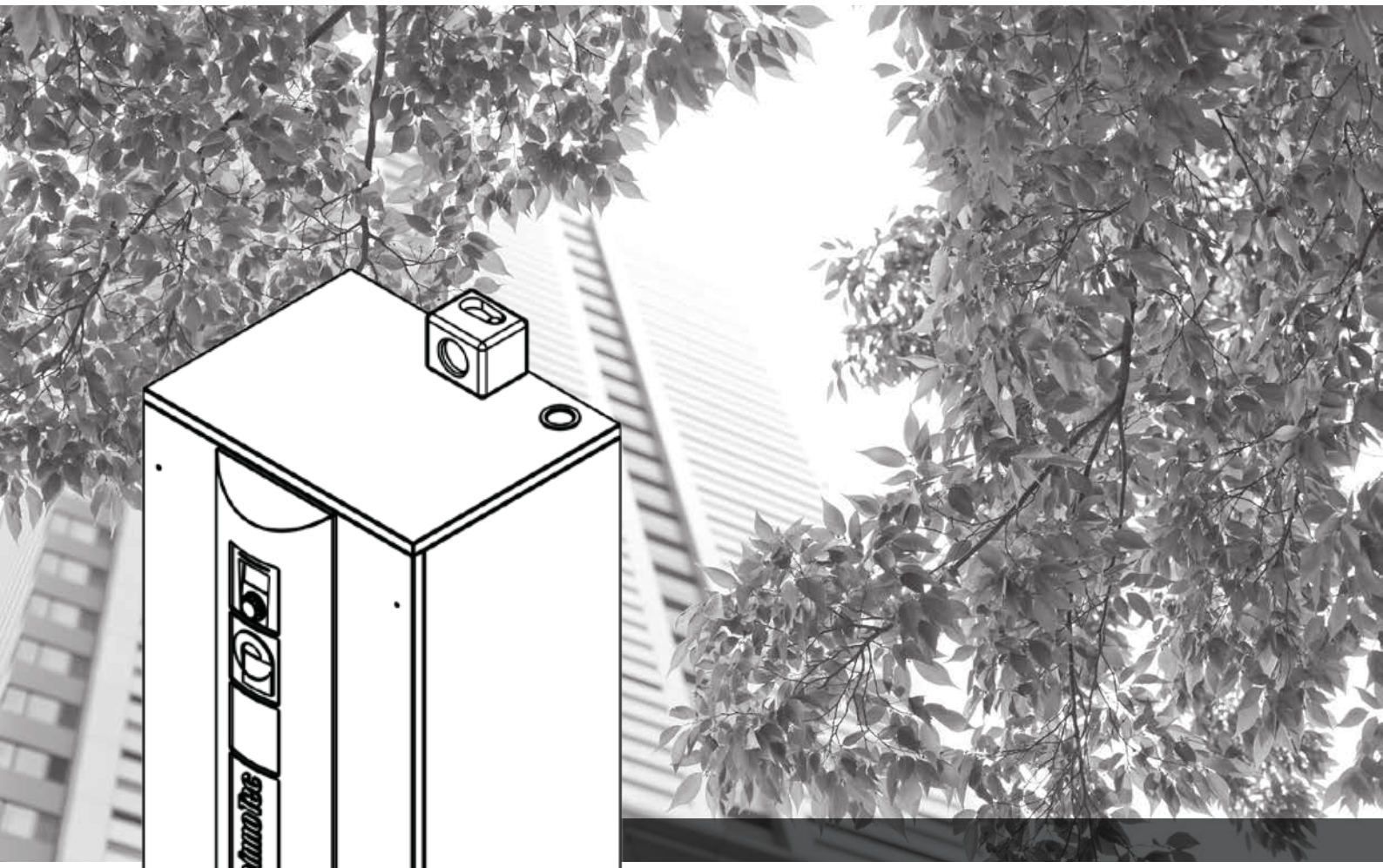
the better way to heat

alpha innotec



Water/Water-Heat Pumps
Compact

Operating Manual

WWC H/X – series
WWC X – series

8305070OfUK – Translation into English of the original German operating manual

UK

Please read first

This operating manual provides important information on handling the unit. It is an integral part of the product and must be stored so that it is accessible in the immediate vicinity of the unit. It must remain available throughout the unit's entire service life. It must be handed over to subsequent owners or users of the unit.

Read the operating manual before starting any work on or with the unit. Especially the chapter on safety. Follow all instructions in full and unreservedly.

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.

Since this operating manual was written for several different models of the unit, 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. They are protected by copyright. They may not be reproduced, transmitted, copied, stored in electronic 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 uers.

Information or instructions for qualified technicians.

DANGER!
Indicates imminent danger, which results in severe injuries or death.

WARNING!
Indicates a potentially dangerous situation, which could result in severe injuries or death.

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

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

NOTE.
Emphasized information.

ENERGY SAVING TIP
Indicates advice, which helps to save energy, raw materials and costs.

Reference to other sections of the operating manual.

Reference to other documents of the manufacturer.

Contents

INFORMATION FOR USERS AND QUALIFIED PERSONNEL

INSTRUCTIONS FOR QUALIFIED TECHNICIANS

Intended use

The unit is only to be used for its intended purpose. This means:

- for heating.
- for domestic water heating.

The unit may be operated only within its technical parameters.

☞ Overview “Technical data / scope of delivery”.

NOTE.
Notify the responsible power supply company of the use of a heat pump or heat pump system.

Disclaimer

The manufacturer is not liable for any damage or losses resulting from 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 improperly carried out 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.

EC conformity

The unit bears the CE marking.

☞ EC Declaration of Conformity

Safety

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 carries out work on the unit must have read and understood the operating manual before starting any work. This also applies if the person concerned has already worked with such a unit or a similar unit or has been trained by the manufacturer.

Every person who carries out work on the unit must comply with the relevant local accident prevention and safety regulations. This especially applies to the wearing of personal protective clothing.

DANGER!
Risk of fatal electric shock!
All electrical connection work must be carried out by qualified electricians only.
Before opening the unit, safely disconnect the system from the power supply and prevent it from being switched back on!

WARNING!
Only qualified personnel (trained heating, refrigerating system and refrigerant engineers and electricians) may carry out work on the unit and its components.

WARNING!
Note and follow safety stickers on and in the unit.

WARNING!
Unit contains refrigerant!
Leaking refrigerant could result in personal injury and environmental damage. Therefore:

- **Switch off system.**
- **Thoroughly ventilate installation room.**
- **Notify the manufacturer’s authorised service centre.**

IMPORTANT
For safety reasons:
Never disconnect the unit from the power supply, unless the unit is being opened.

IMPORTANT
Only install the heat pump indoors.

☞ Dimensioned drawing and installation plan for the respective unit model.

Customer service

For technical assistance, please contact your qualified technician or the manufacturer's local service partner.

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

DE: www.alpha-innotec.de

EU: www.alpha-innotec.com

Warranty / Guarantee

For warranty and guarantee provisions, please refer to your purchase documents.

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

Disposal

When withdrawing the old unit from service, always comply with the relevant local laws, guidelines, directives and standards concerning the recovery, recycling and disposal of the operating materials and components of refrigerating units.

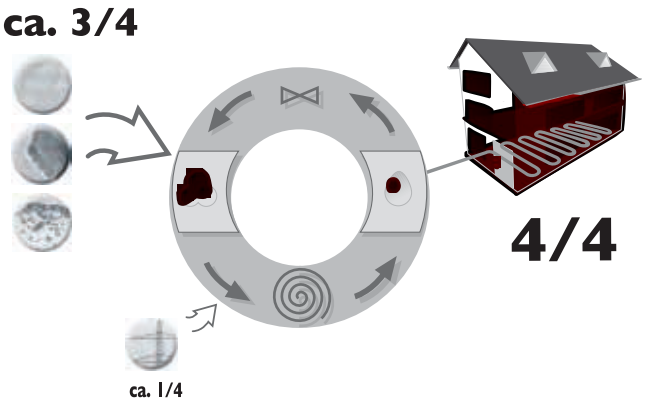
☞ "Dismantling".

Operating principle of heat pumps

Heat pumps operate on the same principle as a refrigerator: same technology, only with reversed benefits. The refrigerator extracts heat from foods, which is released into the room through fins on the back.

The heat pump extracts heat from our environment: air, earth or ground water. The extracted heat is conditioned in the unit and supplied to the heating water. Even when it is extremely cold outside, the heat pump draws enough heat to heat a house.

Example: drawing of a brine/water heat pump with floor heating:



4/4 = usable energy
approx. 3/4 = environmental energy
approx. 1/4 = external electrical energy

Area of use and heat source requirements

Taking into consideration the ambient conditions, limits of use and the relevant regulations, every heat pump can be used in new or existing heating systems.

☞ "Technical data / scope of delivery" overview,

WATER TEMPERATURE / WATER QUANTITY

The water in the extraction well of the heat source system must have a minimum temperature of 7 °C all year round and may not exceed a temperature of 25°C. Depending on the heat output required or its cooling capacity as a relevant variable for dimensioning the heat source, a minimum water rate is required, which must be provided by the heat source as a continuous output. Before installing the water/water heat pump, a pump test should/must be carried out for at least 12 hours with verification of a quasi-constantly lowered water table (persistence) in order to provide information about the quantity of water available. For efficient operation of the well, during the initial start-up the nominal flow rate must be adjusted on the heat source side. Any appropriate components, which enable balancing are to be installed in the pipe network here. The material of the components used must be chosen according to the water quality. The necessary flow rate (heat source water rate) must meet the heat pump's requirements.

☞ "Technical data/scope of supply" overview.

WATER QUALITY

In Germany the well must be designed and built to DIN 4021 and VDI 4640 (in other countries according to the corresponding regulations). Wells may only be drilled and built by drilling companies with a permit in accordance with DVGW W120. The water quality of the heat source is defined as normal groundwater. Ensure that the suction and return pipe always extends below the water level by sufficient depth, to ensure that oxygen is not added to the water (risk of iron oxide deposits). Please discuss the problem of iron oxide deposits with your well builder. During the planning the quality of the groundwater should be checked in advance as well as possible (e.g. by asking the competent water authority or searching for data on existing adjacent wells) and subsequently verified by water analysis in the built production well. The following table helps to assess the water quality.

! IMPORTANT

A water analysis and pump test must be carried out before installing the water/water heat pump.

i NOTE:

Water analyses are prepared by water test laboratories. Initial information about possible use of groundwater is available from your local water management authority. A pump test provides information as to whether a sufficient quantity / rate of water is available to cover the requirements for the heating output of your unit. The minimum groundwater flow rate must at least be available as a continuous output.

☞ "Technical data/scope of supply" overview, "Heat source flow rate" section.

EVALUATION OF THE WATER ANALYSIS

Water constituents - minimum requirement. The water should be analysed in advance for the test values listed below (table). An important criterion to be used for taking water samples is the DVGW Standard, Technical Notices, Leaflet W 112 and use of the technical rules listed in it (DIN, EN and ISO standards).

Designation	Limit
pH value	> 6.8
Iron level	< 0.2 mg / l
Manganese level	< 0.1 mg / l
Chloride level	< 300 mg / l
Free chlorine level	< 3 mg / l
Turbidity	none
Technical freedom from sand	< 0,1 ml sand per 10 l pumped water

! IMPORTANT

If a value does not conform to the value listed in the table, a water/water heat pump may not be used. Direct operation of the unit in conjunction with surface water, wastewater, industrial wastewater or mixtures of water and alkali solutions, acids or chlorine is also not allowed.

Heat metering

In addition to proof of the system's efficiency, the EEWaermeG (German law on renewable energy heat) also requires heat metering (referred to in the following as WME). The WME is mandatory for air/water heat pumps. For brine/ water and water/water heat pumps, a WME must be installed for flow temperatures ≥ 35 °C. The WME must record the total thermal energy output (heating and domestic hot water) in the building. In the case of heat pumps with heat metering the analysis is carried out via the controller. This displays the thermal energy output into the heating system in kWh.

NOTE.
Unit variants with or without heat metering are available.

Operation

ENERGY SAVING USE OF THE HEAT PUMP HEATING

By deciding to purchase a heat pump or a heat pump system you are making 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 panel of the heating and heat pump controller.

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 in an environmentally friendly way in heating mode, please pay particular attention to the following:

ENERGY SAVING TIP
Avoid unnecessarily high flow temperatures.
The lower the flow temperature on the heating water side the more efficient the system.

ENERGY SAVING TIP
Preferably use purge ventilation. Compared to continuously open windows, this form of ventilation (fully opening windows for a short period, two to three times a day) reduces energy consumption and your heating bill.

Care of the unit

You can clean the outer surfaces of the unit with a damp cloth and proprietary household cleaning products.
Do not use cleaning or care products that contain abrasives, acids and/or chlorine. Such products would irreparably damage the surfaces and could also cause technical damage to the unit.

Maintenance of the unit

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

According to EU regulation (EC) 517/2014, leak inspections and maintenance of a log book are required by law for certain heat pumps!

Log book for heat pumps, Section “Information on use of the log book”.

The components of the heating circuit and the heat source (valves, expansion vessels, circulation pumps, filters, dirt traps) should be tested and cleaned as needed, however, at least annually, by qualified personnel (heating or refrigerating system fitters).
It is best to arrange a maintenance agreement with a heating installation company. The company will arrange the necessary regular maintenance work.

CLEANING AND FLUSHING UNIT COMPONENTS

CAUTION!
Unit components may be cleaned and flushed only by customer service personnel authorised by the manufacturer. Use only liquids recommended by the manufacturer.
After flushing the condenser with chemical cleaning agent, any residues must be neutralised and the system intensively flushed with water. Always note and follow the technical data of the respective heat exchanger manufacturer.

Malfunctions

In the event of a malfunction, you can detect the cause of the malfunction via the diagnostics program of the heating and heat pump controller.

Operating manual of the heating and heat pump controller.

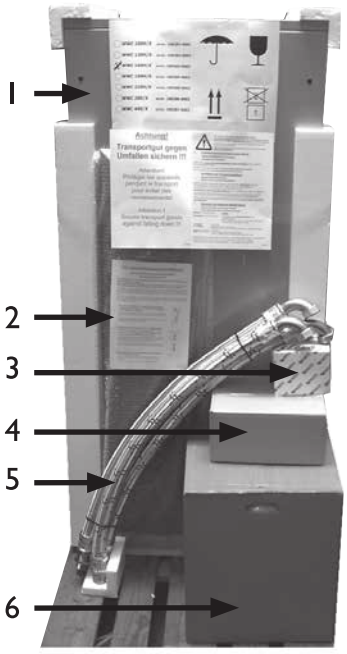
WARNING!
Only customer service personnel authorised by the manufacturer may carry out service and repair work on the components of the unit.

Note that no fault is displayed if the safety temperature limiter on the electric heating element has triggered (depending on model).

"Commissioning", "Safety temperature limiter" section.

Scope of delivery

Example layout of the scope of delivery:



1 Compact unit with hermetic compressor, all safety-relevant components for refrigeration circuit monitoring, installed sensors for recording the hot gas, heating water flow and return temperature, sensors for monitoring the heat source temperature, flow monitors for monitoring the water flow rate
2 Screen
3 Safety assembly for the heating circuit
4 Separate package (size 1: one box; size 2: two boxes) with control panel, external temperature sensor, dirt trap, Sylomer strips, seals
5 Vibration isolators for the heating circuit and for the heat source
6 Expansion vessel for the heating circuit with cap valve

Complete the following first:

① Check the delivery for outwardly visible signs of damage…

② Check to make sure that the delivery is complete… Any defects or incorrect deliveries must be reported immediately.

NOTE.
Note the unit model.

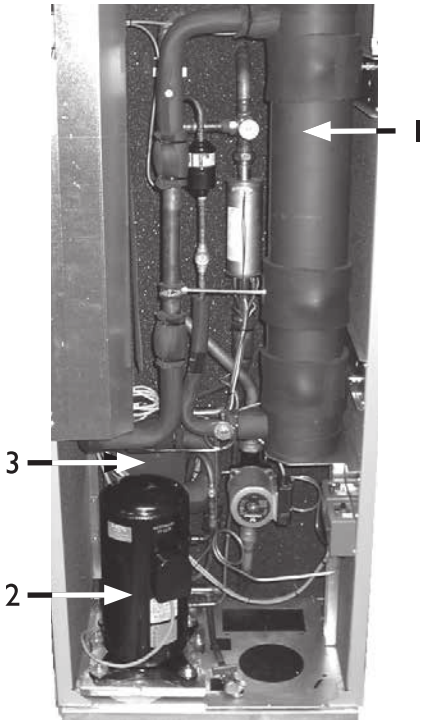
"Technical data / scope of delivery" overview.

FUNCTIONALLY NECESSARY ACCESSORIES

IMPORTANT
Only use the manufacturer's original accessories.

If the unit is to be used for heating water, a 3-way switching valve must be installed. This is not included with the unit and must be ordered separately.

MAIN COMPONENTS



1 evaporator
2 compressor
3 condenser

Installation

The following applies to all work to be done:

NOTE.
Always comply with the relevant local accident prevention regulations, statutory regulations, guidelines and directives.

NOTE.
Note the sound information for the respective model.

"Technical data / Scope of delivery" overview, "Sound" section.

INSTALLATION ROOM

ATTENTION
Install the heat pump only indoors.
The installation room must be frost-free and dry.

WARNING!
Please note and follow the respective relevant local standards, directives and regulations applicable, especially the minimum volume necessary depending on the refrigerant capacity of the relevant heat pump system (EN 378-1).

Refrigerant	Limit
R 134a	0.25 kg/m³
R 404A	0.48 kg/m³
R 407C	0.31 kg/m³
R 410A	0.44 kg/m³

Overview "Technical data / scope of delivery", "General unit data" section.

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

NOTE.
If several heat pumps of the same type are installed, only one heat pump must be considered.
If several heat pumps of different types are installed, the heat pump with the largest refrigerant capacity must be considered.

TRANSPORT TO INSTALLATION LOCATION

Always comply with the following safety information during transport:

WARNING!
Several people are required to transport the unit. Take into account the weight of the unit.

☞ "Technical data / Scope of delivery" overview, "General unit data" section,

CAUTION!
Wear safety gloves.

WARNING!
The unit can tilt and tip over when being removed from the wooden pallet and during transport. This can result in personal injury and damage to the unit.
- **Take suitable precautions to prevent the risk of tipping over.**

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

IMPORTANT
Do not tilt the unit more than a maximum of 45° (in any direction).

To prevent transport damage, you should transport the unit to its final place of installation in its packed condition (on the wooden pallet with packaging) using a pallet truck.
If it is not possible to transport the unit to the final installation location using a pallet truck, you can also transport the heat pump on a handcart.
Before transporting with a handcart, we recommend removing the front panel in order to reduce the weight of the unit.

① Remove packaging and set extra box aside (will be needed later on!)...

② Remove angle bracket, transport and packaging material from the unit…

Dispose of angle bracket, transport and packaging material properly and in an ecologically compatible way...

Lift unit from the pallet…

③ Remove front panel of unit...

③.①

To do so, loosen the quick-release screws. Turn through 90° to the left…

③.②

Lift front panel and set aside in a safe place.

④ Push handcart under the rear side of the unit.

IMPORTANT
If the handcart is pushed under the unit at the rear panel, ensure you do not damage any connections during transport.

IMPORTANT
Transport with a handcart on the front side of the unit is not permitted.

IMPORTANT
Do not tilt the unit more than a maximum of 45° (in any direction).

INSTALLATION

CAUTION!
Several people are required to install the unit.

NOTE.
Take into account the size of the unit.

☞ "Technical data / Scope of delivery" overview, "General unit data" section.

NOTE.
Always refer to and follow the installation plan for the respective model. Note the size and minimum clearances.

☞ Installation plan for the respective model.

Proceed as follows at the installation location:

① If you have no already done so, remove angle bracket, transport and packaging material from the unit. Set the extra box to the side and lift the unit from the wooden pallet...

☞ "Transport to installation location".

Dispose of angle bracket, transport and packaging material properly and in an ecologically compatible way...

② Set unit on a stable, solid and level, preferably sound-insulated surface. Ensure that the floor is designed for the weight of the heat pump...

Set up the unit so that the switchbox side (= operator side) is accessible at all times...

☞ "Technical data/Scope of delivery" overview, "General unit data" section.

③ Use the Sylomer strips supplied to level out any minor unevenness.

The Sylomer strips give the heat pump additional stability. They absorb sound and vibrations transfer to the floor.

Place the Sylomer strips under the heat pump as follows:

③•①

Tilt the unit to one side, slowly and carefully...

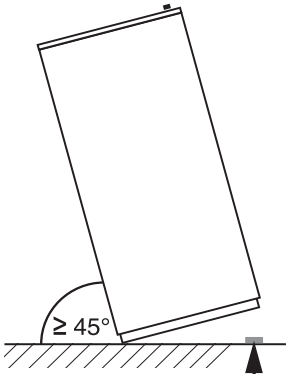
Secure unit in raised tilted position so that it cannot accidentally tip back into the original position.

! IMPORTANT
Do not tilt the unit more than a maximum of 45° (in any direction).

CAUTION!
Hands and fingers could be crushed during the following work!

③•②

Position a Sylomer strip under the unit, flush with the respective outer edge...



③•③

Slowly and carefully tilt the unit back into its initial position.

④ Repeat steps ③•① to ③•③ for the remaining sides of the unit.

Position Sylomer strips at right angles to each other, end-to-end:

Front side of unit (= operator side)

Installing the hydraulic connections

NOTE.
All materials used in the heat source circuit (pipes, connections, sealing material…) must be corrosion resistant and suitable for the ground-water quality. Use suitable plastics or stainless steel.

IMPORTANT
Connect the unit to the heating circuit according to the hydraulic diagram for the respective model.

"Hydraulic connection" instructions.

IMPORTANT
The heat source system must be designed according to the specifications of the planning manual.

Planning manual and "Hydraulic connection" documents.

NOTE.
Check to make sure that the cross-section and lengths of the pipes for the heating circuit are adequately dimensioned. The free compression of the circulation pumps must be able to deliver at least the minimum throughput required for your model.

"Technical data/Scope of delivery" overview, "Heat source" and "Heating circuit" sections.

NOTE:
Check whether the cross-sections and lengths of the heat source pipes are adequately dimensioned.

NOTE:
The heat source pump must be designed as a constant speed pump. It must at least produce the minimum throughput required for your unit model. The heat source pump must be designed by performing a pipe network calculation.

"Technical data/Scope of delivery" overview, "Heat source" sections..

IMPORTANT
Please note that the designed heat source pump may only be used within its pump characteristic curve!

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

NOTE:
Install the dirt trap included in the scope of delivery in the well shaft (heat source inlet)

The connections for the heating circuit or the heat source are located at the rear of the unit:

For position of the connections, please refer to the dimensioned drawing for the respective model.

① Install shut-off devices for the heating water outlet (flow) and heating water inlet (return) on the heat pump side…

Install shut-off devices for the heat source inlet and heat source outlet on the heat pump side…

NOTE.
By installing the shut-off devices, the evaporator and condenser of the heat pump can be flushed, if necessary.

② Thoroughly flush the heating circuit and heat source circuit before connecting to the unit…

NOTE.
Dirt and deposits in the heating circuit and heat source can cause malfunctions.

③ Connect the fixed pipes of the heating circuit with the corresponding connections at the rear of the unit. Use vibration isolators and elbow unions (size 2 only)…

Vibration isolators must be installed to prevent structurally borne sound transfer to the fixed piping.

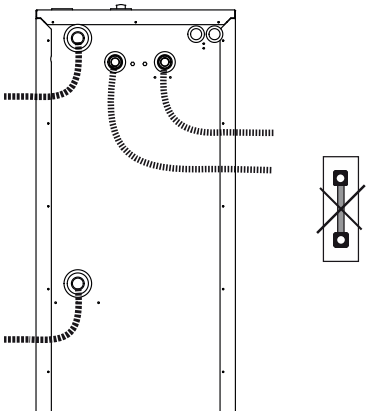
Vibration isolators for the heating circuit are included with the unit; they have a zinced mesh and are marked in colour.

