

the better way to heat



Brine/Water Heat Pumps

Operating Manual SWCV series





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1 About this operating manual

This operating manual is part of the unit.

- ▶ Before working on or with the unit read the operating manual carefully and follow it for all activities at all times, especially the warnings and safety instructions.
- ▶ Keep the operating manual to hand at the unit and hand over to the new owner if the unit 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 refers solely to the unit identified by the nameplate and unit sticker (→ "Rating plate", page 7 and "Unit sticker", page 3).

1.2 Reference documents

The following documents contain additional information to this operating manual:

- Planning & design manual, hydraulic integration
- Operating manual of the heating and heat pump controller
- Brief description of the heat pump controller
- Operating manual of the expansion board (accessories)
- Logbook, if included with this unit by the manufacturer

Unit sticker

The unit sticker contains important information for contact with the manufacturer or the local partner of the manufacturer.

- ▶ Stick on the unit sticker (barcode with serial and product number) here.



1.3 Symbols and identification 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
▶	Single step action prompt
1., 2., 3., ...	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



1.4 Contact

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

- Germany: www.alpha-innotec.de
- EU: www.alpha-innotec.com

2 Safety

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

2.1 Intended use

The unit is solely intended for the following functions:

- Heating
- Domestic water heating (optional, with accessories)
- Cooling (optional, with accessories or unit type ...K3)
- ▶ Proper use includes complying with the operating conditions (→ “Technical data / Scope of supply”, from page 24) 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 unit are not as intended.

2.2 Personnel qualifications

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

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

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

Children must not play with the product.

The product may only be opened by qualified personnel.

All instructional information in this operating manual is solely directed at qualified, skilled personnel.

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

- ▶ Ensure that the personnel is familiar with the local regulations, especially those on safe and hazard-aware working.
- ▶ Only allow qualified personnel with “electrical” training to carry out work on the electrics and electronics.
- ▶ Only allow qualified, skilled personnel to do any other work on the system, e.g.
 - Heating installer
 - Plumbing installer
 - Refrigeration system installer (maintenance work)

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

There is a risk of cutting your hands on sharp edges of the unit.

- ▶ Wear cut-resistant protective gloves during transport.

2.4 Residual risks

Electric shock

Components in the unit are live with life-threatening voltage. Before opening the unit panelling:

- ▶ Disconnect unit from power supply.
- ▶ Protect unit against being switched back on again.
- ▶ Residual voltage at the inverter. Wait for 90 seconds before opening the unit.



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.

Injury due to flammable liquids and potentially explosive atmospheres

Constituents of antifreeze mixtures, e.g. ethanol, methanol, are highly flammable and form an explosive atmosphere:

- ▶ mix antifreeze in well-ventilated rooms.
- ▶ Note the hazardous substance markings and comply with the relevant safety regulations.

Injuries and environmental damage due to refrigerant

The unit contains harmful and environmentally dangerous refrigerant. If refrigerant leaks from the unit:

1. Switch off unit.
2. Thoroughly ventilate installation room.
3. Notify authorised customer service.

2.5 Disposal

Batteries

Improper disposal of the buffer battery damages the environment.

- ▶ Dispose of the buffer battery in an environmentally compatible way according to the local regulations.

Media harmful to the environment

Improper disposal of environmentally harmful media (antifreeze, refrigerant) damages the environment:

- ▶ Collect media safely.
- ▶ Dispose of the media in an environmentally compatible way according to the local regulations.

2.6 Avoid damage to property

Decommissioning/draining the heating

If the system/heat pump is decommissioned or drained after already being filled, it must be ensured that the condenser and any heat exchangers have been drained completely for the event of freezing temperatures. Residual water in heat exchangers and condensers can result in damage to the components.

- ▶ Completely drain the system and the condenser, and open vent valves.
- ▶ Blow them clear with compressed air, if required.

Improper action

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

- Proper planning, design and start-up
- Closed system with regard to corrosion
- Integration of adequately dimensioned pressure retention
- Use of deionised heating water (VE water) or with water corresponding to VDI 2035 only
- 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 unit.



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

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

If the system is filled with untreated domestic water, calcium precipitates as scale. Limescale deposits form on the heat transfer surfaces of the heating. The efficiency drops and energy costs rise. In extreme cases the heat exchangers are damaged.

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

Unsuitable quality of the water-antifreeze mixture in the heat source

- ▶ Use of pure water in the heat source is not permitted
 - ▶ For operation of the heat source with a water-antifreeze mixture, ensure that the water used fulfils the quality specifications of the heating water side.
- "7 Flushing, filling and venting", from page 17

3 Description

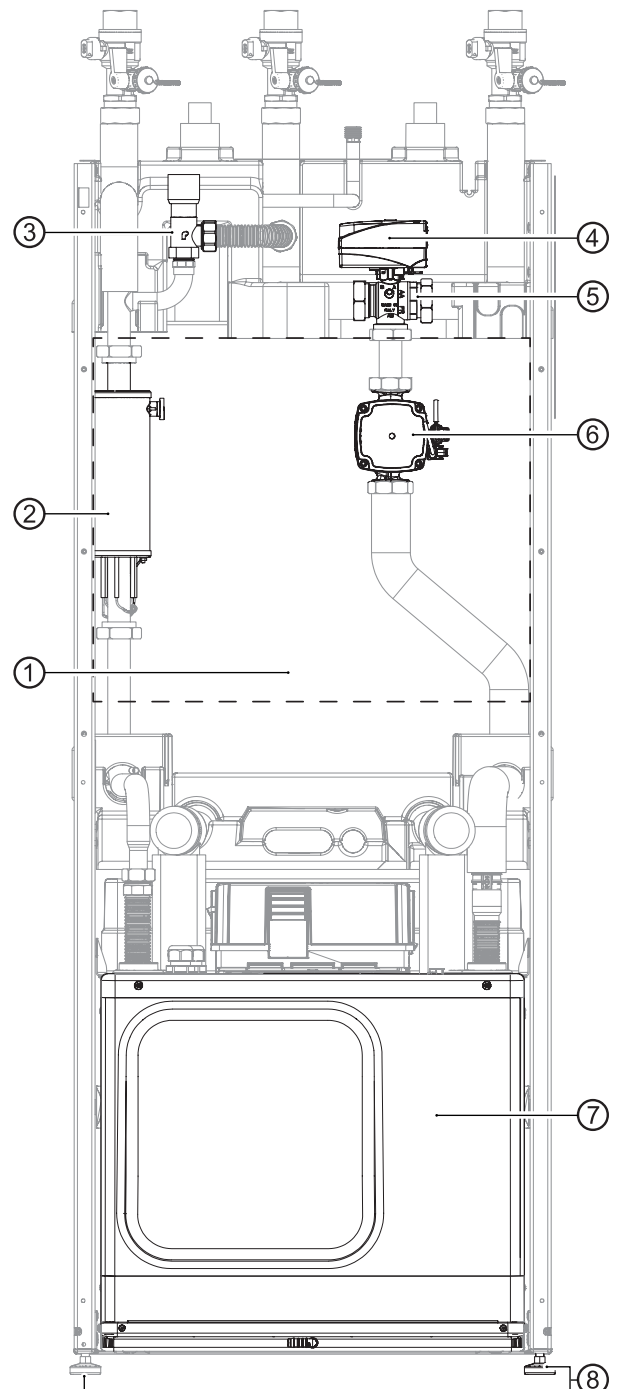
3.1 Layout



NOTE

This section essentially names the components relevant for fulfilling the tasks described in this operating manual.

Housing with unit components





- 1 Electrical switch cabinet
- 2 Heating element
- 3 Overflow valve
- 4 Valve motor
- 5 3-way changeover valve, heating circuit/
domestic hot water
- 6 Heating circuit/hot water circulation pump
- 7 Module box
- 8 Height-adjustable foot (4x)

Rating plate

Rating plates are attached to the following places on the unit:

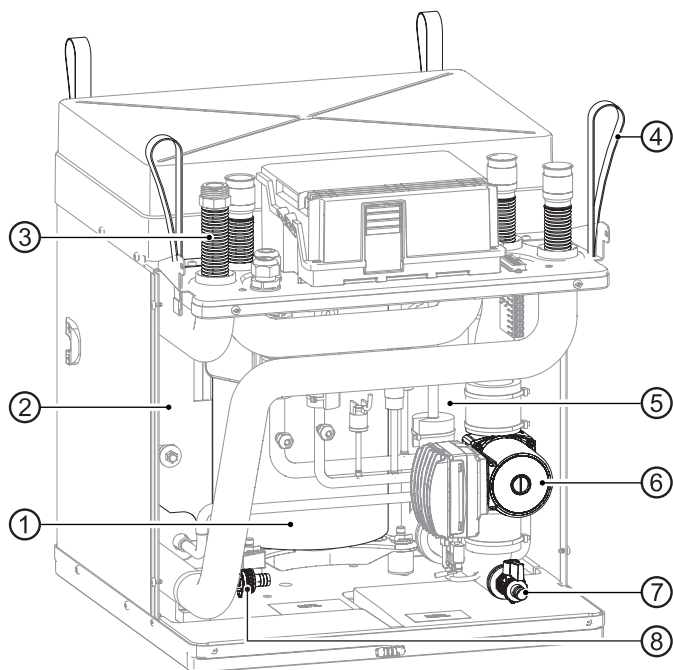
- on the right-hand outer panel, at the top
- left-hand side, on the module box

The rating plate contains the following information at the top:

- Unit type, product number
- Serial number, unit index

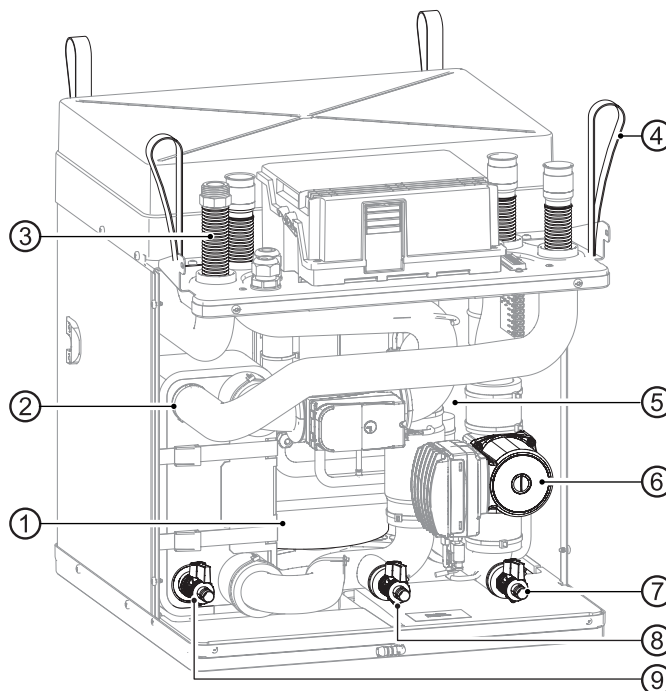
The rating plate also contains an overview of the most important technical data.

Module box – variant without cooling



- 1 Compressor
- 2 Condenser
- 3 Vibration isolator (4x)
- 4 Lifting lug (4x)
- 5 Evaporator
- 6 Heat source circulation pump
- 7 Heat source filling and drain tap
- 8 Heating filling and drain tap

Module box – variant with cooling



- 1 Compressor
- 2 Condenser
- 3 Vibration isolator (4x)
- 4 Lifting lug (4x)
- 5 Evaporator
- 6 Heat source circulation pump
- 7 Heat source filling and drain tap
- 8 Heat source filling and drain tap
- 9 Heating filling and drain tap

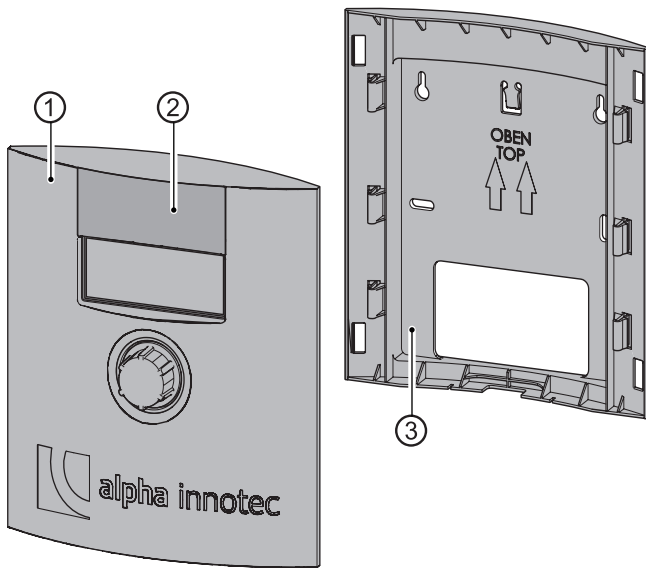


NOTE

The hose connectors are not part of the scope of delivery with all KFE ball valves.

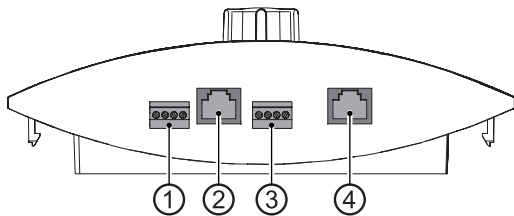


Control unit



- 1 Control panel
- 2 Push up flap upstream of USB connection (for qualified personnel for software updates and for data logging)
- 3 Wall-mounted bracket (only necessary for wall-mounted installation)

Underside of the control panel



- 1 Connection room control unit RBE RS 485 (accessory)
- 2 RJ45 connection cable to the network link
- 3 Connection LIN bus to the regulator board
- 4 RJ45 connection not assigned

3.2 Accessories

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

- Additional masking plate for the front cover panel, if the control is mounted on the wall
- Domestic hot water tank
- Changeover valve, domestic hot water
- Room thermostat for switching the cooling function (if included)

- Dew point monitor for protecting a system with cooling function at low flow temperatures
- Expansion board
- "Cooling package" for retrofitting type H units with a cooling function
- For units without cooling: Pump assemblies for separate storage tank integration (heating circuit)
- Heating circuit safety package
- Heat source circuit safety package

3.3 Function

Liquid refrigerant is evaporated (evaporator), the energy for this process is environmental heat and comes from the "ground" heat source (collector, borehole heat exchanger or groundwater via intermediate exchanger). The gaseous refrigerant is compressed (compressor), this causes the pressure to rise and therefore the temperature too. The gaseous refrigerant with high temperature is liquefied (condenser).

Here the high temperature is discharged to the heating water and is used in the heating circuit. The liquid refrigerant with high pressure and high temperature is expanded (expansion valve). The pressure and temperature drop and the process begins again.

Due to the integrated changeover valve and the integrated energy efficiency circulation pump the heated heating water can be used for charging the domestic hot water or for heating the building. The temperatures required and use are controlled by the heat pump controller. Reheating, drying out screed or increasing the domestic hot water temperature can be carried out using the integrated electric heating element, which is activated by the heat pump controller as and when necessary.

An integrated overflow valve ensures that the heat pump does not switch to high-pressure fault if all heating circuits are closed. The integrated vibration isolators for the heating circuit and heat source prevent structure-borne sound and vibrations from being transferred onto the fixed pipes and therefore into the building.



Cooling

Cooling is integrated in type K units. Type H units can be retrofitted with the “Cooling package” accessories. The following options are possible for units with cooling function (→ operating manual of the heating and heat pump controller):

- Passive cooling (without compressor)
- Control of the cooling function via the heating and heat pump controller
- Automatic switching between heating and cooling mode

Network connection on the control

The control can be connected to a computer or network via a network cable. The heating and heat pump controller can then be controlled from the computer or from the network.

4 Operation and care



NOTE

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

4.1 Energy and environmentally aware operation

The generally accepted requirements for energy-aware and environmentally-aware operation of a heating system also apply to use of a brine/water 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 gap /tilt open (continuous ventilation), but instead open wide for a short time (purge ventilation)

4.2 Maintenance

Wipe down the outside of the unit 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.

5 Delivery, storage, transport and installation

IMPORTANT

Damage to the housing and the unit components due to heavy objects.

- ▶ Do not place any objects on the unit which are heavier than 30 kg.

5.1 Scope of supply



NOTE

On delivery the accessories are enclosed in two packages on the housing.

- ▶ Check delivery immediately after receipt for outwardly visible damage and completeness.
- ▶ Notify supplier of any defects immediately.

The separate pack included contains:

- Sticker with the unit number for attaching to page 3 of this manual
- Control unit, consisting of the control, wall bracket and masking plate
- 6-mm anchors with screws (2x each) for wall-mounting the control unit
- Safety valve, outdoor sensor
- Compression fittings (2x)
- Replacement material after dismantling the module box:
 - Insulation hoses (2x)
 - Cable ties (4x)
 - for units up to 12 kW capacity: O-rings (6x), flat seal (1x)
 - for units with 14 kW capacity and higher: O-rings (8x)
- Ball valves with filling and drain device (3x)



5.2 Storage

- ▶ Where possible do not unpack the unit until directly before installation.
- ▶ Store unit protected against:
 - Moisture/damp
 - Frost
 - Dust and dirt

5.3 Unpacking and transport



NOTE

The module box can be removed for transport (→ “Dismantle the module box”, page 12).

Notes on safe transport

The housing with the unit components and the module box are heavy (→ “Technical data / Scope of supply”, from page 24). There is a risk of injuries or damage to property if the housing with the unit components falls or overturns or if the module box falls.

- ▶ The housing with the unit components and module box must be transported and installed by several persons.
- ▶ Secure the housing with the unit components during transport. Carry the module box by the carrying lugs.

There is a risk of cutting your hands on sharp edges of the unit.

- ▶ Wear cut resistant protective gloves.

The hydraulic connections are not designed for mechanical loads.

- ▶ Do not lift or transport the unit by the hydraulic connections.

If the module box is tilted by more than 45°, compressor oil runs into the cooling circuit.

- ▶ Do not tilt the unit with installed module box by more than 45°.

Transport the unit preferably with a pallet truck, alternatively with a handcart.

Transport with a pallet truck

- ▶ Transport the unit to the place of installation packaged and secured on a wooden pallet.

Unpacking



NOTE

If the unit is not transported by a pallet truck: Do not lift off the pallet until after unpacking and dismantling the housing panels.

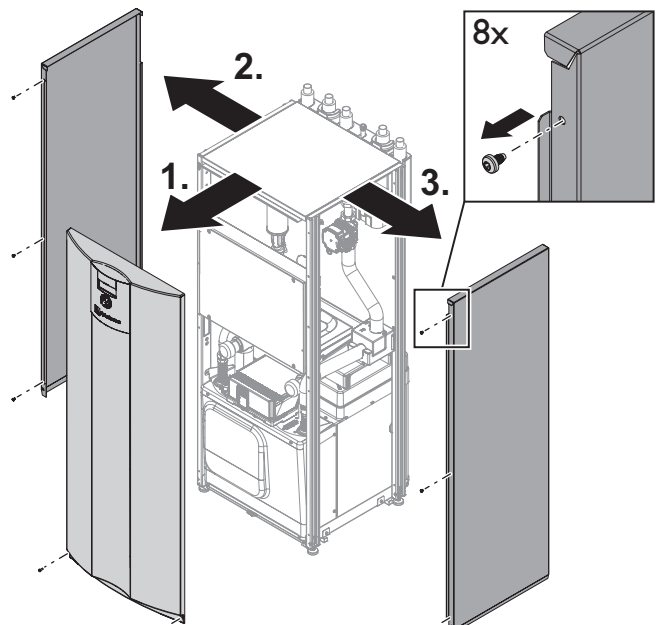
1. Remove plastic films. Ensure that you do not damage the unit.
2. Dispose of the mounting bracket, transport and packaging material in an environmentally friendly way according to local regulations.
3. Remove the film from the plastic element of the front panel in the place of installation.

Dismantle housing panels for transport with handcart or carrying the unit

- ✓ Unit is unpacked (→ “Unpacking”, page 10).

To avoid damage to the housing panels:

1. Undo 2 screws at the bottom of the front panel. Lift up the front panel and put down in safe place.
2. Undo 3 screws at the right panel. Lift up the side panel and put down in safe place.
3. Undo 3 screws at the left panel. Lift up the side panel and put down in safe place..





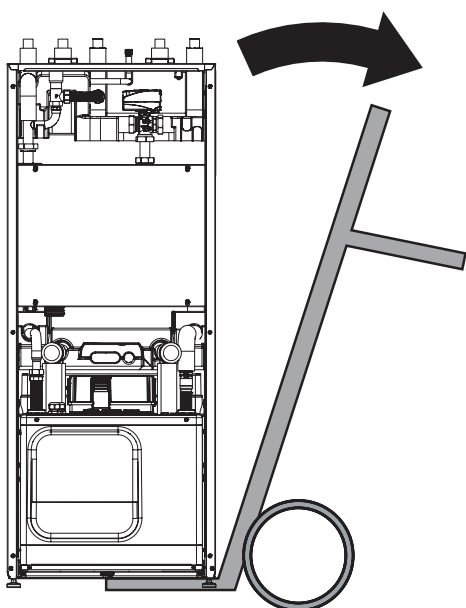
Transport with a handcart

NOTE

- If transporting with a handcart the module box must be pushed in.
- The following figure with the handcart shows transporting the unit on its left-hand side; it can also be transported on its right-hand side.

✓ Housing panels are dismantled.

To avoid damage: On a handcart, load the unit on its side only.



Transport unit on the handcart.

Carrying the unit

✓ Housing panels are dismantled.

1. Dismantle module box (→ “Dismantle the module box”, page 12) and carry it by the support lugs to the place of installation.
2. Carry the housing with the unit components separately to the place of installation.

