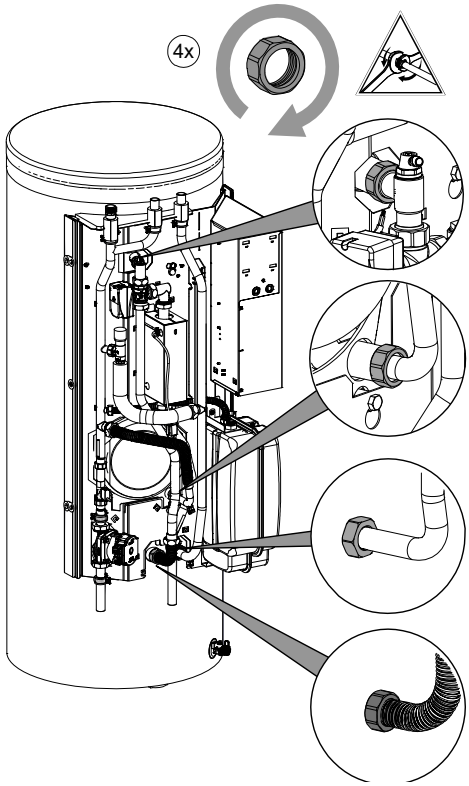


IMPORTANT
When mounting the hydraulic system, insert the cable of the domestic hot water temperature sensor through its grommet into the support plate. Take care not to damage the cable.

7.2.
7.3.



7.4.



8. temperature sensor (TBW) through its grommet into the switch box and connect it.

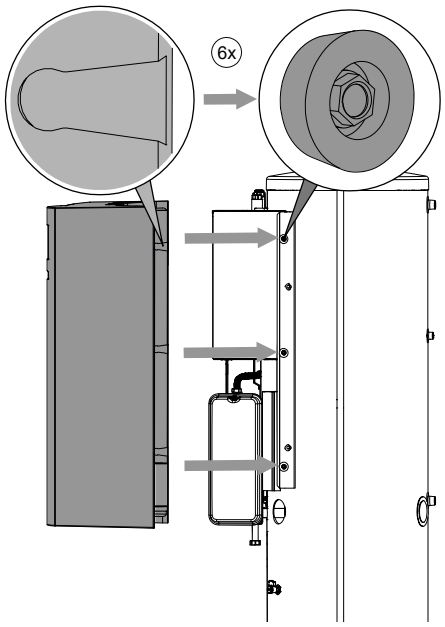
   Opening and closing the switch box:

→ “Open the side cover of the electrical switch box”, page 13

   Terminals for the domestic hot water temperature sensor:

→ „Terminal diagrams“, from page 26

9. If no further hydraulic or electrical work is being carried out for the time being, put the hood on the hydraulics.



6 Installing 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, ensure that the connection pipework between the heat pump and hydraulic station are also taken into account.

✓ Freely pressing the recirculating pump produces at least the minimum throughput required for the device type (→ “Free pressing”, page 21).

► 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.

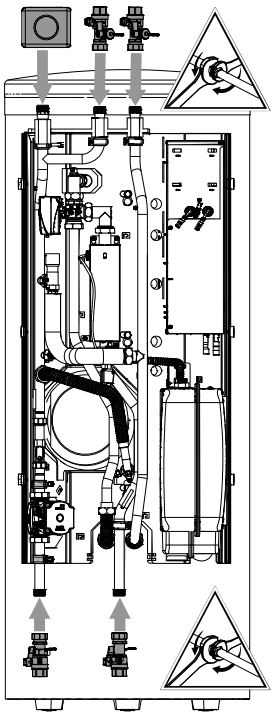
► Insert the vent at the highest point of the heating circuit.

► Lift up the hood at the front of the hydraulic station (→ “5.2.2 Making transport easier“, page 7).

6.1 Heating circuit

Safety module and shut-off ball valves

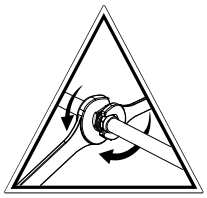
1. Take the safety module and the shut-off ball valves out of the accessory pack and fit them to the connections provided. Use seals from the accessory pack.



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 the hydraulic connection to the unit.
2. Establish the hydraulic connection to the heating circuit.



→ Position of the connections: “Dimensioned drawings”, page 22

6.2 Expansion vessel

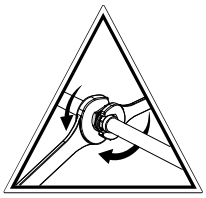
The expansion vessel for the heating circuit is integrated. Always inspect whether the size of the expansion vessel is large enough for the system. If necessary, an additional expansion vessel must be installed on site in accordance with the relevant valid standards.

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 calculation according to the relevant standards (EN 12828).

6.3 Hydraulic connection for the domestic hot water tank

Connect the domestic hot water tank according to DIN 1988 and DIN 4753 Part 1 (or the standards and directives applicable locally).

→ Position of the connections: “Dimensioned drawings“, page 22



The working overpressure cited on the name plate must not be exceeded. Install a pressure reducer if required.
The sensor for the domestic hot water preparation is already connected in the switch box.

IMPORTANT
The electrical conductivity of the domestic hot water must be > 100 µS/cm and must lie within the drinkable water quality limits.

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 (→ „Technical data / Scope of supply“, from page 19))
- 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

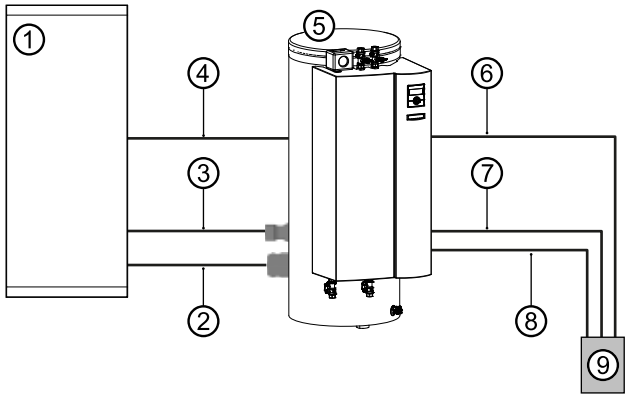
Establish the electrical connections between the heat pump and the hydraulic station

→ Operating manual of the heat pump

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

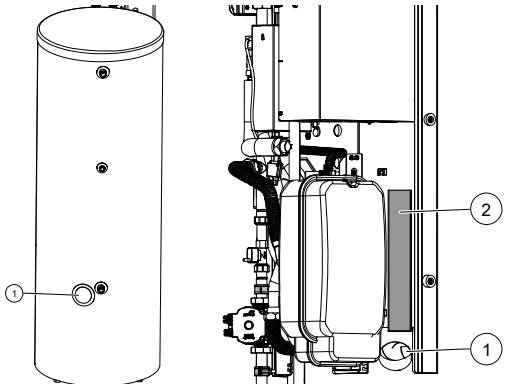
7.2 Electrical connection

The electrical connection is established via the switch box.
The hydraulic station is connected on site to the sub-distribution according to the following scheme:



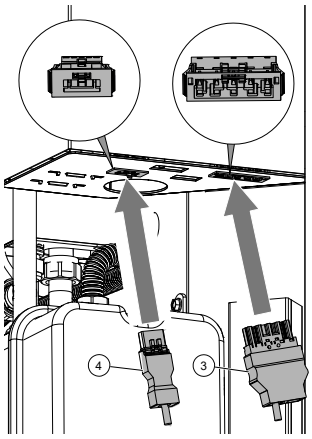
1 Heat pump
2 Load Compressor
3 Bus (shielded)
4 Control voltage (for dual heat pump only)
5 Hydraulic station
6 Elektric heating element load line
7 Control voltage
8 Load Compressor
9 Sub-distribution

1. Feed the control and sensor cables, the Bus and load cable from the heat pump, the cable for the EVU blocking time as well as the cables of external loads through the grommet on the rear (①) of the device into the interior of the device.

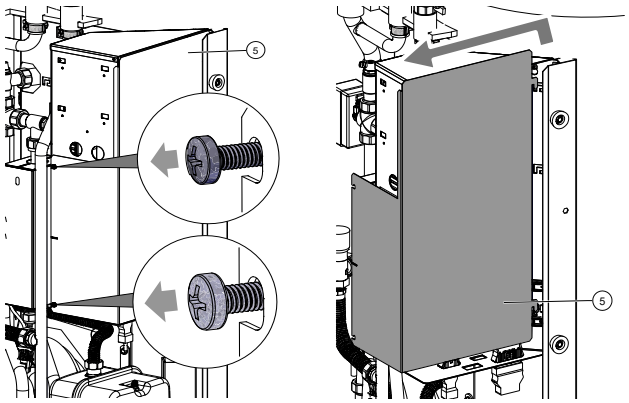


2. Feed the cables through the cable duct (②) to the switch box.

3. Insert the wired plugs of the heat pump load cable (③) and the bus cable (④) into the corresponding socket at the bottom of the electrical switch box.



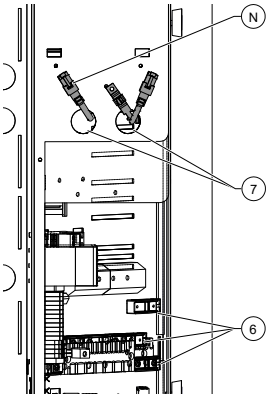
4. Strip of all other cables before feeding them into the switch box (stripping length of each of the individual wires: 6 mm).
5. Open the side cover (⑤) of the electrical switch box.



6. Feed the cables into the cable ducts of the switch box.
7. Carry out electrical connections in accordance with the terminal diagram.

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

8. Insert all cables introduced into the switch box into the cable ducts in the switch box, route them through the strain reliefs (⑥) and screw them into the strain reliefs.
9. Route plug-in connections for the control panel out of the openings (⑦) in the front cover of the electrical switch box.



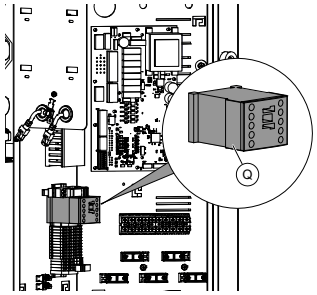
NOTE

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

→ “Connections on the control panel”, page 14

NOTE

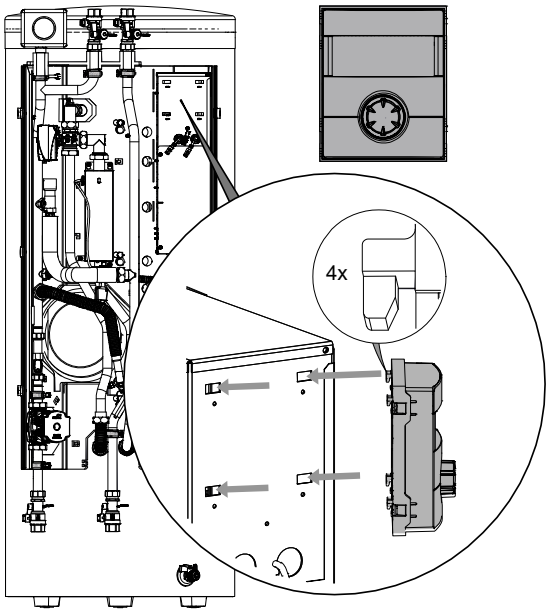
In devices with integrated electric heating element, the electric heating element is connected for 9 kW (6 kW) in the factory. At contactor Q, it is possible to select 6 kW (4 kW) = 2 phase operation. Disconnect Q5/6 for this. Or 3 kW (2 kW) = 1 phase operation. Disconnect Q5/6 and Q5/4 for this. The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



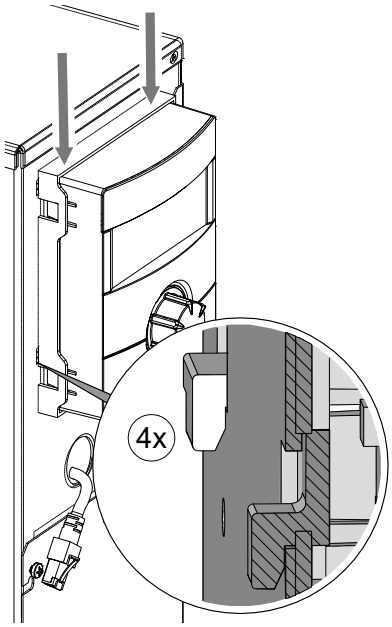
10. Close the electrical switch box by re-attaching the side cover.

