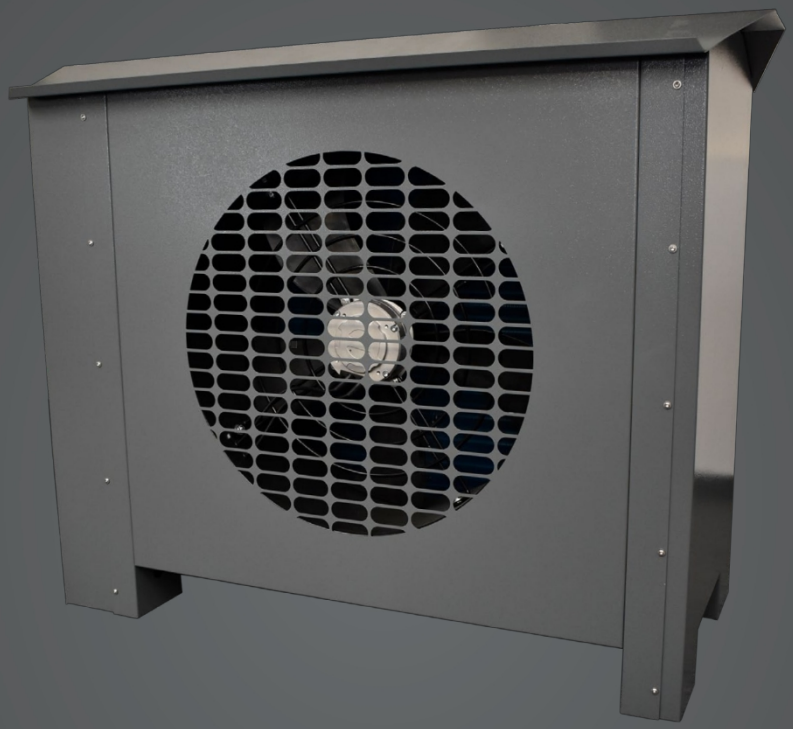


Original operating instructions

WP SAT 15 / WP SAT 40

As of 2025-04

ratiotherm
Smart Energy Systems

INFORMATION

These operating instructions are part of the technical documentation for the device in accordance with:

- Directive 2014/35/EU of the European Parliament and of the Council of February 26, 2014, on the harmonization of the laws of Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
- Directive 2014/68/EU of the European Parliament and of the Council of May 15, 2014, on the harmonization of the laws of Member States relating to the making available on the market of pressure equipment

This operating manual is intended for the operator, who must hand it over to the personnel who come into contact with the device. The operator must ensure that the information contained in the operating manual and the accompanying documents has been read and understood.

NOTE: If in doubt, consult the operating instructions, which must be kept in a known and easily accessible location. The manufacturer accepts no liability for damage to persons, animals, or property, or to the device itself, resulting from improper use, failure to observe or insufficient observance of the safety criteria contained in these operating instructions, or from modification of the device or the use of unsuitable spare parts. The copyright for these operating instructions is held exclusively by the company:

ratiotherm

Smart Energy Systems

ratiotherm GmbH & Co. KG
Wellheimer Straße 34
91795 Dollnstein Germany

Status: 07/11/2022

TABLE OF CONTENTS

1. INFORMATION ABOUT THE DOCUMENT

The following notes serve as a guide through the entire documentation. Other documents are also valid in conjunction with these operating instructions. These operating instructions for specialist tradesmen are part of the ratiotherm WP SAT 15/40 outdoor air unit. The ratiotherm WP SAT 15/40 device must not be operated without these operating instructions.
The operating instructions must be made available to the operator and the specialist installer for information at all times. If the WP SAT 15/40 is sold, the instructions must also be supplied. We accept no liability for damage caused by failure to observe these instructions.

1.1 SAFETY AND WARNING NOTICES

Signal words and colors

The following signal words are based on DIN ISO 3864-2 and are used in this documentation. The safety colors have been adopted from ISO 3864-1. The design complies with DIN EN 82079-1 and ANSI Z 535.4.

Signal word	Explanation
DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury. .
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury. .
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor injury or property damage. damage.
NOTE	Indicates operating instructions and cross-references. A note indicates the risk of property damage or risk of injury.

