

OPERATING MANUAL

LW 140A - LW 252A



83054200jUK

UK

Air/Water heat pumps
Outdoor installation



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 is designed for household use and is solely intended for the following functions:

- for heating.
- for heating hot water.

All other uses of the unit are not as intended.

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 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.
- ▶ Ensure that the personnel are qualified to handle refrigerant.
- Work on the refrigerating circuit may only be carried out by qualified personnel with appropriate qualifications for refrigeration system installation.
- Work on the electrics and electronics may only be carried out by electrical technicians.
- Any other work on the system may only be carried out by qualified personnel (heating installer, plumbing installer).

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.



6 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:

- www.alpha-innotec.com

7 Warranty / Guarantee

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



NOTE

Please contact your dealer concerning warranties and guarantees.

8 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.

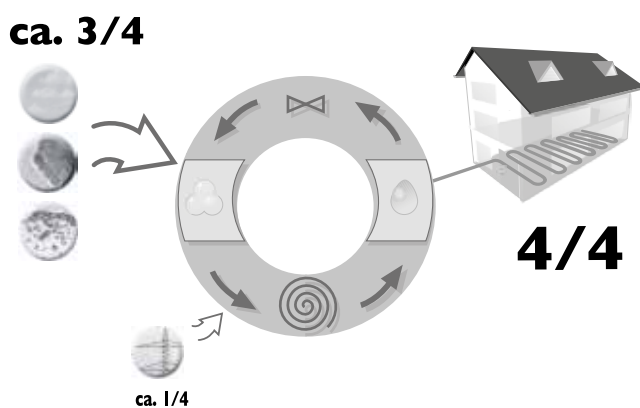
→ “29 Dismantling”, page 21

9 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:



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

10 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



11 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.

12 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.

13 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.



14 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



15 Installation and assembly

Observe the following when performing all work:



NOTE

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



NOTE

Observe the sound levels of the respective model.

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

15.1 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



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

15.2 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 140A and LW 180A

The units LW 140A and LW 180A can be lifted with ¾" pipes (provided by customer) that are suitable for the weight of the respective unit. Special holes are provided in the frame for this purpose.



NOTE

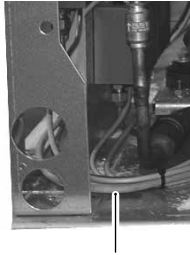
The unit types LW 251A and LW 252A cannot be lifted with pipes.

1. Remove the lower facing panels of the unit.
→ “15.4 Attaching the air flow baffles“, page 11, point 1.
2. Insert the pipes through the holes in the frame on the switch box side.





Make sure that pipes do not damage cable assemblies 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.

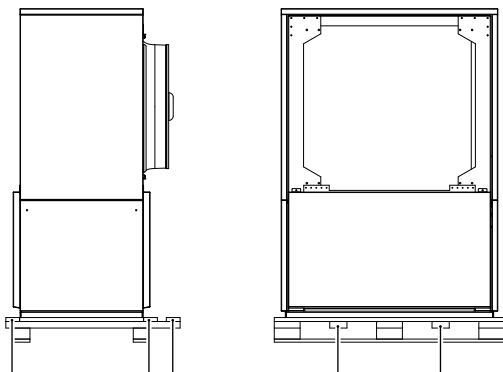
Lifting the unit with a crane



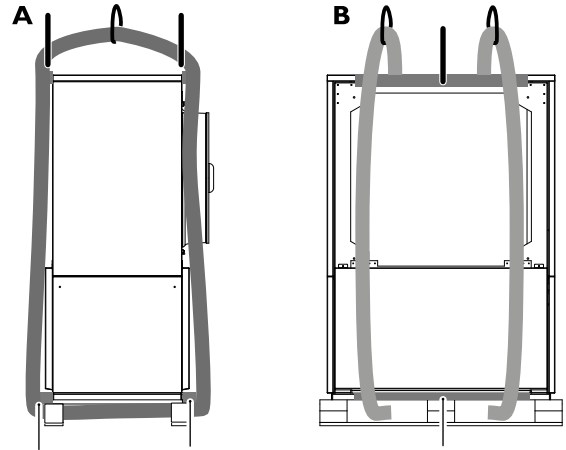
NOTE

The unit types LW 251A and LW 252A 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").

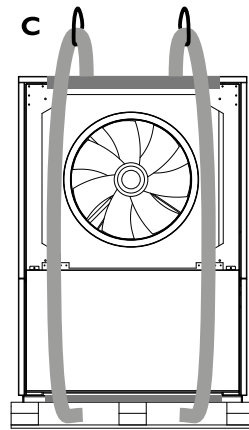


A Front view (switch box side)
B Side view 1



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.



15.3 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.

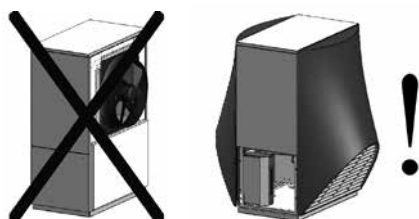
15.4 Attaching the air flow baffles



WARNING

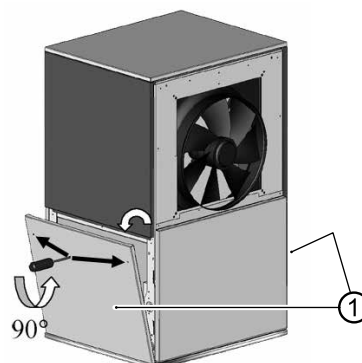
Unit has rotating parts.

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



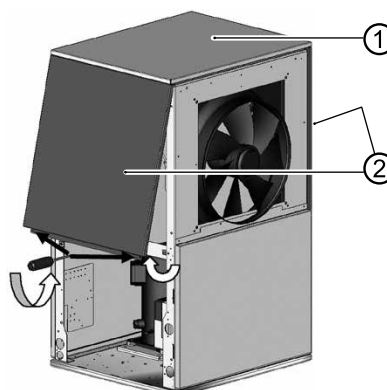
1. If you have not already done so, remove lower facing panels on the switch box and water connection side of the unit.
 - 1.1. To do so, loosen the two quick-release screws on the lower facing panels.

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



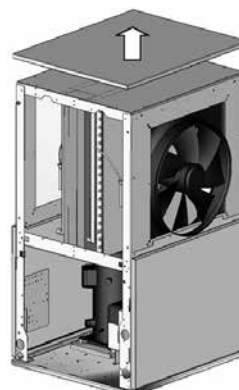
1 lower facing panels

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.





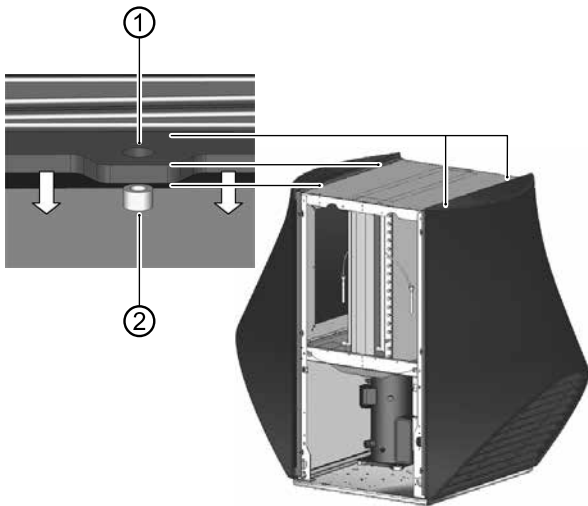
4. Install air flow baffles.



IMPORTANT

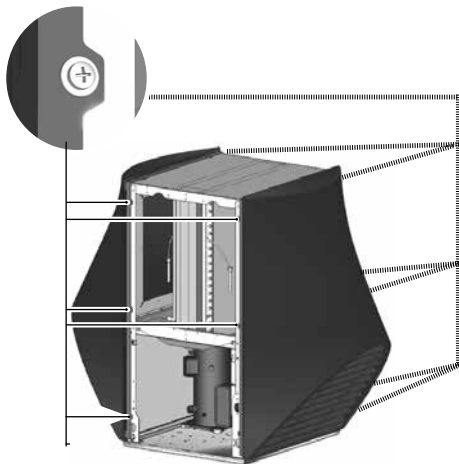
Remove the protective sheeting from the air flow baffles before installation

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

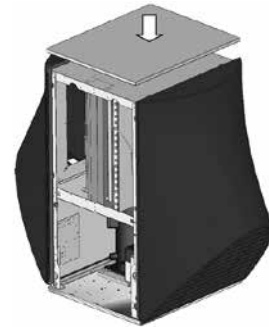


- 1 eyelet on air flow baffle
2 brass bushing on frame

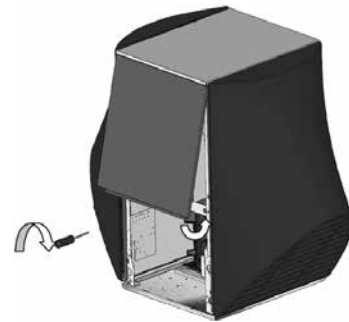
- 4.2. Bolt air flow baffles to the frame on the switch box side and water connection side.



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).



15.5 Installation / connection to heating circuit

! IMPORTANT

Avoid open heating systems and / or heating systems that are not oxygen diffusion-tight. If this is not possible, a system separation must be installed.

Depending on the dimensioning of the heat exchanger and the additionally required circulation pump, the system separation worsens the energy efficiency of the system.

! IMPORTANT

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

- ▶ Ensure that a air / magnetic sludge separator is installed in the heating circuit.
- ▶ Ensure that a dirt filter with a mesh size of 0.7 mm is installed as close as possible to the heating water inlet (return).
- ▶ Rinse the hydraulic system thoroughly prior to establishing the hydraulic connection of the heat pump.

! IMPORTANT

Flush the hydraulic system only in its flow direction.

! 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.

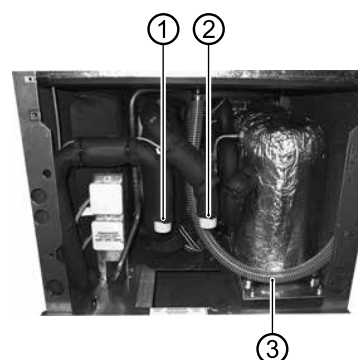
i NOTE

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.

i 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.

15.6 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.

16 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.

17 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.

- “25 Set the overflow valve“, page 18

18 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.

19 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.

20 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



21 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.

22 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!