8 Installing the control panel

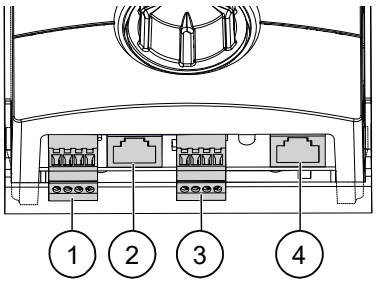
1.



2.



3. Make cable connections on the bottom 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.

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).

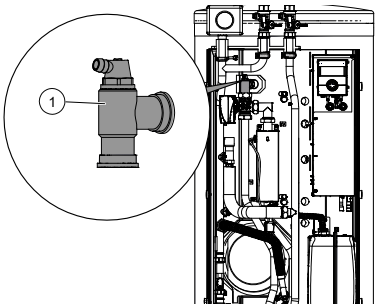
9.2 Flush and fill the heating and domestic hot water charging circuit

✓ Outlet pipe of the safety valve is connected.

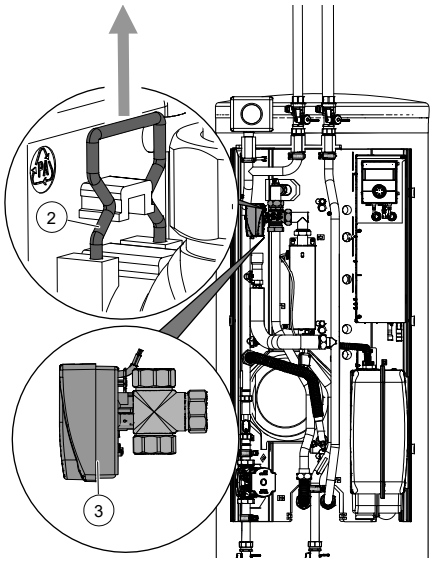
► Ensure that the set pressure of the safety valve is not exceeded.

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

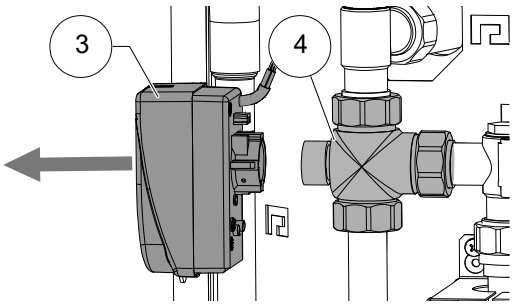
1. Vent the system at the highest point.
2. Open the vent valve (①) on the 3-way switching valve.



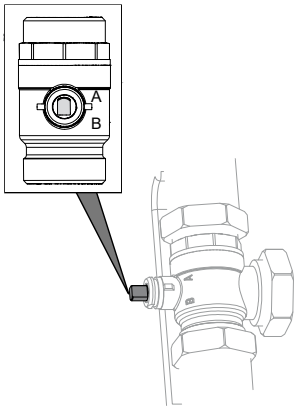
3. Pull off the U-clip (②) on the back of the valve motor (③) on the switching valve (④) upwards.



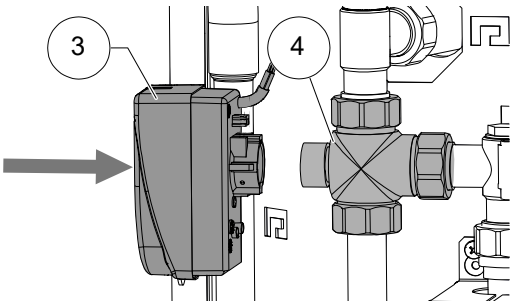
4. Carefully pull the valve motor (③) forward off the 3-way switching valve (④).



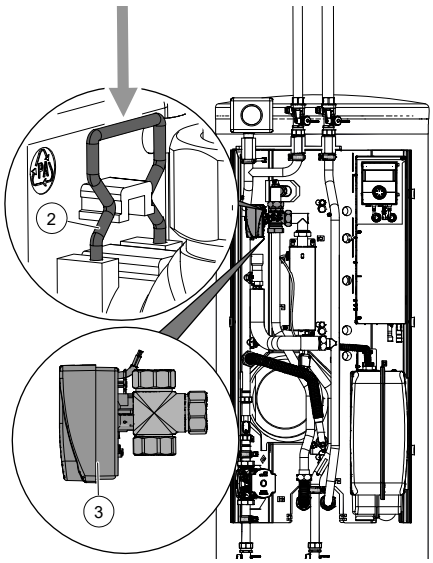
5. Turn the spindle of the 3-way switching valve so that the rounded side of the spindle points in the direction of marking A of the connections of the 3-way switching valve.



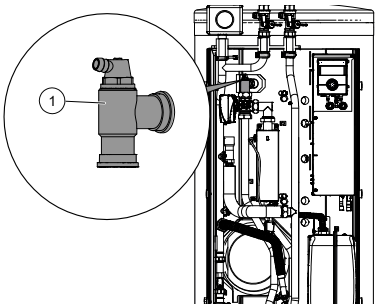
6. Flush the domestic hot water charging circuit for approx. 1 minute.
7. Turn the spindle so that the rounded side of the spindle points in the direction of marking B of the connections of the 3-way switching valve.
8. Flush heating circuit thoroughly, until no more air is discharged.
9. Position the valve motor (③) on the 3-way switching valve (④).



10. Insert the U-clip (②) into the base of the valve motor (③).



11. 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.
12. Close the vent valve (①) on the 3-way switching valve.



9.3 Flushing, filling and venting the domestic hot water tank

IMPORTANT
Before flushing and filling the domestic hot water tank, the outlet pipe of the safety valve must be connected. The set pressure of the safety valve must not be exceeded.

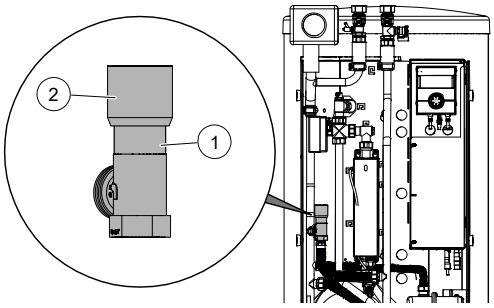
1. Open the domestic cold water supply valve on the domestic hot water tank.
2. Open the domestic hot water valves at the tapping points.
3. Flush the domestic hot water tank until no more air discharges from the valves at the tapping points.
4. Close the domestic hot water valves at the tapping points.

10 Insulate hydraulic connections

Insulate hydraulic lines in accordance with local regulations.

1. Open shut-off devices.
2. Perform a pressure test and check for leaks.
3. Insulate external piping on site.
4. Insulate all connections, fittings and pipes.

11 Overflow valve



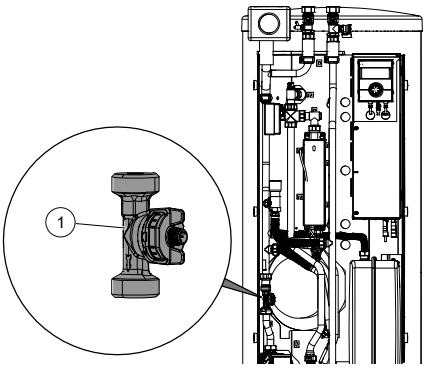
1 Overflow valve
2 Adjusting knob

→ Operating manual of the heat pump

12 Volumetric flow meter / heat meter

(only with HSDV variants)

The volumetric flow meter / heat meter (①) integrated in HSDV 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

✓ Water supply to the domestic hot water tank is open

✓ Domestic hot water tank is filled

NOTE
If the heat pump is switched on whilst the tank is empty, the control panel indicates a fault.

→ Operating manual of the heating and heat pump controller

→ Operating manual of the heat pump

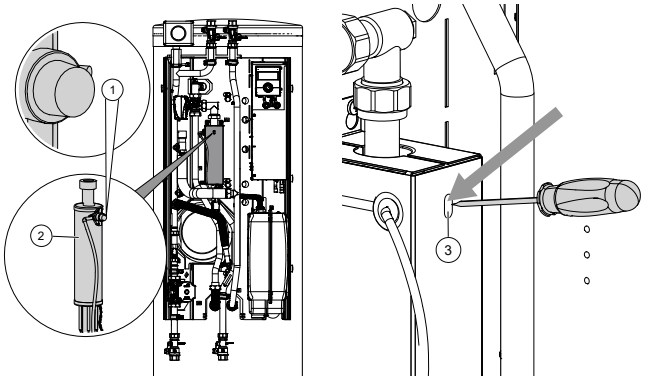
14 Faults

- ► Read out the cause of the fault via the diagnostics programme 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 device number to hand.

14.1 Unlock the 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, located underneath the cover) has tripped.
- ► 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 device 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 circuit board of the heating and heat pump controller.
2. Dispose of the buffer battery in accordance with local regulations.

