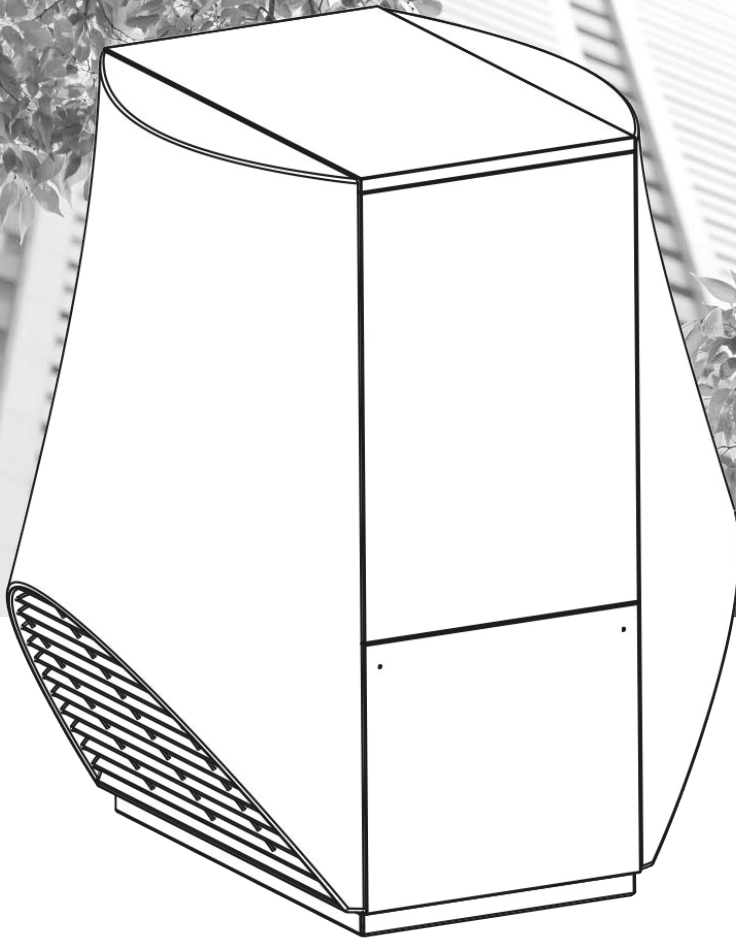
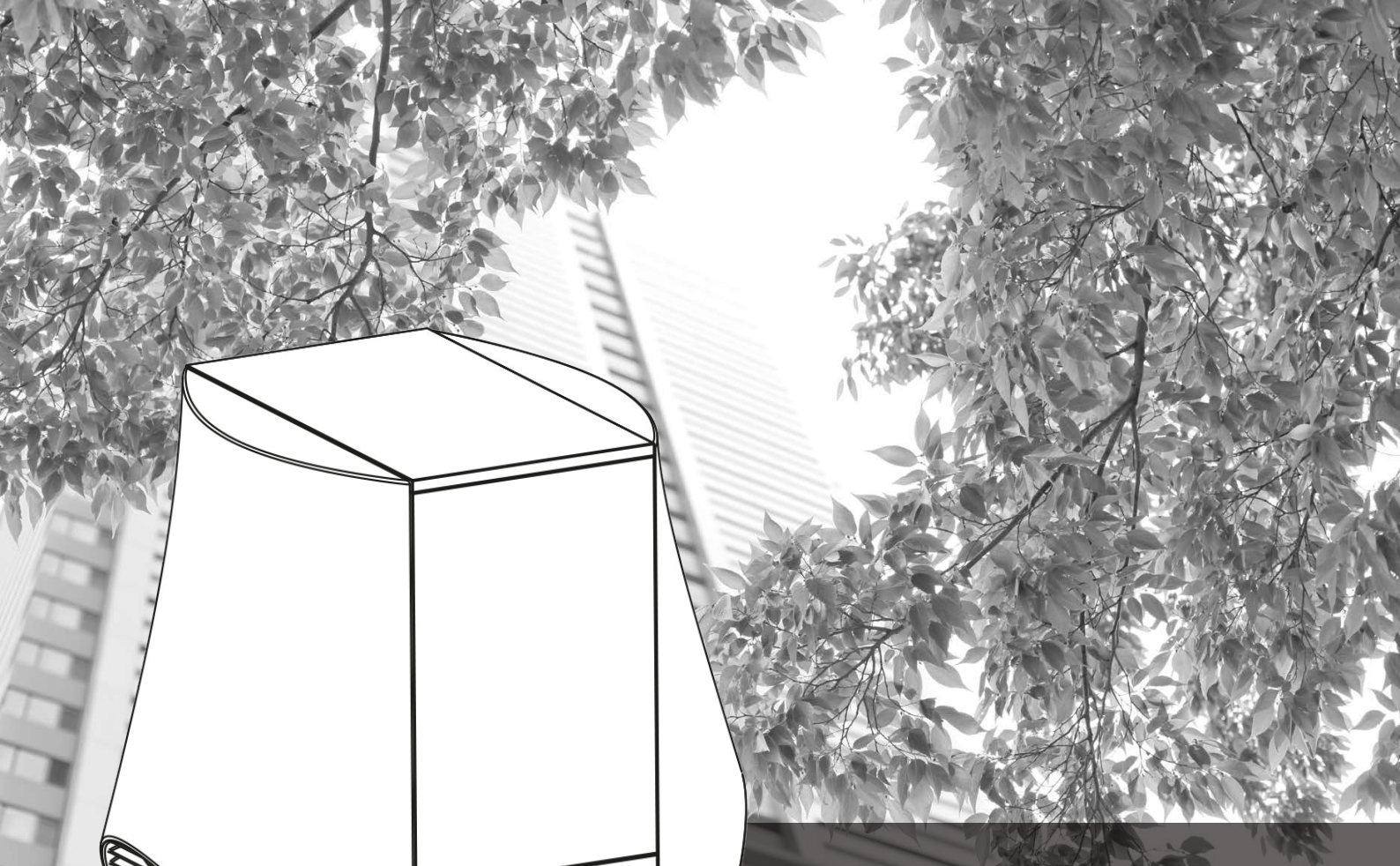


the better way to heat



Air/Water Heat Pumps
Outdoor installation

Operating Manual

LW 140A – LW 251A





1 Please read first

This operating manual provides important information on the handling of 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 entire service life of the unit. It must be handed over to subsequent owners or operators of the unit.

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

It is possible that this operating manual may contain instructions that seem incomprehensible or unclear. In case of questions or uncertainty, contact the factory customer service department or the manufacturer's local service 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 operate the unit. Treat all constituent parts confidentially. The information contained herein is protected by copyright. No part of this operating manual may be reproduced, transmitted, copied, stored in electronic data systems or translated into another language, either wholly or in part, without the express written permission of the manufacturer.

2 Symbols

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



Information for users.



Information or instructions for qualified technicians.



DANGER

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



WARNING

Indicates a possibly dangerous situation that could result in severe injuries or death.



CAUTION

Indicates a possibly dangerous situation that could result in medium or light injuries.



IMPORTANT

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



NOTE

Emphasized information.



Prerequisite for an action.



Single-step instruction for action.

1., 2., 3., ... Numbered step within a multi-step instruction for action. Adhere to the given sequence..



List.



Reference to further information elsewhere in the operating manual or in another document.



ENERGY SAVING TIP

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



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3 Intended use

The unit may be used only for the intended use. This means:

- for heating.
- for heating hot water.

The unit may be operated only within its technical parameters.

→ “Technical data/scope of delivery“, from page 22



NOTE

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



CAUTION

The unit is not suitable for use in IT network systems.

4 Exclusion of liability

The manufacturer will not be liable for damage resulting from unauthorized use of the unit.

The manufacturer's liability will also be voided in the following cases:

- if work is performed on the unit and its components in a manner that does not comply with the terms of this operating manual;
- if work is performed on the unit and its components in an improper manner;
- if work is performed on the unit that is not described in this operating manual, and this work was not expressly approved in writing by the manufacturer;
- if the unit or components in the unit are modified, redesigned or removed without the express written permission of the manufacturer.

5 EC conformity

The unit bears the CE mark of conformity.

→ “EC declaration of conformity“, page 43

6 Safety

The unit is safe to operate when used for its intended purpose. 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.

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

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

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

Children must not play with the product.

The product may only be opened by qualified personnel.

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

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

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

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



During the warranty and guarantee period, service work and repairs may only be carried out by personnel authorised by the manufacturer.



DANGER

Danger of fatal injury due to electric current!

Electrical connections may be installed only by qualified electricians.

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

Existing earthing connections within housings or on mounting plates must not be altered. If this should nevertheless be necessary in the course of repair or assembly work:

- ▶ Restore earthing connections to their original condition after completion of the work.



IMPORTANT

If using the unit in 3~230V systems, please note that the residual-current circuit breaker (RCCB) used must be AC-DC sensitive.



WARNING

Observe safety labels on and in the unit.



WARNING

Unit contains refrigerants!

Leaking refrigerant could result in personal injury or material damage. Therefore:

- Shut down unit.
- Notify the manufacturer's authorized service center.



IMPORTANT

For safety reasons:

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



IMPORTANT

Install the heat pump only outdoors and operate only with outside air as the heat source. Do not restrict or block the air-conducting sides.

- "Dimensional drawings", from page 27, and "Installation plans", from page 29, for respective unit model



WARNING

Never switch on unit if air flow baffles on the unit are removed.



IMPORTANT

The integration of the heat pump in ventilation systems is not permissible. The use of the cooled air for cooling purposes is not permitted.



IMPORTANT

The ambient air in the location where the heating pump is installed and also the intake air which is used as a source of heat must not contain any kind of corrosive components! Components such as ammonia, sulphur, chlorine, salt, sewer gas, flue gases etc. may cause damage leading to complete failure or even a total write-off of the heating pump!



CAUTION

In the air outlet area the air temperature is approx. 5 K below the ambient temperature. Under certain climatic conditions, an ice layer can therefore form in the air outlet area. Install the heat pump such that the air blower does not discharge into footpath areas.

Decommissioning / draining the heating

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

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



7 Contact

Addresses for purchasing accessories, for servicing or for answers to questions about the unit and this operating manual can be found on the internet and are kept up-to-date:

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

8 Warranty / Guarantee

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



NOTE

Please contact your dealer concerning warranties and guarantees.

9 Disposal

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

→ “30 Dismantling”, page 20

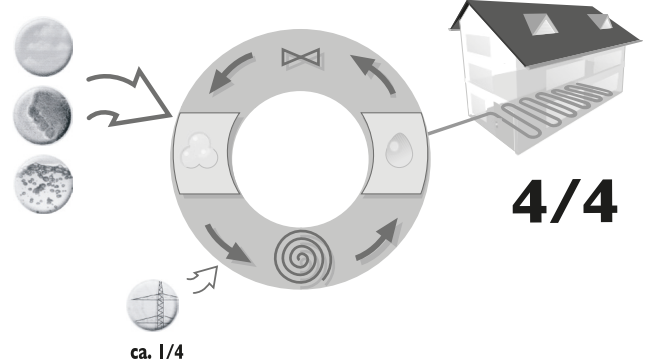
10 Operating principle of heat pumps

Heat pumps operate on the principle of a refrigerator: the same technology, only with the opposite effect. 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 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:

ca. 3/4



$\frac{4}{4}$ = usable energy
 approx. $\frac{3}{4}$ = environmental energy
 approx. $\frac{1}{4}$ = external electrical energy

11 Area of utilization

Taking into consideration the ambient conditions, limits of application and the applicable regulations, every heat pump can be utilized in new or existing heating systems.

→ “Technical data/scope of delivery“, from page 22



12 Heat quantity recording

In addition to the proof of the unit's efficiency, EEWaermeGalso meets the demand for a heat quantity recording (hereafter referred to as HQR). The HQR is mandatory with air/water heat pumps. With brine/ water and water/water heat pumps, a HQR may only be set up when a forward flow temperature of $\geq 35^{\circ}\text{C}$ has been reached. The HQR must record the total warm energy release (heating and hot water) in the building. In heat pumps with heat quantity recording, the analysis is conducted by the regulator. The regulator displays the thermal energy that is exchanged from the heating system in kWh.

13 Operation

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

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



NOTE

Make sure that the control settings are correct.

→ Operating manual of the heating and heat pump regulator

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



ENERGY SAVING TIP

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



ENERGY SAVING TIP

When letting in fresh air, do not leave windows open for an extended period, thus saving energy and reducing your heating costs.

14 Care of the unit

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

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



15 Scope of delivery

Packing unit 1:



Air flow baffles (quantity of 2, each in a separate box)

Packing unit 2:



Basis unit with fully hermetically enclosed compressor, all safety-related components for monitoring of cooling circuit and hose for condensate discharge (connected on heat pump side).

1. Inspect delivery for outwardly visible signs of damage.
2. Check to make sure that delivery is complete. Any defects or incorrect deliveries must be claimed immediately.



NOTE

Note the model.

→ “Technical data/scope of delivery“, from page 22

Accessories necessary for operation



IMPORTANT

Use only original accessories from the manufacturer of the unit.

Heating and heat pump controllers, as wall-mounted controllers or integrated in the hydraulic tower (for output range 14 – 18kW), as well as control and sensor cables, are functionally necessary accessories, which you must order separately.

The heat pump is a functioning unit only with the heating and heat pump regulator and the control and sensor wires.



Heating and heat pump regulator
(for wall mounting)

Control and sensor wires are available in various lengths, as required.

Additional accessories

You must order separately:

- installation accessories (vibration decouplers) for air/water outdoor installation heat pumps
- air / magnetic sludge separator



16 Installation and assembly

Observe the following when performing all work:

i NOTE
Always comply with applicable accident prevention regulations, statutory regulations, ordinances and directives.

i NOTE
Observe the sound levels of the respective model.

→ “Technical data/scope of delivery“, from page 22, “Sound” section.

16.1 Installation site requirements

- ✓ Perform installation outdoors only.
- ✓ Clearance dimensions are met
- “Dimensional drawings“, from page 27, and “Installation plans“, from page 29, for respective unit model

i NOTE
The noise emissions of the heat pumps must be taken into account in the respective installation plans for air/water heat pumps. The respective regional regulations must be observed.