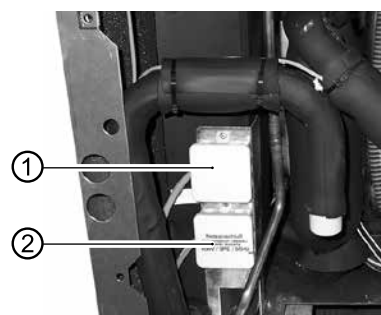
WARNING

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.
→ “15.4 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.

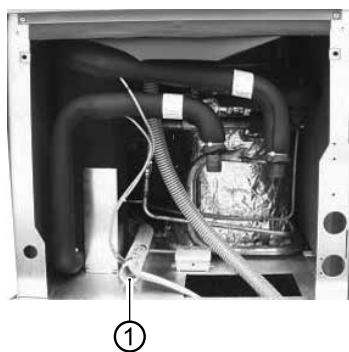
Heat pump side connection of the control and sensor wires

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.



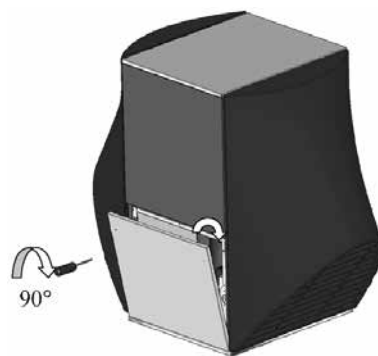
NOTE

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.

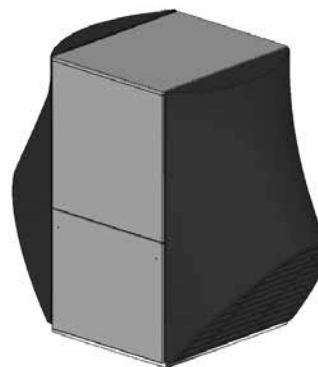
4. Install control and sensor wires in a conduit as far as where they enter the building and from there on to the heating and heat pump regulator.
5. Connect control and sensor wires to the heating and heat pump regulator according to the terminal

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.





23 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 and magnesium precipitate as mineral 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

i 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).

1. Ensure that the pH-value of the heating water is between 8.2 – 10, for aluminium materials between 8.2 – 9.
Ideally, the pH value should already be in the required range after filling. After 6 weeks at the latest, it must have adjusted to the required range.
2. Ensure that the electrical conductivity is < 100 µS/cm.

i NOTE

If the required water quality is not achieved, consult a company specialising in the treatment of heating water.

3. 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
4. Keep a system log for hot water heating systems in which relevant planning data and the water quality are 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.



24 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.

25 Set the overflow valve



REMARQUE

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

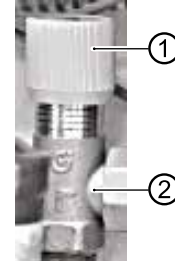
Complete the worksteps quickly, otherwise the maximum return temperature can be exceeded and the heat pump switches to high-pressure fault.

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.

26 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!
- "27.1 Maintenance after commissioning", page 19

27 Maintenance of the unit



NOTE

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.

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.

- Check at regular intervals that the condensate can drain out of the device freely, without obstruction. To this end, check the condensate pan in the device regularly for dirt/clogging and clean as necessary. Also check the evaporator from all sides and clean if necessary

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.



NOTE

Icing on air infeed and outfeed openings is weather-related and normal. Do not remove icing thermally.

► Wear protective gloves and carefully remove the icing with your hands.

27.1 Maintenance after commissioning

Immediately after commissioning, check all installed dirt traps for dirt and clean them if necessary.

► Switch off the system while the check and cleaning is being carried out.

Next checking and cleaning at the latest 2 weeks after commissioning.



27.2 Annual maintenance

- Determine the quality of the heating water by analysis. In the event of deviations from the specifications, take suitable measures without delay.
- Check all installed dirt traps for dirt and clean them if necessary.
- Test the function of the safety valve for the heating circuit.

27.3 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.

28 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.



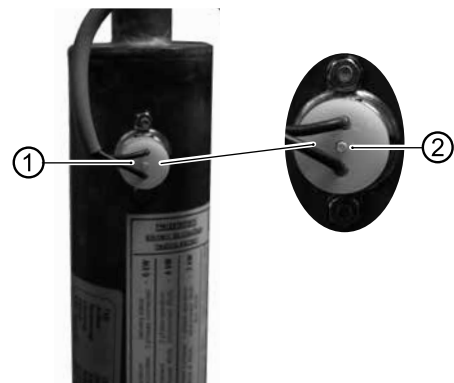
NOTE

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

28.1 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.



29 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.



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				m³/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 cosφ				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 l 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

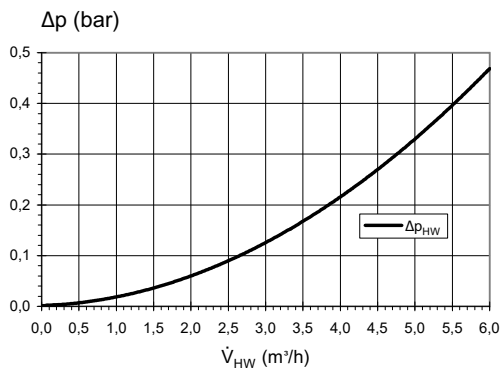
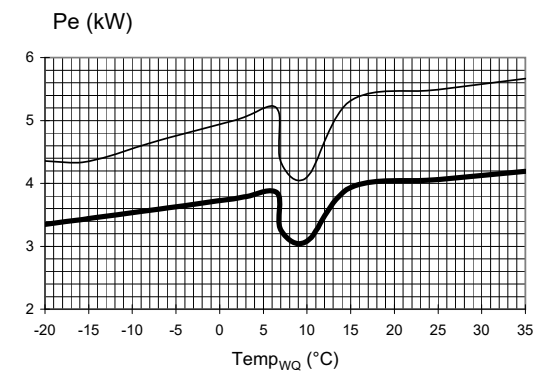
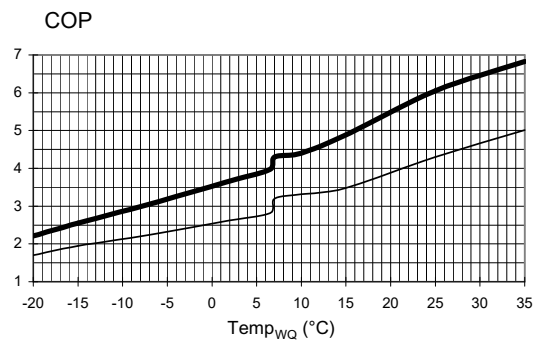
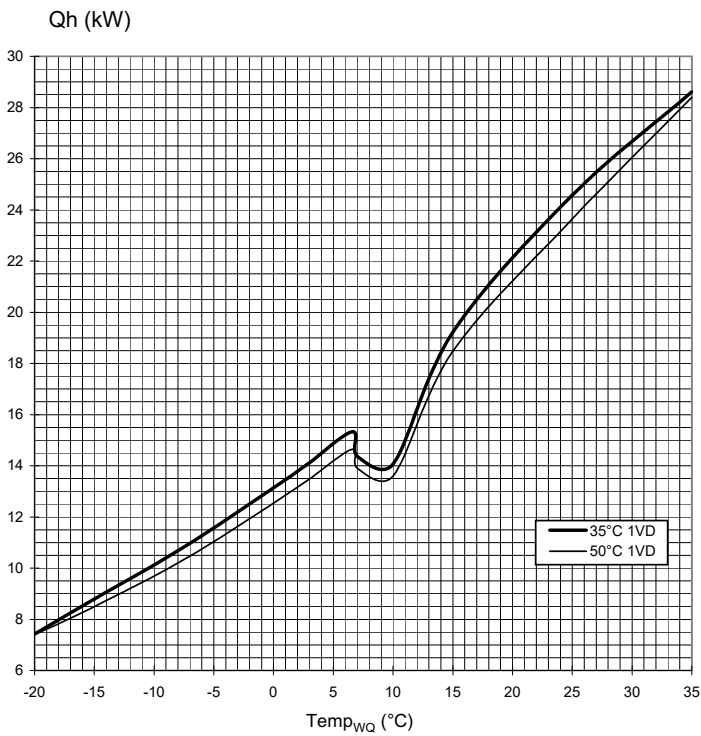


	LW 140A	LW 180A	LW 251A	LW 252A
	— • —	— • —	— • —	— • —
	— •	— •	— •	— •
	•	•	•	•
	—	19.6 3.9	27.3 3.9	27.3 3.9
	14.4 4.3	10.1 4.2	14.1 4.2	14.1 4.2
	—	18.7 3.3	26.1 3.3	26.1 3.3
	13.9 3.5	9.8 3.4	13.7 3.4	13.7 3.4
	—	17.2 3.6	24.0 3.6	24.0 3.6
	13.8 3.7	9.5 3.8	13.2 3.8	13.2 3.8
	—	21.2 4.0	29.2 4.0	29.2 4.0
	14.1 4.4	10.3 4.5	14.2 4.5	14.2 4.5
	—	14.1 2.8	19.4 2.8	19.4 2.8
	10.8 3.0	7.3 2.9	10.1 2.9	10.1 2.9
	—	—	—	—
	—	—	—	—
	20 ¹ – 50 ²	20 ¹ – 50 ²	20 ¹ – 50 ²	20 ¹ – 50 ²
	-20 – 35	-20 – 35	-20 – 35	-20 – 35
	A> -7 / 60 ²	A> -7 / 60 ²	A> -7 / 60 ²	A> -7 / 60 ²
	—	—	—	—
	50	52	57	57
	—	—	—	—
	58	60	65	65
	5600	5600	7800	7800
	—	—	—	—
	2000 2900 3600	2000 3800 4800	2500 5000 6200	2500 5000 6200
	0.12 2900	0.18 3800	0.12 5000	0.12 5000
	— —	— —	— —	— —
	—	—	—	—
	—	—	—	—
	4	4	5	5
	370	420	540	540
	R5/4"AG	R5/4"AG	R5/4"AG	R5/4"AG
	—	—	—	—
	R407C 5.8	R407C 6.8	R407C 9.8	R407C 9.8
	—	—	—	—
	30 1	30 1	30 1	30 1
	3~N/PE/400V/50Hz C16	3~N/PE/400V/50Hz C20	3~N/PE/400V/50Hz C25	3~N/PE/400V/50Hz C25
	1~N/PE/230V/50Hz B10	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~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)	7.0 (3.4) 14.4 (7.0) 0.7 (0.7)
	13.0	18.0	24.5	24.5
	74 26	51.5 30	74 30	74 30
	24	24	24	24
	9 6 3	9 6 3	9 6 3	9 6 3
	— —	— —	— —	— —
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	813514c	813515d	813516d	813516d