Accessories for heat pump type			HSV 9M1/3	HSV 12.1M3
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 k	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	0,63 | – | 1200	0,55 | – | 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	150	161
Weight of individual components		kg | kg | kg	– | – | –	– | – | –
Domestic hot water tank				
Net volume		l	180	279
Magnesium sacrificial anode	Impressed current | Magnesium	• yes – no	– | •	– | •
Domestic hot water temperature, heating pump mode | Electric heating element		up to °C | up to °C	55 | 65	55 | 65
Mixed water quantity according to ErP: 2009/125/EC (at 40 °C, draw-off of 10 l/min)		l	230	365
Standing loss according to ErP: 2009/125/EC (at 65 °C)		W	55	66
Maximum pressure | Operating pressure		bar | bar	6 | 10 | 13	6 | 10 | 13
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 | 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
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		• | 62	• | 83
Diaphragm expansion vessel Heating circuit | Volume | Prepressure	incl. in scope of supply: • yes – no | l | bar		• | 12 | 1,5	• | 12 | 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

813320b 813326a

Accessories for heat pump type				HSDV 9M1/3	HSDV 12.1M3
Air/water output-controlled	Indoor and outdoor installation	4 kW | 8 kW | 12 kW	• yes – no	– | –	– | –
Air/water dual output-controlled	Outdoor installation	9 kW	• yes – no	•	•
Air/water output-controlled	Outdoor installation	5 kW | 7 kW	• yes – no	– | –	– | –
Air/water	Outdoor installation	14 kW | 18 kW	• yes – no	–	–
Air/water Dual	Outdoor installation	5 kW | 7 kW | 9 kW	• yes – no	–	–
Installation location					
Room temperature		min. | max.	°C	5 | 35	5 | 35
Relative humidity maximum (non-condensing)			%	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	0.65 | – | 1150	0.81 | – | 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	150	161
Weight of individual components			kg | kg | kg	– | – | –	– | – | –
Domestic hot water tank					
Net volume			l	180	279
Magnesium sacrificial anode	Impressed current | Magnesium		• yes – no	– | •	– | •
Domestic hot water temperature, heating pump mode | Electric heating element			up to °C | up to °C	60 | 65	60 | 65
Mixed water quantity according to ErP: 2009/125/EC (at 40 °C, draw-off of 10 l/min)			l	230	365
Standing loss according to ErP: 2009/125/EC (at 65 °C)			W	55	66
Operating pressure | Max. pressure | Test pressure			bar | bar | bar	6 | 10 | 13	6 | 10 | 13
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
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		• | 62	• | 83
Diaphragm expansion vessel Heating circuit | Volume | Prepressure		incl. in scope of supply: • yes – no | l | bar		• | 12 | 1.5	• | 12 | 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: m

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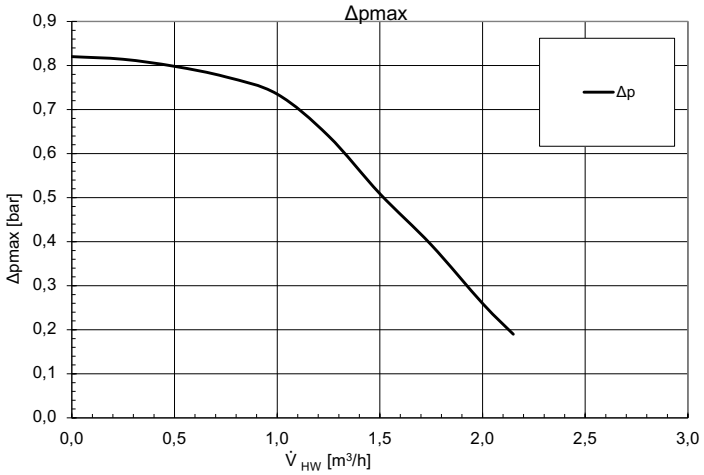
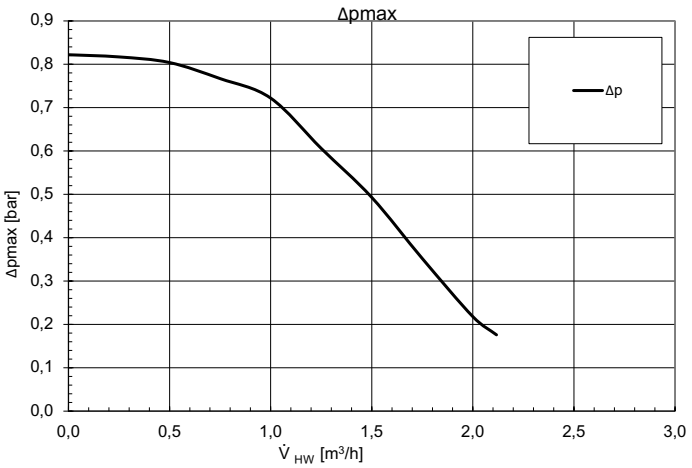
Free pressing

HSV 9M1/3



823284

HSDV 9M1/3

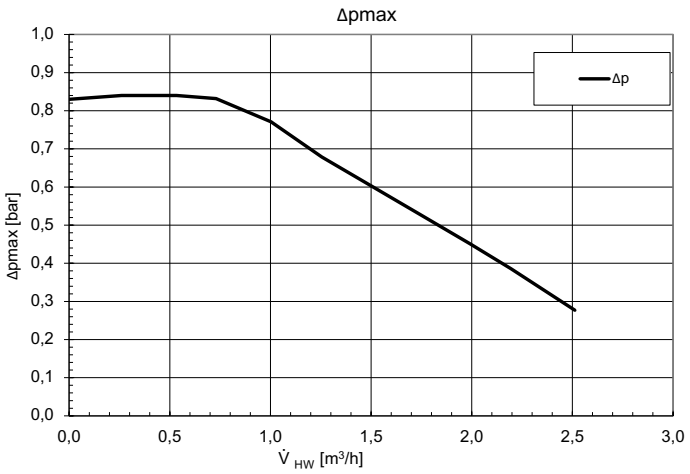


823288

Keys: UK823284 / UK823288

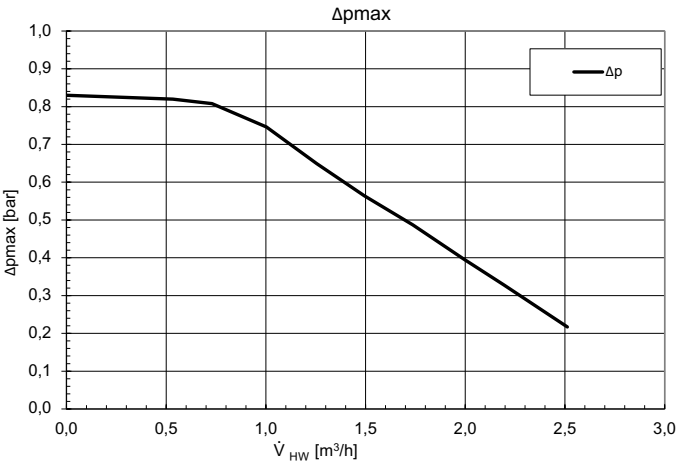
$\dot{V}_{HW}$	Volumetric flow of hot water
Δpmax	Maximum free pressing