5.4 Installation

Installation room and space requirements

NOTE

Note and follow the local regulations and standards regarding the installation room and space requirements. The table shows the regulations as per EN 378-1 relevant in Germany.

Refrigerant	Limit [kg/m ³]
R 134a	0.25
R 404A	0.52
R 407C	0.31
R 410A	0.44
R 448A	0.39

→ “Technical data / Scope of supply”, from page 24

$$\text{Minimum room volume} = \frac{\text{Refrigerant capacity [kg]}}{\text{Limit [kg/m}^3\text{]}}$$

NOTE

If several heat pumps of the same type are installed only one heat pump need to be taken into account. If several heat pumps of different types are installed, only the heat pump with the largest refrigerant volume needs to be taken into account.

- ✓ Minimum volume corresponds to the requirements for the refrigerant used.
- ✓ Installation inside the building only.
- ✓ Installation room is dry and frost-free.
- ✓ Clearance dimensions are met (→ “Installation plans”, from page 33).
- ✓ The surface/floor is suitable for installation of the unit:
 - level and horizontal
 - load-bearing capacity for the unit's weight

Aligning the unit

- ▶ Align the unit horizontally and stably in the installation site using the height-adjustable feet and a spanner size SW 13. Adjustment range: 25 mm.



6 Installation and connection

6.1 Dismantle the module box

IMPORTANT

If the module box is tilted by more than 45°, compressor oil runs into the cooling circuit.

- ▶ Do not tilt the module box by more than 45°.

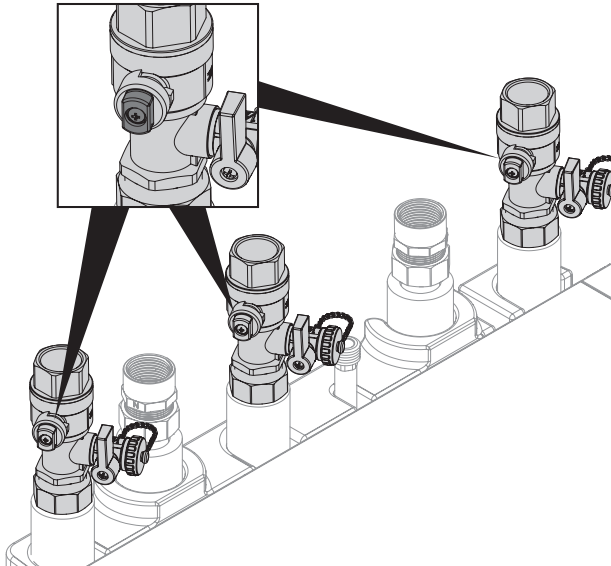


NOTE

- If necessary the module box can be dismantled for easier transport of the unit or for service reasons.
- Steps 1 to 5 are only required if the module box is connected and filled.

- ✓ Unit is safely disconnected from the power supply and protected against being switched back on again.

1. Remove the front panel of the module box (→ “7.1 Remove the front panel of the module box”, page 17).
2. Close shut-off valves to the heating circuit.



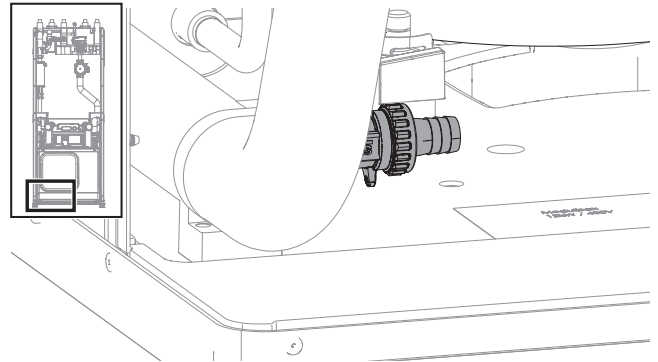
3. Drain the unit via the filling and drain tap of the heating.



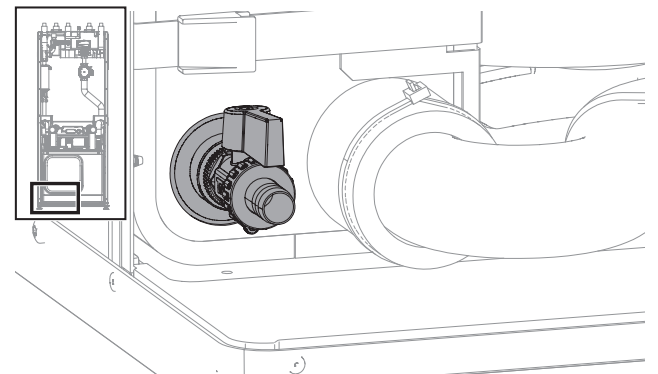
NOTE

The hose connectors are not part of the scope of delivery with all KFE ball valves.

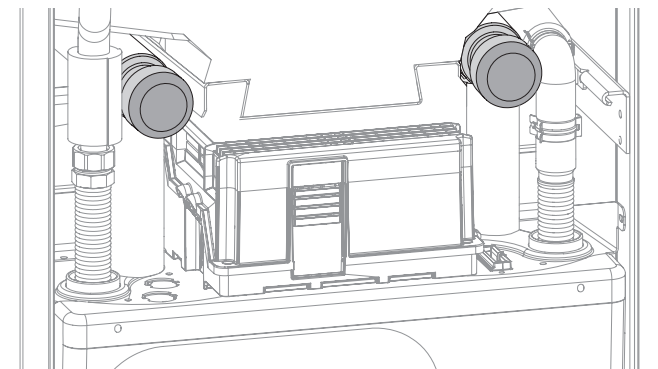
- ▶ Unit **without** cooling:



- ▶ Unit **with** cooling:

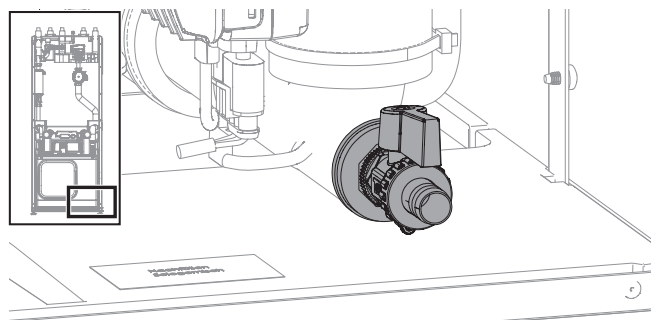


4. Use a spanner to close the shut-off valves of the heat source (behind the covers).



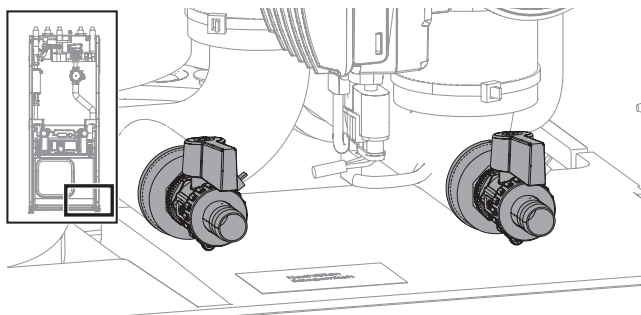
5. Drain the unit via the filling and drain tap of the heat source.

- ▶ Unit **without** cooling:



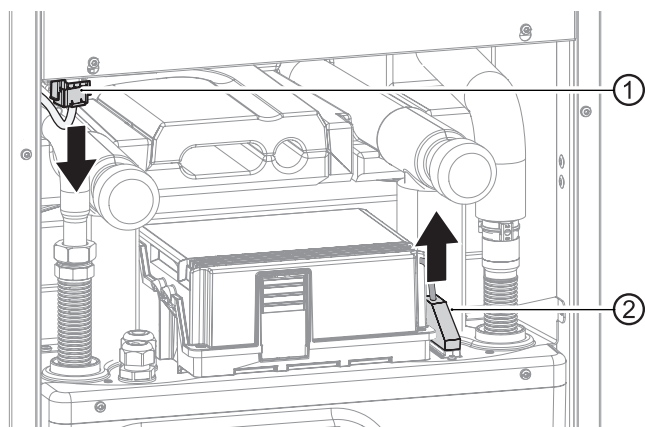


► **Unit with cooling:**

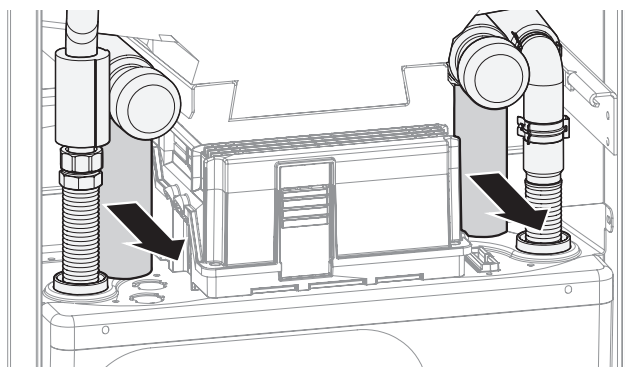


6. Disconnect the electrical connections:

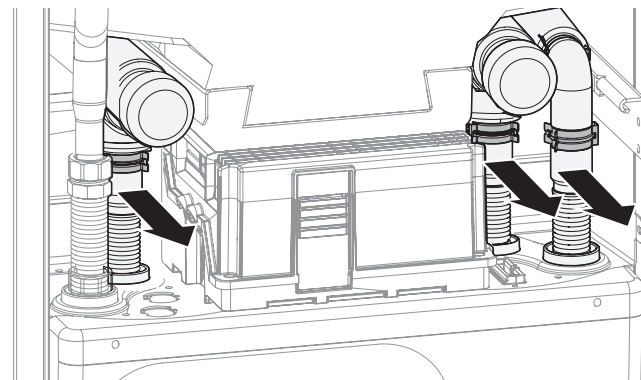
- Disconnect 2 white connectors (①) at the bottom of the electrical control cabinet. To do this, release the lugs by pressing on the sides of the connectors
- Pull out the black rectangular connector (②) at the top of the module box



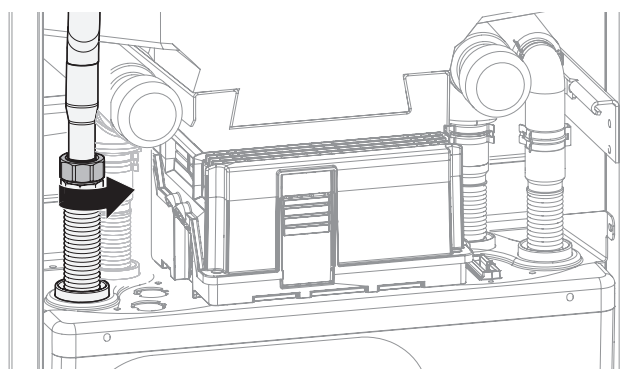
7. Remove the insulation on the hydraulic connections.



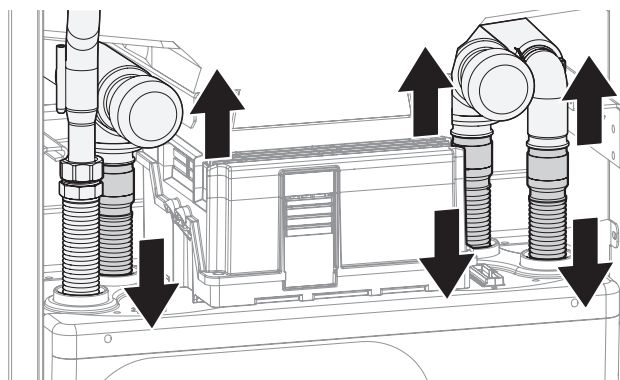
8. Remove 3 clips on the hydraulic connections.



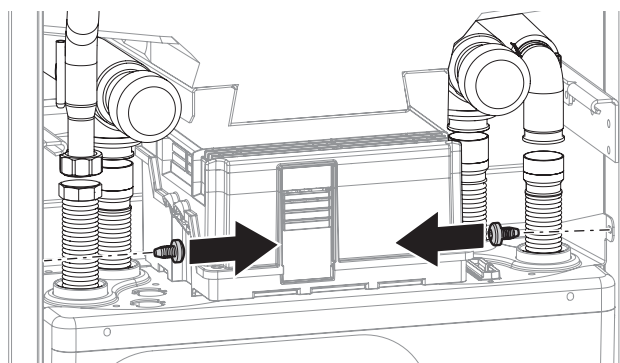
9. Use spanner size SW 37 to unscrew the heating flow.



10. Disconnect the hydraulic connections; to do this, push the pipes apart as far as necessary.

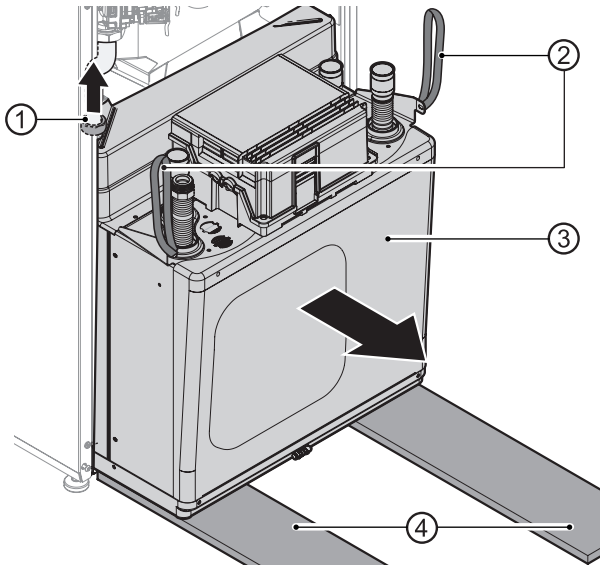


11. Remove the 2 side retaining screws.

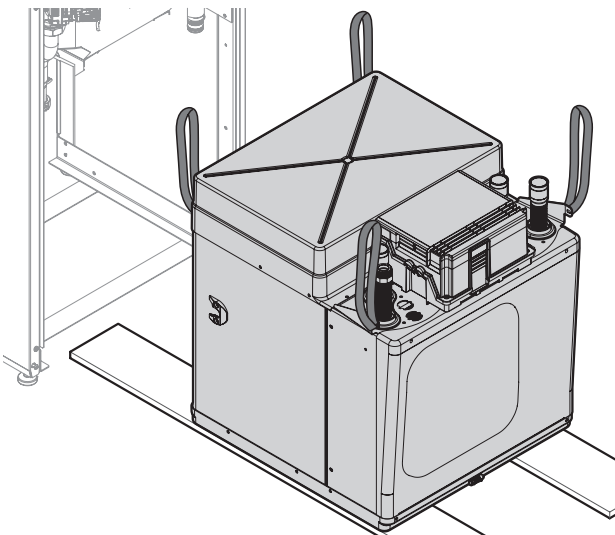




12. To protect the floor and move the module box (③) more easily: place boards (④) under it, e.g. from the packaging material.



13. Lift and hold nut (①) on the heating flow.
14. Slowly and carefully pull out the module box by the carrying lugs (②). Ensure that none of the pipes are damaged
15. Pull out the module box completely and place it on the boards.



6.2 Install the module box

1. Place the module box carefully in the bottom of the housing and slowly and carefully push it in.
 - Lift and hold nut on the heating flow
 - Lift up pipes so that they do not get damaged
2. Attach the two side retaining screws.
3. Connect the hydraulic connections. At the same time, replace O-rings on the heat pump connections (→ separate pack included).
4. Perform pressure test and insulate pipes with the enclosed insulation hoses (→ separate pack).
5. Connect the electrical cables:
 - Plug both connectors into the electrical control cabinet. Ensure that the connectors move easily and the lugs latch into position
 - Plug in the black rectangular connector at the top of the module box

6.3 Install the hydraulic connections



NOTE

The heat source can be connected from the top, right or left.

If the heat source will be connected at the side, the cables can be cut to a residual length of at least 250 mm from the edge of the device (→ “Dimensional drawings“, page 30).

IMPORTANT

Damage to the copper pipes due to unacceptable loading!

- ▶ Secure all connections against twisting.
- ✓ The heat source system has been installed in accordance with the specifications (→ planning & design manual, dimensioned diagrams, installation plans).
- ✓ Cross-sections and lengths of the pipes for the heating circuit and heat source are dimensioned adequately.
- ✓ The free pressure of the circulation pumps produces at least the minimum throughput required for the unit type (→ “Technical data / Scope of supply“, from page 24).
- ✓ The cables for the heat source and the heating are fixed to the wall or ceiling via a fixed point.



Install the compression fittings and ball valves

IMPORTANT

Leaks or fracture of the union nut due to excessive force!

1. Check pipe ends for scratches, dirt and deformation.
2. Check proper position of the clamping ring on the fitting.
3. Push the pipe through the clamping ring up to the limit stop in the fitting.
4. Tighten the union nut hand-tight and attach waterproof marking.
5. Tighten union nut with $\frac{3}{4}$ rotation.
6. Check connection for leaks.

If the connection leaks:

1. Undo connection and check pipe for damage.
2. Tighten the union nut hand-tight and retighten with the open-ended spanner with $\frac{1}{8}$ to $\frac{1}{4}$ turn, as the clamping ring is already in a clamping position.

Connect the unit to the heat source and heating circuit

1. Install shut-off devices at the connections of the heat source and heating circuit.
2. For units with 14 kW capacity and higher: Install the shut-off devices at the heat source.
3. Insert the vent at the highest point of the heat source and the heating circuit.
4. Recommendation: Fit a dirt filter with mesh size 0.9 mm onto the heat source inlet.
5. Ensure that the operating overpressures (→ "Technical data / Scope of supply", from page 24) are not exceeded.

6.4 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

NOTE

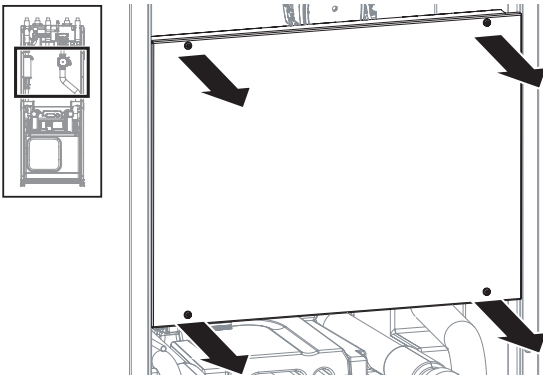
Ensure that the unit is supplied with electricity at all times. After working inside the unit and attaching the unit panelling, switch the power supply back on immediately.

- 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 miniature 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 24)
- 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: 30 m.
The LIN-bus cable must be a shielded cable of at least 4 x 0.5 mm²



Pull in the cables and conductors and make the connections

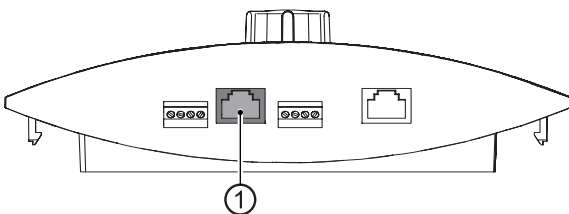
1. Strip the sheathing of all cables to the external loads before laying in the cable duct of the control box.
2. Open electrical switchbox:
 - Undo 4 screws in the cover panel of the electrical control box
 - Remove the cover panel



3. Feed the control/sensor cables and unit supply cable into the housing from the rear.
4. Route cables from underneath through the cable openings in the control box.
5. Connect cables to the respective terminals (→ “Terminal diagrams”, from page 40).

Operate the controller via a PC /network

1. During installation lay a shielded network cable (category 6) through the unit.
2. Plug the RJ-45 connector of the network cable into the socket of the control unit (①).



NOTE

The network cable can be retrofitted at any time.

6.5 Installing the control panel

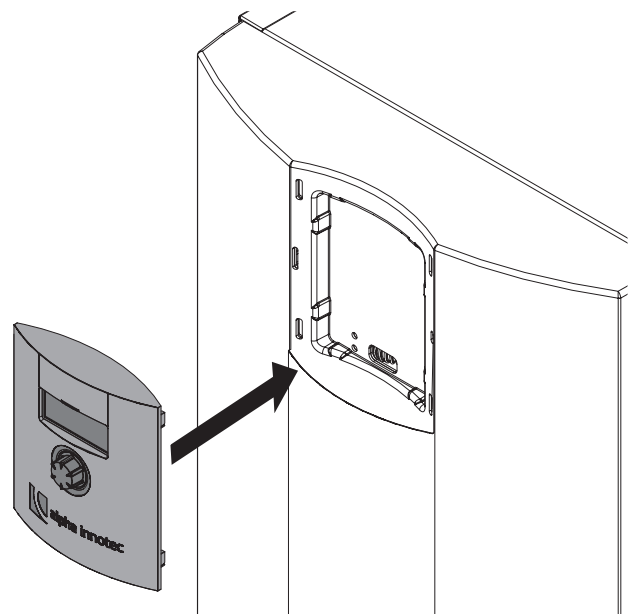


NOTE

The control can be inserted in a recess in the front panel of the unit or can be installed on the wall.

Insert the control in the unit and connect

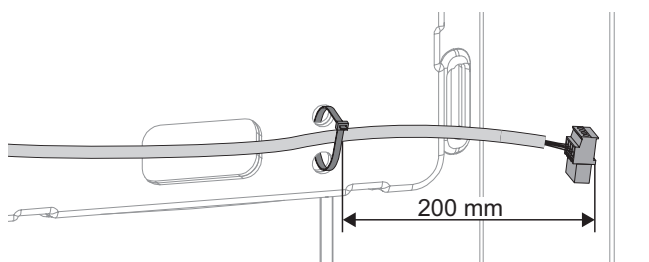
1. If required: Remove masking plate from the slot. To do this, dismantle the front panel (→ “Dismantle housing panels for transport with handcart or carrying the unit”, page 10), press the lugs together and push out of the openings.
2. Remove film from the plastic element of the front panel.
3. Position the control in the recess in the front unit panel.