LW 140A

Performance curves



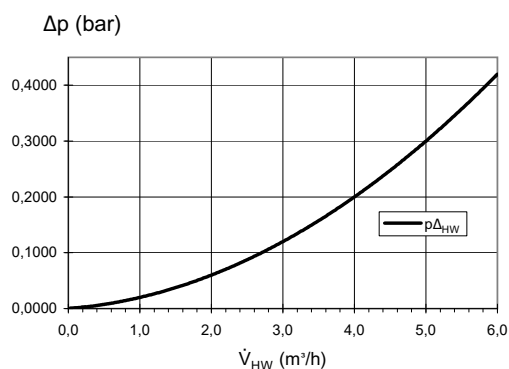
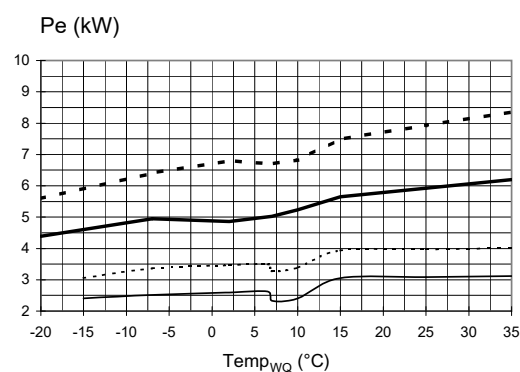
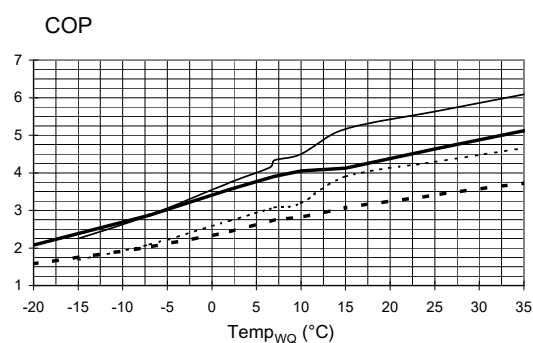
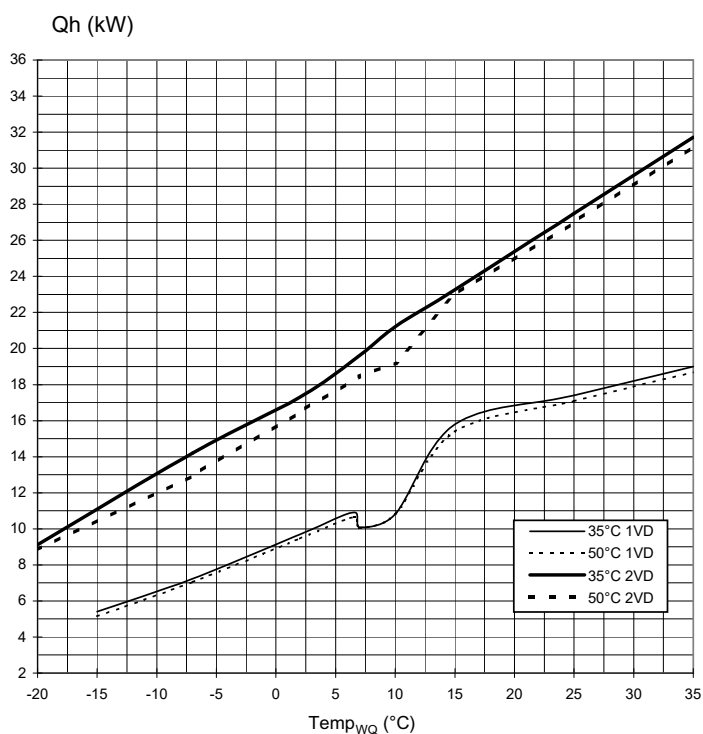
823154

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



Performance curves

LW 180A



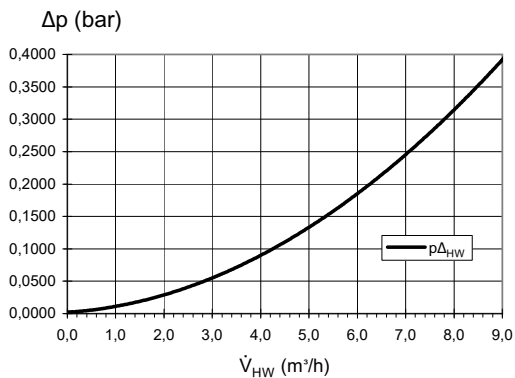
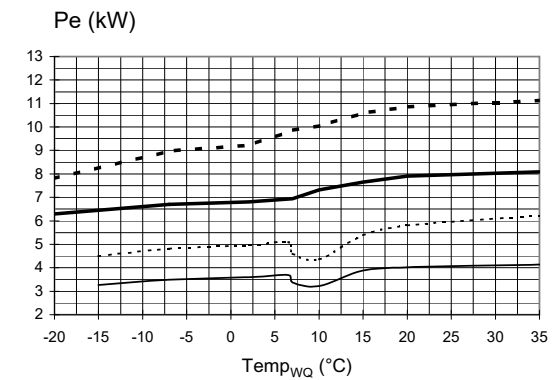
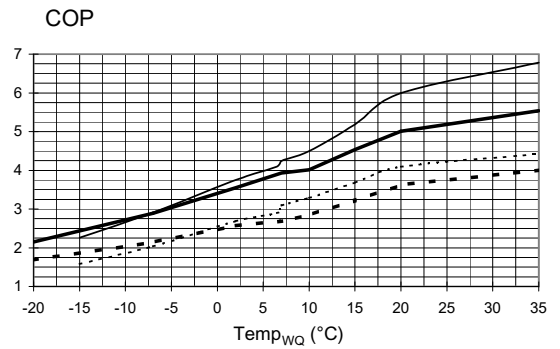
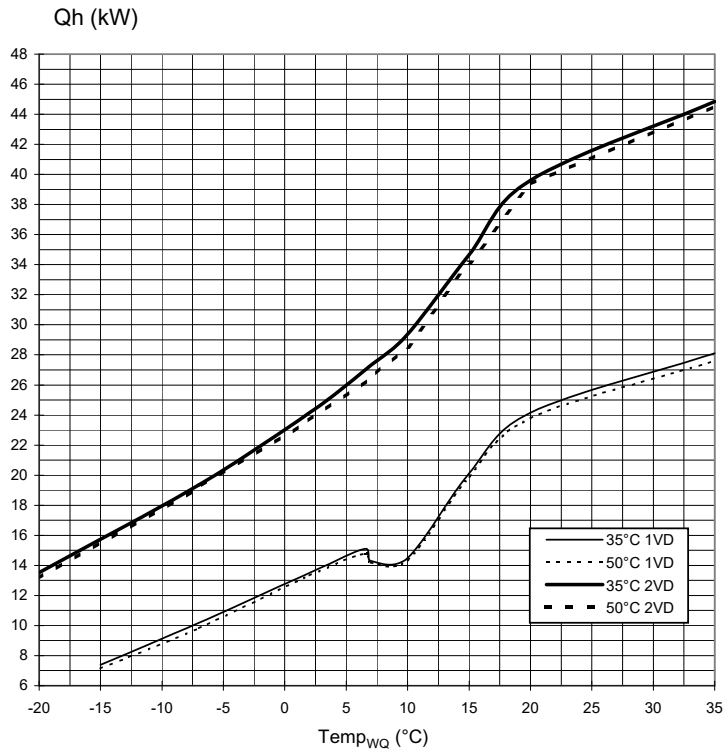
823155

Keys:	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)



LW 251A / LW 252A

Performance curves



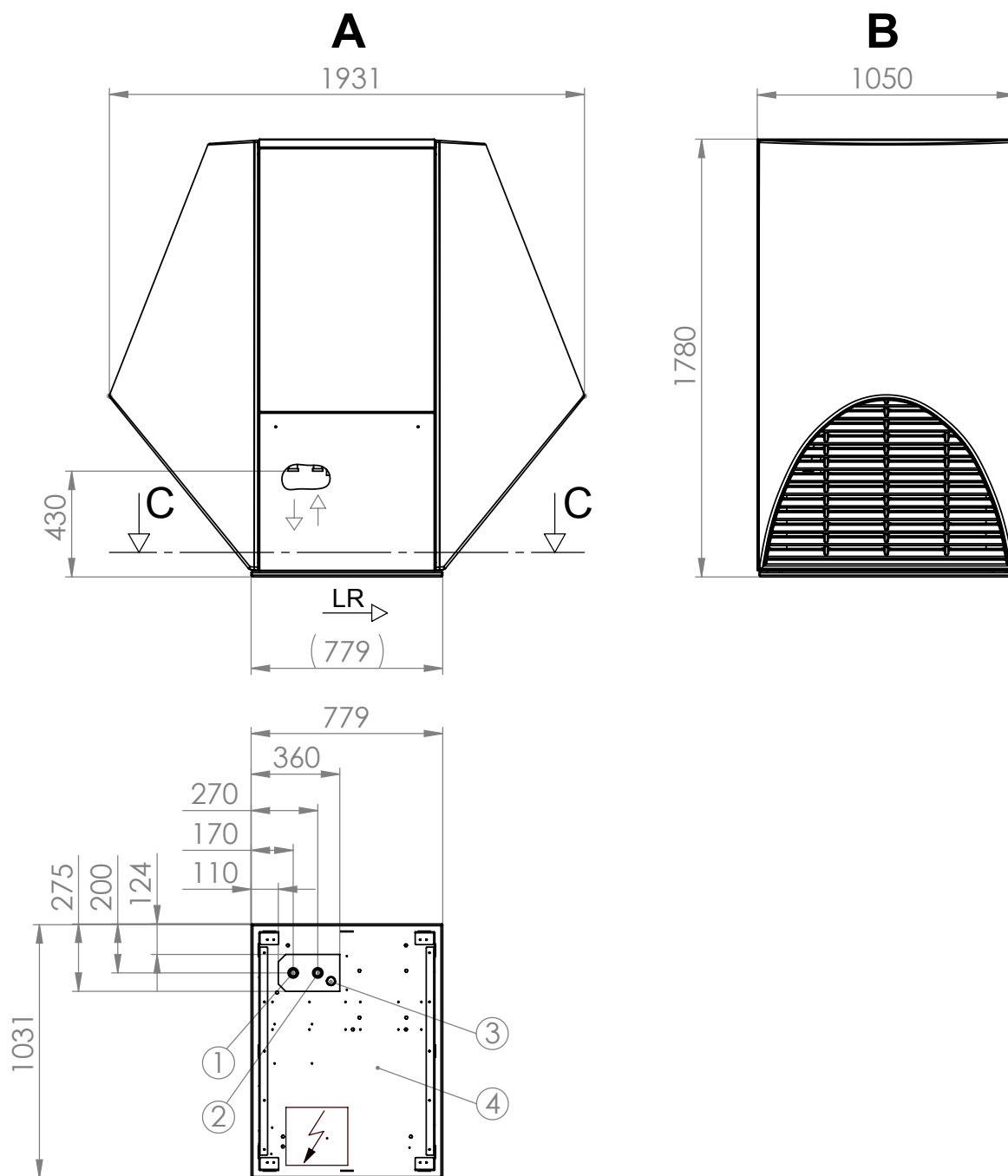
823156a

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



LW 140A – LW 180A

Dimensional drawings



Keys: UK819436
All dimensions in mm.