HSV 12.1M3



823312

HSDV 12.1M3



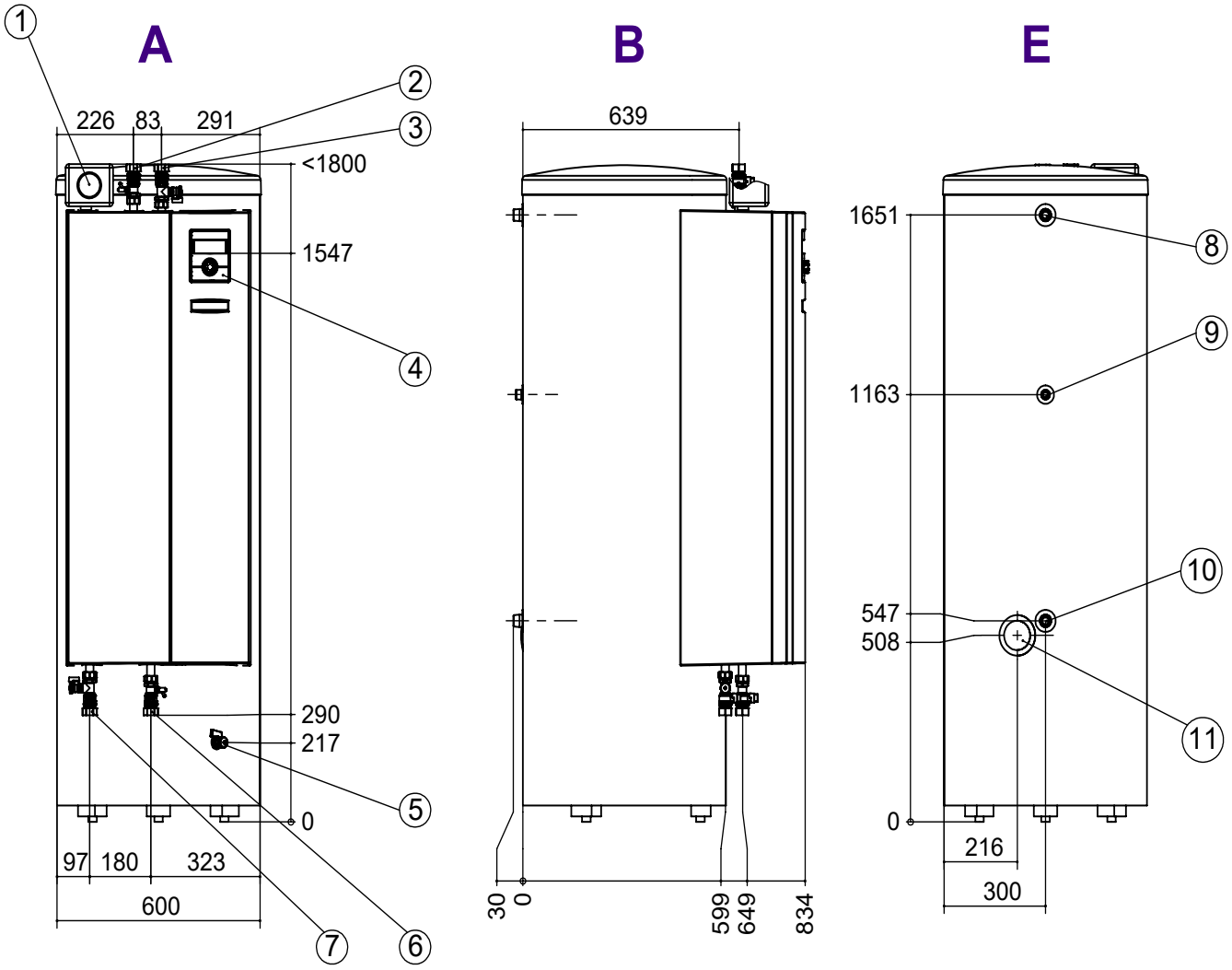
823313

Keys: UK823285 / UK823289

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

Dimensioned drawings

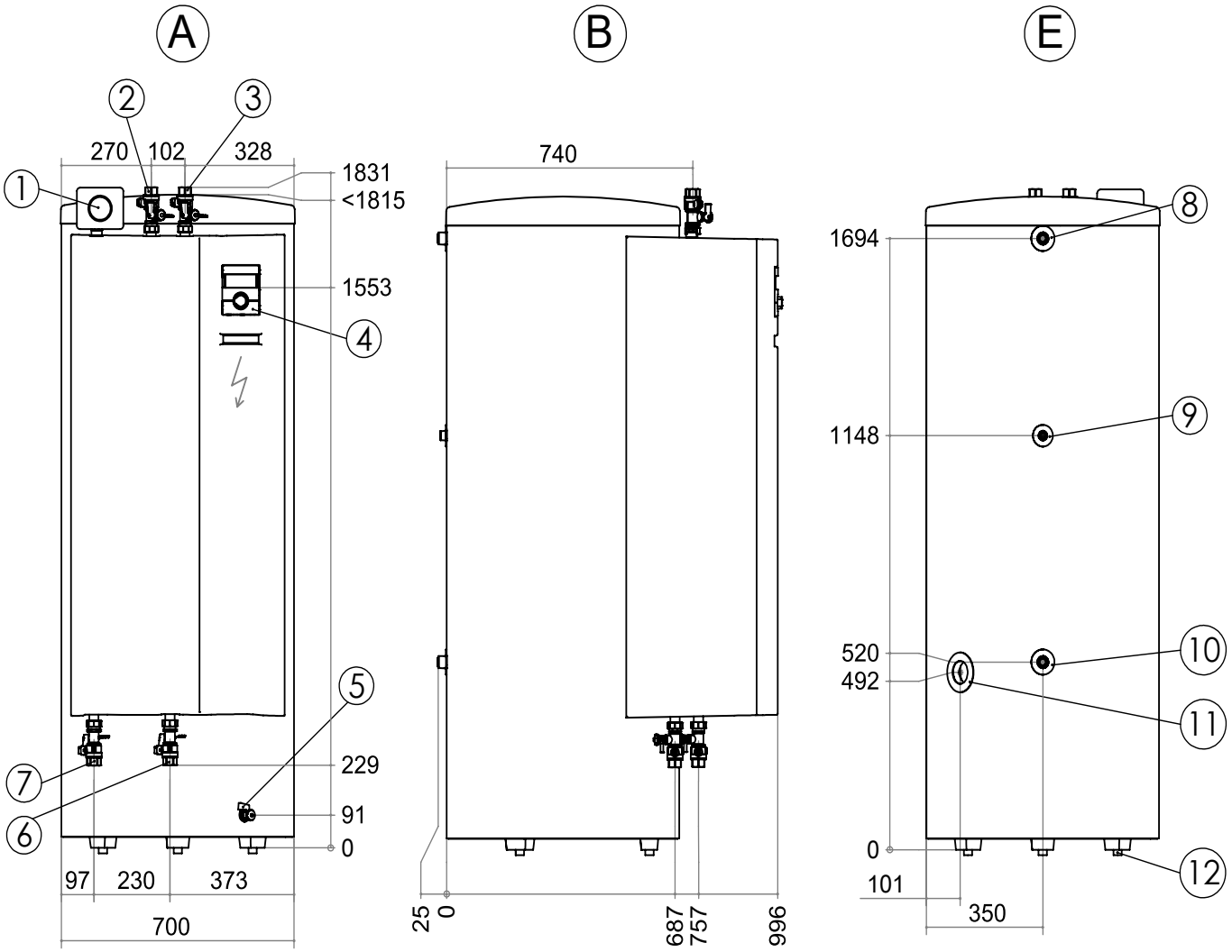
HS(D)V 9M1/3



Keys: UK819417a

All dimensions in mm.

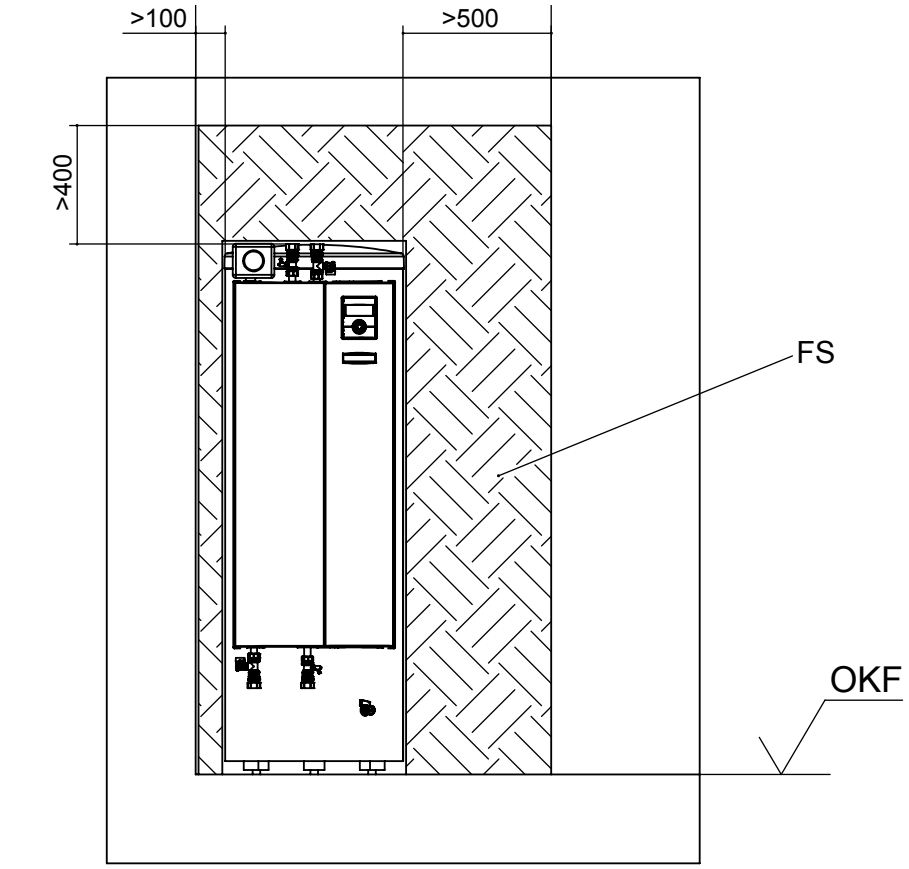
Pos.	Name	Dim.
A	Front view	
B	Side view from left	
E	Rear view	
1	Safety module	
2	Heating water inlet (return)	Rp 1" internal thread
3	Heating water outlet (flow)	Rp 1" internal thread
4	Control panel	
5	Emptying, buffer tank	G ½"
6	Hot water inlet (from heat pump)	Rp 1" internal thread
7	Hot water outlet (to heat pump)	Rp 1" internal thread
8	Domestic hot water	R 1" external thread
9	Circulation pump	R ¾" external thread
10	Cold water	R 1" external thread
11	Penetrations for electric/sensor cables	

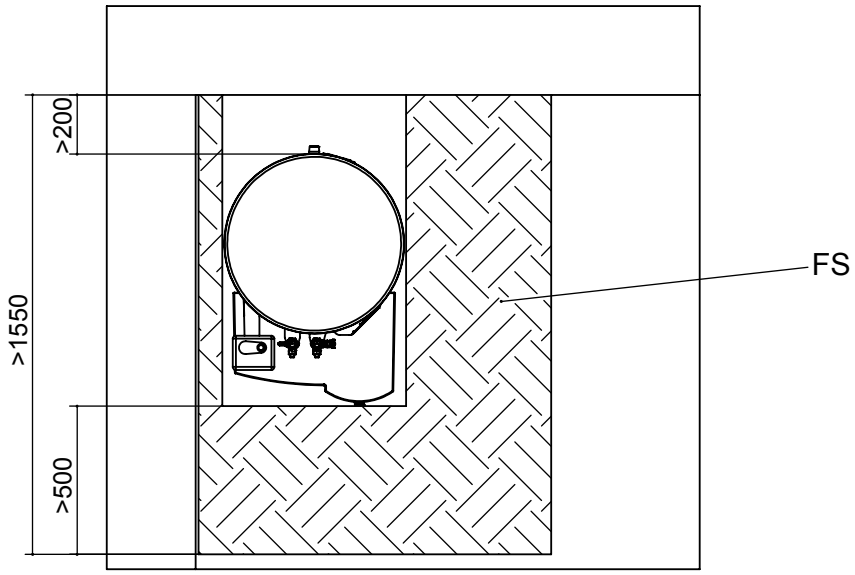


Keys: UK819511

All dimensions in mm.

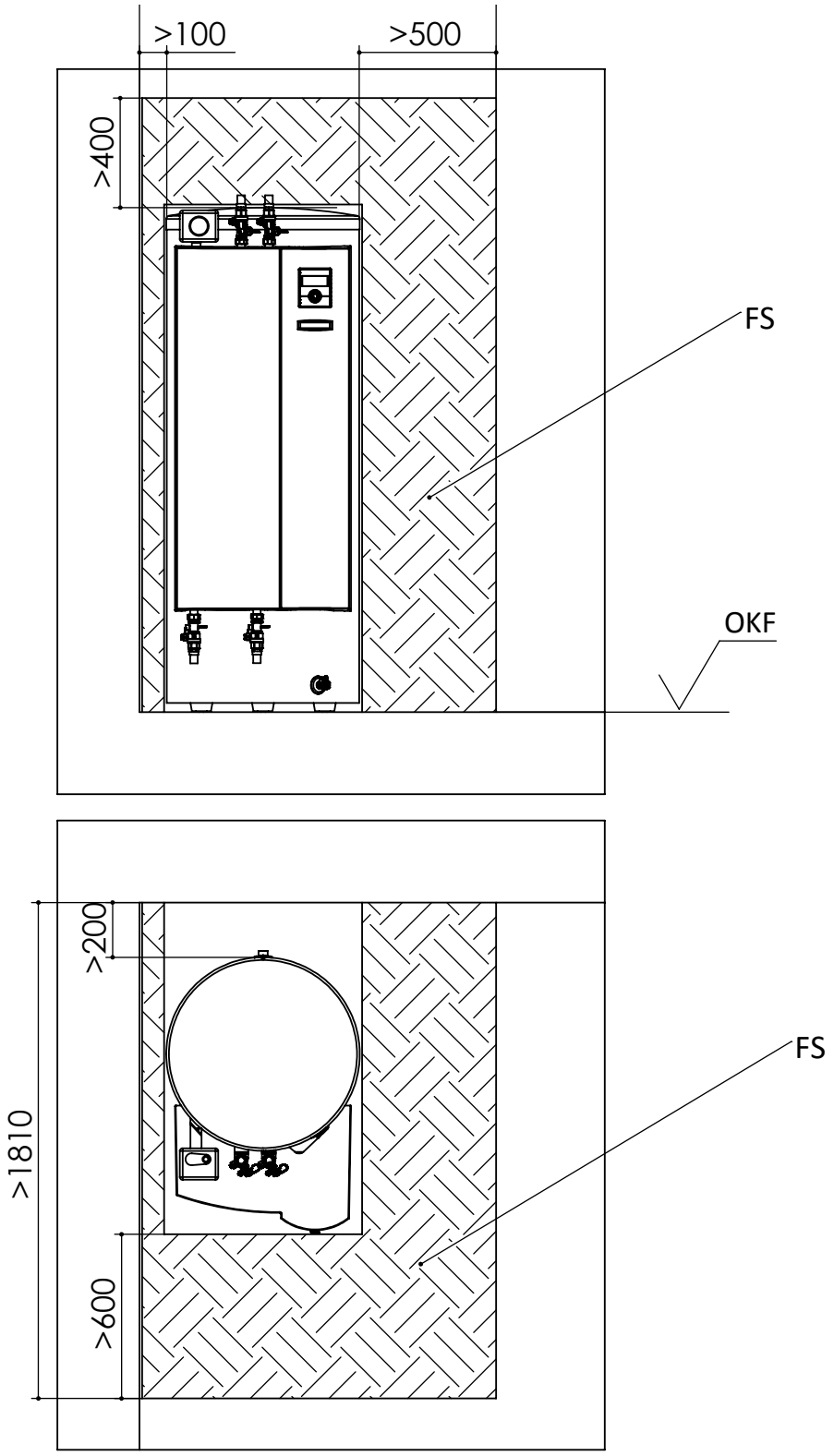
Pos.	Name	Dim.
A	Front view	
B	Side view from left	
E	Rear view	
1	Safety module	
2	Heating water inlet (return)	Rp 1" internal thread
3	Heating water outlet (flow)	Rp 1" internal thread
4	Control panel	
5	Emptying, buffer tank	Rp ½" internal thread
6	Hot water inlet (from heat pump)	Rp 1" internal thread
7	Hot water outlet (to heat pump)	Rp 1" internal thread
8	Domestic hot water	R 1" external thread
9	Circulation pump	R ¾" external thread
10	Cold water	R 1" external thread
11	Penetrations for electric/sensor cables	
12	Adjusting foot M12 (3x) variable height, additional 15-30mm	





Keys: UK819418
All dimensions in mm.