4. Cut the cable to length generously so that the front panel can be removed and placed to the side of the unit. Do not cut the cable ties for strain relief of the LIN bus cable at the electric control box.
 - LIN bus cable approx. 1.1 m from the fixing of the strain relief at the electrical control box
 - All other cables approx. 1.2 m



5. Use cable ties (→ separate pack) to fix the LIN bus cable to a web of the masking plate around 20 cm in front of the connector (strain relief).



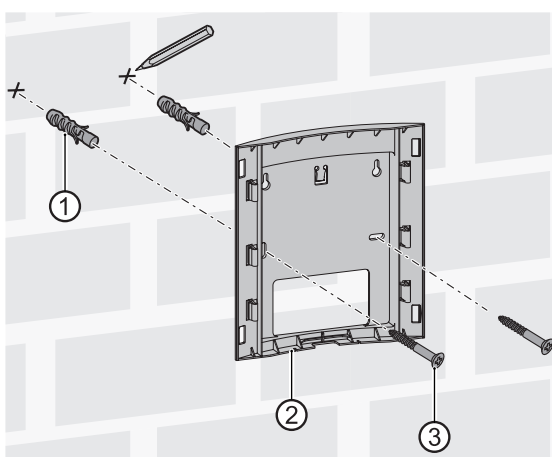
6. Push the cable through the opening in the front panel of the unit from below and into the control.
7. Press the lugs of the control into the openings in the front panel of the unit.

Mount the control on the wall and connect

IMPORTANT

Mount the wall bracket with control panel **only vertically** on a wall!

1. Release the rear bracket from the control.
2. If visually unattractive: Cut off the lugs on the rear of the control (are only needed to insert in the front panel).
3. Mark 2 drillholes (→ Dimensional drawing “Wall-mounted bracket”, page 32).
4. If cables are fed in from underneath: Break out the web at the bottom in the middle of the wall bracket. Use side-cutters if necessary.
5. Fix the wall-mounted bracket (②) with 2 wall plugs (①) and 2 screws (③).

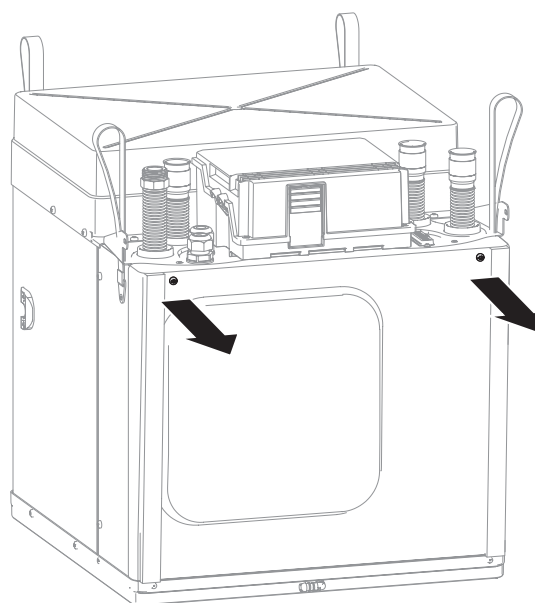


6. Feed in the cables from the wall (e.g. in-wall box) or from below.
7. Route the LIN bus cable from the top right-hand side at the rear from the heat pump and plug into the control at the bottom.
8. Push the control onto the wall-mounted bracket.
9. Put on the masking plate if applicable (accessories).

7 Flushing, filling and venting

7.1 Remove the front panel of the module box

- Unscrew the front panel of the module box.



7.2 Fill, flush and vent heat source

Frost protection must be provided in the heat source. Below are the approved antifreeze agents based on:

- Monopropylene glycol
- Monoethylene glycol
- Ethanol
- Methanol

Antifreeze agents based on salt are not permitted.



- ▶ When selecting the antifreeze agent, it must be ensured that it is compatible with the following materials:

- Brass (CW602N and CW614N)
- Stainless steel (AISI304, AISI316 and AISI316L)
- Copper (Cu-DHP CW024A - EN1652)
- Cast iron (EN-GJL-150)
- Composite (PES 30% GF)
- EPDM (ethylene propylene diene rubber)
- PTFE (Polytetrafluoroethylene)
- FKM (fluororubber)

If an antifreeze agent is not compatible with one of these materials, it may not be used.

Antifreeze agents from our product range are safe with regard to our units and the accessories purchased from us and guarantee compatibility with the listed materials.

- ▶ Pressure losses must be observed when selecting the antifreeze agent.
- ▶ The antifreeze agent that is selected and used must comply with the specifications and requirements of the local authorities and water management authorities.



WARNING

Methanol and ethanol can give off flammable and explosive gases. Therefore, the safety provisions for the anti-freeze must be noted and followed!

The hazard markings of all anti-freezes used must be noted and the relevant safety provisions must be followed.

- ▶ Make sure that the mixing ratio of water and antifreeze agent meets the required minimum antifreeze temperature in the heat source.
- “Technical data / Scope of supply“, from page 24
- ▶ For operation of the heat source with water-antifreeze mixture, ensure that the water used fulfils the quality specifications of the heating water side.
- “Heating water quality“, from page 19
- ✓ Drain pipe of the safety valve is connected.
- ✓ Room is ventilated.

1. Flush the heat source system thoroughly.
2. Mix antifreeze with water thoroughly with the required ratio, before adding to the heat source.
3. Check the concentration of the water-antifreeze mixture.
4. Fill the heat source with the water-antifreeze mixture.
Fill until the system is air-free.
5. Fill the unit via the ball valves in the module box.

7.3 Vent the circulation pump of the heat source

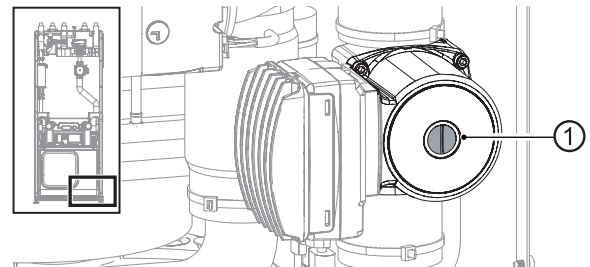
- ✓ The front panel of the module box is unscrewed.



NOTE

The figure shows the unit variant with cooling. In the unit variant without cooling the circulation pump is located in the same place.

1. Place vessel for collecting discharging liquid under the outlet.
2. Undo deflating screw (①) in the middle of the circulation pump of the heat source.



NOTE

The hose connectors are not part of the scope of delivery with all KFE ball valves.

3. Wait until liquid is discharged uniformly.
4. Screw the deflating screw (①) of the circulation pump of the heat source back on tightly.
5. Screw the front panel of the module box.
6. Dispose of collected liquid according to the local regulations.
7. Set system pressure to 1 bar.



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

Heating water quality



NOTE

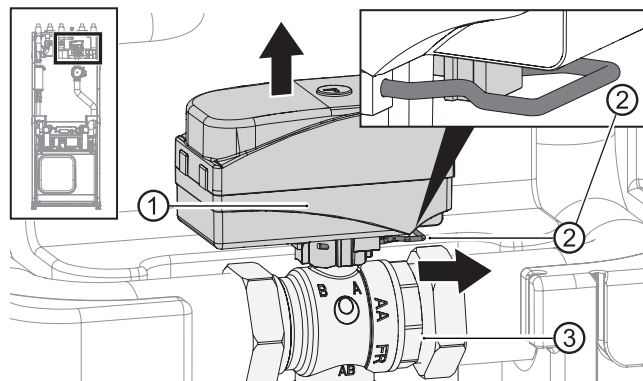
- For detailed information refer, among other things, to the VDI Guidelines 2035 “Vermeidung von Schäden in Warmwasserheizanlagen”
- Required pH value: 8.2 ... 10;
for aluminium materials:
pH value: 8.2 ... 8.5

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

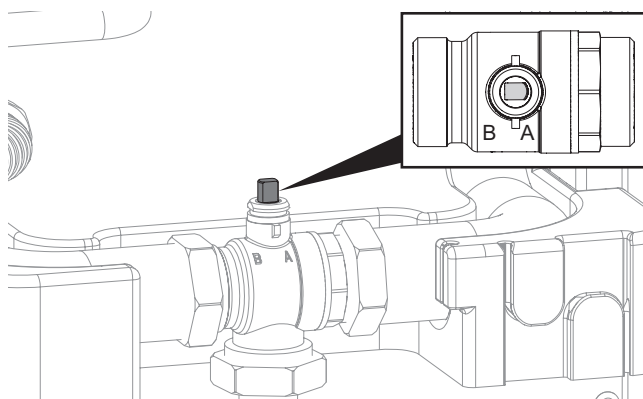
Advantages of low-salt operation:

- 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).
- ✓ Drain pipe of the safety valve is connected.
- ✓ The front panel of the module box is unscrewed.
- ▶ Ensure that the set pressure of the safety valve is not exceeded.

1. Pull the U-clip (②) off the floor of the valve motor (①).
2. Pull the valve motor carefully upwards and off the 3-way changeover valve (③).



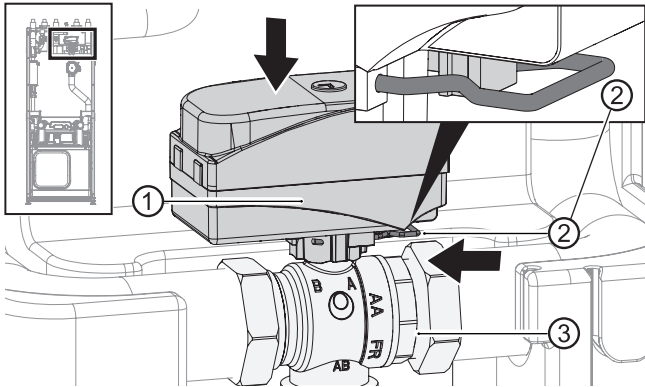
3. Turn the spindle of the 3-way changeover valve so that the rounded side of the spindle points in the direction of marking A of the connections of the 3-way changeover valve.



4. Flush the domestic hot water charging circuit for approx. 1 minute.
5. 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 changeover valve.
6. Flush heating circuit thoroughly, until no more air is discharged.
7. Position the valve motor (①) on the 3-way changeover valve (③).



8. Insert the U-clip (②) into the floor of the valve motor.



9. Ensure that the U-clip has latched into position correctly:

- ✓ Valve motor sits securely on the 3-way changeover valve.
- ✓ Both prongs of the U-clip sit on the lug.
- ✓ The tips of the U-clip are visible by approx. 2 mm (not significantly more!).

10. Screw the front panel of the module box.

8 Insulate hydraulic connections

1. Insulate heating circuit and heat source according to the local regulations.
2. Open shut-off devices.
3. Perform a pressure test and check for leaks.
4. Insulate the internal piping of the module box with the insulation material from the separate pack included.
5. Insulate external piping on site.
6. Insulate all connections, fittings and pipes.
7. Insulate heat source so that it is vapour-diffusion tight.
8. Insulate the heating circuit of units with cooling vapour-diffusion tight too.
9. In units with cooling and capacity 14 kW and higher, insulate the venting valve at the cold heat exchanger too so that it is vapour-tight. To do this, glue the insulation strips on top of each other (→ separate pack)

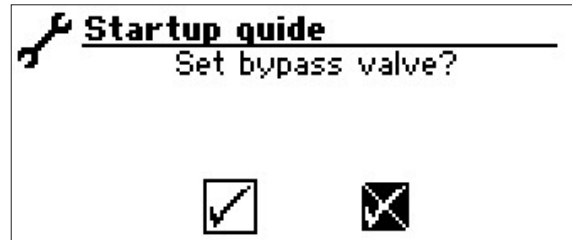
9 Set the overflow valve

i NOTE

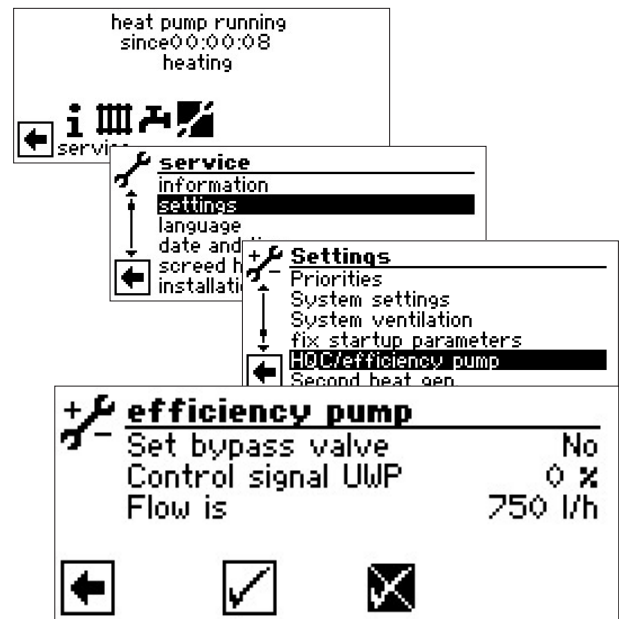
- The activities in this section are only necessary for in-line tank integration.
- Complete the worksteps quickly, otherwise the maximum return temperature can be exceeded and the heat pump switches to high-pressure fault.
- Turn the adjusting knob at the overflow valve to the right to increase the temperature difference (the temperature drop), turn it to the left to reduce it.

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

The IBN assistant already provides the option, in the event of the integration of the storage tank in series to adjust the overflow valve according to the hydraulic system.



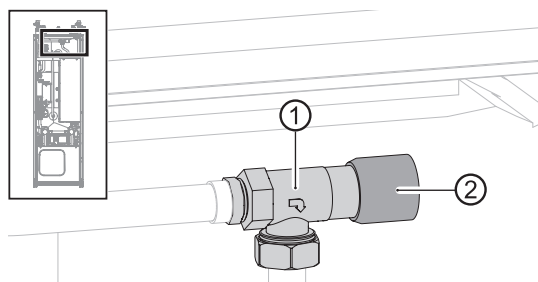
Confirm the IBN assistant or:





The “Set bypass valve” menu item is set by default to “No”. The overflow valve adjustment function is deactivated.

- The UWP control signal is the indication of the currently required pump capacity in %
 - If the flow rate is the current flow rate (measuring accuracy +/- 200 l/h)
1. Fully open the overflow valve, close the heating circuits
 2. If the “Set bypass valve” menu item is set from “No” to “Yes”, the circulation pump is activated with 100% – and the pump starts up.
 3. If the control signal UWP reaches 100%, close the overflow valve to the extent that the maximum flow rate (→ “Technical data / Scope of supply“, from page 24) can be ensured.



- 1 Overflow valve
- 2 Rotary-push button

4. If you exit the “Set bypass valve” menu or at the latest after one hour, the circulation pump switches back to standard regulation
5. Open valves to heating circuit.

10 Commissioning

- ✓ Relevant planning & design data of the system is documented in full.
 - ✓ The competent energy supplier has been notified of operation of the heat pump system.
 - ✓ System is air-free.
 - ✓ Installation check using the rough checklist has been completed successfully.
1. Ensure that the following points are fulfilled completely:
 - Clockwise rotating load infeed field is present at the compressor
 - The system is installed and mounted in accordance with this operating manual
 - The electrical installation has been carried out properly in accordance with this operating manual and local regulations
 - The power supply for the heat pump is equipped with an all-pole circuit-breaker with at least 3 mm contact spacing (IEC 60947-2)
 - The level of the tripping current is compliant
 - Heating circuit is flushed and vented
 - Frost protection of the heat source meets the requirements
→ “Technical data / Scope of supply“, from page 24
 - All shut-off devices of the heating circuit are open
 - All shut-off devices of the heat source are open
 - The pipe systems and components of the system are leak-tight
 2. Fill out carefully and sign the notice of completion for heat pump systems.
 3. In Germany: Send notice of completion for heat pump systems and rough checklist to the manufacturer’s factory customer service department.
In other countries: Send notice of completion for heat pump systems and rough checklist to the manufacturer’s local partner.
 4. Arrange for the heat pump system to be commissioned by after-sales service authorised by the manufacturer; this is a chargeable service.



11 Maintenance



NOTE

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

11.1 Basic principles

The cooling circuit of the heat pump requires no regular maintenance.

Local regulations – e.g. EU Regulation (EC) 517/2014 – among other things, require leak checks beforehand and/or for a logbook to be kept for certain heat pumps.

The hermetic tightness and refrigerant fill quantity are criteria for whether a logbook has to be kept and leak tests performed or not, and at what time intervals.

- ▶ Ensure compliance with local regulations with regard to the specific heat pump system.

11.2 Maintenance as required

- Checking and cleaning the components of the heating circuit and the heat source, e.g. valves, expansion vessels, circulation pumps, filters, dirt traps
- Test the function of the safety valve for the heating circuit

11.3 Clean and flush the evaporator and condenser

- ▶ Clean and flush the evaporator/condenser strictly according to the manufacturer's regulations.
- ▶ After flushing the evaporator/condenser with chemical cleaning product: neutralise any residues and flush the evaporator/condenser thoroughly with water.

11.4 Yearly maintenance

- ▶ Record the quality of the heating water analytically. In case of deviations from the specifications, take suitable measures without delay.

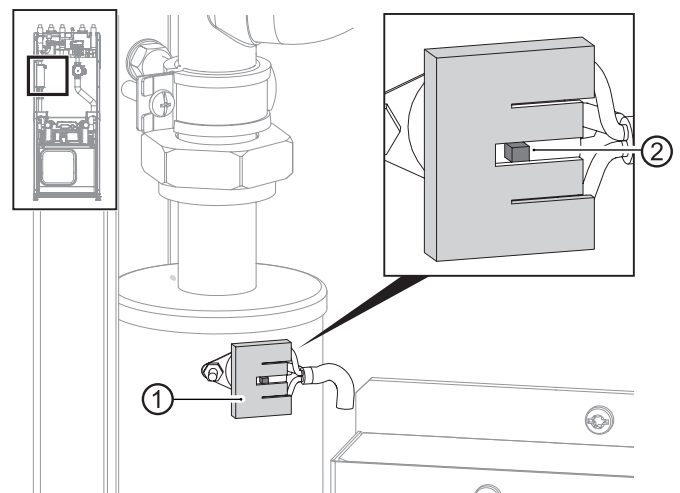
12 Faults

- ▶ Read out the cause of the fault via the diagnostics program of the heating and heat pump controller.
- ▶ Contact the local partner of the manufacturer or the factory's customer service. Have the fault message and unit number (→ "Unit sticker", page 3) to hand.

12.1 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 (②) of the safety temperature limiter (①) has jumped out (by approx. 2 mm).



- ▶ Press the reset button back (②) in again.
- ▶ If the safety temperature limiter trips again, contact the local partner of the manufacturer or the factory's customer service.

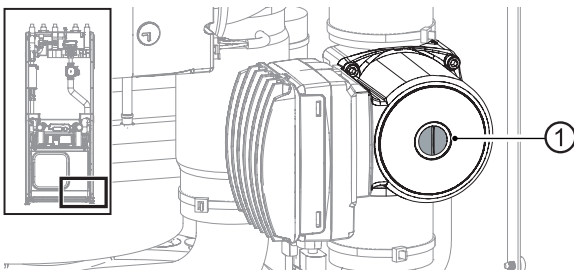


12.2 Manually unblock the circulating pumps

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

Release the blockage of the heat source circulation pump

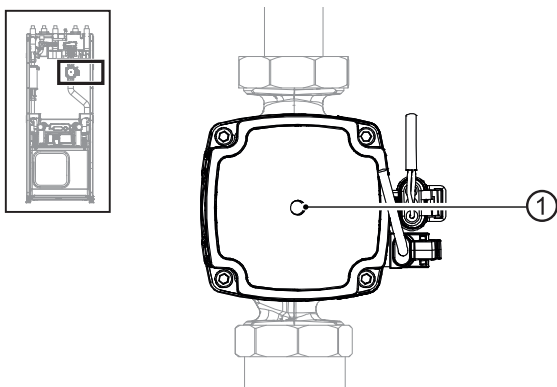
1. Unscrew the front panel of the module box.
2. Undo deflating screw (①) in the middle of the circulation pump of the heat source.



3. Insert a screwdriver into the opening and release the blocked shaft in the direction of rotation of the circulating pump.
4. Reinsert and tighten the deflating screw (①).
5. Screw the front panel of the module box.

Release the blockage of the heating circulating pump

- ▶ Insert the screwdriver into the hole (①), press the plunger in the circulating pump against the shaft and release the blocked shaft in the direction of rotation of the circulating pump.



13 Dismantling and Disposal

13.1 Dismantling

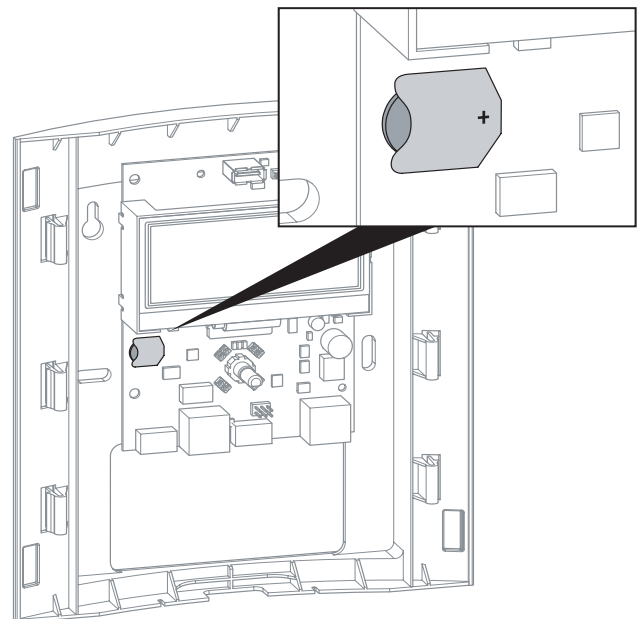
- ✓ Unit is safely disconnected from the power supply and protected against being switched back on again.
- ▶ Collect all media safely.
- ▶ Separate components by their materials.