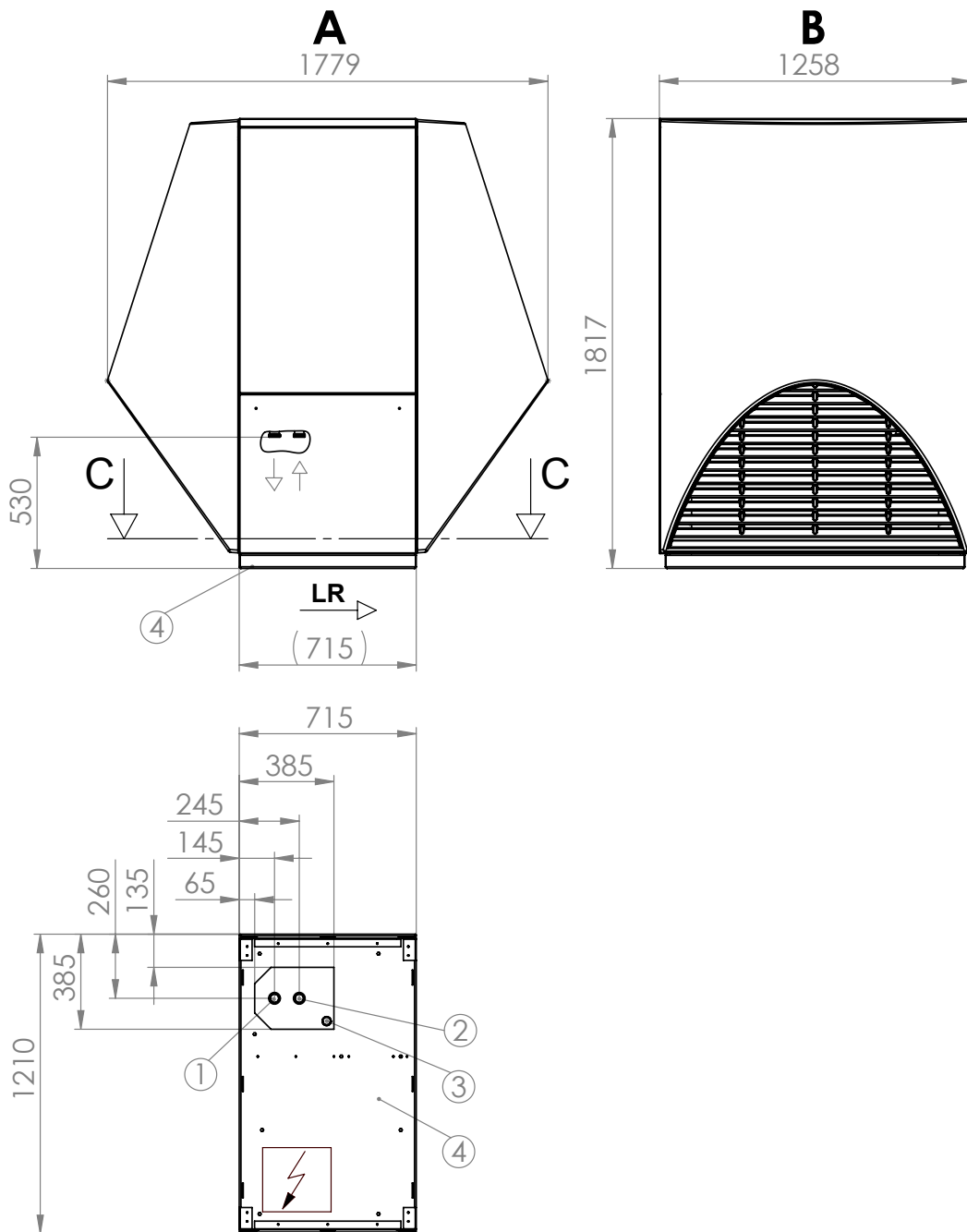
- A Front view
- B Side view
- C Plan view
- (Section, without façade and shrouds)

- 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 / LW 252A



Keys: UK819437
All dimensions in mm.

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

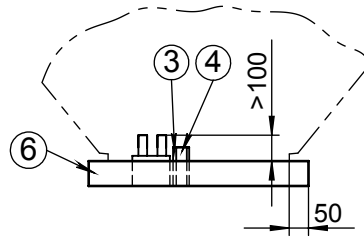
- 1 Heating water outlet (flow) R 1 1/4"
- 2 Heating water inlet (return) R 1 1/4"
- 3 Condensate hose, outside -Ø 36x3
- 4 Baseplate
- LR Air direction



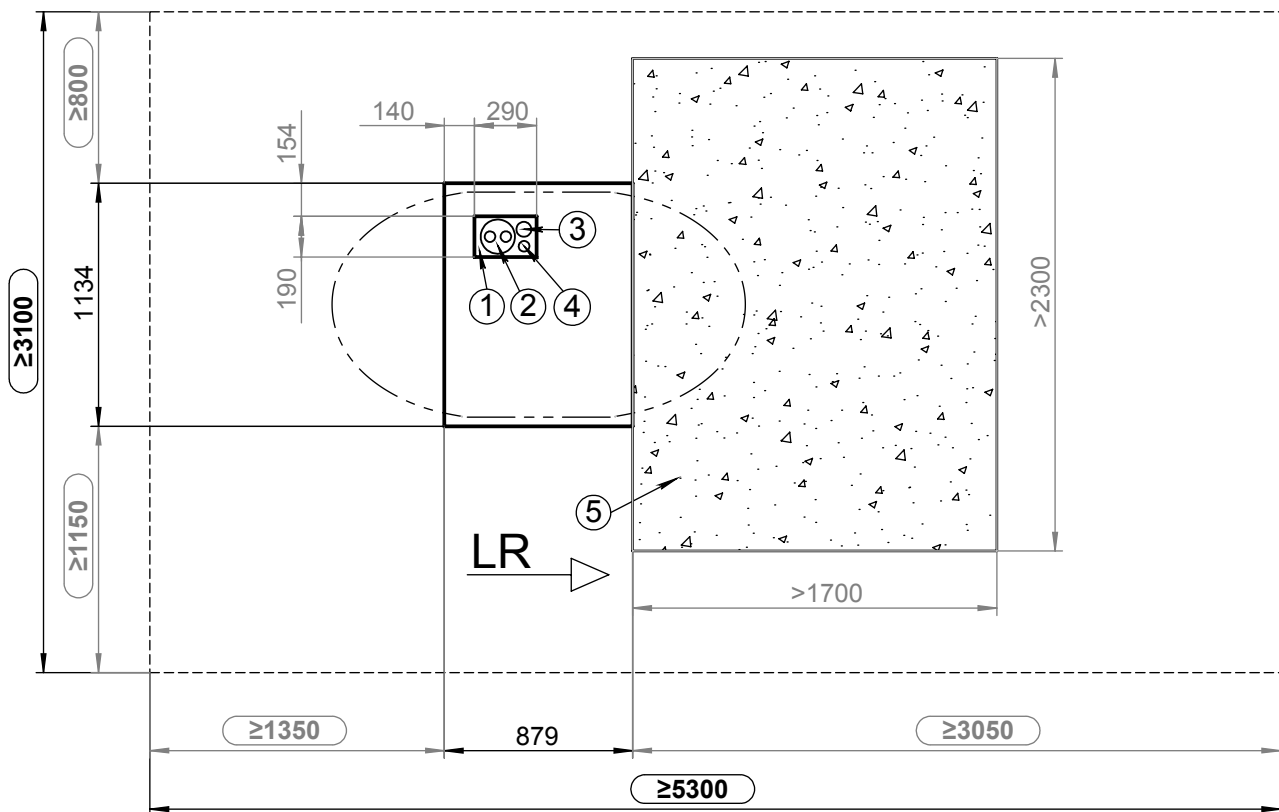
Installation plan

LW 140A – LW 180A

A



C



Keys: 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

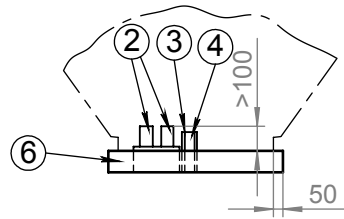
4 Condensate discharge, minimum diameter 50mm