④ Connect the fixed piping of the heat source with the relevant connections at the rear of the unit. Use vibration isolators and elbow unions (size 2 only)…

Vibration isolators must be installed to prevent structurally borne sound transfer to the fixed piping.

Vibration isolators for the heat source are included with the unit and have a stainless steel mesh.

Lay vibration isolators in the quadrant, as shown by way of example in the following sketch:



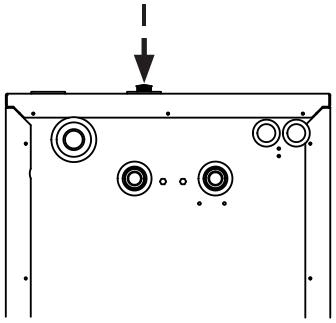
Straight or extended hose laying of the vibration isolators is not permitted.

SAFETY ASSEMBLY

You must install the safety assembly for the heating circuit. The safety assembly for the heating circuit is included in the extra box.

The discharge from the heating water safety valve must be drained according to the relevant standards and regulations. Discharging the safety valve discharge into the sewers is allowed only if fed via a a funnel siphon, which must be accessible at all times.

The connection for the safety assembly is located on the outside at the top rear of the unit.



I Heating circuit safety assembly connection

EXPANSION VESSEL

The expansion vessel for the heating circuit and the corresponding cap valve are included in the scope of delivery. They must both be integrated in the heating circuit on site in compliance with the relevant standards, guidelines and directives.

! IMPORTANT

In conjunction with a multi-functional and/or buffer tank with volume >200 l, always install an additional, adequately-dimensioned expansion vessel.

Domestic water heating

If the unit is to be used for domestic water heating, a 3-way changeover valve must be installed. This is not included with the unit and must be ordered separately.

! IMPORTANT
Only use the manufacturer's original accessories.

Domestic water heating with the heat pump requires an additional heating water circuit (parallel) to the heating circuit. When connecting, make sure that the domestic hot water charge is not fed through a buffer tank in the heating circuit.

"Hydraulic connection" documents.

Domestic hot water tank

If the heat pump is to be used for domestic water heating, you must integrate special domestic hot water tanks in the heat pump system. Choose a storage volume so that the required quantity of domestic hot water is available even during a power failure.

NOTE:
The heat exchanger surface of the domestic hot water tank must be dimensioned so that the heating output of the heat pump is transferred with minimum spread.

You can choose a domestic hot water tank from our product range. They are optimally matched to your heat pump.

NOTE:
Integrate the domestic hot water tank in the heat pump system as shown in the hydraulic diagram for your system.

"Hydraulic connection" documents.

Electrical connection work

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, safely disconnect the system from the power supply and prevent it from being switched back on!

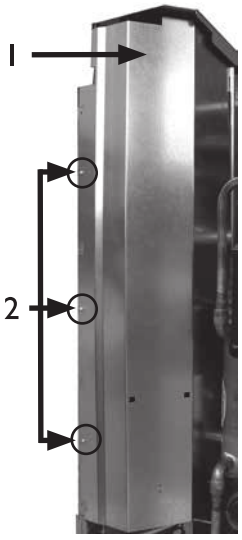
WARNING!
During installation and when carrying out electrical work, comply with the relevant EN-, VDE and/or local safety regulations.
Comply with technical connection requirements of the responsible power supply company (if required by the latter)!

NOTE.
All live cables must be stripped before they are laid in the cable duct of the switchbox!

① Open unit, if closed…

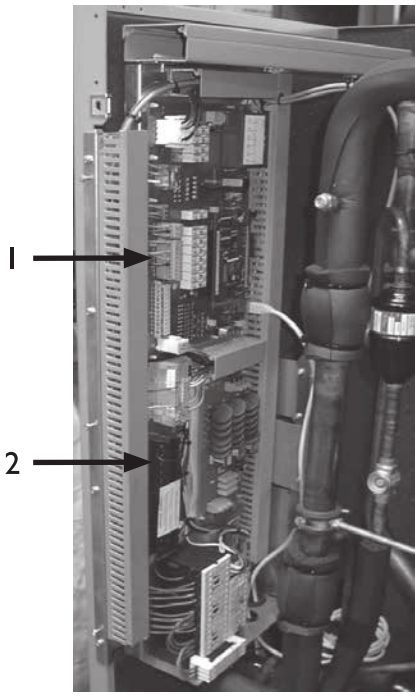
"Transport to the installation location", ② and ③.

② Open electrical switchbox inside the unit…



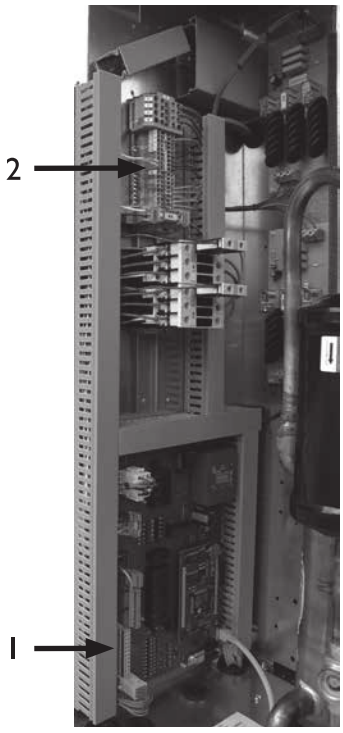
1 Cover plate of the switchbox
2 Screw plugs

Opened switch box size 1:



1 Controller board connections
2 Power and control cable connections

Opened switch box size 2:



1 Controller board connections
2 Power and control cable connections

③ Feed the load and control cables as well as the cables for sensors into the inside of the unit through the openings provided at the rear of the unit…

☞ For positioning of the rubber grommets for feeding through the cables, see "dimensioned drawing" for the respective model.

④ Lay load and control leads in the cable duct inside the unit all the way to the switchbox.

⑤ Install electrical connections according to the terminal diagram and the circuit diagrams.

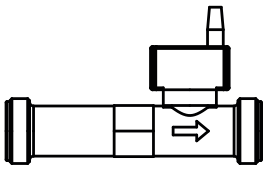
☞ "Terminal diagrams" and "Circuit diagrams" for the respective model.

! IMPORTANT
Install electric connections only according to the terminal diagram and the circuit diagrams that apply to your model.

! IMPORTANT
Ensure clockwise rotary field of the load power supply (compressor).
Operation with the incorrect rotary direction of the compressor can cause serious, irreparable damage to the compressor.

! IMPORTANT
The power supply for the heat pump must be equipped with a three-phase automatic circuit-breaker with at least 3mm contact spacing to IEC 60947-2.
Note the level of the tripping current.

☞ "Technical data / Scope of delivery" overview, "Electrics" section.



! IMPORTANT
The sensor cable for heat quantity recording may not be shortened!

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

If this is required, install a shielded network cable (category 6, with RJ-45 connector) through the unit when installing the connections and run it through the front panel of the unit, parallel to the existing control cable of the heating and heat pump controller.

⑥ After completing all electrical installation work, close the switchbox inside the unit…

⑦ Screw on the front panel of the unit, if no further installation work inside the unit is to be carried out immediately.

Flushing and filling the system

! IMPORTANT
The system must be absolutely free from air before commissioning.

WATER QUALITY OF THE FILL AND MAKE-UP WATER IN WATER HEATING SYSTEMS ACCORDING TO VDI 2035

PART I AND II

Use of modern, energy-efficient heat pump systems is becoming increasingly widespread. Their ingenious technology enables these systems to achieve very good efficiencies. The decreasing space available for heat generators has led to the development of compact units with increasingly smaller cross-sections and high capacities. This means the complexity of the systems and the material diversity are also increasing, which plays an important role especially in their corrosion behaviour. The heating water not only affects the efficiency of the system, but also the life of the heat generator and the heating components of a system.

The guide values of VDI 2035 Part I and Part II must therefore be complied with as minimum requirements for proper operation of the systems. Our practical experience has shown that the safest, most reliable and fault-free running is achieved with so-called low-salt operation.

VDI 2035 Part I provides important information and recommendations regarding scaling and its prevention in heating and domestic hot water heating systems.

VDI 2035 Part II primarily deals with the requirements for reducing heating water corrosion in hot water heating systems.

PRINCIPLES OF PART I AND PART II

The occurrence of scaling and corrosion damage in hot water heating systems is low, if

- proper planning, design and commissioning is carried out
- the system is closed in corrosion terms
- adequately dimensioned pressurising is integrated
- the guide values for the heating water are complied with
- and regular servicing and maintenance are carried out.

A system log should be kept, in which the relevant planning & design data is entered (VDI 2035).

DAMAGE THAT CAN OCCUR IN CASE OF FAILURE TO COMPLY WITH THE ABOVE

- Malfunctions and the failure of components (e.g. pumps, valves)
- Internal and external leaks (e.g. from heat exchangers)
- Cross-section reduction and blockaging of components (e.g. heat exchanger, pipes, pumps)
- Material fatigue
- Gas bubbles and gas cushion formation (cavitation)
- Negative effect on heat transfer (formation of coatings, deposits) and associated noises (e.g. boiling noises, flow noises)

LIMESCALE – THE ENERGY KILLER

Filling with untreated drinking water inevitably leads to the precipitation of all calcium as scale. The consequence: limescale deposits form on the heat transfer surfaces of the heating. The efficiency falls and the energy costs rise. A rule of thumb is that 1 millimetre of limescale deposit causes an efficiency loss of 10%. In extreme cases it can even cause damage to the heat exchangers.

WATER SOFTENING TO VDI 2035 – PART I

If the water is softened in accordance with the VDI 2035 guidelines before it is used to fill the heating system, no scale can form. This effectively and permanently prevents limescale deposits and the resulting negative effects on the entire heating system.

CORROSION – AN UNDERESTIMATED PROBLEM

VDI 2035, Part II, deals with the problem of corrosion. Softening the heating water can prove to be insufficient. The pH value can significantly exceed the limit of 10. pH values higher than 11 can set in, which even damage rubber seals. The VDI 2035, Part I guidelines are fulfilled; however, VDI 2035, Part 2 suggests a pH value between 8.2 and maximum 10.

If aluminium materials are used, which is the case in many modern heating systems, a pH value of 8.5 must not be exceeded! Because otherwise there is a threat of corrosion – aluminium is attacked without the presence of oxygen. Therefore, apart from softening the heating fill and make-up water, the heating water should also be appropriately conditioned. This is the only way to comply with the VDI 2035 requirements and the recommendations and installation instructions of the heat pump manufacturer.

Part 2 of VDI 2035 also refers to the reduction in total salt content (conductivity). The risk of corrosion is far lower if deionised water is used than is the case if the system is operated with salty, i.e. softened water.

Even if the water has been softened beforehand, it contains dissolved, corrosive salts, which act as electrolytes due to the use of different materials in the heating system and therefore accelerate corrosion processes. This can ultimately result in pitting.

ON THE SAFE SIDE WITH LOW-SALT OPERATION

The problems listed above do not occur at all with low-salt operation, as the heating water contains neither corrosive

salts such as sulphates, chlorides and nitrates nor alkalising sodium hydrogen carbonate. The corrosive properties of deionised water are very low and in addition, scale cannot form in the boiler. This is the ideal approach for closed heating circuits, in particular, because low oxygen input into the heating circuit can also be tolerated.

In general, when the system is filled with deionised water, the pH value sets itself within the ideal range due to “self-alkalinisation”. If necessary, a pH value of 8.2 can be very easily alkalised by adding chemicals. In this way, optimum protection of the entire heating system is achieved.

MONITORING

Analytical recording and monitoring of the relevant water values and the added active conditioning substances is of decisive importance. Therefore, they should be monitored regularly using appropriate water test equipment.

FLUSH AND FILL THE HEATING CIRCUIT AND THE DOMESTIC HOT WATER TANK

① Place a bleeder (vent) at the highest point of the heating circuit in the heating water outlet (flow)…

② If necessary, place a bleeder at the highest point of the heating circuit in the heating water inlet (return)…

③ Open unit, if closed…

☞ “Transport to the installation location”, ② and ③.

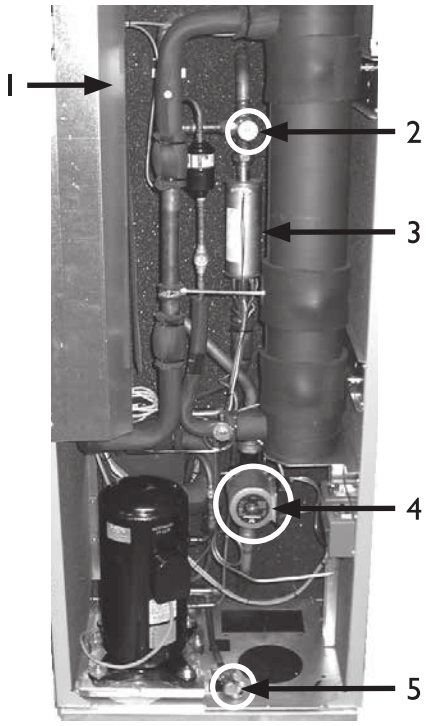
④ Flush and fill the unit via the filling and draining tap...

! IMPORTANT

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.

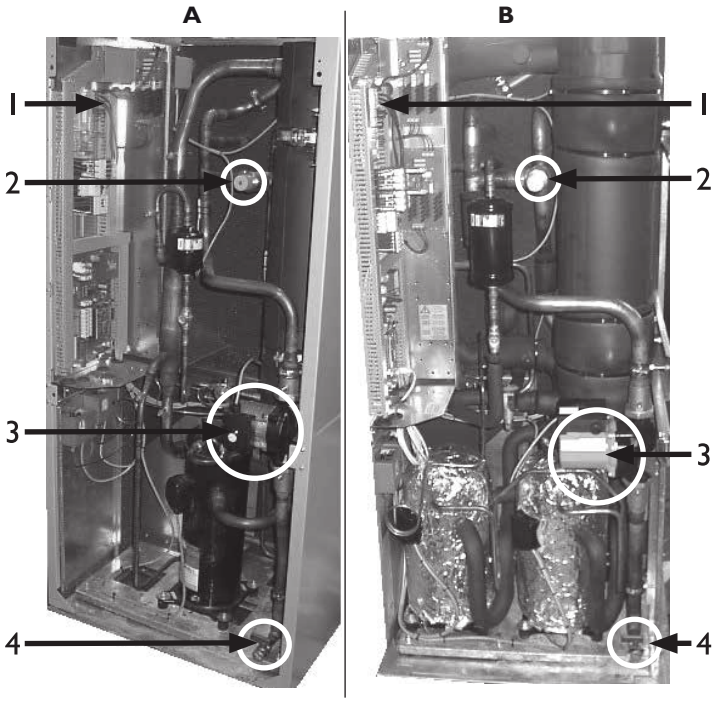
Bleeding

VIEW OF INSIDE OF UNIT, SIZE 1



1 Electrical switchbox
2 Overflow valve
3 Electric heating element
4 Circulation pump, heating circuit
5 Fill and drain tap, heating circuit

VIEW OF INSIDE OF UNIT, SIZE 2



A 28kW unit
B 44kW unit

1 Electrical switchbox
2 Overflow valve
3 Circulation pump, heating circuit
4 Fill and drain tap, heating circuit

BLEEDING THE UNIT

The unit is bled automatically if the bleeder (vent valve) of the safety assembly is open. If the heating circuit is filled or drained, the venting valve of the safety assembly opens.

BLEEDING THE CIRCULATION PUMP OF THE HEATING CIRCUIT

Unscrew the screw cover in the middle of the circulation pump until loose and close again after venting.

BLEEDING THE DOMESTIC HOT WATER TANK

To bleed the domestic hot water tank, the domestic hot water charge circuit must be flushed separately.

To do this, manually switch the domestic hot water changeover valve to domestic hot water charging. After bleeding, return it to the initial position.

NOTE:
Once the heat pump, heating circuit and domestic hot water charging circuit have been flushed, the bleeding program of the heating and heat pump controller must be started, after the control panel has been installed.

⑤ If no further steps follow, install the front panel.

Insulating the hydraulic connections

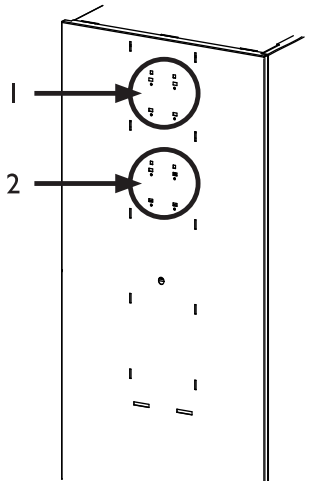
NOTE.
Insulate the heating circuit and the heat source according to relevant local standards and guidelines.

① Check all hydraulic connections for leaks. Perform leak test…

② Insulate all connections, vibration isolators, connections and pipes of the heating circuit and the heat source. Insulate the heat source so that it is **vapour-diffusion tight**.

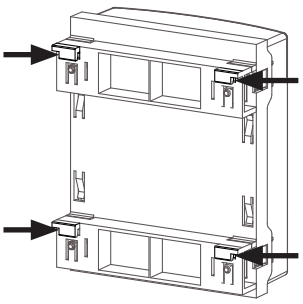
Installing the control panel

There are 4 each recesses at different heights in the front panel of the unit for fastening the control panel:

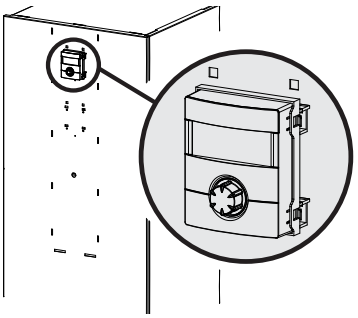


1 four upper recesses
2 four lower recesses

There are 4 hooks at the rear of the control panel, which are used to hook the control panel on the front panel of the unit:

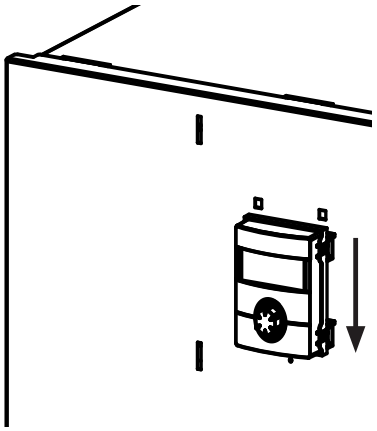


① Hook the control panel's hooks into the recesses of the front panel (either in the upper or lower recesses)...

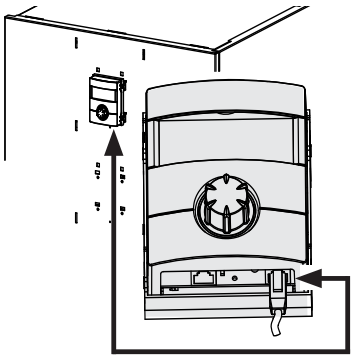


Example:
Control panel in upper recesses

② Push down the hooked in control panel, until it latches into place…



③ Push the control cable of the heating and heat pump controller into the **right-hand** socket on the underside of the control panel…



NOTE.
A connection to a computer or a network can be made via the left socket at the bottom of the control panel, thereby allowing the heating and heat pump controller to be controlled remotely from there. This requires a shielded network cable (category 6) to be laid through the unit during the electrical connection work.

Operating manual for the heating and heat pump controller, "Qualified technician" version, "Web server" section.

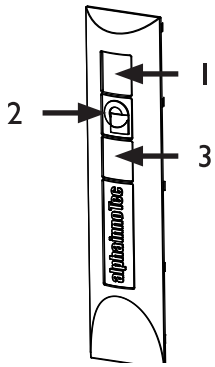
If this network cable is available, insert the network cable's RJ-45 connector into the left socket of the control panel.

NOTE.
The network cable can be exchanged at any time. In order to be able to connect it, the screen must first be removed.

Installation and removal of the screen

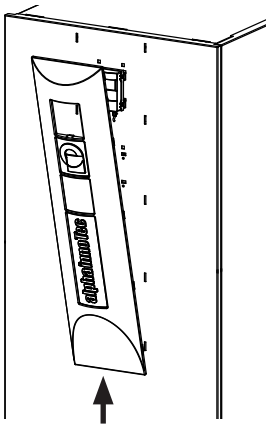
INSTALLING THE SCREEN

NOTE.
The masking plate is provided in the as delivered unit so that the control panel is inserted in the upper recesses of the front panel.
If the control panel has been inserted in the lower recesses of the front panel, you must first remove the masking plate's dummy cover and then reinsert it above the logo.

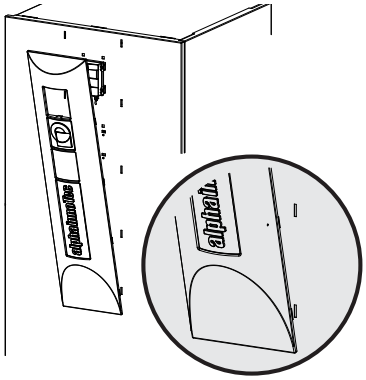


Screen at time of delivery:
1 Recess for control panel
2 Logo
3 Dummy cover

① First, insert the masking plate **below** in the slots provided in the front panel…

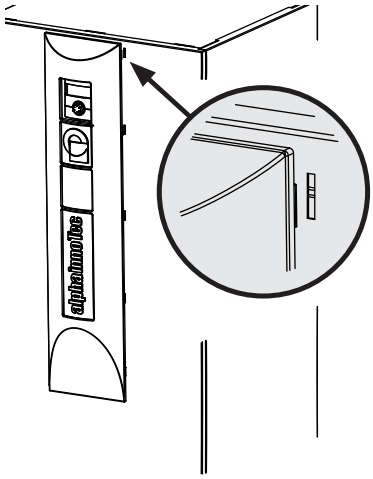


② Then, beginning on one side, latch the lugs on the masking plate **from the bottom up** into the slots provided in the front panel…



③ **Then, on the opposite side, latch the** lugs on the masking plate **from the bottom up** into the slots provided in the front panel…

④ Finally, press the upper latching lugs of the masking plate into the slots provided in the front panel.



DISMANTLING THE MASKING PLATE

In order to dismantle the masking plate, the latching lugs must be completely released **on one side first** by pushing **towards the middle of the masking plate**. Then release the lugs on the opposite side.

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…

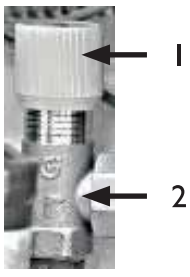
③ Ensure that the total flow is routed via the overflow valve…

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

Heat source temperature	Recommended settings
10 °C	9 K



⑥ Open valves to heating circuit…

⑦ Reset the heating and heat pump controller.

Commissioning

NOTE.
The commissioning has to be in the heating mode.

① Carry out a thorough installation check and work through the general checklist…

Manufacturer's homepage.

By checking the installation you prevent damage to the heat pump system, which could be caused by work carried out improperly.

Check that…

- **clockwise rotary field** of the load power supply (compressor) is ensured.
- The heat pump **installation and assembly** have been carried out according to the requirements of this operating manual.
- the electrical installation work has been completed properly.
- The power supply for the heat pump must be equipped with an all-pole automatic circuit-breaker with at least 3 mm contact spacing to IEC 60947-2.
- The heating circuit is flushed, filled and thoroughly vented.
- All valves and shut-off devices of the heating circuit are open.
- All pipe systems and components of the system are leaktight.

② Carefully fill out and sign the completion report for heat pump systems...