1.2 SAFETY SIGNS

1.2.1 OTHER SYMBOLS ACCORDING TO DIN ISO 7010

Some of the following special safety signs according to DIN EN ISO 7010 and DIN ISO 3864 are used at corresponding points in this operating manual and require special attention depending on the combination of signal word and graphic symbol. Note the distinction between:

- Mandatory signs – prescribe an action (e.g., use eye protection).
- Warning signs – depict a source of danger and supplement a warning notice.
- Prohibition signs – prohibit certain actions.

Symbol	Explanation	Symbol	Explanation
	General warning sign		Warning of flammable substances
	Warning of electrical voltage		General prohibition sign
	Warning of hot surfaces		No entry

Symbol	Explanation	Symbol	Explanation
	Follow instructions		General command sign
	Disconnect before maintenance or repair		Use hand protection

1.2.2 OTHER SIGNS ACCORDING TO DIN ISO 7000

Symbol	Explanation	Symbol	Explanation
	Observe operating manual (instructions for use)		Service indicator, Refer to the operating manual (instructions for use)
	Instructions for use/operating instructions (operating manual)		

1.2.3 OTHER SYMBOLS

Symbol	Explanation	Symbol	Explanation
	Recycling		Dispose of packaging material in accordance with regulations

2. IDENTIFICATION AND NOTES

2.1 PRODUCT

Device designation: Heat pump (air/water) Type: WP SAT 15 / SAT 40
Year of manufacture: See type plate
Country of origin: Germany

2.2 INTENDED USE

The WP SAT 15 / SAT 40 device is designed to use environmental heat from the ambient air in combination with an indoor heat pump unit to provide direct heating support and hot water preparation. Any other or extended use of the device is considered improper and therefore inappropriate. In this case, the safety and protective functions of the device may be impaired. ratiotherm GmbH & Co. KG is not liable for any damage resulting from this. Intended use also includes:

- Compliance with all instructions in this operating manual,
- Observing all warnings and
- Compliance with the inspection and maintenance conditions.

The WP SAT 15 / SAT 40 device is built according to the state of the art and recognized safety regulations. The device is intended exclusively for domestic and/or commercial use for hot water preparation (domestic water) and for heat or cold generation.

Improper or unintended use may result in danger to the life and limb of the user or third parties. In addition, damage to the device and other property may occur. The SAT 15/40 device is not intended for use by persons (including children) with limited physical, sensory, or mental abilities, or persons with insufficient experience and/or knowledge. The risk is borne solely by the operator and user.

2.3 TARGET GROUPS

For safety reasons, the design of the device does not allow it to be used by persons with disabilities (e.g., visual impairments). **⚠ DANGER!** Only perform tasks for which you are authorized.

2.3.1 TARGET GROUP MATRIX

Tasks	Operators and users	Specialist personnel
Transport/storage		X
Assembly/installation		X
Commissioning/adjustment		X
Automatic operation (control)	X	X
Setup/conversion/technical modification		X
Maintenance/inspections/repairs		X
Cleaning	X	X
Troubleshooting and repair		X
Decommissioning/dismantling/disposal		X

2.3.2 TARGET GROUP DEFINITION

Operators and users

A person who has purchased the device for use in an existing syste for direct heating support and hot water preparation. The person must have knowledge of the necessary protective devices and protective measures.

Qualification of operators and users:

- Of legal age and physically/mentally capable of performing work on the device.
- Knowledge of how to operate the product, imparted by qualified personnel and the operating instructions.

Specialist personnel

A person from a qualified specialist company for heating and hot water systems. The specialist personnel must have acquired special knowledge and experience through professional training. The person must have knowledge of relevant standards, be able to assess the work assigned to them (e.g., instruction of personnel, switching on, programs, and switching off) and identify possible hazardous situations.

Qualification of qualified personnel:

- Of legal age and physically/mentally capable of performing work on the device.
- Knowledge: several years of experience working with heating systems and hot water supply

2.4 MISUSES

2.4.1 REASONABLY FORESEEABLE MISUSE

Reasonably foreseeable misuse that poses a risk to personnel, third parties, or the device includes the following for all operating modes:

- Using the device contrary to its intended use.
- Supplying components that are not certified by the manufacturer.
- Operating the device outside its physical operating limits.
- Modifying the control software without prior consultation with ratiotherm GmbH & Co. KG.
- Modifications to the device as well as additions and conversions without prior consultation with ratiotherm GmbH & Co. KG.
- Operating the device contrary to the provisions of the risk assessment.
- Bypassing or deactivating protective and safety devices.
- Operating the device with obvious faults.
- Operation of the device by persons (including children) with limited physical, sensory, or mental abilities.