13.2 Disposal and Recycling

- ▶ Dispose of media harmful to the environment according to local regulations, e.g. antifreeze mixture, refrigerant.
- ▶ Recycle or ensure proper disposal of unit components and packaging materials according to local regulations.

13.3 Removal of the buffer battery

1. Use a screwdriver to push out the buffer battery on the processor board of the control



2. Dispose of the buffer battery according to local regulations.



Technical data / Scope of supply

Performance data		Values in brackets: (1 Compressor)		SWCV 62(H)(K)3		SWCV 92(H)(K)3	
Heating capacity COP	for B0/W35 acc. to EN14511	Partial load operation	kW COP	3,32 4,86	4,00 4,76		
	for B0/W45 acc. to EN14511	Partial load operation	kW COP	3,09 3,76	3,82 3,74		
	for B0/W55 acc. to EN14511	Partial load operation	kW COP	2,95 3,13	3,41 2,90		
	for B7/W35 flow of B0/W35	Partial load operation	kW COP	4,18 5,94	4,91 5,74		
Heating capacity	for B0/W35	min. max.	kW kW	1,25 5,95	1,77 8,65		
	for B0/W45	min. max.	kW kW	1,16 5,50	1,79 8,42		
	for B0/W55	min. max.	kW kW	1,00 5,17	1,96 8,18		
	for B7/W35	min. max.	kW kW	1,55 7,20	2,31 10,60		
Cooling capacity at max. flow rate (B15/W25), units with passive cooling: Identifier K			kW	5,8	7,8		
Operating limits							
Heating circuit return min. Heating circuit flow max.		Heating within heat source min./max.		°C		20 65	20 65
Heat source, heating		min. max.		°C		-5 30	-5 30
Additional operating points				...		B-9/W60	B-9/W60
Sound							
Sound pressure level at 1 m distance from edge of unit		min. max.		dB(A)		29 36	29 39
Sound power level		min. max.		dB(A)		-	-
Sound power level acc. to EN12102				dB(A)		44 51	44 54
Tonality Low-frequency				dB(A) • yes - no		-	-
Heat source							
Flow rate (pipe dimensioning)				l/h		1450	2000
Max. free heat pump pressure Δp (with cooling Δp_K)** Flow rate				bar (bar) l/h		0,5 (0,47) 1450	0,56 (0,49) 2000
Approved anti-freeze mixture		Monoethylene glycol Propylene glycol Methanol Ethanol		• • • •		• • • •	• • • •
Anti-freeze concentration: Minimum frost protection down to				°C		-15	-15
Max. allowable operating pressure				bar		3	3
Circulation pump control range		min. max.		l/h		300 2200	300 4000
Heating circuit							
Flow rate (pipe dimensioning) Min. volume buffer tank in series Min. volume separation buffer tank				l/h		1050 - -	1500 - -
Max. free heat pump pressure Δp (with cooling Δp_K) Volume flow				bar (bar) l/h		0,65 (0,63) 1050	0,46 (0,41) 1500
Max. allowable operating pressure				bar		3	3
General unit data							
Total weight (with cooling)				kg (kg)		145 (153)	149 (157)
Box weight (with cooling) Tower weight (with cooling)				kg (kg) kg (kg)		80 (88) 65 (65)	84 (92) 65 (65)
Refrigerant type Refrigerant capacity				... kg		R407C 1,16	R407C 1,25
Domestic hot water tank							
Net volume				l		-	-
Magnesium sacrificial anode		Impressed current Magnesium		• yes - no		- -	- -
Domestic hot water temperature, heating pump mode Electric heating element				up to °C up to °C		- -	- -
Mixed water quantity according to ErP: 2009/125/EC (at 40 °C, draw-off of 10 l/min)				l		-	-
Standing loss according to ErP: 2009/125/EC (at 65 °C)				W		-	-
Maximum pressure Test pressure				bar bar		- -	- -
Electrics							
Voltage code all-pole fuse protection for heat pump *)**)				... A		-	-
Voltage code all-pole fuse protection for heat pump *) + electric heating element **)				... A		3~N/PE/400V/50Hz C16	3~N/PE/400V/50Hz C16
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 **)				... A		-	- -
WP*): effect. Power consumption B0/W35 (partial load operation) EN14511 Electric consumption α				kW A ...		0,68 3,0 1,0	0,84 3,6 1,0
WP*): effective power consumption B0/W35 acc. to EN14511: min. max.				kW kW		0,24 1,4	0,3 2,2
WP*): Max. machine current Max. power consumption within the operating limits				A kW		12 2,6	12 2,9
Starting current: direct with soft starter				A A		< 5 -	< 5 -
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 3	- 6 3
Circulation pump power consumption, heating circuit heat sour min. max.				W W		2 - 60 5 - 87	2 - 60 3 - 140
Other unit information							
Safety valve Heating circuit Response pressure		included in scope of supply: • yes - no bar		• 3		• 3	• 3
Safety valve Heat source Response pressure		included in scope of supply: • yes - no bar		- -		- -	- -
Buffer tank Volume		included in scope of supply: • yes - no l		- -		- -	- -
Diaphragm expansion vessel Heating circuit Volume Prepressure		incl. in scope of supply: • yes - no l bar		- -		- -	- -
Diaphragm expansion vessel Heat source Volume Prepressure		incl. in scope of supply: • yes - no l bar		- -		- -	- -
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		• • -		• • -	• • -

*) Only compressor, **) Follow local regulations, ***) Figures for 25% mono-ethylene glycol

813594b

813588b



Technical data / Scope of supply

Performance data				SWCV 122(H)(K)3	SWCV 162(H)(K)3
Heating capacity COP	for B0/W35 to EN14511	Partial load operation	kW COP	5,06 4,87	9,42 4,92
	for B0/W45 to EN14511	Partial load operation	kW COP	4,78 3,75	9,15 3,85
	for B0/W55 to EN14511	Partial load operation	kW COP	4,58 3,13	9,06 3,22
	for B7/W35 flow of B0/W35	Partial load operation	kW COP	5,92 6,08	11,31 6,05
Heating capacity	for B0/W35 to EN14511	min. max.	kW kW	2,48 13,56	3,2 17,20
	for B0/W45 to EN14511	min. max.	kW kW	2,24 12,88	2,58 17,00
	for B0/W55 to EN14511	min. max.	kW kW	2,54 12,53	2,47 17,00
	for B7/W35 to EN14511	min. max.	kW kW	2,94 15,82	4,00 19,10
Cooling capacity at max. volume flow (B15/W25), units with passive cooling: Identifier K			kW	12,3	14,9
Limits of use					
Heating circuit return min. Heating circuit flow max.			°C	20 65	20 65
Heat source		min. max.	°C	-5 30	-5 30
Additional operating points			...	B-9/W60	B-9/W60
Sound					
Sound pressure level at 1m distance from edge of unit		min. max.	dB(A)	29 38	29 36
Sound power level to EN12102		min. max.	dB(A)	44 53	44 51
Heat source					
Flow rate (pipe dimensioning)			l/h	3200	3900
Max. free heat pump pressure Δp (with cooling Δp_K ***) Volume flow			bar (bar) l/h	1,08 (1,03) 1270	0,88 (0,80) 2350
Approved anti-freeze			Monoethylene glycol Propylene glycol Methanol Ethanol	• • • •	• • • •
Anti-freeze concentration: Minimum frost protection down to			°C	-15	-15
Max. allowable operating pressure			bar	3	3
Heating circuit					
Flow rate (pipe dimensioning) Min. volume buffer tank in series Min. volume separation buffer tank			l/h	2300 - -	2900 - -
Max. free heat pump pressure Δp (with cooling Δp_K) Volume flow			bar (bar) l/h	0,69 (0,65) 870	0,54 (0,50) 1600
Max. allowable operating pressure			bar	3	3
General unit data					
Total weight (with cooling)			kg	168 (176)	180 (188)
Box weight (with cooling) Tower weight (with cooling)			kg (kg) kg (kg)	103 (111) 65 (65)	115 (123) 65 (65)
Refrigerant type Refrigerant capacity			... kg	R407c 2,0	R407c 2,20
Domestic hot water tank					
Net volume			l	—	—
Impressed current anode			integrated: • yes — no	—	—
Domestic hot water temperature, heating pump mode Electric heating element			up to °C up to °C	— —	— —
Mixed water quantity according to ErP: 2009/125/EC (at 40°C, draw-off of 10 l/min)			l	—	—
Standing loss according to ErP: 2009/125/EC (at 65°C)			W	—	—
Maximum pressure			bar	—	—
Electrics					
Voltage code all-pole heat pump fusing *)**)			... A	3~N/PE/400V/50Hz C10	3~N/PE/400V/50Hz C10
Voltage code all-pole heat pump fusing *) + electric heating element **)			... A	—	—
Voltage code Control voltage fusing **)			... A	1~N/PE/230V/50Hz B10	1~N/PE/230V/50Hz B10
Voltage code Electric heating element fusing **)			... A	3~N/PE/400V/50Hz B16	3~N/PE/400V/50Hz B16
WP*): effect. Power input B0/W35 (50Hz) EN14511 Power consumption cos ϕ			kW A ...	1,04 1,7 0,88	1,91 3,1 0,89
WP*): effective power input B0/W35 to EN14511: min. max.			kW kW	0,53 3,29	0,83 4,62
WP*): Max. machine current Max. power input within the limits of use			A kW	9,0 5,5	10 7,3
Starting current: direct with soft starter			A A	< 5 —	< 5 —
Degree of protection			IP	20	20
Electric heating element output			kW	9 6 3	9 6 3
Circulation pump power consumption, heating circuit heat sour			min. — max.	W W	2 – 60 3 – 180
2 – 60 3 – 180			W W	2 – 60 3 – 180	2 – 60 3 – 180
Other unit information					
Safety valve, heating circuit Heat source		included in scope of supply: • yes — no		• —	• —
Expansion valve, heating circuit Heat source		included in scope of supply: • yes — no		— —	— —
Overflow valve Changeover valve		integrated: • yes — no		• •	• •
Vibration isolators, heating circuit Heat source		integrated: • yes — no		• •	• •

*) Only compressor, **) Follow local regulations, ***) Figures for 25% mono-ethylene glycol

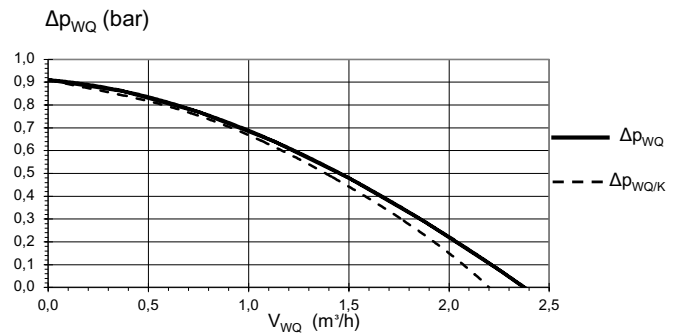
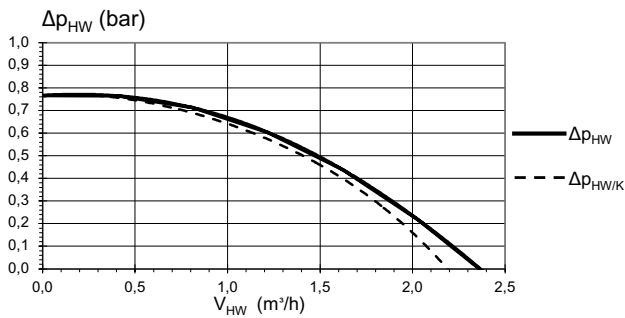
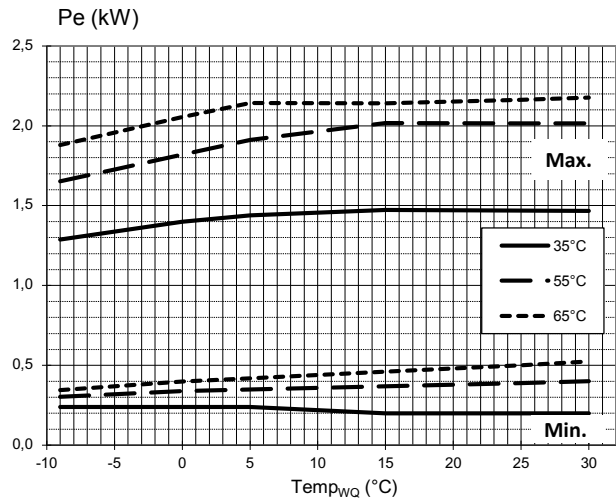
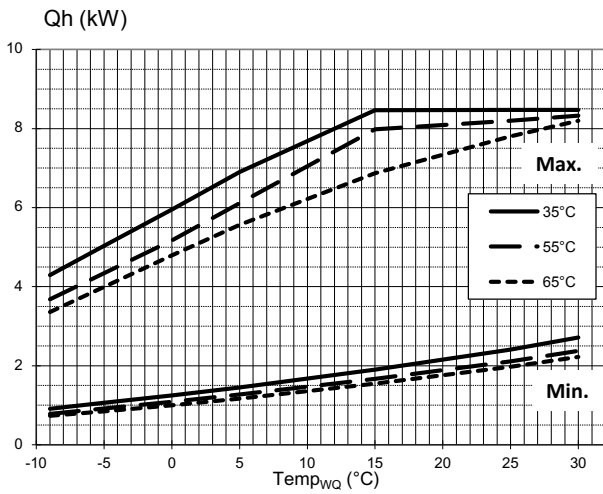
813497b

813489d



SWCV 62(H)(K)3

Performance curves



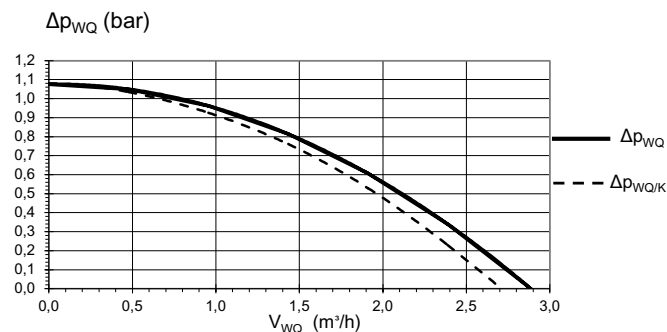
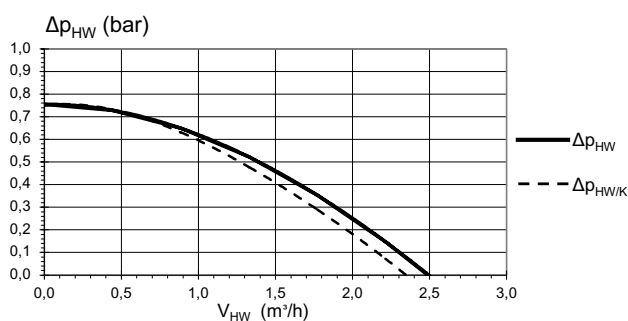
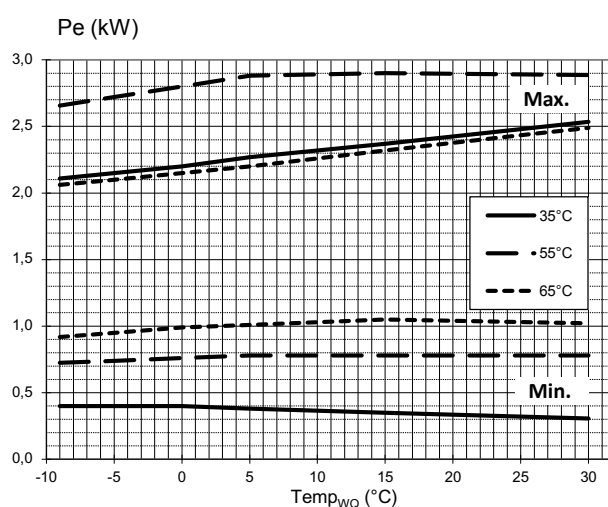
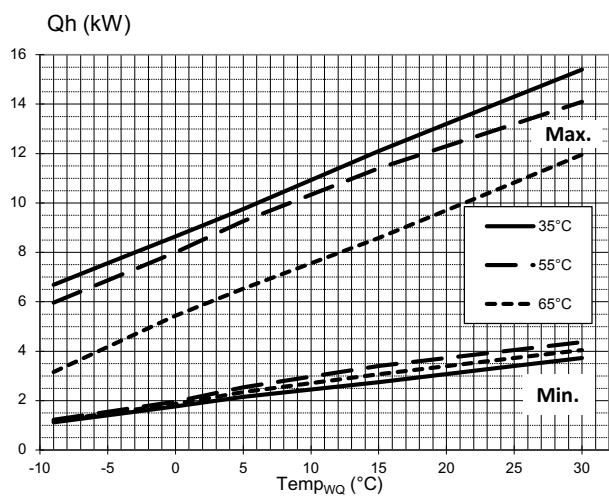
823255b

Keys:	UK823000L/170408
\dot{V}_{HW}	Heating water volume flow rate
\dot{V}_{WQ}	Heat source volume flow rate
$Temp_{WQ}$	Heat source temperature
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance
$\Delta p_{HW} / \Delta p_{HW/K}$	Heating circuit free pressure / Heating circuit with cooling free pressure
$\Delta p_{WQ} / \Delta p_{WQ/K}$	Heat source free pressure / Heat source with cooling free pressure



Performance curves

SWCV 92(H)(K)3



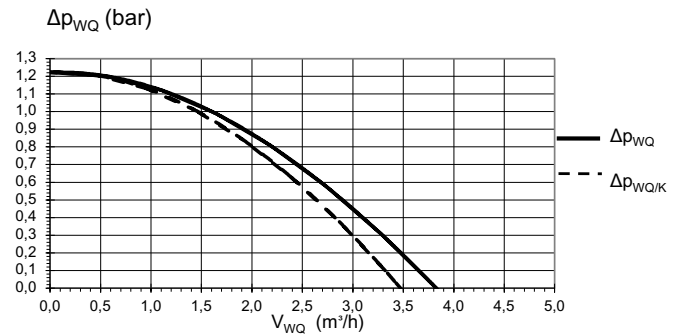
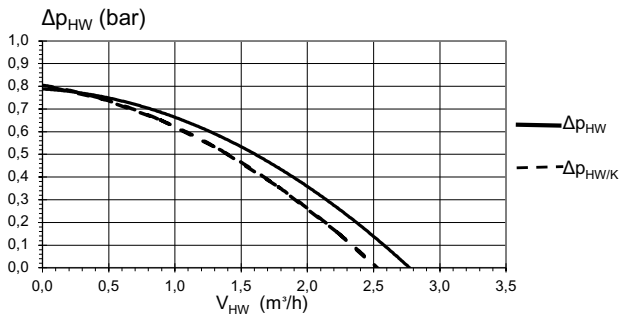
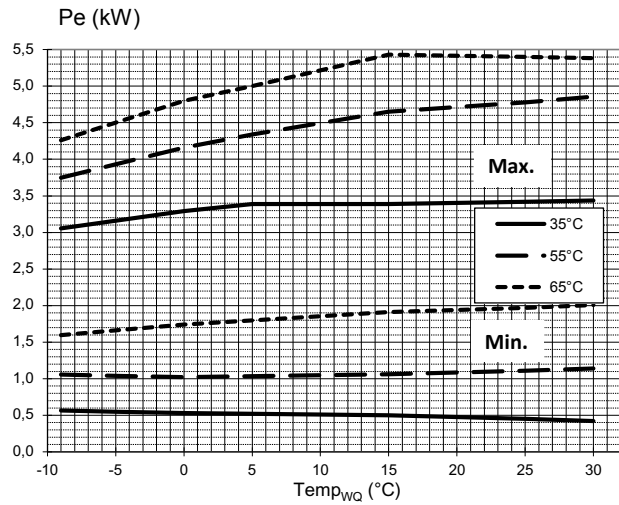
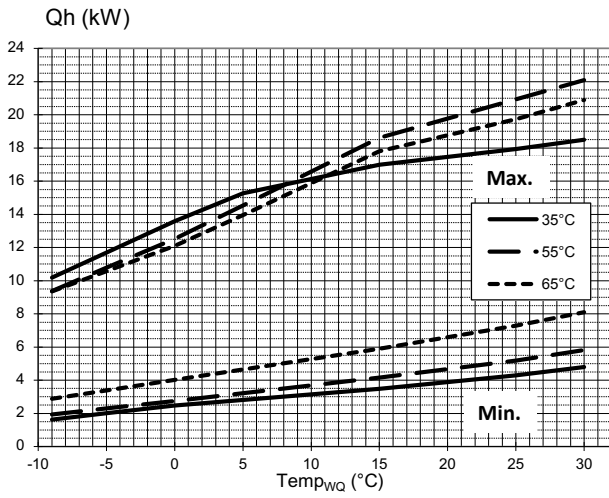
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Keys:	UK823000L/170408
\dot{V}_{HW}	Heating water volume flow rate
\dot{V}_{WQ}	Heat source volume flow rate
$Temp_{WQ}$	Heat source temperature
Q_h	Heating capacity
Pe	Power consumption
COP	Coefficient of performance
$\Delta p_{HW} / \Delta p_{HW/K}$	Heating circuit free pressure / Heating circuit with cooling free pressure
$\Delta p_{WQ} / \Delta p_{WQ/K}$	Heat source free pressure / Heat source with cooling free pressure



