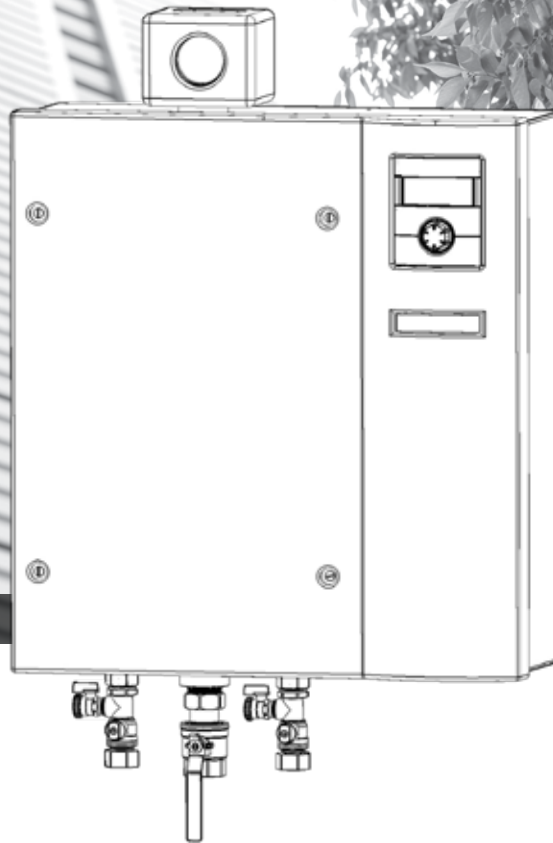
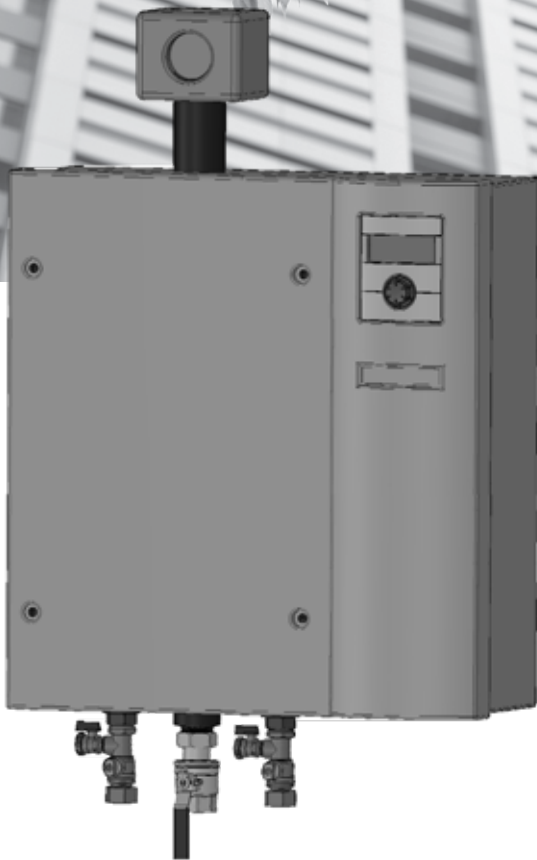
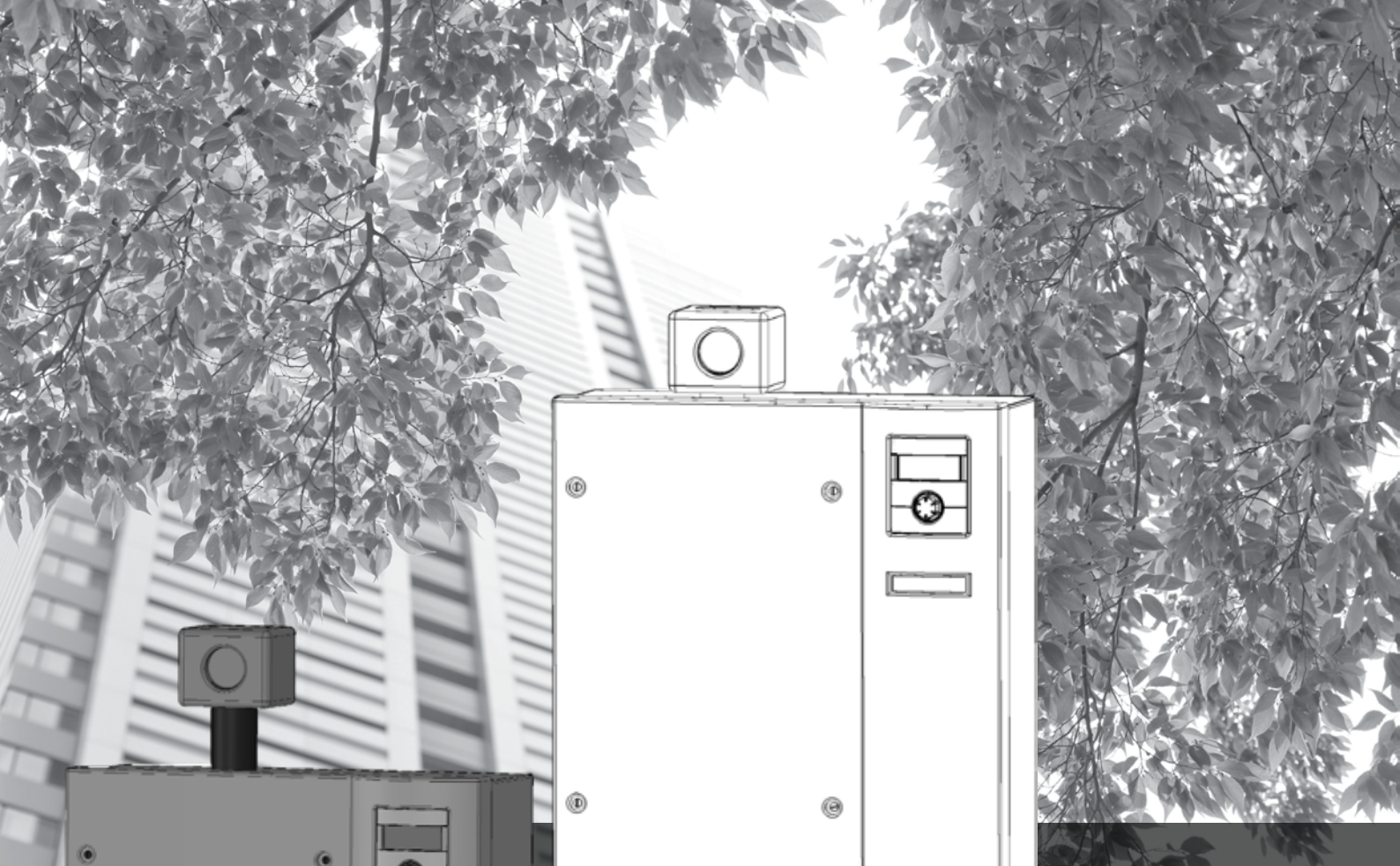


*the better way to heat*



Accessories for  
two Dual Air / Water Heat Pumps

# Operating Manual

Hydraulic Module 2

HMD 2/(S)E

HMD 2/R(S)E

83055500bUK – Translation into English of the original German operating manual





## Please read first

This operating manual provides important information on handling the unit. It is an integral part of the product and must be kept ready to hand in the immediate vicinity of the unit. It must remain available throughout the entire service life of the unit. It must be handed over to subsequent owners or users of the unit.

Read the operating manual before working on or operating the unit. This applies in particular to the chapter on safety. Always follow all instructions completely and without restrictions.

It is possible that this operating manual may contain instructions that seem incomprehensible or unclear. In the event of any questions or if any details are unclear, contact the factory customer service department or the manufacturer's local partner.

As this operating manual has been written for several unit models, always comply with the parameters for the respective model.

This operating manual is intended only for persons assigned to work on or with the unit. Treat all constituent parts confidentially. The information contained herein is protected by copyright. No part of this manual may be reproduced, transmitted, copied, stored in electronic data systems or translated into another language, either wholly or in part, without the express written permission of the manufacturer.

## Symbols

The following symbols are used in the operating manual. They have the following meaning:



Information for operators.



Information or instructions for qualified technicians.



### **DANGER!**

Indicates a direct impending danger resulting in severe injuries or death.



### **WARNING!**

Indicates a potentially dangerous situation that could result in serious injuries or death.



### **CAUTION!**

Indicates a potentially dangerous situation that could result in moderate or slight injuries.



### **ATTENTION**

Indicates a potentially dangerous situation, which could result in property damage.



### **NOTE**

Emphasised information.



### **ENERGY SAVING TIP**

Indicates suggestions that help to save energy, raw materials and costs.



Reference to other sections of the operating manual.



Reference to other documents of the manufacturer.



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## Intended use

The hydraulic module is a functionally relevant accessory for dual air/water heat pumps intended for outdoor installation. Taking into account the limits of use, the unit can be used in conjunction with up to two dual air/water heat pumps installed outdoors in new or existing heating systems.

The unit must be used solely for its intended purpose. This means, in conjunction with a dual air/water heat pump:

- for heating.
- for cooling (reversible variant only).
- for water heating.

The unit may be operated only within its technical parameters.



“Technical Data /Scope of Supply” overview from Page 18 and “Technical Data /Scope of Supply” overview of the operating manual of the heat pump to which the hydraulic module is connected.

## Disclaimer

The manufacturer is not liable for damage or losses resulting from any use of the unit which is not its intended use.

The manufacturer's liability also expires:

- if work is carried out on the unit and its components contrary to the instructions in this operating manual.
- if work is carried out improperly on the unit and its components.
- if work is carried out on the unit which is not described in this operating manual, and this work has not been explicitly approved by the manufacturer in writing.
- if the unit or components in the unit have been altered, modified or removed without the explicit written consent of the manufacturer.

## Safety and Security

The unit is safe to operate for its intended use. The construction and design of the unit conform to current state-of-the-art standards, all relevant DIN/VDE regulations and all relevant safety regulations.

Every person who performs work on the unit must have read and understood the operating manual prior to starting any work. This also applies if the respective person has already worked with such a unit or a similar unit or has been trained by the manufacturer.

Every person who performs work on the unit must comply with the applicable accident prevention and safety regulations. This applies in particular to the wearing of personal protective equipment.



### **DANGER!**

**Risk of fatal electric shock!**

**All electrical connection work must be carried out by qualified electricians only.**

**Before opening the unit, disconnect the system from the power supply and prevent it from being switched back on!**



### **WARNING!**

**Only qualified personnel (trained heating, cooling engineers and electricians) may carry out work on the unit and its components.**



### **WARNING!**

**Observe safety labels on and in the unit.**



### **ATTENTION**

For safety reasons:

Never disconnect the unit from the power supply system, unless the unit is being opened.



## Customer Services

For technical information please contact your local heating engineer or the manufacturer's local partner.

For a current list and additional partners of the manufacturer, please visit

EU: [www.alpha-innotec.com](http://www.alpha-innotec.com)

DE: [www.alpha-innotec.de](http://www.alpha-innotec.de)

## Warranty / Guarantee

For warranty and guarantee conditions, please refer to the purchase documents.



### NOTE

Please contact your dealer about all matters concerning warranties and guarantees.

## Waste disposal

When decommissioning the unit, always comply with applicable laws, directives and standards for the recovery, recycling and disposal of materials and components.



“Dismantling”, Page 17

## Heat metering

In addition to proof of the unit's efficiency, the EEWaermeG also requires heat metering (hereafter referred to as HQR). Heat metering is mandatory for air/water heat pumps. A WME (heat metering) only has to be installed for brine/water and water/water heat pumps for a flow temperature  $\geq 35$  °C. The WME must record the total thermal energy output (heating and hot water) in the building. In heat pumps with heat metering, the analysis is carried out by the regulator. The regulator displays the thermal energy discharged in the heating system in kWh.

## Operation

Your decision to purchase a heat pump or a heat pump system is a long-term contribution to protecting the environment through low emissions and reduced primary energy use.

You can operate and control the heat pump system with the control element of the heating and heat pump regulator.



### NOTE

Make sure that the control settings are correct.



Operating manual of the heating and heat pump controller.

To ensure that your heat pump or heat pump system operates efficiently and ecologically, the following are especially important:



### ENERGY SAVING TIP

Avoid unnecessarily high flow temperatures. A lower flow temperature on the hot water side increases the efficiency of the system.



### ENERGY SAVING TIP

Preferably use purge ventilation. Compared to continuously open windows, it is better to air rooms by fully opening windows for a short period, two to three times a day (so-called “rapid” or “purge” ventilation); this reduces energy consumption and your heating bill.





## Care of the unit

The outer surfaces of the unit can be cleaned with a damp cloth and standard cleaning products.

Do not use cleaning or care products that contain abrasives, acids and/or chlorine. Such products would destroy the surfaces and could also damage the technical components of the unit.

## Maintenance of the unit

The components of the heating circuit and the heat source (valves, expansion vessels, circulation pumps, filters, dirt traps) should be checked and cleaned as necessary, however, at least annually, by qualified personnel (heating or cooling system fitters).

It is best to sign a maintenance agreement with a heating installation company. The company will arrange for the required maintenance at regular intervals.

## Malfunctions

In the event of a fault, you can read out the cause of the fault from the diagnostic program of the heating and heat pump regulator.



Operating manual of the heating and heat pump controller.

### ! ATTENTION

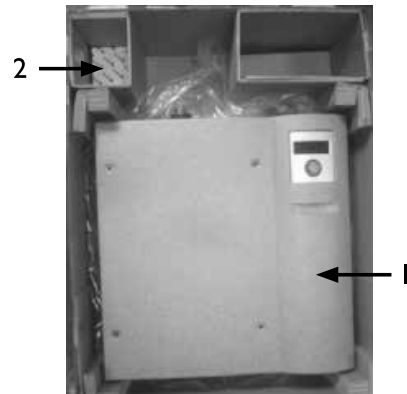
Only customer service personnel authorised by the manufacturer may carry out service and repair work on the components of the unit.

Note that no malfunction is displayed if the safety temperature limiter on the electric heating element has tripped.



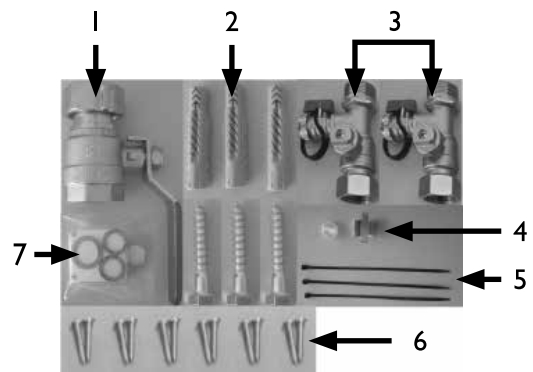
“Commissioning”, “Safety temperature limiter” section. Page 16

## Scope of supply



- 1 Hydraulic module with integrated heating and heat pump controller
- 2 Safety assembly  
(in the case of the reversible variant these are the half-shells for insulation. The safety assembly itself is preassembled and installed.)

Example of layout of the accessory package:



- 1 Ball valve DN 32 (1x)
- 2 Screws and anchors for wall bracket (3x each)
- 3 Ball valves DN 20 (2x)
- 4 Heat transfer paste and clip for fixing the return flow sensor
- 5 Cable ties
- 6 Strain relief screws (12x)
- 7 Flat seals: 1" (2x), 1/4" (1x)

not shown:

- Stickers for unit and cable labelling
- 2 jumpers for operation in the 230 V power supply system

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



### NOTE

Note the unit model.

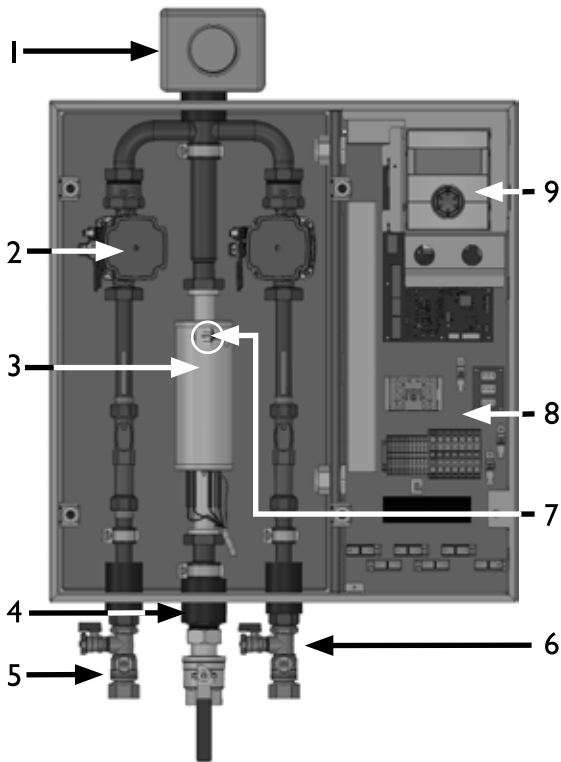


“Technical Data /Scope of Supply” overview from Page 18 or rating plate on the unit.