- ✓ Free air intake and blowing air are possible without any air short-circuit.
- ✓ The surface is suitable for installation of the unit:
 - The foundation is level and horizontal
 - The surface and the foundation have a load-bearing capacity sufficient for the unit’s weight
- ✓ Ground surface in the air outlet area of the heat pump is permeable to water

16.2 Transport to installation site

To prevent damage during transport, always transport the unit to final installation site in its original packaging, using a lifting truck, forklift or crane.

! WARNING
Several people are required to transport the unit. Do not underestimate the weight of the unit.

→ “Technical data/scope of delivery“, from page 22, “General unit data” section.



WARNING
Unit is not fastened to the wooden pallet. Danger of tipping over during transport! This can result in personal injury and damage to the unit.

- ▶ Take suitable precautionary measures to eliminate the danger of tipping.

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

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

Lifting the unit with pipes only LW 140... and LW 180...

The units LW 140... and LW 180... can be lifted with $\frac{3}{4}$ ” pipes (provided by customer) that are suitable for the weight of the respective unit. Special holes are provided in the frame for this purpose.

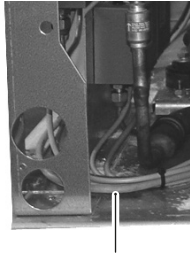
i NOTE
The unit type LW 251A cannot be lifted with pipes.

1. Remove the lower facing panels of the unit.
→ “16.4 Attaching the air flow baffles“, page 11, point 1.
2. Insert the pipes through the holes in the frame on the switch box side.





Makesurethatpipesdonotdamagecableassemblies and components in the unit.



Guide pipes carefully past cable assemblies and components in the unit.

3. Guide pipes out through the holes on the water connection side.

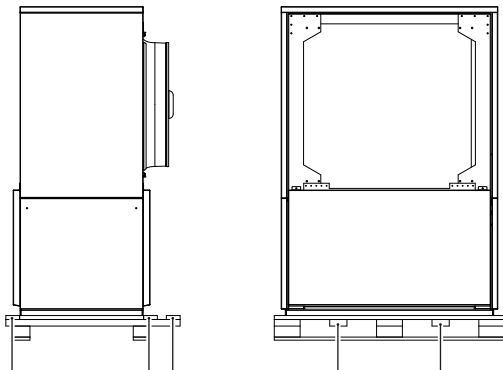


4. Lift unit by the pipes, with at least four persons, and place on the base. Make sure that the frame of the unit is in full contact with the underlying surface.

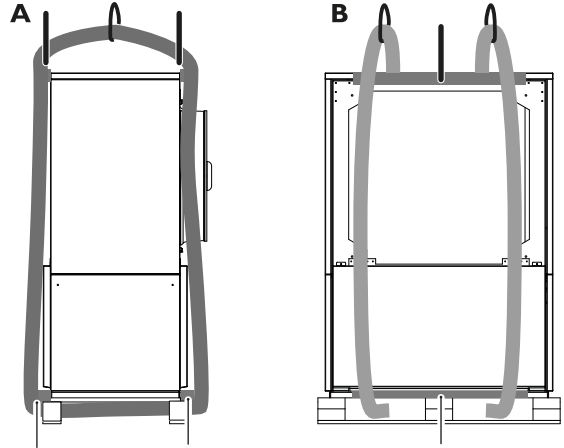
Lifting the unit with a crane

NOTE
The unit type LW 251A must be lifted with a crane.

1. Remove side laths on the wooden pallet.



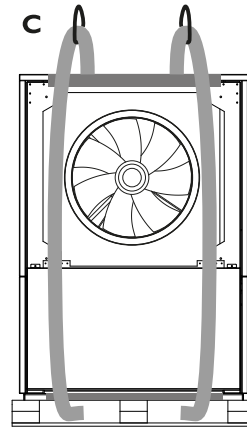
2. Guide lifting straps under the unit. Insert laths or beams between the lifting straps and the unit in order to prevent damage to the housing, or remove facing panels (see removal instructions under "Attaching air flow baffles").



A Front view (switch box side)
B Side view 1



DANGER
Lifting straps should not be too close together or too near the center; otherwise the unit may tip!



C Side view 2



IMPORTANT
Guide lifting straps past the fan on the side. Make sure the straps do not press against the fan during transport.

3. Lift unit with the crane and place on the base. Make sure that the frame of the unit is in full contact with base.



16.3 Installation



CAUTION

In the air outlet area the air temperature is approx. 5 K below the ambient temperature. Under certain climatic conditions, an ice layer can therefore form in the air outlet area. Install the heat pump such that the air blower does not discharge into footpath areas.



IMPORTANT

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



NOTE

Always observe the installation plan for the respective unit model. Note the size and minimum clearances.

→ "Installation plans", from page 29, for respective unit model

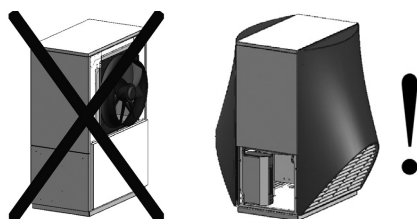
Set up the unit so that the switch box side is accessible at all times.

16.4 Attaching the air flow baffles



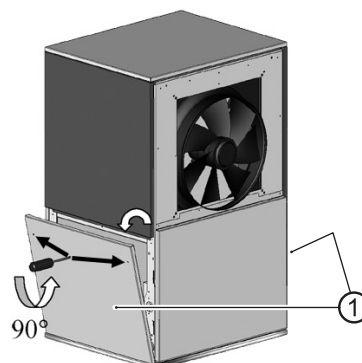
WARNING

Unit has rotating parts. For safety reasons, mount the two air flow baffles on the unit before continuing with any other work.



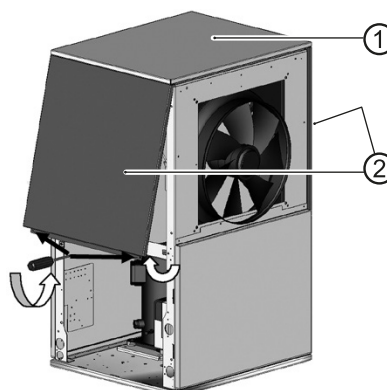
1. If you have not already done so, remove lower facing panels on the switch box and water connection side of the unit.
- 1.1. To do so, loosen the two quick-release screws on the lower facing panels.

- 1.2. Pull each facing panel forward, detach from the unit and set securely aside.



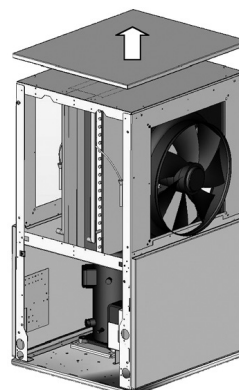
1 lower facing panels

2. Remove upper facing panels from unit.
- 2.1. To do so, loosen the two screws on the lower edges of the upper facing panels.
- 2.2. Pull each facing panel downward and forward, detach from top cover of unit and set securely aside.



1 top cover of unit
2 upper facing panels

3. The top cover of the unit was fastened by the upper facing panels. After removal of the upper facing panels, the top cover is loose. Remove top cover and set securely aside.





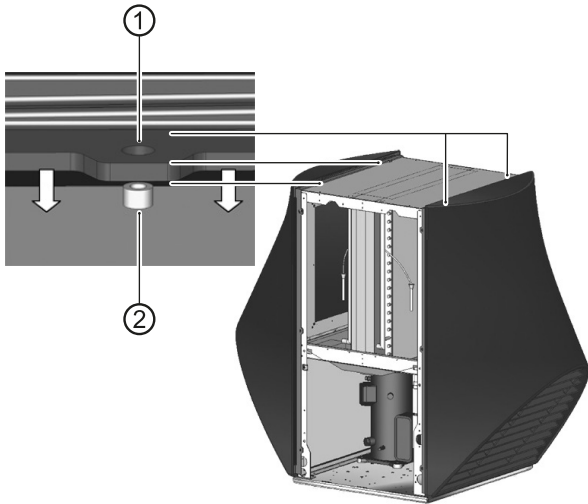
4. Install air flow baffles.



IMPORTANT

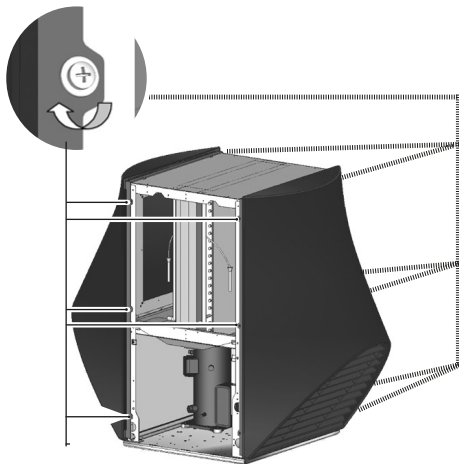
Remove the protective sheeting from the air flow baffles before installation

- 4.1. Suspend air flow baffles on the brass bushings on the top side of the frame.

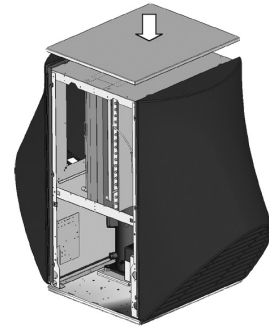


- 1 eyelet on air flow baffle
- 2 brass bushing on frame

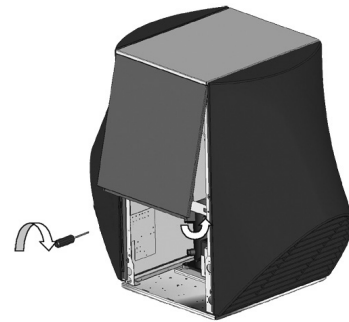
- 4.2. Bolt air flow baffles to the frame on the switch box side and water connection side.



5. Return top cover to frame.



6. Suspend upper facing panels in the top cover. Bolt to the frame at bottom.



The air flow baffles are now installed. You can now carry out mounting and installation work on the unit, and afterwards attach the lower facing panels. (see "Electrical connection work", "Heat pump side connection of control and sensor wires", 6).



16.5 Installation / connection to heating circuit

! IMPORTANT

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

- ▶ Ensure that a sludge separator is installed in the hydraulic system.
- ▶ Rinse the hydraulic system thoroughly prior to establishing the hydraulic connection of the heat pump.

! IMPORTANT

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

→ “Hydraulic connection” instructions

i NOTE

Check to make sure that the diameters and lengths of the pipes for the heating circuit (including the ground lead between the heat pump and the building!) are sufficiently dimensioned.

i NOTE

Circulating pumps must be multi-stage. They must be able to deliver at least the minimum hot water flow rate required for your model.

→ “Technical data/scope of delivery“, from page 22, “Heating circuit” section

! IMPORTANT

The hydraulic system must be equipped with a buffer tank, the required volume of which depends on the model of your unit.

→ “Technical data/scope of delivery“, from page 22, “Heating circuit” section, “buffer tank”

! IMPORTANT

When installing the connections, always secure the connections on the unit from twisting, in order to prevent damage to the copper pipes in the interior of the unit.

1. Install the outside pipes of the heating circuit beneath the frost line.
2. Install shut-off devices for the hot water outflow (forward flow) and hot water inflow (return flow) on the heat pump side.



NOTE

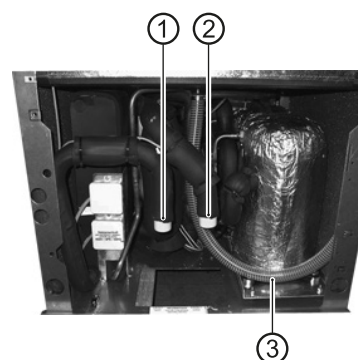
During installation of the shut-off devices, the liquefier of the heat pump can be rinsed, if necessary.

3. Connect the unit to the pipes of the heating circuit via vibration decouplers. They must be installed in order to prevent damage from vibrations to the pipes.



NOTE

If an existing system is being replaced, the old vibration decoupling may not be reused. Vibration decouplers are available as accessories.



- 1 Hot water inflow (return flow) connection
- 2 Hot water outflow (forward flow) connection
- 3 Condensate water hose

4. Install the condensate water hose in the unit so that there is no contact with refrigerant pipes.
5. Make sure that frost-free condensate discharge is ensured.
 - “Installation plans“, from page 29, for respective unit model
 - Heat pump planning & design manual
6. Seal empty pipes on unit side.

16.6 Condensate discharge

The condensate from the air must be discharged frost-free via a condensate pipe with a minimum diameter of 50 mm. For underlying surfaces that are permeable to water, it is sufficient to insert the condensate pipe vertically at least 90 cm into the ground. If the condensate is discharged into drainage or sewage systems, install frost-free with gradient.

Discharge of the condensate into the sewage system is permitted only via a funnel siphon, which must be accessible at all times.



17 Pressure relief

Equip the heating circuit in accordance with local standards and directives with a safety valve and an expansion tank.

Also install filling and emptying devices, shut-off devices and non-return valves in the heating circuit.

18 Overflow valve

Use an overflow valve for tanks integrated in series to ensure the minimum flow rate of the heating circuit volume flow through the heat pump. The overflow valve must be dimensioned so that the minimum flow rate of the volume flow through the heat pump is ensured when the heating circuit is shut off.

→ “26 Set the overflow valve”, page 17

19 Buffer tank

The hydraulic connection of the heat pump requires a buffer tank in the heating circuit. The required volume of the buffer tank is calculated based on the following formula:

$$V_{\text{Pufferspeicher}} = \frac{\text{Minimum flow rate of heat circuit volume flow / hour}}{10}$$

→ For the minimum flow rate of the heat circuit volume flow, see “Technical data/scope of delivery”, from page 22, “Heating circuit” section

In mono-energetic air/water systems, integrate the buffer tank in the heating water outflow (forward flow) before the overflow valve.

20 Circulating pumps



CAUTION

Always note the model.

Do not use regulated circulating pumps.

Circulating pumps and domestic hot water circulation pumps must be multi-stage pumps.

21 Water heating

Water heating with the heat pump requires an additional hot water circuit, parallel to the heating circuit. Make sure that the heating water charge is not channeled through the buffer tank of the heating circuit.

→ “Hydraulic connection” instructions

22 Hot-water tank

If the heat pump will be used for heating hot water, you must integrate special hot-water tanks in the heat pump system. The storage volume must be sufficient so that the required hot water quantity is available even during a power outage.



NOTE

The heat exchanger surface of the hot water tank must be dimensioned so that the heating capacity of the heat pump is transferred with minimal spreading.