SWCV 122(H)(K)3

Performance curves



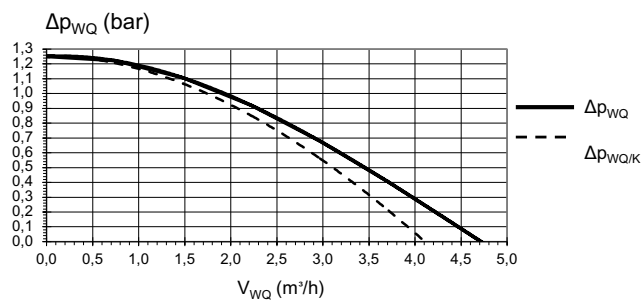
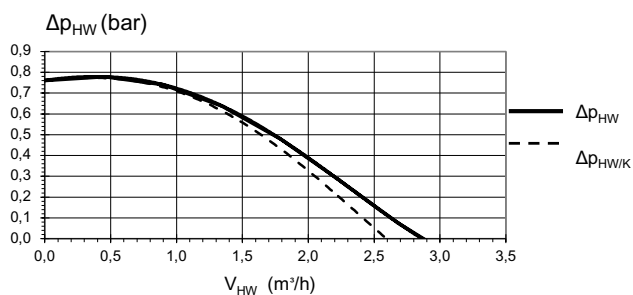
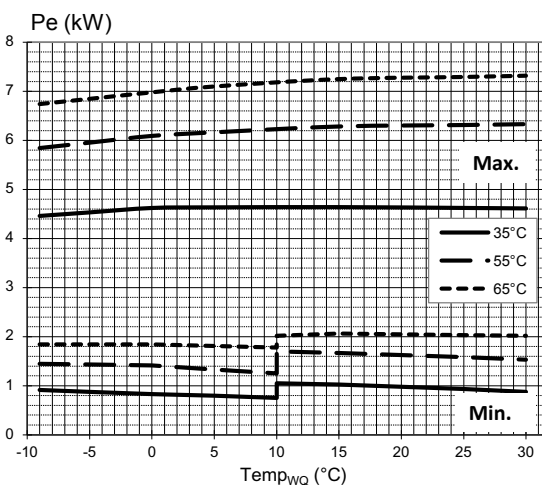
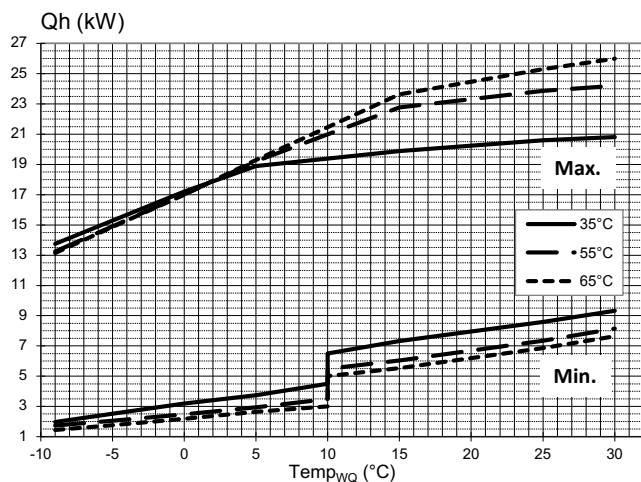
823274b

Keys:	UK823000L/170408
\dot{V}_{HW}	Heating water volume flow rate
\dot{V}_{wQ}	Heat source volume flow rate
Temp _{wQ}	Heat source temperature
Q _h	Heating capacity
Pe	Power consumption
COP	Coefficient of performance
$\Delta p_{HW} / \Delta p_{HW/K}$	Heating circuit free pressure / Heating circuit with cooling free pressure
$\Delta p_{wQ} / \Delta p_{wQ/K}$	Heat source free pressure / Heat source with cooling free pressure



Performance curves

SWCV 162(H)(K)3



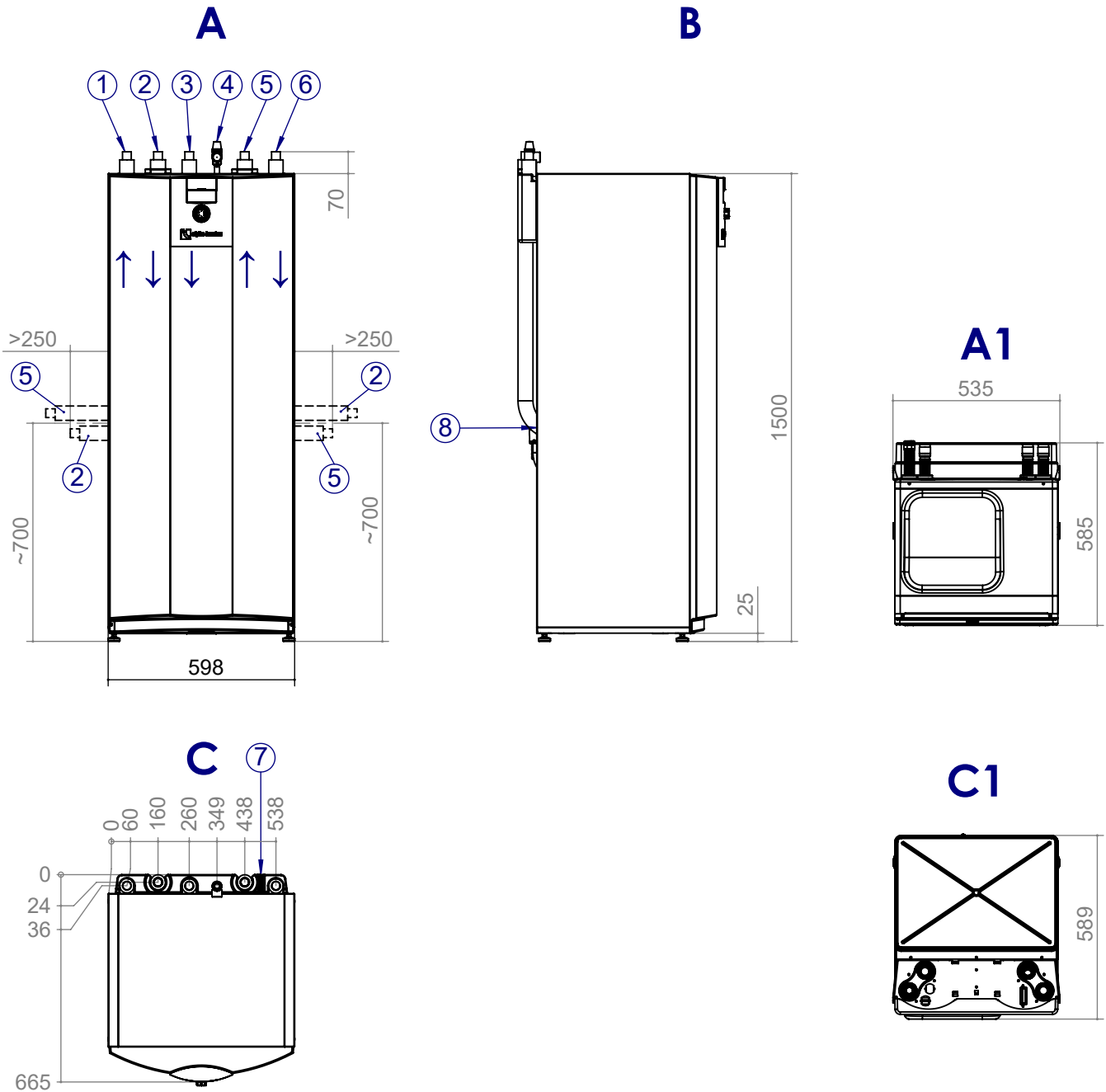
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Keys:	UK823000L/170408
\dot{V}_{HW}	Heating water volume flow rate
\dot{V}_{WQ}	Heat source volume flow rate
$Temp_{WQ}$	Heat source temperature
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance
$\Delta p_{HW} / \Delta p_{HW/K}$	Heating circuit free pressure / Heating circuit with cooling free pressure
$\Delta p_{WQ} / \Delta p_{WQ/K}$	Heat source free pressure / Heat source with cooling free pressure



SWCV 62(H)(K)3 – SWCV 162(H)(K)3

Dimensional drawings



Keys: UK819451a
All dimensions in mm..

A	Front view
B	Side view from left
C	Plan view
A1	Front view of module box
C1	Top view of module box

Pos.	Name	outside diameter
1	Heating water outlet (flow)	Ø28
2	Heat source inlet (in heat pump) optionally at the top, on the right or left	Ø28
3	Heating water inlet (return)	Ø28
4	Heating circuit safety valve (in the separate package)	Rp 3/4" internal thread
5	Heat source outlet (from heat pump) optionally at the top, on the right or left	Ø28
6	Domestic hot water charging circuit inlet (return)	Ø28
7	Cable entry LIN bus cable	-
8	Cable entry connection cable	-

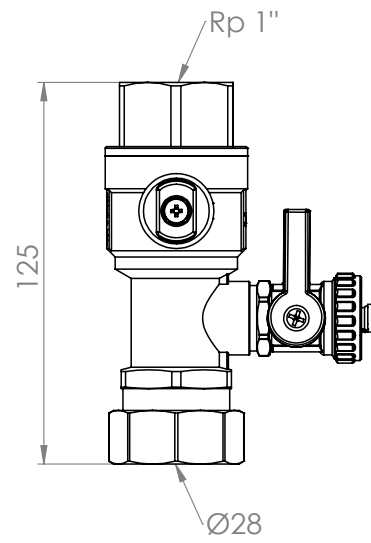


Connections

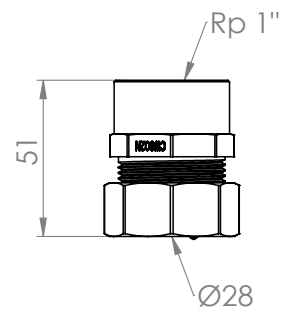
Dimensional drawings

SWCV 62(H)(K)3 – SWCV 162(H)(K)3

Heating circuit



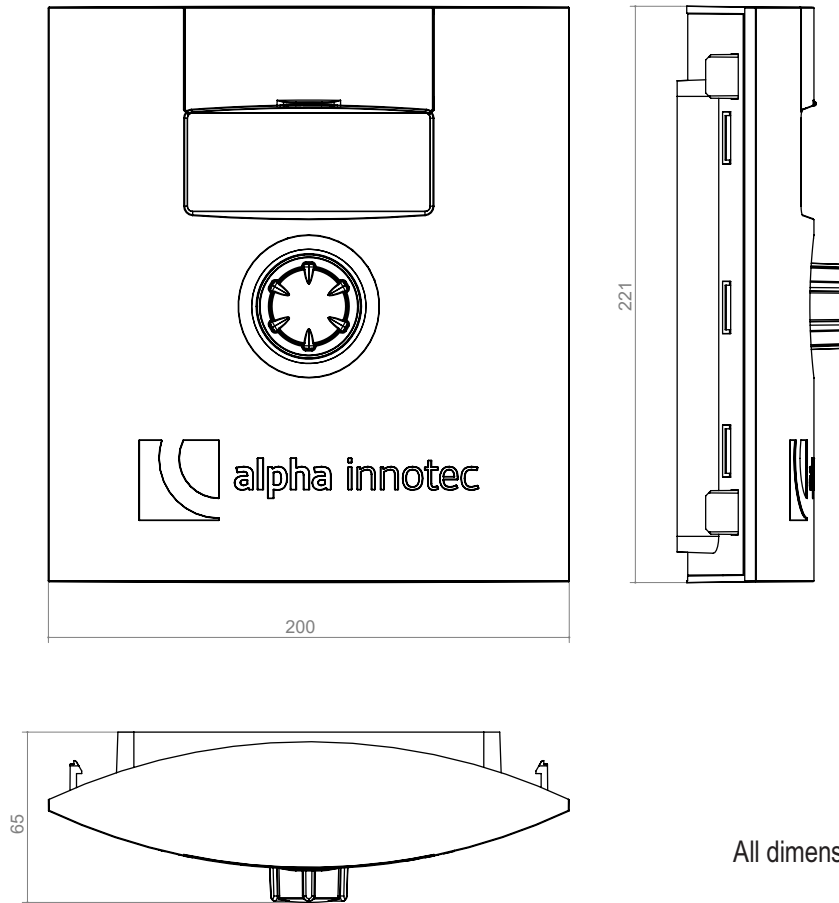
Heating source





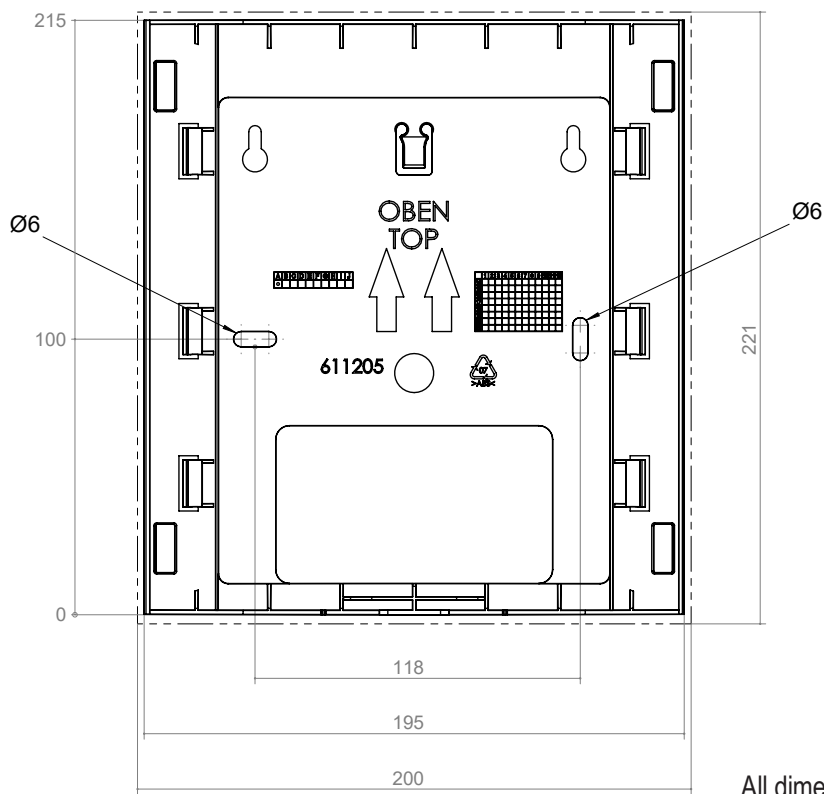
Dimensional drawings

Control unit



All dimensions in mm..

Wall-mounted bracket



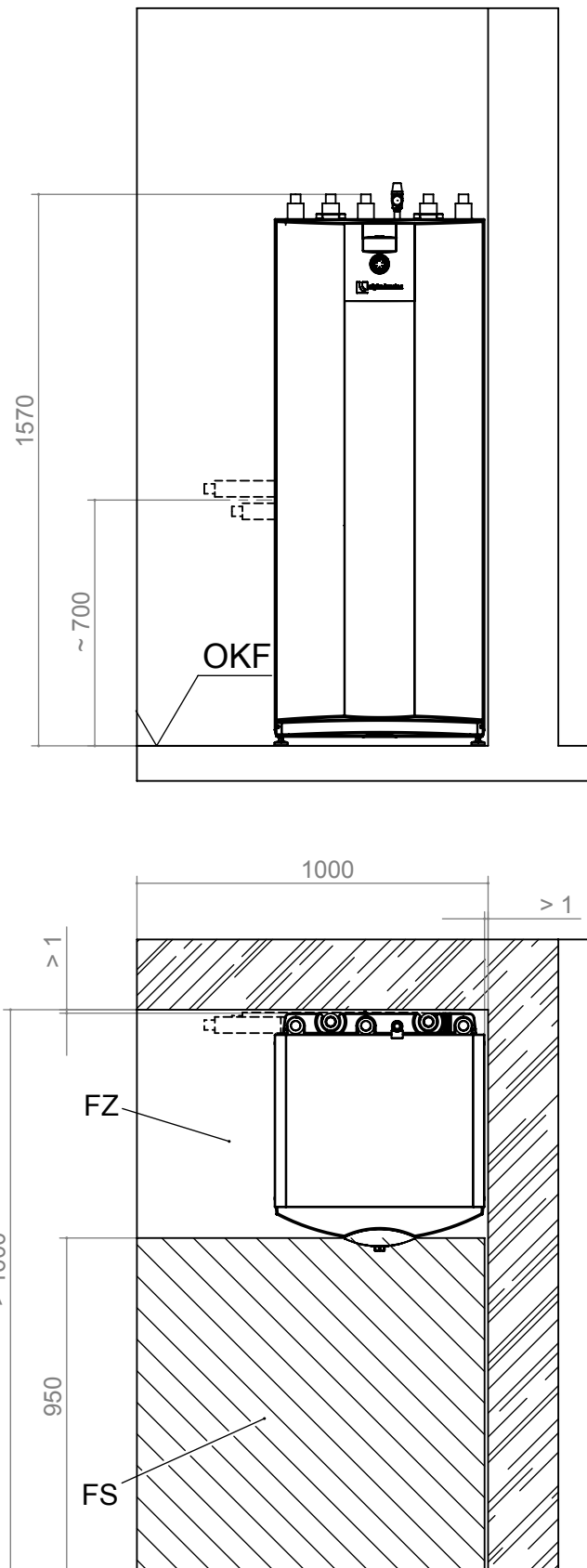
All dimensions in mm..



SWCV 62(H)(K)3 – SWCV 162(H)(K)3

Installation plan 1

V1



Keys: UK819452

All dimensions in mm.

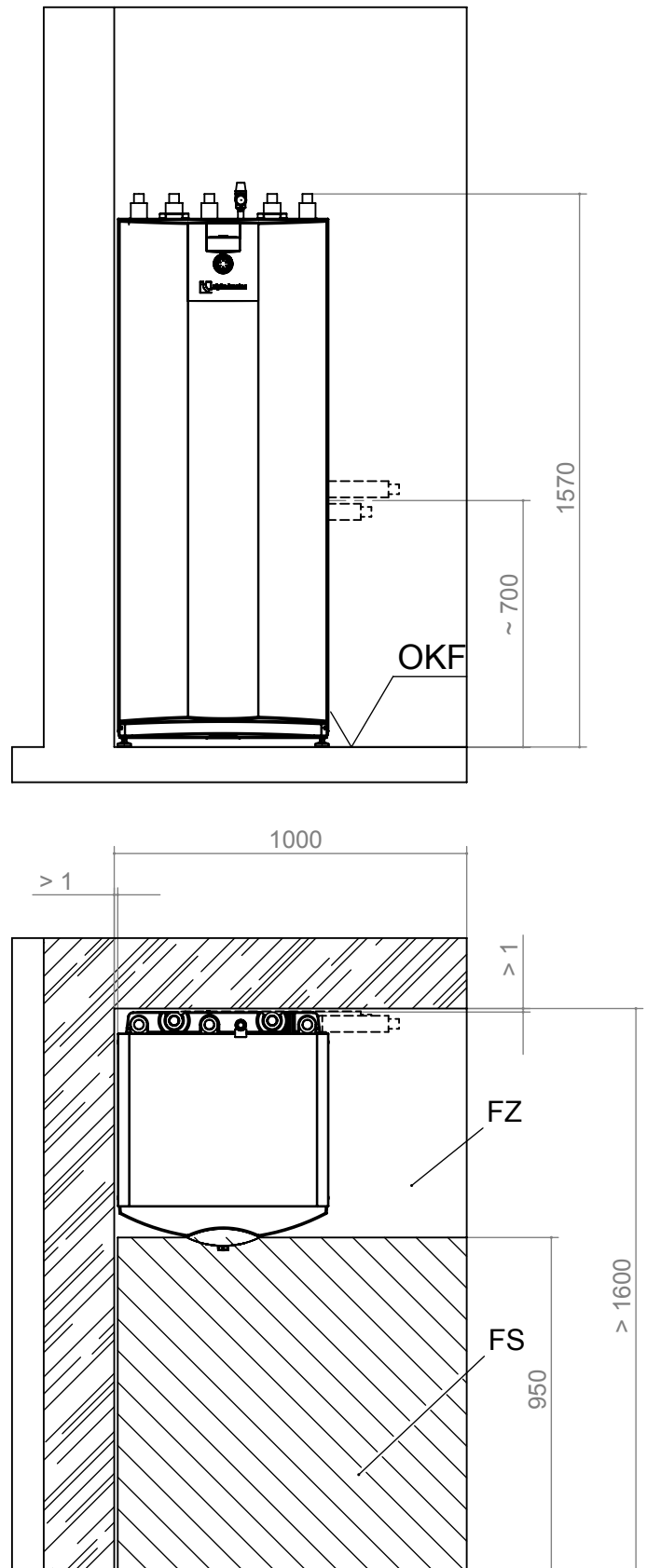
V1	Version 1	FS	Free space for service purposes
OKF	Finished floor level	FZ	Free space for functionally necessary accessories



Installation plan 2

SWCV 62(H)(K)3 – SWCV 162(H)(K)3

V2



Keys: UK819452

All dimensions in mm.

