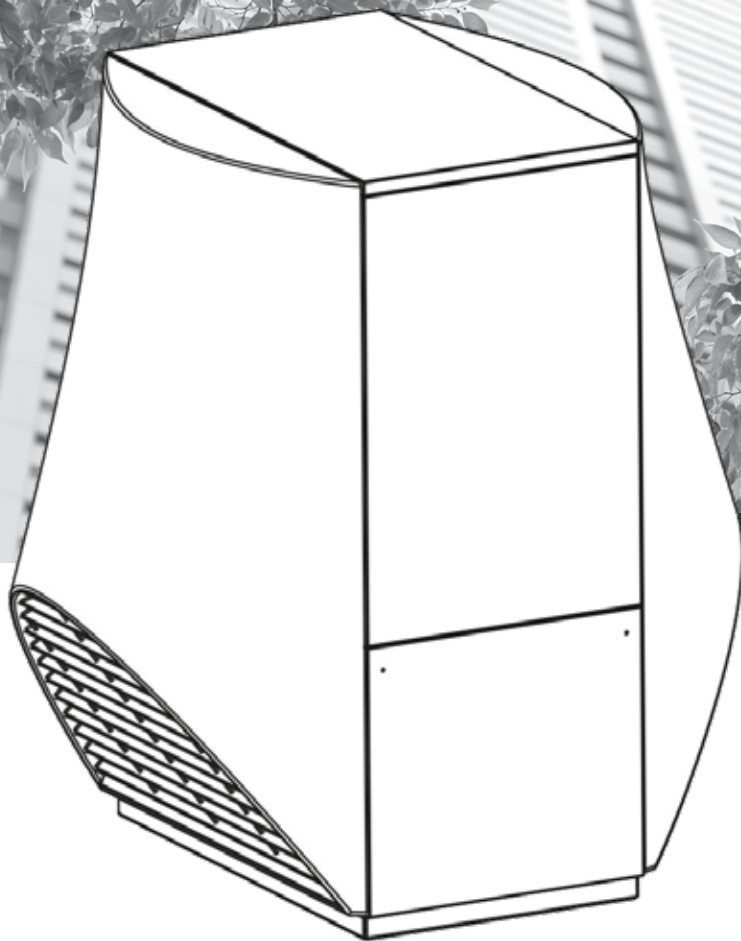
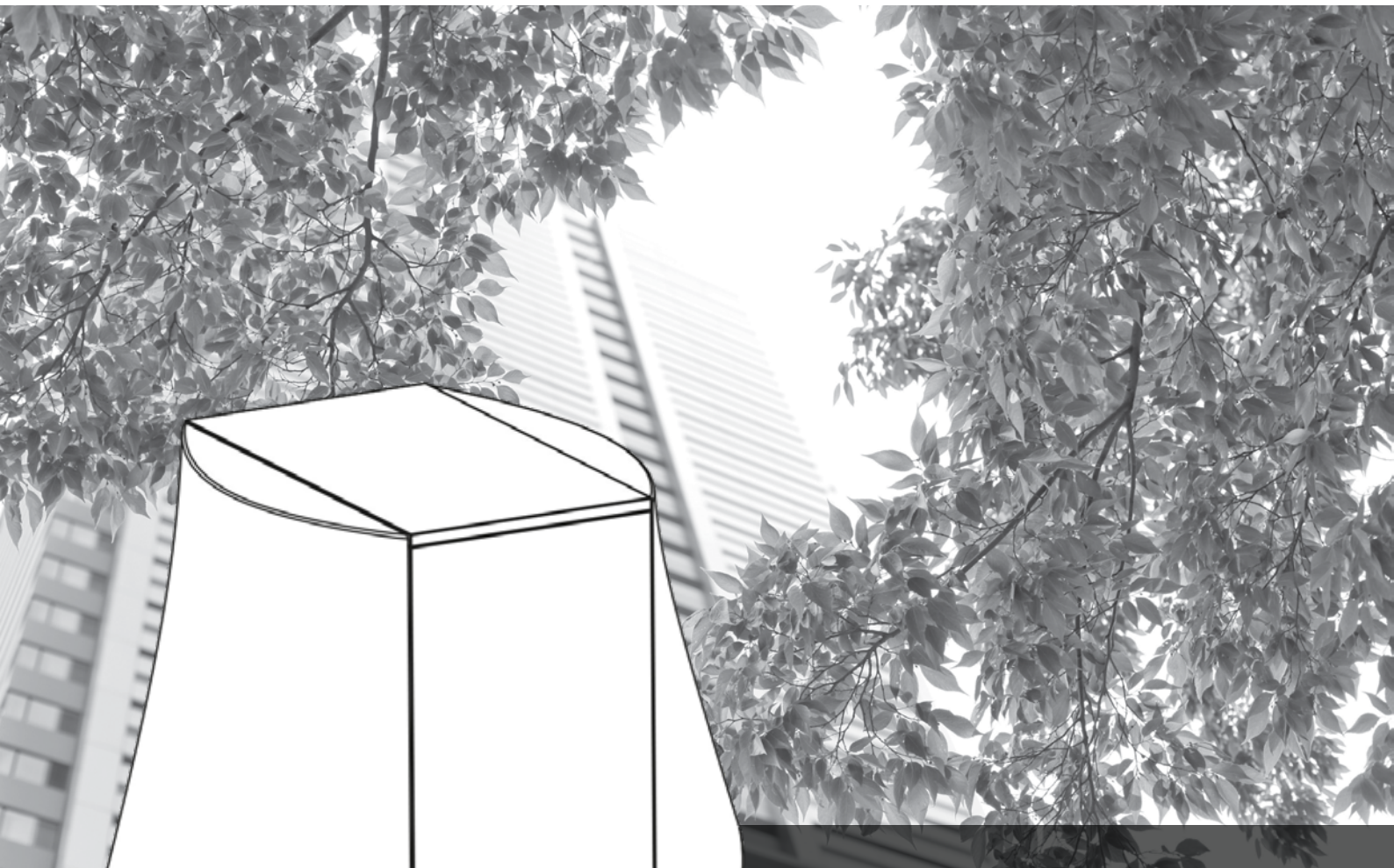


the better way to heat



Air/Water Heat Pumps
Outdoor Installation

LW... A/RX

83051400cUK – Translation into English of the original German operating manual





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 information may be reproduced, transmitted, copied, stored in electronic data systems or translated into another language, either wholly or in part, without the express written permission of the manufacturer.

Symbols

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



Information for users.



Information or instructions for qualified personnel.



DANGER!

Indicates immediate impending danger resulting in severe injuries or death.



WARNING!

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



WARNING!

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



ATTENTION

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



NOTICE.

Emphasised information.



ENERGY SAVING TIP

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



Reference to other sections of the operating manual.



Reference to other documents of the manufacturer.



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Intended use

The unit may be used only for the intended purpose. That means:

- for heating.
- for cooling.
- for heating hot water.

The unit may be operated only within its technical parameters.

 Overview “Technical data / scope of delivery”.



NOTICE

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

Disclaimer


The manufacturer will not be liable for damage resulting from unauthorised 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.

EC conformity

The unit bears the CE mark of conformity.

 EC declaration of conformity

Safety and Security

The unit is operationally safe when used for the intended purpose. The construction and design of the unit conform to the state of the art, all relevant DIN/VDE regulations and all relevant safety regulations.

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

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



DANGER!

Danger of fatal injury due to electric shock!

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 technicians (trained heating, cooling, refrigerant and electrical technicians) may perform work on the unit and its components.



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 authorised service centre.




ATTENTION

For safety reasons:

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



! **ATTENTION**
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 drawing and installation plan for respective model.


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

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

! **ATTENTION**
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!

! **ATTENTION**
By cooling with low flow temperatures, condensate can be expected to form on the heat distribution system as the temperature falls below the dew point. If the heat distribution system is not designed for these operating conditions, it must be protected by appropriate safety devices, e.g. dew point monitor (purchasable accessory).

 **NOTICE**
If the heating surfaces are used for heating and cooling, the control valves must be suitable for heating and cooling.
In addition, a dew-point monitor should be used for cooling.

 **WARNING!**
In the air outlet area the air temperature is ca. 5 K below the ambient temperature. Under certain climatic conditions, therefore, an ice layer can form in the air outlet area. Install the heat pump so that the air blower does not blow in the direction of footpaths.

Customer Services

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


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

DE: www.alpha-innotec.de

EU: www.alpha-innotec.com

Warranty / Guarantee

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

 **NOTICE**
Please contact your dealer concerning warranties and guarantees.

Waste disposal

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

 "Dismantling".

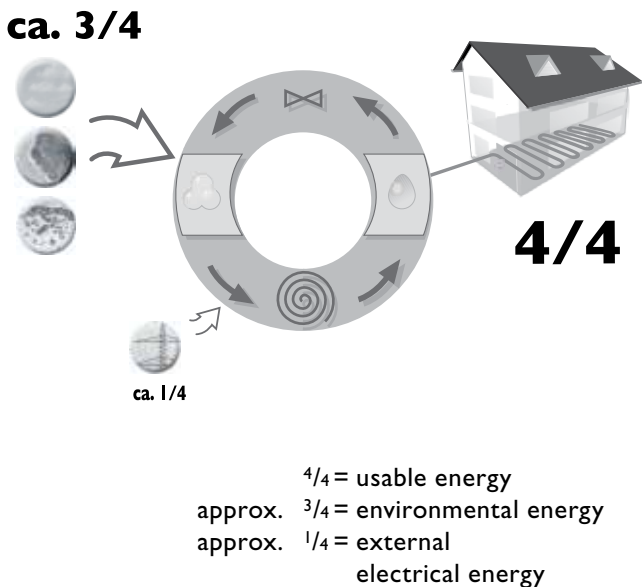


Operating principle of heat pumps

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:



Area of utilisation

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

Overview "Technical data / scope of delivery".

Heat quantity recording

In addition to verification of the unit's efficiency, EEWaermeG also 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, an 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.

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.



NOTICE

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. The lower the flow temperature on the hot water side, the more efficient the system.



ENERGY SAVING TIP

Do not leave windows open continuously; ventilate by opening windows wide for a short time as this saves energy and reduces your heating costs.



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.

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.

The intake and blow-out openings must be inspected for dirt at regular intervals (depending on the installation location) and cleaned, if necessary.

! ATTENTION

Regularly check to ensure that the condensate can drain out of the unit unobstructed. To this end, check the condensate pan in the unit as well as the condensate drain on a regular basis to ensure that they are clean / free from obstructions; clean as needed.

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.

It is a good idea to have a maintenance contract with a heating installation company. The company will conduct the required maintenance at regular intervals.

CLEANING AND FLUSHING UNIT COMPONENTS



WARNING!

Unit components may be cleaned and flushed only by customer service personnel authorised by the manufacturer. Use only liquids recommended by the manufacturer.

Flushing of the condenser with chemical cleaning agents must be followed by neutralisation of residue and intensive flushing with water. Always observe the technical data of the manufacturer of the heat exchanger.

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 authorised by the manufacturer.



Scope of delivery

(TWO PACKING UNITS):

Packing unit 1:



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

Packing unit 2:



Compact 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.



NOTICE.

Note the model.



Overview "Technical data / scope of delivery".

ACCESSORIES NECESSARY FOR OPERATION



ATTENTION

Use only original accessories from the manufacturer of the unit.

The heating and heat pump regulators – functioning as wall regulators, comfort boards as well as control and sensor wires – are necessary for operation of the unit and must be ordered 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

The installation accessories (vibration decouplers) for air/water indoor installation heat pumps must be ordered separately.

Dew point monitors must be ordered separately.

With the LW... A/RX you must select the electrical heating element for the specific system and order it separately.