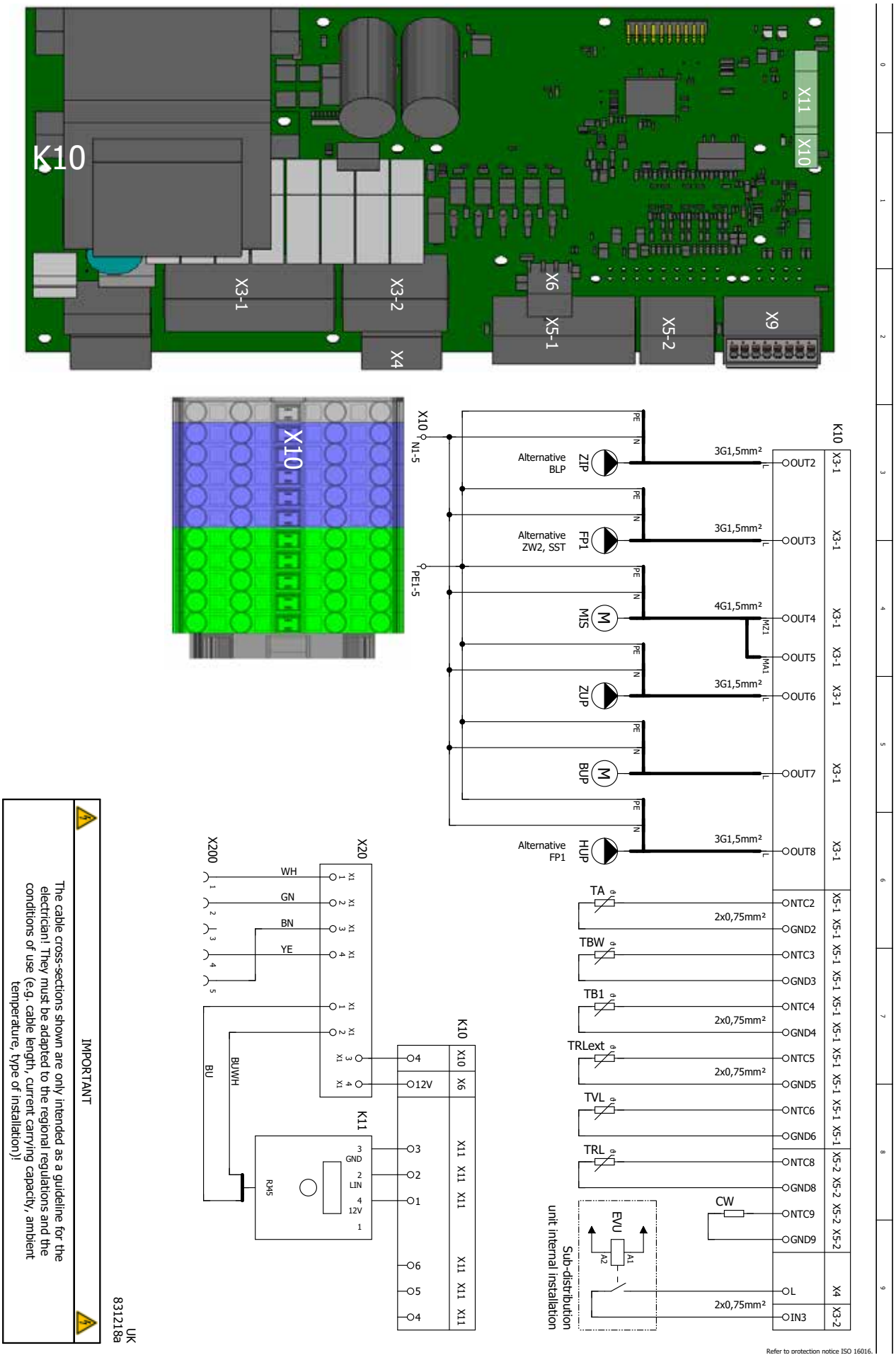
Pos.	Name
FS	Free space for service purposes
OKF	Top edge of finished floor



Keys: UK819490

All dimensions in mm.

Pos.	Name
FS	Free space for service purposes
OKF	Top edge of finished floor



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)!

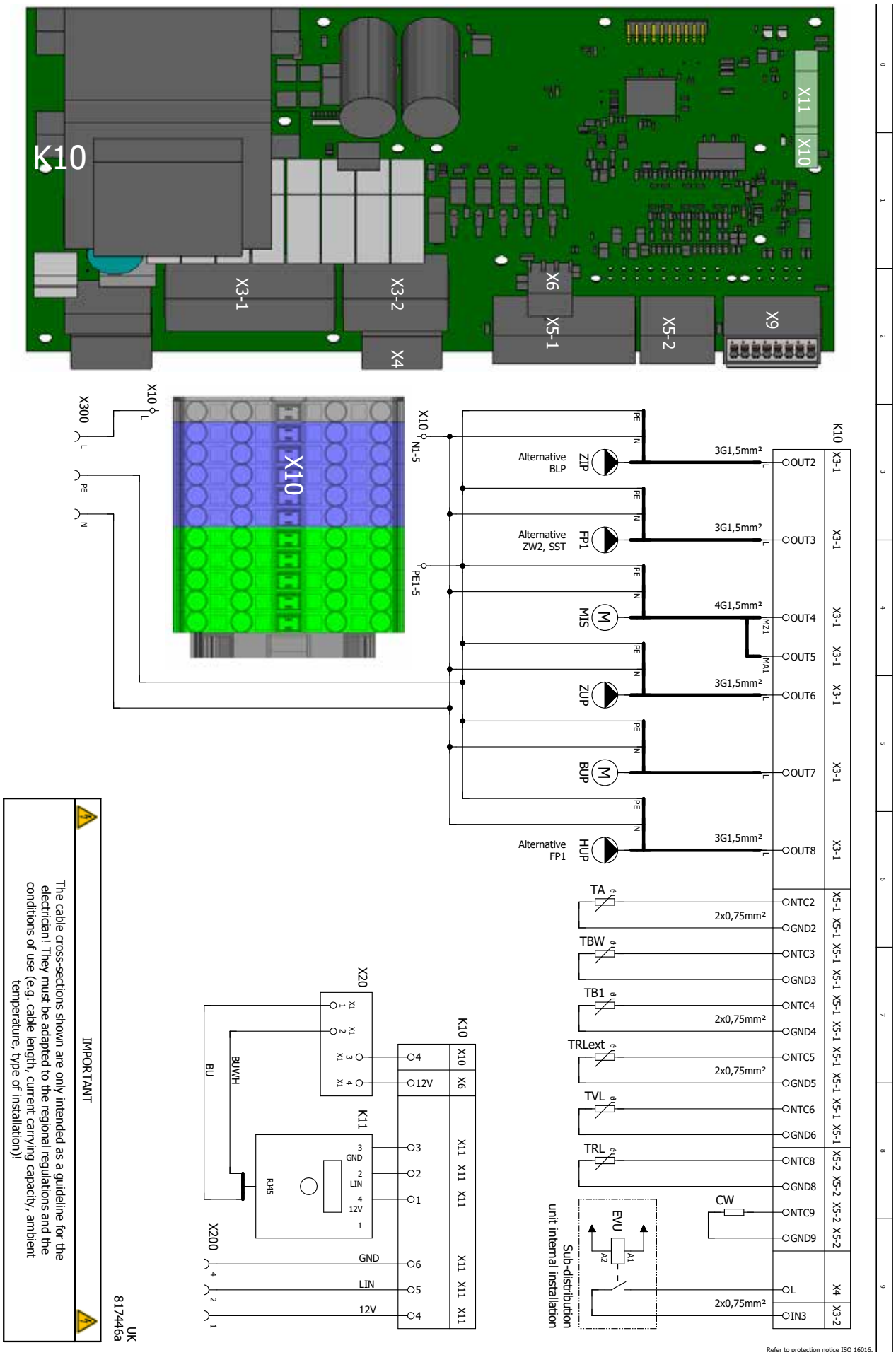
UK 83121 8a

Terminal diagram 2/2

UK 831218a

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	X
TRLext.	External return sensor	
TVL	Flow sensor	X
VBO	Brine pump	
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
X20
X1
BU
BUWH
RJ45
K11
GND
LIN
12V
X200
X10
X6
X11
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 817446a
Refer to protection notice ISO 16016.

Terminal diagram 2/2

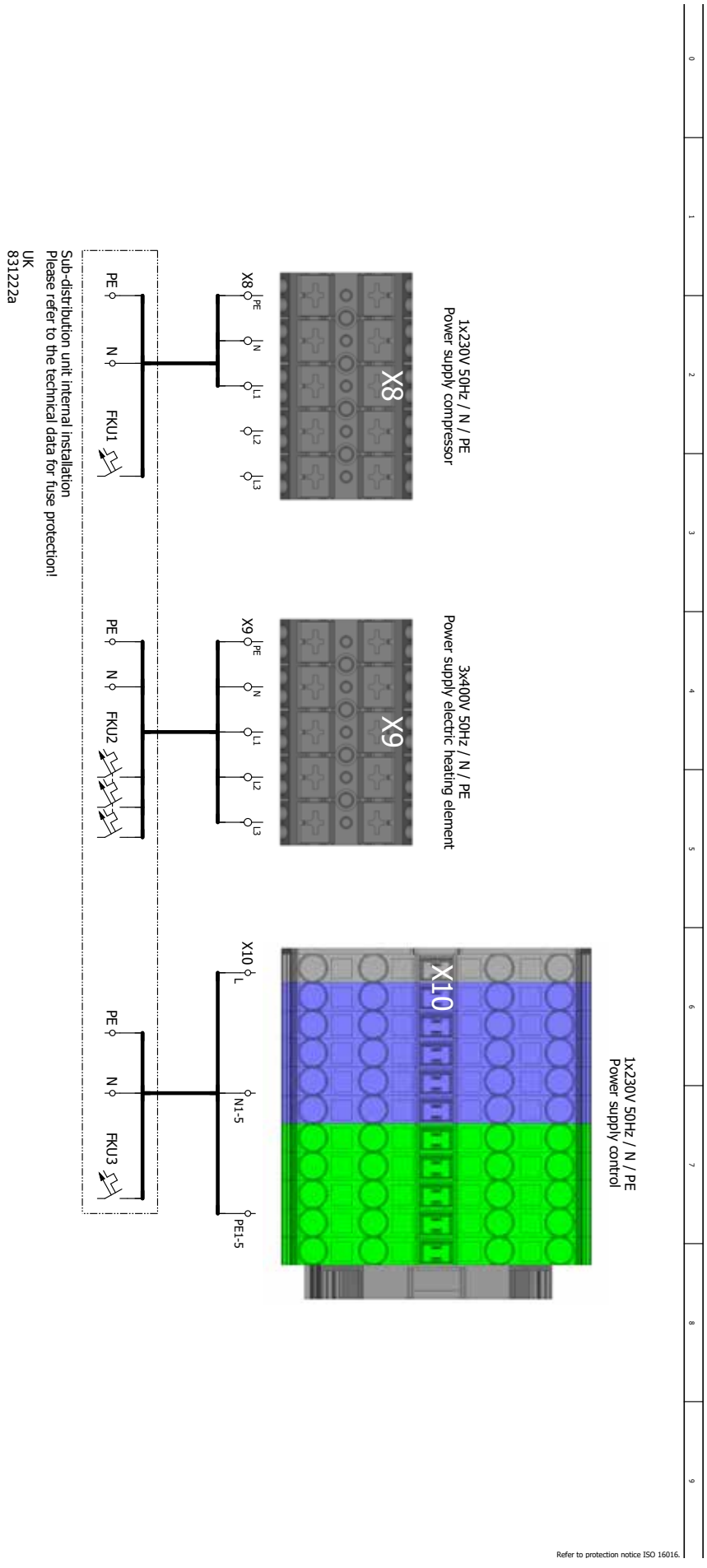
UK 817446a

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	
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	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.