⚠ DANGER

Unauthorized modifications to the device

Unauthorized modifications pose a risk of death or injury.

Do not make any unauthorized modifications to the device without the prior approval of ratiotherm GmbH & Co. KG.

2.4.2 UNFORESEEABLE MISUSE/ABUSE

Unforeseeable misuse can occur due to:

- Disasters,
- the impact of foreign objects and/or
- Force majeure.

2.5 WARRANTY, LIABILITY, GUIDELINES, STANDARDS, AND LAWS

The "General Terms and Conditions of Sale and Delivery" of ratiotherm GmbH & Co. KG apply in principle. The "General Terms and Conditions of Sale and Delivery" have been available to the operator since the conclusion of the contract at the latest. Warranty and liability claims for personal injury and property damage are excluded if the damage is attributable to one or more of the following causes:

- Improper use of the device,
- Improper handling of the device,
- Operation of the device with defective protective devices,
- Failure to observe the safety and warning instructions in the operating manual,
- Unauthorized structural modifications to the device,
- Inadequate implementation of the specified maintenance measures, and
- disasters involving foreign objects or force majeure.

The operating instructions must be read before handling the device. The operating instructions familiarize personnel with the handling of the device and provide information on all phases of the device's life cycle. The operating instructions must be accessible to personnel at all times. The safety and warning instructions in the operating instructions and on the device must be observed and complied with. If you have any further questions that go beyond the scope of these operating instructions, please contact ratiotherm GmbH & Co. KG.

The following guidelines, standards, and laws must be observed when using the device in Germany:

- VDE and EVU regulations and provisions (in particular VDE 0100)
- Regulations and provisions of local utility companies
- DVGW worksheet W 382 "Installation and operation of pressure reducers in drinking water consumption systems"
- DIN 1988 – TRWI Technical rules for drinking water installations
- DIN 4753 – Water heating systems for drinking and service water
- DIN 8947 – Ready-to-connect heat pumps for water heating with electrically driven compressors
- Accident prevention regulations VGB 20 Accident prevention regulations "Refrigeration systems" with implementation instructions
- Energy Saving Ordinance EnEV – Ordinance on energy-saving thermal insulation and energy-saving system technology in buildings from 2009

NOTE

Guidelines, standards, and laws

Additional local guidelines, standards, and laws, e.g., building regulations, may apply. **As a general rule, the applicable legal guidelines, standards, and laws in the respective country must be observed.**

3. SAFETY INSTRUCTIONS

DANGER! Read and observe the operating instructions before working on and with the device.
Despite all precautions taken, there may still be some residual risks that are not immediately apparent. You can reduce the existing residual risks by observing and complying with the general safety instructions and warnings as well as the intended use.

3.1 GENERAL SAFETY INSTRUCTIONS

Observe the following general safety instructions:

- The volume of water increases during the heating process. Therefore, never close the blow-off line of the safety valve.
- Please note that hot water may escape from the blow-off line.
- If leaks occur in the area of the device, switch off the device and shut off the connection to the rest of the heating system. The leaks must then be repaired immediately.
- Do not use the following products to prevent corrosion on the device: sprays, solvents, chlorinated cleaning agents, paints, adhesives, etc.
- Components that have not been tested with the device may cause damage to the device or impair its functions. Only use original spare parts and original wear parts.
- Have the device assembled/installed/commissioned/adjusted by qualified personnel only.
- Observe the existing regulations, rules, and guidelines as well as the local installation requirements.
- To avoid injuries of any kind, the general accident prevention regulations must be observed under all circumstances and appropriate personal protective equipment must be used.
- Technical modifications to the system are not permitted. This also applies to the retrofitting of safety devices and welding on load-bearing parts.
  Safety devices must not be taken out of operation. Only original spare parts and original accessories from the manufacturer may be used.