Installation and assembly

Observe the following when performing all work:



NOTICE

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



NOTICE

Observe the sound levels of the respective model.



Overview “Technical data/scope of delivery”, “Sound” section.

INSTALLATION LOCATION



ATTENTION

Install the unit only outdoors.



Dimensional drawing and installation plan for respective model.

TRANSPORT TO INSTALLATION LOCATION

o prevent damage during transport, always transport the unit to final installation location 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.



Overview “Technical data/scope of delivery”, “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.



ATTENTION

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



ATTENTION

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



SOUND

The noise emission from the heat pumps must be taken into account in the respective installation plans for air / water heat pumps. The respective regional regulations must be complied with.



NOTE.

The following sound pressure levels are calculated values. Other constellations, adjoining other buildings or even reflecting surfaces may lead to a level increase. An exact specification of each sound pressure level is possible only through a measurement spot when the heat pump is already installed.

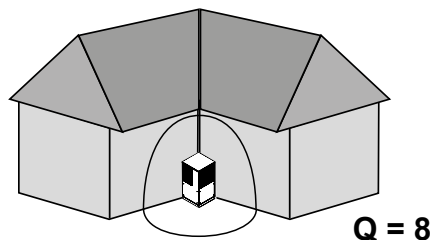
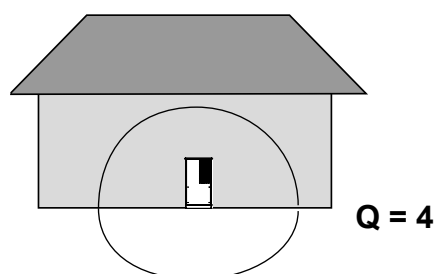
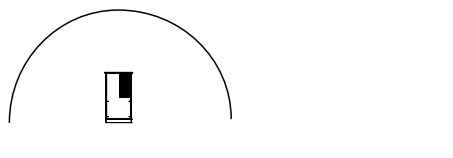
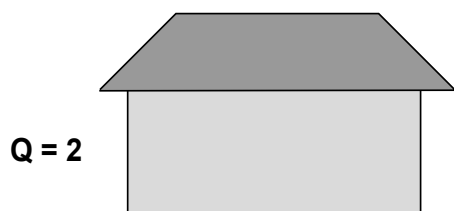
The following sound pressure levels result, depending on the distance and installation variant with directivity factor Q (see sketches page 11):

LW 90 A/RX	Distance from the heat pump in m																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Directivity factor	Sound pressure level at max. heating output in dB(A)																			
Q																				
2	58	52	48,5	46	44	42,4	41,1	39,9	38,9	38	37,2	36,4	35,7	35,1	34,5	33,9	33,4	32,9	32,4	32
4	61	55	51,5	49	47	45,4	44,1	42,9	41,9	41	40,2	39,4	38,7	38,1	37,5	36,9	36,4	35,9	35,4	35
8	64	58	54,5	52	50	48,4	47,1	45,9	44,9	44	43,2	42,4	41,7	41,1	40,5	39,9	39,4	38,9	38,4	38

LW 140 A/RX	Distance from the heat pump in m																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Directivity factor	Sound pressure level at max. heating output in dB(A)																			
Q																				
2	59	53	49,5	47	45	43,4	42,1	40,9	39,9	39	38,2	37,4	36,7	36,1	35,5	34,9	34,4	33,9	33,4	33
4	62	56	52,5	50	48	46,4	45,1	43,9	42,9	42	41,2	40,4	39,7	39,1	38,5	37,9	37,4	36,9	36,4	36
8	65	59	55,5	53	51	49,4	48,1	46,9	45,9	45	44,2	43,4	42,7	42,1	41,5	40,9	40,4	39,9	39,4	39



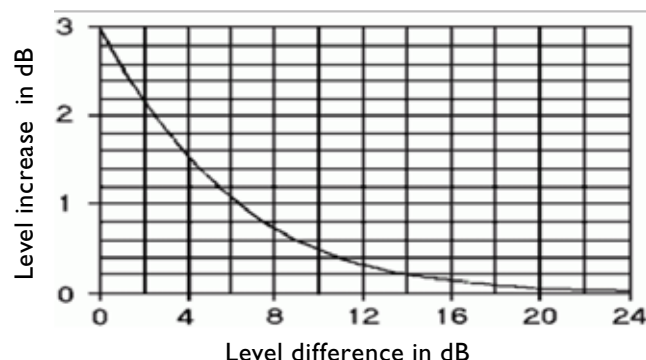
The directivity factor Q for the different installation variants:



In case of 2 or more units of the same heat pump type, the respective level increase must be added to the corresponding sound pressure level from the following table

Number of n equally loud sound sources	Level increase ΔL in dB
1	0,0
2	3,0
3	4,8
4	6,0
5	7,0
6	7,8
7	8,5
8	9,0
9	9,5
10	10,0
12	10,8

In case of different, not equally loud units, the level increase is read off the following diagram:



Example: If the level difference between two unequal sound sources is 5 dB, the level increase is an additional 1.2 dB.

INSTALLATION

Place the unit on a solid, level foundation that is capable of bearing weight. Make sure that the foundation is designed for the weight of the heat pump. Materials that meet this requirement can be used for the foundation (concrete, stone slabs, etc.). The ground surface in the air outlet area of the heat pump must be permeable to water.

! ATTENTION

In the air outlet area the air temperature is ca. 5K below the ambient temperature. Under certain climatic conditions, therefore, an ice layer can form in the air outlet area.

Install the heat pump so that the air blower does not blow in the direction of footpaths.



WARNING!

Several people are required to install the unit.



NOTICE

Always comply with the installation plan for the respective model. Adhere to the size and minimum clearances.



Installation plan for respective model.



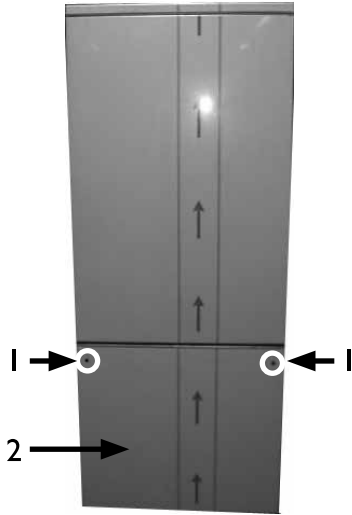
NOTICE

Set up the unit so that the switch cabinet side (= operating side) is accessible at all times.



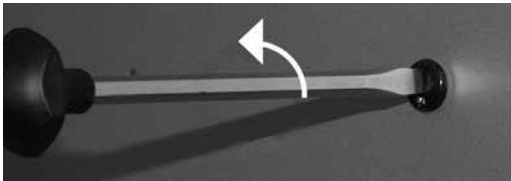
PREPARING FOR INSTALLATION

- 1 Remove lower facing panels on the switch cabinet side (= operator side) and the water connection side of the unit:



- 1 Quick-release screws
- 2 Lower facing panel

Loosen quick-release screws. Turn counter-clockwise 90°...



- 2 On both sides, pull lower facing panel upward and outward, detach and set securely aside.



LIFTING THE UNIT WITH PIPES

(ONLY LW 90A/RX...)

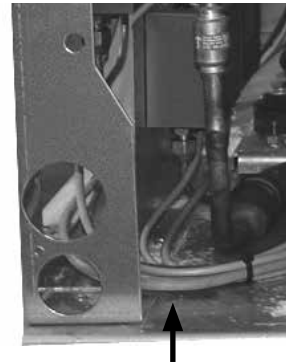
The units can be lifted with $\frac{3}{4}$ " pipes (provided by customer) that are suitable for the weight of the respective unit. Special holes are provided in the frame for this purpose.

- 1 Insert the pipes through the holes in the frame on the switch cabinet side (= operator 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...



- 2 Insert the pipes through the holes in the frame on the water connection side...



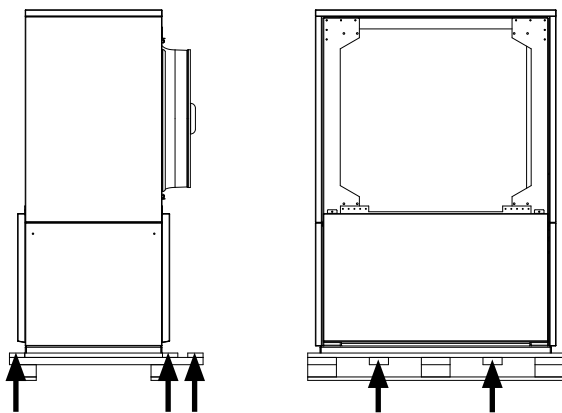


- ③ Lift unit by the pipes, with at least four persons, and place on the base. Make sure that the frame of the unit is in full contact with the underlying surface...

LIFTING THE UNIT WITH A CRANE

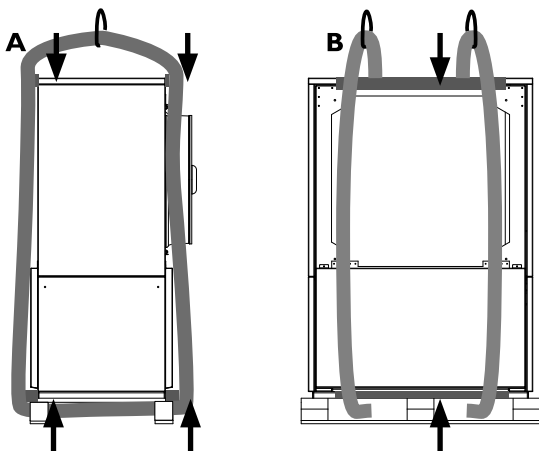
NOTICE.
Models LW 140A/RX and higher must be lifted using a crane.

- 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”.

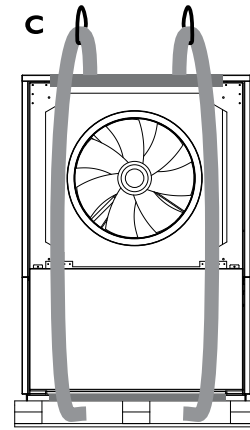


A Front view (operator side)
B Side view I



DANGER!

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



C Side view 2



ATTENTION

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

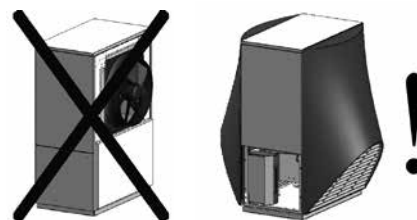
- ③ Lift unit with the crane and place on the base. Make sure that the frame of the unit is in full contact with base.

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.





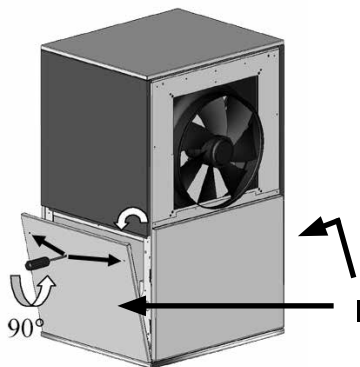
- ① If you have not already done so, remove lower facing panels on the switch cabinet and water connection side of the unit...

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

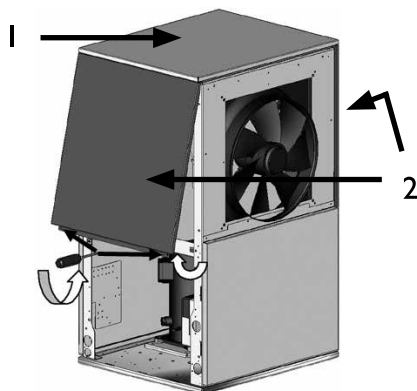
- ② Remove upper facing panels from unit...

②•①

To do so, loosen the two screws on the lower edges of the upper facing panels...