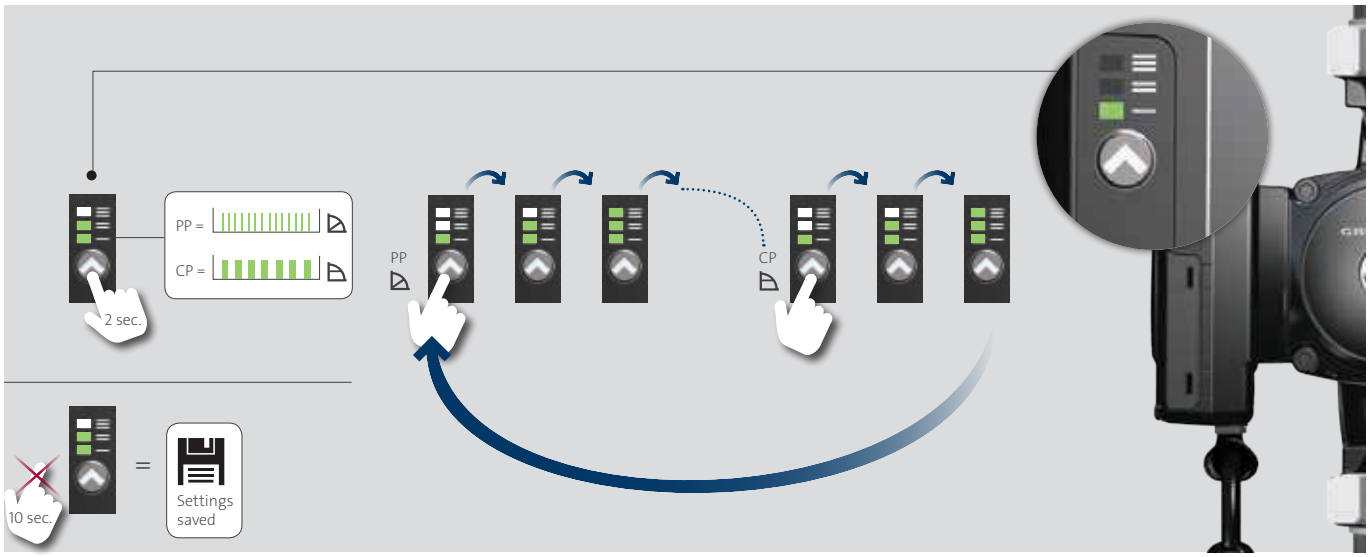
Manufacturer's homepage.

③ Within Germany and Austria:
Send completion report for heat pump systems and general checklist to the manufacturer's factory customer service department…

In other countries:
Send completion report for heat pump systems and general checklist to the manufacturer's local partner…

④ The heat pump system is commissioned by customer service personnel authorised by the manufacturer. There is a fee for starting up!

PUMP SETTINGS FOR WWC 220HX AND WWC 280X



PP	=	Proportional Pressure	short flashing
CP	=	Constant Pressure	long flashing

Factory setting is Constant Pressure at Level 3.

For operation, the recirculation pump always has to be in the range „Constant Pressure"

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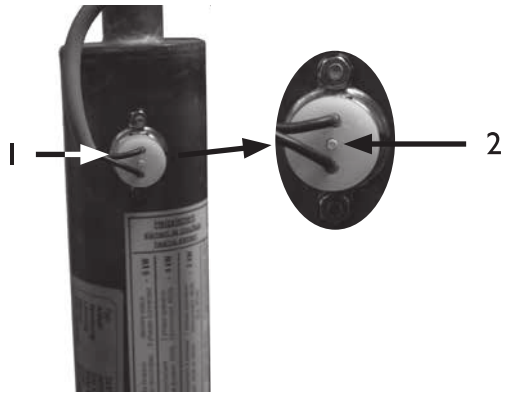
INFORMATION FOR UNITS WITH INTEGRATED ELECTRIC HEATING ELEMENT

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 of this safety temperature limiter has sprung out. If necessary, push it back in again.



1 Safety temperature button on electric heating element
2 Reset button

Dismantling

DANGER!
Risk of fatal electric shock!
Electrical work may only be carried out by qualified electricians.

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

WARNING!
Only qualified heating or refrigerating system personnel may dismantle the unit from the system.

IMPORTANT
Recycle or ensure proper disposal of unit components, refrigerants and oil according to the relevant regulations, standards and guidelines.

REMOVAL OF THE BUFFER BATTERY

IMPORTANT
Before scrapping the heating and heat pump controller, remove the buffer battery on the processor board. The battery can be pushed out using a screwdriver. Dispose of battery and electronic components in an environmentally friendly way.

Technical data / Scope of delivery

Heat pump type	Brine/water ı Air/water ı Water/water			• applicable ı — not applicable
Installation location	Indoors ı Outdoors			• applicable ı — not applicable
Conformity				CE
Performance data	Heating capacity/COP at			
	W10/W35	Standard point to EN14511	2 compressors 1 compressor	kW ı ... kW ı ...
	W10/W45	Standard point to EN14511		kW ı ...
	W10/W35	Standard point acc. to EN255	2 compressors 1 compressor	kW ı ... kW ı ...
Limits of use	Heating circuit			°C
	Heat source			°C
	additional operating points			...
Sound	Sound pressure level averaged at distance of 1m around the machine (in free field)			dB(A)
	Sound power level to EN12102			dB
Heat source	Flow rate: minimum flow ı nominal flow ı maximum flow			l/h
	Pressure loss heat pump Δp (with cooling ΔpK) ı Flow rate			bar (bar) ı l/h
	Free compression heat pump Δp (with cooling ΔpK) ı Flow rate			bar (bar) ı l/h
	Recommended heat source pump			
	Power consumption of the heat source pump at nominal throughput			kW
	Nominal power / electricity consumption of heat source pump			kW ı A
	Total compression of the recommended heat source pump at nominal throughput			bar
	Dirt trap, to be installed upstream of the heat pump (included in additional box)			
Heating circuit	Flow rate: minimum flow ı nominal flow ı maximum flow			l/h
	Pressure loss heat pump Δp (with cooling ΔpK) ı Flow rate			bar (bar) ı l/h
	Free compression heat pump Δp (with cooling ΔpK) ı Flow rate			bar (bar) ı l/h
General unit data	Dimensions (see dimensioned drawing for the specified unit size)			unit size
	Total weight (including cooling)			kg (kg)
	Additional weight module 1			kg
	Additional weight module 2			kg
	Connections	Heating circuit		...
		Heat source		...
	Refrigerant	Refrigerant type ı Quantity		... ı kg
Electrics	Voltage code ı all-pole circuit breaker heat pump *)			... ı A
	Voltage code ı circuit breaker control voltage *)			... ı A
	Voltage code ı circuit breaker electric heating element *)			ı A
Heat pump	Effective power consumption in the standard point W10/W35 to EN14511: Power consumption ı current consumption ı cosφ			kW ı A ı ...
	Maximum machine current within the use limits			A
	Starting current: direct ı with soft starter			A ı A
	Degree of protection			IP
	Output, electric heating element 3 ı 2 ı 1 phase			kW ı kW ı kW
Components	Circulation pump, heating circuit at nominal flow rate: Power consumption ı current consumption			kW ı A
	Circulation pump, heat source at nominal flow rate: Power consumption ı current consumption			kW ı A
Passive cooling function	Specification only for units with designator K: Cooling output at nominal flow rate (15°C heat source, 25°C heating water)			kW
Safety equipment	Safety component heating circuit ı Safety component heat source			Incl. in scope of delivery: • yes — no
Heating and heat pump controller				Incl. in scope of delivery: • yes — no
Electronic soft starter				integrated: • yes — no
Expansion vessels	Heat source: Scope of delivery ı Volume ı Initial pressure			• yes — no ı l ı bar
	Heating circuit: Scope of delivery ı Volume ı Initial pressure			• yes — no ı l ı bar
Overflow valve				integrated: • yes — no
Vibration decouplers	Heating circuit ı heat source			Incl. in scope of delivery: • yes — no

UK813241-a

*) comply with local regulations n.d. = not detectable

WWC100HX	WWC130HX	WWC160HX	WWC190HX	WWC220HX
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• ı —	• ı —	• ı —	• ı —	• ı —
•	•	•	•	•
—	—	—	—	—
11,0 ı 5,6	12,9 ı 5,5	14,7 ı 5,6	18,6 ı 5,6	21,8 ı 5,7
—	—	—	—	—
—	—	—	—	—
11,2 ı 5,7	12,7 ı 5,7	14,8 ı 5,7	18,6 ı 5,7	21,8 ı 6,1
20 - 65	20 - 65	20 - 65	20 - 65	20 - 65
7 - 25	7 - 25	7 - 25	7 - 25	7 - 25
—	—	—	—	—
40	40	40	40	43
53	53	53	53	56
2200 ı 2200 ı 4100	2600 ı 2600 ı 4500	3000 ı 3000 ı 5200	3800 ı 3800 ı 6500	4400 ı 4400 ı 7700
0,06 (—) ı 2200	0,1 (—) ı 2600	0,11 (—) ı 3000	0,16 (—) ı 3800	0,23 (—) ı 4400
—	—	—	—	—
Grundfos SP 3A-6	Grundfos SP 3A-6	Grundfos SP 3A-6	Grundfos SP 3A-6	Grundfos SP 5A-6
0,33	0,38	0,38	0,38	0,54
0,38 ı 1,4	0,38 ı 1,4	0,38 ı 1,4	0,38 ı 1,4	0,55 ı 2,2
3,00	2,85	2,57	1,76	2,67
5/4“	5/4“	5/4“	5/4“	6/4“
950 ı 1900 ı 2400	1100 ı 2200 ı 2800	1300 ı 2500 ı 3100	160 ı 3100 ı 3900	1900 ı 3700 ı 4700
—	—	—	—	—
0,34 (—) ı 1350	0,46 (—) ı 1600	0,40 (—) ı 1800	0,52 (—) ı 2200	0,61 (—) ı 3700
1	1	1	1	1
213 (—)	216 (—)	219 (—)	227 (—)	235 (—)
—	—	—	—	—
—	—	—	—	—
R 5/4“ AG	R 5/4“ AG	R 5/4“ AG	R 5/4“ AG	R 5/4“ AG
R 5/4“ AG	R 5/4“ AG	R 5/4“ AG	R 5/4“ AG	R 5/4“ AG
R407c ı 2,95	R407c ı 3,5	R407c ı 3,95	R407c ı 4,3	R407c ı 4,5
3~/PE/400V/50Hz ı C10	3~/PE/400V/50Hz ı C10	3~/PE/400V/50Hz ı C10	3~/PE/400V/50Hz ı C13	3~/PE/400V/50Hz ı C13
1~/N/PE/230V/50Hz ı B10	1~/N/PE/230V/50Hz ı B10	1~/N/PE/230V/50Hz ı B10	1~/N/PE/230V/50Hz ı B10	1~/N/PE/230V/50Hz ı B10
3~/N/PE/400V/50Hz ı C10	3~/N/PE/400V/50Hz ı C10	3~/N/PE/400V/50Hz ı C16	3~/N/PE/400V/50Hz ı C16	3~/N/PE/400V/50Hz ı C16
1,96 ı 3,8 ı 0,74	2,35 ı 4,4 ı 0,77	2,6 ı 4,6 ı 0,81	3,27 ı 6,0 ı 0,79	3,82 ı 7,0 ı 0,79
5,9	6,9	7,5	9,4	11,0
30 ı —	— ı 20	— ı 25	— ı 28	— ı 30
20	20	20	20	20
6 ı 4 ı 2	6 ı 4 ı 2	9 ı 6 ı 3	9 ı 6 ı 3	9 ı 6 ı 3
0,07 ı n.n.	0,16 ı n.n.	0,16 ı n.n.	0,17 ı n.n.	0,18 ı n.n.
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• ı 25l ı 1,5	• ı 25l ı 1,5	• ı 35l ı 1,5	• ı 35l ı 1,5	• ı 50l ı 1,5
•	•	•	•	•
• ı •	• ı •	• ı •	• ı •	• ı •
813233-e	813234-f	813235-e	813236-d	813237-g

Technical data / Scope of delivery

Heat pump type	Brine/water ı Air/water ı Water/water			• applicable ı — not applicable
Installation location	Indoors ı Outdoors			• applicable ı — not applicable
Conformity				CE
Performance data	Heating capacity/COP at			
	W10/W35	Standard point to EN14511	2 compressors 1 compressor	kW ı ... kW ı ...
	W10/W45	Standard point to EN14511		kW ı ...
	W10/W35	Standard point acc. to EN255	2 compressors 1 compressor	kW ı ... kW ı ...
Limits of use	Heating circuit			°C
	Heat source			°C
	additional operating points			...
Sound	Sound pressure level averaged at distance of 1m around the machine (in free field)			dB(A)
	Sound power level to EN12102			dB
Heat source	Flow rate: minimum flow ı nominal flow ı maximum flow			l/h
	Pressure loss heat pump Δp (with cooling ΔpK) ı Flow rate			bar (bar) ı l/h
	Free compression heat pump Δp (with cooling ΔpK) ı Flow rate			bar (bar) ı l/h
	Recommended heat source pump			
	Power consumption of the heat source pump at nominal throughput			kW
	Nominal power / electricity consumption of heat source pump			kW ı A
	Total compression of the recommended heat source pump at nominal throughput			bar
	Dirt trap, to be installed upstream of the heat pump (included in additional box)			
Heating circuit	Flow rate: minimum flow ı nominal flow ı maximum flow			l/h
	Pressure loss heat pump Δp (with cooling ΔpK) ı Flow rate			bar (bar) ı l/h
	Free compression heat pump Δp (with cooling ΔpK) ı Flow rate			bar (bar) ı l/h
General unit data	Dimensions (see dimensioned drawing for the specified unit size)			unit size
	Total weight (including cooling)			kg (kg)
	Additional weight module 1			kg
	Additional weight module 2			kg
	Connections	Heating circuit		...
		Heat source		...
	Refrigerant	Refrigerant type ı Quantity		... ı kg
Electrics	Voltage code ı all-pole circuit breaker heat pump *)			... ı A
	Voltage code ı circuit breaker control voltage *)			... ı A
	Voltage code ı circuit breaker electric heating element *)			ı A
Heat pump	Effective power consumption in the standard point W10/W35 to EN14511: Power consumption ı current consumption ı cosφ			kW ı A ı ...
	Maximum machine current within the use limits			A
	Starting current: direct ı with soft starter			A ı A
	Degree of protection			IP
	Output, electric heating element 3 ı 2 ı 1 phase			kW ı kW ı kW
Components	Circulation pump, heating circuit at nominal flow rate: Power consumption ı current consumption			kW ı A
	Circulation pump, heat source at nominal flow rate: Power consumption ı current consumption			kW ı A
Passive cooling function	Specification only for units with designator K: Cooling output at nominal flow rate (15°C heat source, 25°C heating water)			kW
Safety equipment	Safety component heating circuit ı Safety component heat source			Incl. in scope of delivery: • yes — no
Heating and heat pump controller				Incl. in scope of delivery: • yes — no
Electronic soft starter				integrated: • yes — no
Expansion vessels	Heat source: Scope of delivery ı Volume ı Initial pressure			• yes — no ı l ı bar
	Heating circuit: Scope of delivery ı Volume ı Initial pressure			• yes — no ı l ı bar
Overflow valve				integrated: • yes — no
Vibration decouplers	Heating circuit ı heat source			Incl. in scope of delivery: • yes — no

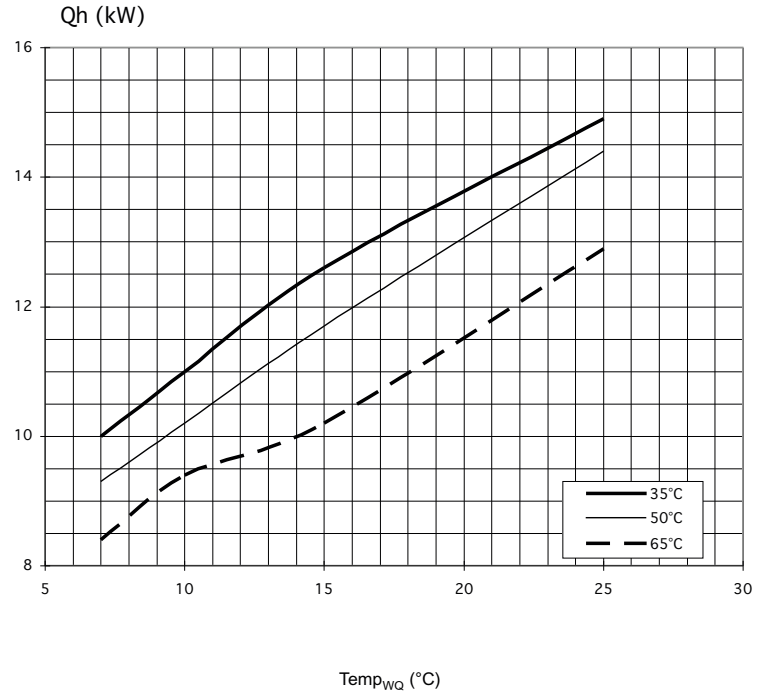
UK813241-a

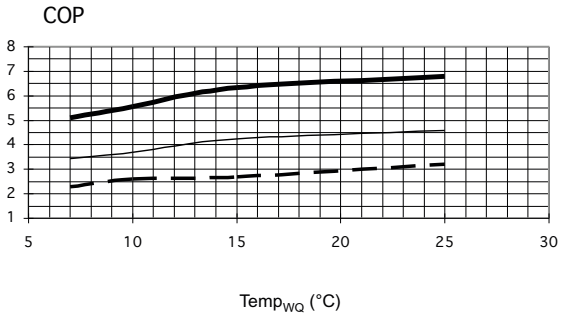
*) comply with local regulations n.d. = not detectable

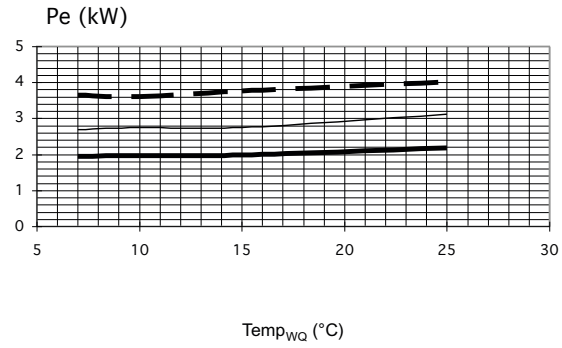
	WWC280X	WWC440X
	— ı — ı •	— ı — ı •
	• ı —	• ı —
	•	•
	—	42,2 ı 5,3
	27,0 ı 5,1	21,3 ı 5,4
	—	—
	—	42,2 ı 5,4
	27,0 ı 5,2	21,3 ı 5,5
	20 - 60	20 - 60
	7 - 25	7 - 25
	—	—
	47	47
	60	60
	5300 ı 5300 ı 9300	8500 ı 8500 ı 14700
	0,18 (—) ı 5300	0,35 (—) ı 8500
	—	—
	Grundfos SP 8A-5	Grundfos SP 8A-5
	0,63	0,73
	0,75 ı 2,3	0,75 ı 2,3
	2,40	2,0
	6/4“	6/4“
	2300 ı 4600 ı 5800	3600 ı 7200 ı 9000
	—	—
	0,4 (—) ı 4600	0,44 (—) ı 5200
	2	2
	365 (—)	402 (—)
	—	—
	—	—
	R 6/4“ AG	R 6/4“ AG
	R 6/4“ AG	R 6/4“ AG
	R407c ı 4,4	R407c ı 8,4
	3~/PE/400V/50Hz ı C20	3~/PE/400V/50Hz ı C32
	1~/N/PE/230V/50Hz ı B10	1~/N/PE/230V/50Hz ı B10
	— ı — ı —	— ı — ı —
	5,29 ı 8,8 ı 0,86	2x 3,9 ı 2x 6,8 ı 0,83
	14,8	2x 11,8
	— ı 29,5	— ı 22
	20	20
	— ı — ı —	— ı — ı —
	0,22 ı n.n.	0,39 ı n.n.
	— ı —	— ı —
	—	—
	• ı —	• ı —
	•	•
	•	•
	— ı — ı —	— ı — ı —
	• ı 50l ı 1,5	• ı 80l ı 1,5
	•	•
	• ı •	• ı •
	813238-e	813239-d

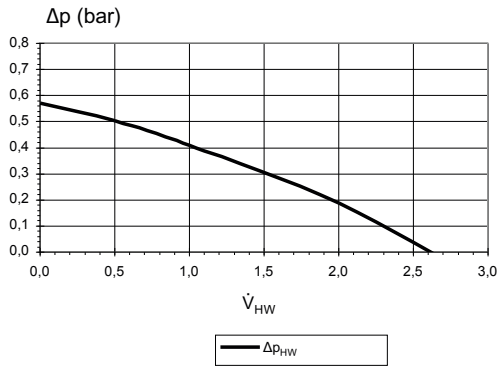
WWC 100H/X

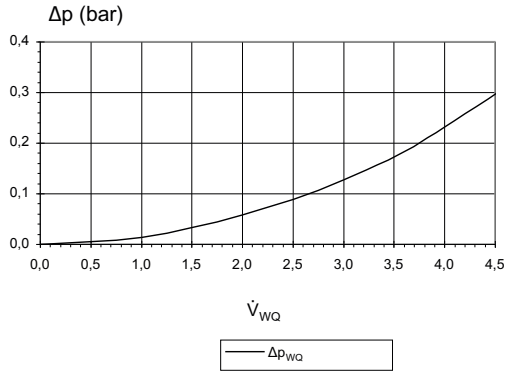
Performance curves









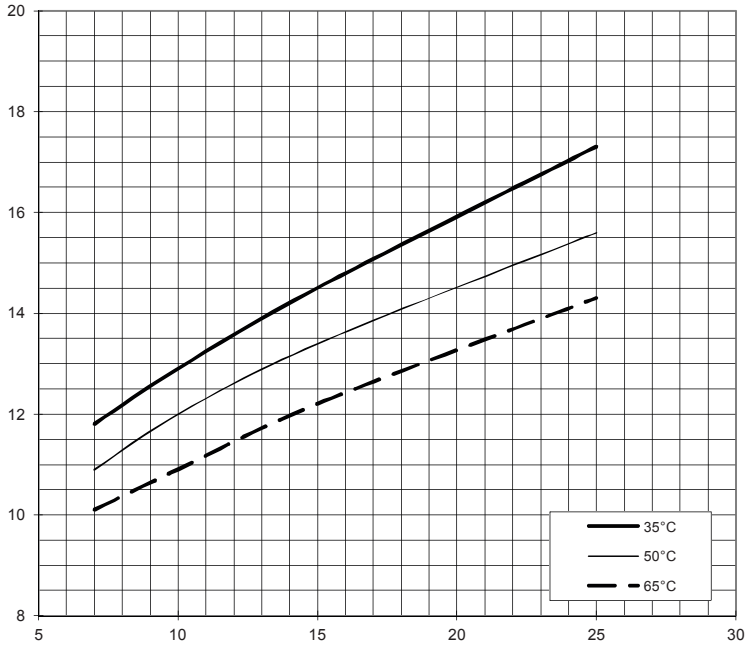


823201

Legend:	UK823200
$\dot{V}_{HW}$	Heating water flow rate
$\dot{V}_{WQ}$	Heat source flow rate
$Temp_{WQ}$	Heat source temperature
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance / efficiency rating
Δp_{HW}	Free compression, heating circuit
Δp_{WQ}	Heat source pressure loss
CP	Compressor

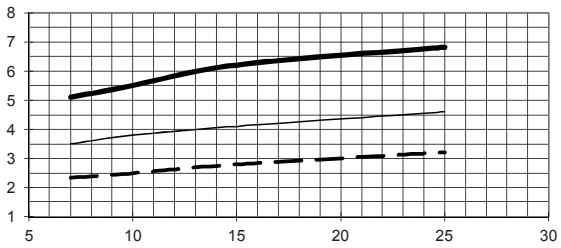
Performance curves

Qh (kW)



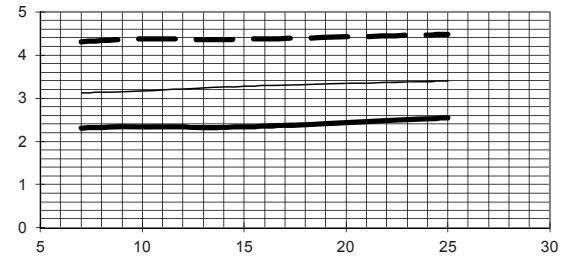
$Temp_{WQ}$ (°C)