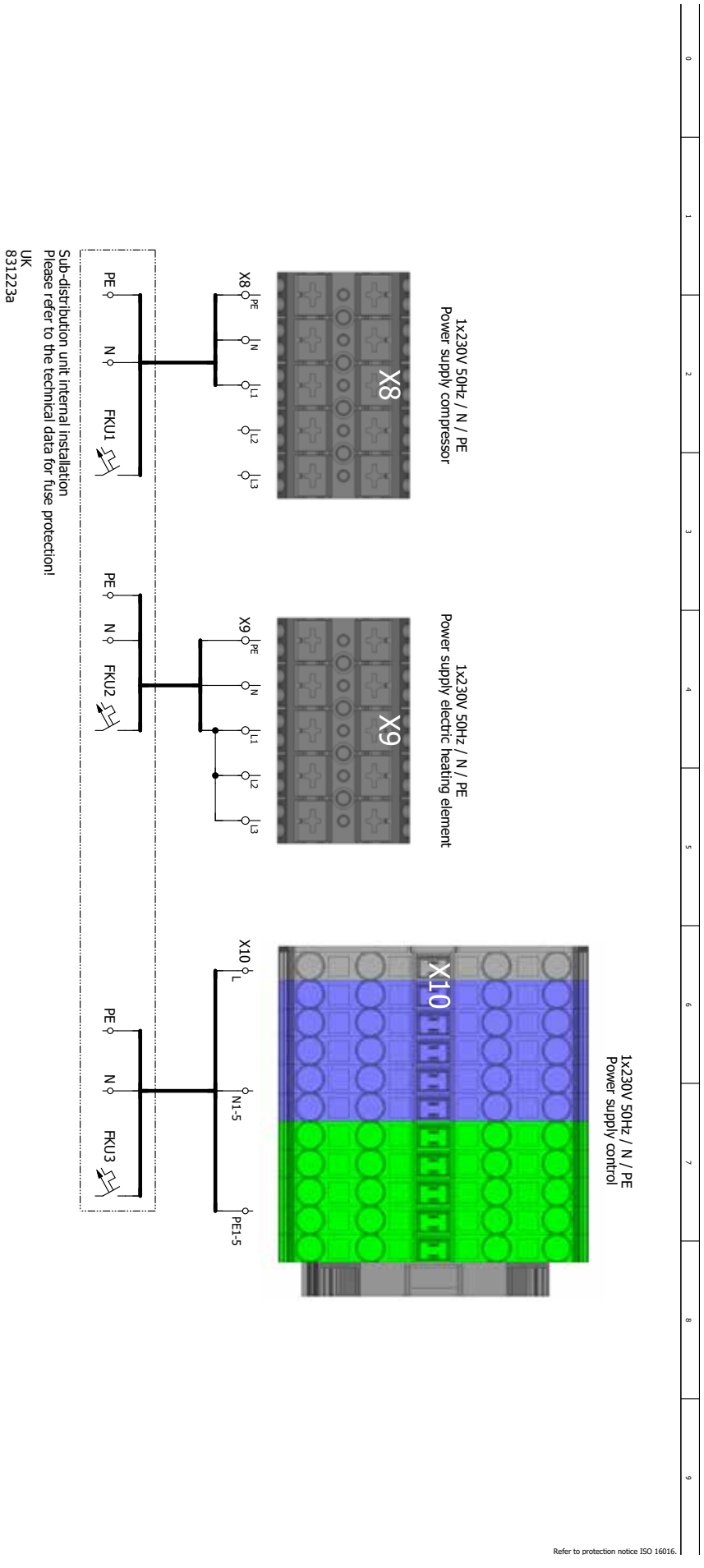
Terminal diagram, mains connection heat pump 1~230V + electric heating element 3~400V

HS(D)V 9M1/3
HS(D)V 12.1M3



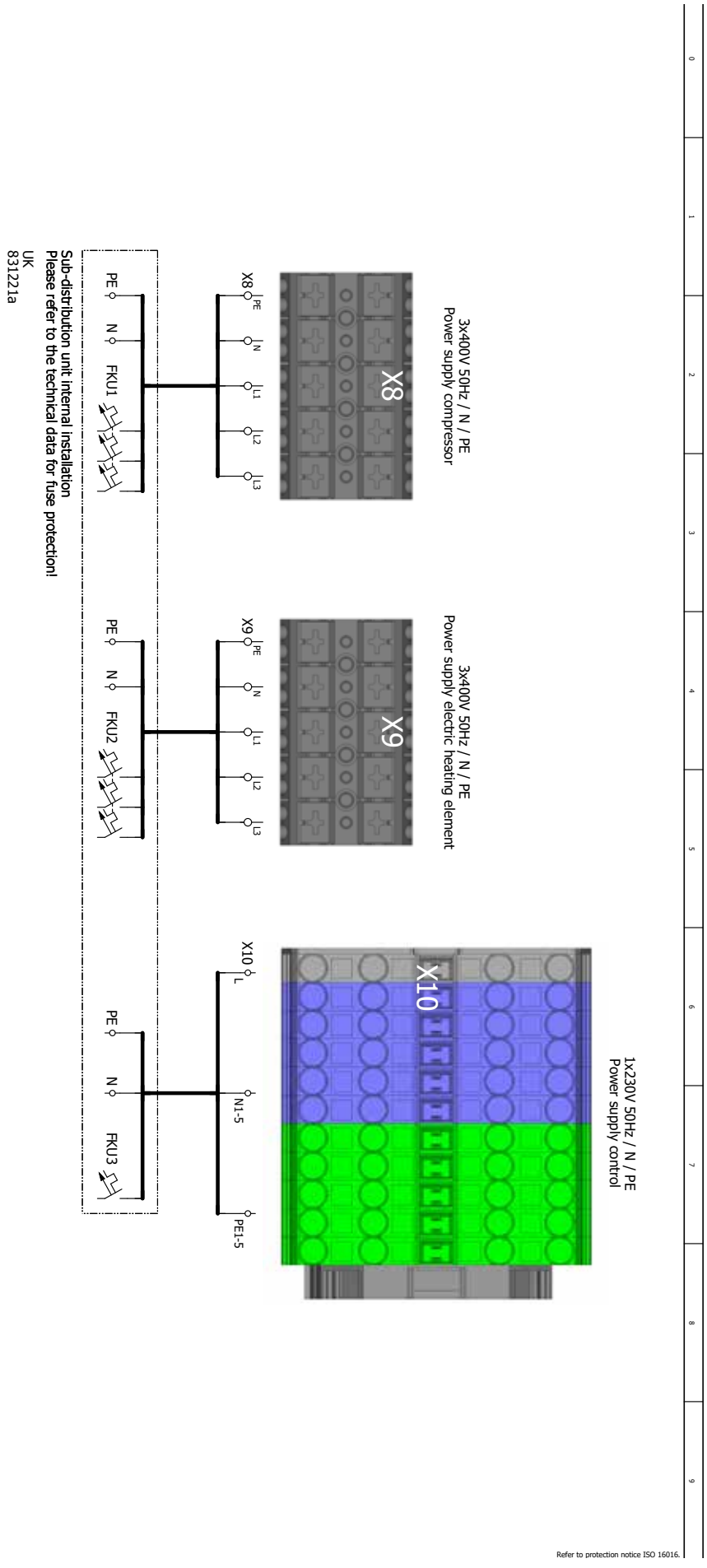
Equipement	Description
FKU1	Circuit breaker compressor
FKU2	Circuit breaker electric heating element
FKU3	Circuit breaker control
X8	Terminal for compressor
X9	Terminal for electric heating element
X10	Terminal for control

HS(D)V 9M1/3 Terminal diagram, mains connection heat pump 1~230V + electric heating element 1~230V