3.2 ADDITIONAL INFORMATION

Local accident prevention regulations apply to all work on the device. In addition, observe the

- applicable binding regulations for accident prevention,
- Recognized technical rules for safe and professional work,
- Existing regulations on environmental protection, and
- other applicable regulations.
- The outlet temperature at the hot water taps can be up to 60 °C. Carefully check the water temperature at the hot water taps before placing your hands completely under the water jet.
- Do not make any changes to the components:
  - On the air heat pump and the water and electricity pipes;
  - On the safety valve;
  - To structural conditions that may affect the operational safety of the device;
  - To structural conditions in the vicinity of the device, insofar as these may affect the operational safety of the device.

3.3 RESIDUAL RISK

⚠ WARNING

Measures/work carried out by unauthorized/unqualified personnel

Measures/work on the device and/or its components and connections by unauthorized/unqualified personnel pose a serious risk of injury.

In the event of malfunctions, only allow qualified personnel to carry out measures/work on the device and/or its components and connections.

⚠ WARNING

Damaged insulation

Damaged insulation poses a serious risk of burns on hot and/or cold surfaces.

Protect yourself with suitable PPE (e.g., heat- and cold-resistant protective gloves).

Allow hot or cold surfaces to cool down or warm up before working. Replace damaged insulation.

⚠ WARNING

Ignition sources in the danger zone

Ignition sources in the danger zone can cause flammable substances to ignite and/or explode.

Keep ignition sources away from the danger zone.

4. DESIGN AND FUNCTION

4.1 TECHNICAL DATA

WP SAT	SAT 15	SAT 40	Unit
Device data			
Sound level at a distance of 5 m	30	40	dB(A)
Dimensions	1374 x 1085 x 580	2260 x 1110 x 1170	W x H x D (mm)
Weight	145	230	kg
Evaporator design	Air heat exchanger		
Material	Aluminum, copper		
Air volume flow	5000	2x 7500	m³/h
Nominal heat output with air	12	30	kW
Max. operating pressure	6	6	bar
Volume flow of brine	1.5 to 3.5	3.5 to 9.7	m³/h
Electrical			
Mains connection	400 V / 3~ / 50 Hz	400 V / 3~ / 50 Hz	
Fuse protection Max. operating current	16	16	A
Heating element			
Nominal power	4.8	10.2	kW