## COMPONENTS OF THE UNIT

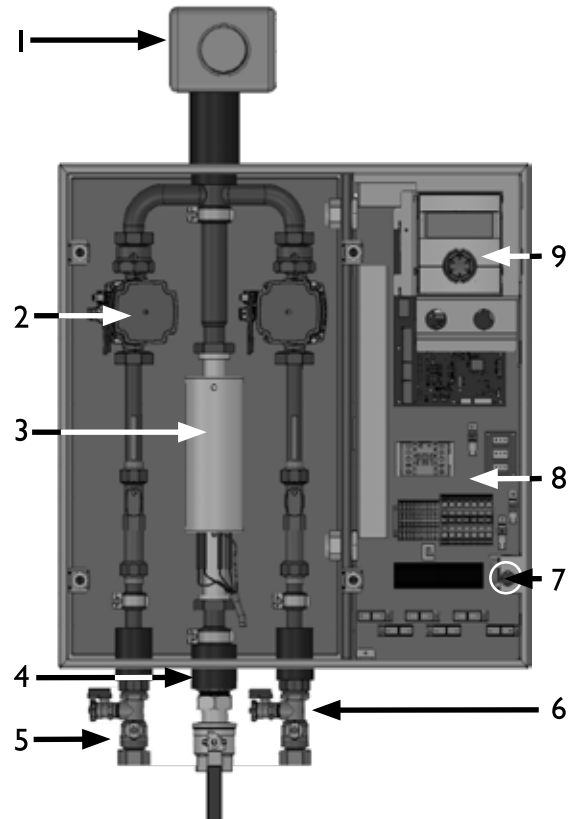
2 versions of the hydraulic module are available:

### HMD 2/(S)E



- 1 Heating circuit safety assembly (insulated)
- 2 Energy efficient heating circuit circulation pump
- 3 Instantaneous water heater 6 kW
- 4 Flow outlet, heat pump 1 and 2
- 5 Flow inlet, heat pump 1
- 6 Flow inlet, heat pump 2
- 7 Safety temperature limiter with Reset button
- 8 Switch cabinet
- 9 Control panel

### REVERSIBLE VARIANT: HMD 2/R(S)E



- 1 Heating circuit safety assembly (insulated)
- 2 Energy efficient heating circuit circulation pump
- 3 Instantaneous flow heater 6 kW with sensor tube for safety temperature limiter
- 4 Flow outlet, heat pump 1 and 2
- 5 Flow inlet, heat pump 1
- 6 Flow inlet, heat pump 2
- 7 Safety temperature limiter with Reset button
- 8 Switch cabinet
- 9 Control panel



# Installation

The following applies to all work to be done:



## NOTE

Always comply with the applicable local accident prevention regulations, statutory regulations, ordinances, guidelines and directives.

## INSTALLATION LOCATION



## ATTENTION

Install the unit inside buildings only.

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



Dimensioned drawing (from Page 21) and installation plan (from Page 24) for the respective model.

## TRANSPORT TO INSTALLATION LOCATION

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

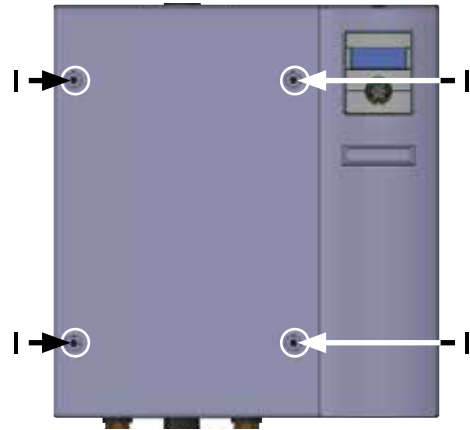


## ATTENTION


Never use components and hydraulic connections on the unit for transport purposes.

## INSTALLATION

- ① 2 people are needed to lift the hydraulic module out of the box...
- ② Undo the quick-release screws in the top section of the hydraulic module and remove the top section from the front...



Quarter-turn screws

- ③ Remove the inner packaging material (transport safeguard).
- ④ Align the mounting rail in line with the drilling pattern at an appropriate height on the wall and mark the drillholes on the wall...  
 Note the drilling pattern (Page 23), safety and service spacings, see installation plan (from Page 24) for the respective model.
- ⑤ Use the plugs and screws supplied to secure the fixing rail onto the wall...



## CAUTION!

Ensure the wall has the necessary load bearing capacity.

The anchors supplied are only suitable for use in the following types of walls:

- Concrete
- Solid lightweight concrete blocks
- Cavity block made of lightweight concrete
- Cellular concrete
- Prestressed concrete - hollow ceiling/floor slabs
- Natural stone with dense, close-grained micro-structure
- Solid sand-lime bricks
- Perforated sand-lime bricks
- 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.



Mounting rail installed on the wall

### ! ATTENTION

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

Cable ducts must be laid at a distance of at least 2 cm from the hydraulic module.



### CAUTION!

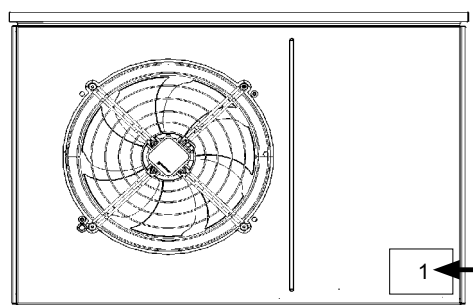
Hands and fingers could be crushed during the following tasks!

- ⑥ 2 people are needed to hang the hydraulic module in the mounting rail.

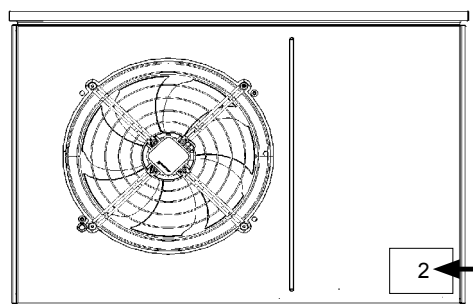
## UNIT LETTERING / LABELLING

Before making the hydraulic and electrical connection you must label the two heat pumps outdoors and their connection cables.

- ① Remove all stickers for unit and cable labelling from the separate package included with the hydraulic module...
- ② Attach the larger sticker with number 1 in a clearly visible position on the outer façade of one of your heat pumps...



- ③ Attach the smaller stickers with number 1 to all connection cables of this heat pump 1 – at the ends which will later be connected to the hydraulic module. This way it is clear at the hydraulic module inside the building that these connection cables lead to heat pump 1...
- ④ Attach the larger sticker with number 2 in a clearly visible position on the outer façade of your second heat pump...



- ⑤ Attach the smaller stickers with number 2 to all connection cables of this heat pump 2 – at the ends which will later be connected to the hydraulic module. This way it is clear at the hydraulic module inside the building that these connection cables lead to heat pump 2...



## INSTALLATION / HYDRAULIC CONNECTION TO HEATING CIRCUIT

### PRESSURE LOSS CALCULATION



#### NOTE

There are two circulation pumps integrated in the hydraulic module, which are appropriately dimensioned to ensure an adequately high volume flow (flow rate) on the heat sink side. The free pressure available is limited, which makes planning in advance indispensable. For details of how high the free pressures of the circulation pumps are at the corresponding heat pump volume flows, refer to the “free pressure” curves in the operating manual of the connected heat pumps.



Operating manuals of your heat pumps

A pressure loss calculation must be performed in advance for the hydraulic connection of the hydraulic module, to dimension the components used (for example, the pipe diameter). This is the only way to determine the head of the still available free pressure, which is provided outside of the hydraulic module by the two integrated circulation pumps.

The free pressure available for the external piping of the heat sink side can be identified in the hydraulic module.



A calculation example of the hydraulic calculation / pressure loss calculation is given on Page 26 of this operating manual. On Page 27 there is a schematic, in which you can enter or calculate the data for your system.

The hydraulic components of a system must be chosen and dimensioned so that the sum of all pressure losses (heat pump, connection pipe, storage tank, changeover valves, heating circuit etc.) is less than the free pressure available in accordance with the operating manual of the connected heat pumps.

As it is possible to operate two heat pumps with different heat outputs at the hydraulic module (for example, an LWD50A and an LWD70A) and therefore to operate them with different volume flows, this means that the two pipe runs of heat pump 1 and heat pump 2 can be loaded asymmetrically:

Depending on the connected heat pump types, the free pressure of pipe run 1, as a result of a higher pressure loss, can be lower than the free pressure of pipe run 2. In this case, for the further dimensioning it is important for the design to be based on the pipe run with the more unfavourable hydraulic conditions.

- ① Calculate the hydraulics of your system in accordance with the schematic on Page 27 ...
- ② Flush the heating circuit thoroughly before connecting the unit to the heating circuit...



#### NOTE

Contamination and deposits in the heating circuit can cause malfunctions.

- ③ Install filling and draining devices, shut-off valves and non-return valves at the required locations in the heating circuit...
- ④ Check whether the units have already been labelled. If not, label the units now...



Page 9, Unit lettering / labelling.

- ⑤ Make hydraulic connections to the hydraulic module according to the unit labelling. The connections for the heating circuit are located on the underside of the hydraulic module.



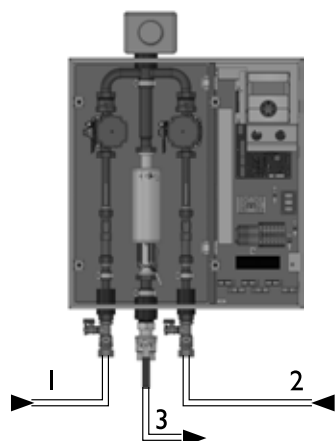
#### NOTE

The circulation pumps or rather the pipe runs on or in the hydraulic module have already been labelled in the factory with number 1 for the connections of heat pump 1 and number 2 for the connections of heat pump 2.



#### ATTENTION

When installing the connections, always secure the connections on the unit against twisting, to prevent damage to the copper pipes inside the unit.



- 1 Flow inlet, heat pump 1
- 2 Flow inlet, heat pump 2
- 3 Flow outlet, heat pump 1 and 2



“Hydraulic integration” documents.

## SAFETY ASSEMBLY

### HMD 2/(S)E

The safety assembly for the heating circuit is in the extra box. The connection for the safety assembly is located at the top of the hydraulic module.

- ① Install the safety assembly at the connection provided at the top of the hydraulic unit...
- ② Lay the safety discharge of the safety valve via a funnel-shaped odour trap and into the drain according to the relevant standards and guidelines.

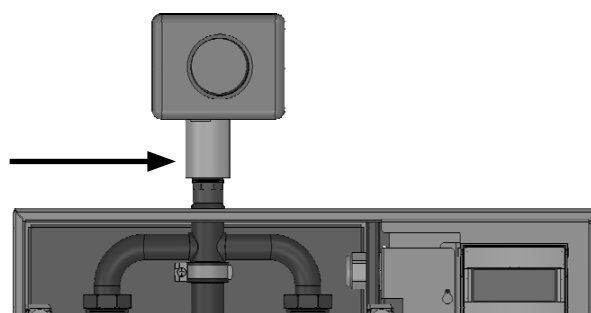
**!** **ATTENTION**  
The safety discharge must be connected!

### HMD 2/R(S)E

The safety assembly for the heating circuit is pre-installed.

**!** **ATTENTION**  
Perform leak test on the piping.

- ① Take the insulation half-shells from the enclosed separate package and insulate the adapter from the hydraulic module to the safety assembly...



- ② Lay the safety discharge of the safety valve via a funnel-shaped odour trap and into the drain according to the relevant standards and guidelines.

**!** **ATTENTION**  
The safety discharge must be connected!

## EXPANSION VESSELS

**!** **ATTENTION**  
The expansion vessel for the heating circuit is not included in the scope of supply!  
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 according to the relevant standards and guidelines.

**i** **NOTE**  
The admission pressure of the expansion vessel must be adjusted to the system (approx. 0.5 bar less than the system filling pressure) according to the calculation to the relevant standards (EN 12828).



# Electrical connections

The following applies to all work to be done:



### DANGER!

**Risk of fatal electric shock!**

**All electrical connection work must be carried out by qualified electricians only.**

**Before opening the unit, disconnect the system from the power supply and prevent it from being switched back on!**



### WARNING!

**Note and follow the relevant EN, VDE and/or local safety regulations during installation and when carrying out electrical work.**

**Comply with technical connection requirements of the responsible power supply company (if required by the latter)!**



### WARNING!

**Install electric connections only according to the terminal diagram that applies to your model.**



### NOTE

All live wires must be stripped before they are installed in the cable duct of the switch cabinets!



### ATTENTION

The power supply for the heat pump and the electric heating element must be equipped with an all-pole automatic circuit-breaker with at least 3 mm contact spacing to IEC 60947-2.

Note the level of the tripping current.



“Technical data /scope of supply” overview, “Electrics” section (from Page 18).

The electrical connection of the heat pumps outdoors is made only via the hydraulic module inside the building.

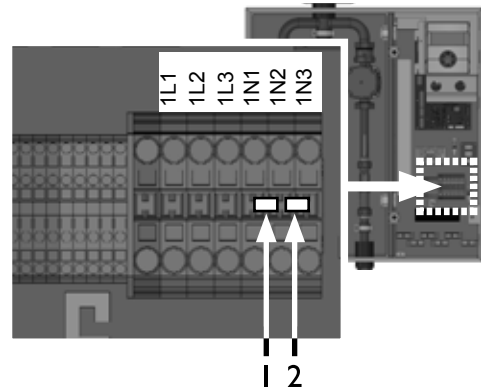


“Schematic diagram of “Electrical connections”, Page 36

## 400 V / 230 V OPERATION

The hydraulic module is compatible with heat pumps for the 3~400V power supply system (3~N/PE/400V/50Hz) and with heat pumps for the 1~230V power supply system (1~N/PE/230V/50Hz).

In the condition as-delivered from the factory the hydraulic module is set up for operation with heat pumps for the 3~400V power supply system. You can see this condition as-delivered from the factory at the terminal block in the switch cabinet of the hydraulic module:



Condition as-delivered from the factory

1 Jumper between 1N1 and 1N2

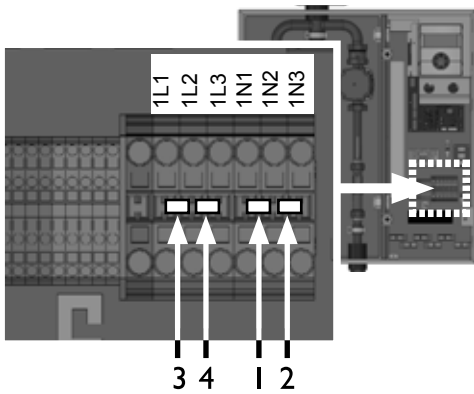
2 Jumper between 1N2 and 1N3

The following unit combinations are possible in condition as-delivered from the factory (3~400V power supply system):

Heat pump type	Hydraulic module
LWD 50A	HMD 2/(S)E
LWD 70A	HMD 2/(S)E
LWD 90A	HMD 2/(S)E
LWD 50A/RX	HMD 2/R(S)E
LWD 70A/RX	HMD 2/R(S)E

## CHANGEOVER 400 V CONNECTION TO 230 V

If the hydraulic module is to be operated with heat pumps for the 1~230V power supply system, in addition to the jumpers in the condition as-delivered from the factory, you must set two additional jumpers between terminals 1L1 and 1L2 and between 1L2 and 1L3. The jumpers are enclosed in the separate package.



New jumpers to be set for operation in the 1~230V power supply system  
 3 Jumper between 1L1 and 1L2  
 4 Jumper between 1L2 and 1L3

**! ATTENTION**

This termination is only allowed if the hydraulic module is operated in the 1~230V power supply system and only with appropriate heat pumps designed for 1~230V power supply systems.

The following unit combinations are possible in the 1~230V power supply system:

Heat pump type	Hydraulic module
LWD 50A/SX	HMD 2/(S)E
LWD 70A/SX	HMD 2/(S)E
LWD 50A/R SX	HMD 2/R(S)E
LWD 70A/R SX	HMD 2/R(S)E

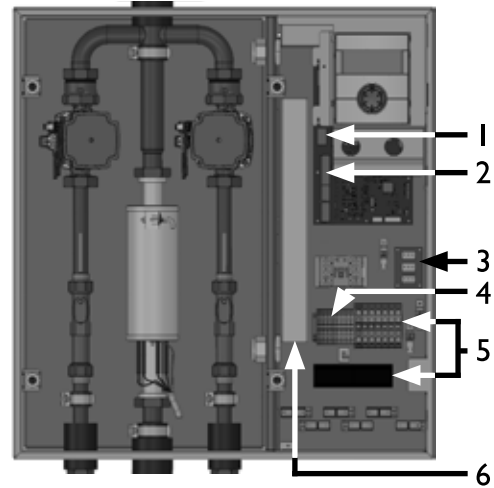
**! ATTENTION**

Before each further action, check which heat pump types are operated with the hydraulic module and if applicable set or remove jumpers. Heat pumps for the 3~400V power supply system may not be operated in the 1~230V power supply system.

**! ATTENTION**

Heat pumps for the 1~230V power supply are not available in all countries. Contact power company before the use of heat pumps for the 1~230V power supply.

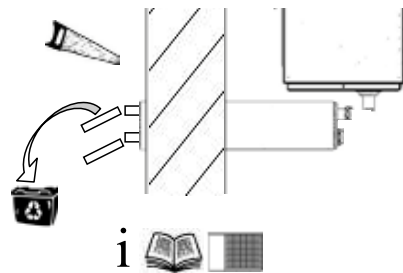
**ELECTRICAL CONNECTION OF THE HEAT PUMPS TO THE HYDRAULIC MODULE**



Example HMD 2/(S)E:

- 1 230V inputs
- 2 Terminal strip, external sensors
- 3 LINBus cable connection  
-X1 for heat pump 1  
-X2 for heat pump 2
- 4 Terminal strip for control supply cables of the heat pumps
- 5 Terminal strip, power supply cables  
- Heat pumps  
X8-1 for heat pump 1  
X8-2 for heat pump 2  
- Heating element
- 6 Cable routing

- ① Feed the connection cable through the ducts of the wall penetration from the outside into the inside of the building. Use the lubricant...



**! ATTENTION**

When laying the cable, note that unshielded power supply cables (power supply of outdoor units) and shielded cables (LINBus) must be laid separately from each other.



Unshielded power supply cables (power supply of outdoor units) and shielded cables (LINBus) must be laid with the following minimum distances between them:

without separator	≥ 50 mm
separator made of aluminium	≥ 20 mm
separator made of steel	≥ 2 mm

- ② From the cable labelling, find out which cables come from heat pump 1 and which cables come from heat pump 2.  
If the units and cables have not yet been labelled, label the units and cables now...