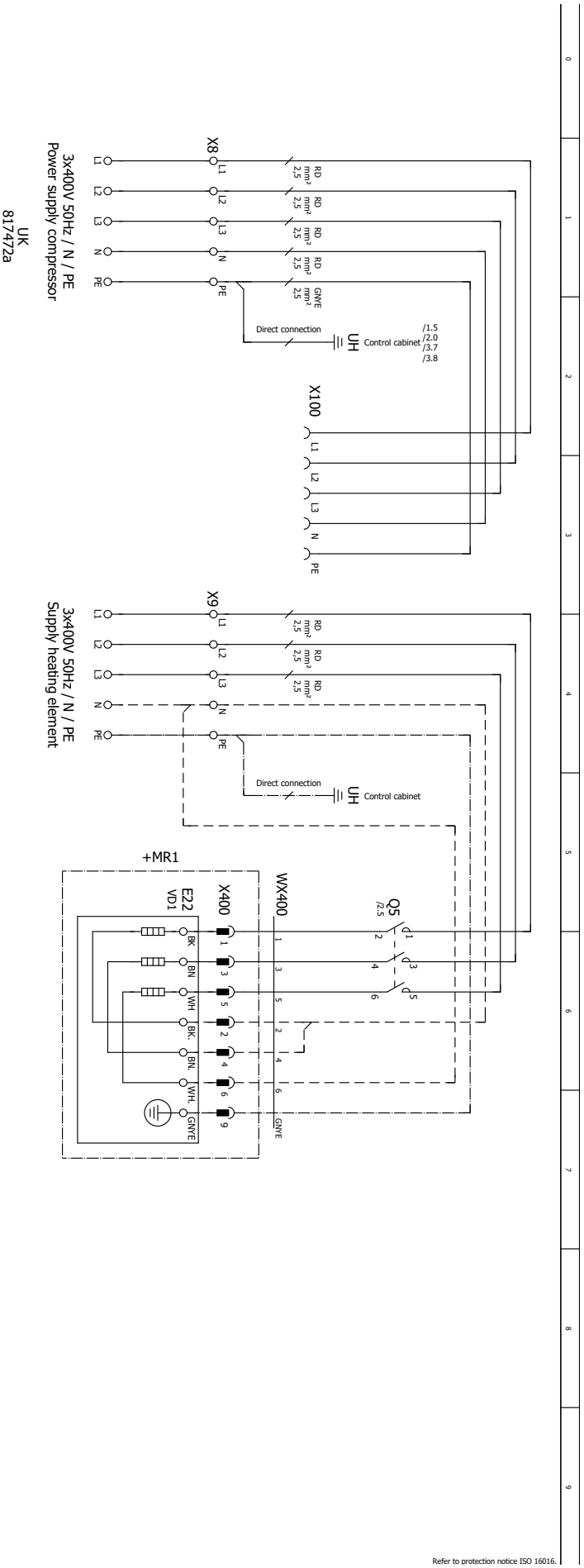


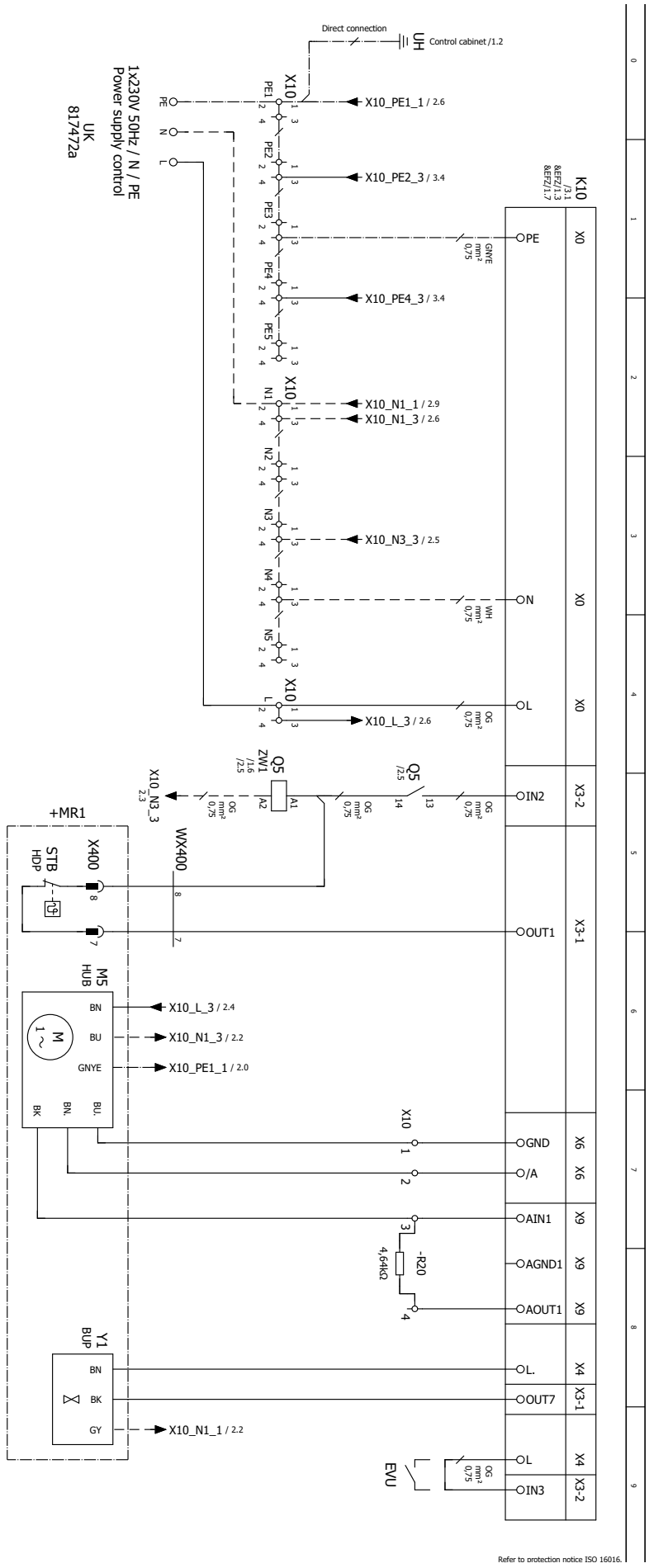
Equipement	Description
FKU1	Circuit breaker compressor
FKU2	Circuit breaker electric heating element
FKU3	Circuit breaker control
X8	Terminal for compressor
X9	Terminal for electric heating element
X10	Terminal for control

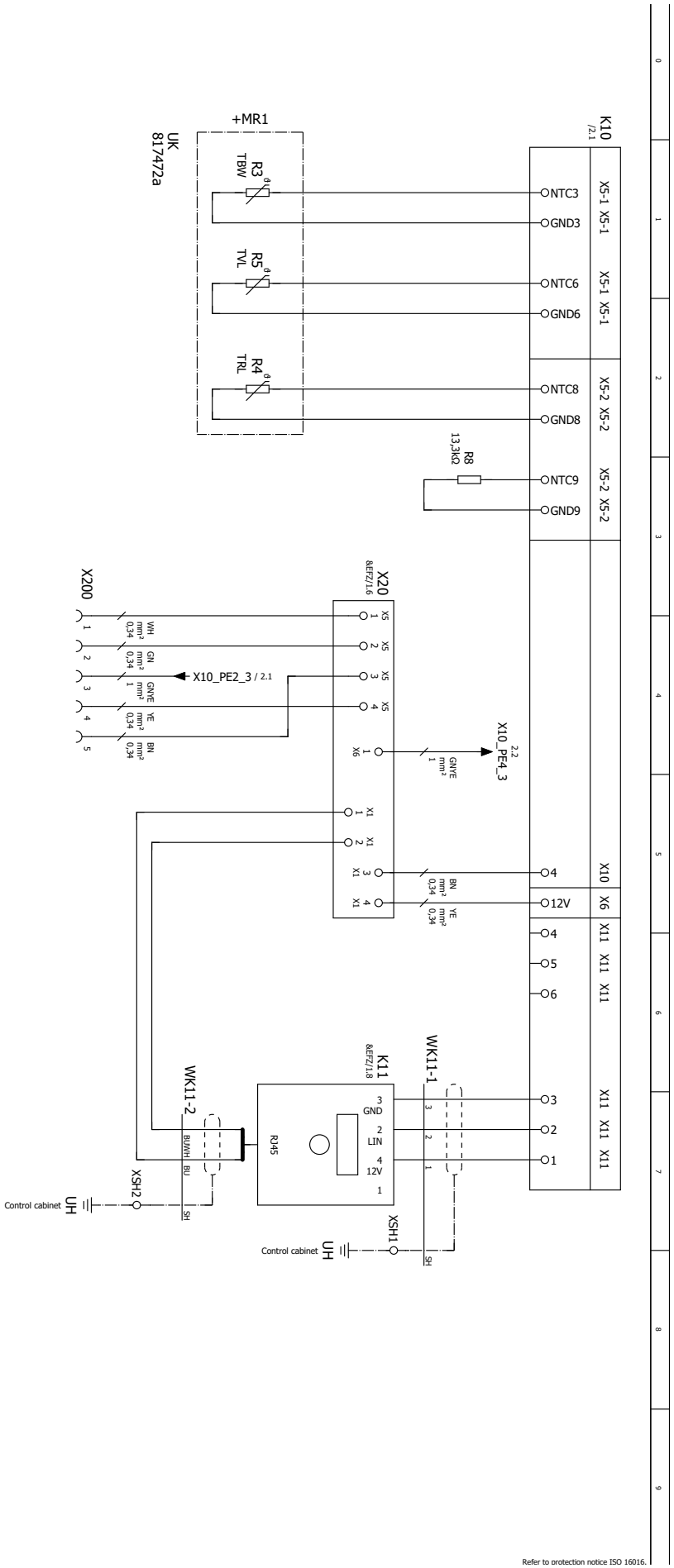
Terminal diagram, mains connection heat pump 3~400V HS(D)V 12.1M3 + electric heating element 3~400V



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

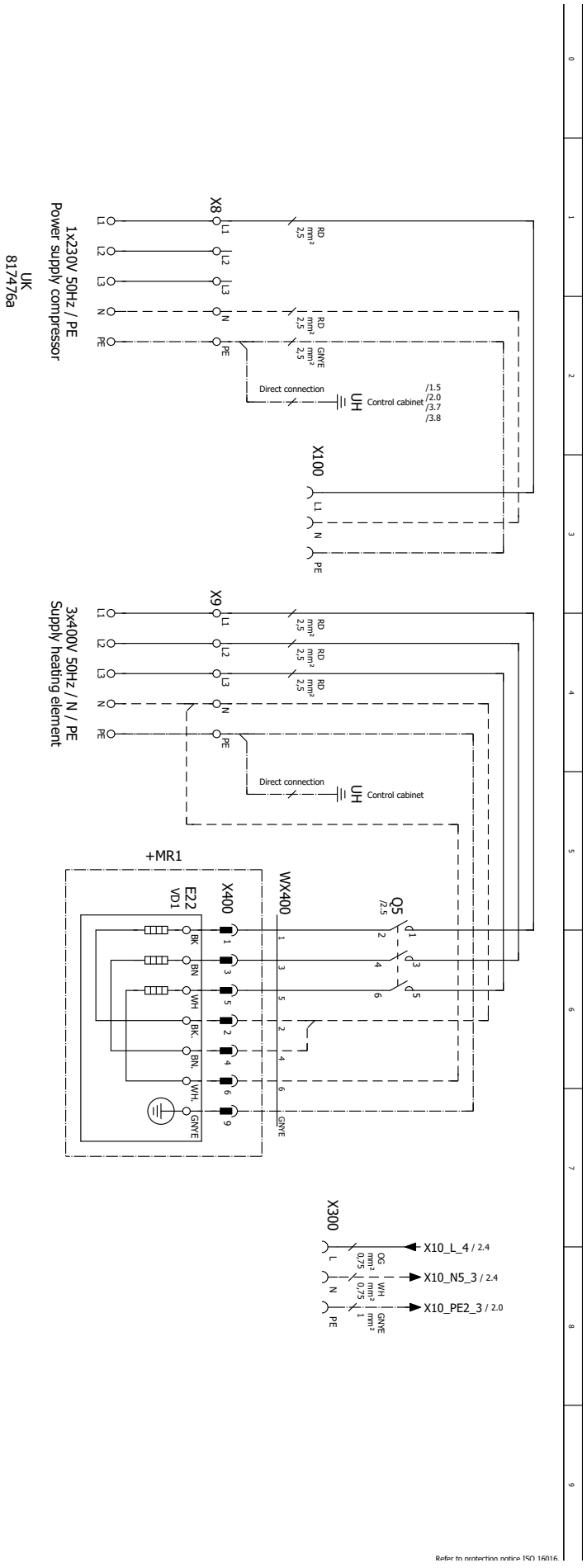

UK
81747a
3x400V 50Hz / N / PE
Power supply compressor
X8
L1
L2
L3
N
PE
RD mm² 2,5
GNYE mm² 2,5
Direct connection
UH
Control cabinet
/1.5
/2.0
/3.7
/3.8
X100
3x400V 50Hz / N / PE
Supply heating element
X9
+MR1
E22
VD1
X400
WX400
Q5
/2.5
BK
BN
WH
BK.
BN.
WH.
GNYE
Refer to protection notice ISO 16016.