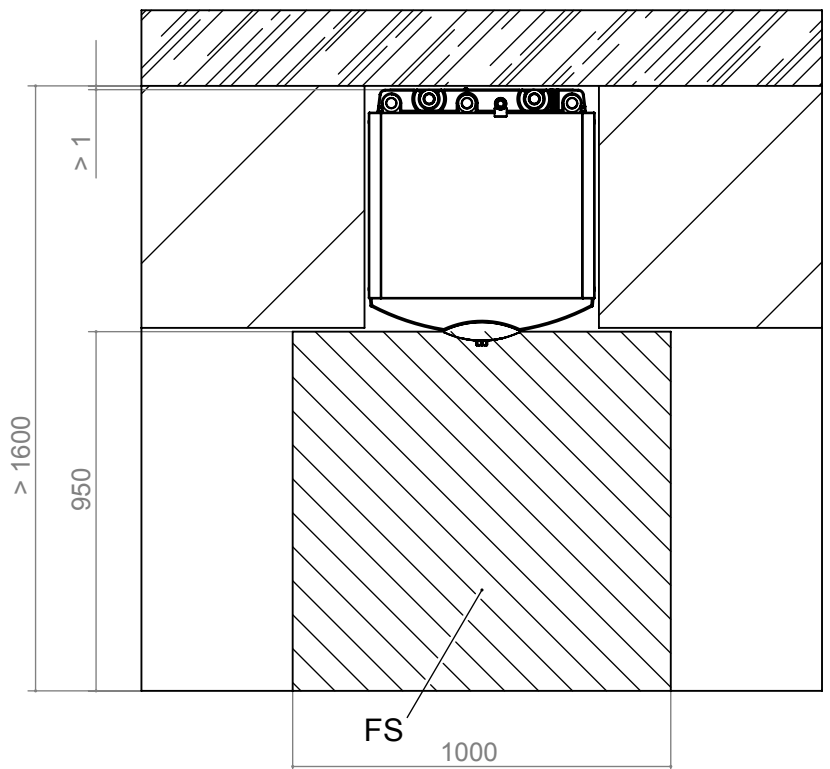
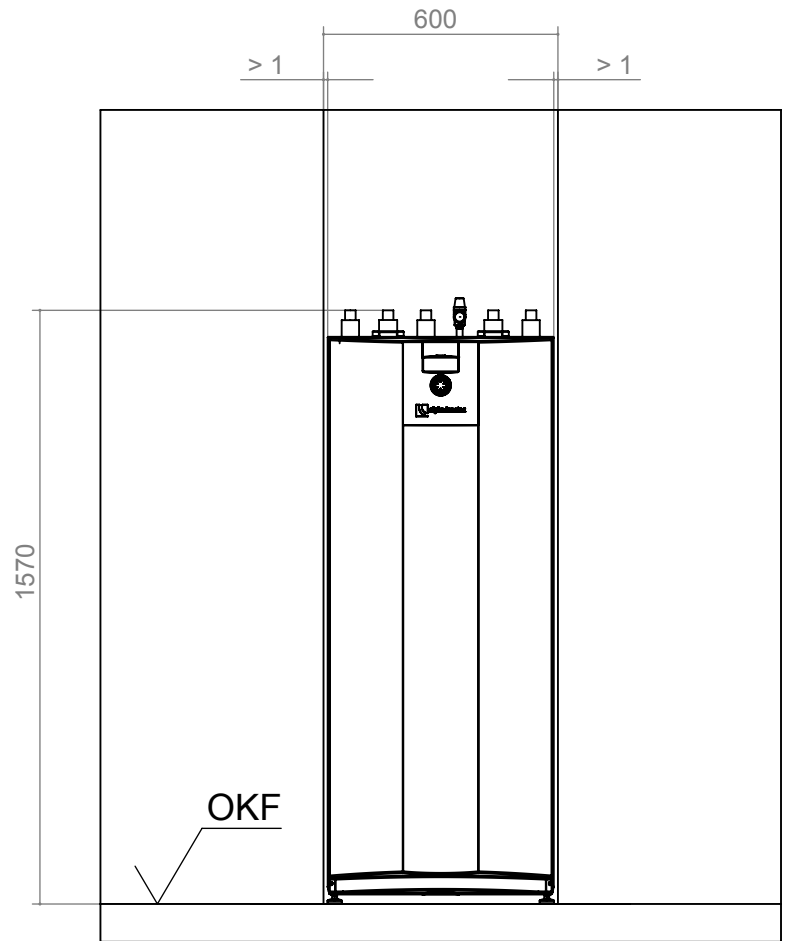
V2	Version 2	FS	Free space for service purposes
OKF	Finished floor level	FZ	Free space for functionally necessary accessories



SWCV 62(H)(K)3 – SWCV 162(H)(K)3

Installation plan 3

V3



Keys: UK819452

All dimensions in mm.

V3	Version 3
----	-----------

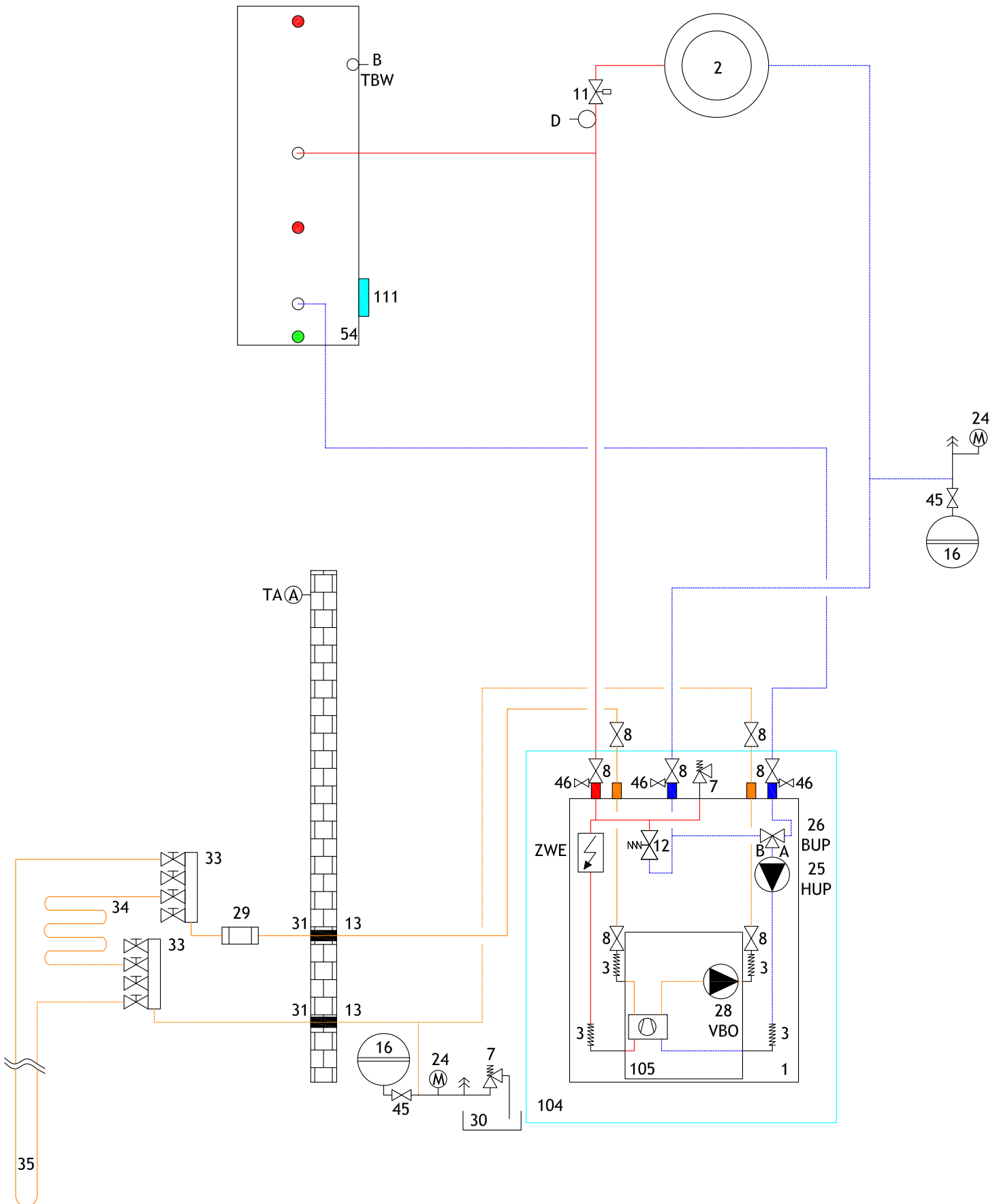
OKF	Finished floor level
-----	----------------------

FS	Free space for service purposes
----	---------------------------------



Hydraulic integration (heating)

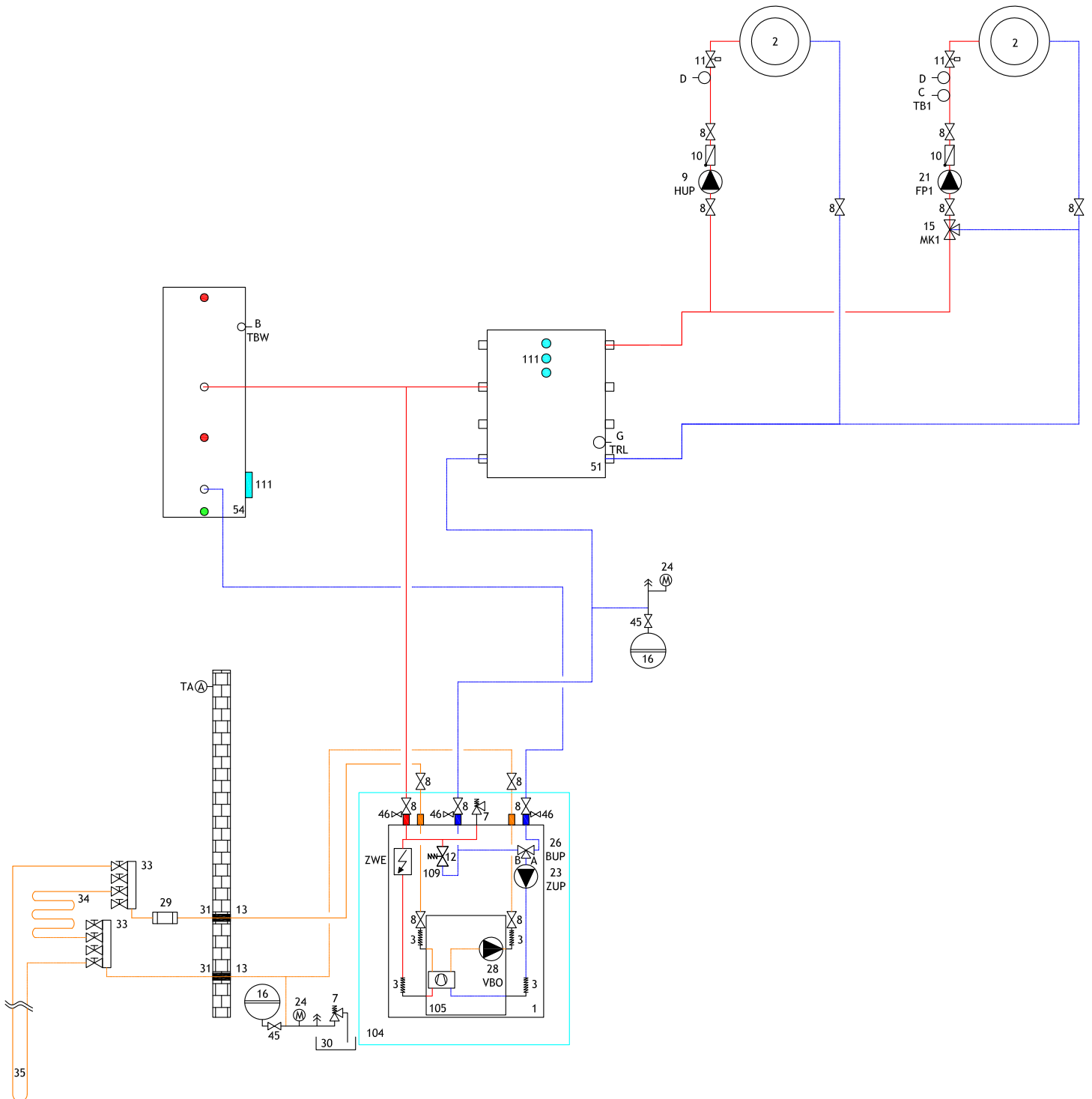
Unit variant H





Unit variant H

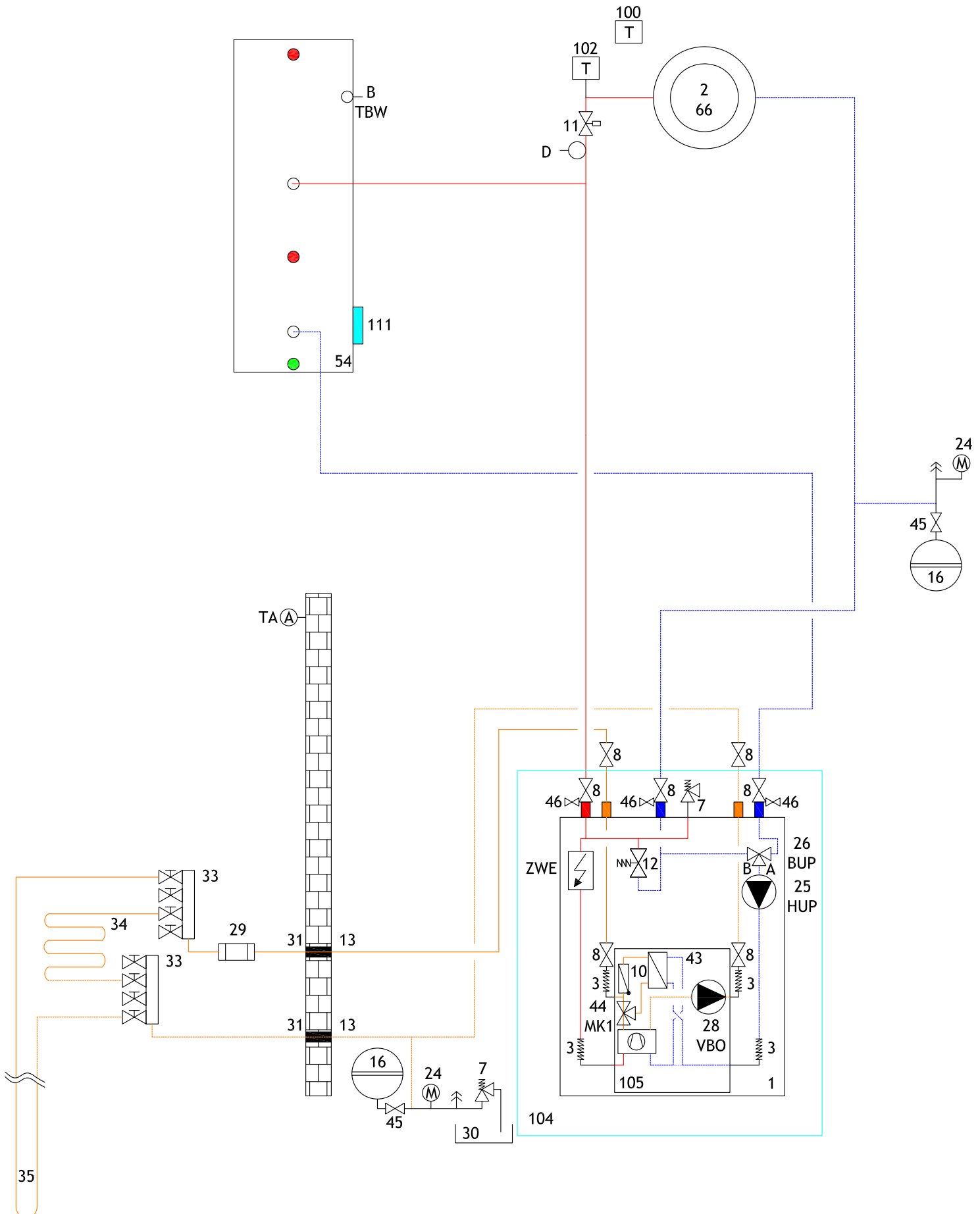
with separate buffer tank





Hydraulic integration (cooling)

Unit variant K





Legend hydraulic diagramm

1	Heat pump	51	Separation tank	TA/A	External sensor
2	Underfloor heating / radiators	52	Gas- or oil-boiler	TB/W/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	TR/L/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	TR/L/H	Sensor return (hydraulic module, dual)
8	Closure	58	Ventilation system		
9	Heating circulation pump	59	Plate heat exchanger	79	Motor valve
10	Non return valve/ one way valve	61	Cooling cylinder	80	Mixing valve
11	Individual room regulation	65	Compact distributor	81	Split heat pump outdoor unit
12	Overflow valve	66	Fancoils	82	Split heat pump indoor unit
13	Steamtight insulation	67	Solar/ service water cylinder	83	Circulation pump
14	Service water circulation pump	68	Solar/ service water cylinder	84	Switching valve
15	Mixer circuit three-way mixer (MK1 discharge)	69	Multifunction tank	113	Connection 2nd heat generator
16	Expansion vessel supplied by customer	71	Dual hydraulic module	BT1	Outdoor temperature sensor
18	Heating rod (heating)	72	Buffer tank wall mounted	BT2	Flow temperature sensor
19	Mixer circuit four-way mixer (MK1 charge)	73	Pipe lead-in	BT3	Return temperature sensor
20	Heating rod (SW)	74	Ventower	BT16	Domestic hot water temperature sensor
21	Mixer circuit circulation pump (FP1)	75	Scope of delivery, hydraulic tower, dual	BT12	Flow temperature liquefier
23	Feed circulating pump (reconnect the integrated circulating pump in the heat pump)	76	Fresh water station	BT19	Temperature sensor immersion heater
24	Manifold	77	Scope of supply water/water booster	BT24	Temperature sensor 2nd heat generator
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				
30	Spill-tray for brine mix				
31	Wall breakthrough	100	Room thermostat for cooling (optional)	15	Mixer circuit three-way mixer (MK2-3 discharge)
32	Inlet pipe	101	Controls supplied by customer	17	Temperature difference regulator
33	Brine manifold	102	Dew-point monitor (optional)	19	Mixer circuit four-way mixer (MK2 charge)
34	Ground collector	103	Room thermostat for reference space in packing list	21	Mixer circuit circulation pump (FP2-3)
35	Ground slinkies	104	Supply heat pump	22	Swimming pool circulating pump
36	Groundwater spring pump	105	Cooling circuit module box removeable for installation	44	Three-way mixer valve (cooling function MK2)
37	Wall bracket	106	Specific glycole mixture	47	Changeover valve swimming bath preparation(B = normally open)
38	Flow switch	107	Scal protection / thermostatic mixer valve	60	Changeover valve cooling operation(B = normally open)
39	Suction well	108	Solar pump assembly	62	Heat meter (optional)
40	Inverted well	109	Overflow valve must be closed	63	Changeover valve solar circuit(B = normally open)
41	Rinse fitting heating circuit	110	Packing list hydraulic tower	64	Cooling circulation pump
42	Circulation pump	111	Mounting for additional heating element	70	Solar separation module
43	Brine / Water heat exchanger (cooling function)	112	Minimum distance to thermal decoupling of the mixing valve	TB2-3/C	Feedwater sensor mixer circuits 2-3
44	Three-way mixer valve (cooling function MK1)			TS2/E	Sensor, temperature difference control (low temperature)
45	Cap valve			TSK/E	Sensor, temperature difference control (high temperature)
46	Filler and drainage valve			TEE/F	Sensor external energy source
48	Domestic hot water charging pump				
49	Direction of groundwater flow				
50	Buffer storage				

Comfort board / Expansion 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
TS2/E	Sensor, temperature difference control (low temperature)
TSK/E	Sensor, temperature difference control (high temperature)
TEE/F	Sensor external energy source

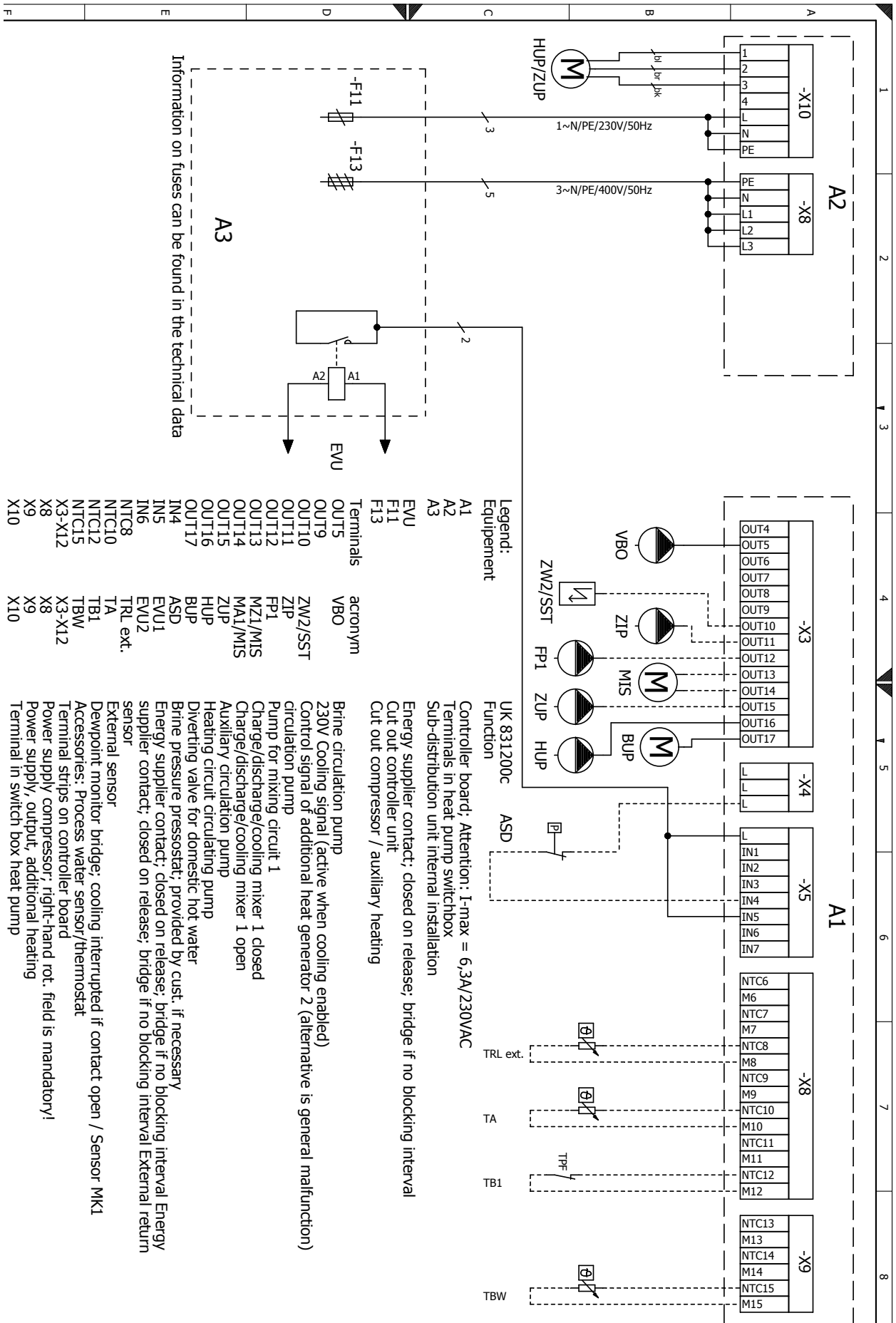
Important notice!