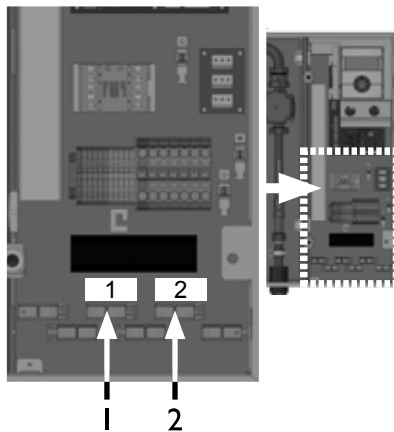
Page 9, Unit lettering / labelling.

- ③ Connect the supply cable of heat pump 1 to terminal strip 1 (X8-1) and the supply cable of heat pump 2 to terminal strip 2 (X8-2)...



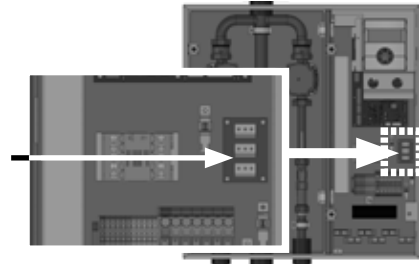
**NOTE**

In the hydraulic module, the terminal strips for these supply cables have already been labelled in the factory with the number 1 for the supply cable of heat pump 1 and number 2 for the connections of heat pump 2.



- 1 Terminal strip X8-1 for heat pump 1 supply cable
- 2 Terminal strip X8-2 for heat pump 2 supply cable

- ④ Connect LINBus cable of heat pump 1 to terminal strip -X1...



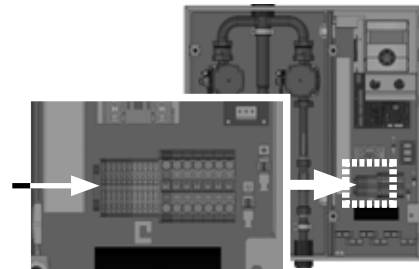
- ⑤ Connect LINBus cable of heat pump 2 to terminal strip -X2...



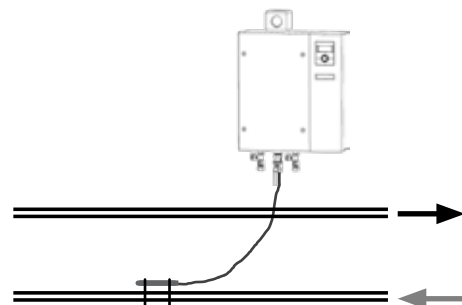
**NOTE**

The Commissioning (startup) Wizard of the heating and heat pump controller will give you instructions on addressing the heat pumps when you start up the system for the first time.  
Then follow the instructions displayed in the screen of the heating and heat pump controller.

- ⑥ Connect the control supply cables of heat pump 1 and heat pump 2 to the terminal strip for control supply cables.  
Heat pump-specific assignment (heat pump 1 / heat pump 2) is not necessary here; the two cables can be connected to the relevant terminal strip in any order...



- ⑦ Use cable ties and heat transfer compound to fix the return sensor to the joint return (heat carrying pipe) of heat pumps 1 and 2...



Hydraulic integration documents





- ⑧ Seal the cable penetrations for cables, which are routed from the heat pumps into the buildings, in the outdoor area.

**NOTE**

The control panel of the heating and heat pump controller can be connected to a computer or network, via the left-hand LAN socket on its underside, using a suitable network cable, enabling the heating and heat pump controller to be controlled remotely from there.

If such a connection is required, install a shielded network cable (category 6, with RJ45 connector) during the electrical connection work and connect it parallel to the existing control cable of the heating and heat pump regulator.

The network cable can be added subsequently at any time.

## Flushing, filling and bleeding the system

**ATTENTION**

The system must be absolutely free from air before commissioning.

Contamination and deposits in the system can cause malfunctions.

**ATTENTION**

Do not exceed a pressure of 2.5 bar when flushing the unit. The drain line of the heating circuit safety valve must be closed before flushing and filling.

Example with storage tanks connected in series:

- ① Connect the hose to the filling and draining tap and lay it to a drain...
- ② Connect the filling and drain tap at the hydraulic module (heating water inlet from the heat pump)...
- ③ Close the shut-off valves in the hydraulic module to the heat pump. Open shut-off valves to the heating circuit...



Example diagram: "Hot water circuit flushing and venting process", Page 28



"Changeover valve" operating manual

- ④ Dismantle the motor of the 3-way valve for water heating (accessory). To do so, remove the U-bolt on the motor base and carefully pull off the motor from above....
- ⑤ Turn the stem through 180° and flush the hot water charging circuit for approx. 1 minute...
- ⑥ Turn the spindle 180° back to its starting position (rounded side of the stem points to B)...
- ⑦ Flush the heating circuit! If necessary, the heating and hot water circuit can be flushed at the same time! To do so, turn stem through 30°...



Example diagram: "Heating circuit flushing and venting process", Page 29

- ⑧ After completing the flushing and filling process, place the stem in the initial position and install the motor of the 3-way valve...
- ⑨ The unit vents automatically if the venters (black cap) of the safety assembly are open. If the heating circuit is filled or emptied, the bleeding valve opens...
- ⑩ Open the shut-off valves in the hydraulic module to the heat pump. Close shut-off valves to the heating circuit. Close the shut-off valves on site to the heat pump:



Example diagram: "Flushing and venting process, heat pump 1", Page 30



Example diagram: "Flushing and venting process, heat pump 2", Page 31

- ⑪ Swap the hoses at the filling and draining taps and flush the condenser of the heat pump via the return...
- ⑫ Also open the venting valve at the condenser of the heat pump. Vent the condenser and then close the venting valve again when fully vented.

## Insulating the hydraulic connections

You must insulate the fixed piping of the heating circuit, the connection pipes between the hydraulic module and the heat pump and the connections of the hot water tank. In (R) variant, vapour diffusion tight.

**NOTE**

Insulate in accordance with applicable local standards and guidelines/directives.



## Set the overflow valve



### REMARQUE

The activities in this section are only necessary for in-line tank integration.

Complete the worksteps quickly, otherwise the maximum return temperature can be exceeded and the heat pump switches to high-pressure fault. Turn the adjusting knob at the overflow valve to the right to increase the temperature difference (the temperature drop), turn it to the left to reduce it.

System is running in heating mode (ideally in cold condition).

- ① In case of low heating curve: Set the system to “Forced heating”...



Operating manual of the heating and heat pump controller.

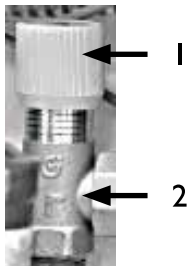
- ② Shut off valves to the heating circuit...
- ③ Ensure that the total flow is routed via the overflow valve...
- ④ Read out the flow and return temperature at the heating and heat pump controller...



Operating manual of the heating and heat pump controller.

- ⑤ Turn the adjusting knob (1) of the overflow valve (2) until the temperature drop between the flow and return temperature is set as follows:

External temperature	Recommended settings
-10 °C	4 K
0 °C	5 K
10 °C	8 K
20 °C	9 K
30 °C	10 K



- ⑥ Open valves to heating circuit...
- ⑦ Reset the heating and heat pump controller.

## Commissioning

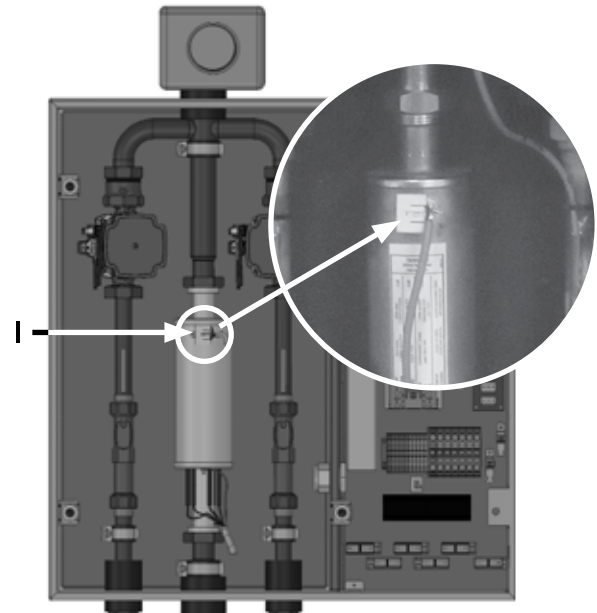


Follow the instructions in the section entitled “Commissioning” in the operating manual for your heat pump.

### SAFETY TEMPERATURE LIMITER

A safety temperature limiter is installed in the electric heating element. In the event of a malfunction in the heat pump or air in the system, check whether the reset button of the safety temperature limiter has tripped. If this is the case, push in the button.

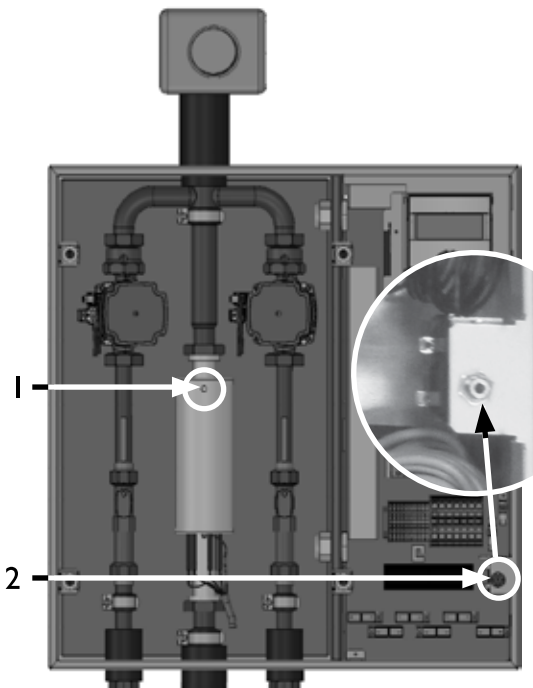
HMD 2/(S)E



1 Reset button of the safety temperature limiter at the electric heating element



HMD 2/R(S)E



- 1 Sensor tube on the electric heating element
- 2 Reset button of the safety temperature limiter

## Dismantling



### **DANGER!**

**Risk of fatal electric shock!**

**All electrical work must be carried out by qualified electricians only.**

**Before opening the unit, disconnect the system from the power supply and prevent it from being switched back on!**



### **WARNING!**

**Only qualified heating or cooling system technicians are allowed to remove the unit from the system.**



### **ATTENTION**

Recycle or provide for proper disposal of unit components in accordance with the applicable regulations, standards and directives.

## REMOVING THE BUFFER BATTERY



### **ATTENTION**

Before scrapping the heating and heat pump controller, remove the buffer battery on the control board. The battery can be pushed out using a screwdriver. Ensure environmentally compatible disposal of the battery and electronic components.



# Technical data/Scope of supply

			HMD2/(S)E
<b>Accessories for Heat pump type</b>	LWD 50A - LWD 70A - LWD 90A - LWD 50A/SX - LWD 70A/SX	• applicable   — not applicable	•
	LWD 50A/RX - LWD 70A/RX - LWD 50A/RSX - LWD 70A/RSX	• applicable   — not applicable	—
	Functionally relevant	• applicable   — not applicable	•
<b>Installation location</b>	Indoors   Outdoors	• applicable   — not applicable	•   —
	Maximum room temperature	°C	35
	Maximum relative humidity	%	60
<b>Conformity</b>		CE	•
<b>Heating circuit</b>	Heating circuit efficiency pump	integrated: • yes — no	•
	Free pressure, heating circuit pump: $\Delta p^{**}$   $\Delta p_{max}$   Volume flow	bar   bar   l/h	0,45   0,45   2 x 1600
	Volume flow: minimum flow rate   maximum flow rate	l/h	2 x 900   2 x 2000
	max. allowable operating pressure	bar	3
	Integrated expansion vessel   Volume   Initial pressure	• yes — no   l   bar	—
	Buffer tank	integrated: • yes — no	—
	Heat metering	integrated: • yes — no	•
	<b>General unit data</b>	Total weight	kg
<b>Electric</b>	Voltage code   all-pole fusing per heat pump LWD 50A*)	...   A	3~/N/PE/400V/50Hz   C16
	Voltage code   all-pole fusing per heat pump LWD 70A*)	...   A	3~/N/PE/400V/50Hz   C16
	Voltage code   all-pole fusing per heat pump LWD 90A*)	...   A	3~/N/PE/400V/50Hz   C16
	Voltage code   all-pole fusing per heat pump LWD 50A/SX *) ***)	...   A	1~/N/PE/230V/50Hz   2 x C16
	Voltage code   all-pole fusing per heat pump LWD 70A/SX *) ***)	...   A	1~/N/PE/230V/50Hz   2 x C20
	Voltage code   circuit breaker control voltage *)	...   A	1~/N/PE/230V/50Hz   B16
	Voltage code   fusing of electric heating element for 1~230V power supply system*)	...   A	1~/N/PE/230V/50Hz   B40
	Voltage code   fusing of electric heating element for 3~230V power supply system*)	...   A	3~/PE/230V/50Hz   B25A
	Voltage code   fusing of electric heating element for 3~400V power supply system*)	...   A	3~/N/PE/400V/50Hz   B16A
	Protection type	IP	20
Output of electric heating element 3   2   1 phase	kW   kW   kW	9   6   3	
Circulating pump, heating circuit: maximum power consumption   current consumption	kW   A	2 x 0,06   2 x 0,26	
<b>Safety equipment</b>	Safety assembly heating circuit   Safety assembly heat source	included in scope of supply: • yes — no	•   —
<b>Heating and heat pump regulator</b>		included in scope of supply: • yes — no	•
<b>Overflow valve</b>		integrated: • yes — no	—

\*) comply with local regulations \*\*\*) factory setting \*\*\*\*) Heat pump is not available in all countries

813315



			HMD2/R(S)E
<b>Accessories for Heat pump type</b>	LWD 50A - LWD 70A - LWD 90A - LWD 50A/SX - LWD 70A/SX LWD 50A/RX - LWD 70A/RX - LWD 50A/RXSX - LWD 70A/RXSX Functionally relevant	• applicable   — not applicable • applicable   — not applicable • applicable   — not applicable	— • •
<b>Installation location</b>	Indoors   Outdoors Maximum room temperature Maximum relative humidity	• applicable   — not applicable °C %	•   — 35 60
<b>Conformity</b>		CE	•
<b>Heating circuit</b>	Heating circuit efficiency pump Free pressure, heating circuit pump: $\Delta p$ **)   $\Delta p_{max}$   Volume flow Volume flow: minimum flow rate   maximum flow rate max. allowable operating pressure Integrated expansion vessel   Volume   Initial pressure Buffer tank Heat metering	integrated: • yes — no bar   bar   l/h l/h bar • yes — no     bar integrated: • yes — no integrated: • yes — no	• 0,45   0,45   2 x 1600 2 x 900   2 x 2000 3 — — •
<b>General unit data</b>	Total weight	kg	40
<b>Electric</b>	Voltage code   all-pole fusing per heat pump LWD 50A*) Voltage code   all-pole fusing per heat pump LWD 70A*) Voltage code   all-pole fusing per heat pump LWD 90A*)  Voltage code   all-pole fusing per heat pump LWD 50A/SX *) ***) Voltage code   all-pole fusing per heat pump LWD 70A/SX *) ***)  Voltage code   circuit breaker control voltage *)  Voltage code   fusing of electric heating element for 1~230V power supply system*) Voltage code   fusing of electric heating element for 3~230V power supply system*) Voltage code   fusing of electric heating element for 3~400V power supply system*)  Protection type Output of electric heating element 3   2   1 phase Circulating pump, heating circuit: maximum power consumption   current consumption	...   A ...   A ...   A  ...   A ...   A  ...   A ...   A ...   A  IP kW   kW   kW kW   A	3~/N/PE/400V/50Hz   C16 3~/N/PE/400V/50Hz   C16 3~/N/PE/400V/50Hz   C16  1~/N/PE/230V/50Hz   2 x C16 1~/N/PE/230V/50Hz   2 x C20  1~/N/PE/230V/50Hz   B16  1~/N/PE/230V/50Hz   B40 3~/PE/230V/50Hz   B25A 3~/N/PE/400V/50Hz   B16A  20 9   6   3 2 x 0,06   2 x 0,26
<b>Safety equipment</b>	Safety assembly heating circuit   Safety assembly heat source	included in scope of supply: • yes — no	•   —
<b>Heating and heat pump regulator</b>		included in scope of supply: • yes — no	•
<b>Overflow valve</b>		integrated: • yes — no	—

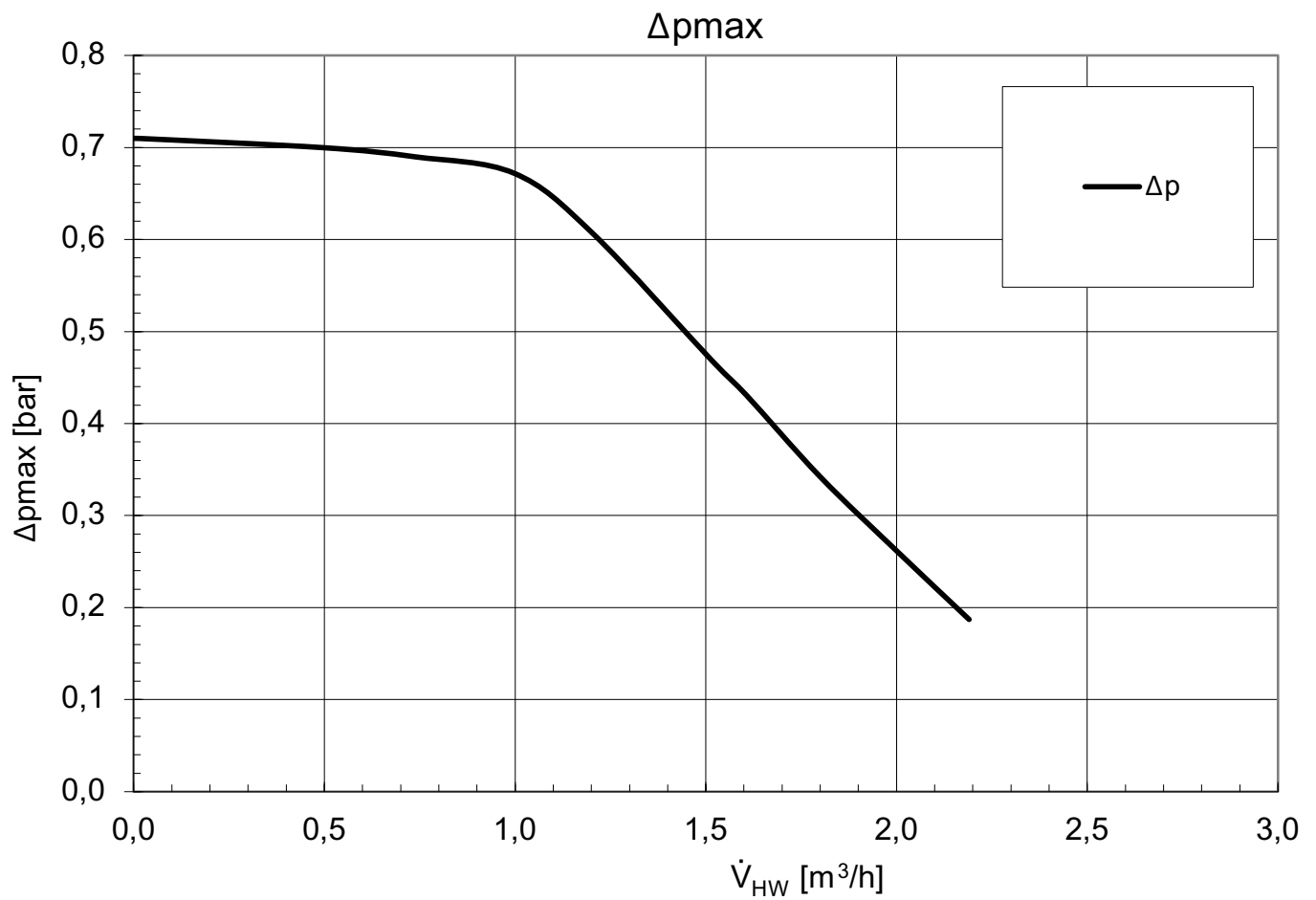
\*) comply with local regulations \*\*\*) factory setting \*\*\*) Heat pump is not available in all countries

813316



HMD 2/...