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

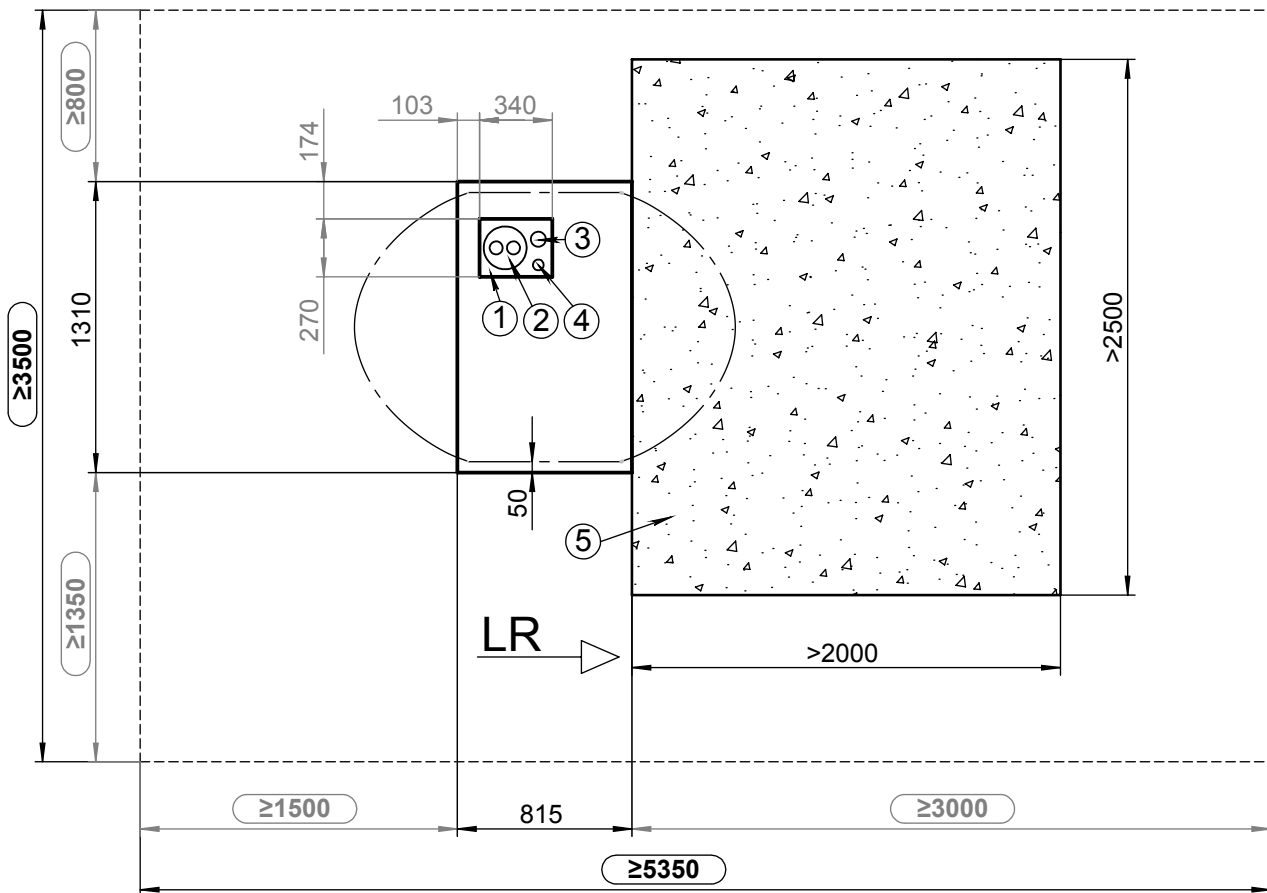
6 Base

LR Air direction

A



C



Keys: 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	Base Air direction
----	-----------------------



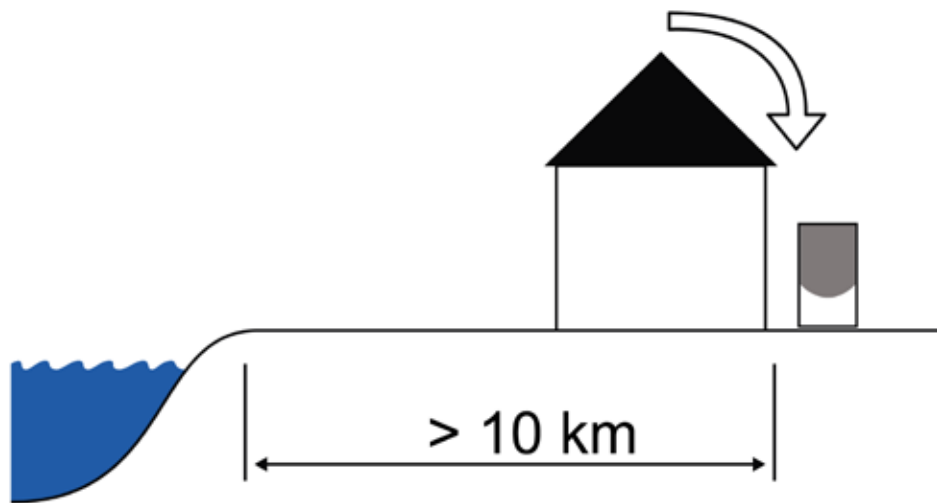
Coastal installation

LW 140A – LW 252A

IMPORTANT

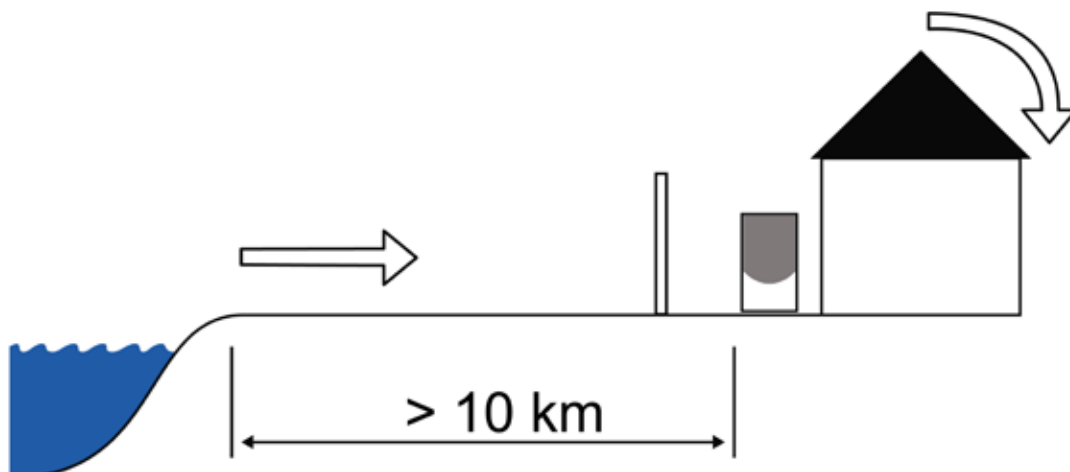
The minimum distances necessary for correct and safe operation as well as any service work must be observed.

- 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

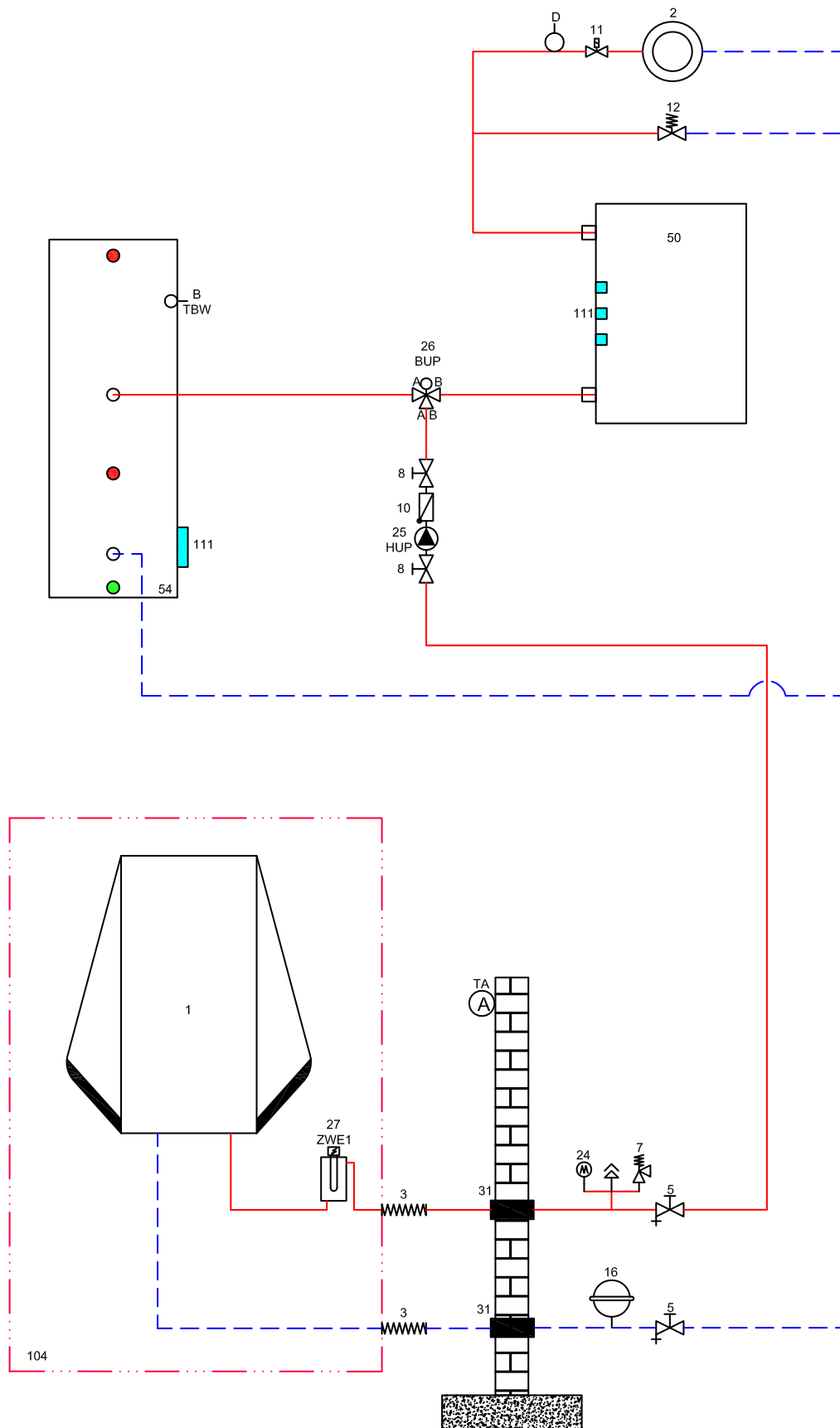
- ✓ in an area near a wall
- ✓ an impermeable windbreak resistant to onshore winds is installed
- ✓ Height and width of the windbreak $\geq 150\%$ of the device dimensions
- ✓ not in sandy surroundings (to avoid the influx of sand)





LW 140A – LW 252A

Row tank



Legend hydraulic diagramm

1	Heat pump	51	Separation tank
2	Underfloor heating / radiators	52	Gas- or oil-boiler
3	Vibration isolation	53	Wood boiler
4	Sylomer strip machine underlay	54	Hot water cylinder
5	Closure and drainage	55	Brine pressure switch
6	Expansion vessel packing list	56	Swimming pool heat exchanger
7	Safety valve	57	Geothermal heat exchanger
8	Closure	58	Ventilation system
9	Heating circulation pump	59	Plate heat exchanger
10	Non return valve/ one way valve	61	Cooling cylinder
11	Individual room regulation	65	Compact distributor
12	Overflow valve	66	Fancoils
13	Steamtight insulation	67	Solar/ service water cylinder
14	Service water circulation pump	68	Solar/ service water cylinder
15	Mixer circuit three-way mixer (MK1 discharge)	69	Multifunction tank
16	Expansion vessel supplied by customer	71	Dual hydraulic module
18	Heating rod (heating)	72	Buffer tank wall mounted
19	Mixer circuit four-way mixer (MK1 charge)	73	Pipe lead-in
20	Heating rod (SW)	74	Ventower
21	Mixer circuit circulation pump (FP-1)	75	Scope of delivery, hydraulic tower, dual
23	Feed circulating pump (reconnect the integrated circulating pump in the heat pump)	76	Fresh water station
24	Manifold	77	Scope of supply water/water booster
25	Heating circulation pump	78	Accessories water/water booster optional
26	Switching valve (heating/service water)(B = normally open)		
27	Heating element		
28	Brine circulation pump		
29	Dirt-trap 0.6 mm mesh		
30	Spill-tray for 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		

TAV	External sensor
TBW/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 !