We offer a variety of hot-water tanks for you to choose from. They are optimized for use with your heat pump.



NOTE

Integrate the hot-water tank in the heat pump system corresponding to the hydraulic diagram for your system.



23 Electrical connections

Observe the following when performing all work:



DANGER

Danger of fatal injury due to electric current!

Electrical connections may be installed only by qualified electricians.

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



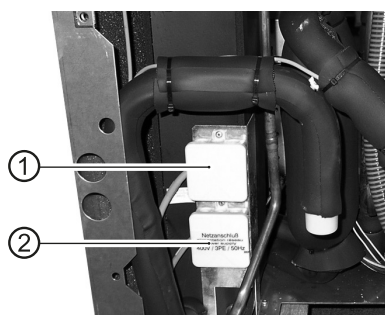
WARNING

Observe the relevant EN, VDE and/or applicable local safety regulations during the installation and during all electrical work. Comply with technical connection requirements of the responsible power supply company (if required by the latter)!

Power connection

The power is connected at the connection boxes on the water connection side.

1. If the unit is closed, open lower facing panel on the water connection side.
→ “16.4 Attaching the air flow baffles”, page 11, point 1
2. Open connection boxes.



- 1 Connection box for electric heating element
- 2 Connection box for compressor

3. Connect power cable to the connection box.
4. Close connection box.

5. Install power cable in a conduit as far as where it enters the building and from there on to the fuse box.
6. Connect power cable to power supply.

! IMPORTANT

Ensure clockwise rotary field of the load power supply (compressor).

- An incorrect rotary field of the compressor during operation can cause serious, irreparable damage to the compressor.

! IMPORTANT

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

Note the level of the release current.

→ “Technical data/scope of delivery“, from page 22, “Electric” section.

! IMPORTANT

If using the unit in 3~230V systems, please note that the residual-current circuit breaker (RCCB) used must be AC-DC sensitive.

Heat pump side connection of the control and sensor wires

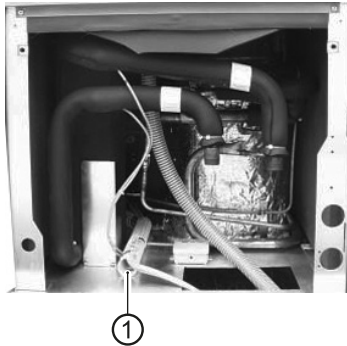
The heat pump is connected to the heating and heat pump regulator by means of the control and sensor wires. They are connected at the electric switch box on the switch box side of the heat pump.

1. Screw control and sensor wires to the two connectors on the side of the electric switch box.





2. Guide control and sensor wires inside the unit through the provided cable duct to the water connection side.



1 Cable duct for control and sensor wires

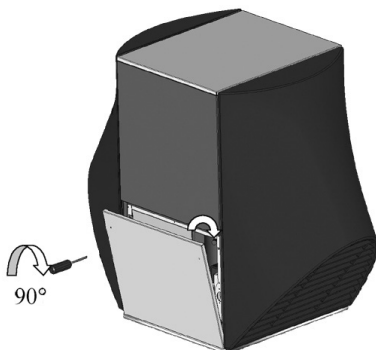
3. Guide control and sensor wires out of the unit.



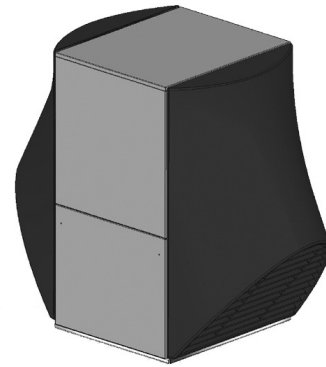
NOTE

In order to enable unHINGING of the electric switch box in the event that customer service is necessary, the control and sensor wires in the heat pump must have an excess length of about 15 cm.

4. Install control and sensor wires in a conduit as far as where they enter the building and from there on to the heating and heat pump regulator.
5. Connect control and sensor wires to the heating and heat pump regulator according to the terminal connection diagram and the circuit diagrams for the respective model.
 - “Terminal diagram”, page 35, and “Circuit diagrams”, from page 36, for the respective model
 - Operating manual of the heating and heat pump regulator
6. Seal empty pipes on unit side.
7. Screw facing panels onto the heat pump. Place lower facing panels diagonally into the frame, close at top and fasten with in quick-release screws.



The unit is now closed.



24 Rinsing, filling and bleeding the system



IMPORTANT

The system must be absolutely free from air before commissioning.

Unsuitable quality of the water for filling up and replenishing the heating circuit

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

If the system is filled with untreated drinking water, calcium deposits will form as scale. Lime scale deposits accumulate on the heat transfer surfaces of the heating. The efficiency is reduced and energy costs increase. In extreme cases, the heat exchangers will be damaged.

Heating water quality



NOTE

- For detailed information refer, among other things, to the VDI Guidelines 2035 “Vermeidung von Schäden in Warmwasserheizanlagen” (preventing damage in hot water heating systems)
 - Required pH value: 8.2 ... 10;
for aluminium materials:
pH value: 8.2 ... 8.5
- ▶ Fill the system with deionised heating water (VE water) or with water corresponding to the VDI 2035 norm only (low-salt operation of the system).



Advantages of low-salt operation:

- Low corrosion-promoting properties
 - No formation of mineral scale
 - Ideal for closed heating circuits
 - Ideal pH value due to self-alkalisation after filling the system
- ▶ If the required water quality is not achieved, consult a company specialising in the treatment of heating water.
- ▶ Keep a system log for hot water heating systems in which relevant planning data is entered (VDI 2035).

Antifreeze in the heating circuit

For air/water heat pumps installed outdoors, it is not necessary to fill a water/antifreeze mixture into the heating circuit.

The heat pumps have safety devices that prevent the water from freezing, even when the heating is switched off. A prerequisite is that the heat pump remains switched on and is not disconnected from the mains. Should there be a risk of frost, the circulation pumps are activated.

The following points must be observed if antifreeze is added, depending on the concentration of the mixture:

- Heat output of the heat pump is reduced
- COP value becomes worse
- In the case of on-site circulating pumps, the delivery rate is reduced; in the case of integrated circulating pumps, the specified free pressure drops
- The compatibility of the material of the components used with the antifreeze mixture must be ensured

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.

Rinsing, filling and bleeding

1. Rinse and fill the heating circuit and bleed it at the highest point.
2. In addition, open the bleeding valve on the condenser of the heat pump. Bleed condenser.

25 Insulating the hydraulic connections

Insulate hydraulic lines in accordance with the local regulations.

1. Open shut-off devices.
2. Perform a pressure test and check for leaks.
3. Insulate the vibration decouplers and the outside pipes of the heating circuit so that they are sealed against vapor diffusion.
4. Insulate all connections, fittings and pipes.
5. Insulate the condensate drain in a frost-proof manner.
6. The unit must be completely closed on all sides to ensure rodent protection.

26 Set the overflow valve



REMARQUE

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

Complete the worksteps quickly, otherwise the maximum return temperature can be exceeded and the heat pump switches to high-pressure fault.

Turn the adjusting knob at the overflow valve to the right to increase the temperature difference (the temperature drop), turn it to the left to reduce it.

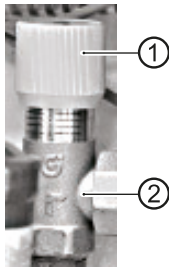
System is running in heating mode (ideally in cold condition).

1. In case of low heating curve: Set the system to "Forced heating".
- Operating manual of the heating and heat pump controller
2. Shut off valves to the heating circuit.
 3. Ensure that the total flow is routed via the overflow valve.
 4. Read out the flow and return temperature at the heating and heat pump controller.
- Operating manual of the heating and heat pump controller



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

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



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

27 Commissioning



DANGER

Prior to commissioning the unit, the air flow baffles must be mounted and the facing panels closed.



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:
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!

28 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, circulating pumps, filters, dirt traps) should be inspected as well as cleaned as needed - at the very least annually - by a qualified heating or cooling system technician.

! IMPORTANT

Check regularly to ensure that the condensate can drain out of the unit unobstructed. To this end, regularly check the condensate pan in the unit and the condensate drain to ensure that they are clean / free from obstructions and clean as needed.

Always regularly control for unimpeded air infeed accordingly. Constrictions or even blockages which, for example occur

- when applying house insulation with polystyrene balls
- through packaging material (foils, films, cartons etc.)
- through foliage, snow, icing or similar weather-related deposits
- through vegetation (bushes, tall grass etc.)
- through air shaft covers (fly protection screens etc.)

and which must be prevented and/or removed immediately.

Icing of the protective grating

When temperatures fall below freezing and high levels of humidity are present, ice can form on the protective grating of the air flow baffles. In order to ensure problem-free operations, the ice must be removed on a regular basis.

28.1 Annual maintenance

- ▶ Determine the quality of the heating water by analysis. In the event of deviations from the specifications, take suitable measures without delay.

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



NOTE

Any person who works on the refrigerant circuit must have a qualification certificate issued by a body accredited by the industry.

28.2 Cleaning and rinsing of unit components



CAUTION

Unit components may be cleaned and rinsed only by customer service personnel authorized by the manufacturer. Use only liquids recommended by the manufacturer. Rinsing of the liquefier with chemical cleaning agents must be followed by neutralization of residue and intensive rinsing with water. Always observe the technical data of the manufacturer of the heat exchanger.



29 Malfunctions

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

→ Operating manual of the heating and heat pump regulator



WARNING

Service and repair work on the components of the unit may be performed only by customer service personnel authorized by the manufacturer.



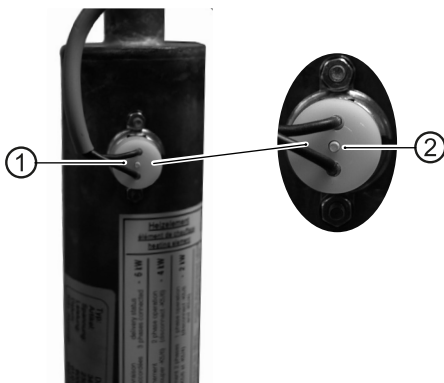
NOTE

If the safety temperature limiter on the electric heating element (depending on unit model) has tripped, no fault is displayed.

29.1 Unlock the safety temperature limiter

A safety temperature limiter is installed in the electric heating element (depending on unit model). If the heat pump fails or there is air in the system:

- ▶ Check whether the reset button (②) of the safety temperature limiter (①) has jumped out (by approx. 2 mm).



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

30 Dismantling



DANGER

Danger of fatal injury due to electric current!

Electrical connections may be installed only by qualified electricians.

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



WARNING

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



IMPORTANT

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

30.1 Removal of the buffer battery



IMPORTANT

Before scrapping the heating and heat pump regulator, remove the buffer battery on the processor board. The battery can be pushed out using a screwdriver. Dispose of battery and electronic components in keeping with environmental considerations.





Technical data / scope of delivery

Heat pump type	Brine/water Air/water Water/water	• applicable — not applicable
Installation location	Indoors Outdoors	• applicable — not applicable
Conformity		CE
Performance data	Heating capacity/COP at	
	A7/W35 Standard point acc. to DIN EN14511-x: 2013	2 Compressors 1 Compressor kW ... kW ...
	A7/W45 Standard point acc. to DIN EN14511-x: 2013	2 Compressors 1 Compressor kW ... kW ...
	A2/W35 Operating point according to DIN EN14511-x: 2013	2 Compressors 1 Compressor kW ... kW ...
	A10/W35 Operating point according to DIN EN14511-x: 2013	2 Compressors 1 Compressor kW ... kW ...
	A-7/W35 Operating point according to DIN EN14511-x: 2013	2 Compressors 1 Compressor kW ... kW ...
	A-15/W65	2 Compressors 1 Compressor kW ... kW ...
Limits of application	Heating circuit	°C
	Heat source	°C
	Additional operating points	°C
Sound	Internal sound pressure level (open air test field, distance of 1m around the engine, average)	dB(A)
	External sound pressure level (open air test field, distance of 1m around the air supplies, average)	dB(A)
	Sound power inside	dB(A)
	Sound power outside	dB(A)
Heat source	Air volume flow at maximum external compression	m ³ /h
	Maximum external pressure	Pa
Heating circuit	Volume flow: minimum flow rate nominal flow rate A7/W35 DIN EN14511-x: 2013 maximum flow rate	l/h
	Pressure loss heat pump Δp volume flow	bar l/h
	Free compression heat pump Δp volume flow	bar l/h
	Content of buffer tank	l
	3-way valve, heating/hot water	...
General unit data	Dimensions (see dimensional drawing for the specified unit size)	unit size
	Total weight	kg
	Connections Heating circuit	...
	Heat source	...
	Refrigerant Refrigerant type Quantity	... kg
	Free cross section, air channels	mm
	Cross section, condensate water / length from unit	mm m
Electric	Voltage code all-pole circuit breaker heat pump **)	... A
	Voltage code circuit breaker control voltage **)	... A
	Voltage code circuit breaker electric heating element **)	A
Heat Pump	Effective power consumption in standard point A7/W35 according to DIN EN14511-x: 2013: Power consumption current consumption $\cos\phi$	kW A ...
	Maximum device current within the limits of application	A
	Starting current: direct with soft starter	A A
	Protection type	IP
	Output electric heating element 3 2 1 phase	kW kW kW
Components	Circulating pump heating circuit at nominal flow rate: Power consumption current consumption	kW A
Safety equipment	Safety component heating circuit Safety component heat source	Includ. in sc. of del.: • yes — no
Heating and heat pump regulator		Includ. in scope of delivery: • yes — no
Control and sensor wire		Includ. in scope of delivery: • yes — no
Power cable to unit		Includ. in scope of delivery: • yes — no
Electronic soft starter		integrated: • yes — no
Expansion vessels	Heat source: Scope of delivery Volume Initial pressure	• yes — no bar
Overflow valve		integrated: • yes — no
Vibration decouplers	Heating circuit heat source	Included in scope of delivery: • yes — no

UK813517b

*) depending on components tolerances and flow **) comply with local regulations n.n. = not detectable w.w. = to choice

1) hot water return 2) hot water flow The performance data and the operating limits apply to clean heat exchangers