Free pressure



Key: UK812036

All dimensions in mm.

$\dot{V}_{HW}$	Heating water volume flow in m³/h per pump branch, two branches available
$\Delta p_{\max}$	maximum free pressure



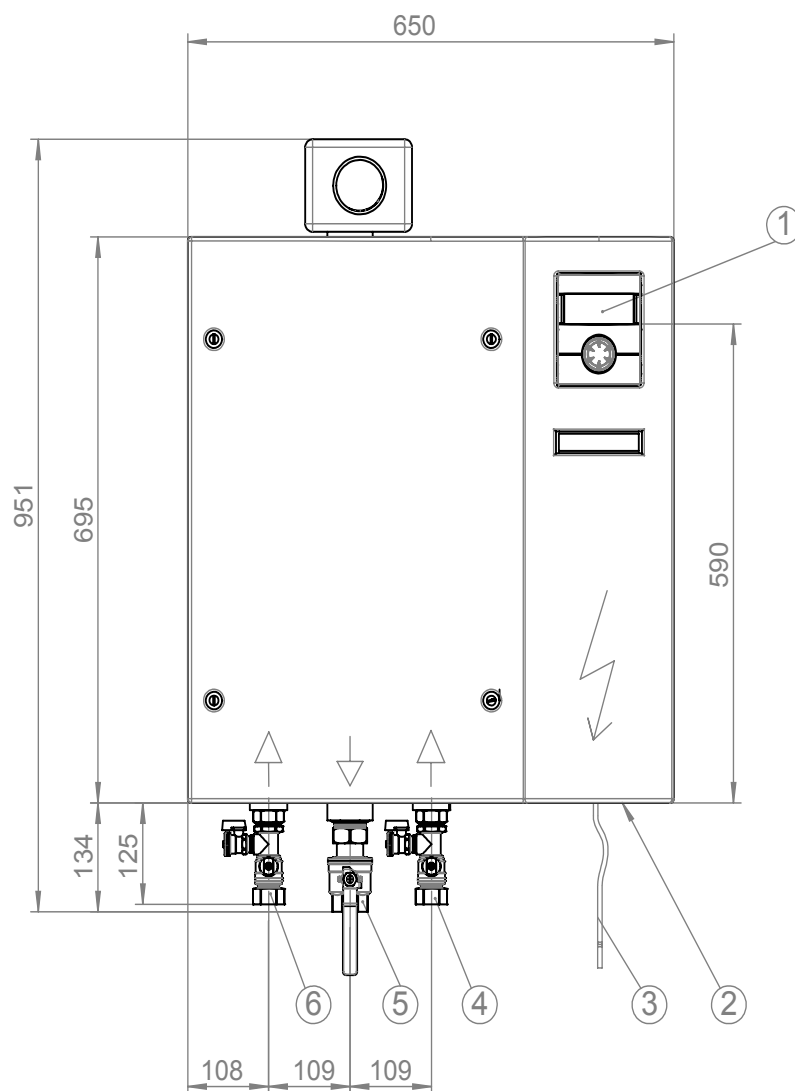
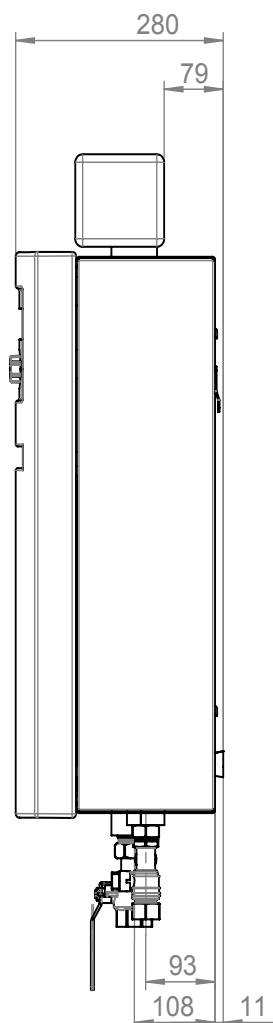


# Dimensioned drawings

# HMD 2/(S)E

Ⓓ

Ⓐ



Legend: UK819439

All dimensions in mm.

A	Front view
D	Side view from right

The hydraulic module is installed in the heating flow!

Item	Designation	Dim.
1	Control element	
2	Penetrations for electric/sensor cables	
3	Return flow sensor approx. 5.5 m from unit	
4	Heating water inlet (from heat pump 2)	Rp 1" IG
5	Heating water outlet (flow)	Rp 1¼" IG
6	Heating water inlet (from heat pump 1)	Rp 1" IG

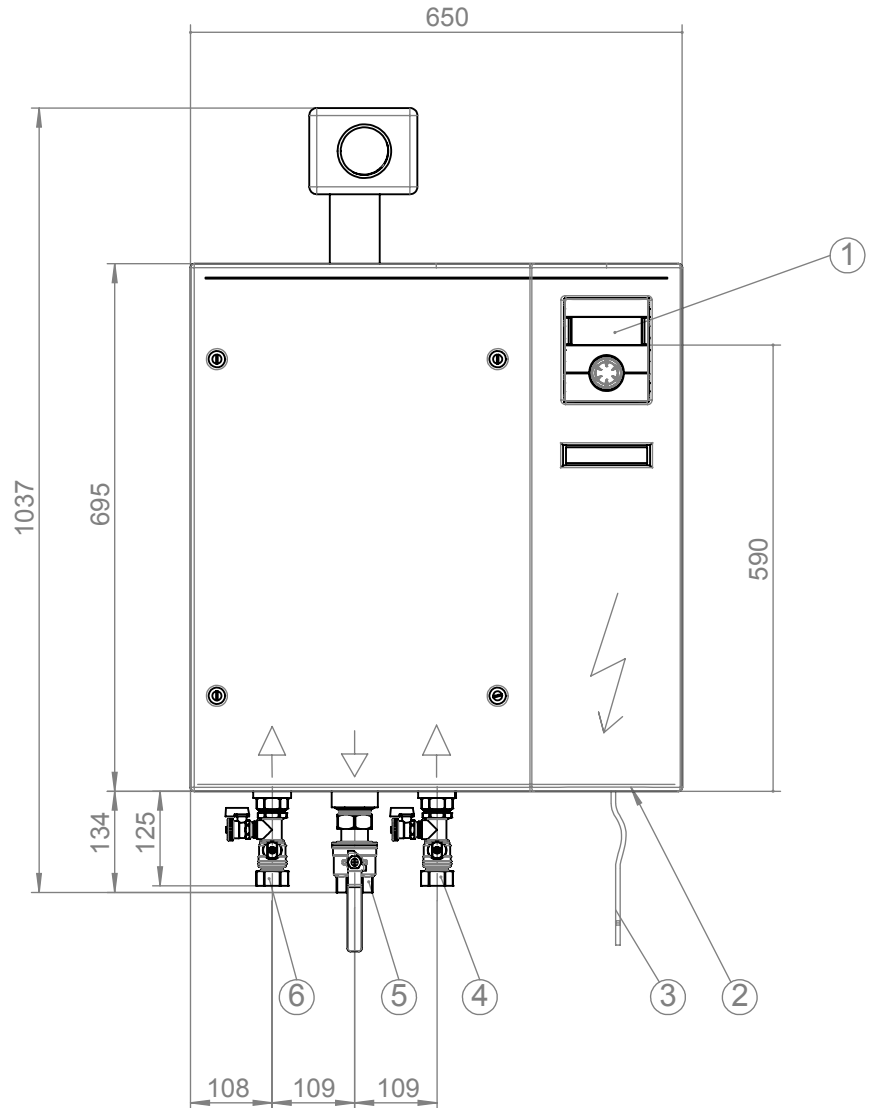
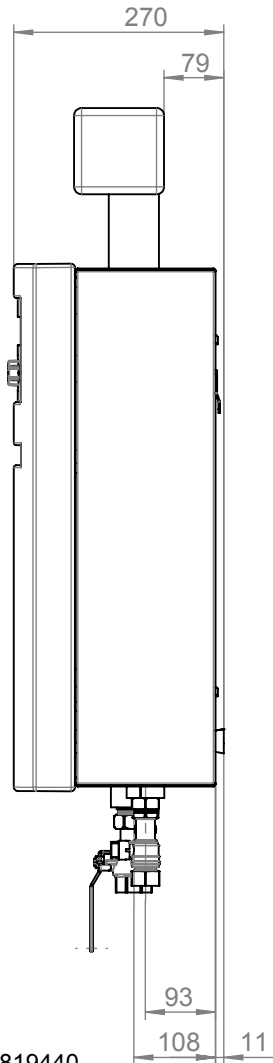


# HMD 2/R(S)E

# Dimensioned drawings

Ⓓ

Ⓐ



Key: UK819440

All dimensions in mm.

A	Front view
D	Side view from right

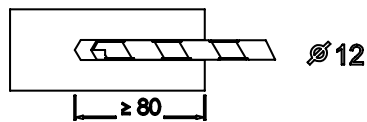
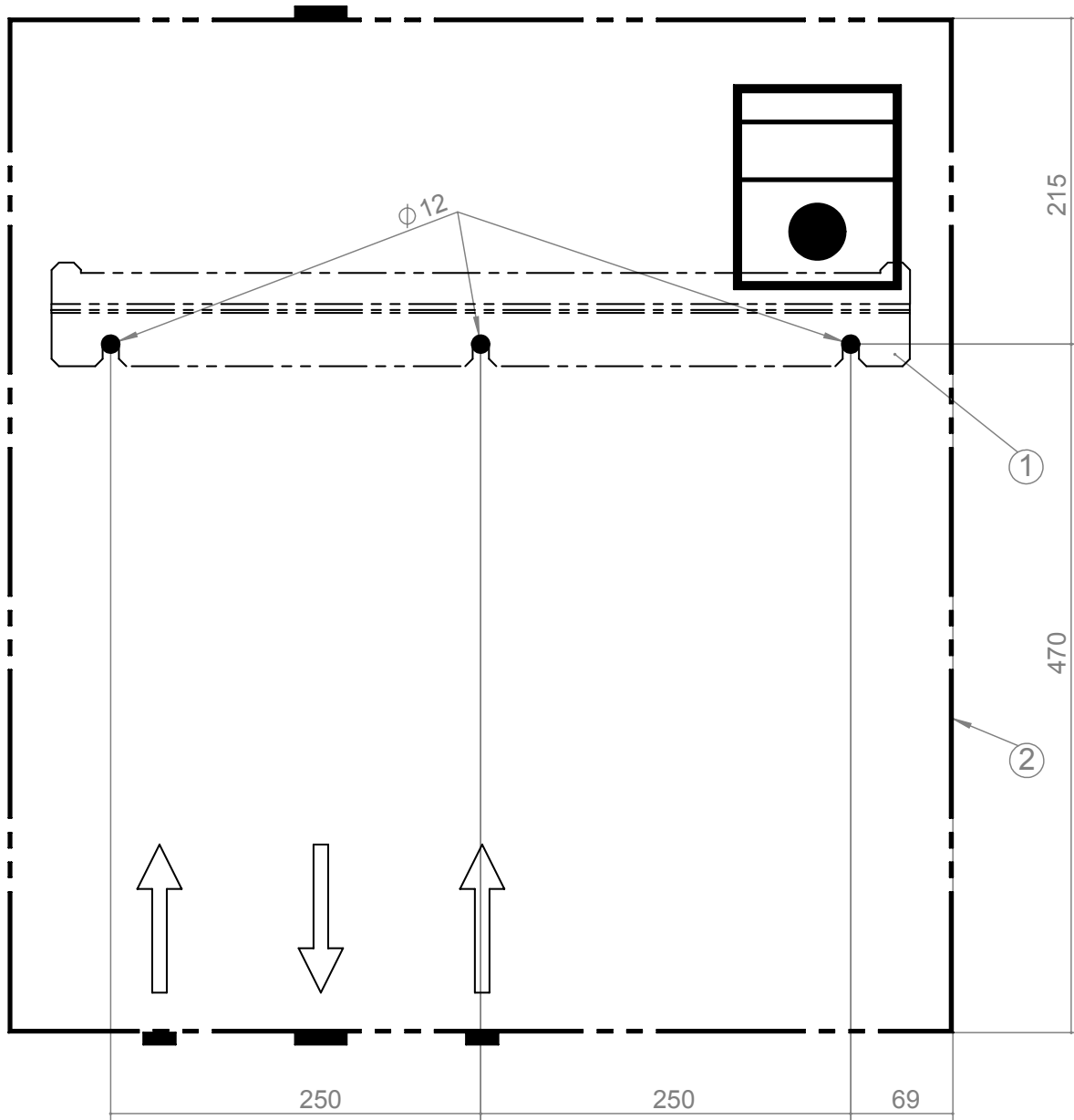
The hydraulic module is installed in the heating flow!

Item	Designation	Dim.
1	Control element	
2	Penetrations for electric/sensor cables	
3	Return flow sensor approx. 5.5 m from unit	
4	Heating water inlet (from heat pump 2)	Rp 1" IG
5	Heating water outlet (flow)	Rp 1¼" IG
6	Heating water inlet (from heat pump 1)	Rp 1" IG



# Drilling pattern

HMD 2/...



Key: UK819443

All dimensions in mm.