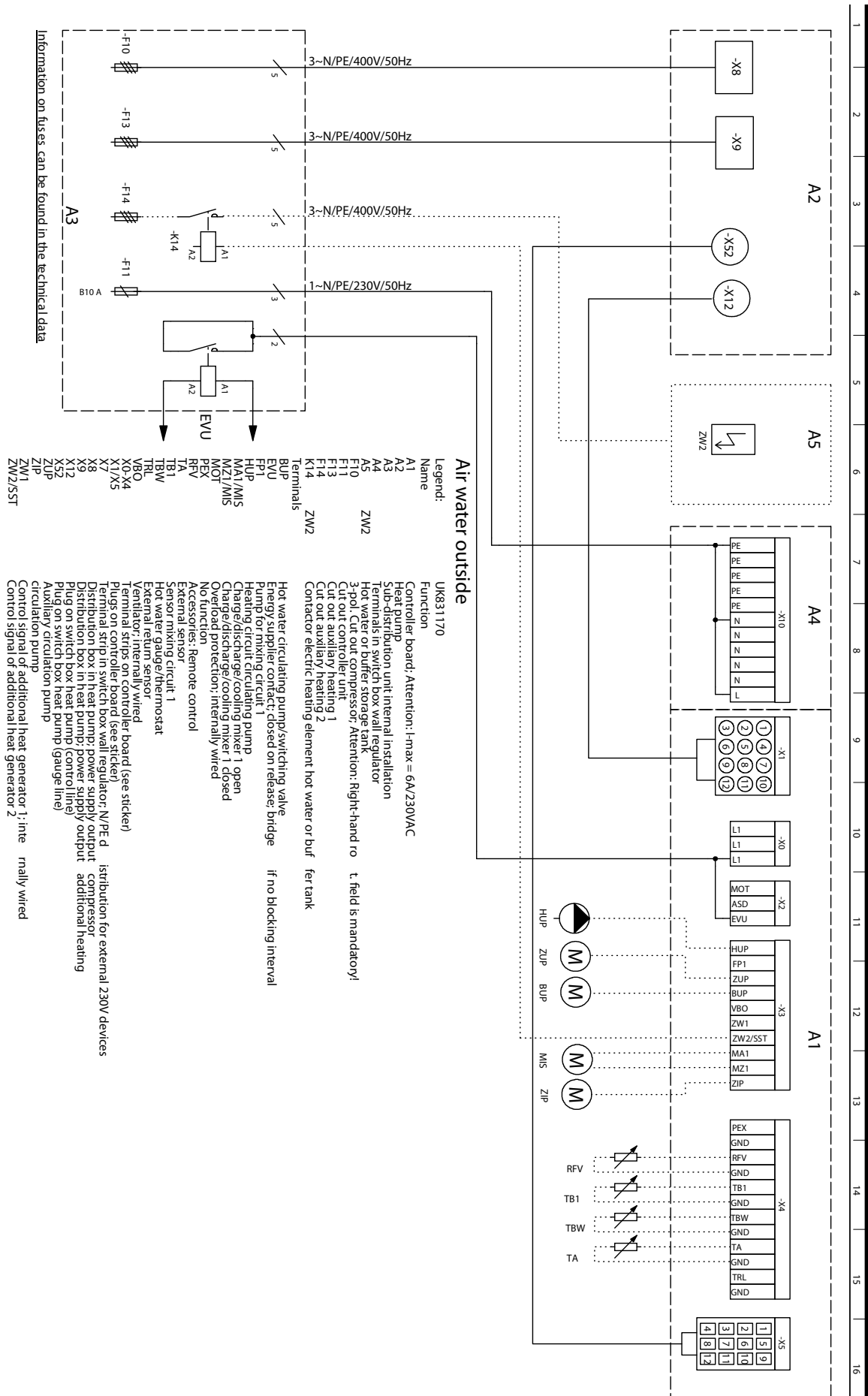
These hydraulic diagrams are schematic representations and are for assistance only. They do not relieve of the obligation to carry out appropriate planning! They do not include all necessary shut-off valves, ventilator fittings or safety devices. These must be incorporated in accordance with the standards 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!