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!



Terminal diagram

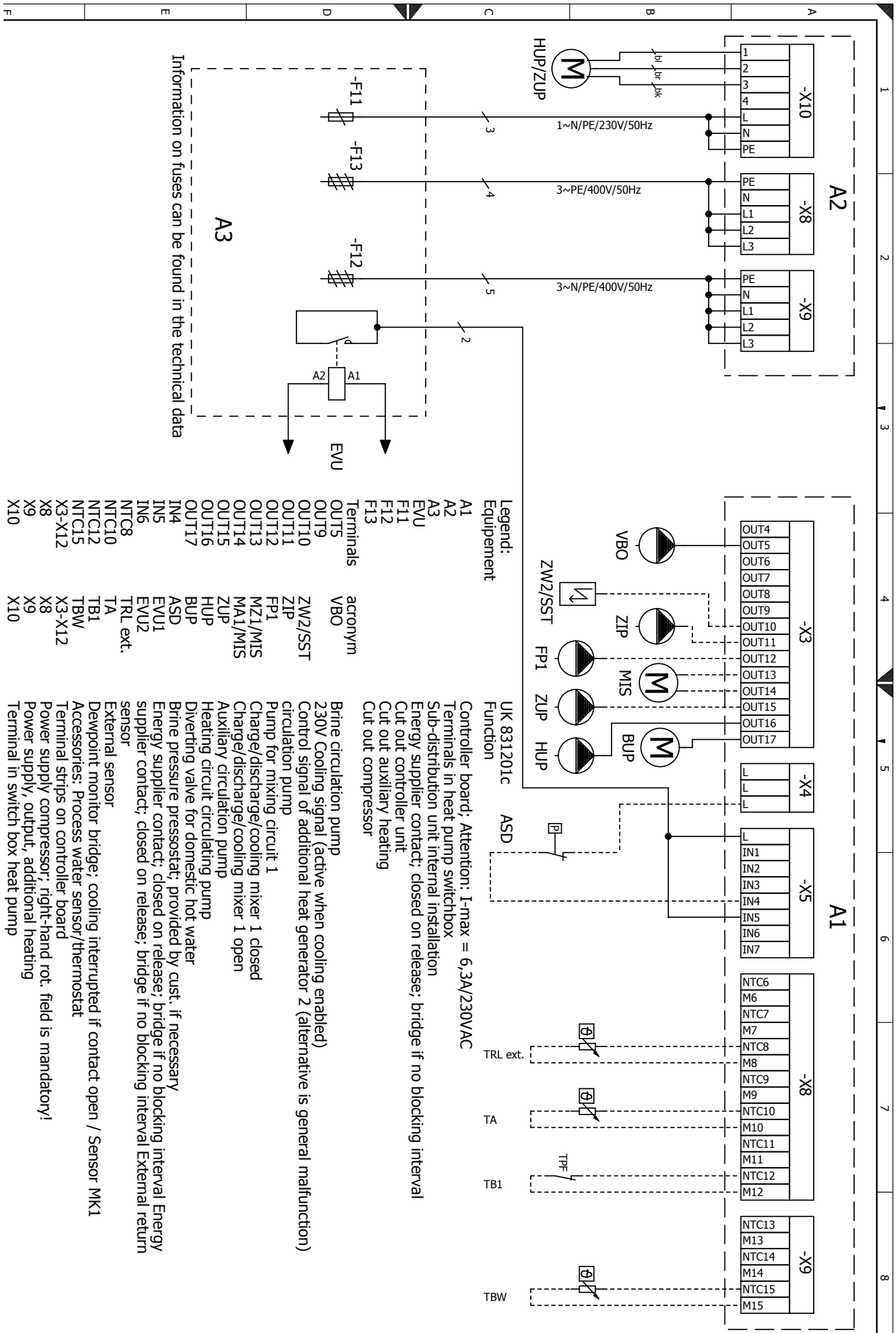
SWCV 62(H)(K)3 – SWCV 92(H)(K)3





SWCV 122(H)(K)3 – SWCV 162(H)(K)3

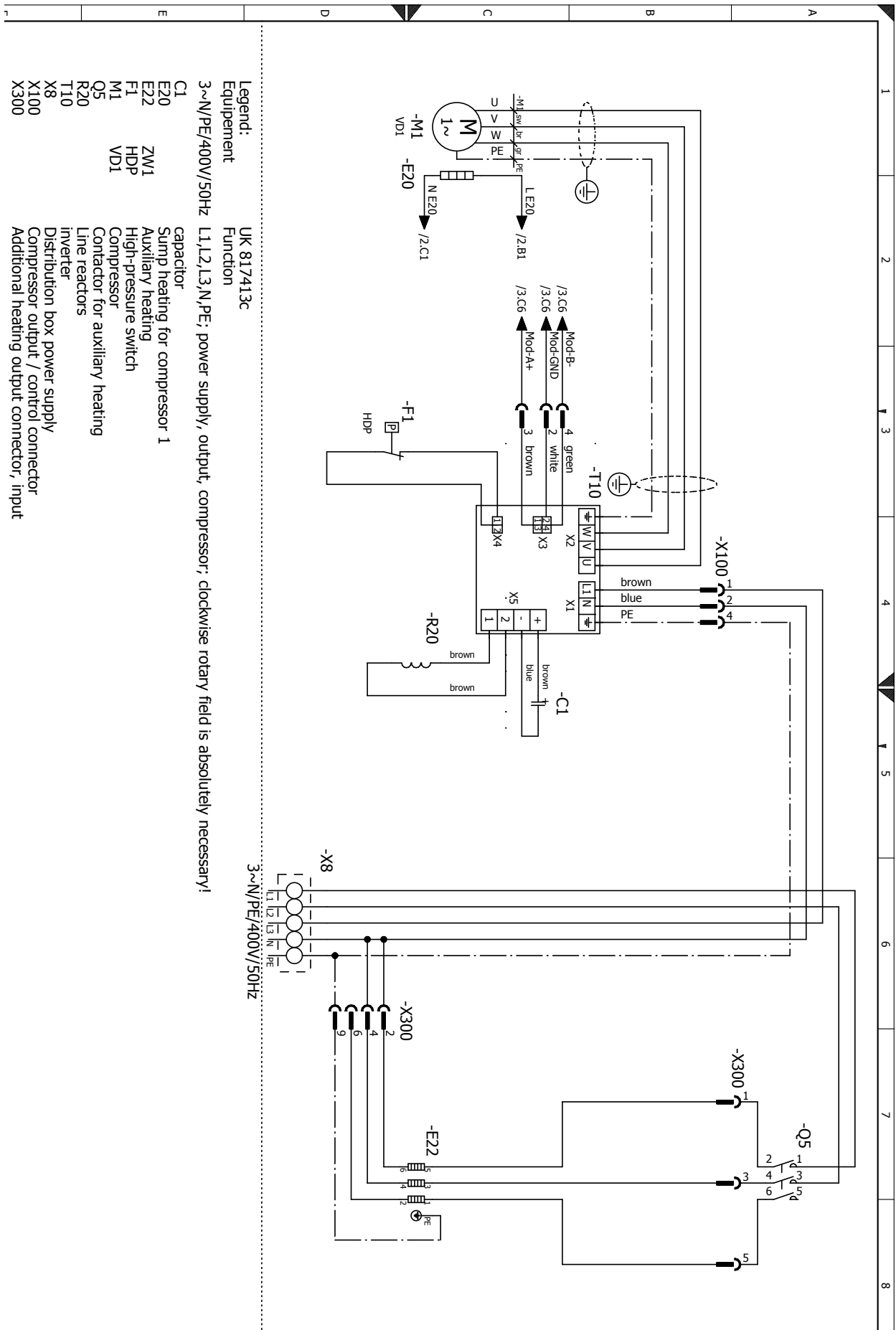
Terminal diagram





Circuit diagram 1/3

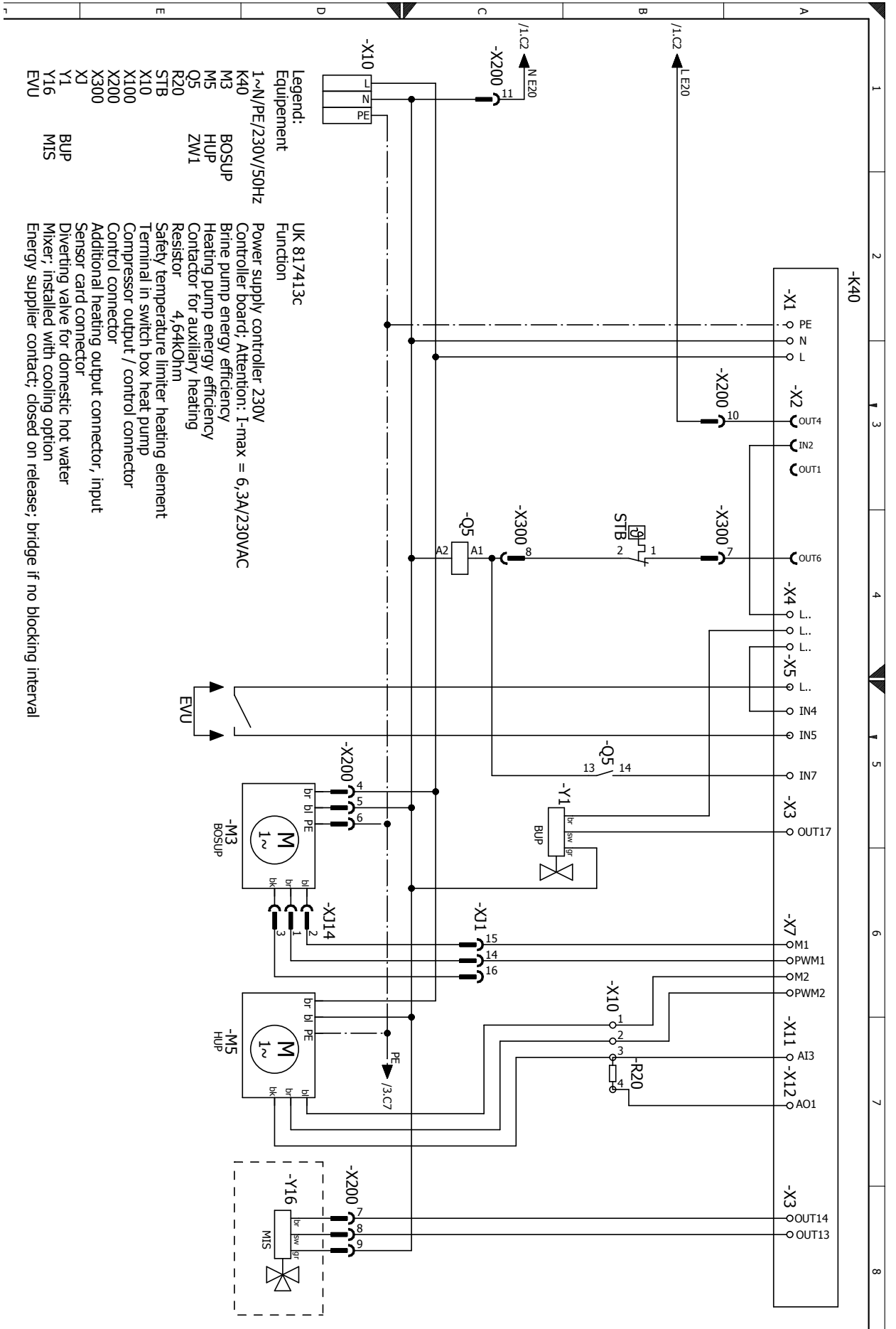
SWCV 62(H)(K)3 – SWCV 92(H)(K)3





SWCV 62(H)(K)3 – SWCV 92(H)(K)3

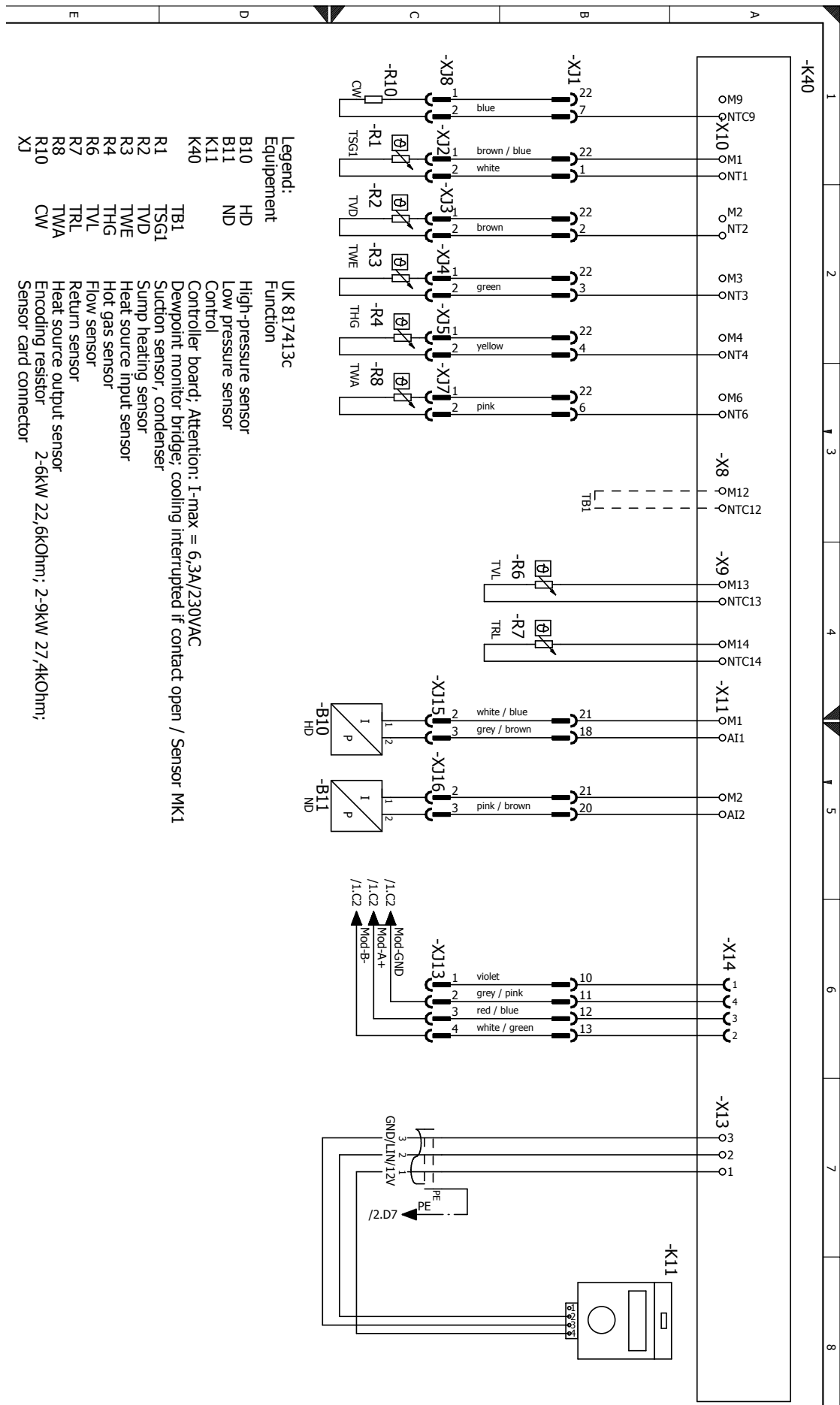
Circuit diagram 2/3





Circuit diagram 3/3

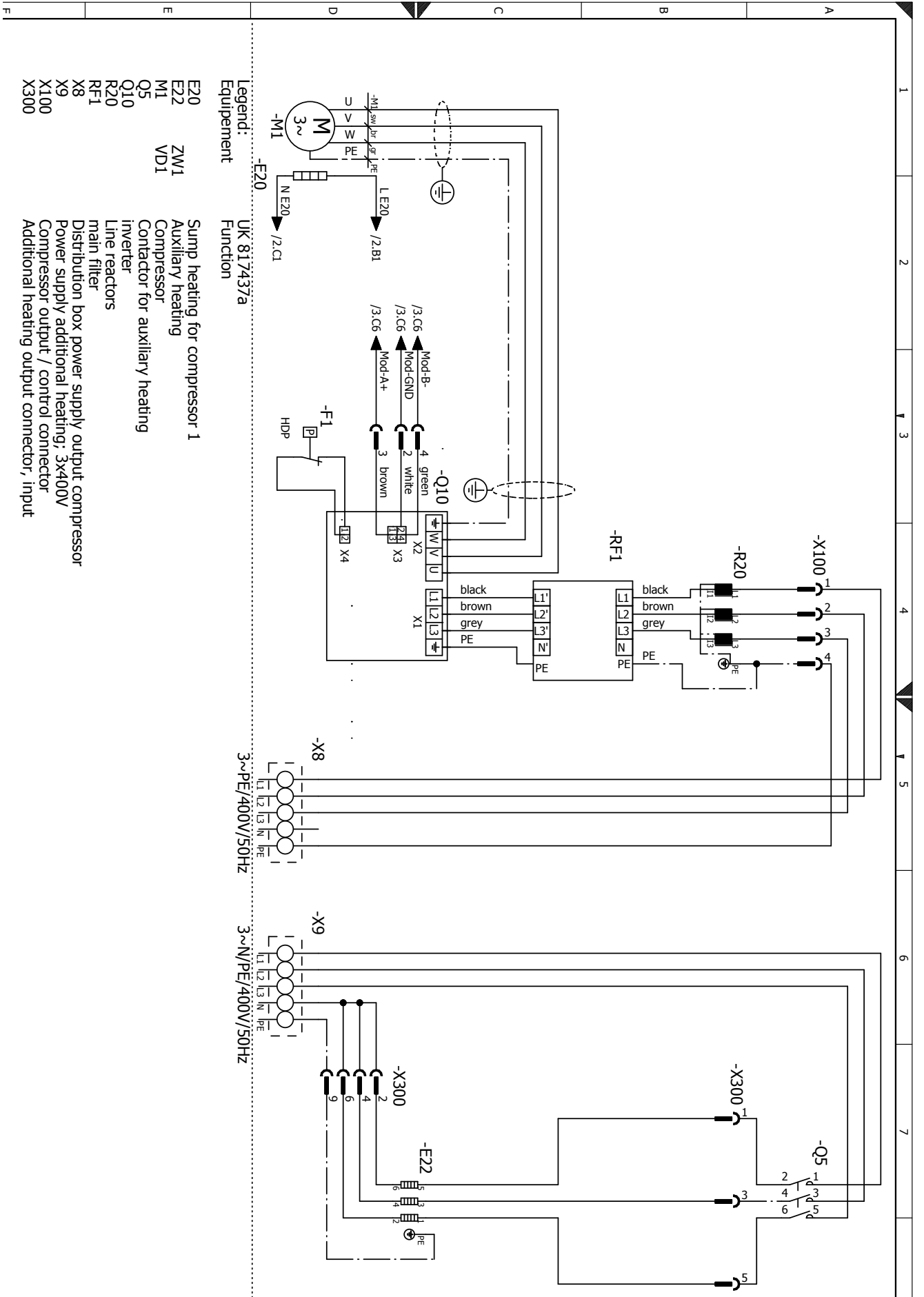
SWCV 62(H)(K)3 – SWCV 92(H)(K)3





Circuit diagram 1/3

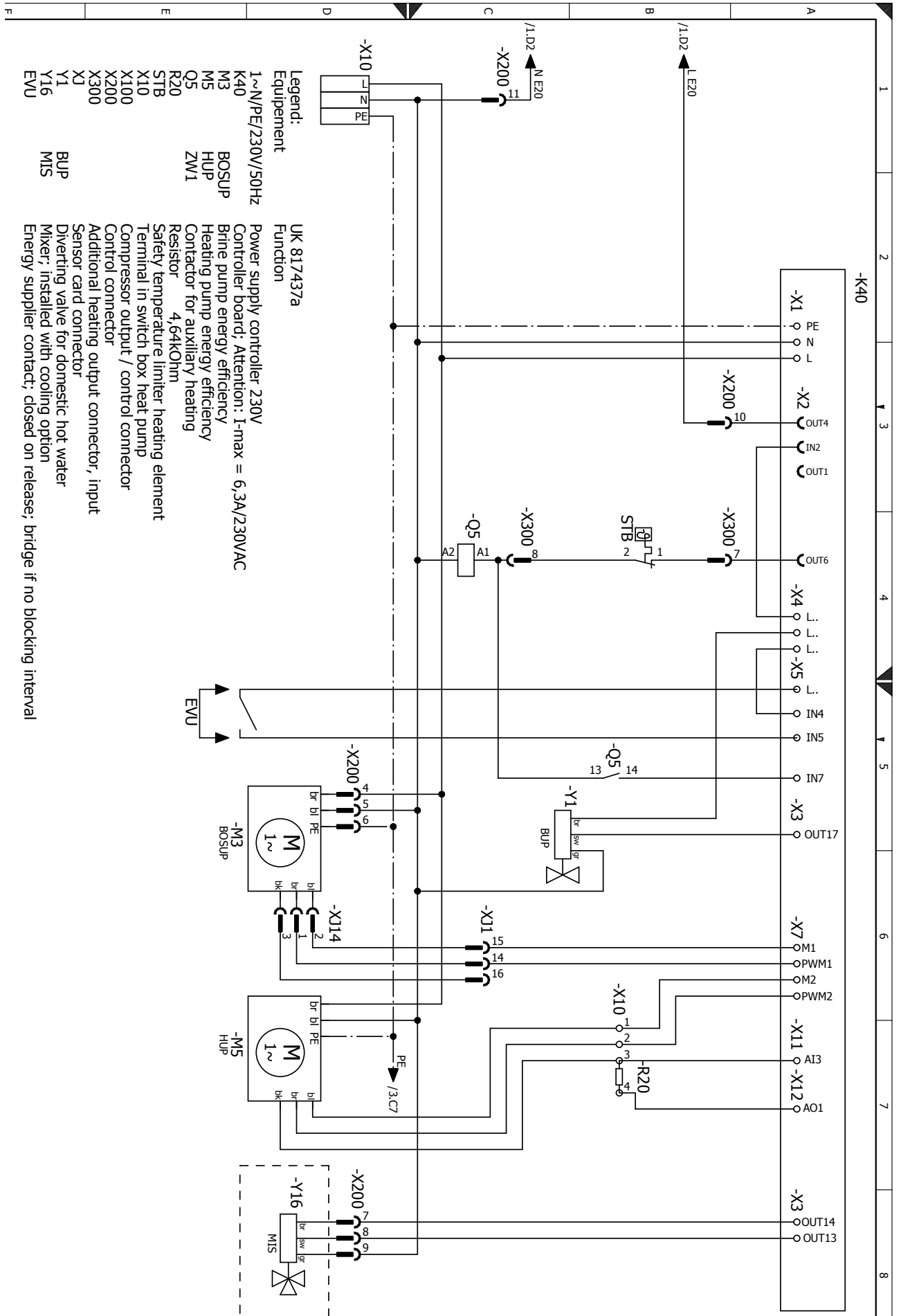
SWCV 122(H)(K)3





Circuit diagram 2/3

SWCV 122(H)(K)3

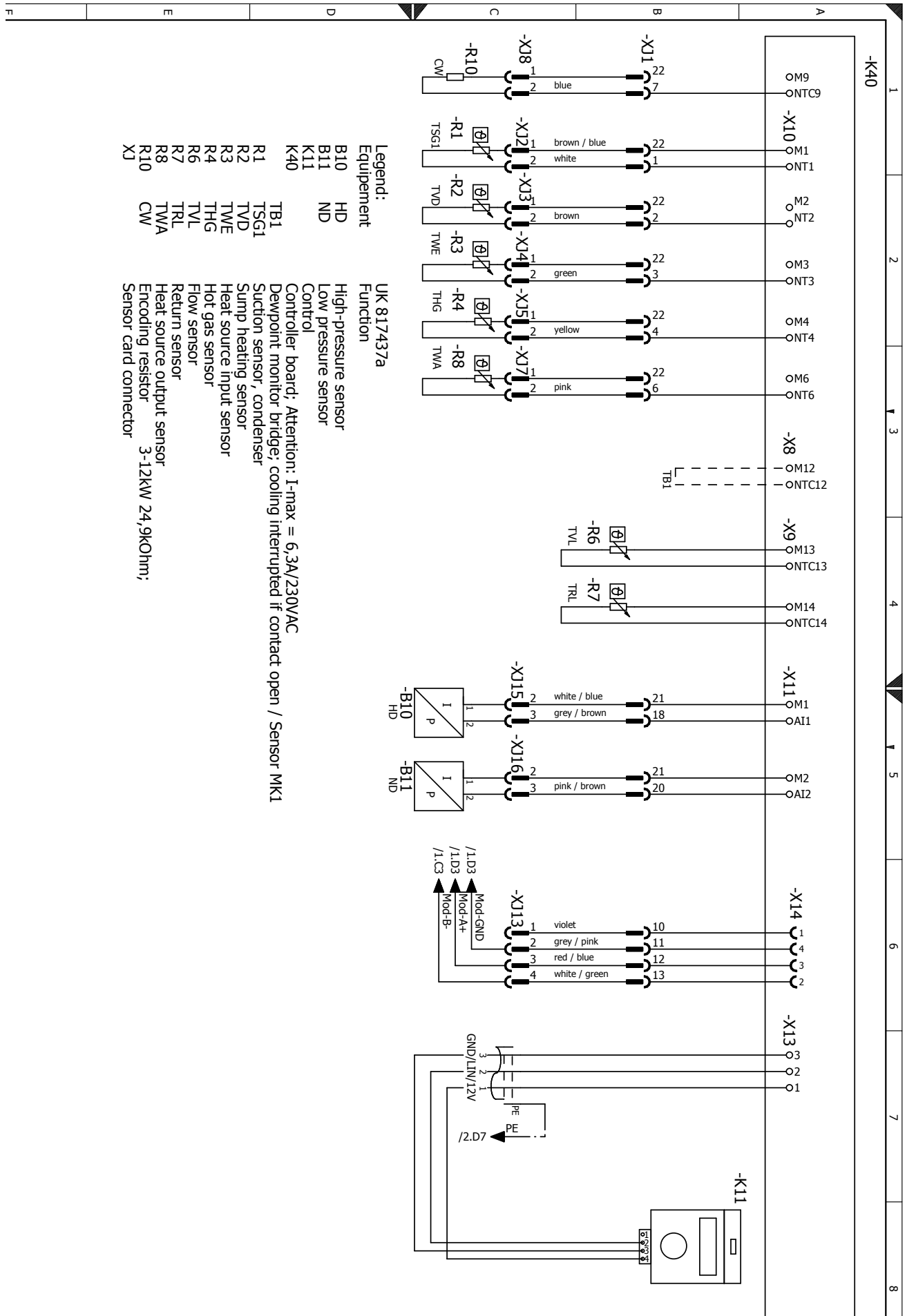


- Legend:**
- | | |
|------------------|---|
| Equipment | UK 817437a |
| Function | Power supply controller: 230V |
| K40 | Controller board: Attention: I-max = 6,3A/230VAC |
| M3 | BOSUP |
| M5 | HUP |
| Q5 | Heating pump energy efficiency |
| R20 | Contactor for auxiliary heating |
| STB | Resistor 4,64kOhm |
| X10 | Safety temperature limiter: heating element |
| X1100 | Terminal in switch box: heat pump |
| X200 | Compressor output / control connector |
| X300 | Control connector |
| XJ | Additional heating output connector, input |
| Y1 | Sensor card connector |
| Y16 | Diverter valve for domestic hot water |
| EVU | Mixer: installed with cooling option |
| | Energy supplier contact; closed on release; bridge if no blocking interval |



SWCV 122(H)(K)3

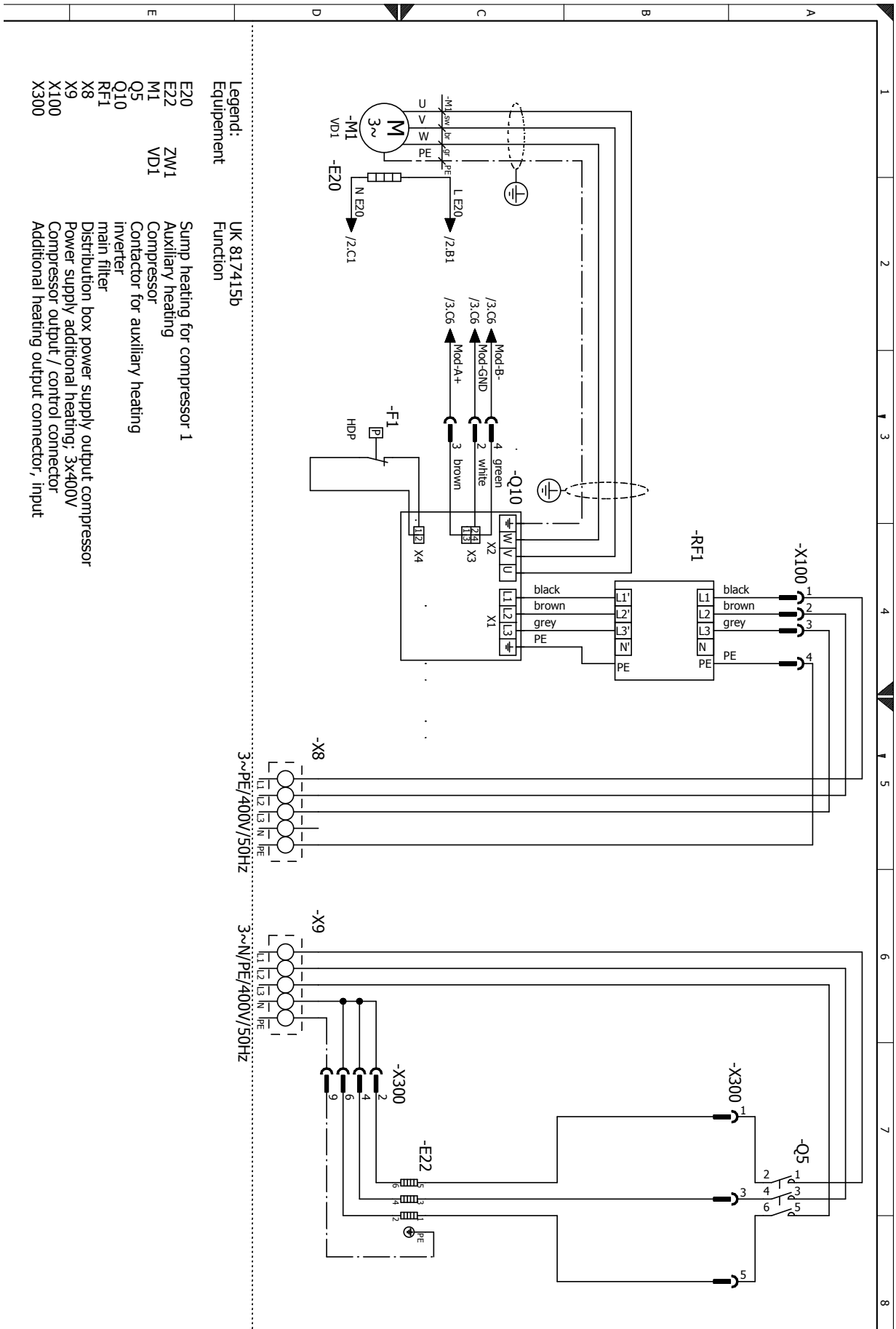
Circuit diagram 3/3





Circuit diagram 1/3

SWCV 162(H)(K)3

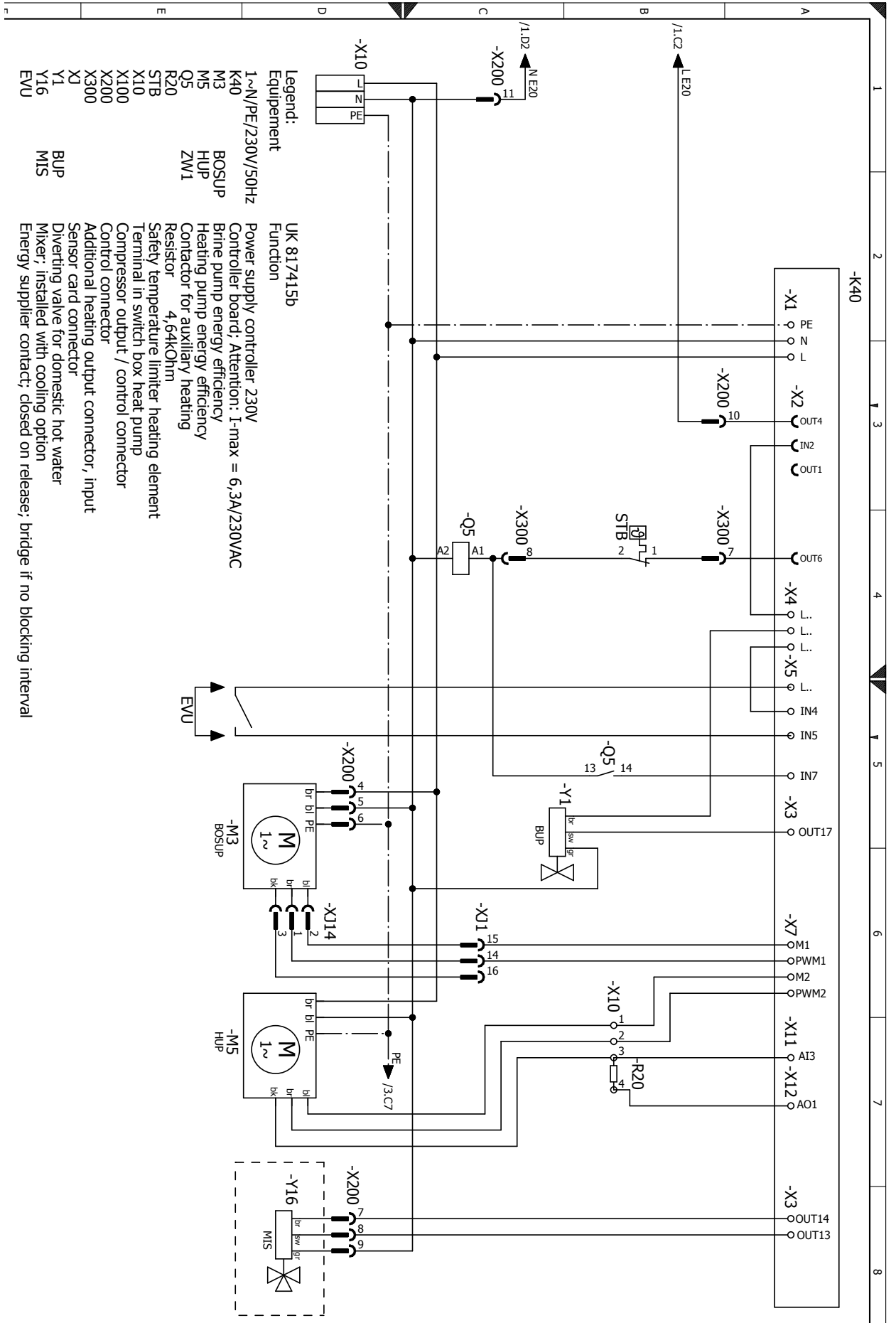


- Legend:**
- | | |
|------------------|---|
| Equipment | UK 817415B |
| Function | Sump heating for compressor 1 |
| E20 | Auxiliary heating |
| E22 | Compressor |
| M1 | Contactor for auxiliary heating |
| O5 | inverter |
| O10 | main filter |
| RF1 | Distribution box power supply output compressor |
| X8 | Power supply additional heating; 3x400V |
| X9 | Compressor output / control connector |