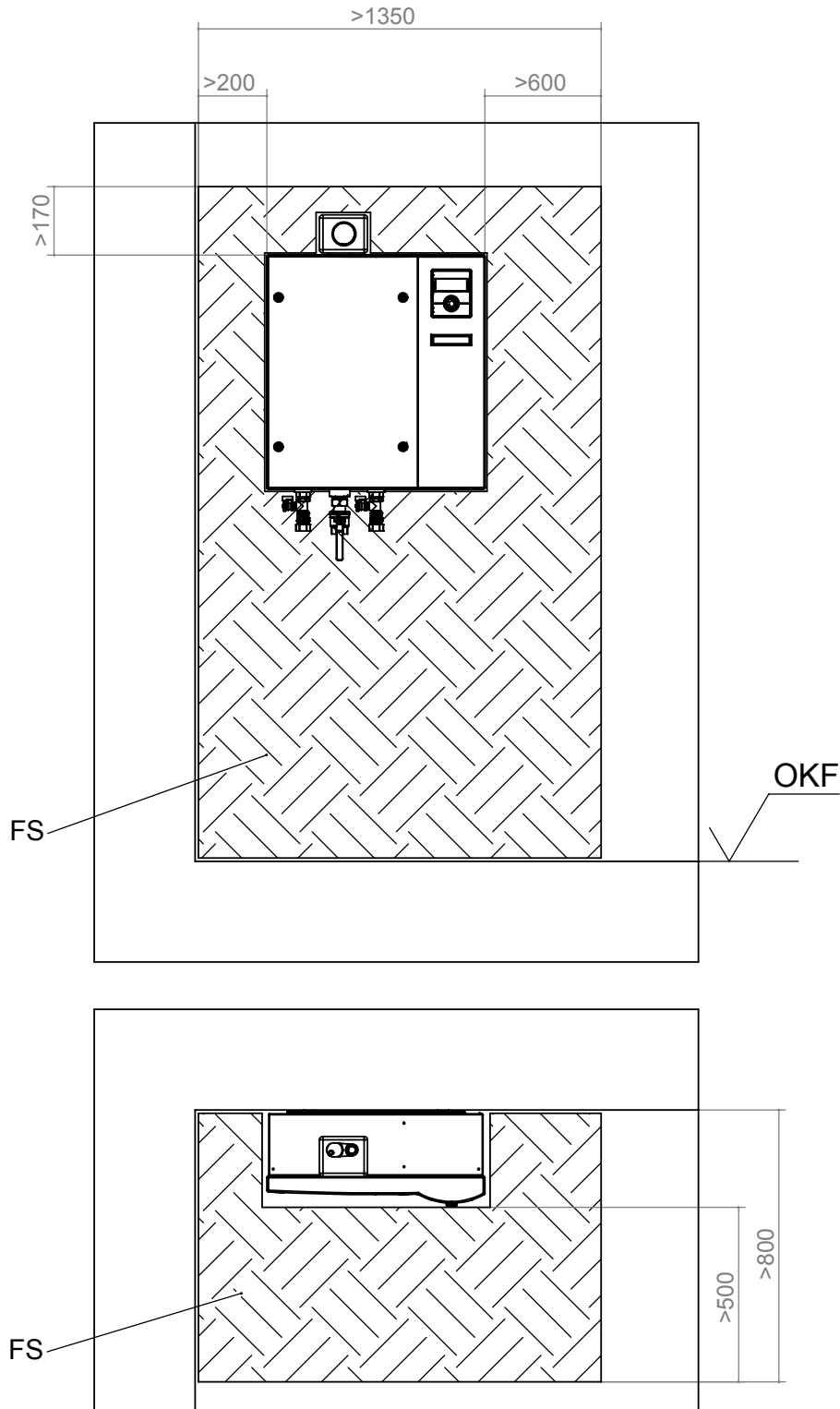
Hole  $\phi 12$  for anchor (enclosed in separate package)

Item	Designation
1	Wall mounting rail (in separate package)
2	Sheet metal housing



# HMD 2/(S)E

# Installation plan



Key: 819441

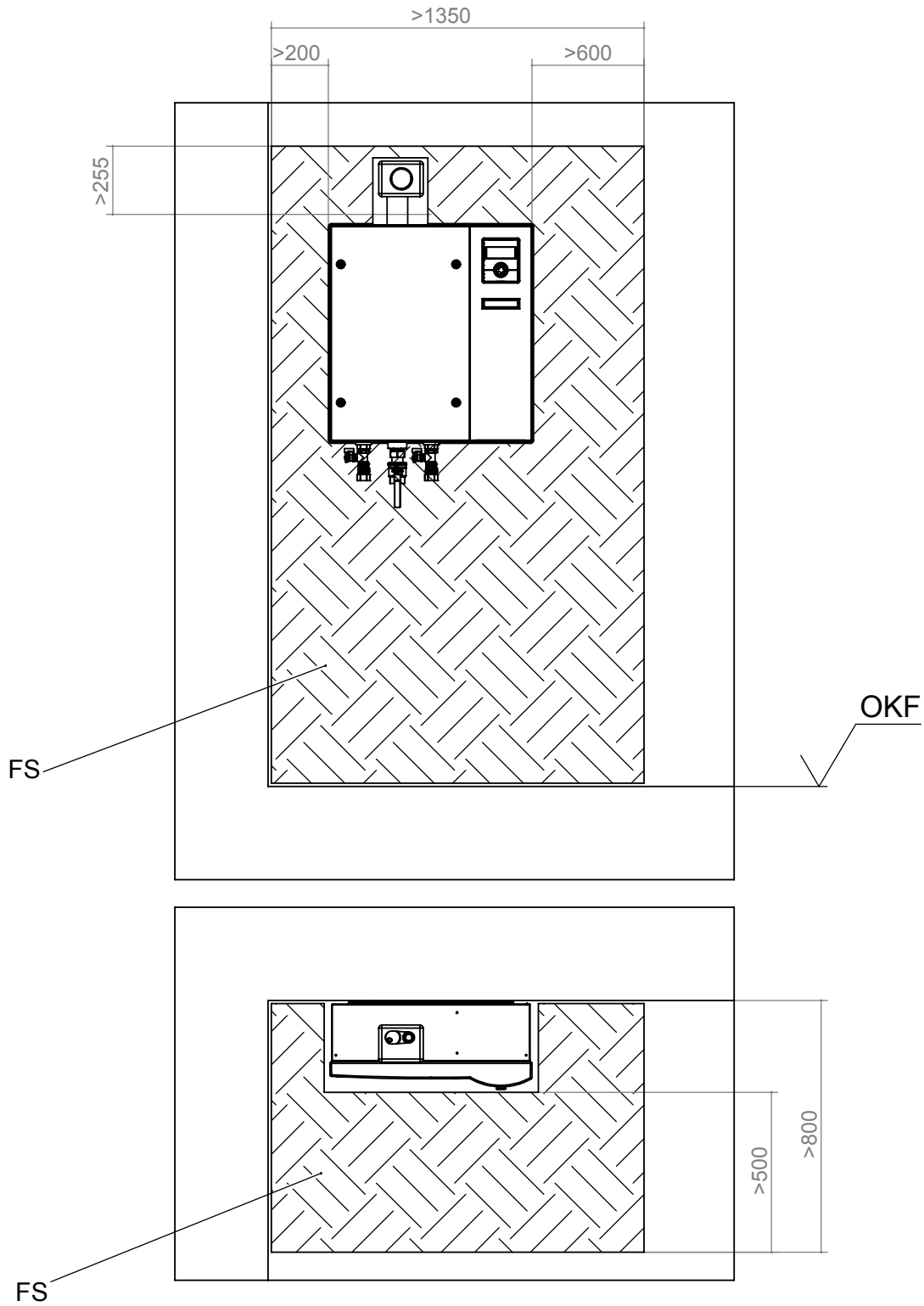
All dimensions in mm.

Item	Designation
OKF	Top edge of finished floor
FS	Free space for service purposes



# Installation plan

# HMD 2/R(S)E



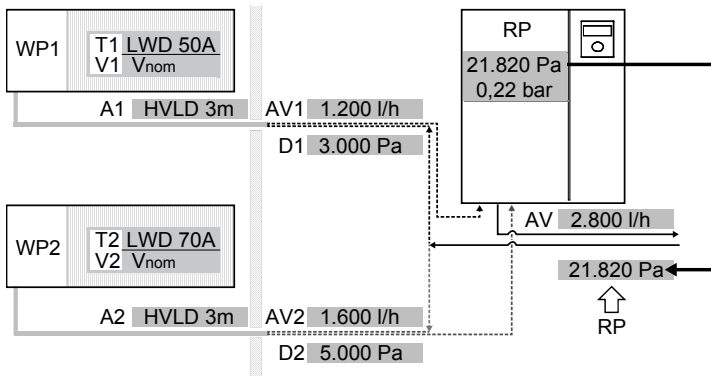
Key: 819442

All dimensions in mm.

Item	Designation
OKF	Top edge of finished floor
FS	Free space for service purposes



# Calculation example



- WP1 Heat pump 1
- T1 Type heat pump 1
- V1 Volume flow heat pump 1  
( $V_{min}$ ,  $V_{nom}$  or  $V_{max}$  of heat pump 1)
- A1 Type of connection pipe heat pump 1
- AV1 Design volume flow heat pump 1
- D1 Pressure loss of the external components used
- WP2 Heat pump 2
- T2 Type heat pump 2
- V2 Volume flow heat pump 2  
( $V_{min}$ ,  $V_{nom}$  or  $V_{max}$  of heat pump 2)
- A2 Type of connection pipe heat pump 2
- AV2 Design volume flow heat pump 2
- D2 Pressure loss of the external components used
- AV Volume flow in joint flow
- RP Maximum free pressure, which is available for the pressure loss of the heat sink

### Calculation of pressure loss, heat pump 1 (here: LWD 50A)

at AV1 of	1,200 l/h
Inherent pressure loss of heat pump	6,000 Pa
+ Inherent pressure loss of connection kit	5,000 Pa
+ Inherent pressure loss of connection pipe HVLVD / WDF	1,080 Pa
<b>= Pressure loss, heat pump 1 (at entry into building)</b>	<b>12,080 Pa</b>

### Calculation of pressure loss, heat pump 2 (here: LWD 70A)

at AV1 of	1,600 l/h
Inherent pressure loss of heat pump	6,000 Pa
+ Inherent pressure loss of connection kit	8,500 Pa
+ Inherent pressure loss of connection pipe HVLVD / WDF	1,680 Pa
<b>= Pressure loss, heat pump 2 (at entry into building)</b>	<b>16,180 Pa</b>

### Volume flows ( $V1 / V2$ ) heat pump

T1 / T2	$V_{min}$	$V_{nom}$	$V_{max}$
LWD 50A/...	900	1200	1500
LWD 70A/...	1200	1600	2000
LWD 90A/...	1600	2000	2500

### Inherent pressure losses of heat pump

T1 / T2	$V_{min}$	$V_{nom}$	$V_{max}$
LWD 50A/...	4000	6000	10000
LWD 70A/...	3000	6000	8000
LWD 90A/...	5000	7000	12000

### Inherent pressure losses of connection kit

T1 / T2	$V_{min}$	$V_{nom}$	$V_{max}$
LWD 50A/...	3000	5000	8000
LWD 70A/...	5000	8500	14000
LWD 90A/...	8500	14000	25000

### Inherent pressure losses of connection pipe

T1 / T2	$V_{min}$	$V_{nom}$	$V_{max}$
LWD 50A/...	100	180	260
LWD 70A/...	180	280	400
LWD 90A/...	280	400	600

### Total free pressure of hydraulic module

T1 / T2	$V_{min}$	$V_{nom}$	$V_{max}$
LWD 50A/...	68000	60000	47000
LWD 70A/...	60000	43000	26000
LWD 90A/...	43000	26000	8000

### Type of connection pipe (A1 / A2)

WDF 1m	1
HVLVD 3m	3
HVLVD 8m	8
HVLVD 14m	14
HVLVD 20m	20

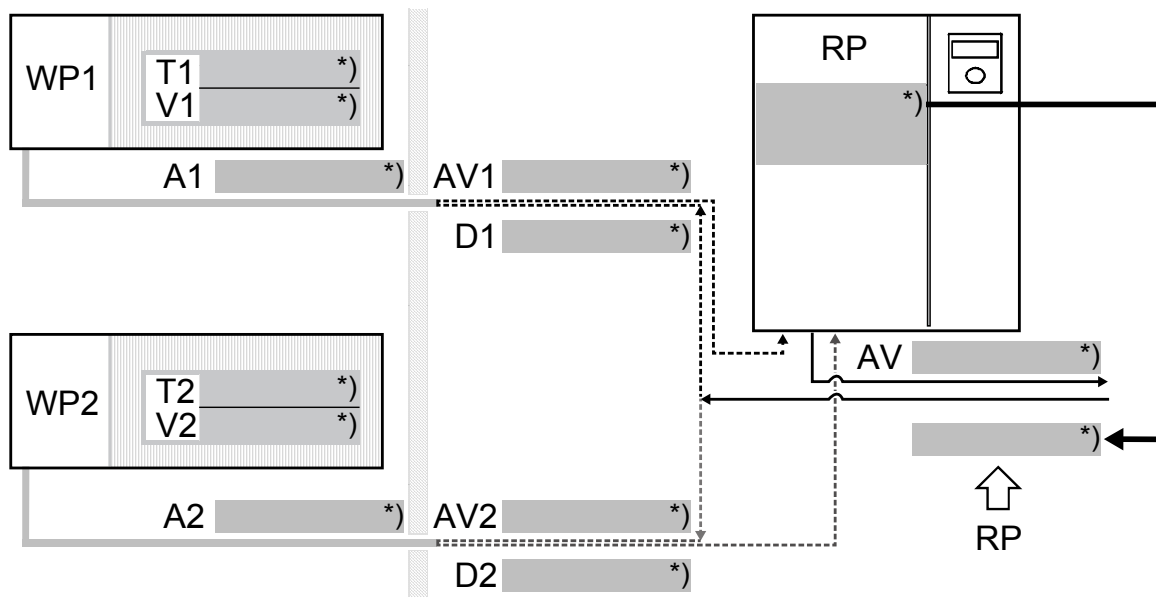
### Calculation of RP with LWD 50A + LWD 70A

Pressure loss, heat pump 1	12,080 Pa
+ Pressure loss, external components (D1)	3,000 Pa
= Interim result 1	15,080 Pa
Pressure loss, heat pump 2	16,180 Pa
+ Pressure loss, external components (D2)	5,000 Pa
= Interim result 2	21,180 Pa
Total free pressure, hydraulic module, for heat pump of the more unfavourable interim result	43,000 Pa
- more unfavourable interim result	21,180 Pa
<b>= RP</b>	<b>21,820 Pa</b>





## Calculation of your system



Complete all fields and table rows marked with an asterisk \*).

- ① In the grey field T1, enter the type of your heat pump 1, enter the type of your heat pump 2 in the field T2...
- ② When entering the value for V1 and V2, decide whether the dimensioning is to be carried out on the basis of  $V_{min}$  (approx. 8 K difference),  $V_{nom}$  (5 K difference) or  $V_{max}$  (approx. 3 K difference). Enter the value for the chosen dimensioning in the field V1 or V2...
- ③ Enter the design volume flow of heat pump 1 in the field AV 1, the design volume flow of heat pump 2 in the field AV2 and in the respective calculation tables...
- ④ Enter the design volume flow of the external components in the field AV...
- ⑤ Determine the pressure loss of the external components for heat pump 1 pipe run and enter in field D1...
- ⑥ Determine the pressure loss of the external components for heat pump 2 pipe run and enter in field D2...
- ⑦ Enter the inherent pressure loss of heat pump 1 (depending on  $V_{min}$ ,  $V_{nom}$  or  $V_{max}$ ) in calculation table 1 and the inherent pressure loss of heat pump 2 (depending on  $V_{min}$ ,  $V_{nom}$  or  $V_{max}$ ) in calculation table 2...
- ⑧ Enter the inherent pressure loss of the connection kit of heat pump 1 in calculation table 1 and the inherent pressure loss of the connection kit of heat pump 2 in calculation table 2 ...
- ⑨ Enter the type of connection pipe for heat pump 1 in the grey field A1 and the type of connection pipe for heat pump 2 in the grey field A2...
- ⑩ Add the inherent pressure losses in the calculation tables to the pressure loss of heat pump 1 and to the pressure loss of heat pump 2...

Calculation table for heat pump 1 pressure loss 1 at AV1 of	
Inherent pressure loss of heat pump	*) Pa
+ Inherent pressure loss of connection kit	*) Pa
+ Inherent pressure loss of connection pipe HVLD / WDF	*) Pa
<b>= Pressure loss, heat pump 1 (at entry into building)</b>	<b>*) Pa</b>

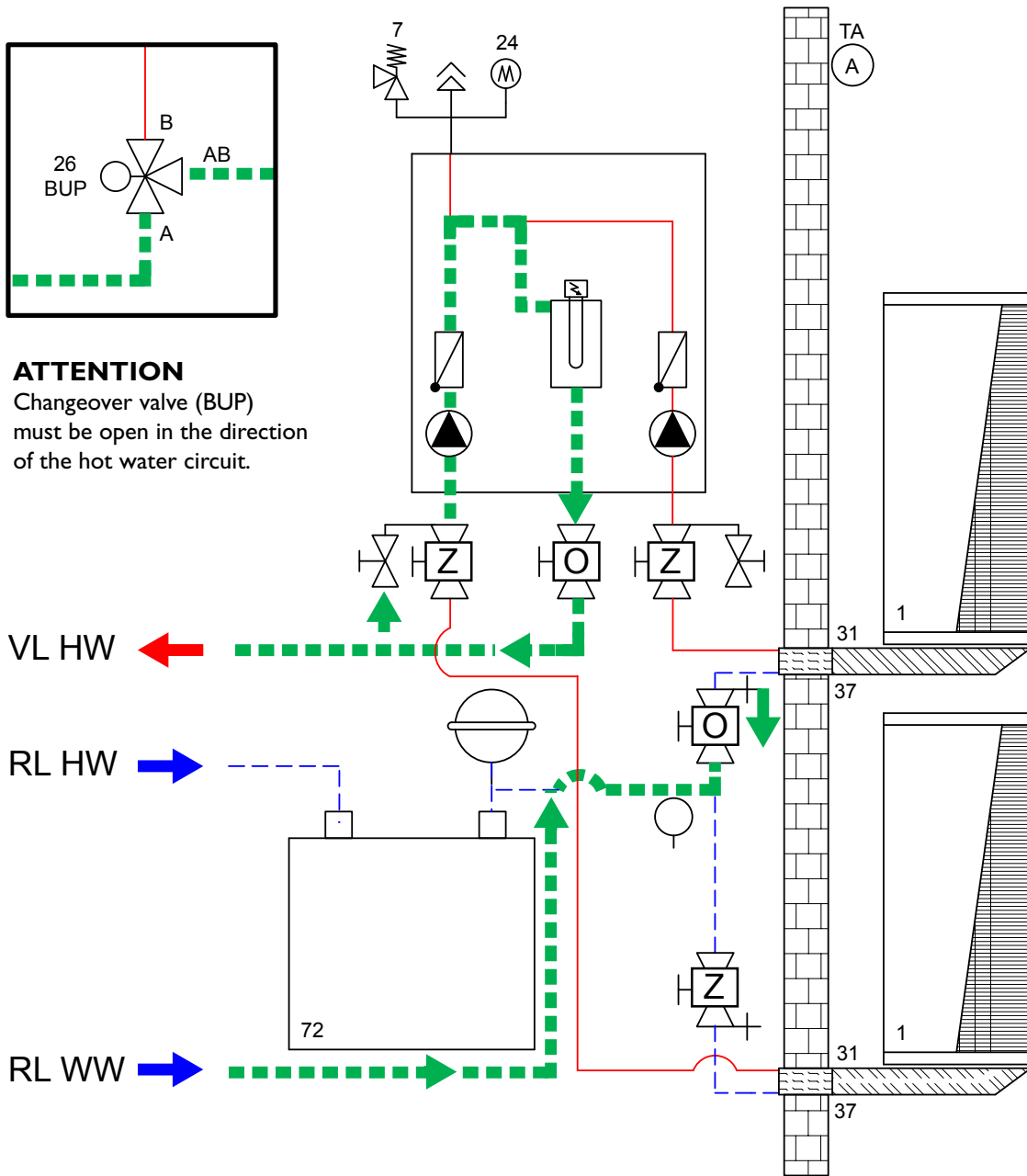
Calculation table for heat pump 2 pressure loss 1 at AV2 of	
Inherent pressure loss of heat pump	*) Pa
+ Inherent pressure loss of connection kit	*) Pa
+ Inherent pressure loss of connection pipe HVLD / WDF	*) Pa
<b>= Pressure loss, heat pump 2 (at entry into building)</b>	<b>*) Pa</b>

- ⑪ Calculate value RP and enter in the RP fields shown in the above figure...