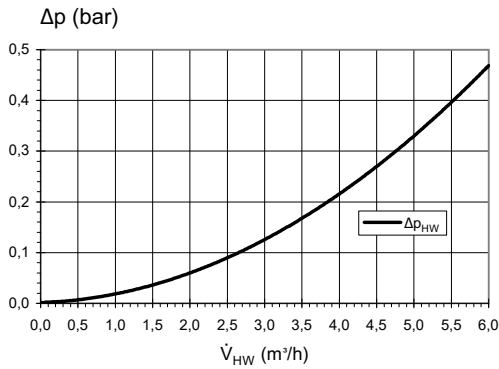
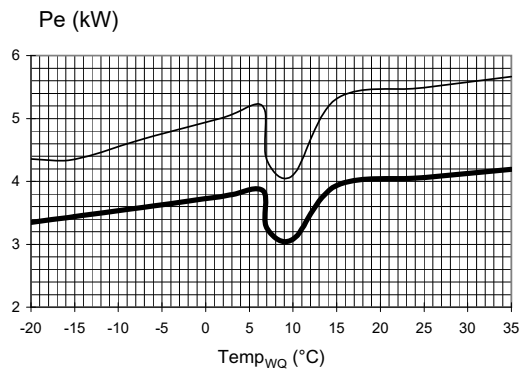
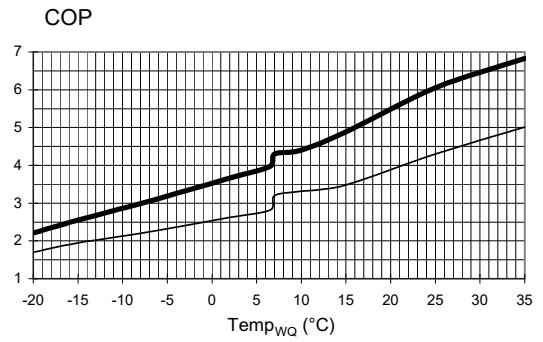
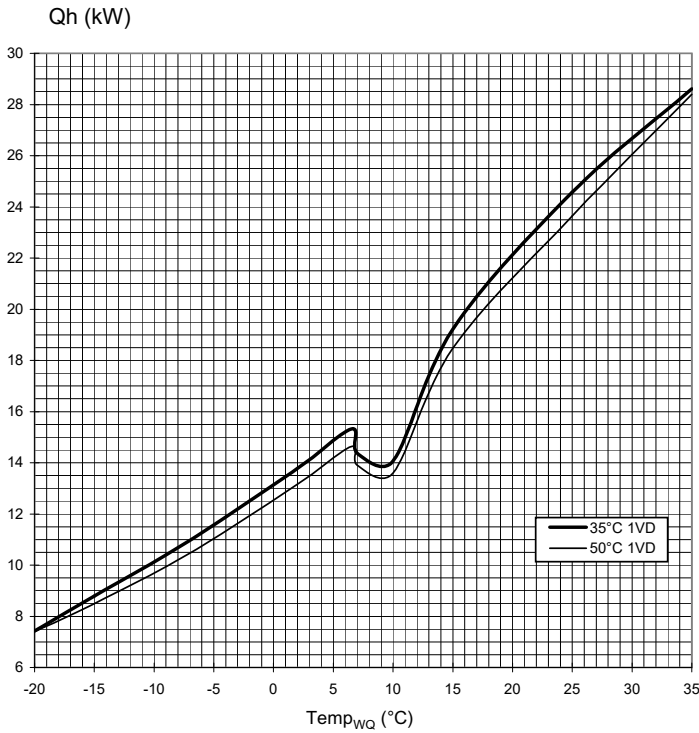


	LW 140A	LW 180A	LW 251A
	— • —	— • —	— • —
	— •	— •	— •
	•	•	•
	—	19.6 3.9	27.3 3.9
	14.4 4.3	10.1 4.2	14.1 4.2
	—	18.7 3.3	26.1 3.3
	13.9 3.5	9.8 3.4	13.7 3.4
	—	17.2 3.6	24.0 3.6
	13.8 3.7	9.5 3.8	13.2 3.8
	—	21.2 4.0	29.2 4.0
	14.1 4.4	10.3 4.5	14.2 4.5
	—	14.1 2.8	19.4 2.8
	10.8 3.0	7.3 2.9	10.1 2.9
	—	—	—
	—	—	—
	20 ¹ – 50 ²	20 ¹ – 50 ²	20 ¹ – 50 ²
	-20 – 35	-20 – 35	-20 – 35
	A> -7 / 60 ²	A> -7 / 60 ²	A> -7 / 60 ²
	—	—	—
	50	52	57
	—	—	—
	58	60	65
	5600	5600	7800
	—	—	—
	2000 2900 3600	2000 3800 4800	2500 5000 6200
	0.12 2900	0.18 3800	0.12 5000
	— —	— —	— —
	—	—	—
	—	—	—
	4	4	5
	370	420	540
	R5/4*AG	R5/4*AG	R5/4*AG
	—	—	—
	R407C 5.8	R407C 6.8	R407C 9.8
	—	—	—
	30 1	30 1	30 1
	3~N/PE/400V/50Hz C16	3~N/PE/400V/50Hz C20	3~N/PE/400V/50Hz C25
	1~N/PE/230V/50Hz B10	1~N/PE/230V/50Hz B10	1~N/PE/230V/50Hz B10
	3~N/PE/400V/50Hz B16	3~N/PE/400V/50Hz B16	3~N/PE/400V/50Hz B16
	3.4 7.0 0.7	5.0 (2.4) 10.3 (4.9) 0.7 (0.7)	7.0 (3.4) 14.4 (7.0) 0.7 (0.7)
	13.0	18.0	24.5
	74 26	51.5 30	74 30
	24	24	24
	9 6 3	9 6 3	9 6 3
	— —	— —	— —
	— —	— —	— —
	—	—	—
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	•	•	•
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	813514c	813515d	813516d



LW 140A

Performance curves



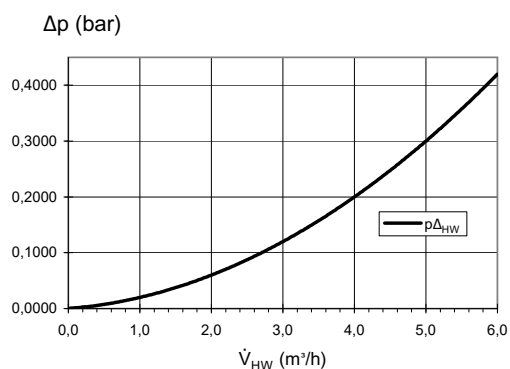
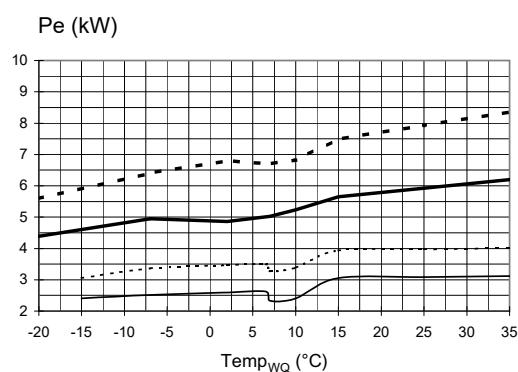
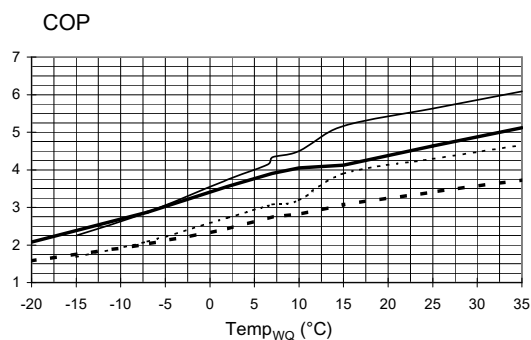
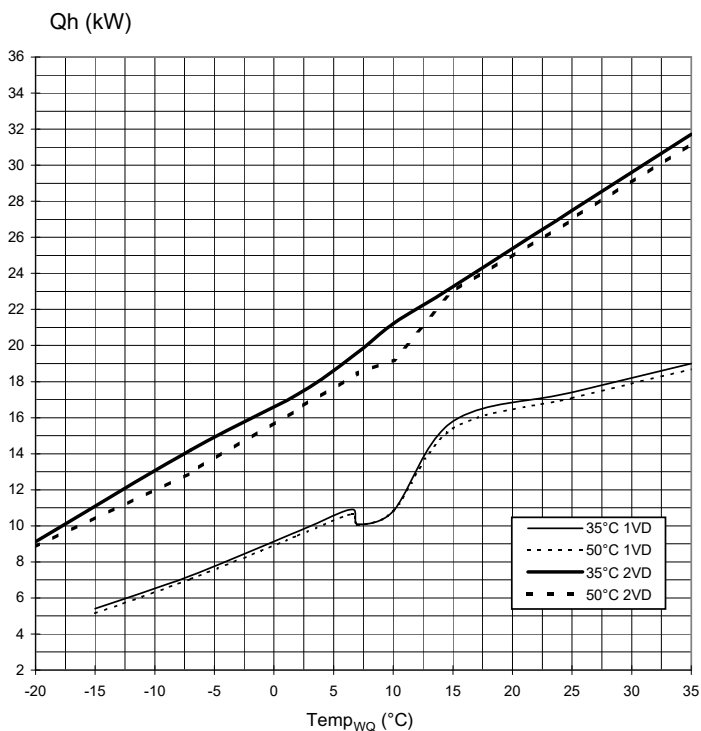
823154

Legend:	UK823129L/170408
V _{HW}	Volume flow, heating water
Temp _{wQ}	Temperature, heat source
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance / efficiency rating
Δp _{HW}	Pressure loss heat pump
VD	Compressor(s)



Performance curves

LW 180A



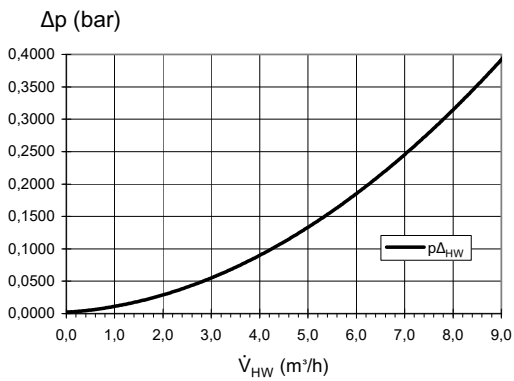
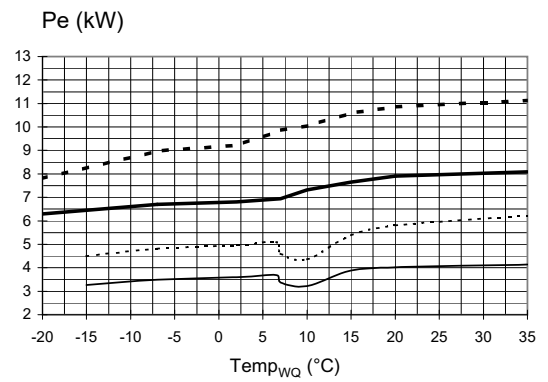
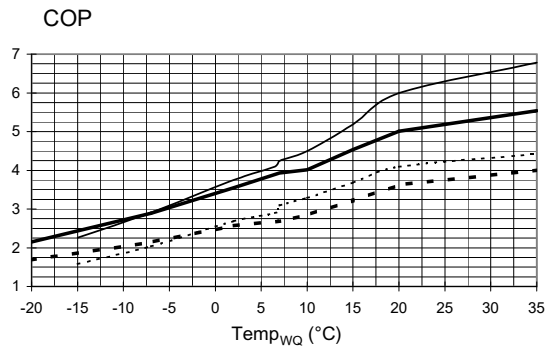
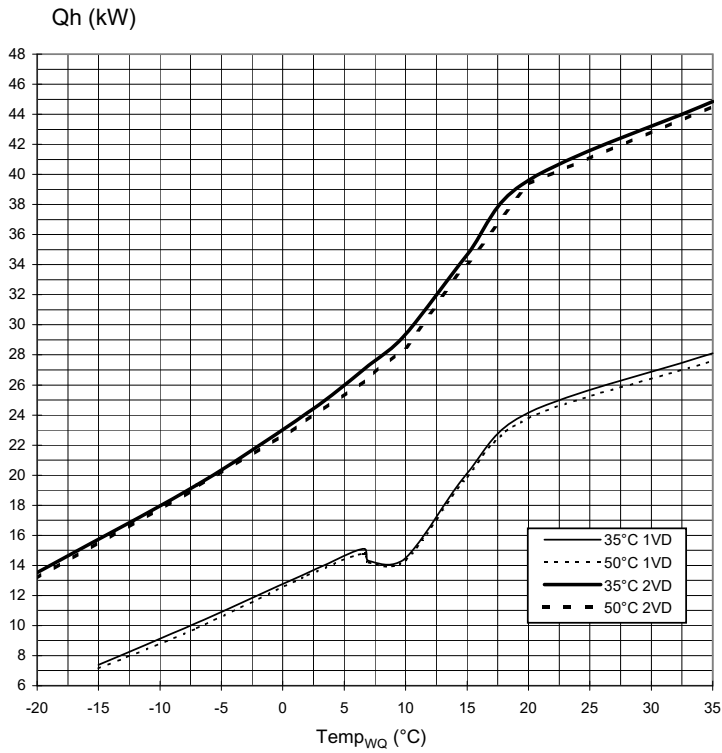
823155

Legend:	UK823129L/170408
\dot{V}_{HW}	Volume flow, heating water
$Temp_{wQ}$	Temperature, heat source
Q_h	Heating capacity
P_e	Power consumption
COP	Coefficient of performance / efficiency rating
Δp_{HW}	Pressure loss heat pump
VD	Compressor(s)