| X100 | Additional heating output connector, input |
| X300 | |



SWCV 162(H)(K)3

Circuit diagram 2/3

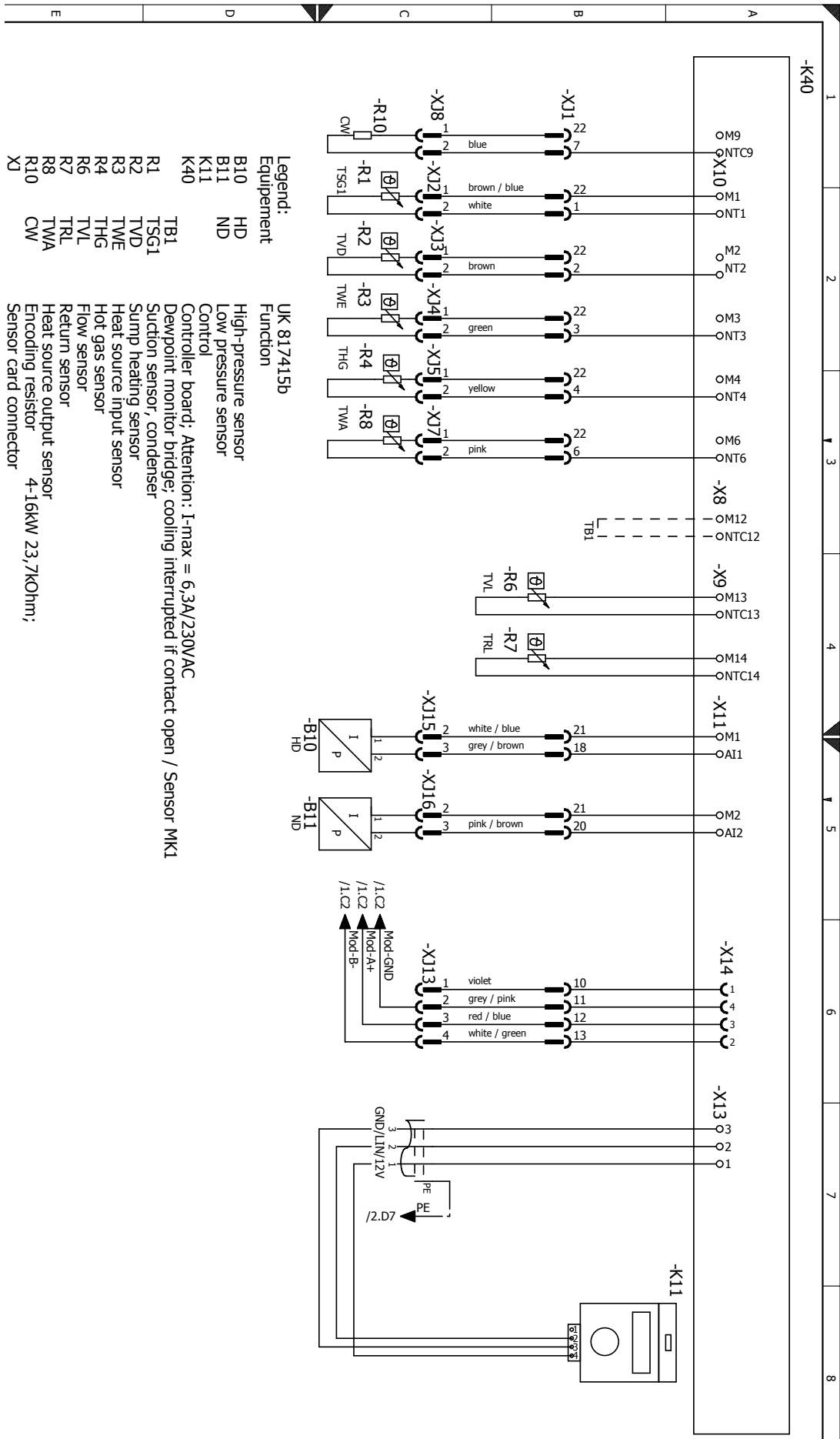


- Legend:**
- | | | |
|------------------|------------|--|
| Equipment | UK 817415b | Function |
| 1~N/PE/230V/50Hz | | Power supply controller 230V |
| K40 | | Controller board; Attention: I-max = 6,3A/230VAC |
| M3 | BOSUP | Brine pump energy efficiency |
| M5 | HUP | Heating pump energy efficiency |
| Q5 | ZW1 | Contactor for auxiliary heating |
| R20 | | Resistor 4,64kOhm |
| STB | | Safety temperature limiter heating element |
| X10 | | Terminal in switch box heat pump |
| X100 | | Compressor output / control connector |
| X200 | | Control connector |
| X300 | | Additional heating output connector, input |
| X1 | | Sensor card connector |
| Y1 | | Diverting valve for domestic hot water |
| Y16 | | Mixer, installed with cooling option |
| EVU | BUP | Energy supplier contact; closed on release; bridge if no blocking interval |
| | MIS | |



Circuit diagram 3/3

SWCV 162(H)(K)3





EC Declaration of Conformity



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	Number	Unit model	Number
SWC 42H3	10068041	SWC 42K3	10069041
SWC 82H3	10068241	SWC 82K3	10069241
SWC 102H3	10068342	SWC 102K3	10069342
SWC 122H3	10068442	SWC 122K3	10069442
SWC 142H3	10068542	SWC 142K3	10069542
SWC 172H3	10068642	SWC 172K3	10069642
SWC 192H3	10068742	SWC 192K3	10069742
SWCV 62H3	10071541	SWC 42H1	10073042
SWCV 162H3	10071641	SWC 62H1	10073142
SWCV 62K3	10071741	SWC 82H1	10073242
SWCV 162K3	10071841	SWC 102H1	10073342
SWCV 62H1	10071941	SWC 132H1	10073442
SWCV 122H3	10072841	SWCV 122K3	10072941
SWCV 122H1	10074941	SWCV 92H3	10076741
SWCV 92H1	10076941	SWCV 92K3	10076841

EC Directives

2014/35/EU 813/2013
 2014/30/EU
 2011/65/EG
 *2014/68/EU

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
 EN 14825

* 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, 30.04.2019

Signature:

Jesper Stannow
 Head of Heating Development

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