RP calculation	
Pressure loss, heat pump 1	*) Pa
+ Pressure loss of ext. components (D1)	*) Pa
<b>= Interim result 1</b>	<b>*) Pa</b>
Pressure loss, heat pump 2	*) Pa
+ Pressure loss of ext. Components (D2)	*) Pa
<b>= Interim result 2</b>	<b>*) Pa</b>
Total free pressure, hydraulic module, for heat pump of the more unfavourable interim result	*) Pa
- more unfavourable interim result	*) Pa
<b>= RP</b>	<b>*) Pa</b>



# Flushing and venting process, hot water circuit



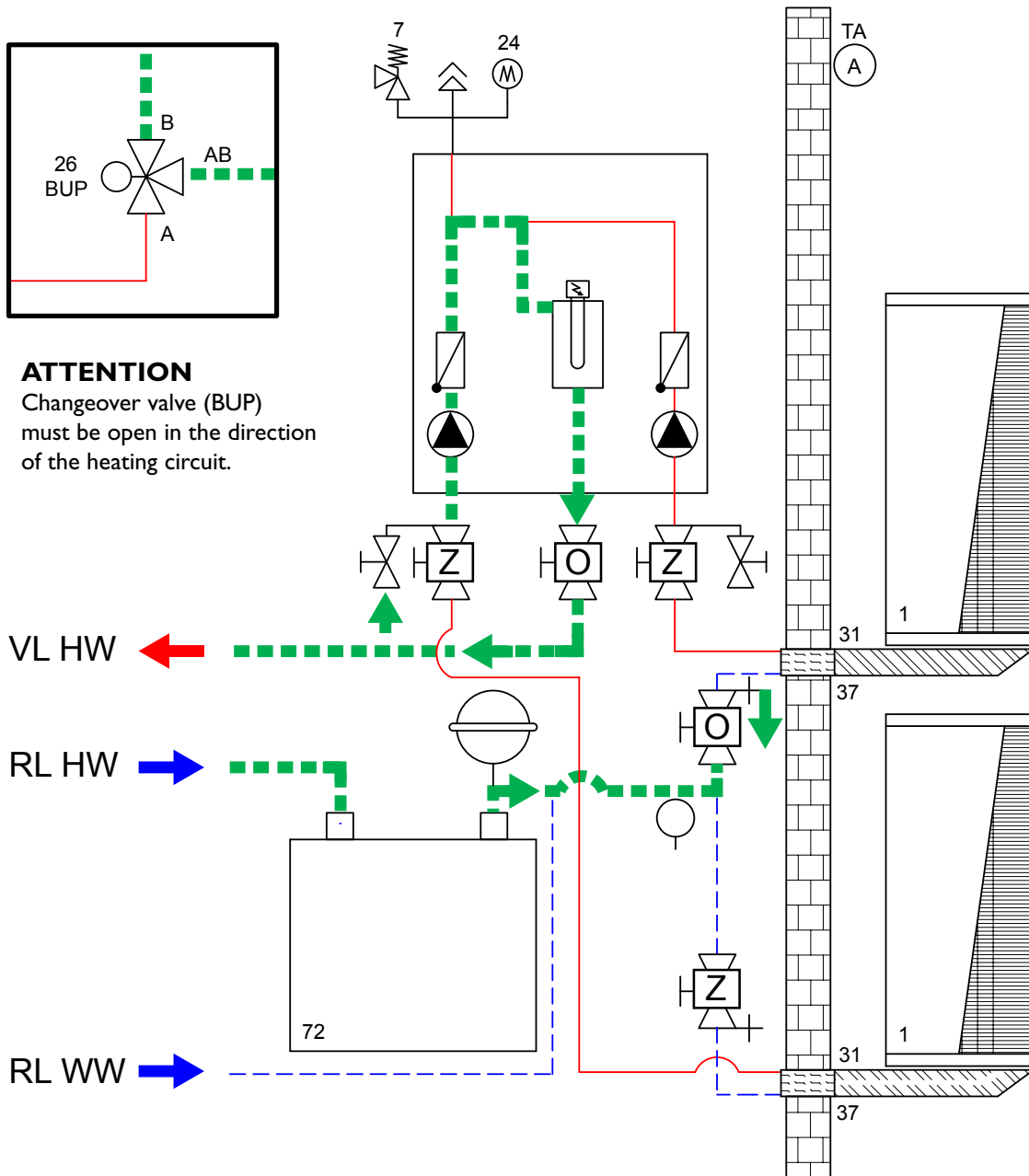
**! ATTENTION**  
Changeover valve (BUP)  
must be open in the direction  
of the hot water circuit.

Key:

VL HW	Heating water flow	1	Heat pump
RL WW	Hot water return	7	Safety valve
Z	Shut-off valve closed	24	Pressure gauge
O	Shut-off valve open	26	Hot water changeover valve (BUP)
TA (A)	Outdoor sensor	31	Wall penetration
		37	Wall bracket
		72	Wall-mounted buffer tank



# Flushing and venting process, heating circuit



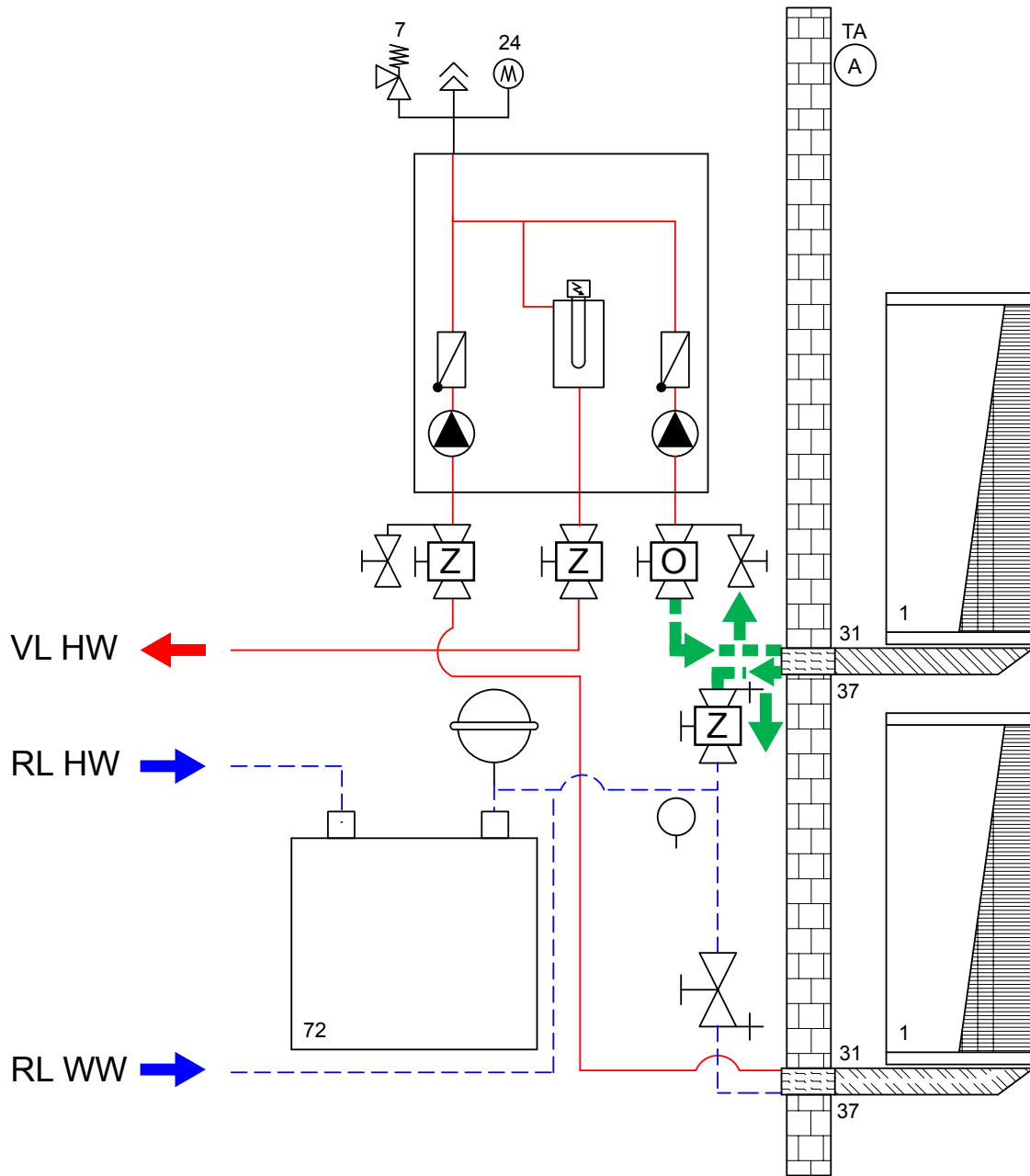
**! ATTENTION**  
Changeover valve (BUP)  
must be open in the direction  
of the heating circuit.

Key:

VL HW	Heating water flow	1	Heat pump
RL WW	Hot water return	7	Safety valve
Z	Shut-off valve closed	24	Pressure gauge
O	Shut-off valve open	26	Hot water changeover valve (BUP)
		31	Wall penetration
		37	Wall bracket
		72	Wall-mounted buffer tank
TA (A)	Outdoor sensor		



# Flushing and venting process, heat pump 1

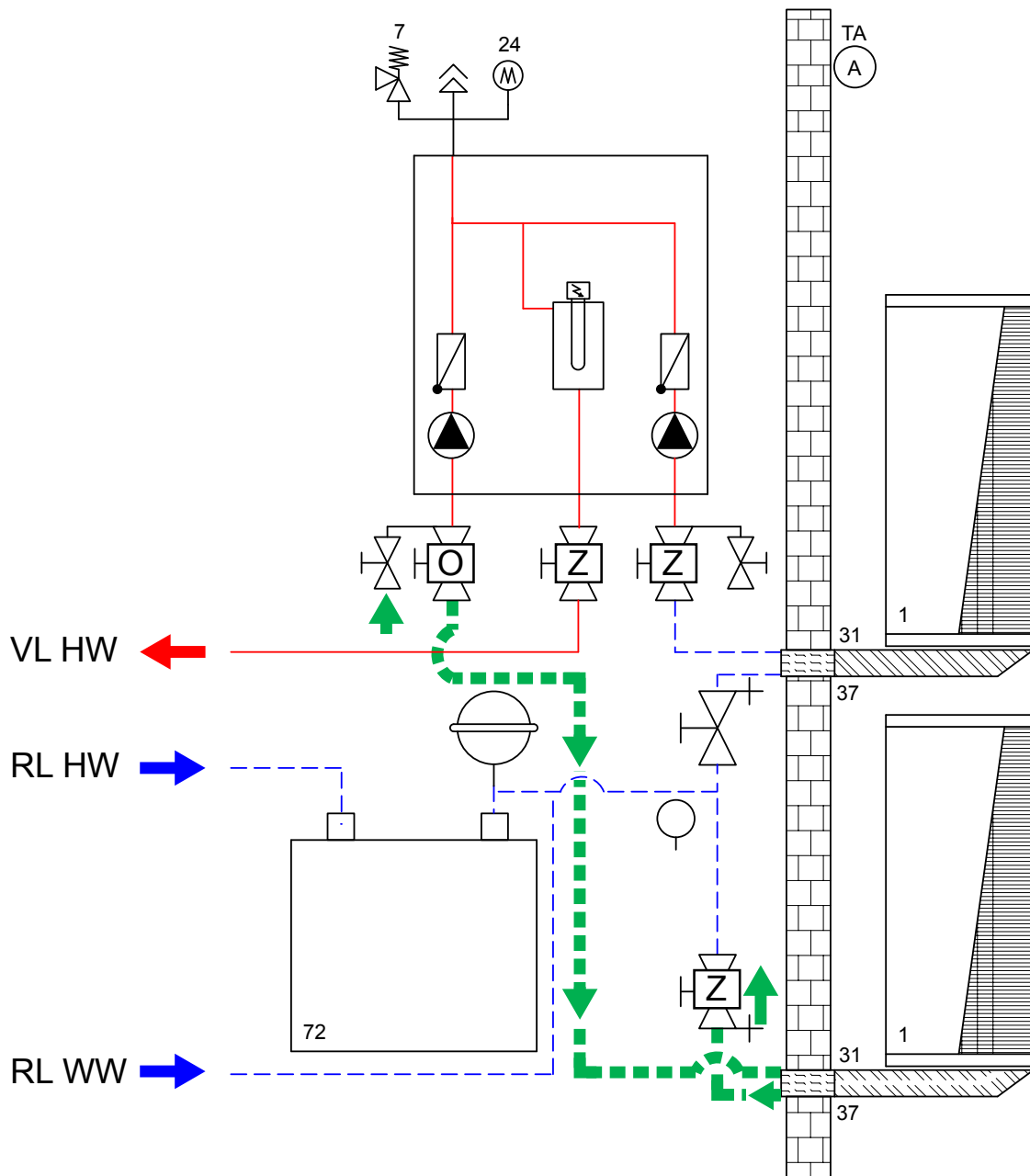


Key:

VL HW	Heating water flow	1	Heat pump
RL WW	Hot water return	7	Safety valve
Z	Shut-off valve closed	24	Pressure gauge
O	Shut-off valve open	26	Hot water changeover valve (BUP)
		31	Wall penetration
		37	Wall bracket
TA $\text{\textcircled{A}}$	Outdoor sensor	72	Wall-mounted buffer tank

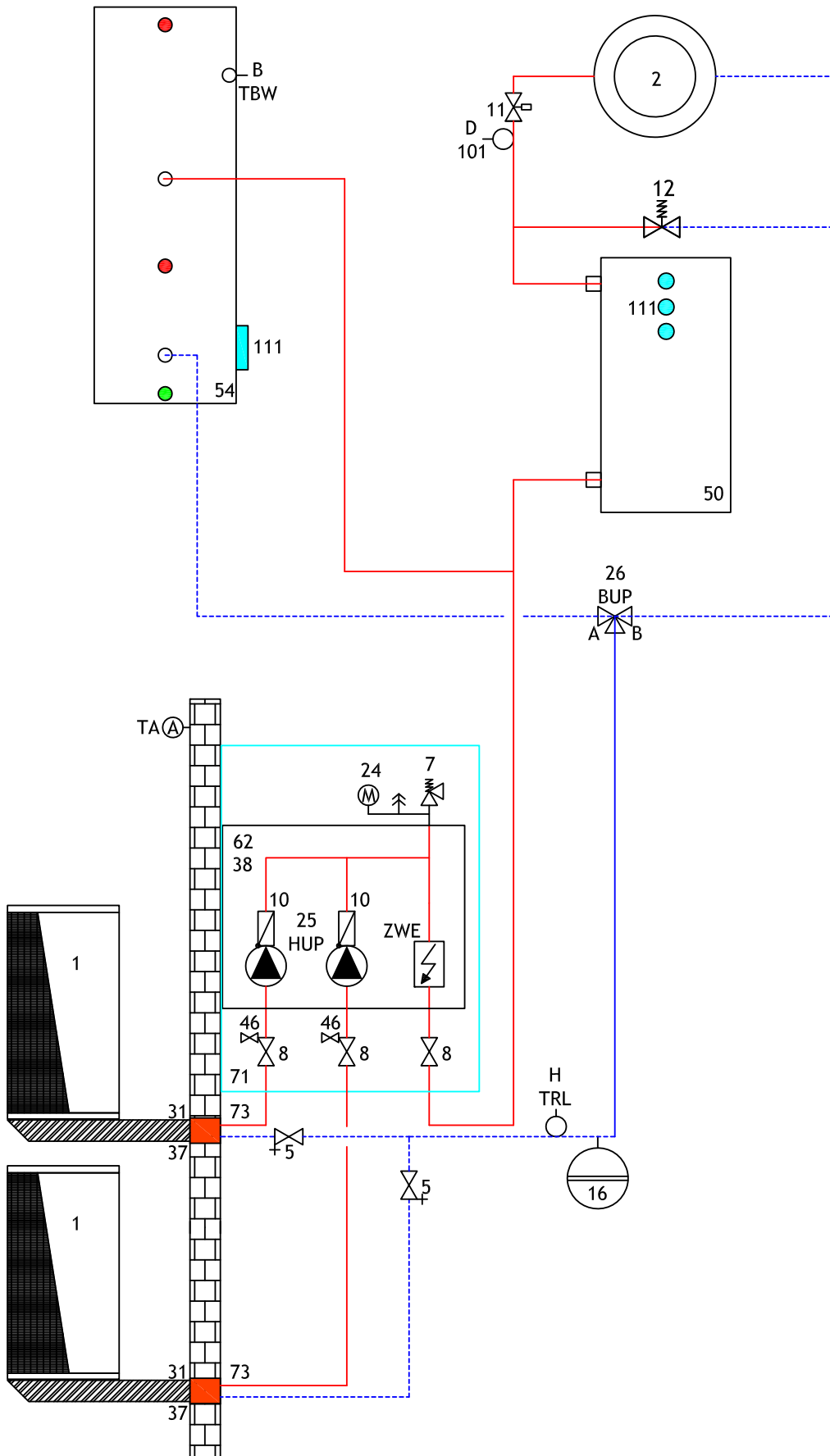


## Flushing and venting process, heat pump 2



Key:

VL HW	Heating water flow	1	Heat pump
RL WW	Hot water return	7	Safety valve
Z	Shut-off valve closed	24	Pressure gauge
O	Shut-off valve open	26	Hot water changeover valve (BUP)
		31	Wall penetration
		37	Wall bracket
TA (A)	Outdoor sensor	72	Wall-mounted buffer tank







**Legend hydraulic diagram**

1	Heat pump	51	Separation tank	TA/A	External sensor
2	Underfloor heating / radiators	52	Gas- or oil-boiler	TBW/B	Domestic hot water sensor
3	Vibration isolation	53	Wood boiler	TB1/C	Feedwater sensor mixer circuits 1
4	Sylomer strip machine underlay	54	Hot water cylinder	D	Floor temperature limiter
5	Closure and drainage	55	Brine pressure switch	TRL/G	Sensor external return
6	Expansion vessel packing list	56	Swimming pool heat exchanger	STA	Line pressure regulator valve
7	Safety valve	57	Geothermal heat exchanger	TRL/H	Sensor return (hydraulic module, dual)
8	Closure	58	Ventilation system	79	Motor valve
9	Heating circulation pump	59	Plate heat exchanger	80	Mixing valve
10	Non return valve/ one way valve	61	Cooling cylinder	81	Split heat pump outdoor unit
11	Individual room regulation	65	Compact distributor	82	Split heat pump indoor unit
12	Overflow valve	66	Fancolls	83	Circulation pump
13	Steamtight insulation	67	Solar service water cylinder	84	Switching valve
14	Service water circulation pump	68	Solar service water cylinder	113	Connection 2nd heat generator
15	Mixer circuit three-way mixer (MK1 discharge)	69	Multifunction tank	BT1	Outdoor temperature sensor
16	Expansion vessel supplied by customer	71	Dual hydraulic module	BT2	Flow temperature sensor
18	Heating rod (heating)	72	Buffer tank wall mounted	BT3	Return temperature sensor
19	Mixer circuit four-way mixer (MK1 charge)	73	Pipe lead-in	BT6	Domestic hot water temperature sensor
20	Heating rod (SW)	74	Ventower	BT12	Flow temperature liquefier
21	Mixer circuit circulation pump (FP1)	75	Scope of delivery, hydraulic tower, dual	BT19	Temperature sensor immersion heater
23	Feed circulating pump (reconnect the integrated circulating pump in the heat pump)	76	Fresh water station	BT24	Temperature sensor 2nd heat generator
24	Manifold	77	Scope of supply water/water booster		
25	Heating circulation pump	78	Accessories water/water booster optional		
26	Switching valve (heating/service water)(B = normally open)				
27	Heating element				
28	Brine circulation pump				
29	Dirt-trap 0.6 mm mesh	100	Room thermostat for cooling (optional)	15	Mixer circuit three-way mixer (MK2-3 discharge)
30	Spill-tray für brine mix	101	Controls supplied by customer	17	Temperature difference regulator
31	Wall breakthrough	102	Dew-point monitor (optional)	19	Mixer circuit four-way mixer (MK2 charge)
32	Inlet pipe	103	Room thermostat for reference space in packing list	21	Mixer circuit circulation pump (FP2-3)
33	Brine manifold	104	Supply heat pump	22	Swimming pool circulating pump
34	Ground collector	105	Cooling circuit module box removable for installation	44	Three-way mixer valve (cooling function MK2)
35	Ground slinkies	106	Specific glycole mixture	47	Changeover valve swimming bath preparation(B = normally open)
36	Groundwater spring pump	107	Scald protection / thermostatic mixer valve	60	Changeover valve cooling operation(B = normally open)
37	Wall bracket	108	Solar pump assembly	62	Heat meter (optional)
38	Flow switch	109	Overflow valve must be closed	63	Changeover valve solar circuit(B = normally open)
39	Suction well	110	Packing list hydraulic tower	64	Cooling circulation pump
40	Inverted well	111	Mounting for additional heating element	70	Solar separation module
41	Rinse fitting heating circuit	112	Minimum distance to thermal decoupling of the mixing valve	TB2-/3/C	Feedwater sensor mixer circuits 2-3
42	Circulation pump			TSS/E	Sensor, temperature difference control (low temperature)
43	Brine / Water heat exchanger (cooling function)			TSK/E	Sensor, temperature difference control (high temperature)
44	Three-way mixer valve (cooling function MK1)			TEE/F	Sensor external energy source
45	Cap valve				
46	Filler and drainage valve				
48	Domestic hot water charging pump				
49	Direction of groundwater flow				
50	Buffer storage				

**Comfort board:**

15	Mixer circuit three-way mixer (MK2-3 discharge)
17	Temperature difference regulator
19	Mixer circuit four-way mixer (MK2 charge)
21	Mixer circuit circulation pump (FP2-3)
22	Swimming pool circulating pump
44	Three-way mixer valve (cooling function MK2)
47	Changeover valve swimming bath preparation(B = normally open)
60	Changeover valve cooling operation(B = normally open)
62	Heat meter (optional)
63	Changeover valve solar circuit(B = normally open)
64	Cooling circulation pump
70	Solar separation module
TB2-/3/C	Feedwater sensor mixer circuits 2-3
TSS/E	Sensor, temperature difference control (low temperature)
TSK/E	Sensor, temperature difference control (high temperature)
TEE/F	Sensor external energy source

**Important notice !**

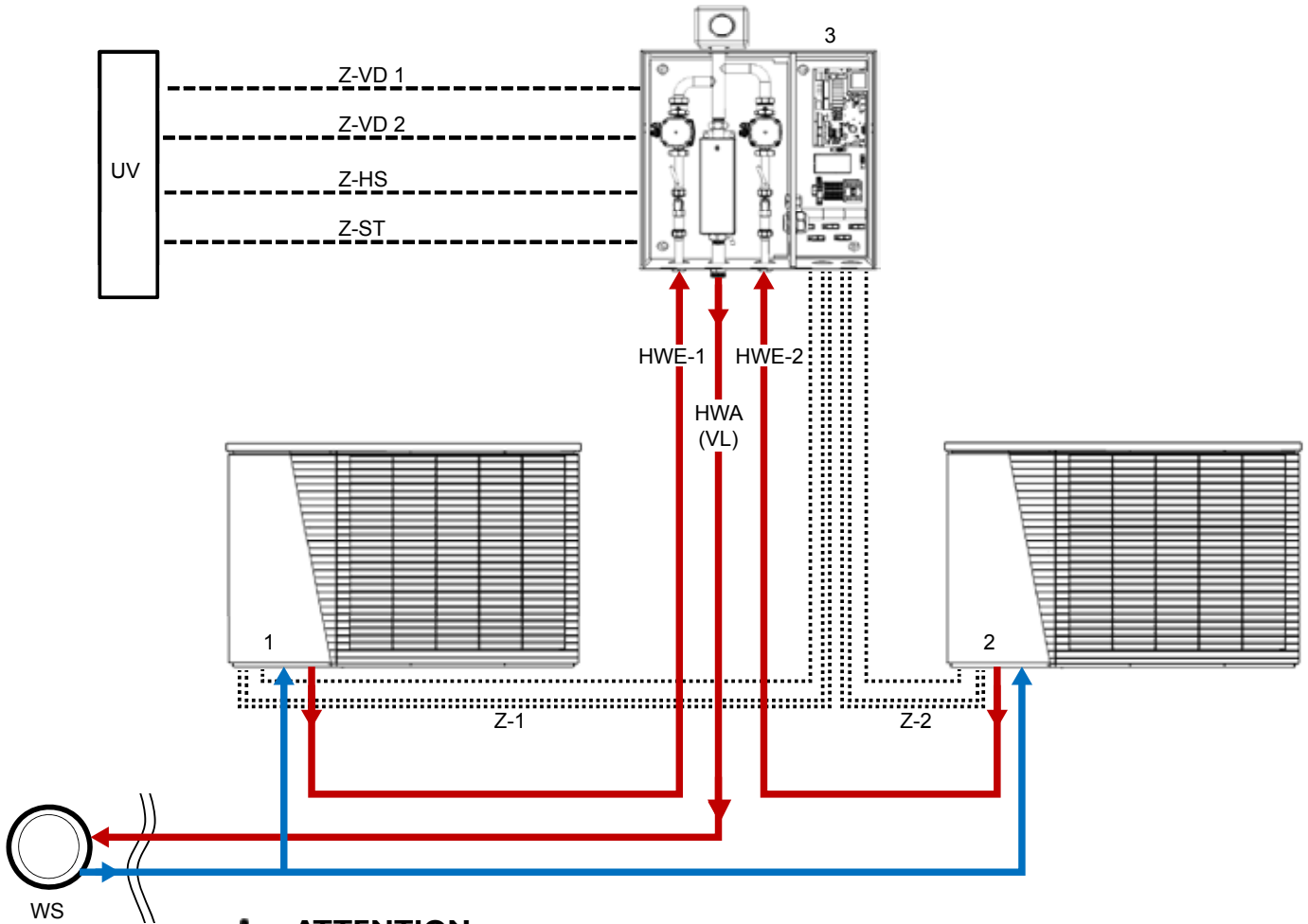
These hydraulic diagrams are schematic representations and are for assistance only. They do not relieve of the obligation to carry out appropriate planning! They do not include all necessary shut-off valves, ventilator fittings or safety devices. These must be incorporated in accordance with the standards and regulations applicable to the respective installation. All country-specific standards, laws and regulations must be observed! The tubes have to be dimensioned according to the nominal volume flow of the heat pump resp. the free pressing of the integrated circulating pump. For detailed information and advice please contact our local sales partner!







# Schematic diagram of the electrical connections



## ! ATTENTION

When laying the cable, note that unshielded power supply cables (power supply of outdoor units) and shielded cables (LINBus) must be laid separately from each other.



Minimum spacings for cable laying, Page 13

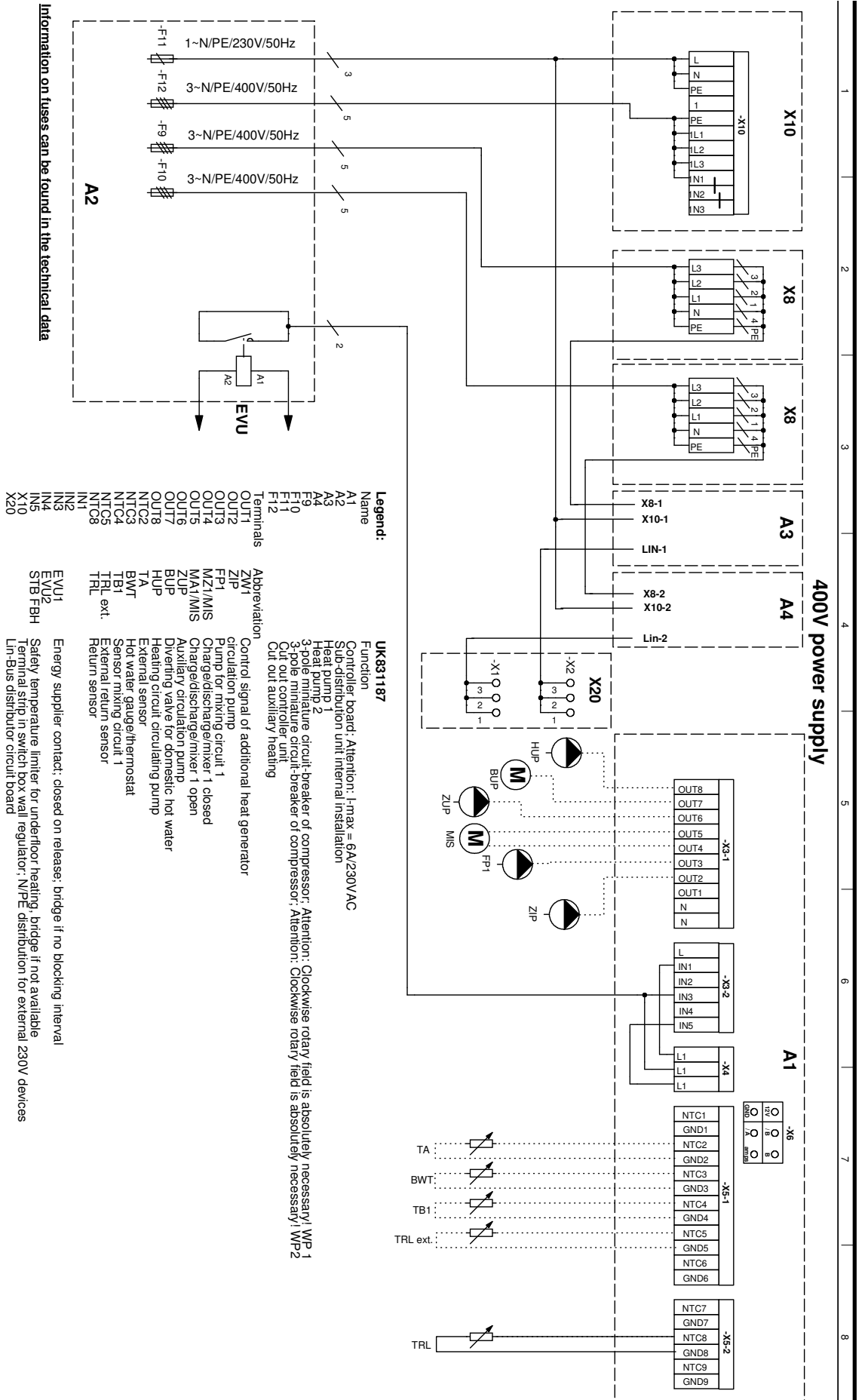
### Key:

UV	Electricity subdistribution	1	Heat pump 1
Z-VD 1	Supply cable for compressor of heat pump 1	Z-1	Supply cables for heat pump 1 (label each with sticker 1!) 1 x Supply cable for compressor 1 x Supply cable for controls 1 x LINBus connection (Note minimum distance from compressor and controls supply cable!)
Z-VD 2	Supply cable for compressor of heat pump 2	2	Heat pump 2
Z-HS	Supply cable for heating element	Z-1	Supply cables for heat pump 2 (label each with sticker 2!) 1 x Supply cable for compressor 1 x Supply cable for controls 1 x LINBus connection (Note minimum distance from compressor and controls supply cable!)
Z-ST	Supply cable for controls	3	Hydraulic module HMD 2/(S)E or HMD 2/R(S)E
HWE-1	Heating water inlet from heat pump 1		
HWE-2	Heating water inlet from heat pump 2		
HWA (VL)	Heating water outlet (flow)		
WS	Heat sink		



# Terminal diagram

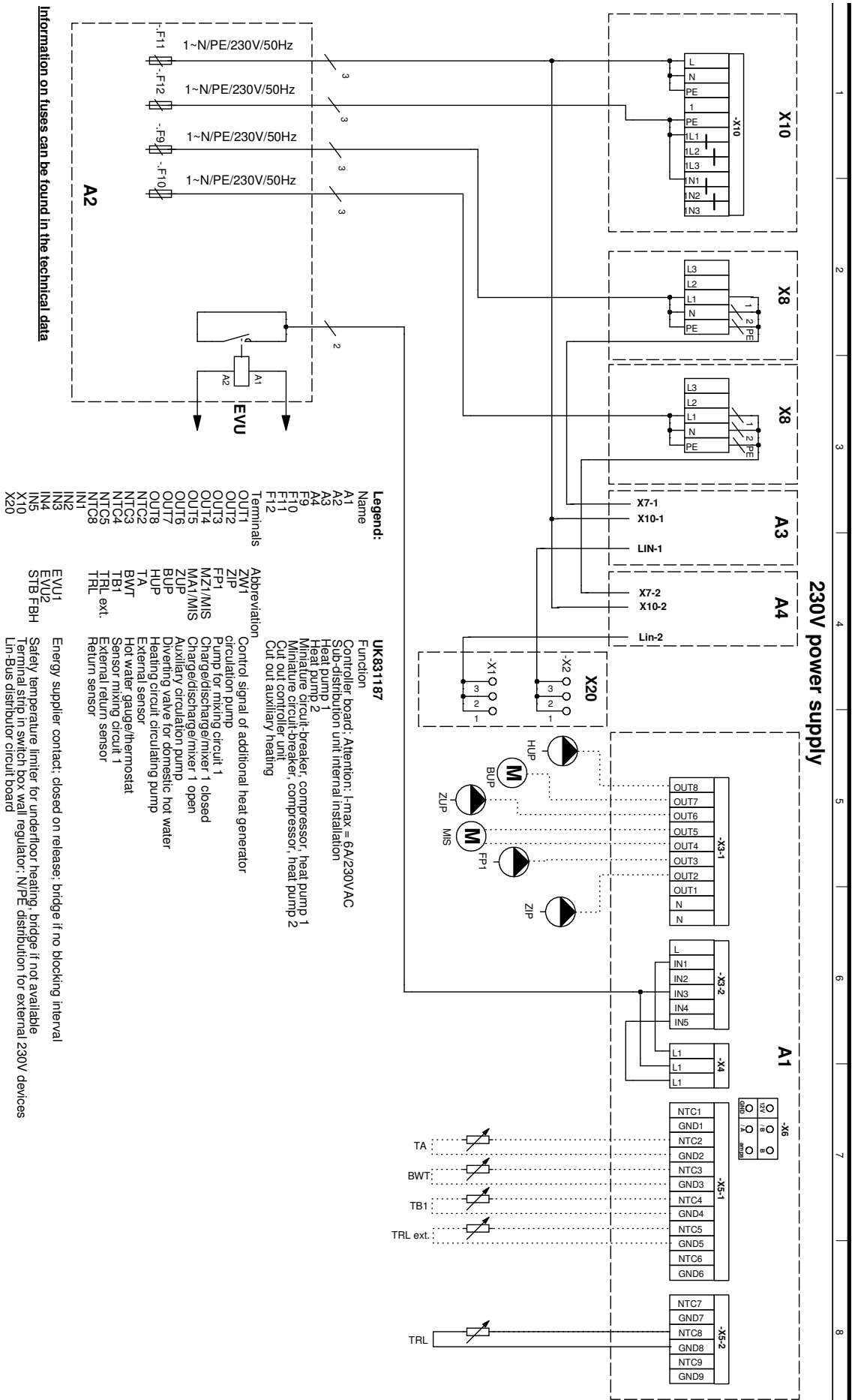
400V: LWD ... / HMD 2/...