LW 251A

Performance curves



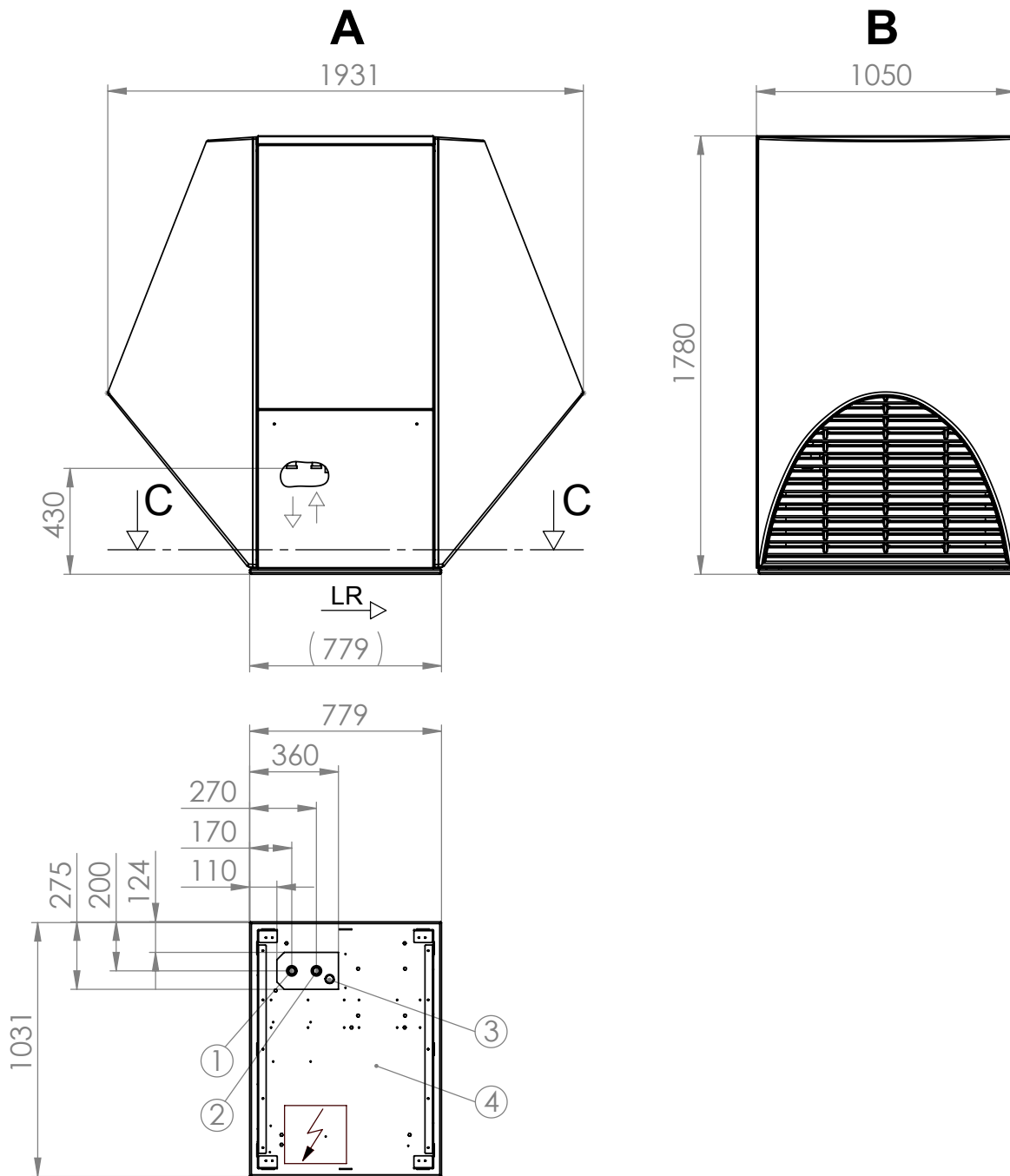
823156a

Legend:	UK823129L/170408
\dot{V}_{HW}	Volume flow, heating water
$Temp_{WQ}$	Temperature, heat source
Q_h	Heating capacity
P_e	Power consumption
COP	Coefficient of performance / efficiency rating
Δp_{HW}	Pressure loss heat pump
VD	Compressor(s)



LW 140A – LW 180A

Dimensional drawings



Key: UK819436
Subject to technical change without notice.
All dimensions in mm.

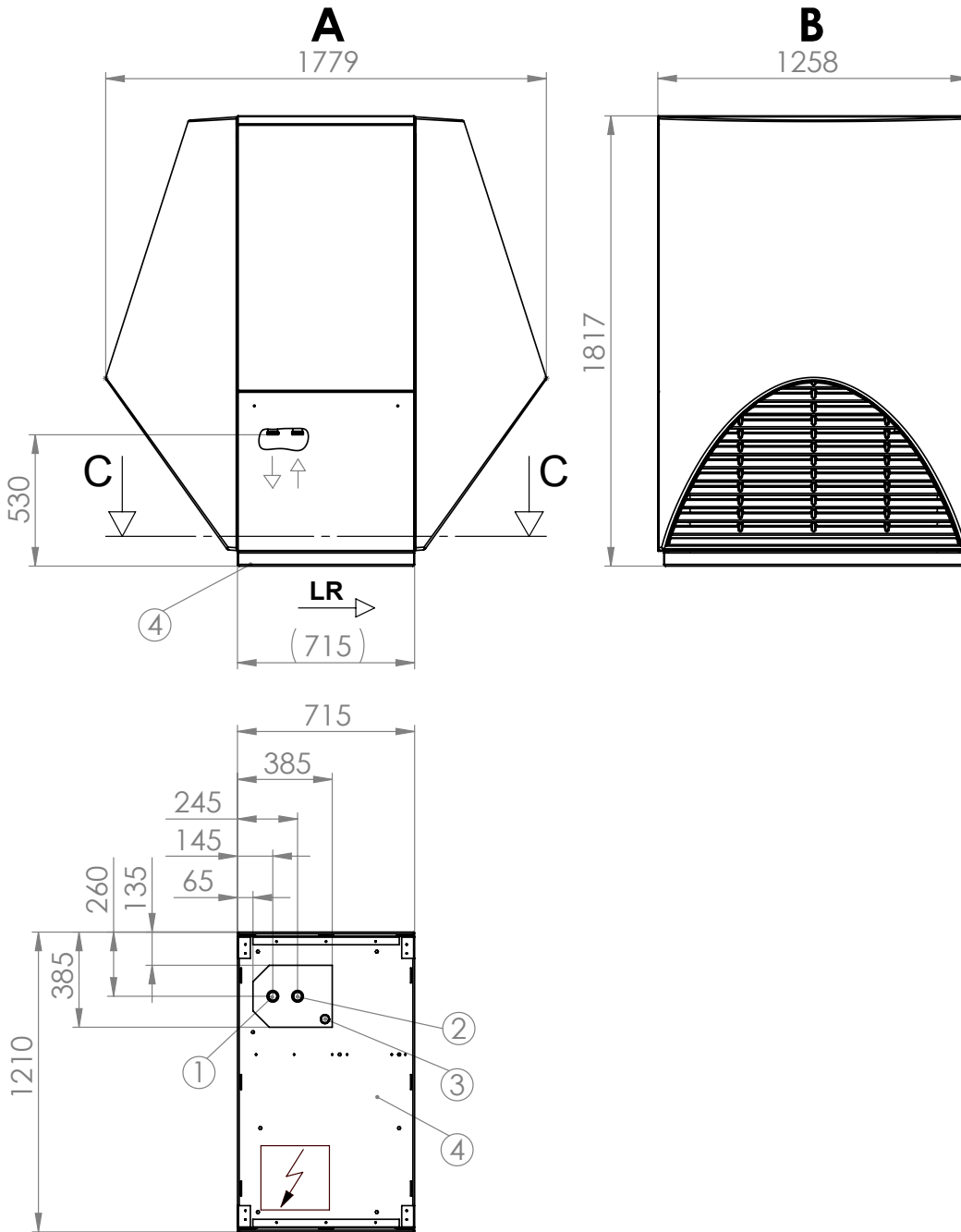
- A Front view
- B Side view
- C Plan view
(Section, without façade and shrouds)

- 1 Heating water outlet (flow) R 1 1/4"
- 2 Heating water inlet (return) R 1 1/4"
- 3 Condensate hose, outside -Ø 36x3
- 4 Baseplate
- LR Air direction



Dimensional drawings

LW 251A



Key: UK819437
Subject to technical change without notice.
All dimensions in mm.

- A Front view
- B Side view
- C Plan view
(Section, without façade and shrouds)

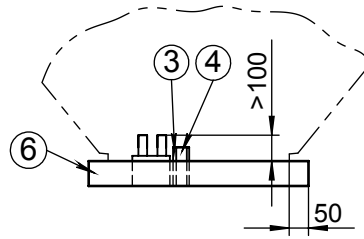
- 1 Heating water outlet (flow) R 1 1/4"
- 2 Heating water inlet (return) R 1 1/4"
- 3 Condensate hose, outside -Ø 36x3
- 4 Baseplate
- LR Air direction



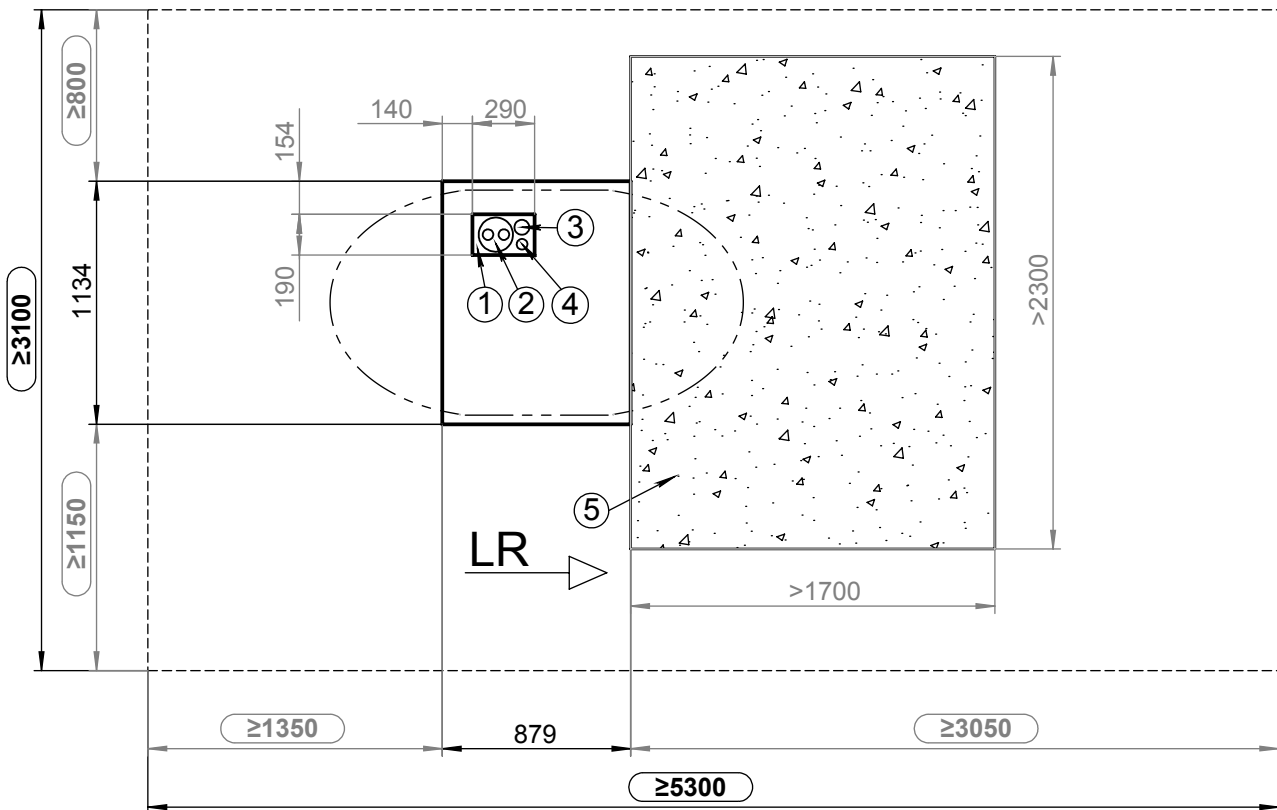
Installation plan

LW 140A – LW 180A

A



C



Legend: UK819377a

All dimensions in mm.

A Front view

C Top view

≥ ... Minimum clearances

1 Recess in base

2 Local heat pipe for heating water forward/return flow

3 Empty pipe for electric cables, minimum diameter 70mm

4 Condensate discharge, minimum diameter 50mm

5 Water-permeable surface (gravel, ...) in the air outlet area

6 Base

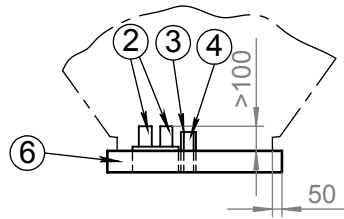
LR Air direction



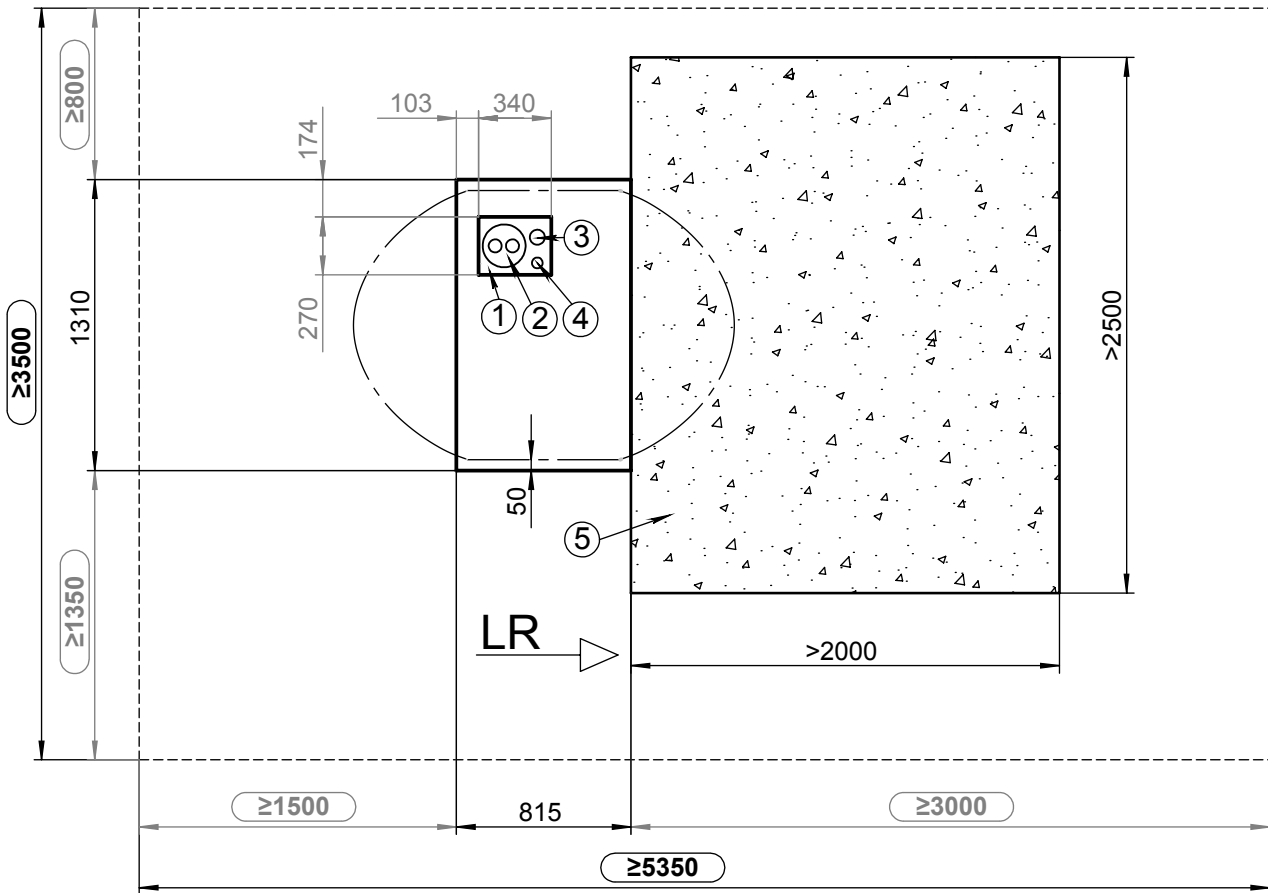
LW 251A

Installation plan

A



C



Legend: UK819378

All dimensions in mm.