COP



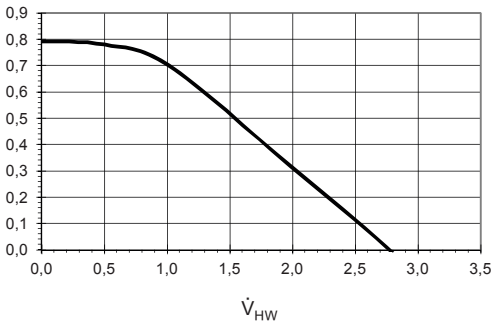
$Temp_{WQ}$ (°C)

Pe (kW)

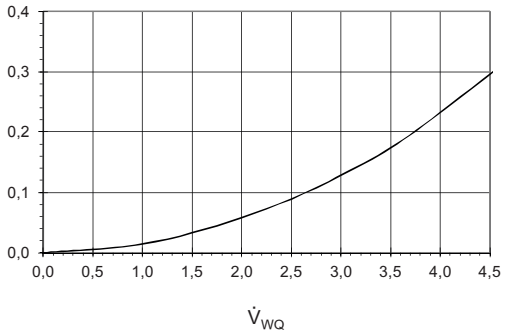


$Temp_{WQ}$ (°C)

Δp (bar)



Δp (bar)



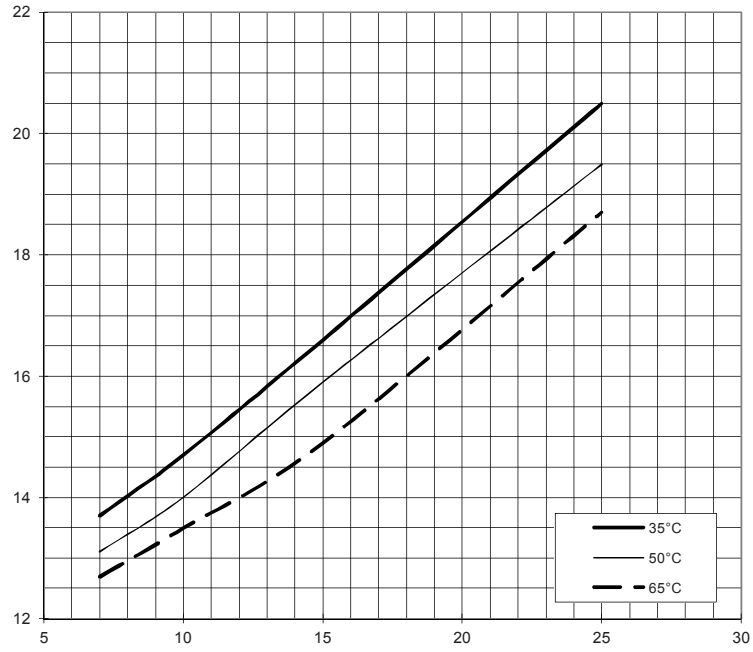
823002-a

Legend:	UK823200
$\dot{V}_{HW}$	Heating water flow rate
$\dot{V}_{WQ}$	Heat source flow rate
$Temp_{WQ}$	Heat source temperature
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance / efficiency rating
Δp_{HW}	Free compression, heating circuit
Δp_{WQ}	Heat source pressure loss
CP	Compressor

WWC 160H/X

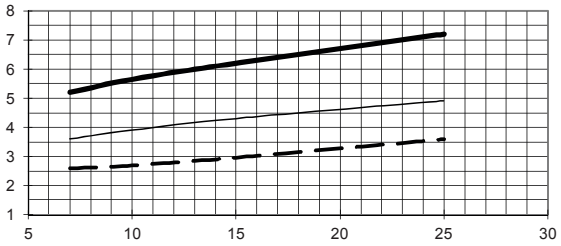
Performance curves

Qh (kW)



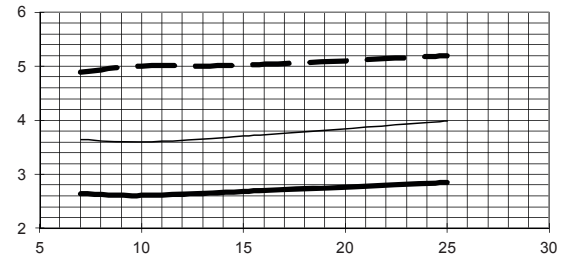
$Temp_{WQ}$ (°C)

COP



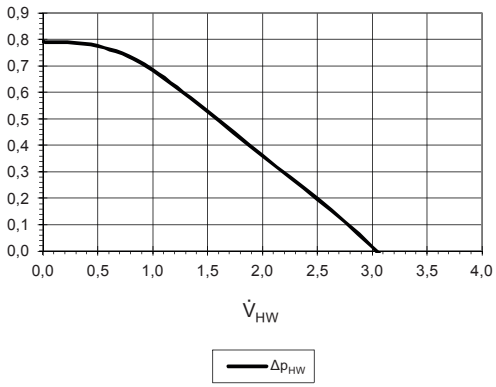
$Temp_{WQ}$ (°C)

Pe (kW)

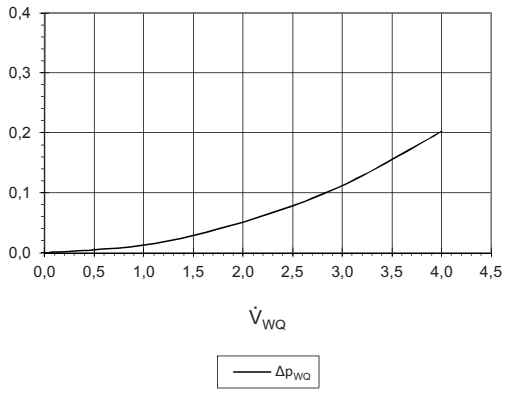


$Temp_{WQ}$ (°C)

Δp (bar)



Δp (bar)



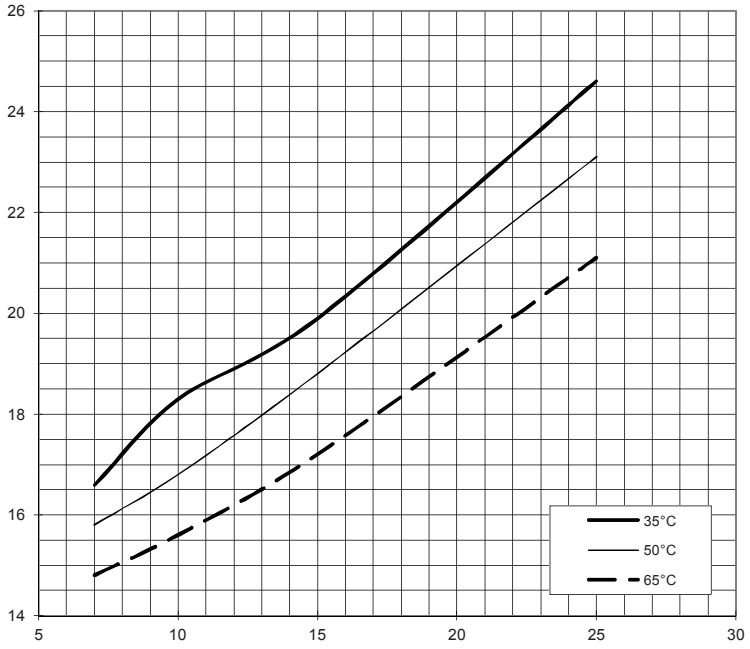
823203-a

Legend:	UK823200
$\dot{V}_{HW}$	Heating water flow rate
$\dot{V}_{WQ}$	Heat source flow rate
$Temp_{WQ}$	Heat source temperature
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance / efficiency rating
Δp_{HW}	Free compression, heating circuit
Δp_{WQ}	Heat source pressure loss
CP	Compressor

Performance curves

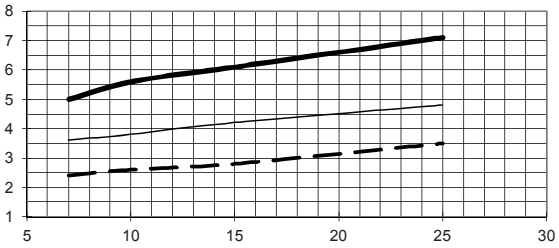
WWC 190H/X

Qh (kW)



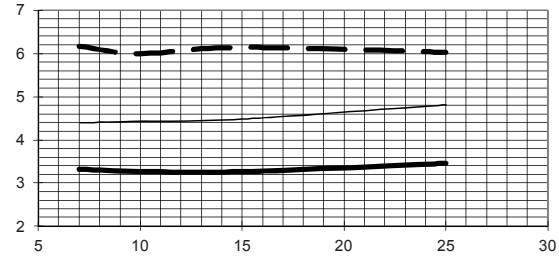
$Temp_{WQ}$ (°C)

COP



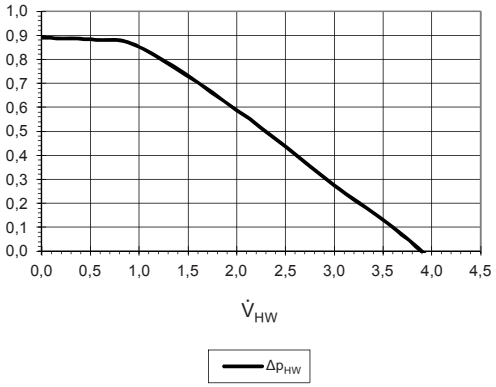
$Temp_{WQ}$ (°C)

Pe (kW)

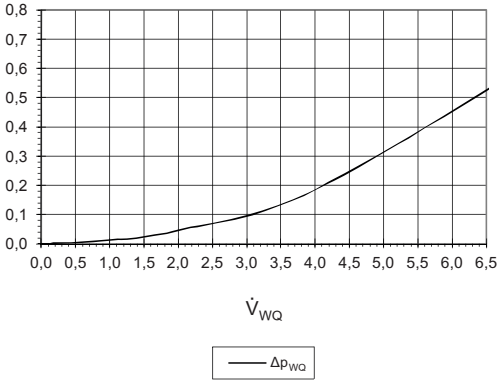


$Temp_{WQ}$ (°C)

Δp (bar)

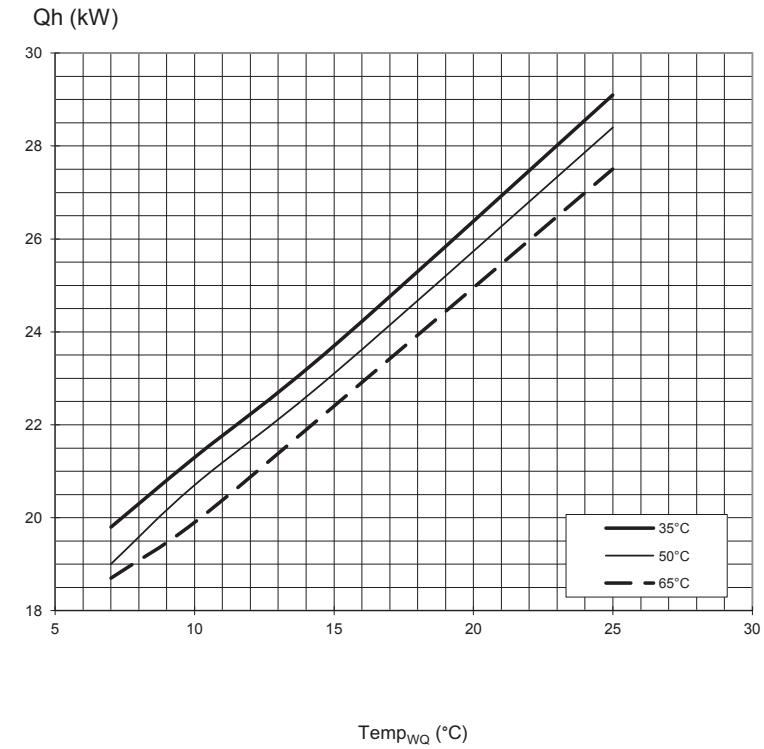


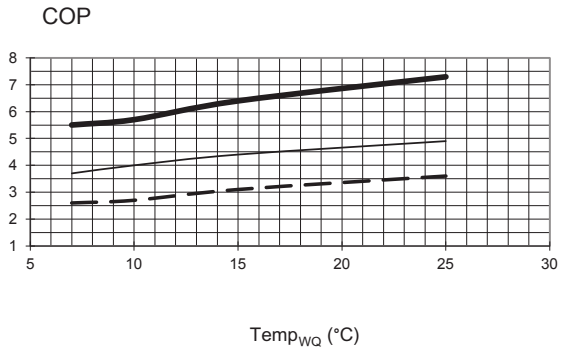
Δp (bar)

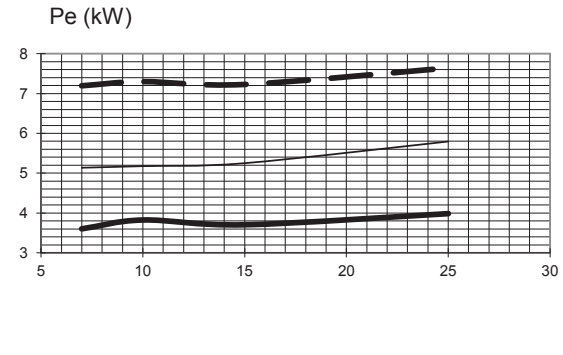


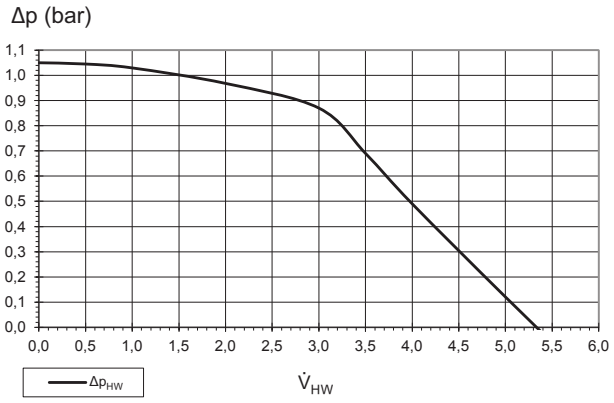
823204-a

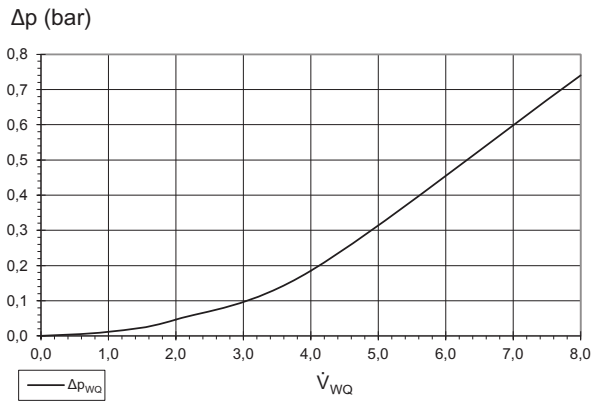
Legend:	UK823200
$\dot{V}_{HW}$	Heating water flow rate
$\dot{V}_{WQ}$	Heat source flow rate
$Temp_{WQ}$	Heat source temperature
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance / efficiency rating
Δp_{HW}	Free compression, heating circuit
Δp_{WQ}	Heat source pressure loss
CP	Compressor









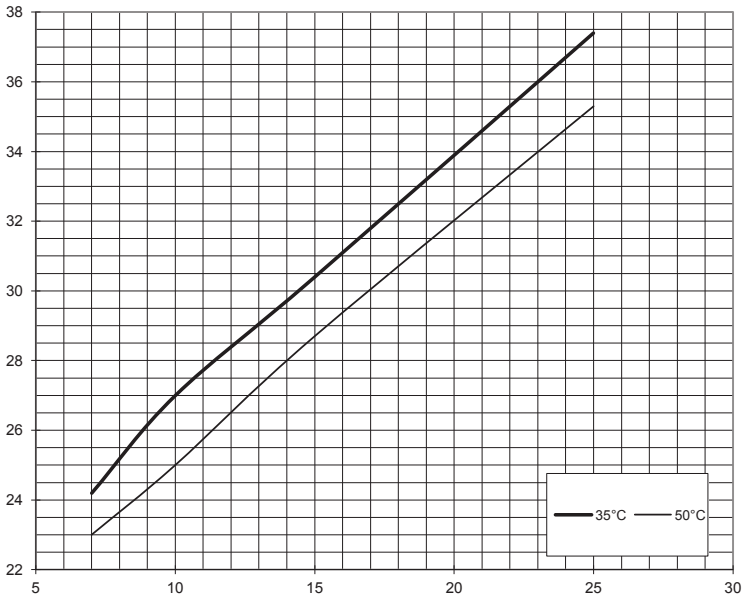


823205a

Legend:	UK823200
$\dot{V}_{HW}$	Heating water flow rate
$\dot{V}_{WQ}$	Heat source flow rate
Temp$_{WQ}$	Heat source temperature
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance / efficiency rating
Δp$_{HW}$	Free compression, heating circuit
Δp$_{WQ}$	Heat source pressure loss
CP	Compressor

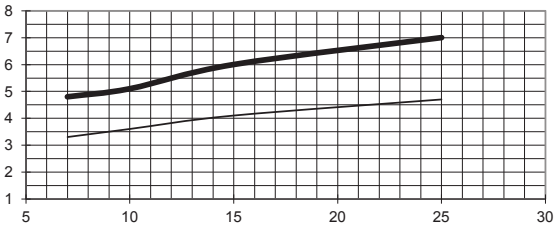
Performance curves

Qh (kW)



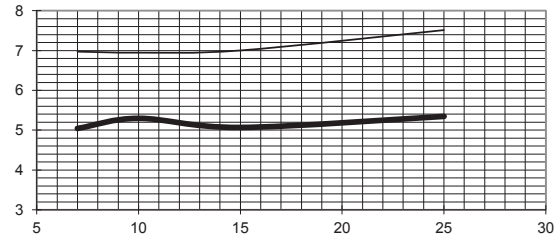
$Temp_{WQ}$ (°C)

COP



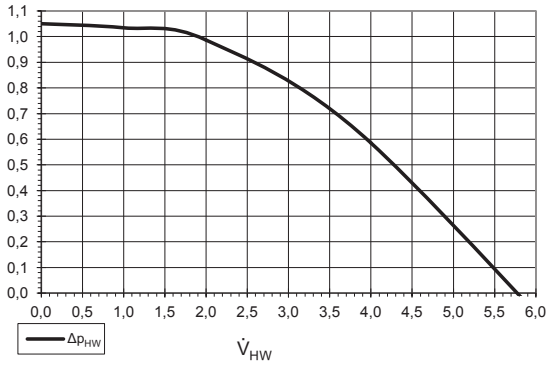
$Temp_{WQ}$ (°C)

Pe (kW)

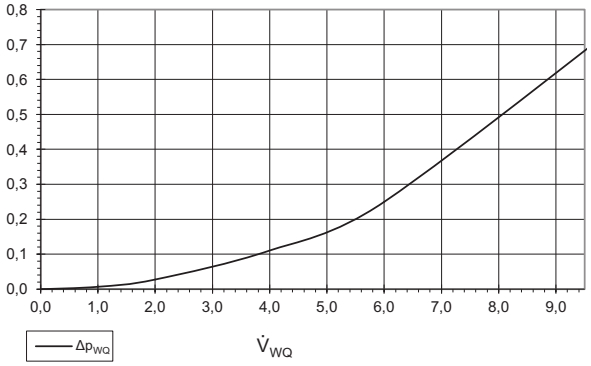


$Temp_{WQ}$ (°C)

Δp (bar)

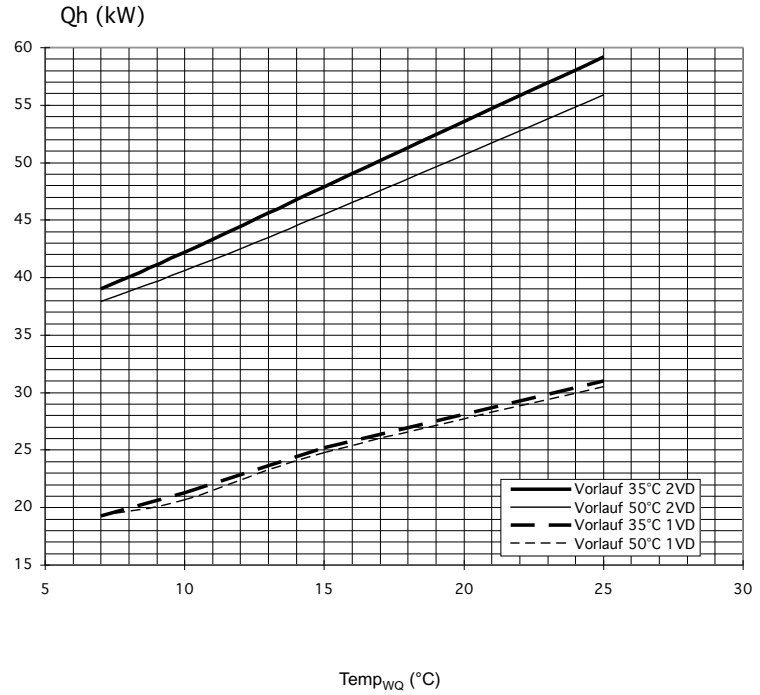


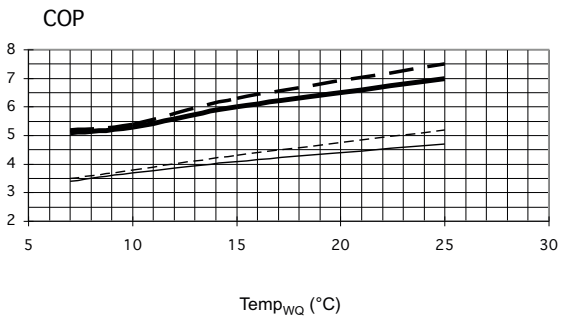
Δp (bar)

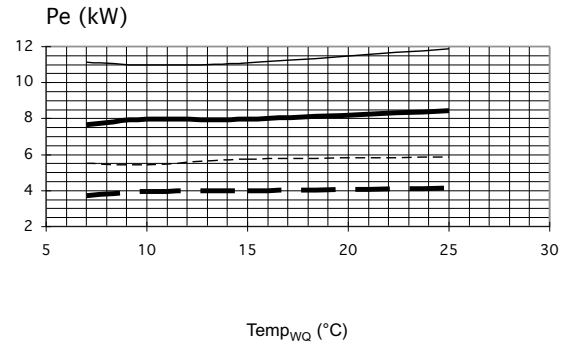


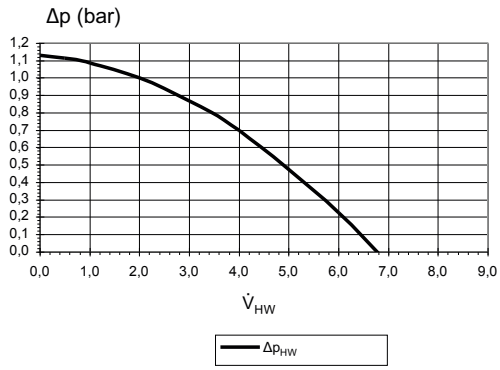
823206a

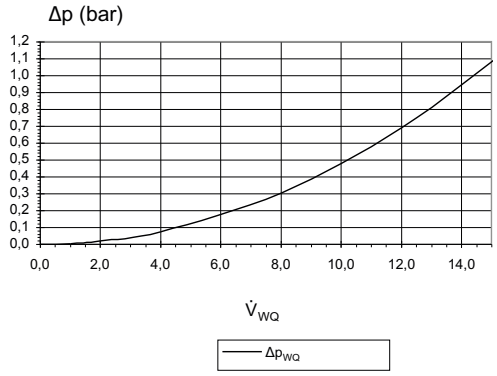
Legend:	UK823200
$\dot{V}_{HW}$	Heating water flow rate
$\dot{V}_{WQ}$	Heat source flow rate
$Temp_{WQ}$	Heat source temperature
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance / efficiency rating
Δp_{HW}	Free compression, heating circuit
Δp_{WQ}	Heat source pressure loss
CP	Compressor