# 230V: LWD ... / HMD 2/...

# Terminal diagram



Information on fuses can be found in the technical data

- Legend:**
- | Name      | Function  |
|-----------|---|
| A1        | Controller board. Attention: I <sub>max</sub> = 6A/230VAC |
| A2        | Sub-distribution unit internal installation               |
| A3        | Heat pump 1   |
| A4        | Heat pump 2   |
| F9        | Miniature circuit-breaker, compressor, heat pump 1        |
| F10       | Miniature circuit-breaker, compressor, heat pump 2        |
| F11       | Out out auxiliary heating                                 |
| F12       | Out out auxiliary heating                                 |
| Terminals | Abbreviation  |
| OUT1      | Control signal of additional heat generator               |
| OUT2      | circulation pump  |
| OUT3      | ZIP   |
| OUT4      | Pump for mixing circuit 1                                 |
| OUT5      | FP1   |
| OUT6      | MZ1/MIS   |
| OUT7      | Charge/dischARGE/mixer 1 closed                           |
| OUT8      | Charge/dischARGE/mixer 1 open                             |
| OUT9      | Auxiliary circulation pump                                |
| OUT10     | BUP   |
| OUT11     | HUP   |
| OUT12     | Diverting valve for domestic hot water                    |
| OUT13     | Heating circuit circulating pump                          |
| OUT14     | External sensor   |
| OUT15     | TA  |
| OUT16     | Hot water gauge/thermostat                                |
| OUT17     | BWT   |
| OUT18     | Sensor mixing circuit 1                                   |
| OUT19     | TB1   |
| OUT20     | External return sensor                                    |
| OUT21     | Return sensor   |
| IN1       | EVU1  |
| IN2       | EVU2  |
| IN3       | IN4   |
| IN4       | IN5   |
| IN5       | STB FBH   |
| IN6       | FBH   |
| IN7       |   |
| IN8       |   |
| IN9       |   |
| IN10      |   |
| IN11      |   |
| IN12      |   |
| IN13      |   |
| IN14      |   |
| IN15      |   |
| IN16      |   |
| IN17      |   |
| IN18      |   |
| IN19      |   |
| IN20      |   |

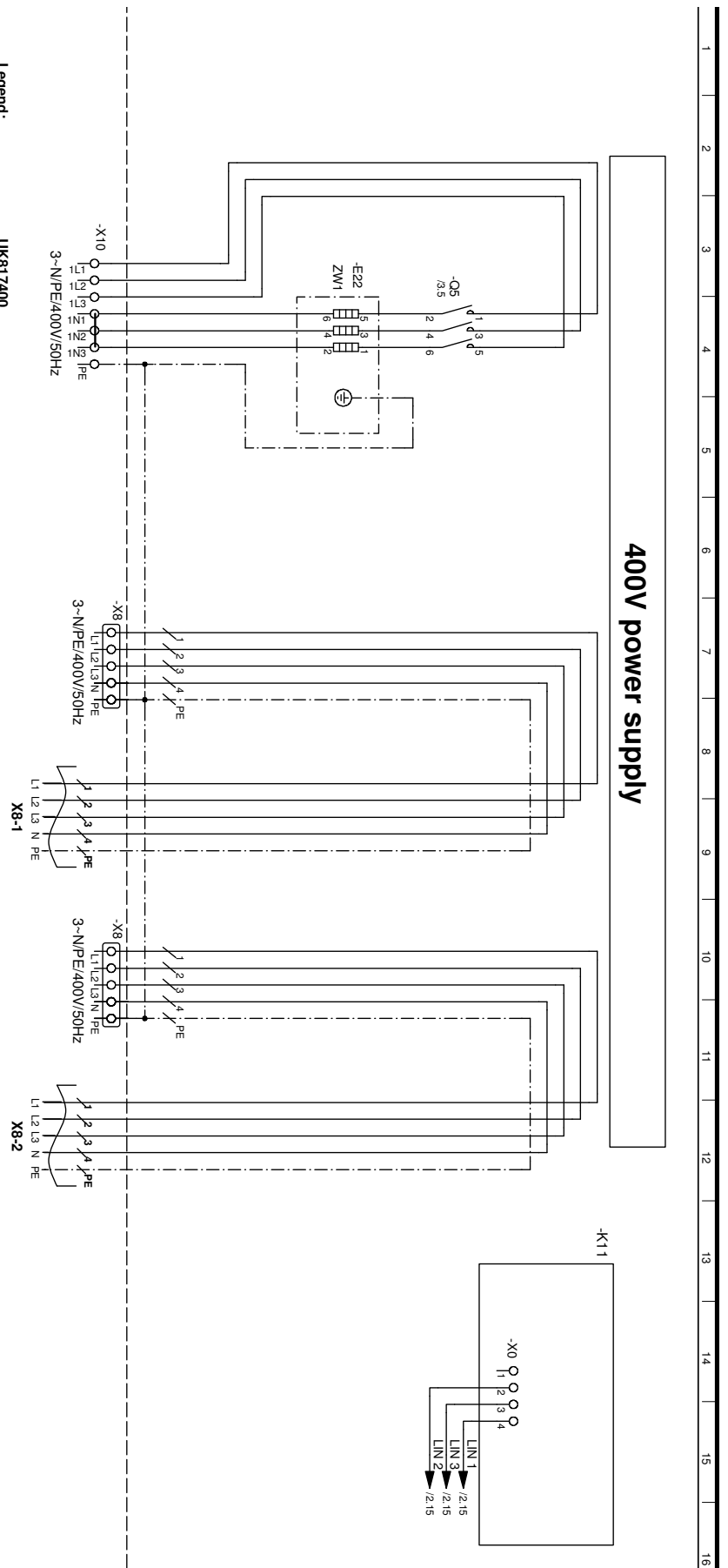
Energy supplier contact: closed on release; bridge if no blocking interval  
 Safety temperature limiter for underfloor heating; bridge if not available  
 Terminal strip in switch box wall regulator; N/PE distribution for external 230V devices  
 Lin-Bus distributor circuit board



# Circuit diagram 1/3

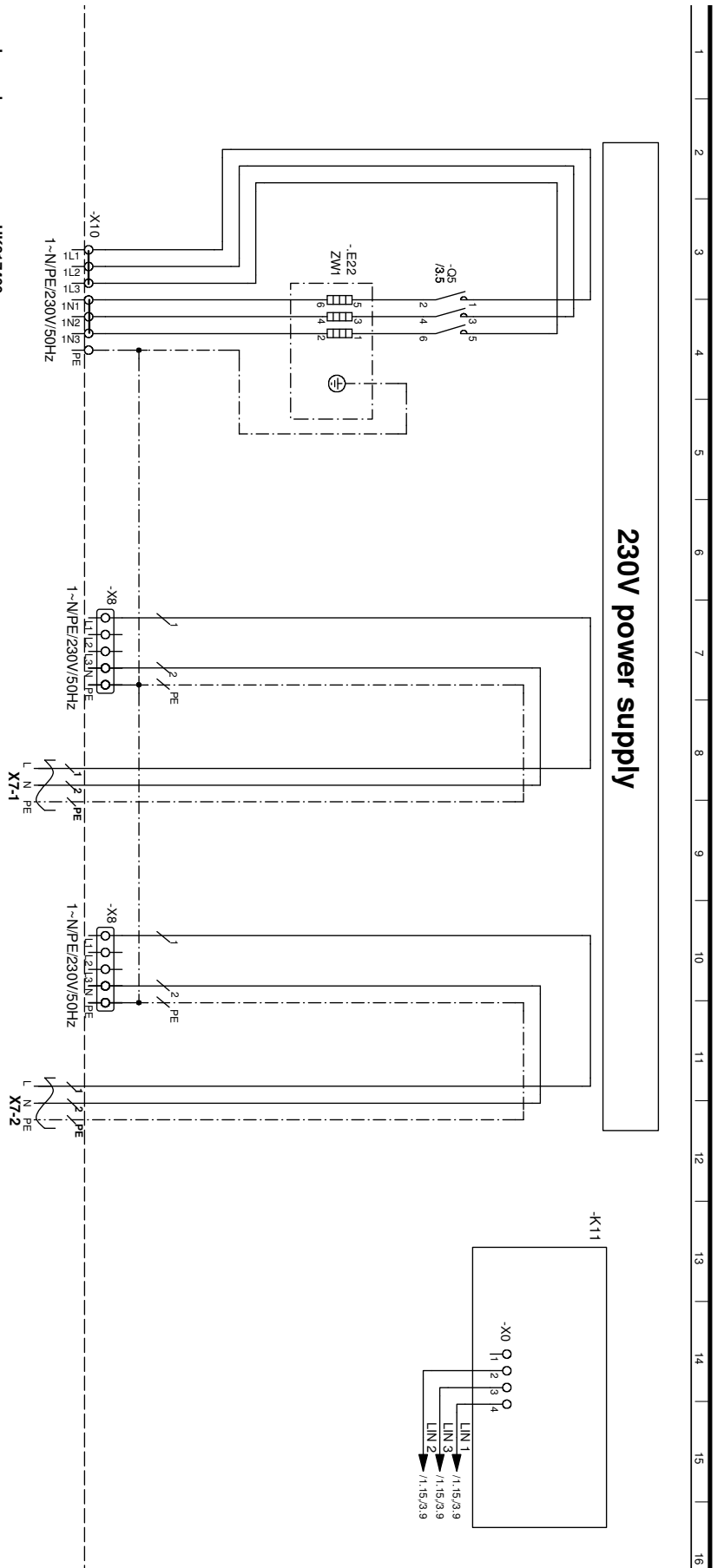
# HMD 2/...

- Legend:**
- | Operating materials  | Function   |
|----------------------|--|
| 3~N/PE/400V/50Hz X8  | Power supply compressor: right-hand rot. field is mandatory! |
| 3~N/PE/400V/50Hz X10 | Power supply aux. heating                                    |
| E22                  | Auxiliary heating  |
| K11                  | Control  |
| O5                   | Contactor for auxiliary heating                              |
| Cable                | Unit connection  |
| LIN                  | LIN bus  |
| X8                   | Power supply, compressor output --> external unit            |





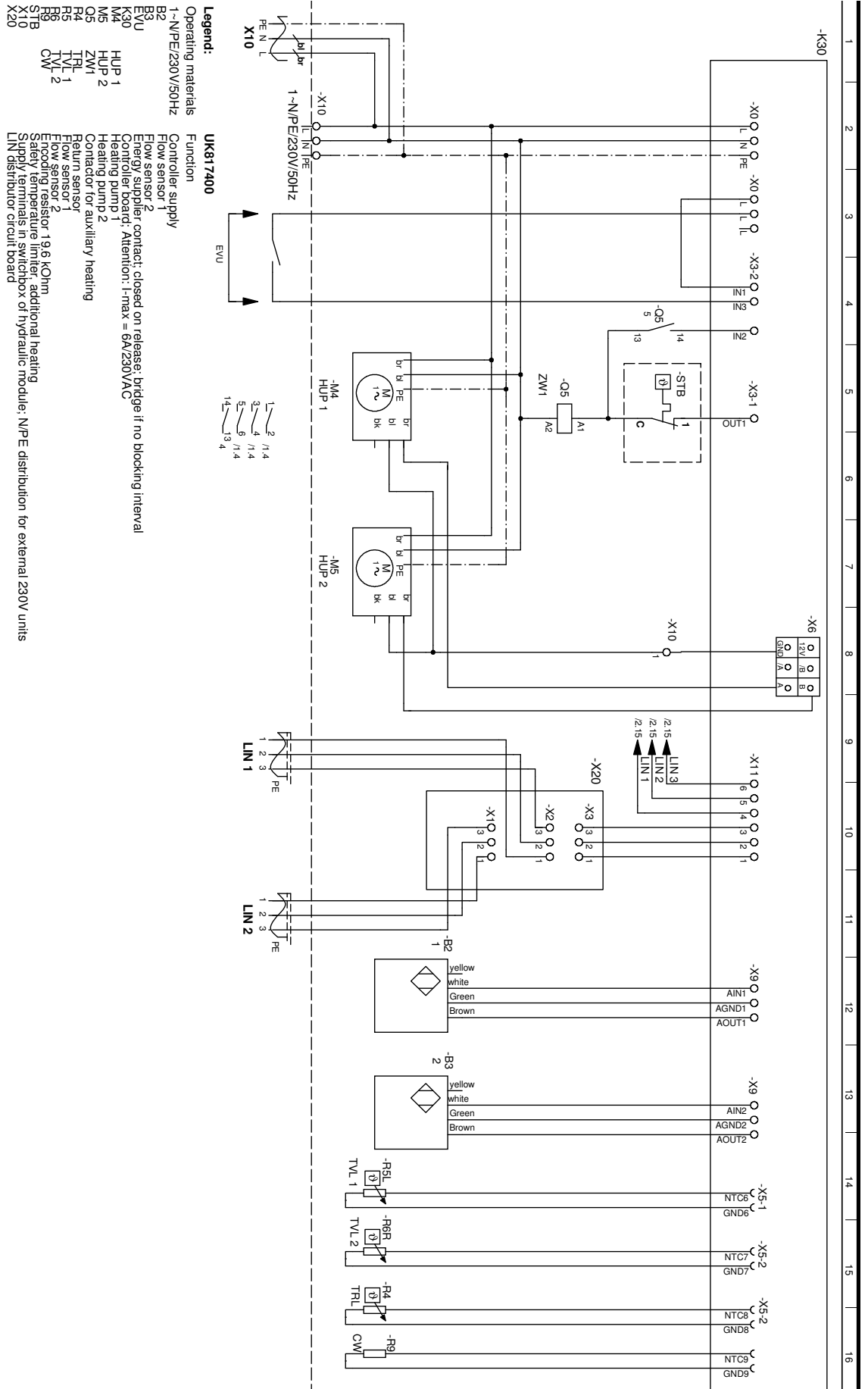
- Legend:**
- |                     |                 |   |
|---------------------|-----------------|---|
| Operating materials | <b>UK817400</b> | Function  |
| 1-N/PE/230V/50Hz    | X8              | Distribution box power supply output compressor   |
| 1-N/PE/230V/50Hz    | X10             | Power supply aux.: heating                        |
| E22                 | ZW1             | Auxiliary heating                                 |
| K11                 |                 | Control   |
| QS                  |                 | Contact for auxiliary heating                     |
| Cable               | LIN             | Unit connection                                   |
| LIN                 |                 | Unit bus  |
| X7                  |                 | Power supply, compressor output --> external unit |





# HMD 2/...

## Circuit diagram 3/3









# EC Declaration of Conformity

in accordance with the EC Machinery Directive 2006/42/EC,  
Annex II A



The undersigned

confirms that the following designated device(s) as designed and marketed by us fulfill the standardized EC directives, the EC safety standards and the product-specific EC standards.

In the event of modification of the device(s) without our approval, this declaration shall become invalid.

Designation of the device(s)

Heat Pump



Unit model	Order number	Item number 1	Item number 2	Item number 3
LWD 5050A-HMD 2	100601H1002	100 601	100 601	150 858 01
LWD 7050A-HMD 2	100602H1202	100 602	100 601	150 858 01
LWD 7070A-HMD 2	100602H1402	100 602	100 602	150 858 01
LWD 9050A-HMD 2	100609H1402	100 609	100 601	150 858 01
LWD 9070A-HMD 2	100609H1602	100 609	100 602	150 858 01
LWD 9090A-HMD 2	100609H1802	100 609	100 609	150 858 01
LWD 5050A/SX-HMD 2	100603H1002	100 603	100 603	150 858 01
LWD 7050A/SX-HMD 2	100604H1202	100 604	100 603	150 858 01
LWD 7070A/SX-HMD 2	100604H1402	100 604	100 604	150 859 01
LWD 5050A/RX-HMD 2R	100605H1002	100 605	100 605	150 859 01
LWD 7050A/RX-HMD 2R	100606H1202	100 606	100 605	150 859 01
LWD 7070A/RX-HMD 2R	100606H1402	100 606	100 606	150 859 01
LWD 5050A/RSX-HMD 2R	100607H1002	100 607	100 607	150 859 01
LWD 7050A/RSX-HMD 2R	100608H1202	100 608	100 607	150 859 01
LWD 7070A/RSX-HMD 2R	100608H1402	100 608	100 608	150 859 01

### EC Directives

2006/42/EG 2009/125/EG  
2006/95/EG 2010/30/EU  
2004/108/EG  
\*97/23/EG  
2011/65/EG

### Standardized EN

EN 378 EN 349  
EN 60529 EN 60335-1/-2-40  
EN ISO 12100-1/2 EN 55014-1/-2  
EN ISO 13857 EN 61000-3-2/-3-3

### \* Pressure equipment component

Category II  
Module A1  
Designated position:  
TÜV-SÜD

Industrie Service GmbH (Nr.:0036)

### Company:

ait-deutschland GmbH  
Industrie Str. 3  
93359 Kasendorf  
Germany

Place, date: Kasendorf, 14.12.2015

Signature:

Jesper Stannow  
Head of Heating Development



ait-deutschland GmbH  
Industriestraße 3  
D-95359 Kasendorf

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