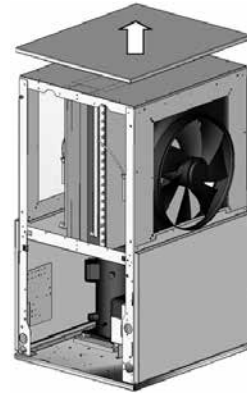
②•②

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

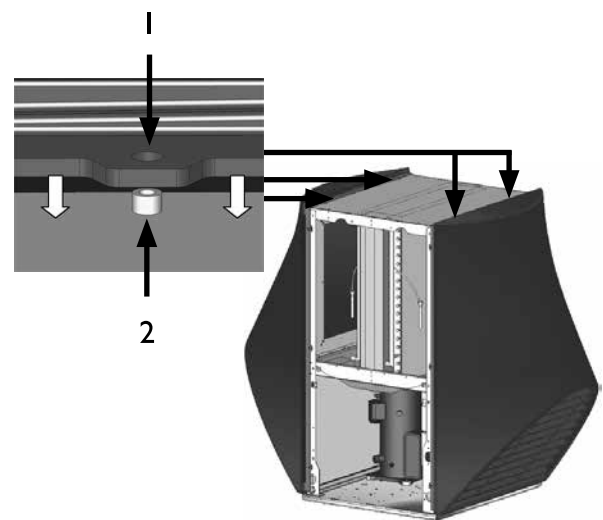
- ③ The top cover of the unit was fastened by the upper facing panels. After removal of the upper facing panels, the top cover is loose. Remove top cover and set securely aside...



- ④ Install air flow baffles...

④•①

Suspend air flow baffles in the brass bushes on the top side of the frame...

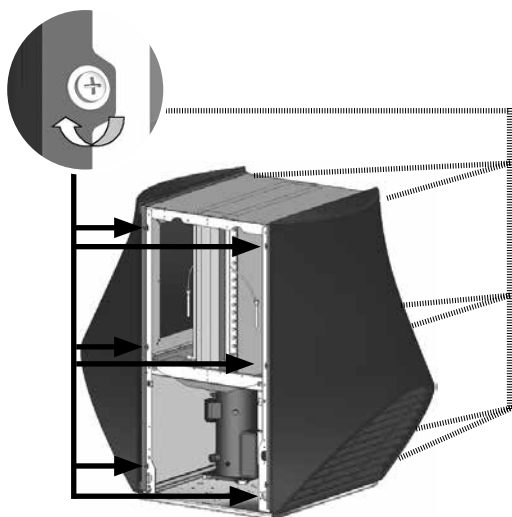


1 eyelet on air flow baffle
2 brass bushing on frame

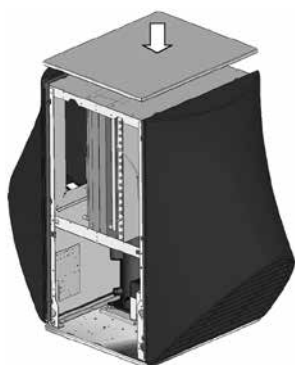


④•②

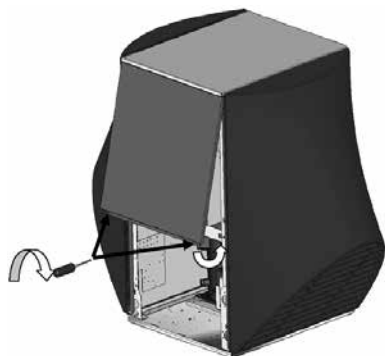
Bolt air flow baffles to the frame on the switch cabinet side (= operator side) and water connection side...



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.

INSTALLATION / CONNECTION TO HEATING CIRCUIT

! ATTENTION

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



“Hydraulic connection” instructions.



NOTICE

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



NOTICE

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



Overview “Technical data/scope of delivery”, “heating circuit” section.



! ATTENTION

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



Overview “Technical data/scope of delivery”, “heating circuit, buffer tank” section.



! ATTENTION

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



- ① Flush heating circuit thoroughly prior to connecting the unit to the heating circuit...



NOTICE

Contamination and deposits in the heating circuit can cause malfunctions.

- ② Install shut-off devices for the hot water outflow (forward flow) and hot water inflow (return flow) on the heat pump side.



NOTICE

During installation of the shut-off devices, the evaporator and condenser of the heat pump can be flushed, if necessary.

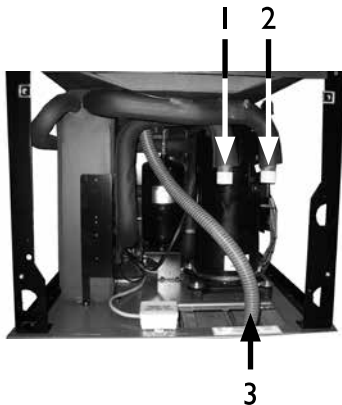
- ③ Connect the unit to the pipes of the heating circuit via vibration decouplers. They must be installed in order to prevent damage from vibrations to the pipes.



NOTICE

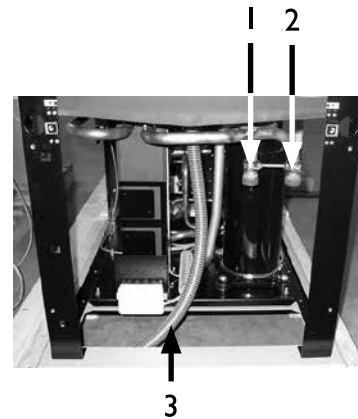
Vibration decouplers are available as accessories.

LW 90A/RX...:



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

LW 140A/RX:



- 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 plan for respective model.



Heat pump planning manual.

- ⑥ Seal empty pipes on unit side.

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.



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.


Separating buffer tank

The hydraulic integration of the heat pump is only permissible with a separating buffer tank (**Isolation against vapour diffusion**).

The flow direction of the hot water system must also be rotated via the switching valve during cooling.

 Hydraulic diagram see page 33.

$$V_{\text{separating buffer tank}} = \frac{\text{minimum flow rate of heat circuit volume flow / hour}}{10}$$

 For the minimum flow rate of the heat circuit volume flow, see overview “Technical data/Scope of delivery”, “Heating circuit” section.

Circulating pumps

! **ATTENTION**
Always note the model.
Do not use unregulated circulating pumps.
Circulating pumps and domestic hot water circulation pumps must be multi-stage, regulated pumps.


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 channelled through the buffer tank of the heating circuit.


 “Hydraulic connection” instructions.

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 cut.

 **NOTICE**
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 optimised for use with your heat pump.

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



Electrical connections

Observe the following when performing all work:



DANGER!
Danger of fatal injury due to electric shock!
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

It is not necessary to open the electric switch cabinet in order to connect the power to the heat pump. The power is connected at the connection boxes on the water connection side.

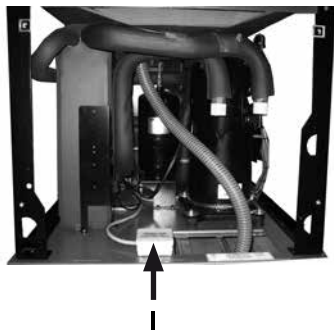
① If the unit is closed, open facing panels...



“Preparing for installation”

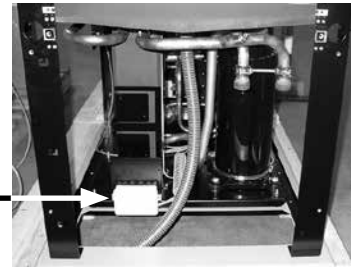
② Open connection boxes...

LW 90A/RX...:



| Connection box for compressor

LW 140A/RX:



| Connection box for compressor

- ③ Connect power cable to the connection box (electric heating element on-site)...
- 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.



ATTENTION

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.



ATTENTION

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.



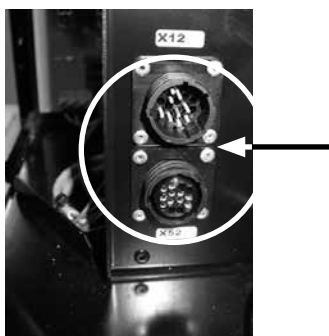
Overview “Technical data/scope of delivery”, “Electric” section.



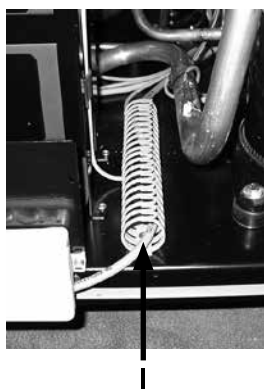
HEAT PUMP SIDE CONNECTION OF THE CONTROL AND SENSOR WIRES

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 cabinet on the switch cabinet side (= operator side) of the heat pump.

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



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



I Cable duct for control and sensor wires (only LW 140A/RX)

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



NOTICE

In order to enable unhinging of the electric switch cabinet 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 diagram and the circuit diagrams for the respective model...



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

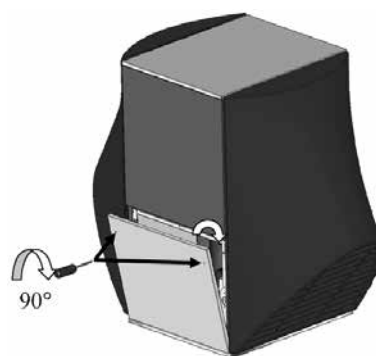


Operating manual of the heating and heat pump regulator.

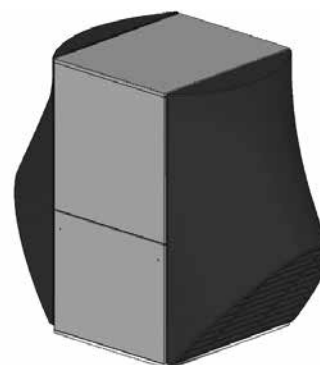
- ⑥ Seal empty pipes on unit side...

- ⑦ Screw facing panels onto the heat pump...

Place lower facing panels diagonally into the frame, close at top and fasten with quick-release screws...



The unit is now closed.





Flushing, filling and bleeding the system

WATER QUALITY OF THE FILL AND ADDITIONAL WATER IN HOT WATER HEATING SYSTEMS ACCORDING TO VDI 2035

PART I AND II

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

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

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

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

PRINCIPLES OF PART I AND PART II

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

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

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

DAMAGE THAT CAN OCCUR IN CASE OF NON-COMPLIANCE

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

LIMESCALE – THE ENERGY KILLER

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

WATER SOFTENING TO VDI 2035 – PART I

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

CORROSION – AN UNDERESTIMATED PROBLEM

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

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



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

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

Contamination and deposits in the heating circuit can cause malfunctions

RINSE, FILL AND BLEED THE HEATING CIRCUIT AND HOT WATER BUFFER TANK

To bleed the hot water tank, the heating circuit and hot water circuit must be rinsed simultaneously.

ON THE SAFE SIDE WITH LOW-SALT OPERATION

The problems listed above do not occur at all with low-salt operation, as neither corrosive salts such as sulphates, chlorides and nitrates nor alkalis sodium hydrogen carbonate are in the heating water. The corrosive properties of deionised water are very low and in addition, fur cannot form in the boiler. This is the ideal approach for closed heating circuits, in particular, because low oxygen input into the heating circuit can also be tolerated.

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

MONITORING

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

- ① Fill and bleed the heating circuit...
- ② In addition, open the bleeding valve on the condenser of the heat pump. Bleed condenser.

Insulating the hydraulic connections

Insulate the vibration decouplers and the pipes of the heating circuit against vapour diffusion.

i NOTICE
Insulate in accordance with applicable local standards and directives.

! ATTENTION
Install the outside pipes of the heating circuit beneath the frost line.