A Front view

C Top view

≥ ... Minimum clearances

1 Recess in base

2 Local heat pipe for heating water forward/return flow

3 Empty pipe for electric cables, minimum diameter 70mm

4 Condensate discharge, minimum diameter 50mm

5 Water-permeable surface (gravel, ...) in the air outlet area

6 Base

LR Air direction



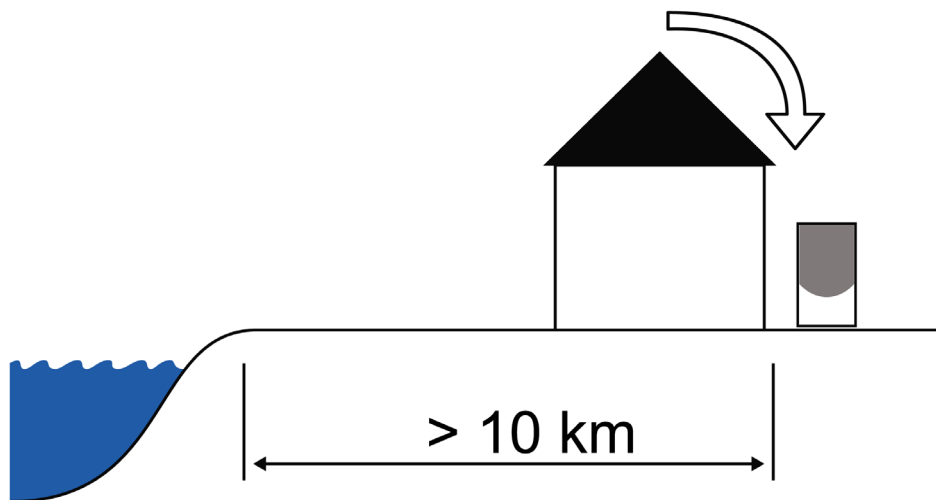
Coastal installation

LW 140A – LW 251A

IMPORTANT

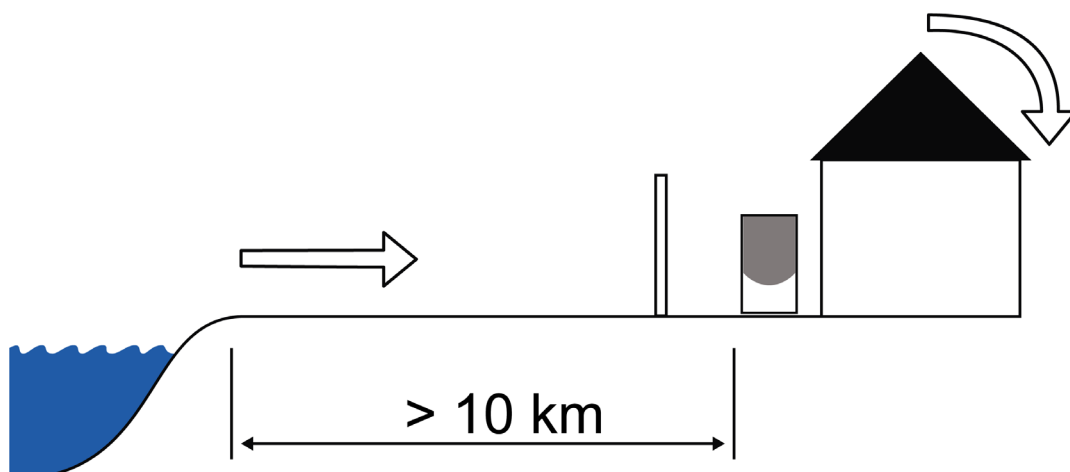
The minimum distances necessary for correct and safe operation as well as any service work must be observed.

- facing away from the coast / prevailing wind direction
 - ✓ in a sheltered area near a wall
 - ✓ not in open areas
 - ✓ not in sandy surroundings (to avoid the influx of sand)



- on the seaward side

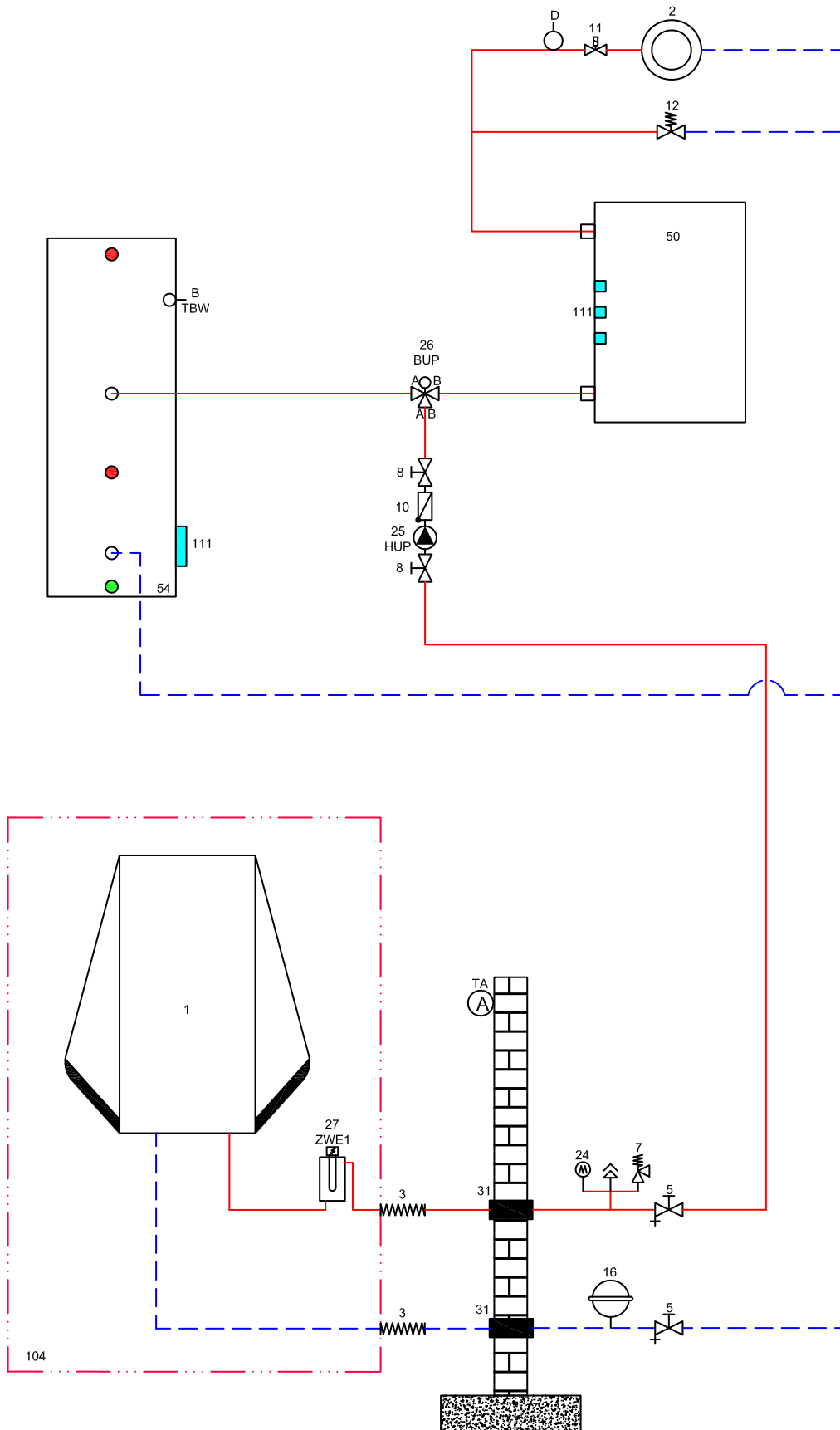
- ✓ in an area near a wall
- ✓ an impermeable windbreak resistant to onshore winds is installed
- ✓ Height and width of the windbreak $\geq 150\%$ of the device dimensions
- ✓ not in sandy surroundings (to avoid the influx of sand)





LW 140A – LW 251A

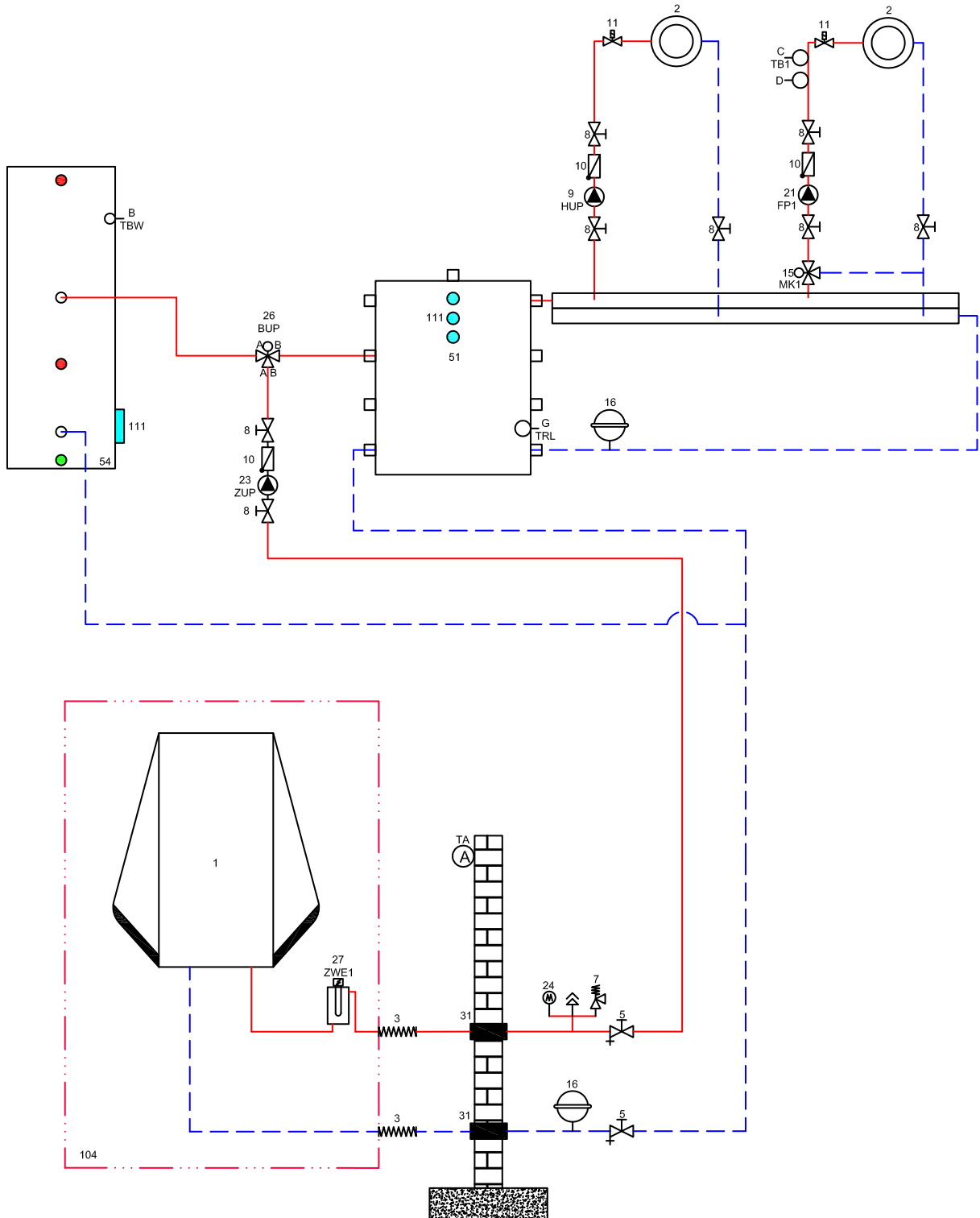
Row tank





Separate buffer tank

LW 140A – LW 251A





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	Manifold
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 manifold
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	Venttower
75	Scope of delivery, hydraulic tower, dual
76	Fresh water station
77	Scope of supply water/water booster
78	Accessories water/water booster optional

TA/A	External sensor
TB/W/B	Domestic hot water sensor
TB1/C	Feedwater sensor mixer circuits 1
D	Floor temperature 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 / Expansion board:

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

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

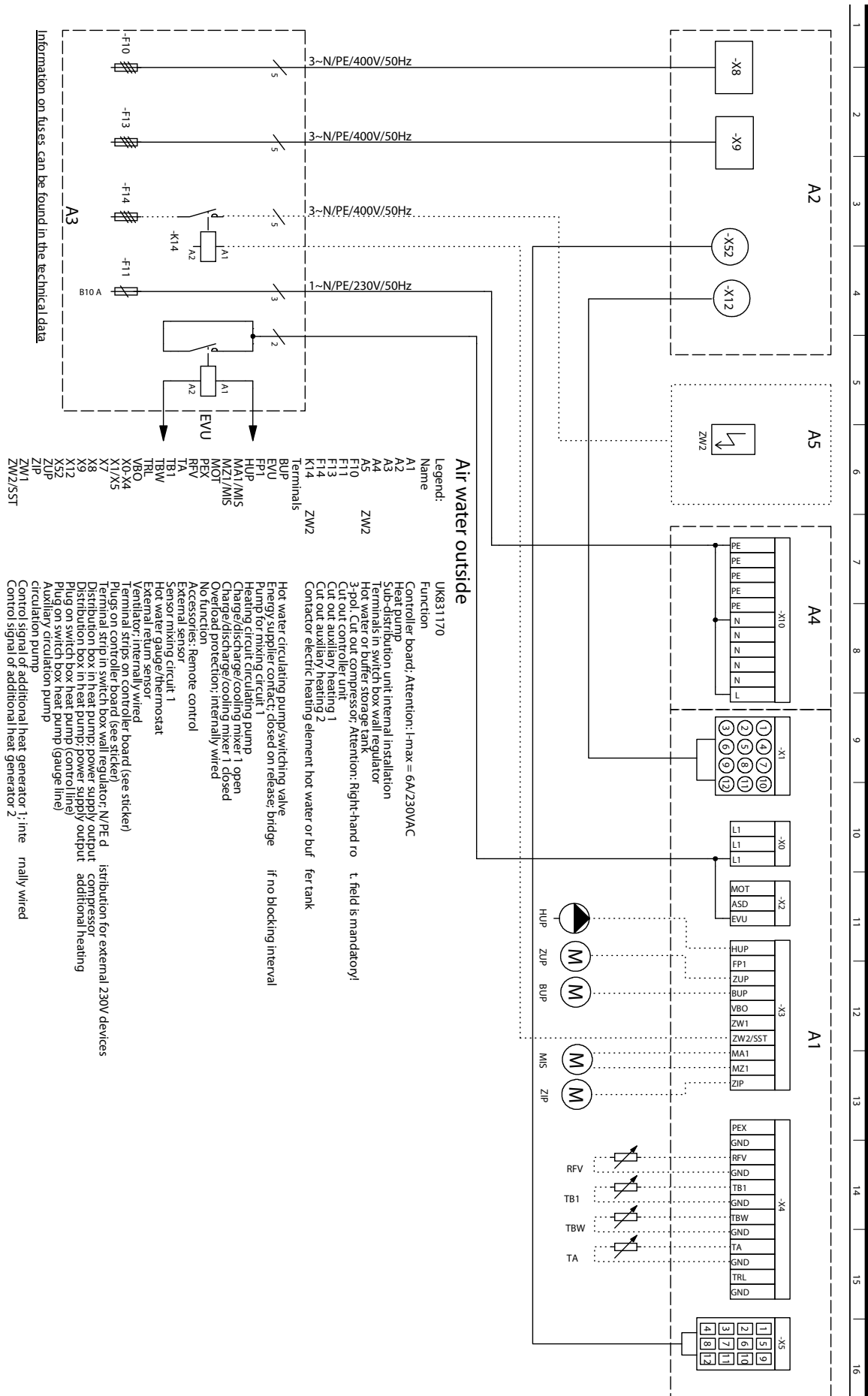
Important notice !

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!