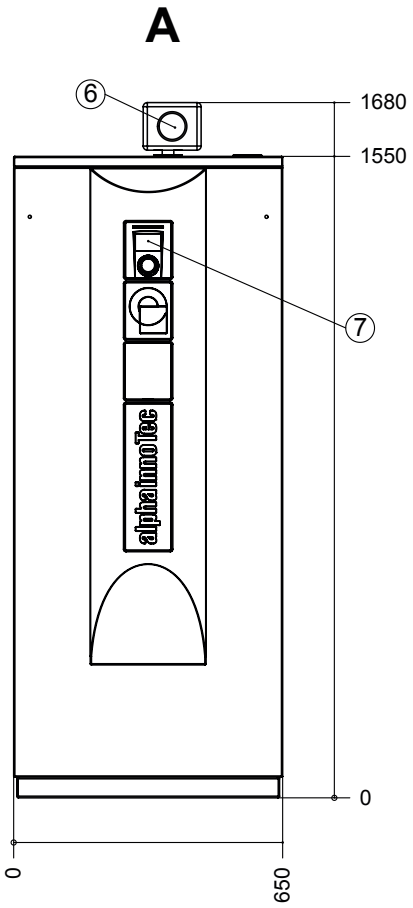


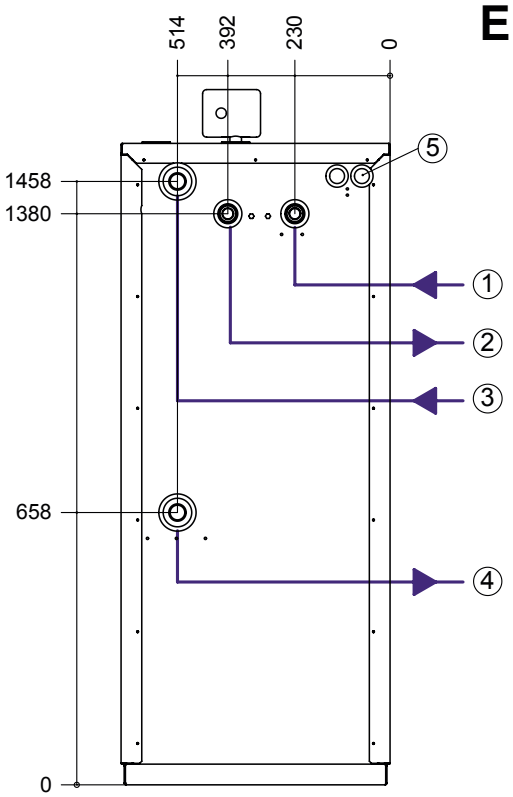
823207

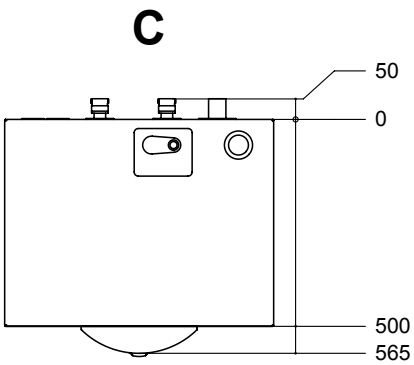
Legend:	UK823200
$\dot{V}_{HW}$	Heating water flow rate
$\dot{V}_{WQ}$	Heat source flow rate
Temp$_{WQ}$	Heat source temperature
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance / efficiency rating
Δp$_{HW}$	Free compression, heating circuit
Δp$_{WQ}$	Heat source pressure loss
CP	Compressor

Dimensional drawings

WWC 100H/X – WWC 220H/X



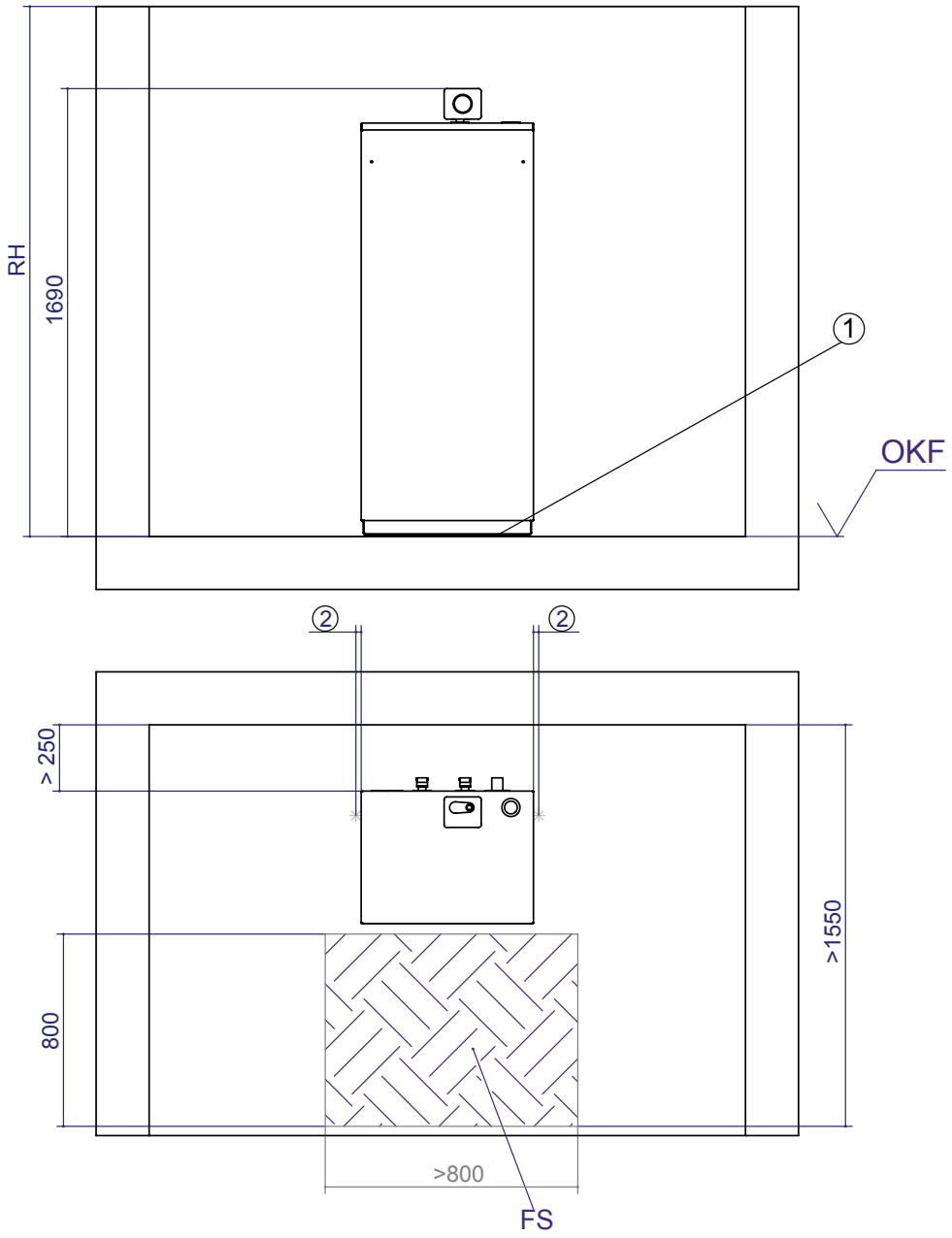




Legend: UK819258b
All dimensions in mm.

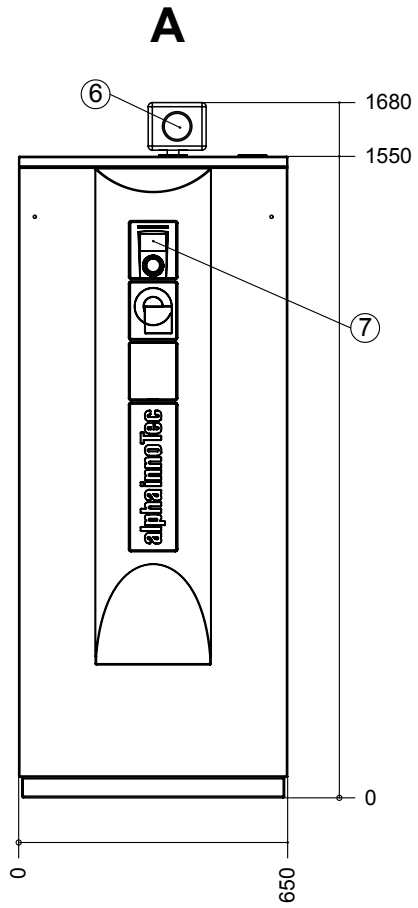
A	Front view
C	Top view
E	Rear view

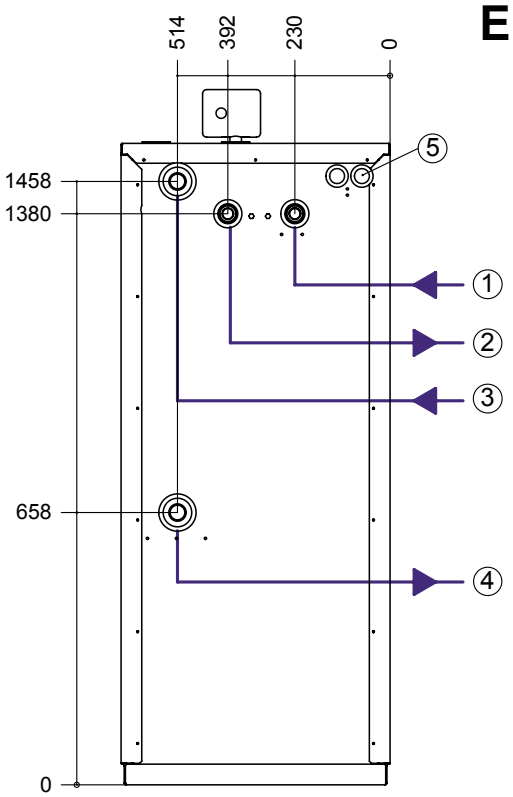
Item	Designation	Dim.
1	Heating water inlet (return); flat seat	G 1 1/4"
2	Heating water outlet (flow): flat seat	G 1 1/4"
3	Heat source inlet at the unit; flat seat	G 1 1/4"
4	Heat source outlet at the unit; flat seat	G 1 1/4"
5	Penetration for electric/sensor cables	---
6	Safety assembly (in extra box)	---
7	Control panel (in extra box)	---

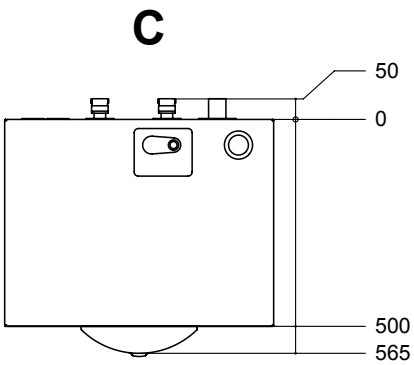


Legend: UK819260a
All dimensions in mm.

RH	Minimum room height 2000
OKF	Finished floor level
FS	Shaded area = free space for service purposes
1	Unit installation on Sylomer strips (in extra box)
2	20 Distance to next object





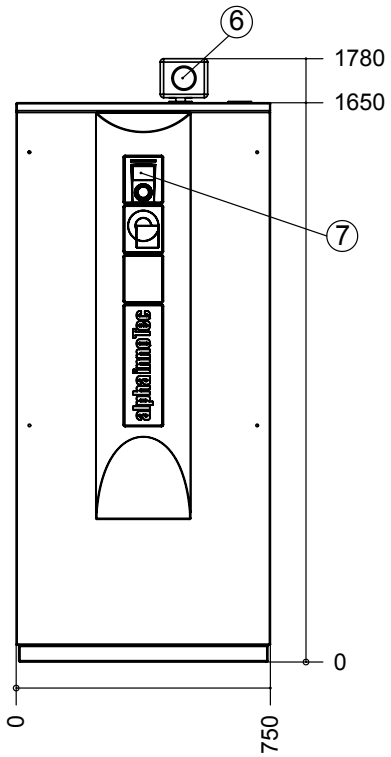


Legend: UK819258b
All dimensions in mm.

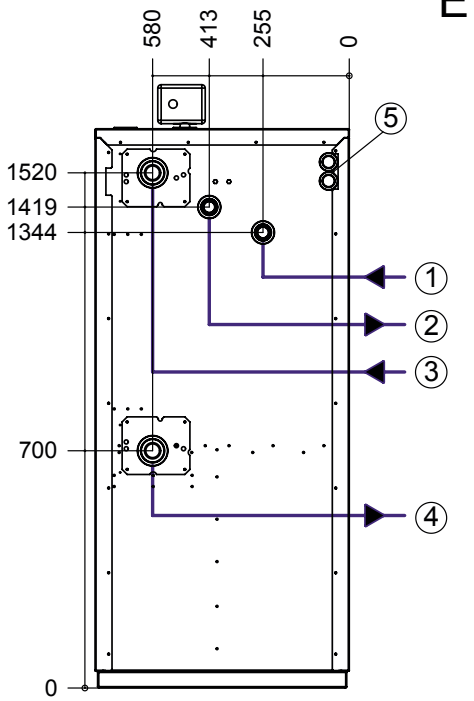
A	Front view
C	Top view
E	Rear view

Item	Designation	Dim.
1	Heating water inlet (return); flat seat	G 1 1/4"
2	Heating water outlet (flow): flat seat	G 1 1/4"
3	Heat source inlet at the unit; flat seat	G 1 1/4"
4	Heat source outlet at the unit; flat seat	G 1 1/4"
5	Penetration for electric/sensor cables	---
6	Safety assembly (in extra box)	---
7	Control panel (in extra box)	---

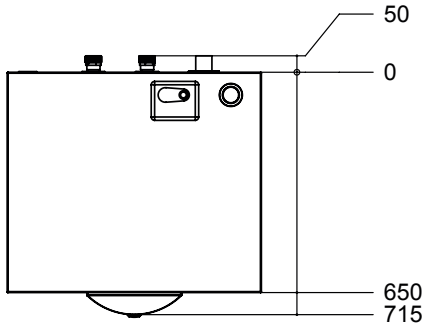
A



E



C



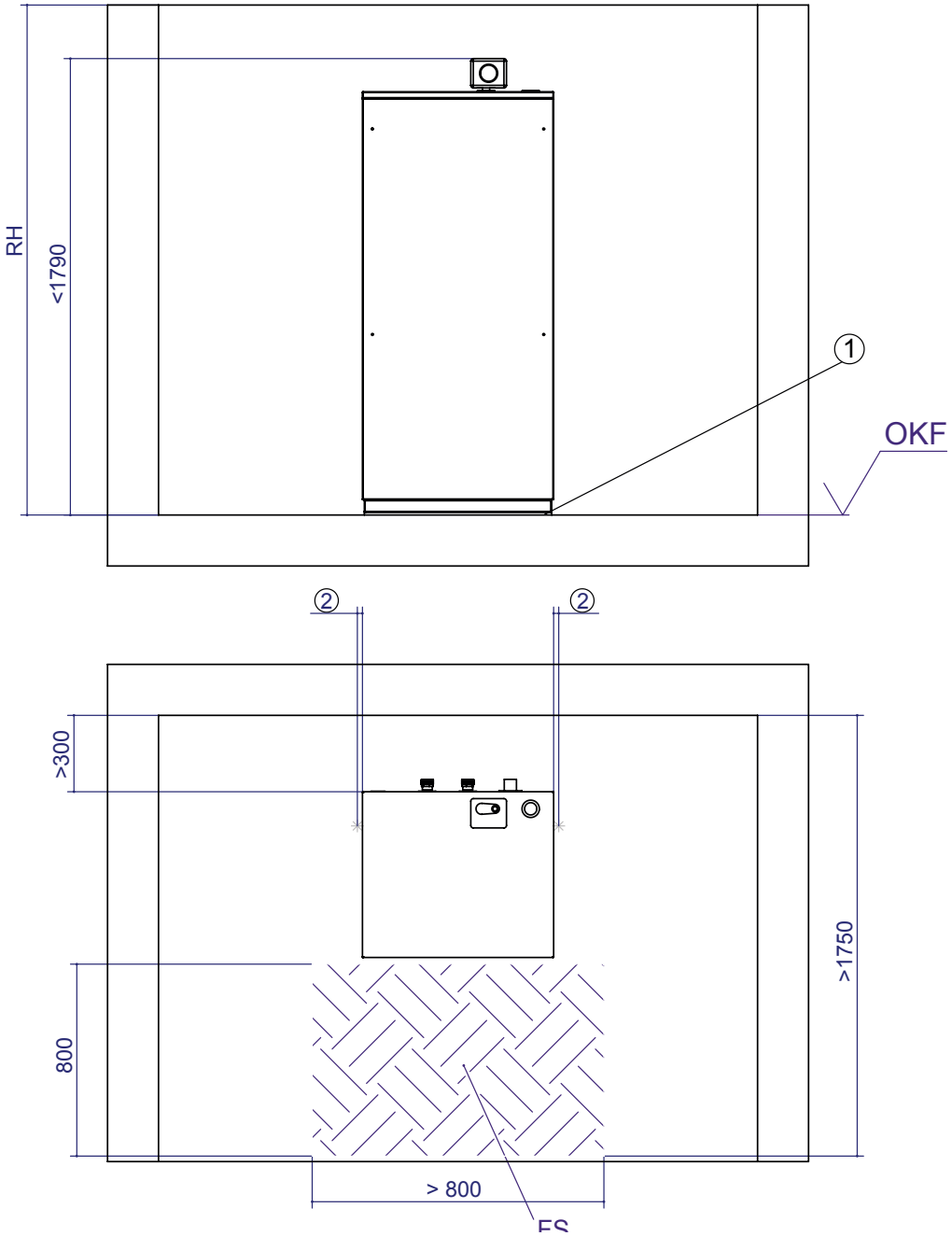
Legend: UK819258b
All dimensions in mm.

A	Front view
C	Top view
E	Rear view

Item	Designation	Dim.
1	Heating water inlet (return); flat seat	G 1 1/4"
2	Heating water outlet (flow): flat seat	G 1 1/4"
3	Heat source inlet at the unit; flat seat	G 1 1/4"
4	Heat source outlet at the unit; flat seat	G 1 1/4"
5	Penetration for electric/sensor cables	---
6	Safety assembly (in extra box)	---
7	Control panel (in extra box)	---