- ① Check seals of all hydraulic connections. Conduct pressure test...
- ② Insulate all connections and lines of the heat circuit and the heat source.



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

In other countries:

Send completion report for heat pump systems and general checklist to the manufacturer's local partner...

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



Dismantling



DANGER!

Danger of fatal injury due to electric shock!

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 cooling system technicians are allowed to dismantle the unit and its components.



ATTENTION

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

REMOVAL OF THE BUFFER BATTERY



ATTENTION

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 heat optimised at	
	A7/W35 Standard point acc. to EN14511	1 compressor kW ...
	A7/W45 Standard point acc. to EN14511	1 compressor kW ...
	A2/W35 Operating point acc. to EN14511	1 compressor kW ...
	A10/W35 Operating point acc. to EN14511	1 compressor kW ...
	A-7/W35 Operating point acc. to EN14511	1 compressor kW ...
Performance data	Cooling capacity/EER cool optimised at	
	A27/W18 Operating point acc. to EN14511	1 compressor kW ...
	A27/W7 Operating point acc. to EN14511	1 compressor kW ...
	A35/W18 Operating point acc. to EN14511	1 compressor kW ...
	A35/W7 Operating point acc. to EN14511	1 compressor kW ...
Heating limits of application	Heating circuit (water)	°C
	Heat source (air)	°C
	Additional operating points	°C
Cooling limits of application	Cooling circuit (water)	°C
	Heat sink (air)	°C
Sound	Sound pressure level outside (measured at distance of 1m around air connections)	dB(A)
	Sound pressure level outside (measured at distance of 1m around air connections)	dB(A)
Heat transfer medium air	Air volume flow at maximum external compression	m ³ /h
	Maximum external pressure	Pa
Heat transfer medium water	Volume flow: minimum flow rate nominal flow rate A7/W35 EN14511 maximum flow rate	l/h
	Pressure losses heating/cooling Δp volume flow	bar l/h
	Pressure losses hot water circuit/swimming pool circuit Δp volume flow	bar l/h
General unit data	Dimensions (see dimensional drawing for the specified unit size)	unit size
	Total weight	kg
	Connections Heating circuit / cooling circuit	...
	Hot water circuit / swimming pool circuit	...
	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	Effect. power consumption in standard point A7/W35 acc. to EN14511: Power consumption current consumption cos ϕ	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
Safety equipment	Safety component heating circuit Safety component heat source	Incl. in scope of delivery: • yes — no
Heating and heat pump regulator		Included in scope of delivery: • yes — no
Control and sensor wire		Included in scope of delivery: • yes — no
Power cable to unit		Included in scope of delivery: • yes — no
Electronic soft starter		integrated: • yes — no
Expansion vessels	Heating circuit: Scope of delivery Volume Initial pressure	• yes — no bar
Overflow valve		integrated: • yes — no
Vibration decouplers	Heating circuit	Included in scope of delivery: • yes — no

UK813506c

*) depending on components tolerances and flow **) comply with local regulations n.n. = not detectable w.w. = optional
 1) hot water return flow 2) hot water forward flow

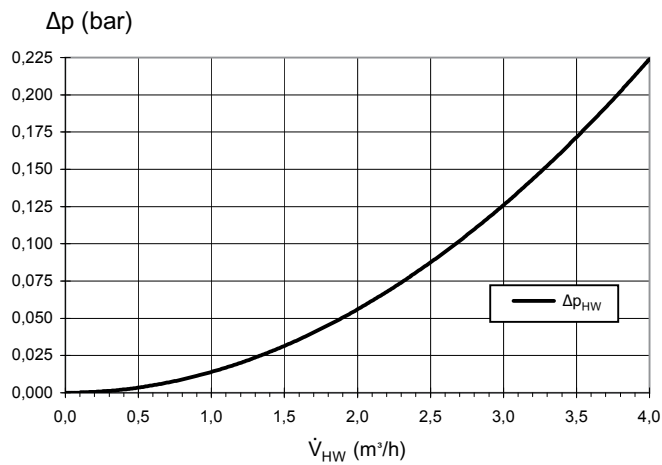
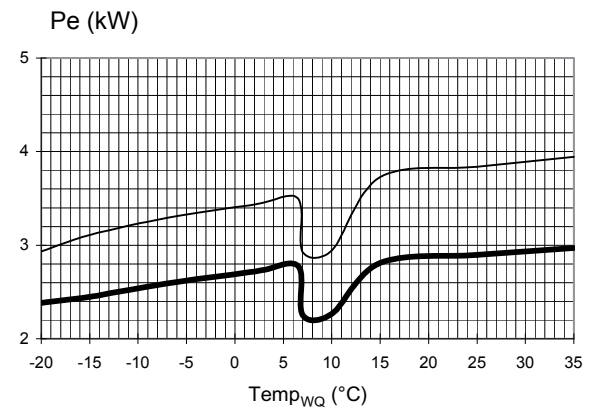
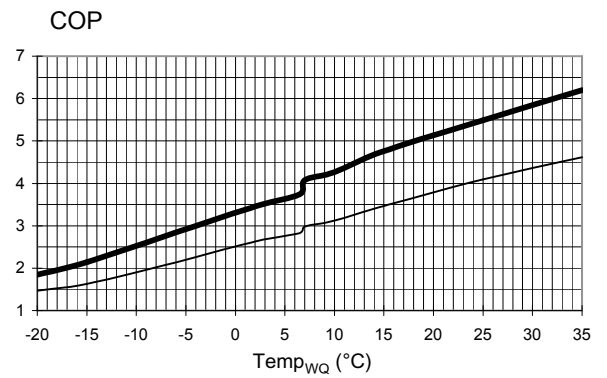
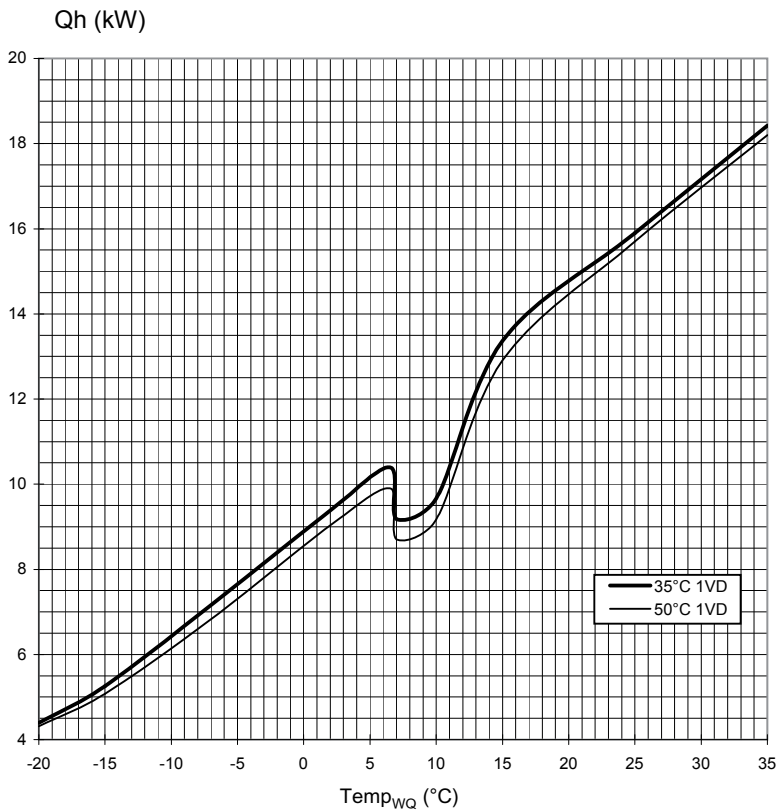


	LW 90 A/RX	LW 140 A/RX
	— • —	— • —
	— •	— •
	•	•
	9,2 4,1	14,4 4,2
	8,9 3,3	13,9 3,5
	9,4 3,5	13,8 3,5
	9,7 4,3	14,1 4,3
	7,2 2,8	10,8 2,9
	14,5 3,7	20,3 3,8
	10,8 3,2	15,4 3,2
	13,0 2,9	18,4 2,9
	9,9 2,5	14,2 2,5
	20 ¹ – 52 ²	20 ¹ – 52 ²
	-20 – 40	-20 – 40
	A> -7 / 60 ²	A> -7 / 60 ²
	7 ² – 20 ²	7 ² – 20 ²
	15 – 40	15 – 40
	—	—
	55	56
	4000	5100
	—	—
	1350 2000 2500	2000 3000 3750
	0,031 1450	0,024 2100
	— —	— —
	2	4
	260	280
	R 1"AG	R5/4"AG
	—	—
	R407C 6,8	R407C 10,2
	—	—
	30 1	30 1
	3~/PE/400V/50Hz C10	3~/PE/400V/50Hz C16
	1~/N/PE/230V/50Hz B10	1~/N/PE/230V/50Hz B10
	—	—
	2,25 4,3 0,75	3,95 7,6 0,75
	8,1	11,9
	51,5 30	74 30
	24	24
	—	—
	—	—
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	813505a	813506d



Heating LW 90A/RX

Performance curves



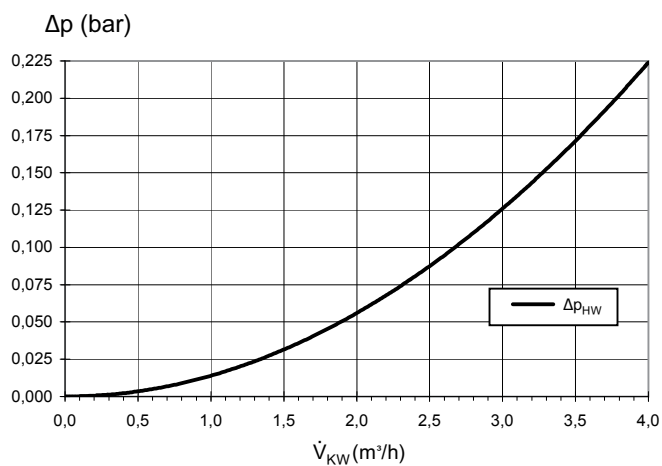
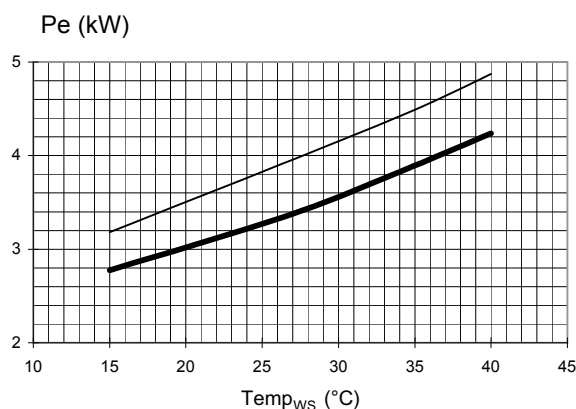
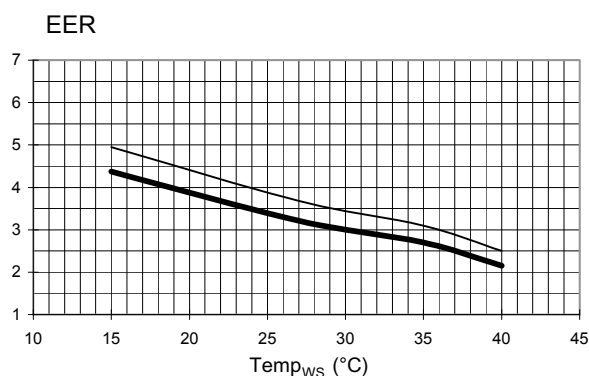
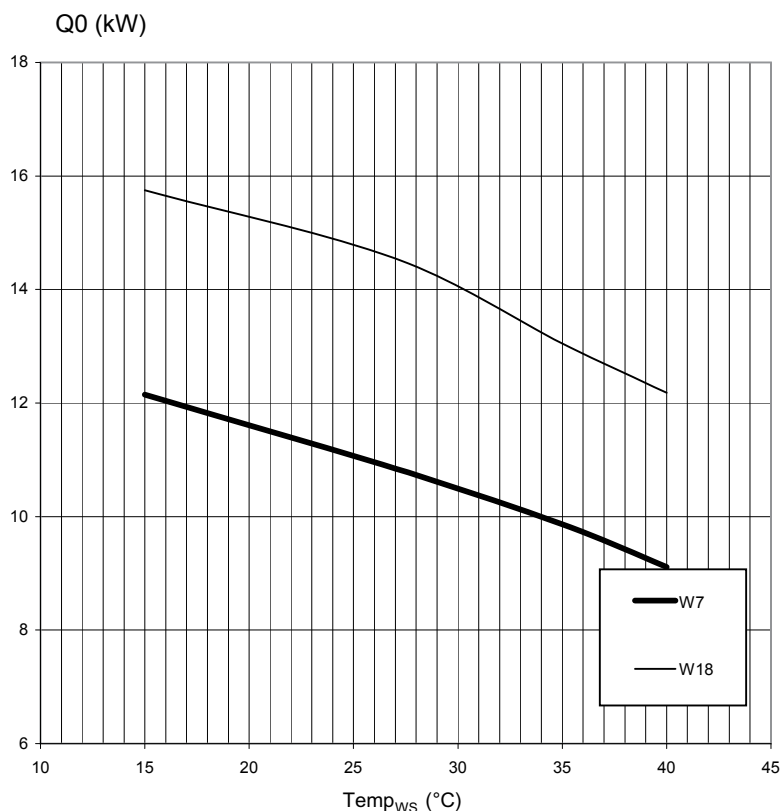
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Legend:	UK823129L/170408
V _{HW}	Volume flow, heating water
Temp _{WQ}	Temperature, heat source
Qh	Heating capacity
Pe	Power consumption
COP	Coefficient of performance / efficiency rating
Δp _{HW}	Pressure loss heat pump
VD	Compressor(s)