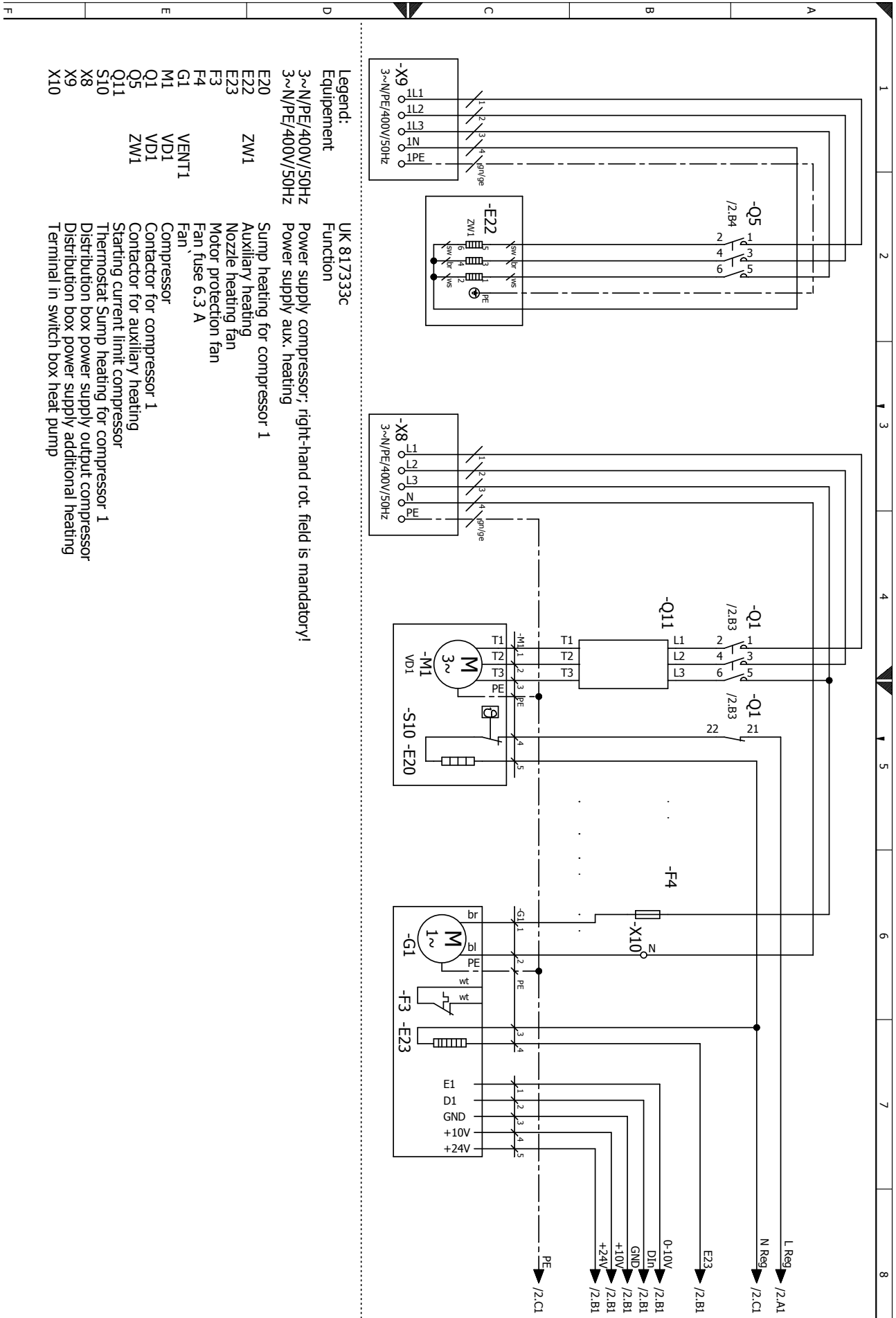
LW 140A – LW 251A

Terminal diagram





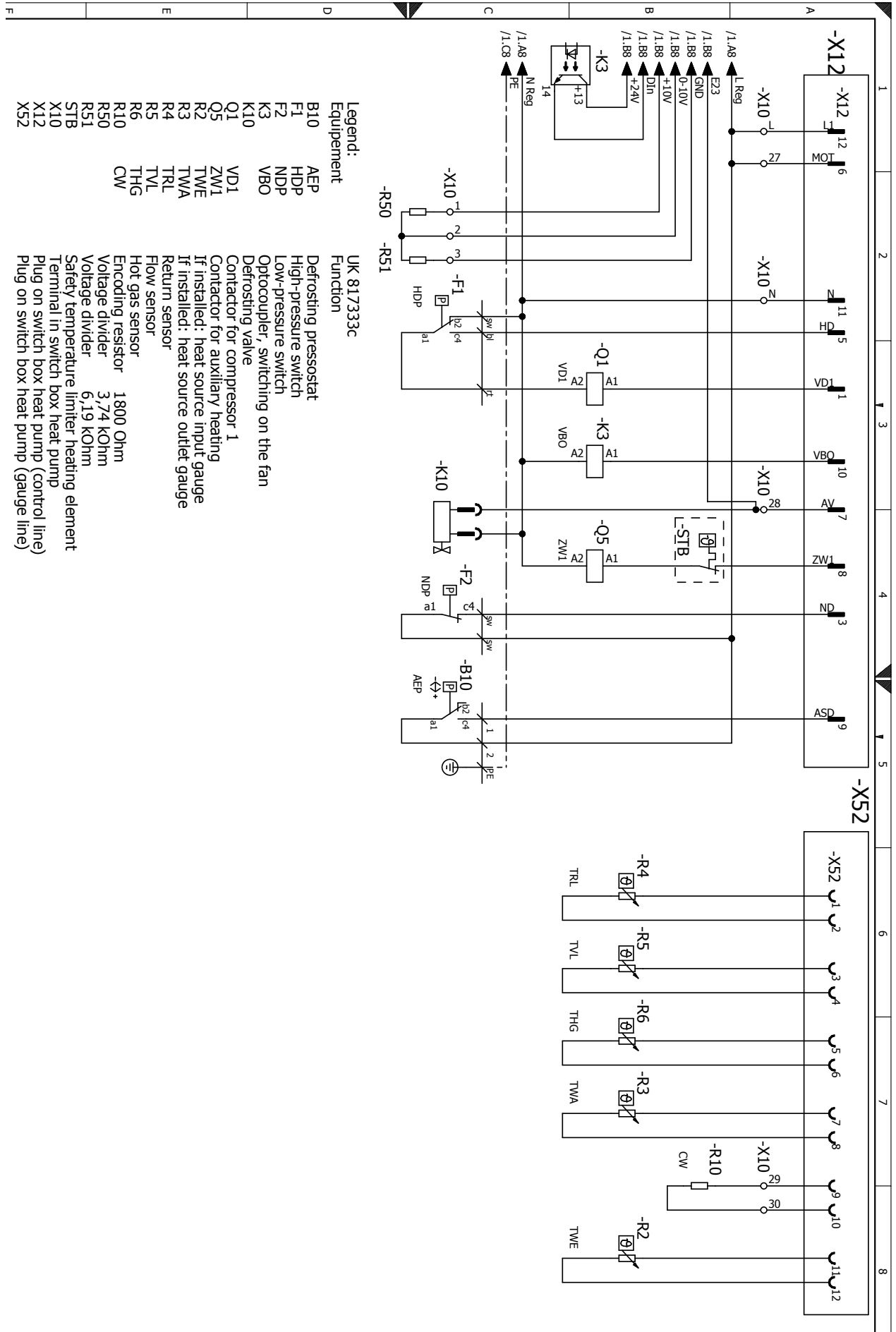
Circuit diagram 1/2





Circuit diagram 2/2

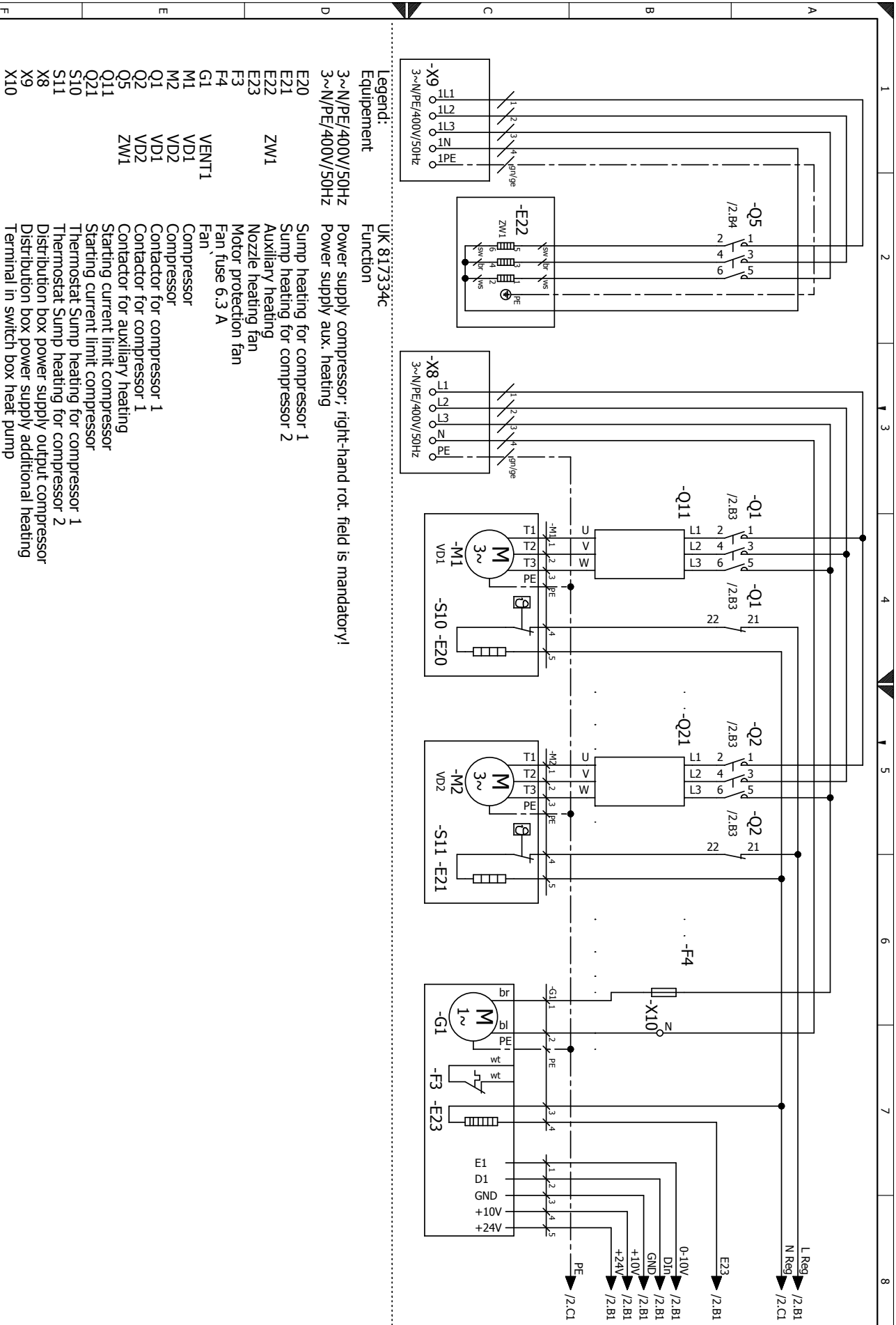
LW 140A





Circuit diagram 1/2

LW 180A

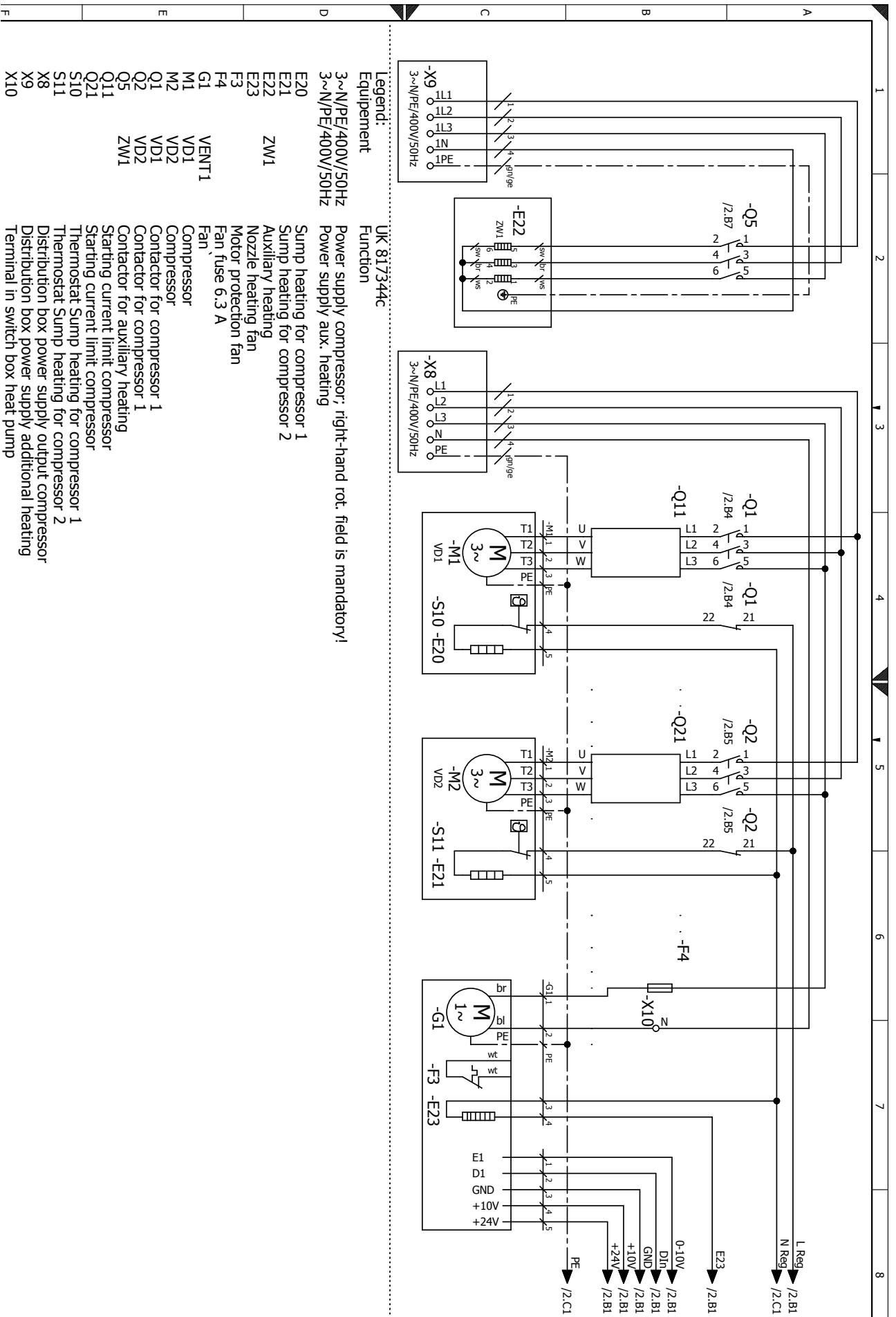


- Legend:**
Equipment
 3~N/PE/400V/50Hz
 3~N/PE/400V/50Hz
 E20
 E21
 E22
 E23
 F3
 F4
 G1
 M1
 M2
 Q1
 Q2
 Q5
 Q11
 Q21
 S10
 S11
 X8
 X9
 X10
- Function**
 UK 817334C
 Power supply aux. heating
 Sump heating for compressor 1
 Sump heating for compressor 2
 Auxiliary heating
 Nozzle heating fan
 Motor protection fan
 Fan fuse 6.3 A
 Fan
 Compressor
 Compressor
 Contactor for compressor 1
 Contactor for compressor 1
 Contactor for auxiliary heating
 Starting current limit compressor
 Thermostat Sump heating for compressor 1
 Thermostat Sump heating for compressor 2
 Distribution box power supply additional heating
 Terminal in switch box heat pump



Circuit diagram 1/3

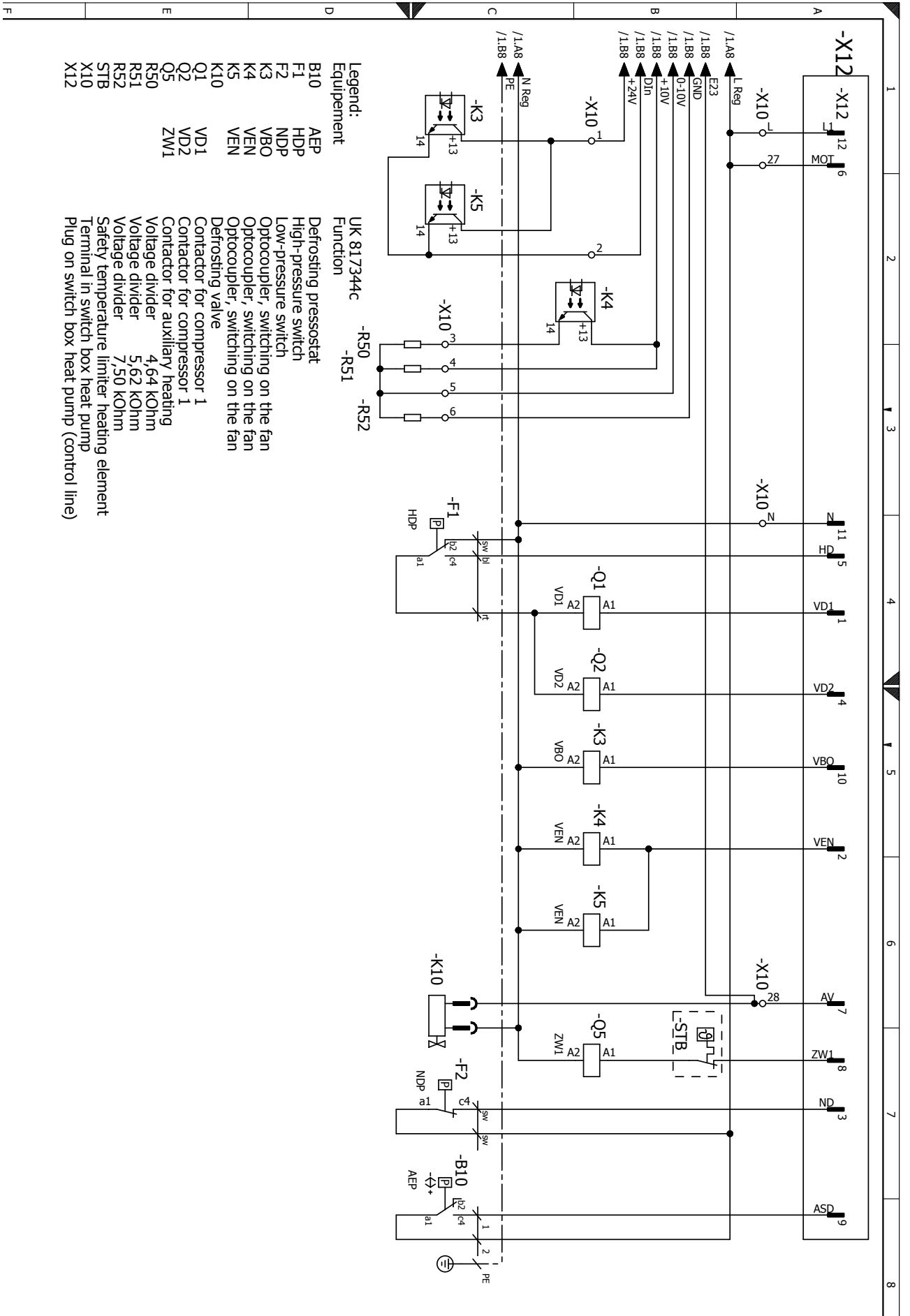
LW 251A





LW 251A

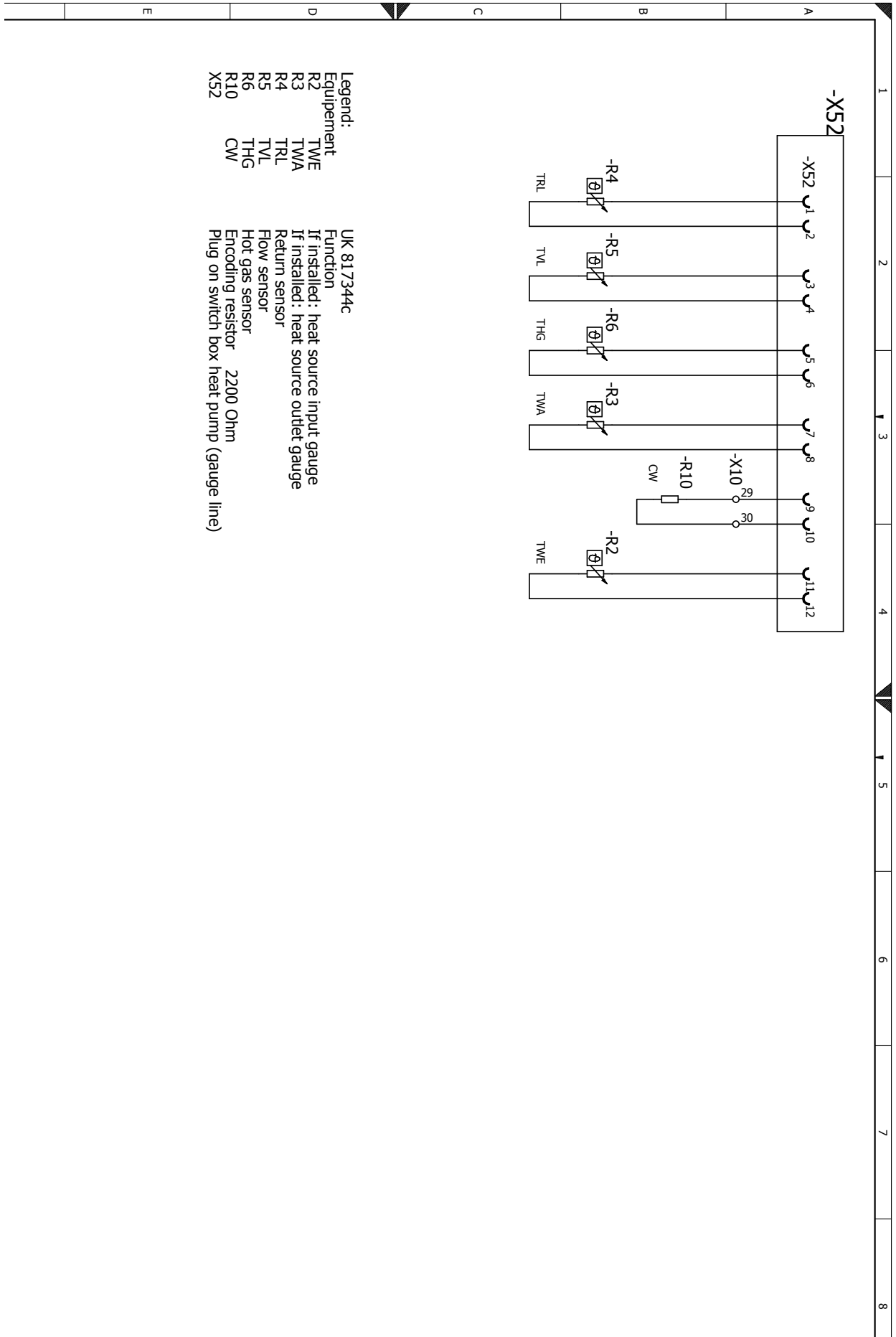
Circuit diagram 2/3





Circuit diagram 3/3

LW 251A





EC Declaration of Conformity in accordance with the EC Machinery Directive 2006/42/EC, Annex IIA



The undersigned confirms that the following designated device(s) as designed and marketed by us fulfill the standardized EC directives, the EC safety standards and the product-specific EC standards. In the event of modification of the device(s) without our approval, this declaration shall become invalid.

Designation of the device(s)

Heat Pump



Unit model	Order number	Item number 1	Item number 2
LW 71A-LUX 2.0	100540LUX02	100540	15029001
LW 81A-LUX 2.0	100541LUX02	100541	15029001
LW 101A-LUX 2.0	100542LUX02	100542	15029001
LW 121A-LUX 2.0	100543LUX02	100543	15029001
LW 140A-LUX 2.0	100544LUX02	100544	15029001
LW 180A-LUX 2.0*	100545LUX02	100545	15029001
LW 251A-LUX 2.0*	100546LUX02	100546	15029001
LW 310A-LUX 2.0*	100547LUX02	100547	15029001
LW 160H-AV-LUX 2.1	100625LUX01	100625	15077701
LW 71A-HT 1	100540HT102	100540	15031841
LW 81A-HT 1	100541HT102	100541	15031841
LW 101A-HT 2	100542HT202	100542	15031941
LW 121A-HT 2	100543HT202	100543	15031941
LW 140A-HT 2	100544HT202	100544	15031941
LW 180A-HT 2	100545HT202	100545	15031941

EC Directives

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

Standardized EN

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

* Pressure equipment component

Category II
 Module A1
 Designated position:
 TÜV-SÜD
 Industrie Service GmbH (Nr.:0036)

Company:

ait-deutschland GmbH
 Industrie Str. 3
 93359 Kasendorf
 Germany

Place, date: Kasendorf, 14.12.2015

Signature:

Jesper Stannow
 Head of Heating Development



ait-deutschland GmbH
Industriestraße 3
D-95359 Kasendorf

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