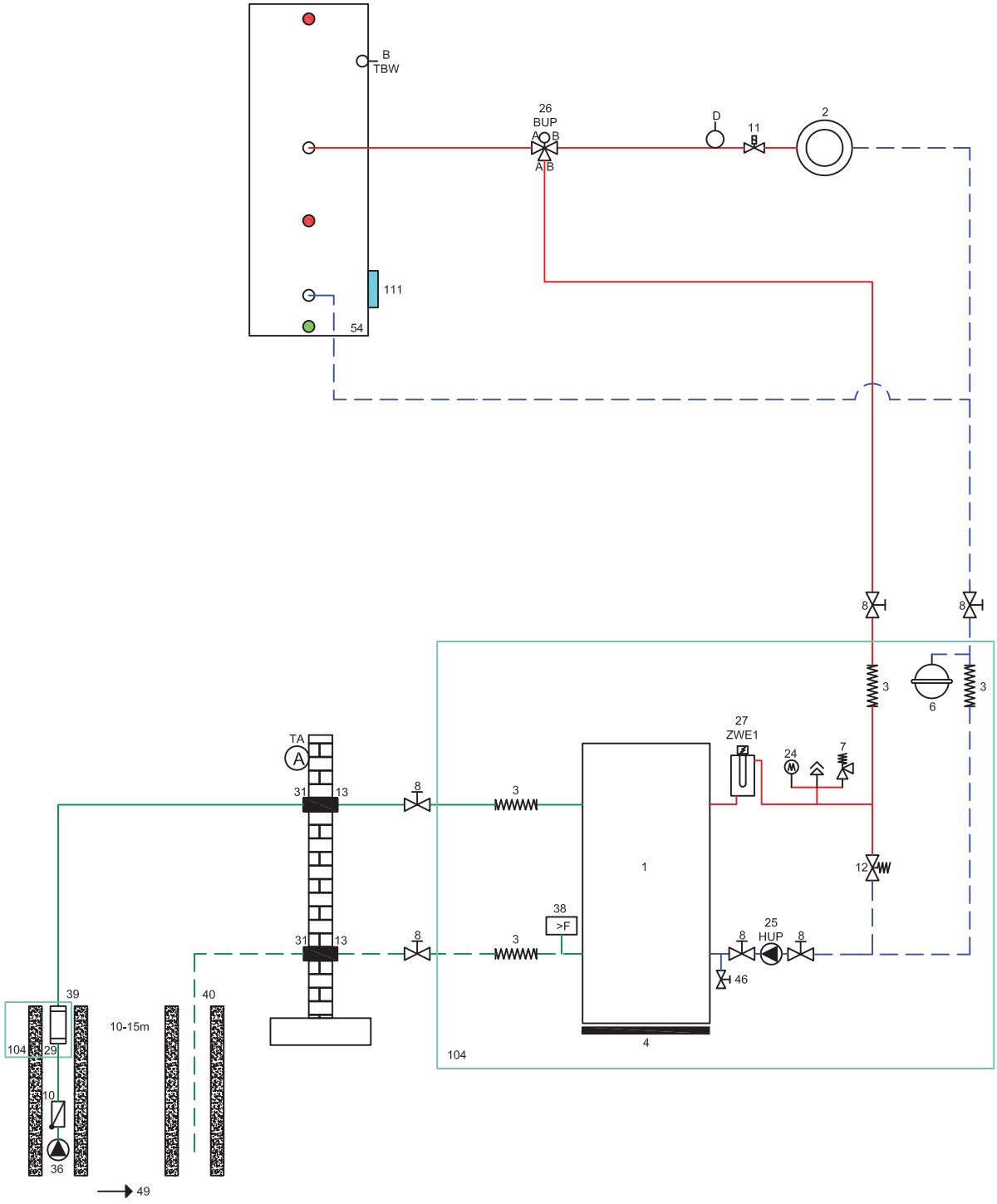
Installation plan

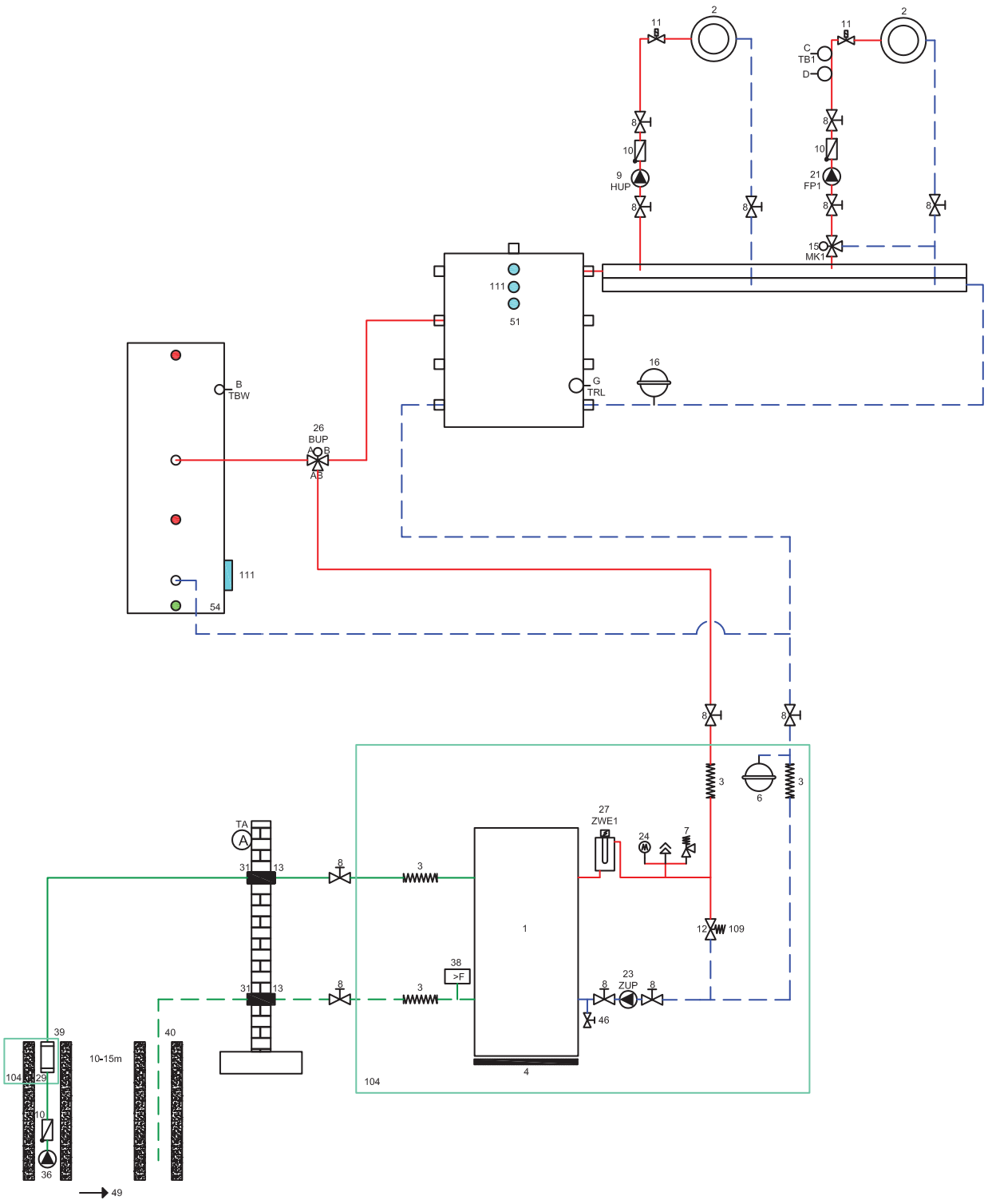
WWC 280X – WWC 440X

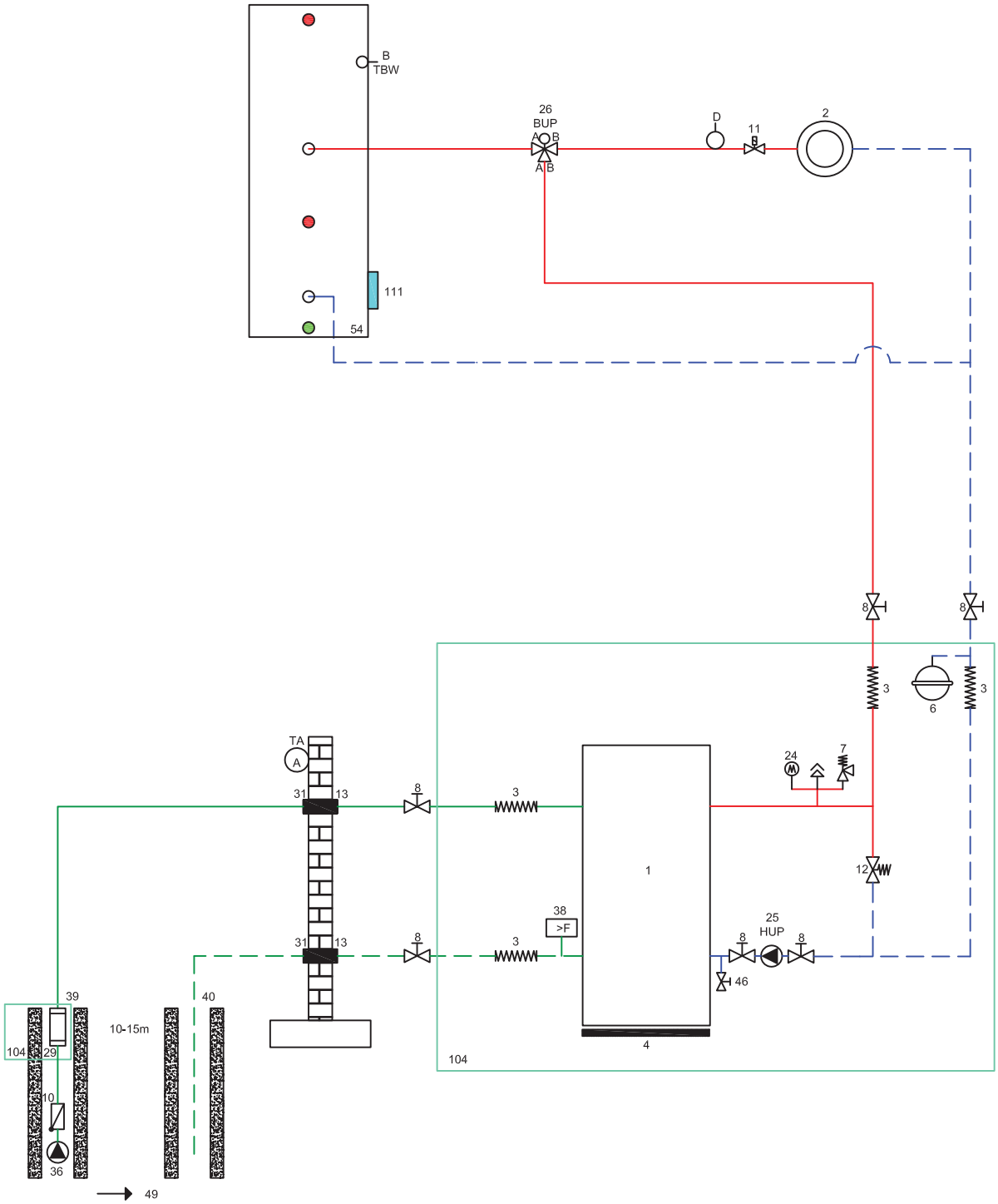


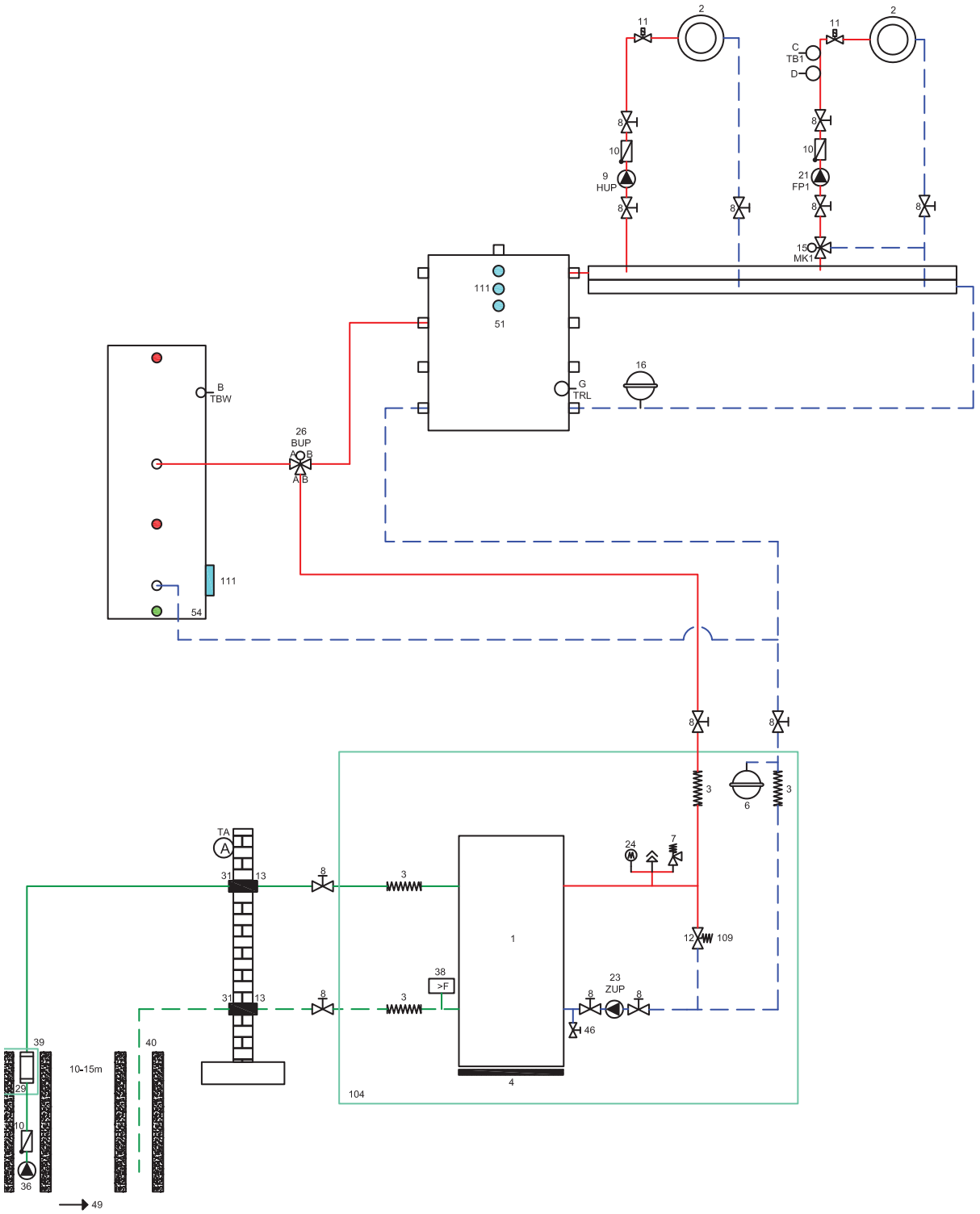
Legend: UK819260a
All dimensions in mm.

RH	Minimum room height 2000
OKF	Finished floor level
FS	Shaded area = free space for service purposes
1	Unit installation on Sylomer strips (in extra box)
2	20 Distance to next object


B
TBW
26
BUP
A B
A B
D
11
2
111
54
8
8
3
6
3
27
ZWE1
24
7
TA
A
31
13
8
3
1
12
38
>F
31
13
8
3
8
25
HUP
8
46
39
40
10-15m
104
29
10
36
49
4
104


11
2
C
TB1
D
8
10
9
HUP
21
FP1
15
MK1
111
51
16
G
TRL
B
TBW
26
BUP
A
B
AB
54
TA
31
13
3
27
ZWE1
24
7
1
12
109
38
>F
23
ZUP
46
4
6
104
39
40
10-15m
29
36
49


B
TBW
26
BUP
A B
A B
D
11
2
111
54
8
8
3
6
3
TA
A
31
13
8
3
24
7
1
12
38
>F
31
13
8
3
25
HUP
8
8
46
39
40
10-15m
104
29
10
36
49
4
104


11
2
C
TB1
D
8
10
9
HUP
21
FP1
15
MK1
111
51
16
G
TRL
B
TBW
26
BUP
A B
54
TA
31
13
3
1
24
7
12
109
38
>F
23
ZUP
46
4
6
39
40
10-15m
29
36
49
104

Legend hydraulic diagramm

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

Comfort board:

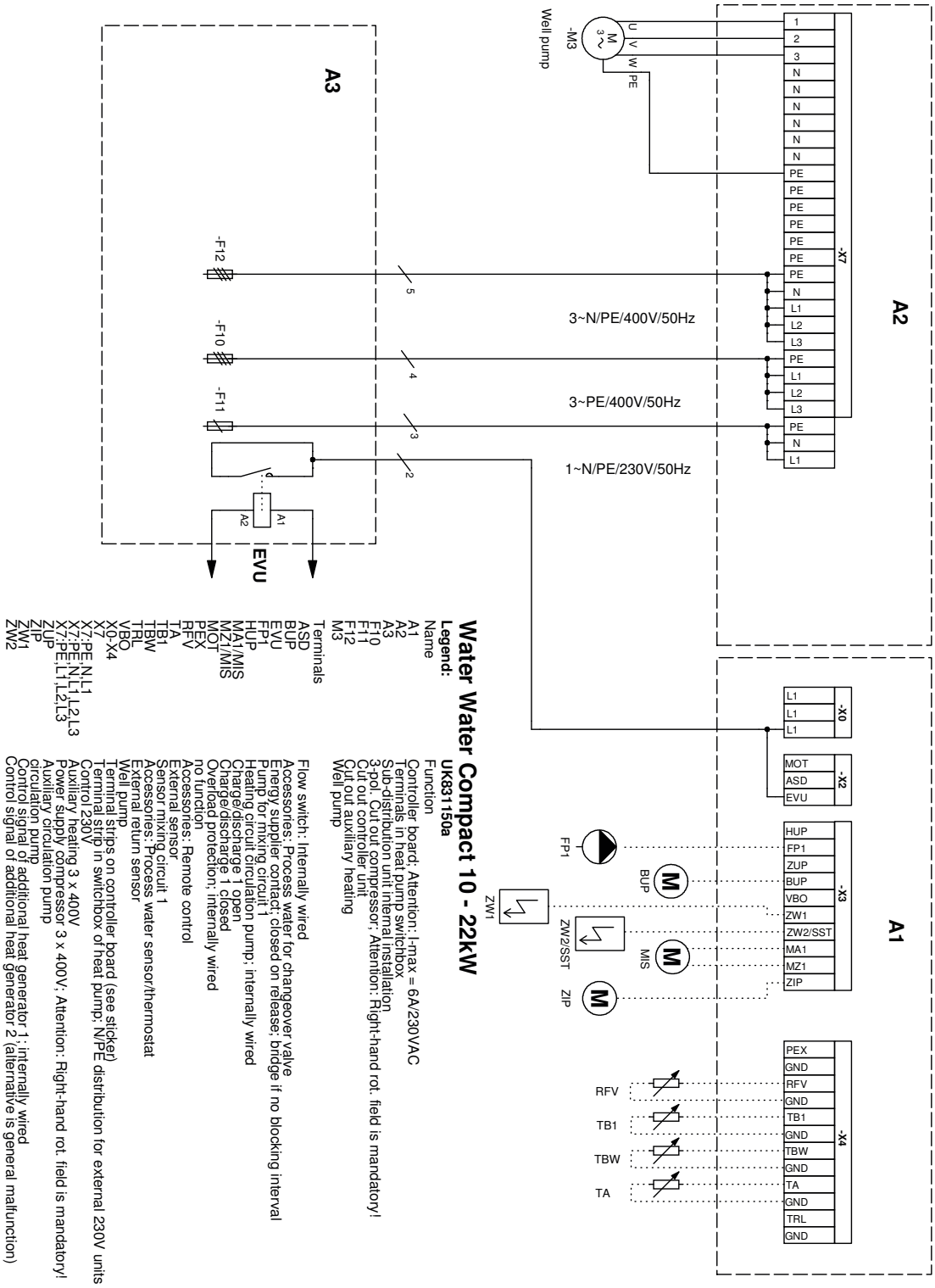
15	Mixer circuit three-way mixer (MK2-3 discharge)
17	Temperature difference regulator
19	Mixer circuit four-way mixer (MK2 charge)
21	Mixer circuit circulation pump (FP2-3)
22	Swimming pool circulating pump
44	Three-way mixer valve (cooling function MK2)
47	Changeover valve swimming bath preparation(B = 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 seperation 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!

Terminal diagram

WWC 100H/X – WWC 220H/X



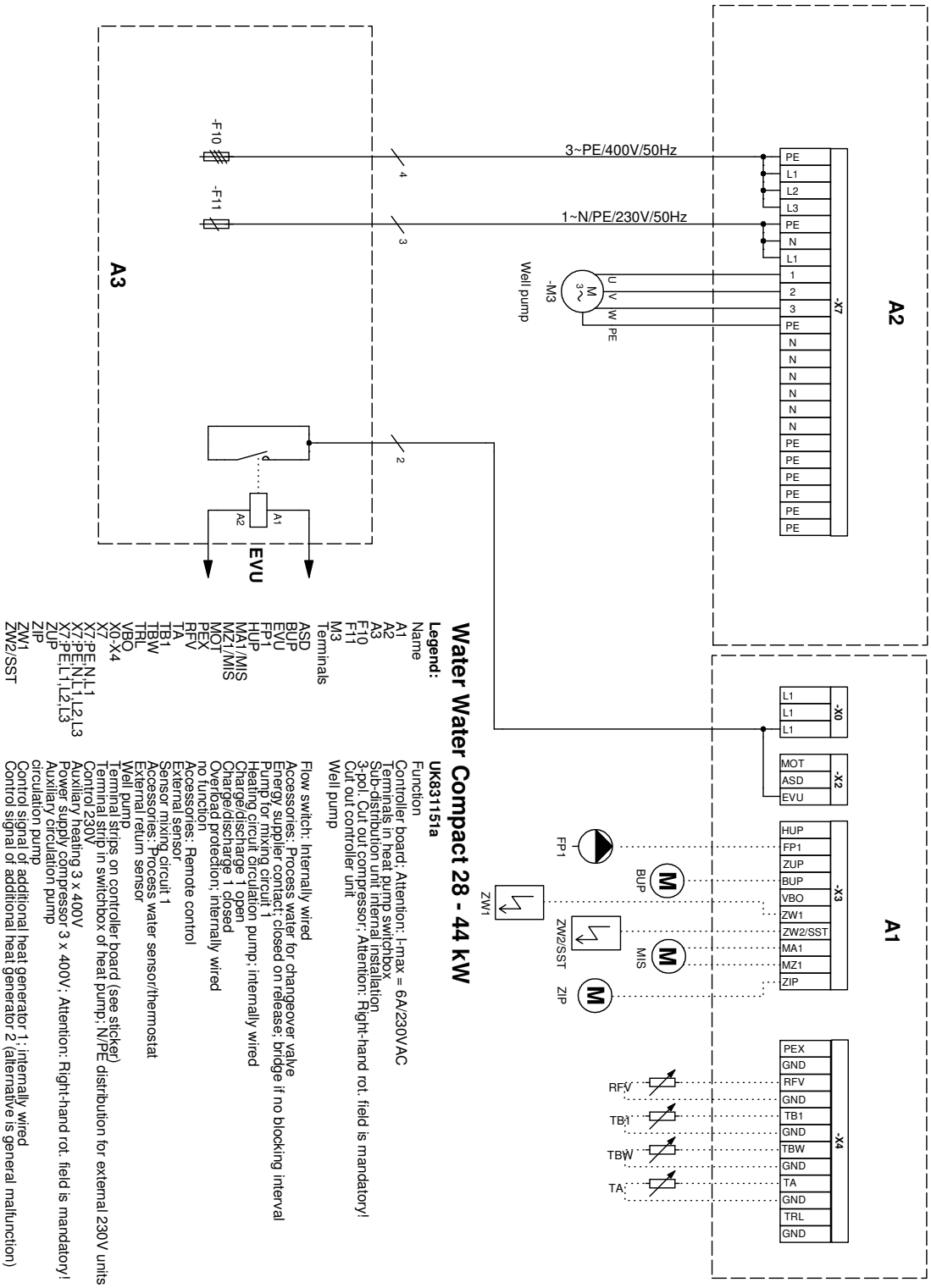
Water Water Compact 10 - 22kW

Legend:

UK831150a

Name	Function
A1	Controller board; Attention: I-max = 6A/230VAC
A2	Terminals in heat pump switchbox
A3	Sub-distribution unit internal installation
F10	3-pol. Cut out compressor; Attention: Right-hand rot. field is mandatory!
F11	Cut out controller unit
F12	Cut out auxiliary heating
M3	Well pump

Terminals	
ASD	Flow switch: Internally wired
BUP	Accessories: Process water for changeover valve
EVU	Energy supplier contact; closed on release; bridge if no blocking interval
FP1	Pump for mixing circuit 1
HUP	Heating circuit circulation pump; internally wired
MA1/MIS	Charge/discharge 1 open
MZ1/MIS	Charge/discharge 1 closed
MOT	Overload protection; internally wired
PEX	no function
RFV	Accessories: Remote control
TA	External sensor
TB1	Sensor mixing circuit 1
TBW	Accessories: Process water sensor/thermostat
TRL	External return sensor
VBO	Well pump
X0-X4	Terminal strips on controller board (see sticker)
X7:PE,N,L1	Terminal strip in switchbox of heat pump; N/PE distribution for external 230V units
X7:PE,N,L1,L2,L3	Control 230V
ZUP	Auxiliary heating 3 x 400V
ZW1	Power supply compressor 3 x 400V; Attention: Right-hand rot. field is mandatory!
ZW2	Auxiliary circulation pump
ZIP	circulation pump
	Control signal of additional heat generator 1; internally wired
	Control signal of additional heat generator 2 (alternative is general malfunction)



Water Water Compact 28 - 44 kW

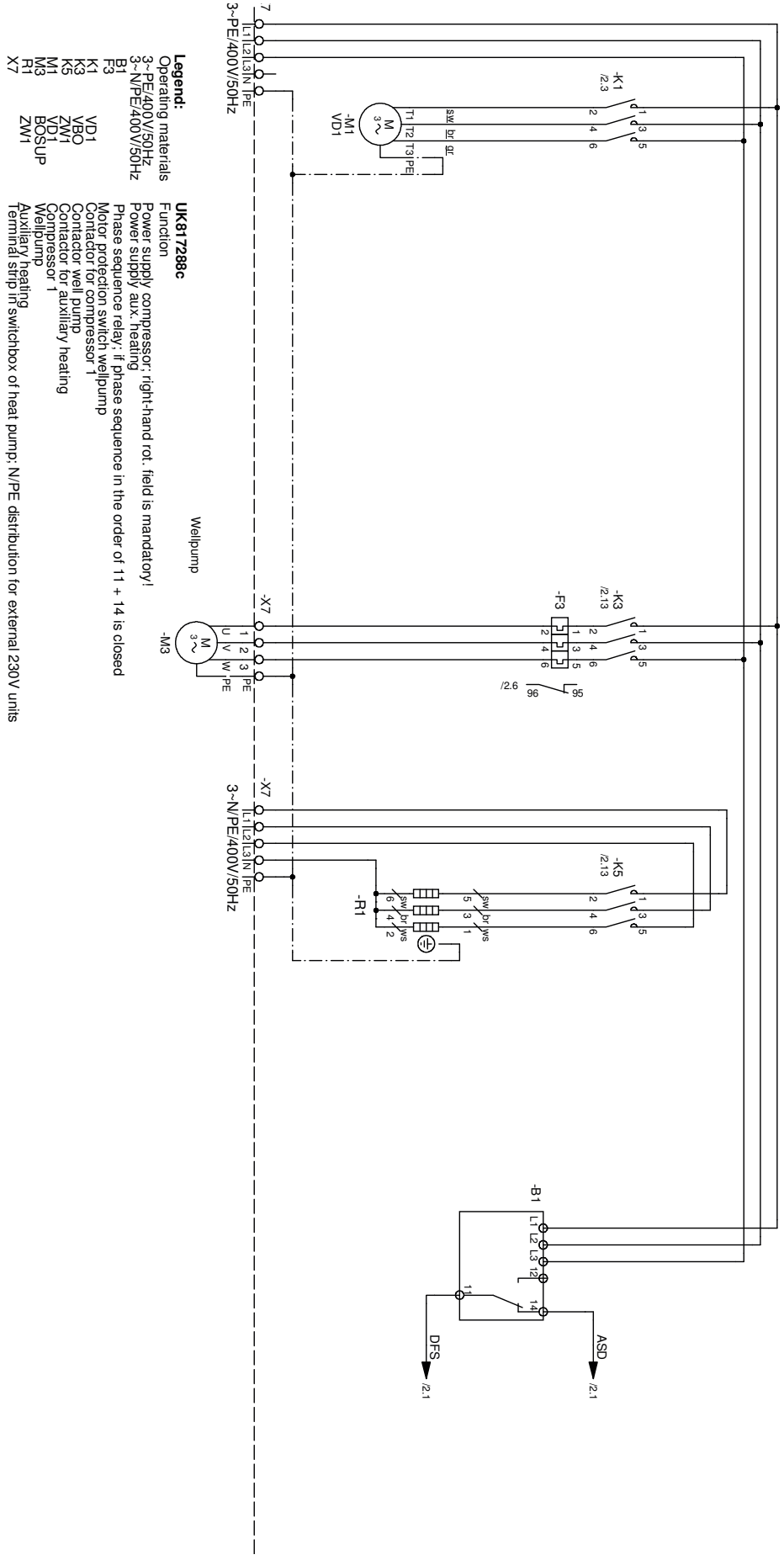
Legend:

Name	Function
A1	Controller board; Attention: I-max = 6A/230VAC
A2	Terminals in heat pump switchbox
A3	Sub-distribution unit internal installation
F10	3-pol. Cut out compressor; Attention: Right-hand rot. field is mandatory!
F11	Cut out controller unit
M3	Well pump

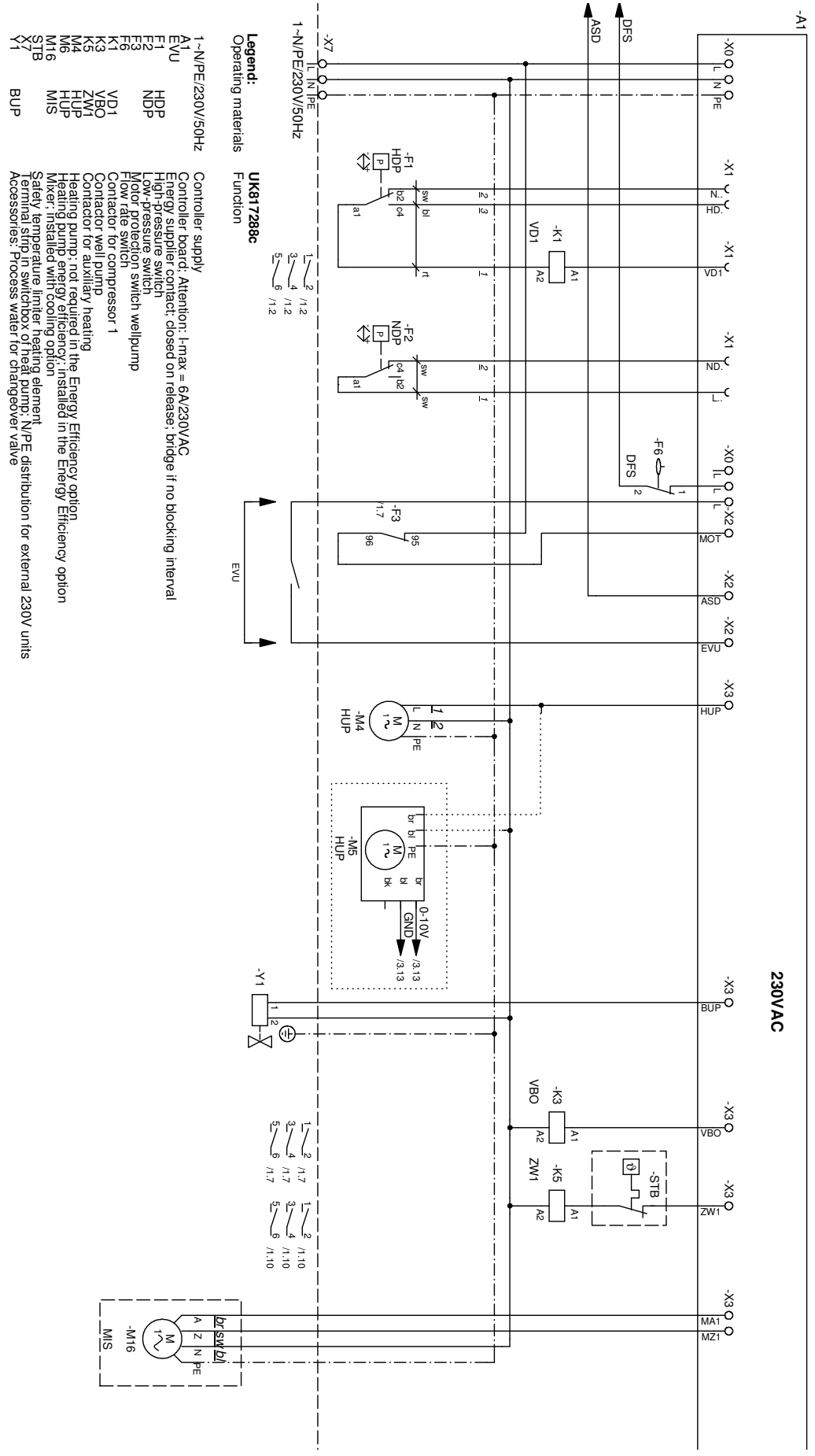
Terminals

ASD	Flow switch: Internally wired
BUP	Accessories: Process water for changeover valve
EVU	Energy supplier contact; closed on release; bridge if no blocking interval
FP1	Pump for mixing circuit 1
HUP	Heating circuit circulation pump; internally wired
MA1/MIS	Charge/discharge 1 open
MZ1/MIS	Charge/discharge 1 closed
MOT	Overload protection; internally wired
PEX	no function
RFV	Accessories: Remote control
TA	External sensor
TB1	Sensor mixing circuit 1
TBW	Accessories: Process water sensor/thermostat
TRL	External return sensor
VBO	Well pump
X0-X4	Terminal strips on controller board (see sticker)
X7	Terminal strip in switchbox of heat pump; N/PE distribution for external 230V units
X7:PE,N,L1	Control 230V
X7:PE,N,L1,L2,L3	Auxiliary heating 3 x 400V
ZUP	Power supply compressor 3 x 400V; Attention: Right-hand rot. field is mandatory!
ZIP	Auxiliary circulation pump
ZW1	circulation pump
ZW2/SST	Control signal of additional heat generator 1; internally wired
	Control signal of additional heat generator 2 (alternative is general malfunction)

Circuit diagram 1/3

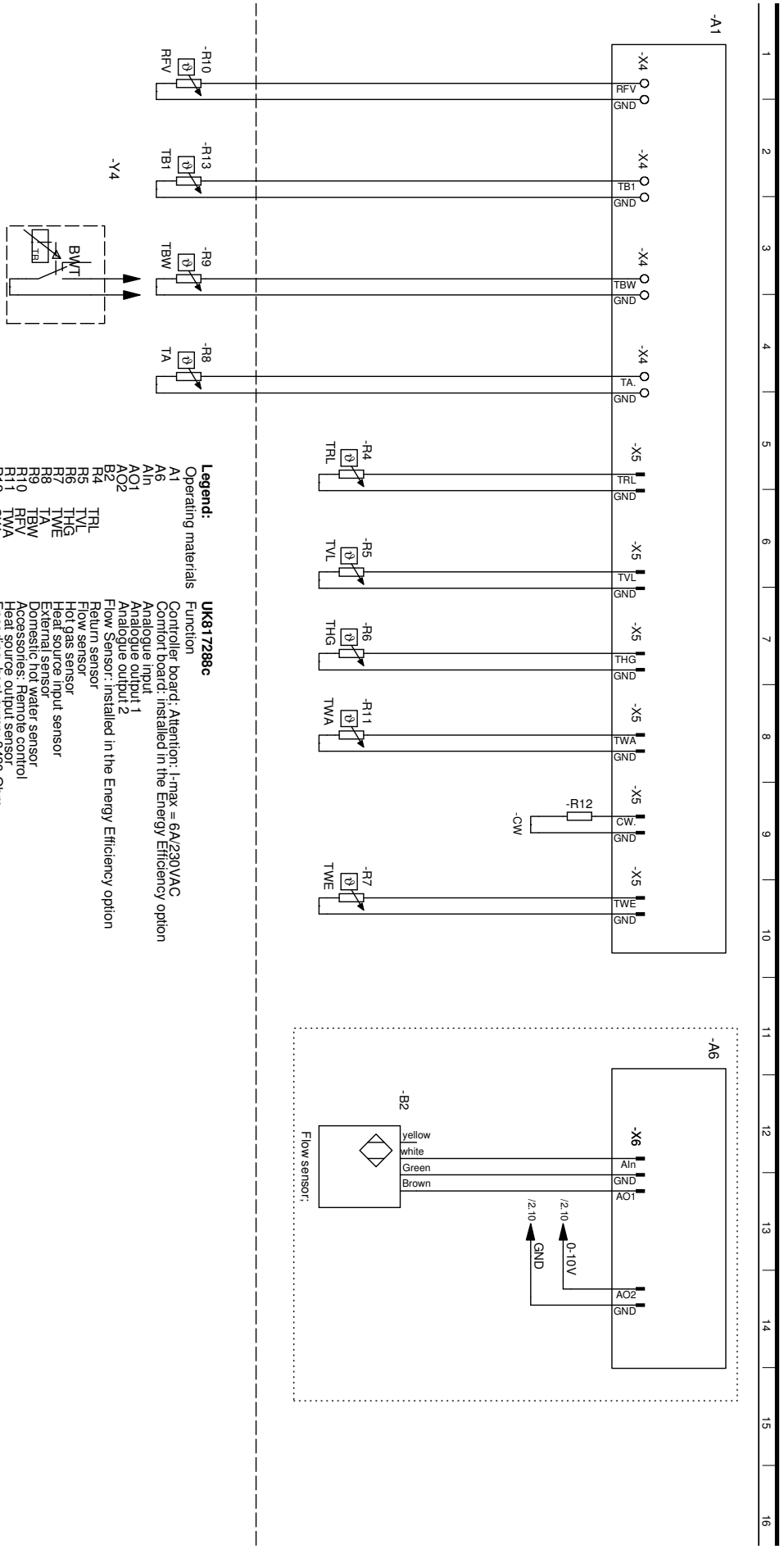


Circuit diagram 2/3



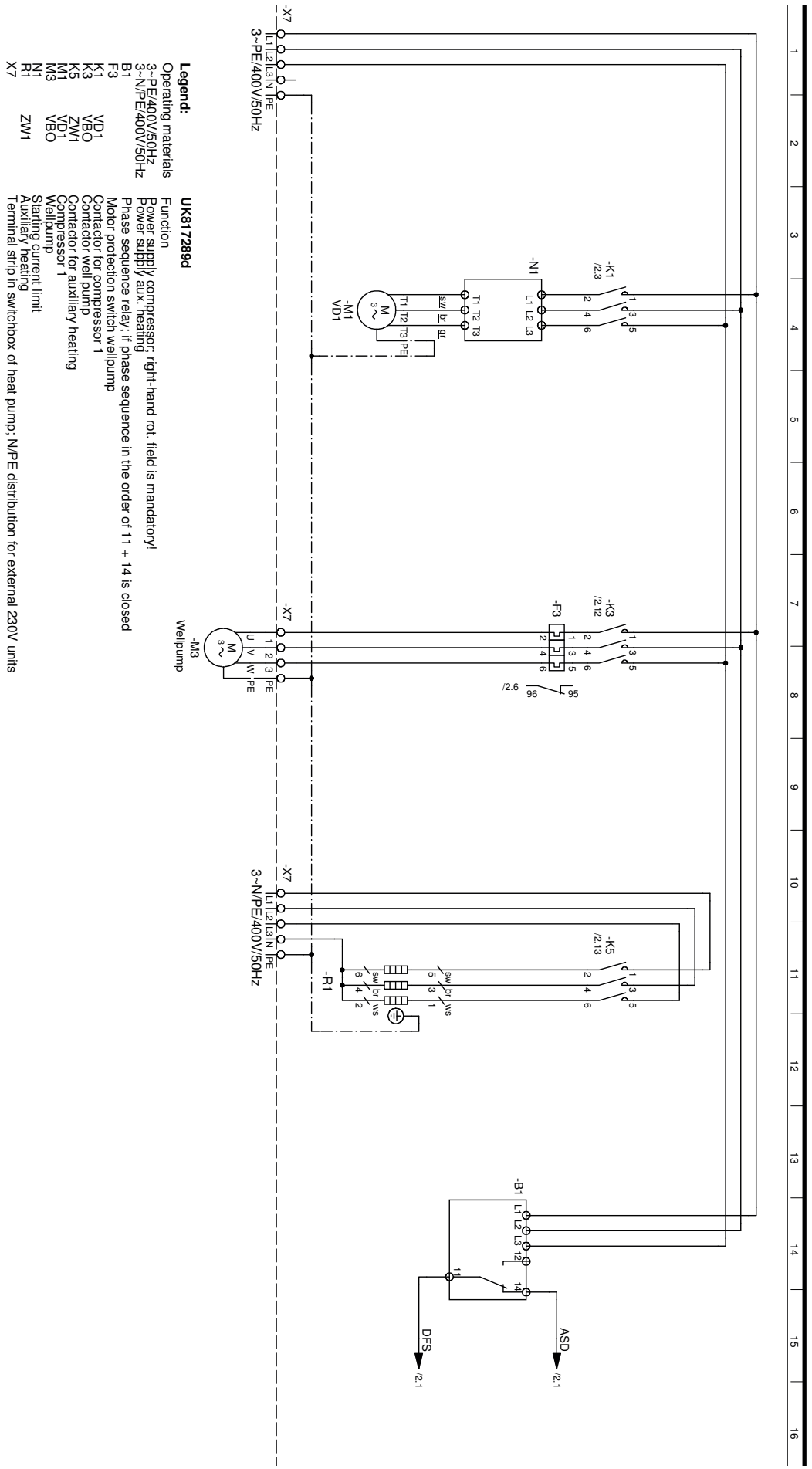
Circuit diagram 3/3

WWC 100H/X



WWC 130H/X – 220H/X

Circuit diagram 1/3



Legend:

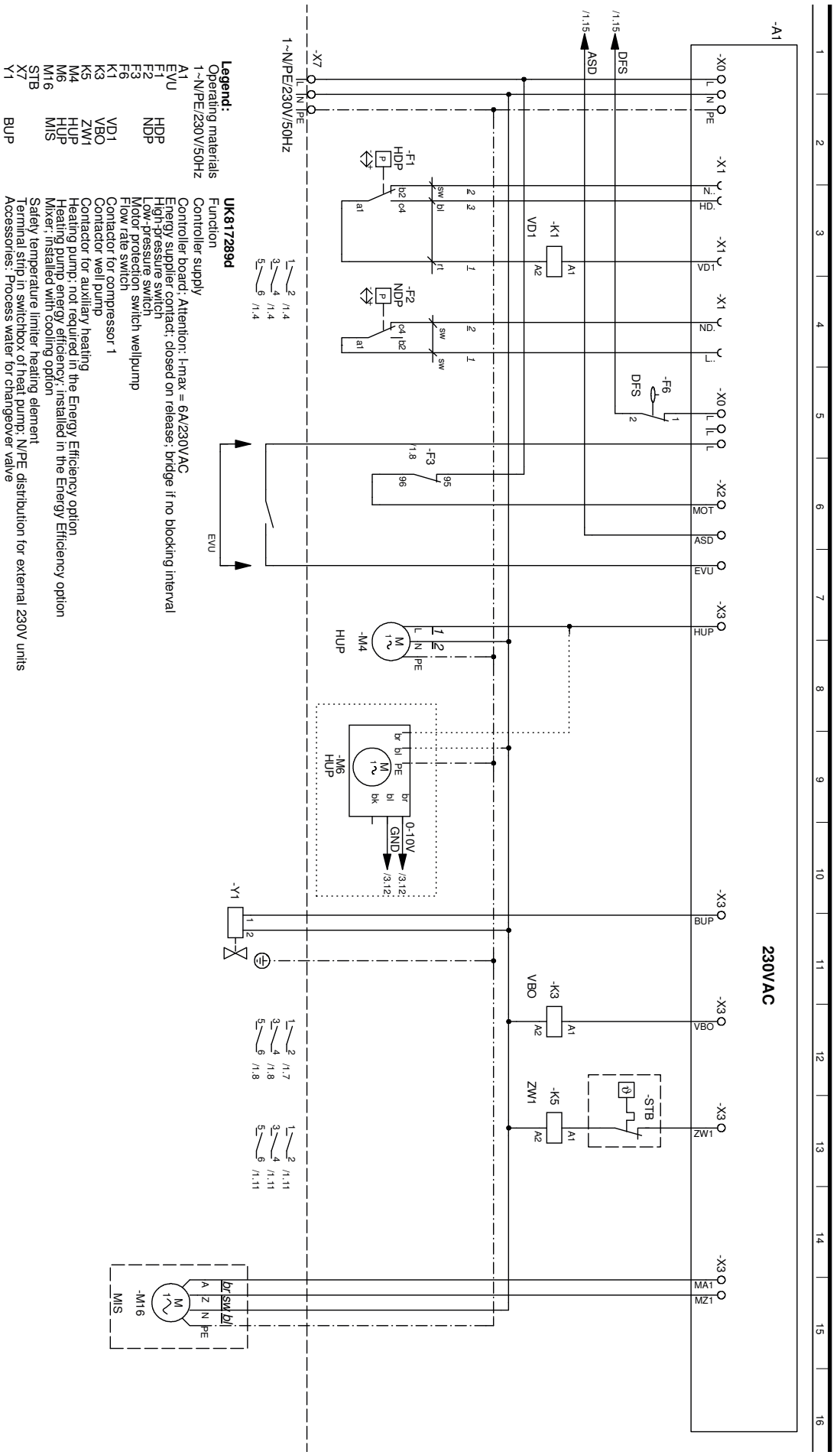
Operating materials	
3~PE/400V/50Hz	
3~N/PE/400V/50Hz	
B1	
F3	
K1	VD1
K3	VBO
K5	ZW1
M1	VD1
M3	VBO
N1	
R1	ZW1
X7	

UK817289d

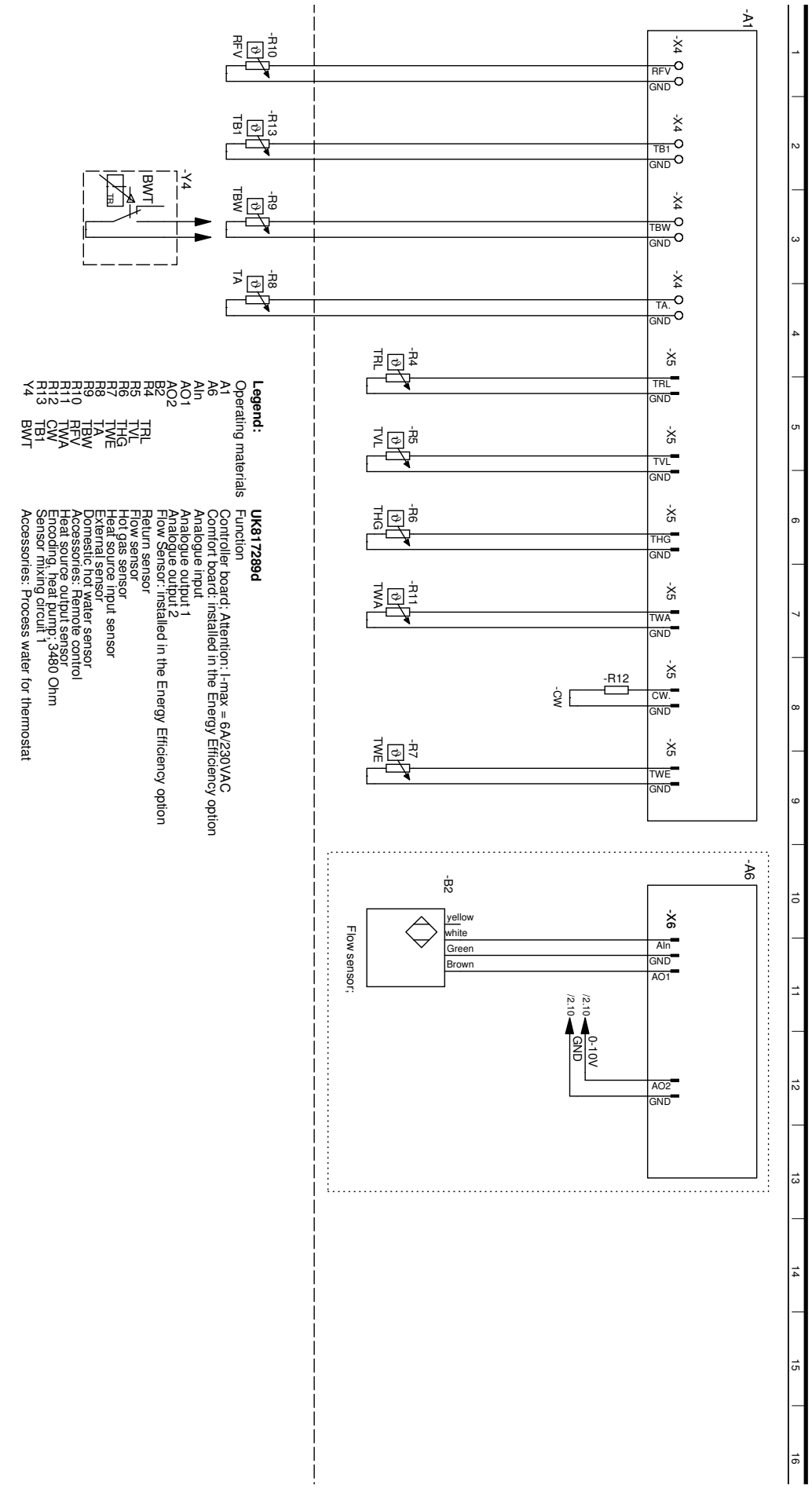
Function
Power supply compressor; right-hand rot. field is mandatory!
Power supply aux. heating
Phase sequence relay; if phase sequence in the order of 11 + 14 is closed
Motor protection switch wellpump
Contactor for compressor 1
Contactor well pump
Contactor for auxiliary heating
Compressor 1
Wellpump
Starting current limit
Auxiliary heating
Terminal strip in switchbox of heat pump; N/PE distribution for external 230V units

Circuit diagram 2/3

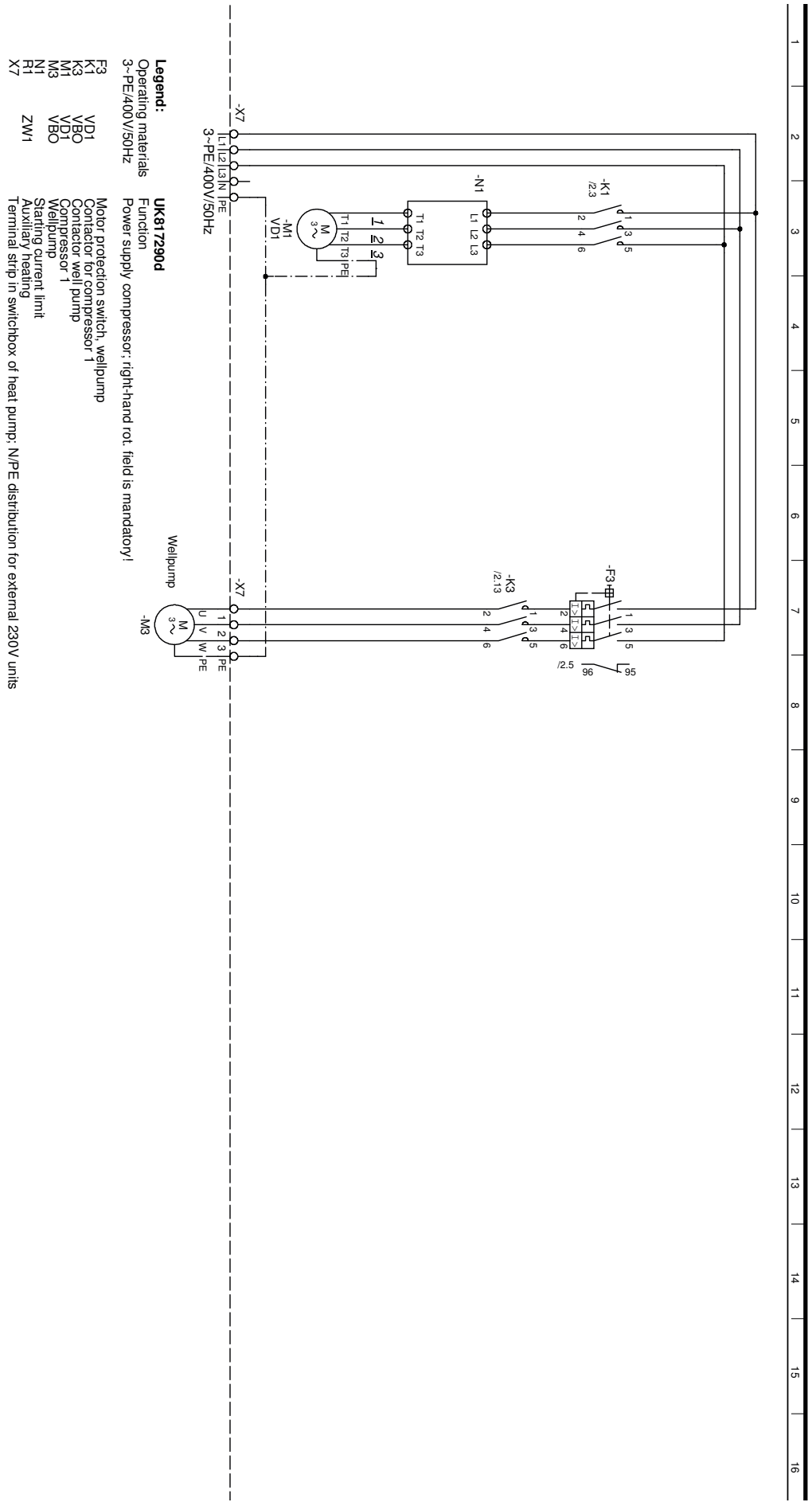
WWC 130H/X – WWC 220H/X



Circuit diagram 3/3



Circuit diagram 1/3



Legend:

Operating materials
3~PE/400V/50Hz

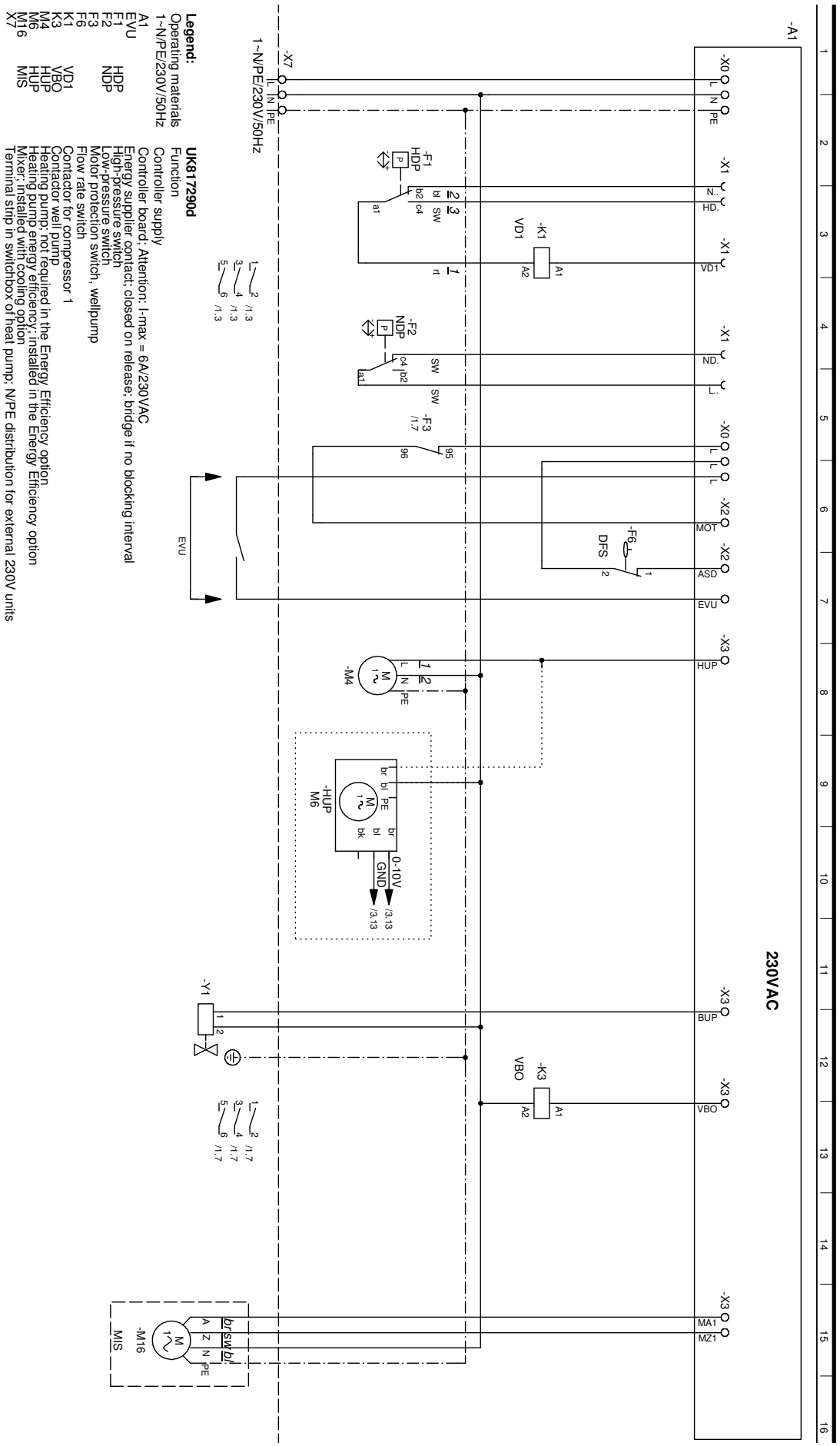
F3	
K1	VD1
K3	VBO
M1	VD1
M3	VBO
N1	
R1	ZW1
X7	

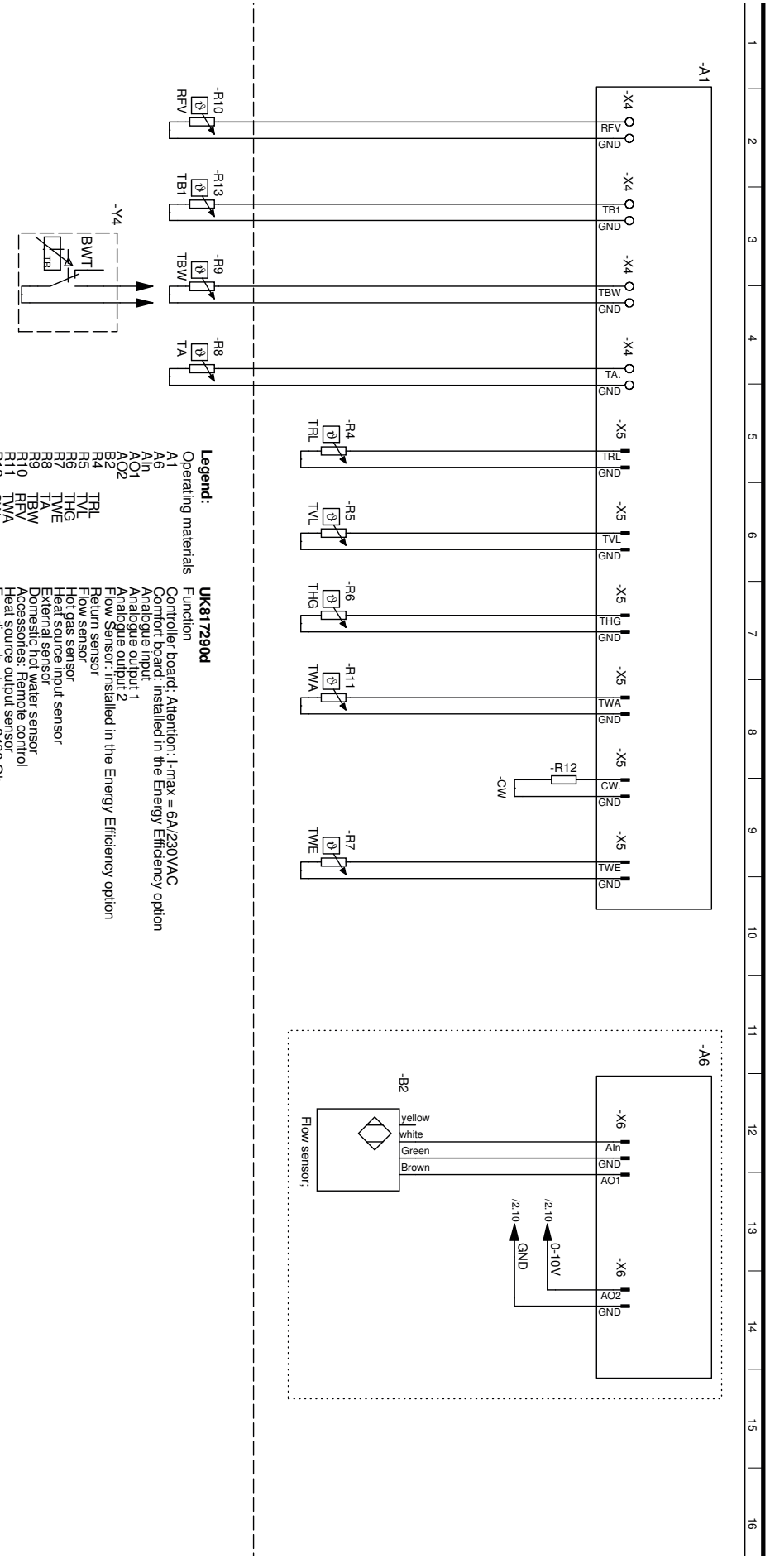
UK817290d

Function
Power supply compressor; right-hand rot. field is mandatory!

Motor protection switch, wellpump
Contactor for compressor 1
Contactor well pump
Compressor 1
Wellpump
Starting current limit
Auxiliary heating
Terminal strip in switchbox of heat pump; N/PE distribution for external 230V units

Circuit diagram 2/3





Legend:

A1	Operating materials
A6	
AIn	Analogue input
AO1	Analogue output 1
AO2	Analogue output 2
B2	Flow Sensor: installed in the Energy Efficiency option
R4	Return sensor
R5	Flow sensor
R6	Hot gas sensor
R7	Heat source input sensor
R8	External sensor
R9	Domestic hot water sensor
R10	Accessories: Remote control
R11	Heat source output sensor
R12	Encoding, heat pump; 3480 Ohm
R13	Sensor mixing circuit 1
Y4	Accessories: Process water for thermostat

TRL	
TVL	
THG	
TWE	
TA	
TBW	
RFV	
TWA	
CW	
TB1	
BWT	

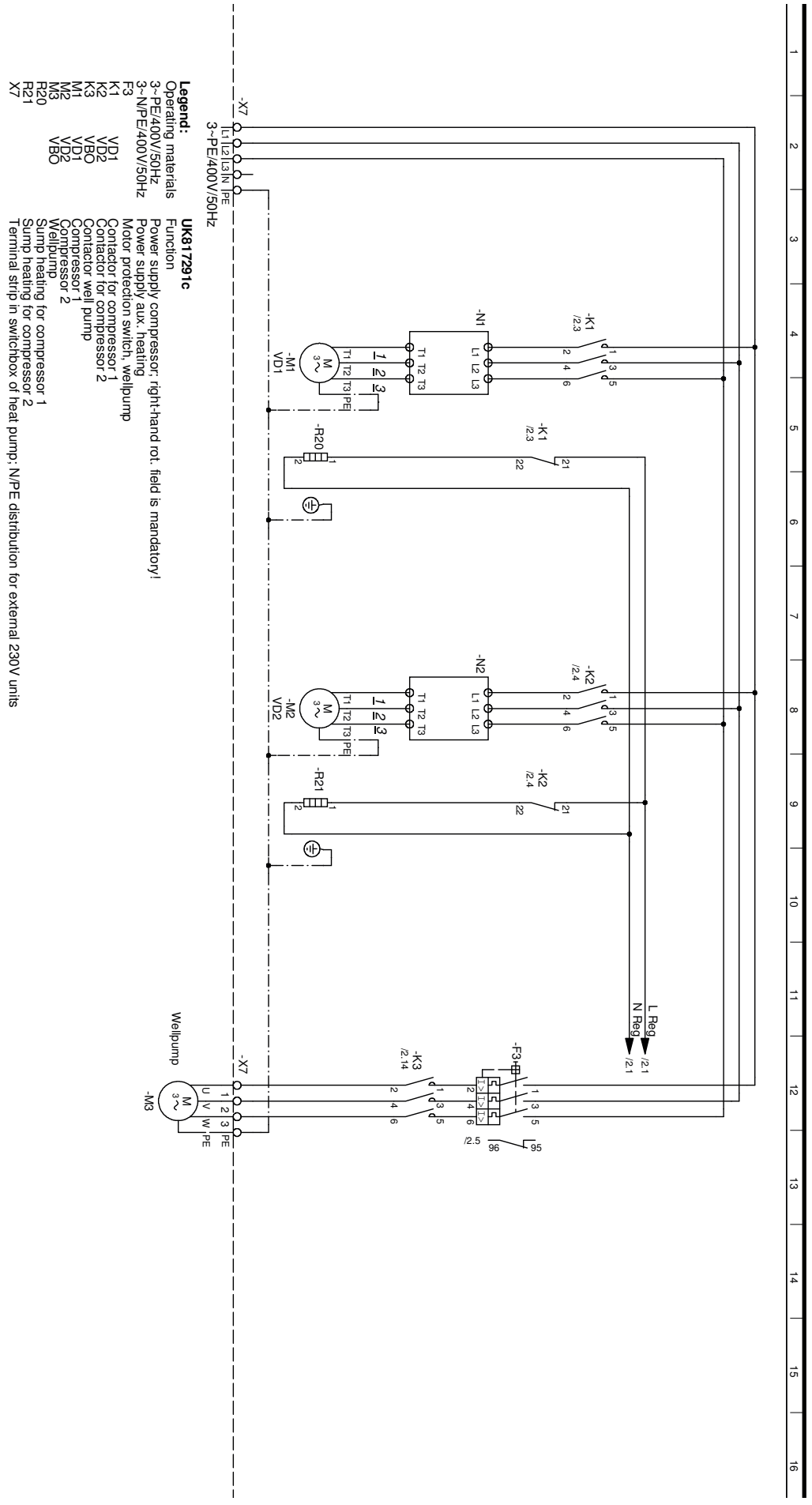
UK817290d

Function

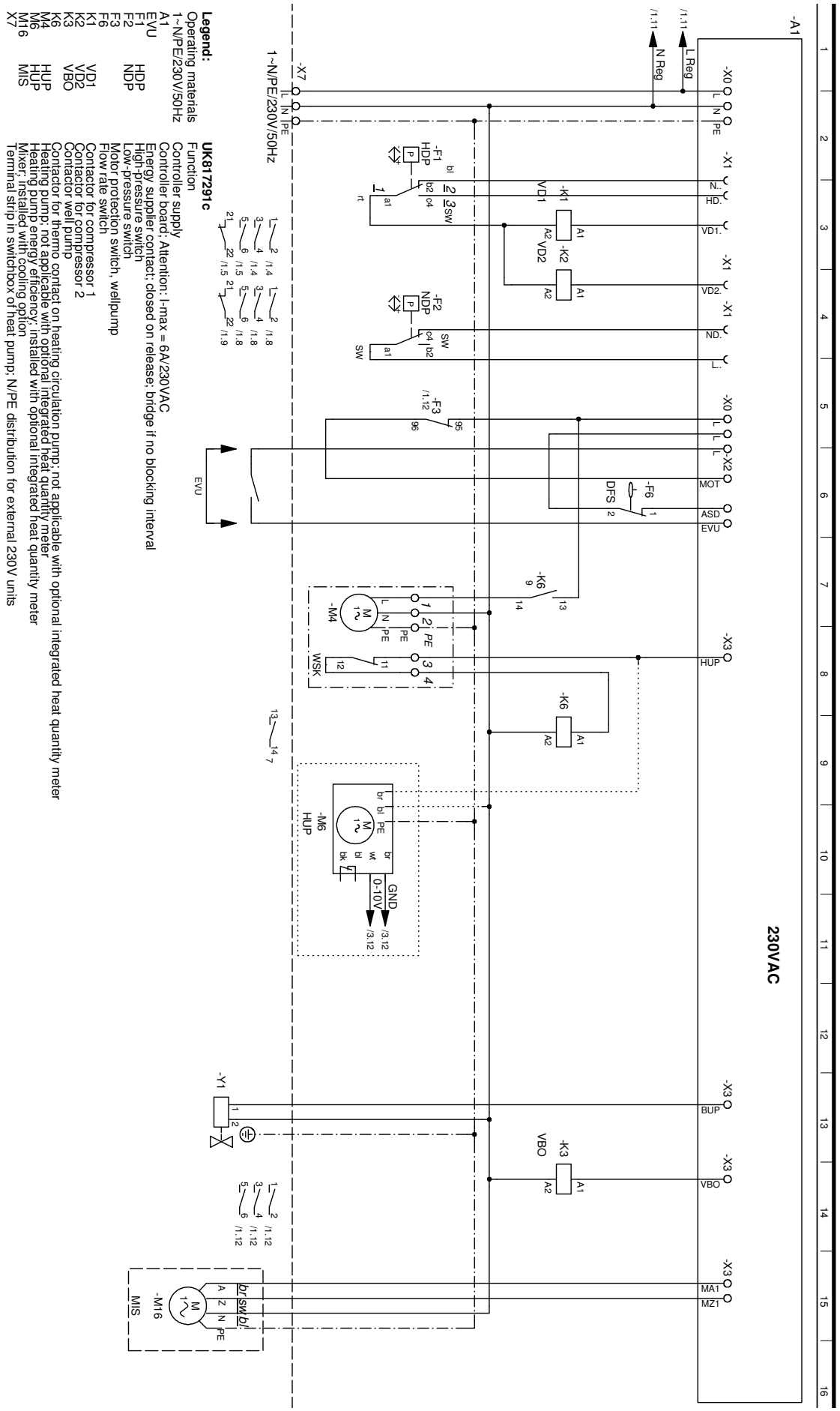
Controller board: Attention: I-max = 6A/230VAC

Comfort board: installed in the Energy Efficiency option

Circuit diagram 1/3



Circuit diagram 2/3

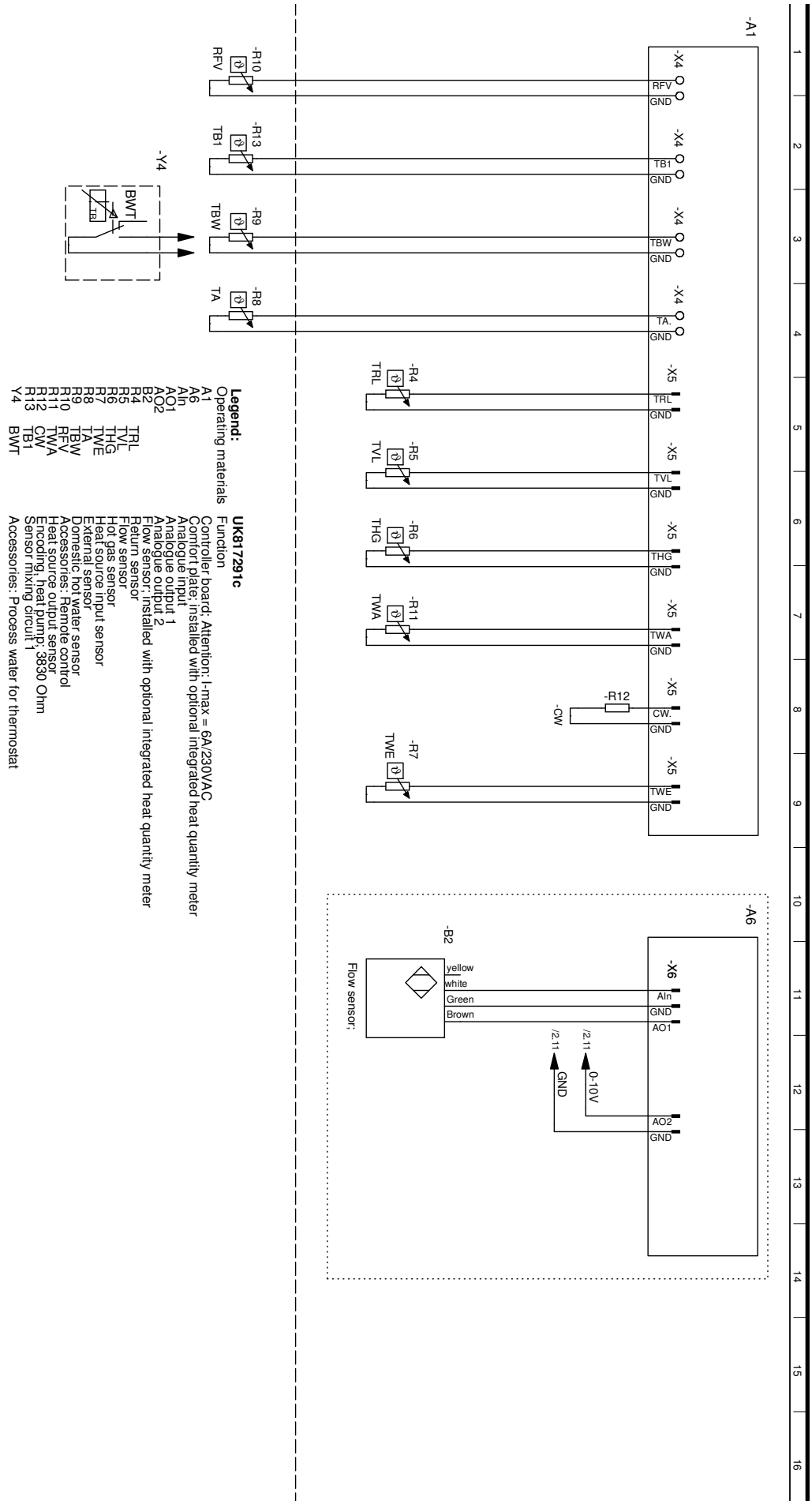


Legend:

UK817291c

Operating materials	Function
1~N/PE/230V/50Hz	Controller supply
A1	Controller board; Attention: I-max = 6A/230VAC
EVU	Energy supplier contact; closed on release; bridge if no blocking interval
F1 HDP	High-pressure switch
F2 NDP	Low-pressure switch
F3	Motor protection switch, wellpump
F6	Flow rate switch
K1 VD1	Contactor for compressor 1
K2 VD2	Contactor for compressor 2
K3 VBO	Contactor well pump
K6	Contactor for thermo contact on heating circulation pump; not applicable with optional integrated heat quantity meter
M4	Heating pump; not applicable with optional integrated heat quantity meter
M6 HUP	Heating pump energy efficiency; installed with optional integrated heat quantity meter
M16 MIS	Mixer; installed with cooling option
X7	Terminal strip in switchbox of heat pump; N/PE distribution for external 230V units

Circuit diagram 3/3



Legend:

Operating materials	Function
A1	Controller board; Attention: I-max = 6A/230VAC
A6	Comfort plate; installed with optional integrated heat quantity meter
AIn	Analogue input
AO1	Analogue output 1
AO2	Analogue output 2
B2	Flow sensor; installed with optional integrated heat quantity meter
R4	Return sensor
R5	Flow sensor
R6	Hot gas sensor
R7	Heat source input sensor
R8	External sensor
R9	Domestic hot water sensor
R10	Accessories: Remote control
R11	Heat source output sensor
R12	Encoding, heat pump; 3830 Ohm
R13	Sensor mixing circuit 1
Y4	Accessories: Process water for thermostat

TRL
TVL
THG
TWE
TA
TBW
RFV
TWA
CW
TB1
BWT

UK817291c

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 alpha innotec

Unit model	Number	Unit model	Number
WWC 100H/X	100 481		
WWC 130H/X	100 482		
WWC 160H/X	100 483		
WWC 190H/X	100 484		
WWC 220H/X	100 485		
WWC 280X	100 486		
WWC 440X*	100 487		

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:

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