Performance curves

Cooling LW 90A/RX



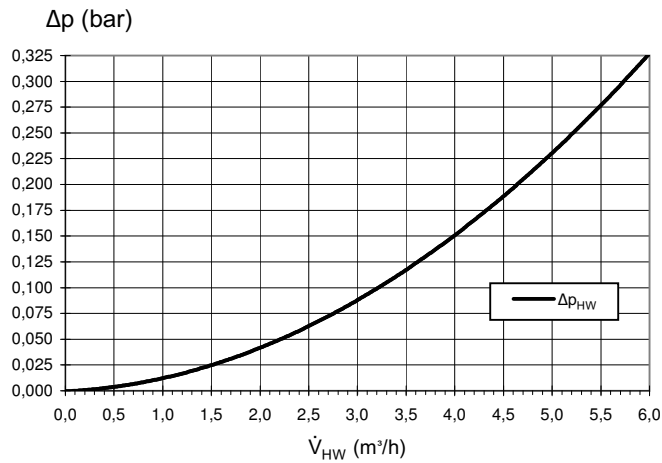
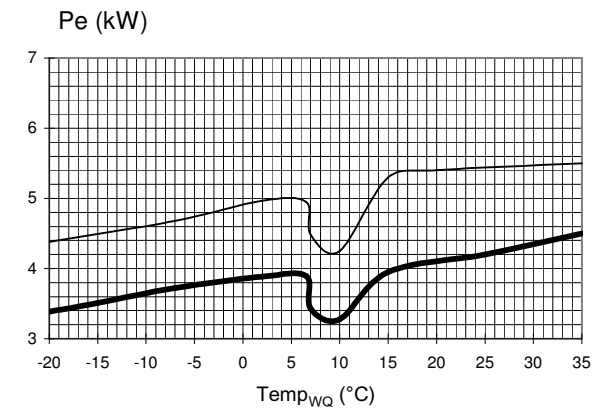
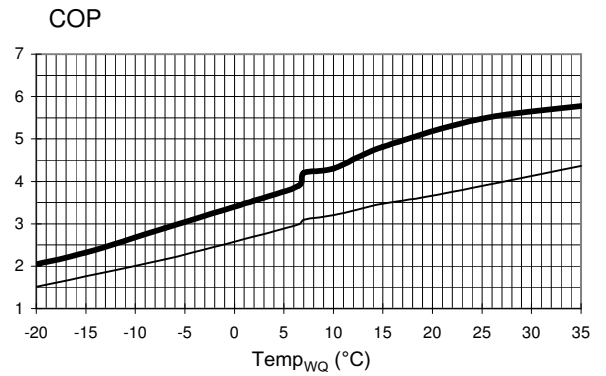
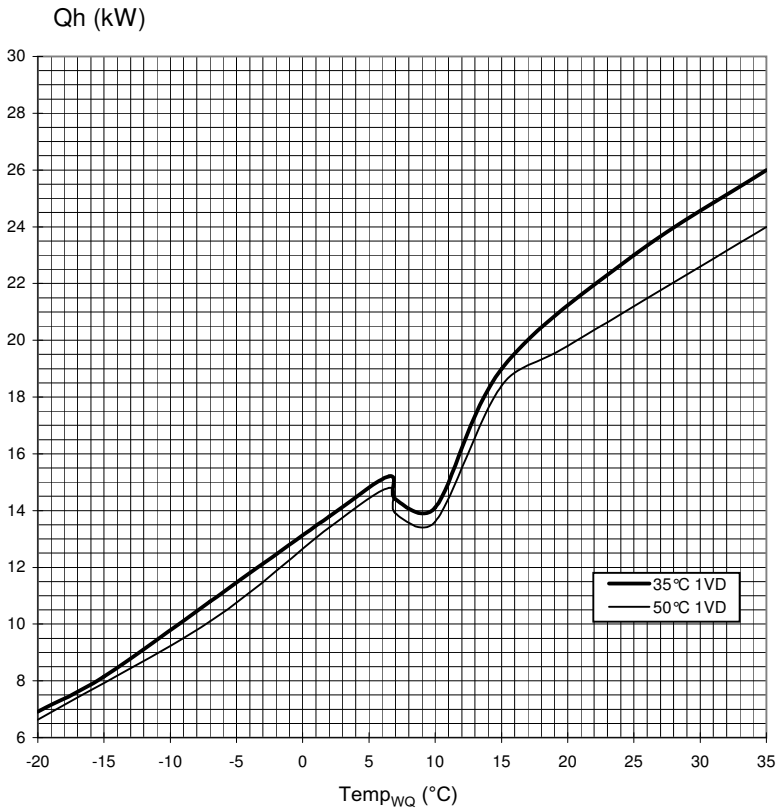
823146a

Legend:	UK823134L/190313
\dot{V}_{KW}	Volume flow cooling water
Temp _{WS}	Heat sink temperature
Q0	Cooling capacity
Pe	Power consumption
EER	Energy efficiency ratio / cooling capacity rate
Δp _{HW}	Pressure loss heat pump
VD	Compressor(s)



Heating LW 140A/RX

Performance curves



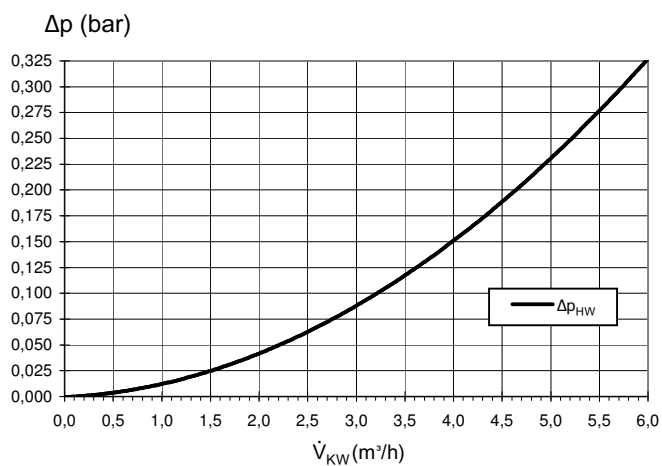
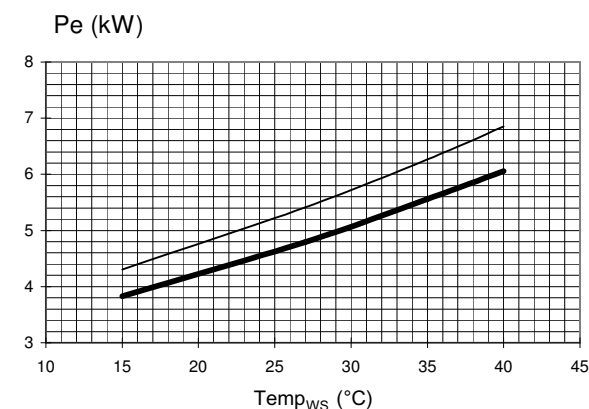
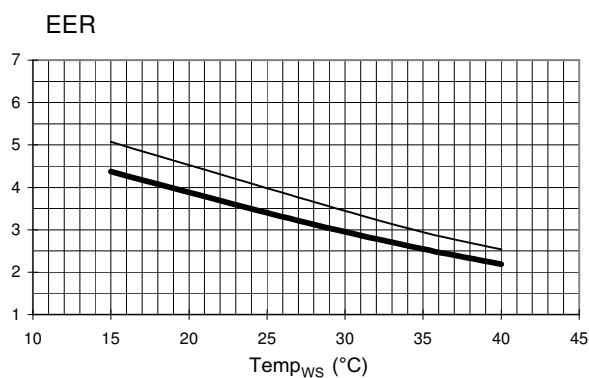
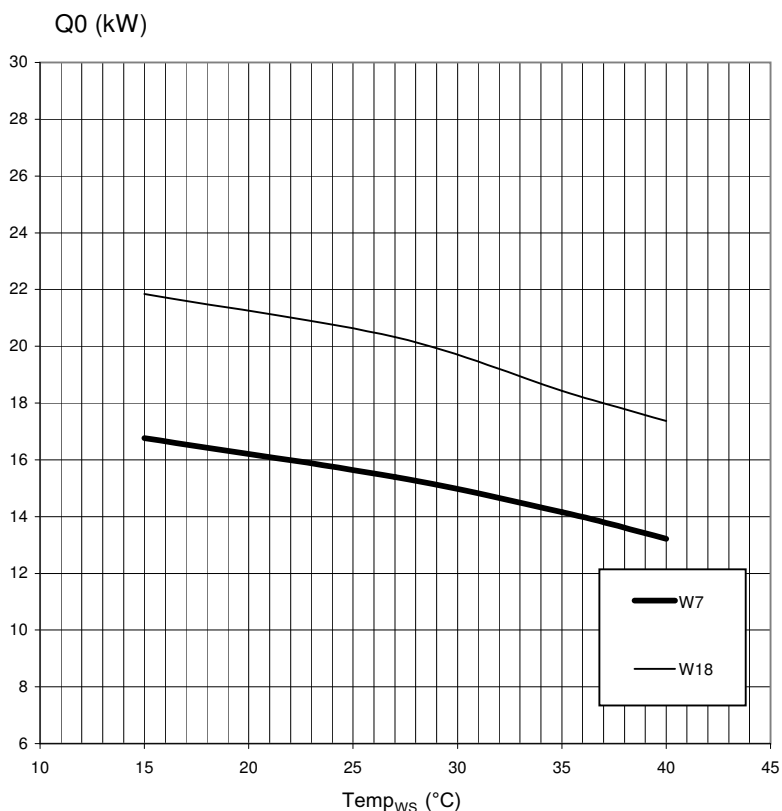
823143b