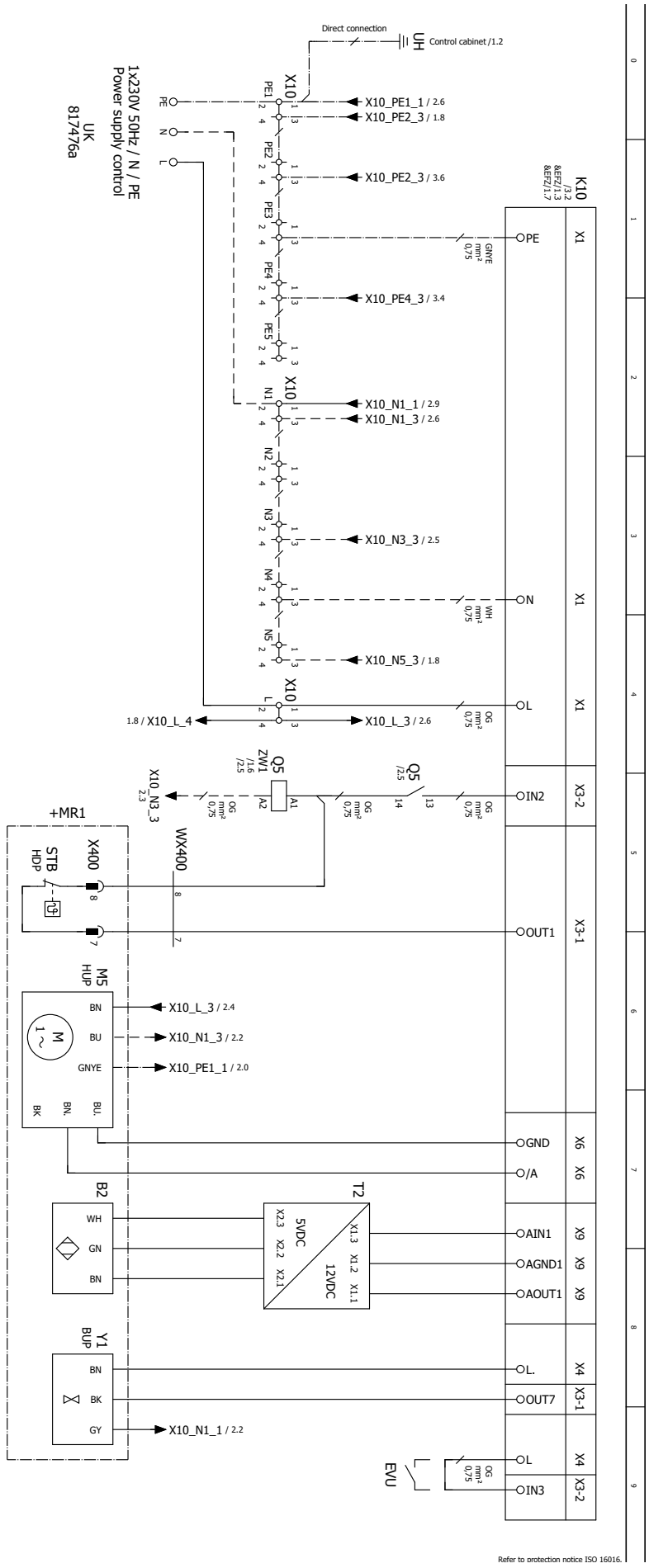

Direct connection
UH
Control cabinet /1.2
1x230V 50Hz / N / PE
Power supply control
UK
81747a
PE
N
L
X10
PE1
PE2
PE3
PE4
PE5
N1
N2
N3
N4
N5
X10_PE1_1 / 2.6
X10_PE2_3 / 3.4
X10_PE4_3 / 3.4
X10_N1_1 / 2.9
X10_N1_3 / 2.6
X10_N3_3 / 2.5
X10_L_3 / 2.6
K10
&EFZ/1.3
&EFZ/1.7
PE
N
L
X0
GNYE mm² 0,75
WH mm² 0,75
OG mm² 0,75
Q5
ZW1
/1.6
/2.5
/2.5
A1
A2
13
14
IN2
X3-2
X10_N3_3
2.3
+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
X10
GND
/A
AIN1
AGND1
AOUT1
X6
X9
-R20
4,64kΩ
Y1
BUP
BN
BK
GY
X10_N1_1 / 2.2
L.
OUT7
X4
X3-1
EVU
L
IN3
X4
X3-2
Refer to protection notice ISO 16016.

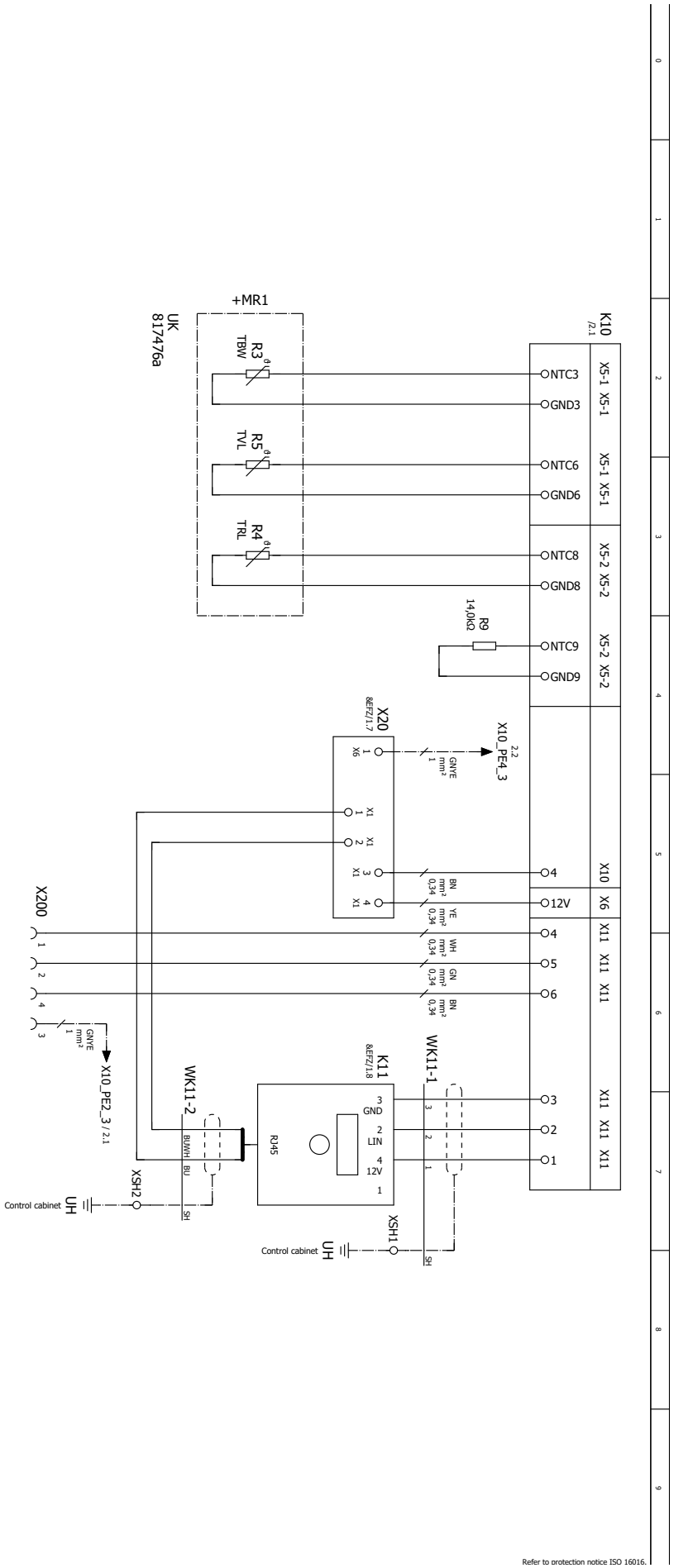

+MR1
UK 817472a
R3 TBW
R5 TVL
R4 TRL
R8 13,3kΩ
K10 /2.1
X5-1
X5-2
NTC3
GND3
NTC6
GND6
NTC8
GND8
NTC9
GND9
X10
X6
12V
X11
X200
X20 &EFZ/1.6
X10_PE2_3 / 2.1
X10_PE4_3 2.2
WH mm² 0,34
GN mm² 0,34
GNYE mm² 1
YE mm² 0,34
BN mm² 0,34
K11 &EFZ/1.8
WK11-1
WK11-2
RJ45
GND
LIN
12V
BU/WH
BU
SH
XSH1
XSH2
Control cabinet
Refer to protection notice ISO 16016.

Equipement	Description
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; HDT6LWD 13,3kOhm; HDT9LWD 14,7KOhm
STB	Temperature shutdown Electric heating element
WK11-1	Connection cable control panel
WK11-2	Connection cable control panel
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
Y1	Domestic hot water valve
+MR1	Machinery room

Refer to protection notice ISO 16016.


UK
81476a
1x230V 50Hz / PE
Power supply compressor
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
Supply heating element
X9
+MR1
E22
VD1
X400
WX400
Q5
/2.5
BK
BN
WH
BK.
BN.
WH.
GNYE
X300
X10_L_4 / 2.4
X10_N5_3 / 2.4
X10_PE2_3 / 2.0
OG mm² 0,75
WH mm² 0,75
GNYE mm² 1
Refer to protection notice ISO 16016


Direct connection
UH Control cabinet /1.2
1x230V 50Hz / N / PE
Power supply control
UK
81476a
PE
N
L
X10
PE1
PE2
PE3
PE4
PE5
N1
N2
N3
N4
N5
X10_PE1_1 / 2.6
X10_PE2_3 / 1.8
X10_PE2_3 / 3.6
X10_PE4_3 / 3.4
X10_N1_1 / 2.9
X10_N1_3 / 2.6
X10_N3_3 / 2.5
X10_N5_3 / 1.8
X10_L_3 / 2.6
1.8 / X10_L_4
K10
&EFZ/3.2
&EFZ/1.3
&EFZ/1.7
PE
N
L
GNYE mm² 0,75
WH mm² 0,75
OG mm² 0,75
X1
IN2
X3-2
OUT1
X3-1
GND
/A
X6
AIN1
AGND1
AOUT1
X9
L.
OUT7
X4
X3-1
IN3
X3-2
Q5 ZW1 /1.6 /2.5
Q5 /2.5
X10_N3_3 2.3
A1
A2
13
14
+MR1
WX400
X400
STB HDP
M5 HUP
BN
BU
GNYE
BK
X10_L_3 / 2.4
X10_N1_3 / 2.2
X10_PE1_1 / 2.0
B2
WH
GN
BN
T2
5VDC
12VDC
Y1 BUP
GY
X10_N1_1 / 2.2
EVU
Refer to protection notice ISO 16016.


+MR1
UK 817476a
R3 TBW
R5 TVL
R4 TRL
R9 14,0kΩ
K10
/2.1
X5-1
X5-2
X10
X6
X11
NTC3
GND3
NTC6
GND6
NTC8
GND8
NTC9
GND9
12V
X20
&EFZ/1.7
X6
X1
X10_PE4_3
2.2
GNYE
mm²
BN
YE
WH
GN
0,34
X200
X10_PE2_3
/ 2.1
K11
&EFZ/1.8
WK11-1
WK11-2
RJ45
GND
LIN
12V
BU/WH
BU
SH
XSH2
XSH1
Control cabinet
UH
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
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 10,5kOhm; HDT9LWD 11,5kOhm
STB	Safety temperature limiter, additional heating
T2	Voltage converter
WK11-1	Connection cable control panel
WK11-2	Connection cable control panel
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	LIN-Bus
X300	Power supply controller 230V
X400	Power supply electric heating element
XSE	Sensorcard
XSH	Shield clamp Control unit
Y1	Domestic hot water valve
+MR1	Machinery room

Refer to protection notice ISO 16016.

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