Terminal diagram

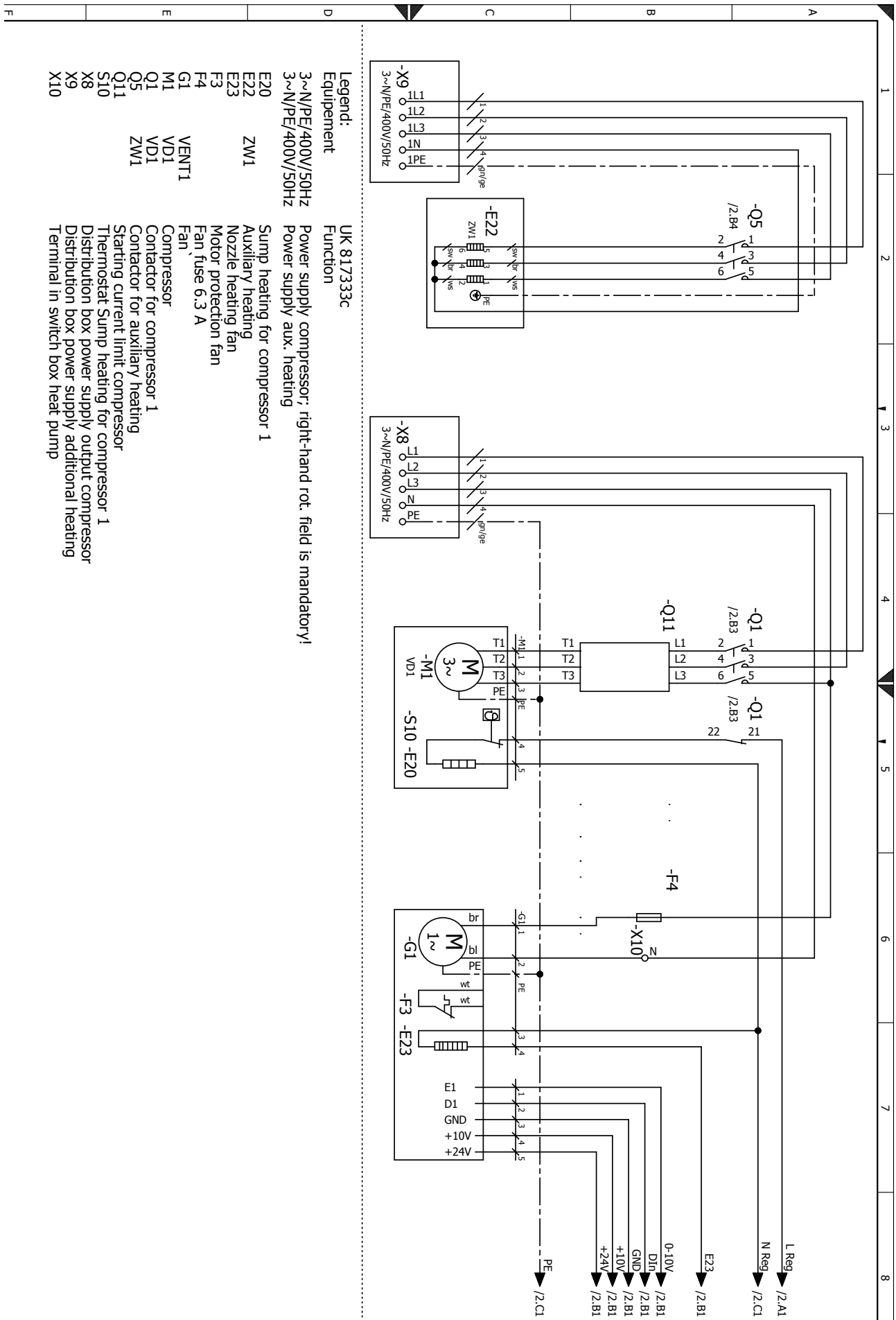
LW 140A – LW 252A





Circuit diagram 1/2

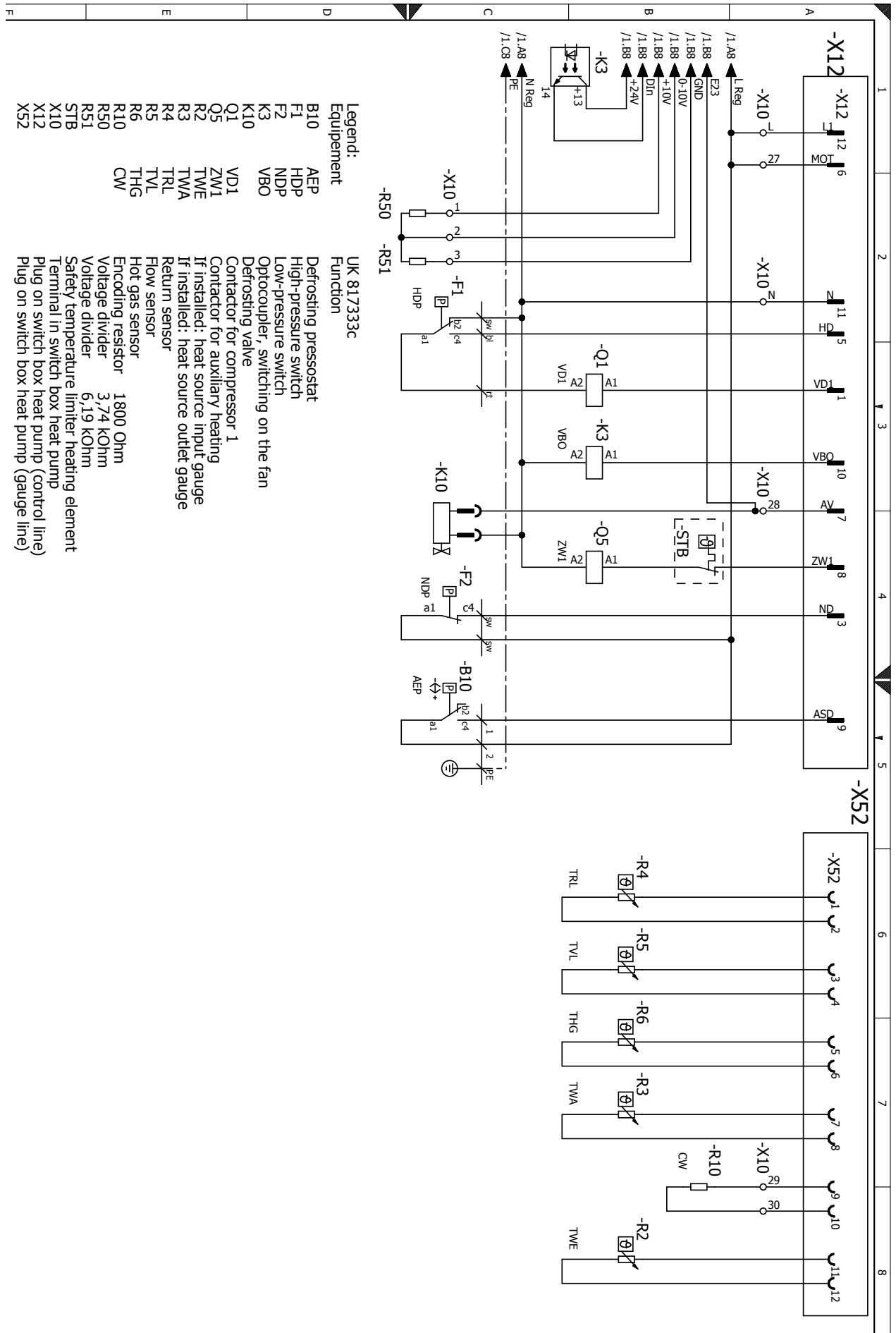
LW 140A





LW 140A

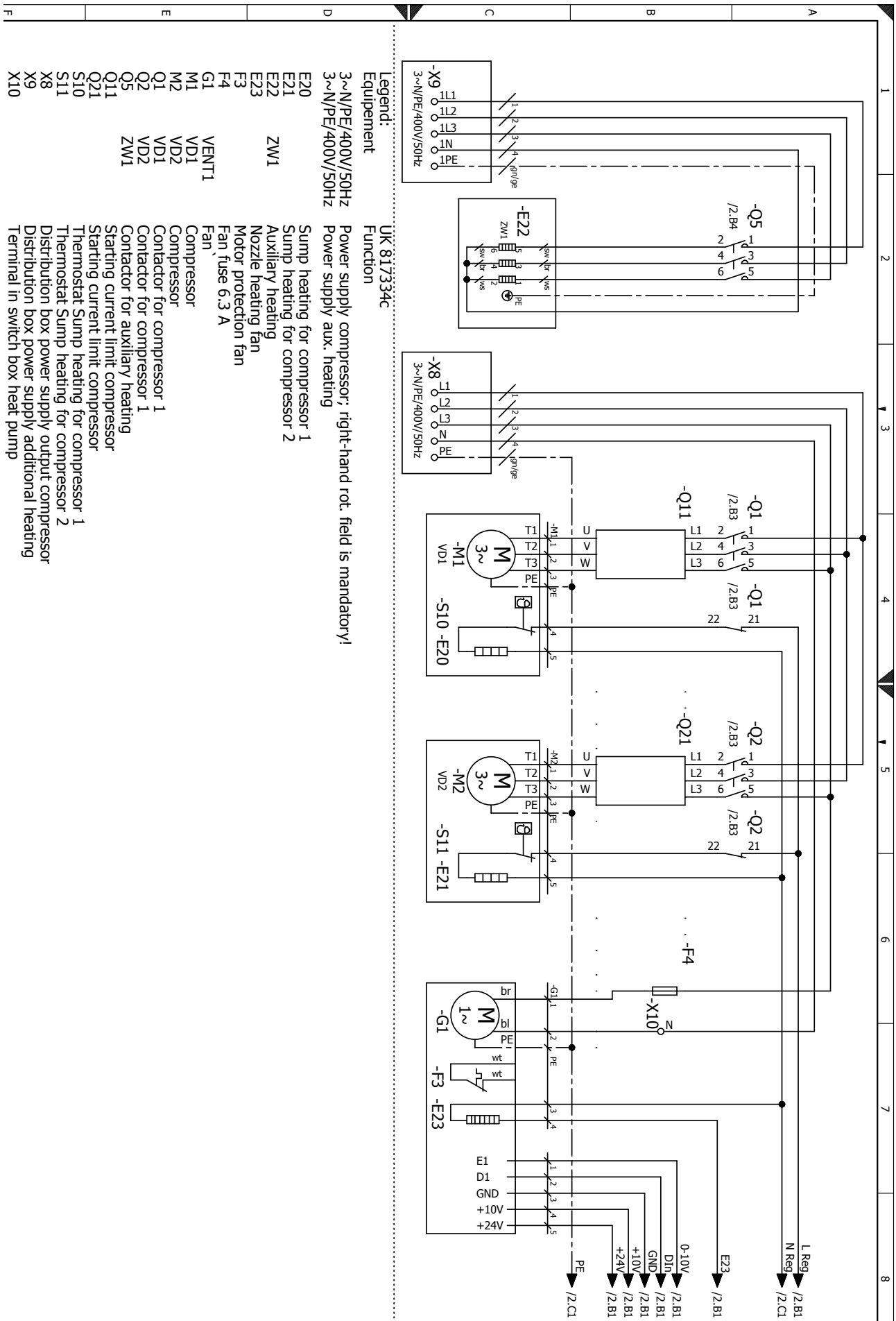
Circuit diagram 2/2





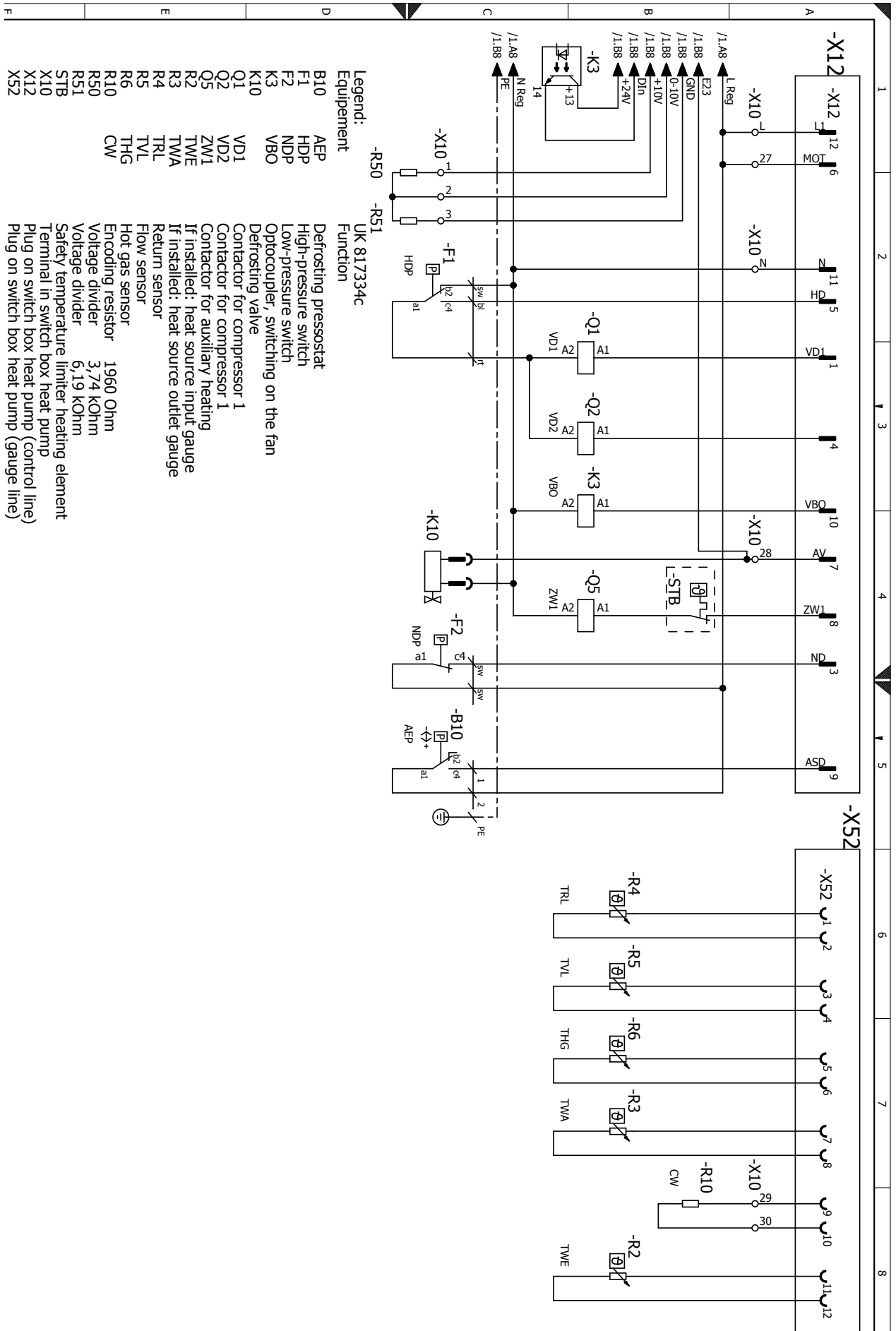
Circuit diagram 1/2

LW 180A





Circuit diagram 2/2

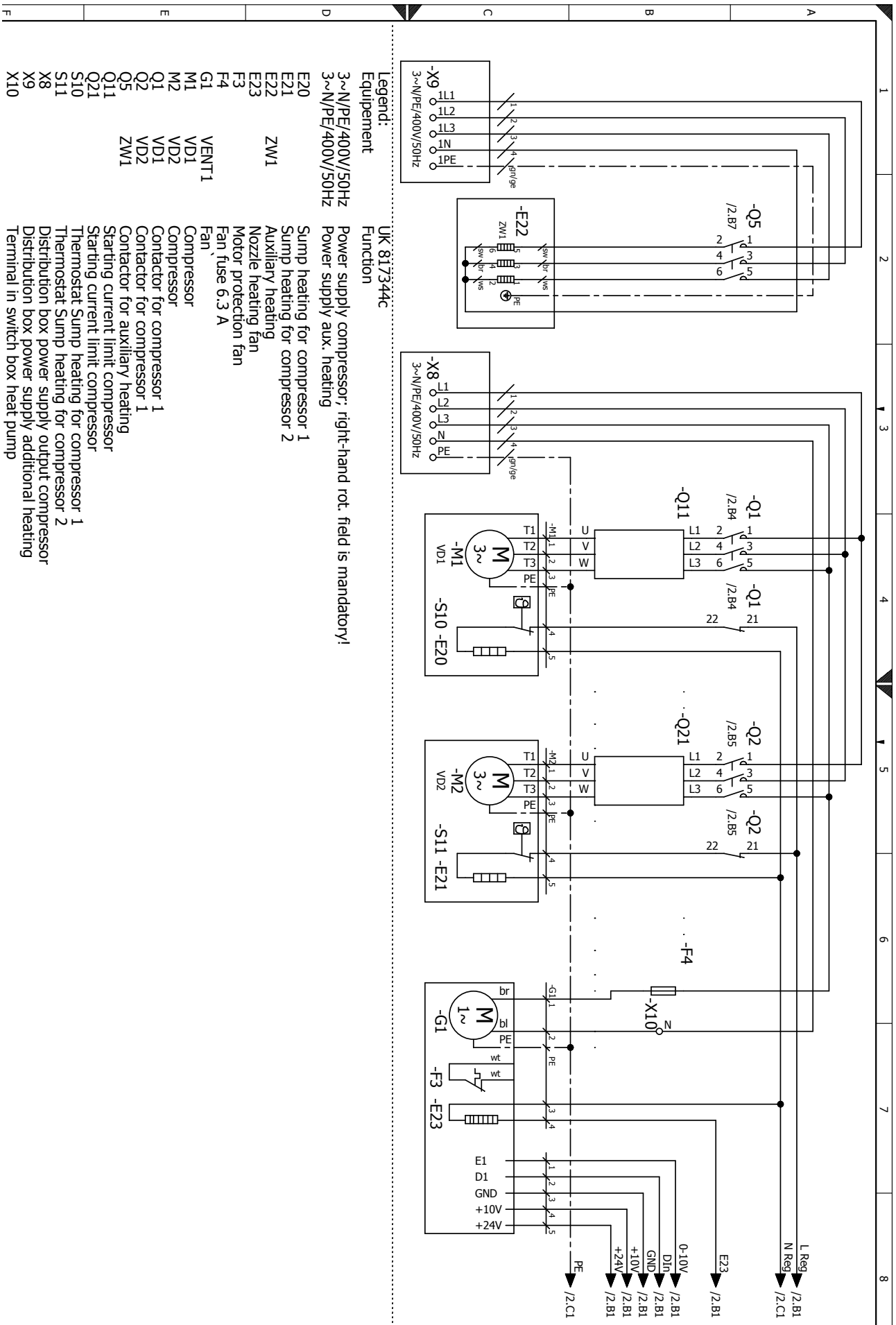