Legend:	UK823129L/170408
\dot{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

Cooling LW 140A/RX



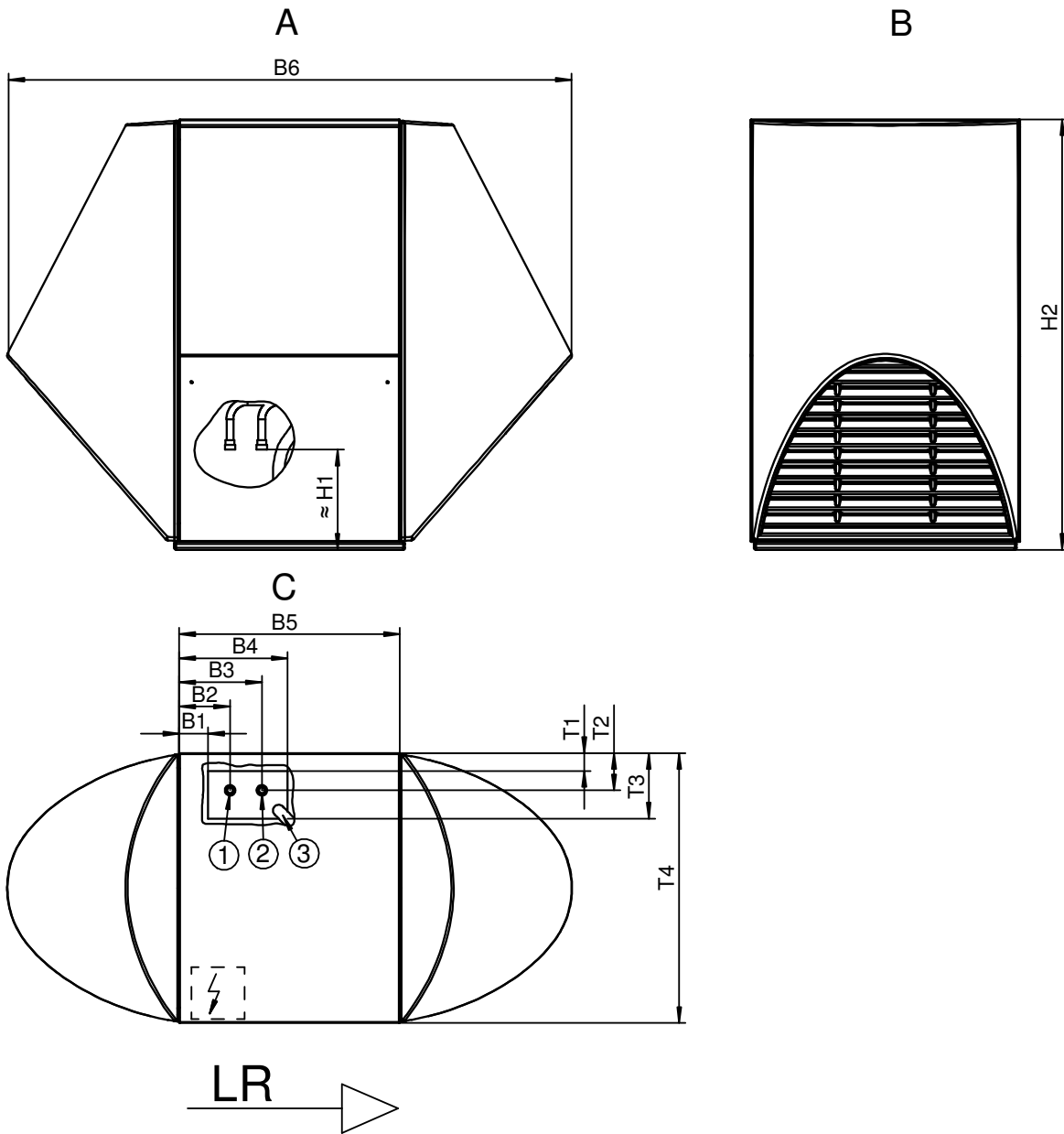
823143b

Legend:	UK823134L/190313
\dot{V}_{KW}	Volume flow cooling water
Temp _{WS}	Heat sink temperature
Q0	Cooling capacity
Pe	Power consumption
EER	Energy efficiency ratio / cooling capacity rate
Δp _{HW}	Pressure loss heat pump
VD	Compressor(s)



LW 90A/RX... – LW 140A/RX

Dimensional drawings



Legend: UK819294c_Rev
All dimensions in mm.

- A Front view
- B Side view
- C Top view
- 1 Heating water outflow (forward flow)
- 2 Heating water inflow (return flow)
- 3 Condensate hose diameter 36
- LR Air direction

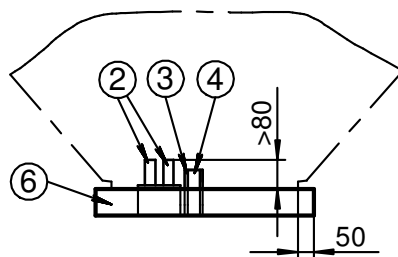
	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	T ₁	T ₂	T ₃	T ₄	H ₁	H ₂	1	2
LW 90A/RX...	91	160	260	341	694	1774	56	117	206	848	315	1353	R 1"	R 1"
LW140A/RX	79	139	239	329	715	1931	132	207	282	1050	430	1780	R 1¼"	R 1¼"



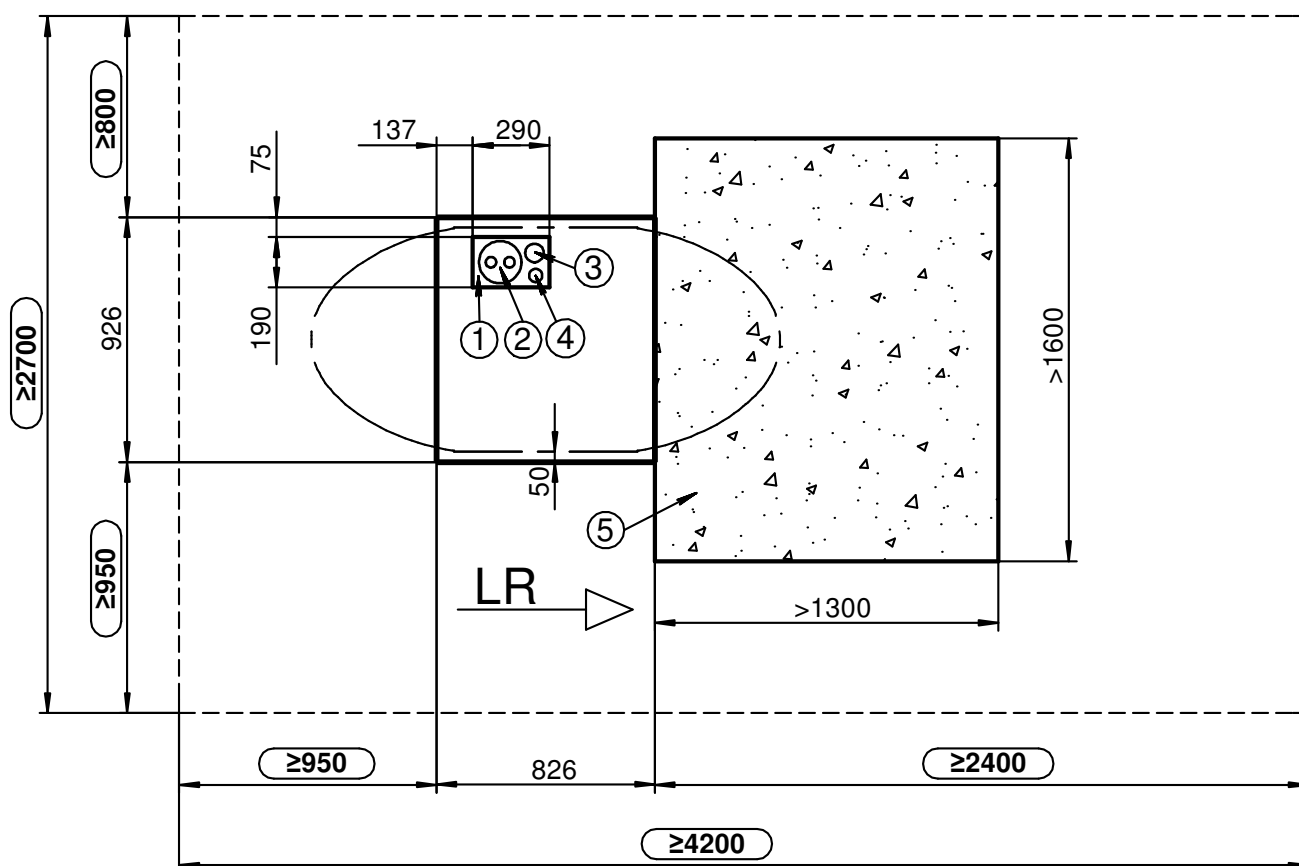
Installation plan

LW 90A/RX...

A



C



Legend: UK819280d

All dimensions in mm.

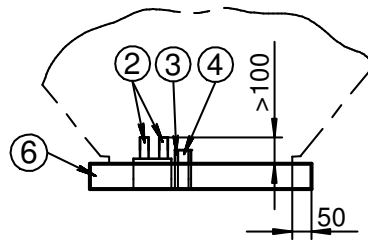
- A Front view
- C Top view
- ≥ ... Minimum clearances
- 1 Recess in base
- 2 Local heat pipe for heating water forward/return flow
- 3 Empty pipe for electric cables, minimum diameter 70mm
- 4 Condensate discharge, minimum diameter 50mm
- 5 water-permeable surface (gravel, ...) in the air outlet area
- 6 Base
- LR Air direction



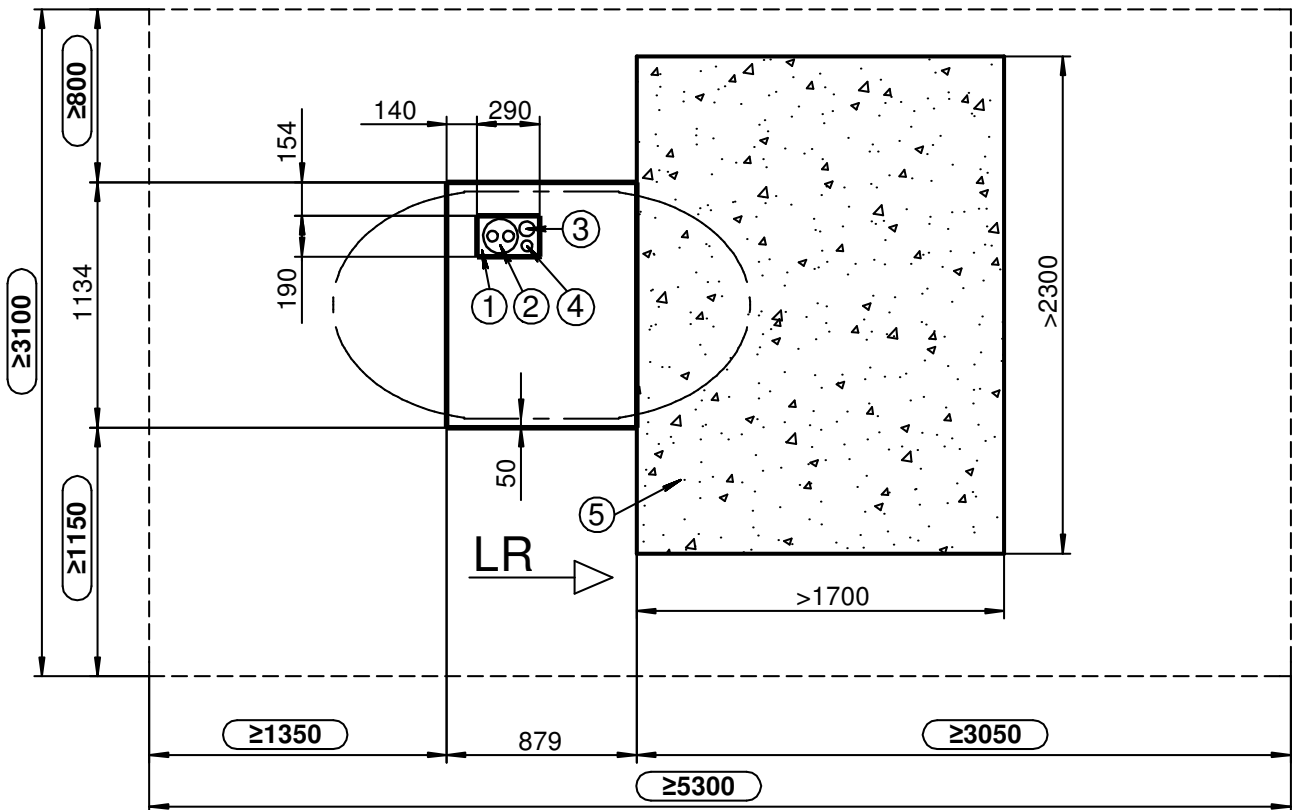
LW 140A/RX

Installation plan

A



C



Legend: UK819293d

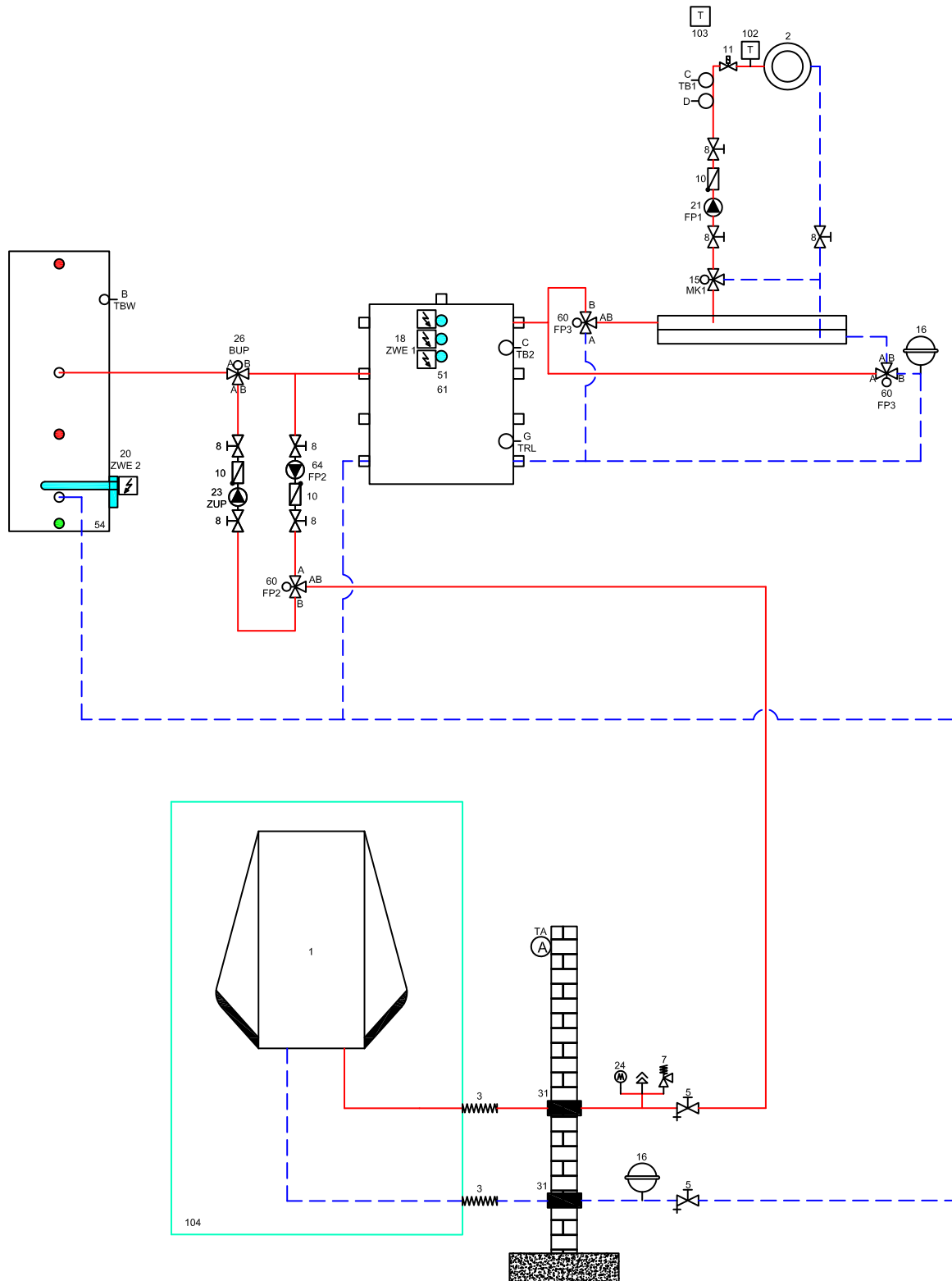
All dimensions in mm.

- 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



Separate buffer tank

LW 90A/RX – LW 140A/RX





Legend hydraulic diagram

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 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

51	Separation 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

TAVA	External sensor
TBWB	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:

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

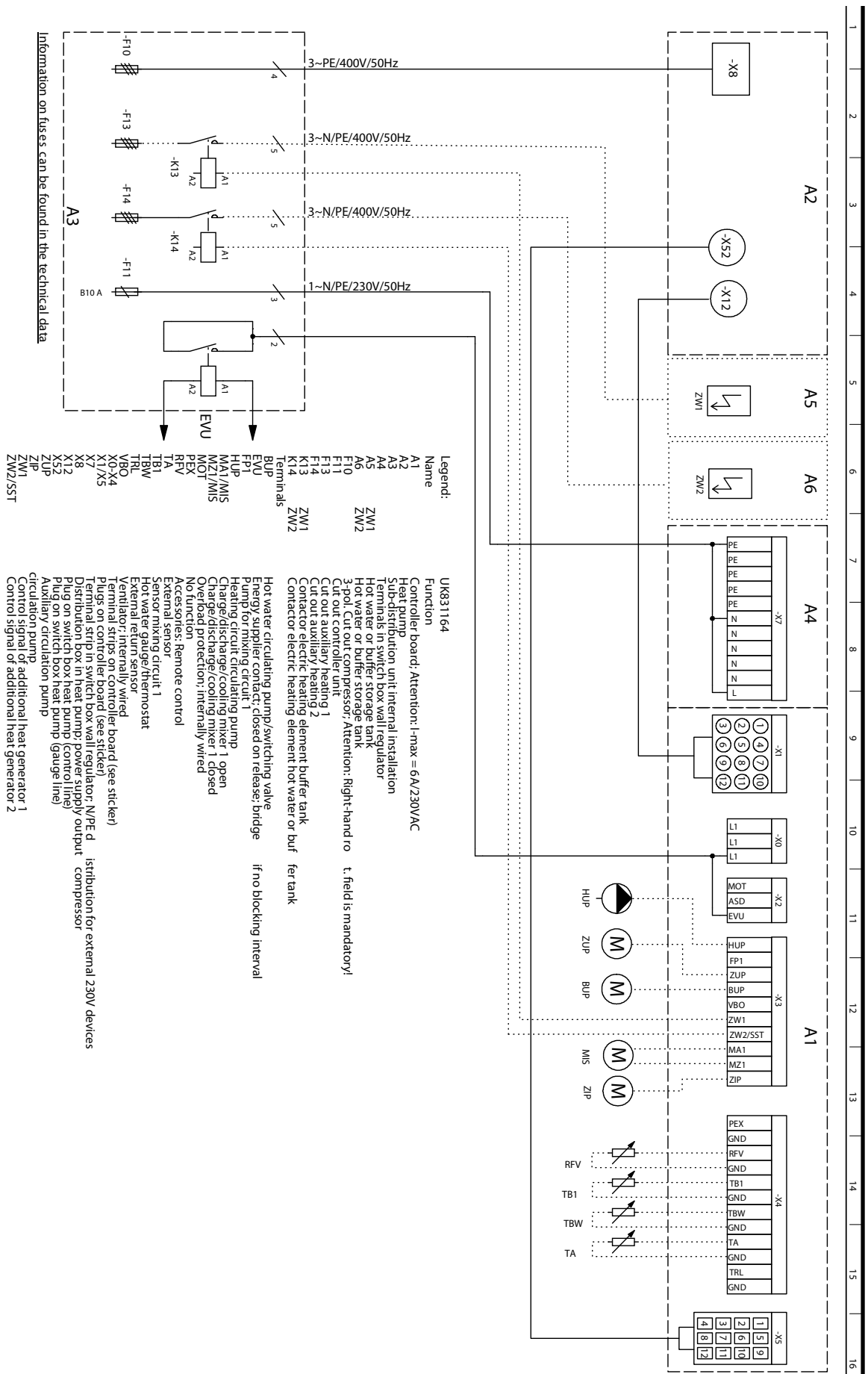
Important notice!

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

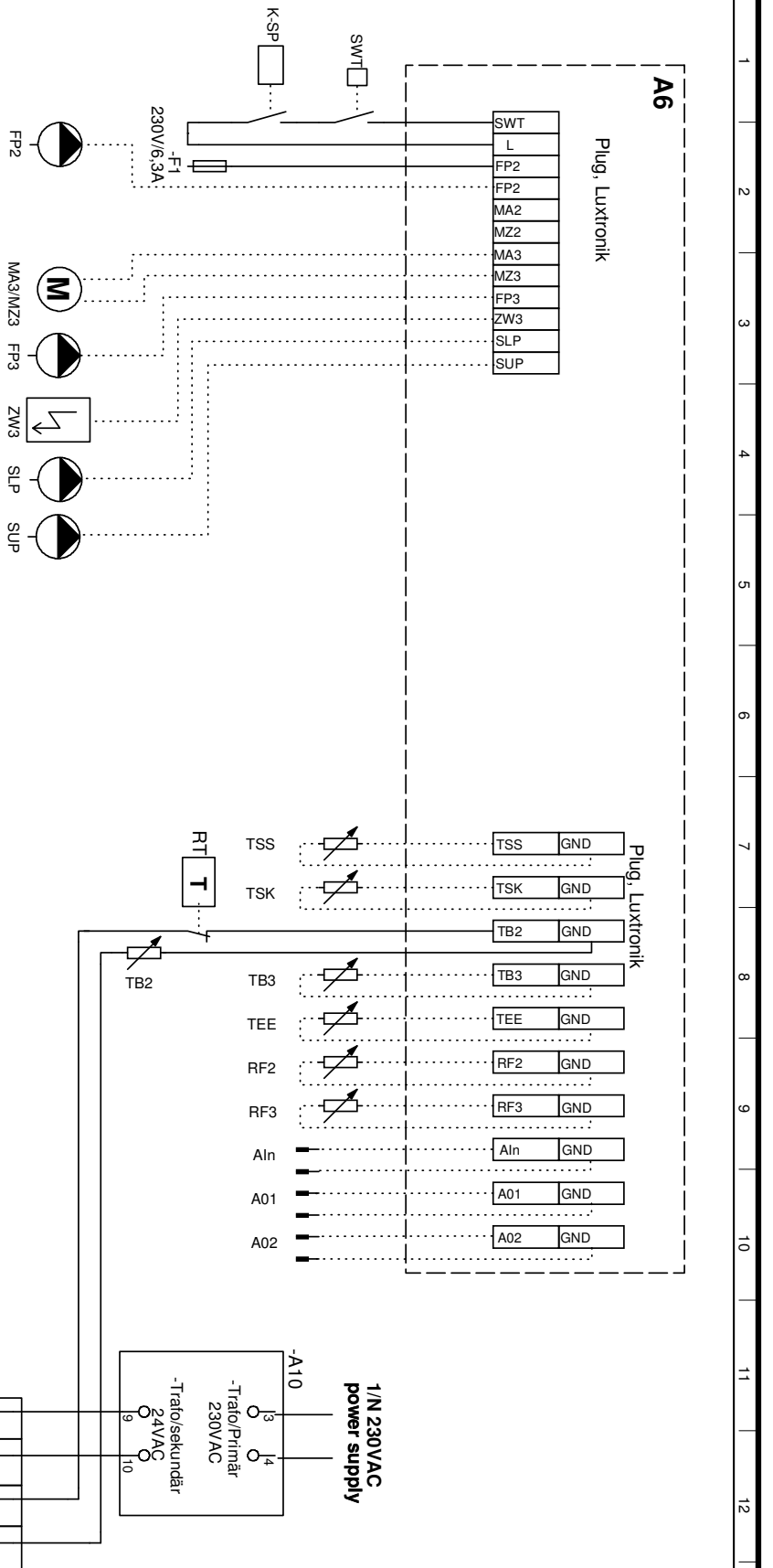
LW 90A/RX – 140A/RX





Comfort board

Terminal diagram



Comfort board, reversible

Legend:

UK831163

Name	Function
A6	Comfort board
A10	Transformer 230/24VAC
F1	Series fuse mixer circuit pump 2 max. 230V 6.3A potential-free contact
FP2	Pump, mixing circuit 2, dry contact
FP3	Pump for mixing circuit 3
K-SP	Contactor, secondary pump
MA3/MZ3	230V Charge/discharge/cooling mixer
RT	Floor thermostat
SLP	Solar charge pump
SUP	Swimming pool, circulating pump
SWT	Swimming pool, thermostat
X100	Accessory connections dew-point detector
X101	Connections, dew-point detector
ZW3	Control signal, additional heat generator 3
Aln	Analogue input 0-10V / 0-20 mA
A01	Analogue output 1 0-10V
A02	Analogue output 2 0-10V
RF2	Room station, mixing circuit 2
RF3	Room station, mixing circuit 3
TB2	Cooler sensor separator storage
TB3	Sensor mixing circuit 3
TEE	Sensor, external energy source
TSK	Error solar collector
TSS	Error solar tank

! CAUTION:

For all unit-specific connections, refer to the terminal diagram for the respective unit.

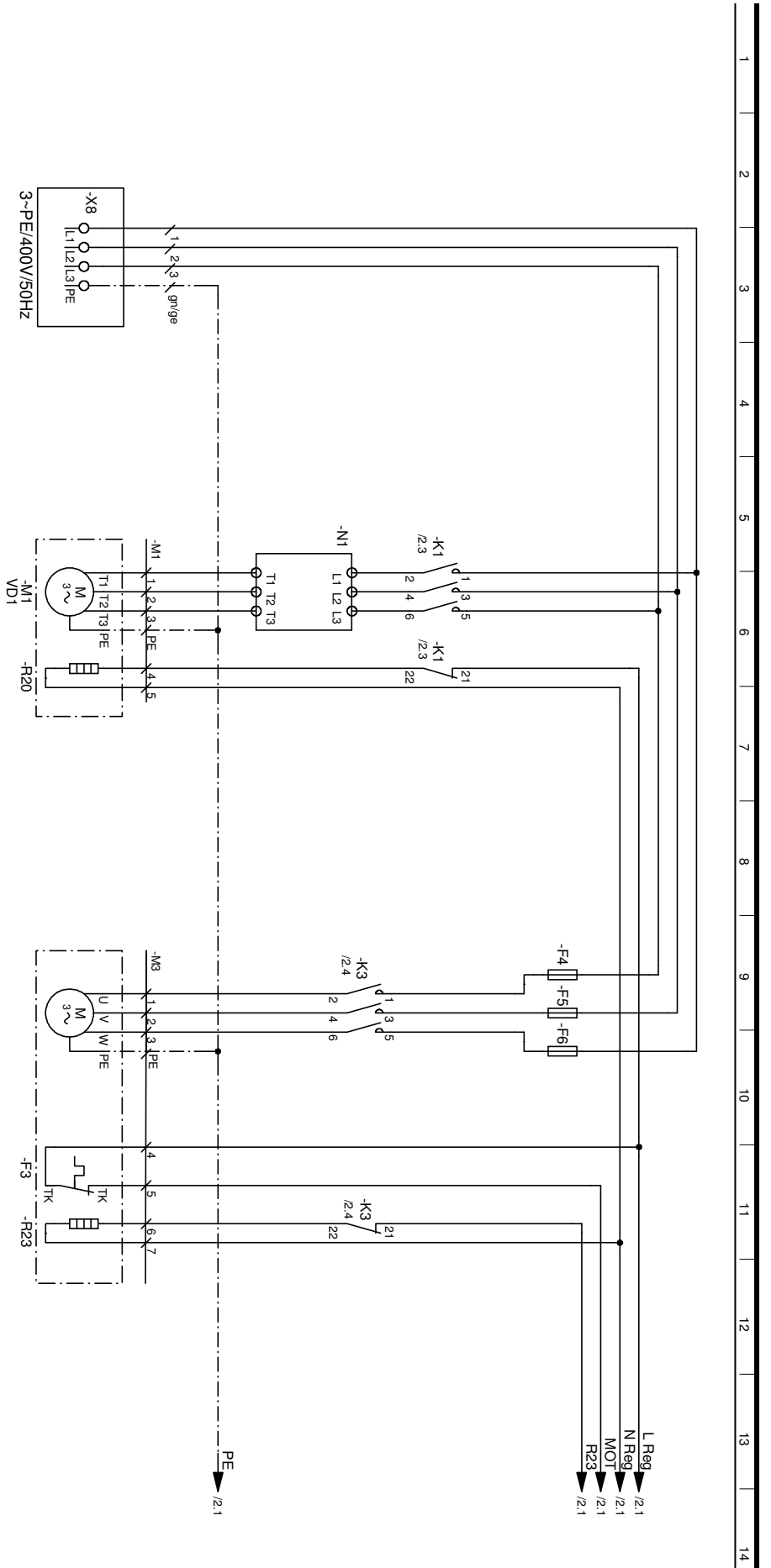


Operating manual for the respective unit



Circuit diagram 1/2

LW 90A/RX – LW 140A/RX

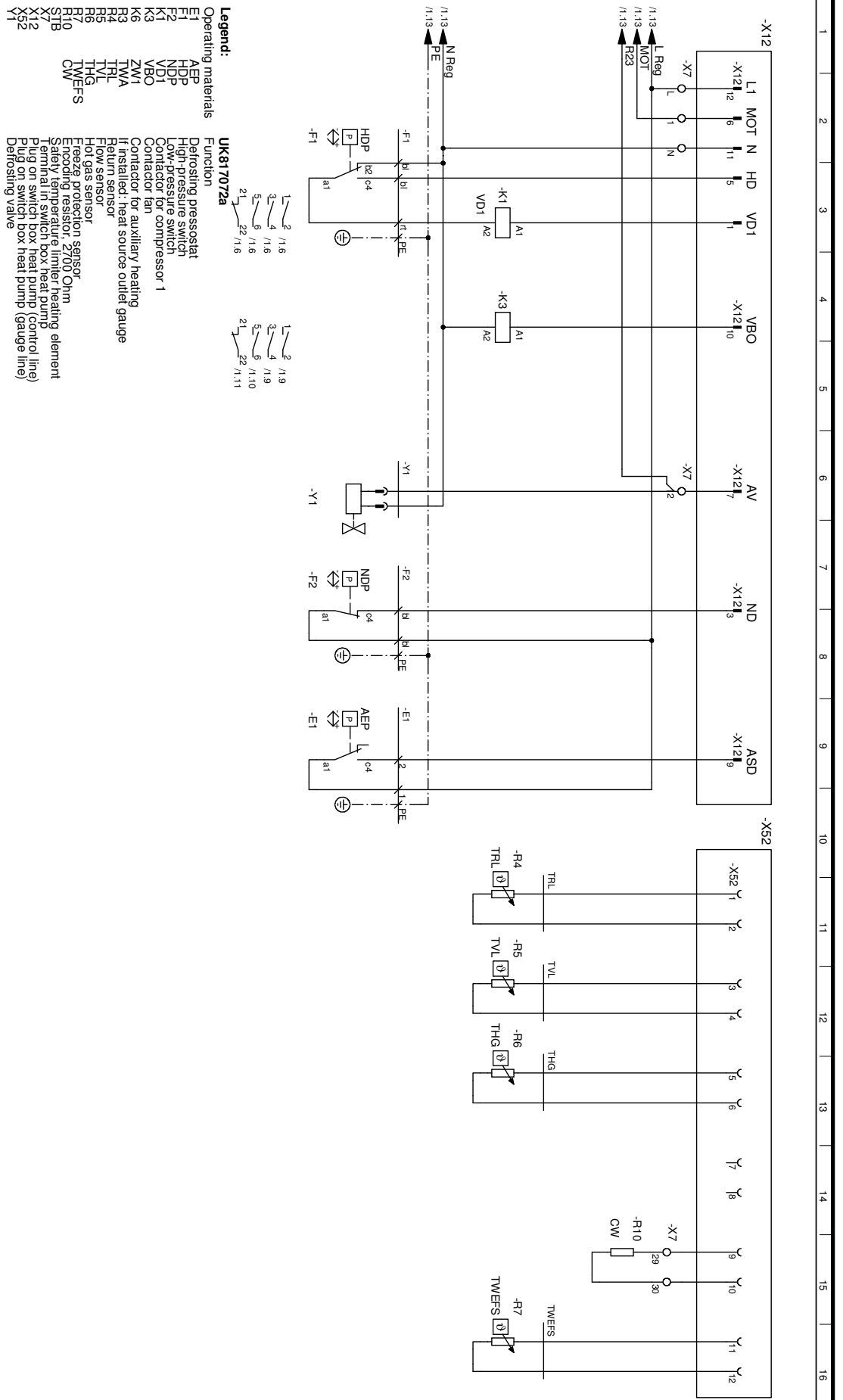


- Legend:**
- Operating materials
 - 3~P/E/400V/50Hz
 - UK817072a**
 - Function
 - Power supply compressor; right-hand rot. field is mandatory!
 - Motor protection fan
 - Fuses ventilator
 - Contactor for compressor 1
 - Network protection fan
 - Compressor 1
 - Compressor 2
 - Fan
 - Starting current limit compressor 1
 - Sump heating for compressor 1
 - Nozzle heating fan
 - Distribution box power supply output compressor
 - Distribution box power supply additional heating
- Legend:**
- F3 - F6
 - K1 - K3
 - M1 - M3
 - N1
 - R20
 - R23
 - X8
 - VD1
 - VD2
 - VENT1



LW 90A/RX – LW 140A/RX

Circuit diagram 2/2





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



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

Designation of the device(s)

Heat Pump



Unit model	Order number	Item number 1	Item number 2
LW 81 ASX-LUX 2.0	100581LUX02	100581	15029001
LW 121 ASX-LUX 2.0	100583LUX02	100583	15029001
LW 81 ASX-HT 1	100581HT102	100581	15031841
LW 121 ASX-HT 1	100583HT202	100583	15031841
LW 90 ARX-LUX 2.0	100431LUX02	100431	15029001
LW 140 ARX- LUX 2.0	100432LUX02	100432	15029001

EC Directives

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

* Pressure equipment component

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

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

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
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