LW 180A



Circuit diagram 1/3

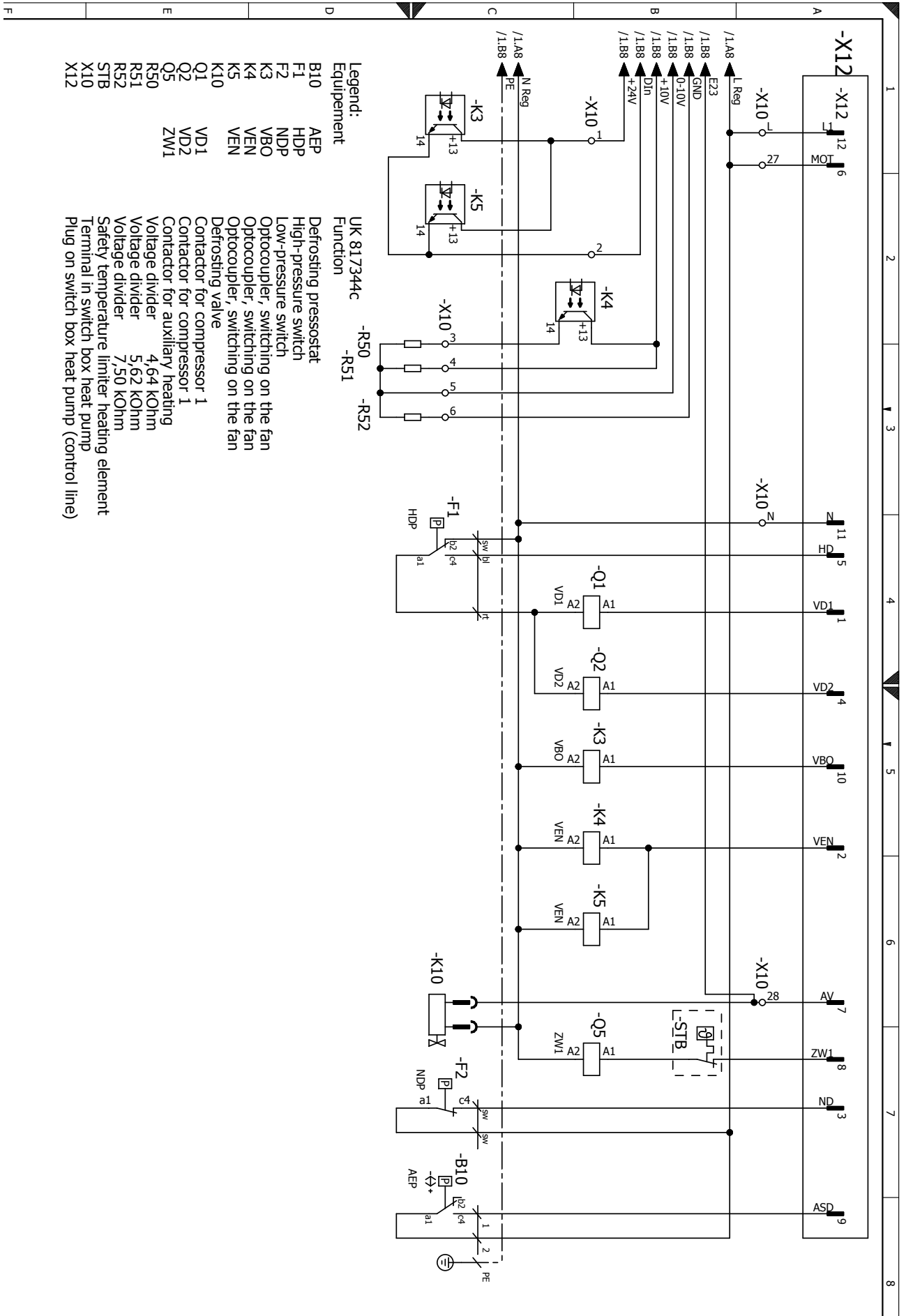
LW 251A / LW 252A





LW 251A / LW 252A

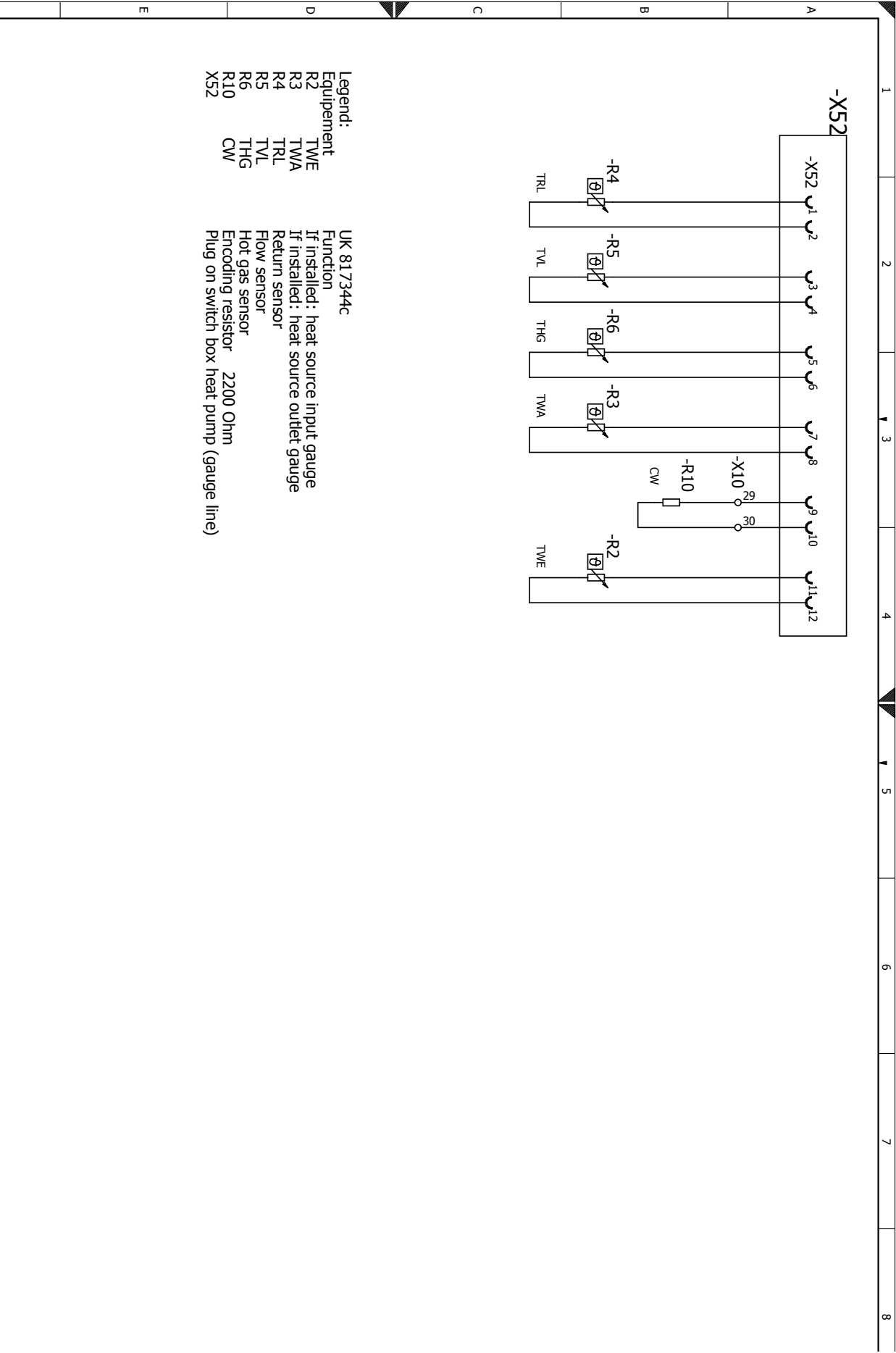
Circuit diagram 2/3





Circuit diagram 3/3

LW 251A / LW 252A







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Subject to technical amendments without prior notice.