4.2 FUNCTION DESCRIPTION

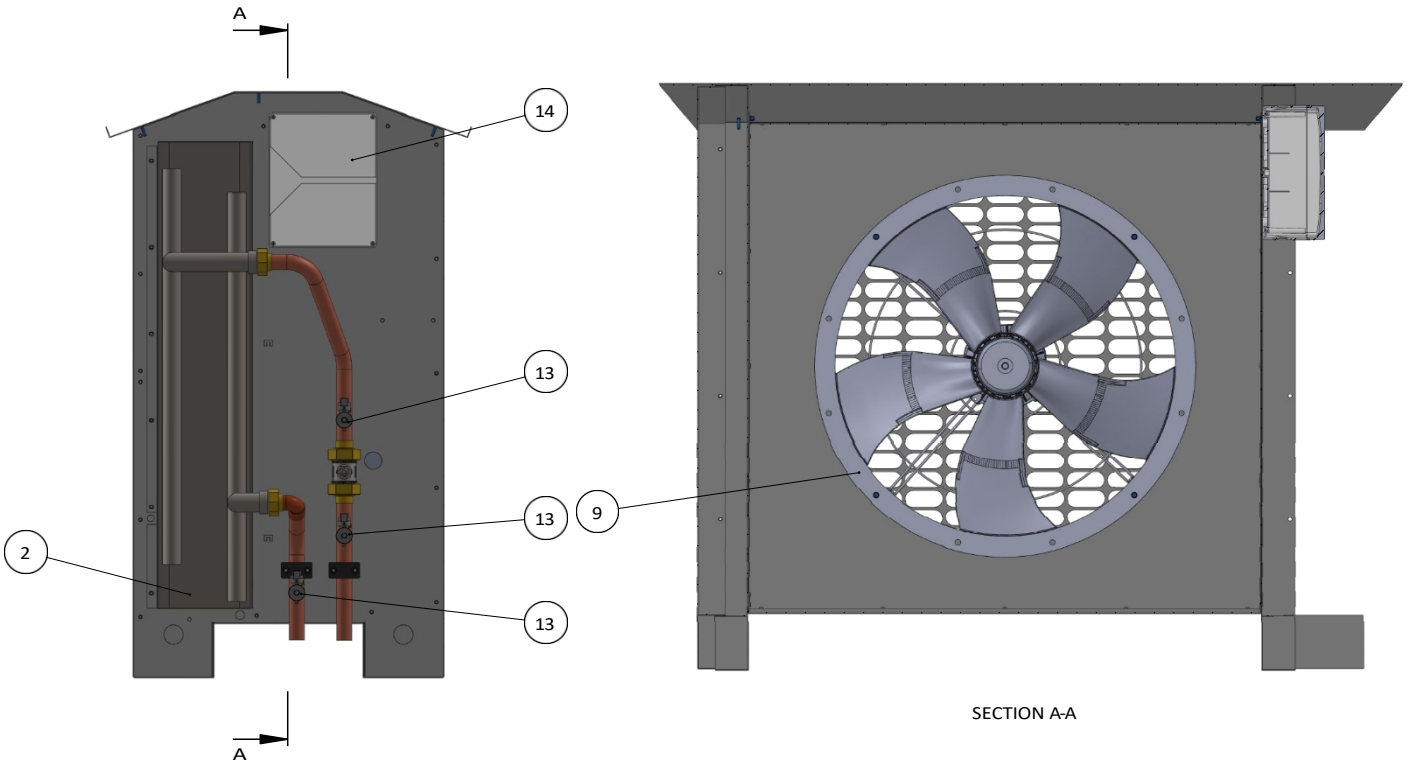
In order to operate a heat pump as effectively as possible, a reliable source of environmental energy is essential to ensure the heat supply for the building. With our WP SAT brine-air outdoor unit, a brine heat pump—which is actually supplied by geothermal energy—can incorporate air as an additional source. The additional module enables the use of air as an energy source for backup or to optimize efficiency. Especially in the summer months, the temperature of the air is higher than that of the brine, enabling a significant increase in COP. This is particularly interesting for use in combination with PVT collectors, as there are weather conditions in which PVT collectors can harvest very little environmental heat.
To avoid heating element operation in this case, the heat pump can continue to use environmental heat efficiently by switching to the WP SAT air unit. Of course, the WP SAT can also be used as the sole energy source and, if necessary, cascaded for greater performance.
The WP SAT can also be used wherever probe fields or ground collectors cannot be dimensioned larger or where a larger collector area is not feasible for cost reasons. Even if geothermal energy is not available or only available to a limited extent in existing systems for any reason, a WP SAT can be retrofitted. The WP SAT is 100% compatible with all ratiotherm geothermal heat pumps.
The device can also be combined with third-party products via an external control unit.

ADVANTAGES

- Very easy installation, as no handling of refrigerant is necessary
- No leak test as with many conventional split systems
- Low noise levels thanks to a special fan and sound-optimized housing
- Completely coordinated system when combined with other ratiotherm components
- Very low maintenance

4.3 ASSEMBLY AND SPARE PARTS

The air heat pump is designed for all weather conditions. The outdoor unit is installed outside so that air can flow freely through the evaporator and does not recirculate. An axial fan transports the air to the evaporator.

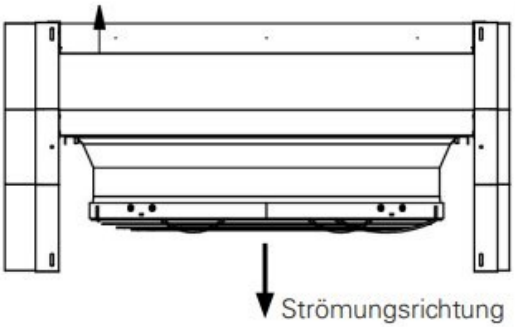


Position number	Designation	Description	Quantity
1	Sheet metal set, outer part		1
2	Heat exchanger fins		1
9	Fan	ra/14649	1
10	Ball valve	ra/11634	1
13	KFE tap	ra/12064	3
14	Electrical box	ra/12603	1

4.4 NOISE POLLUTION SAT 15

Power	30	100
5 m	30.4 dB	31.8 dB
3 m	30.4 dB	33.1 dB
1 m	30.5 dB	38.0 dB

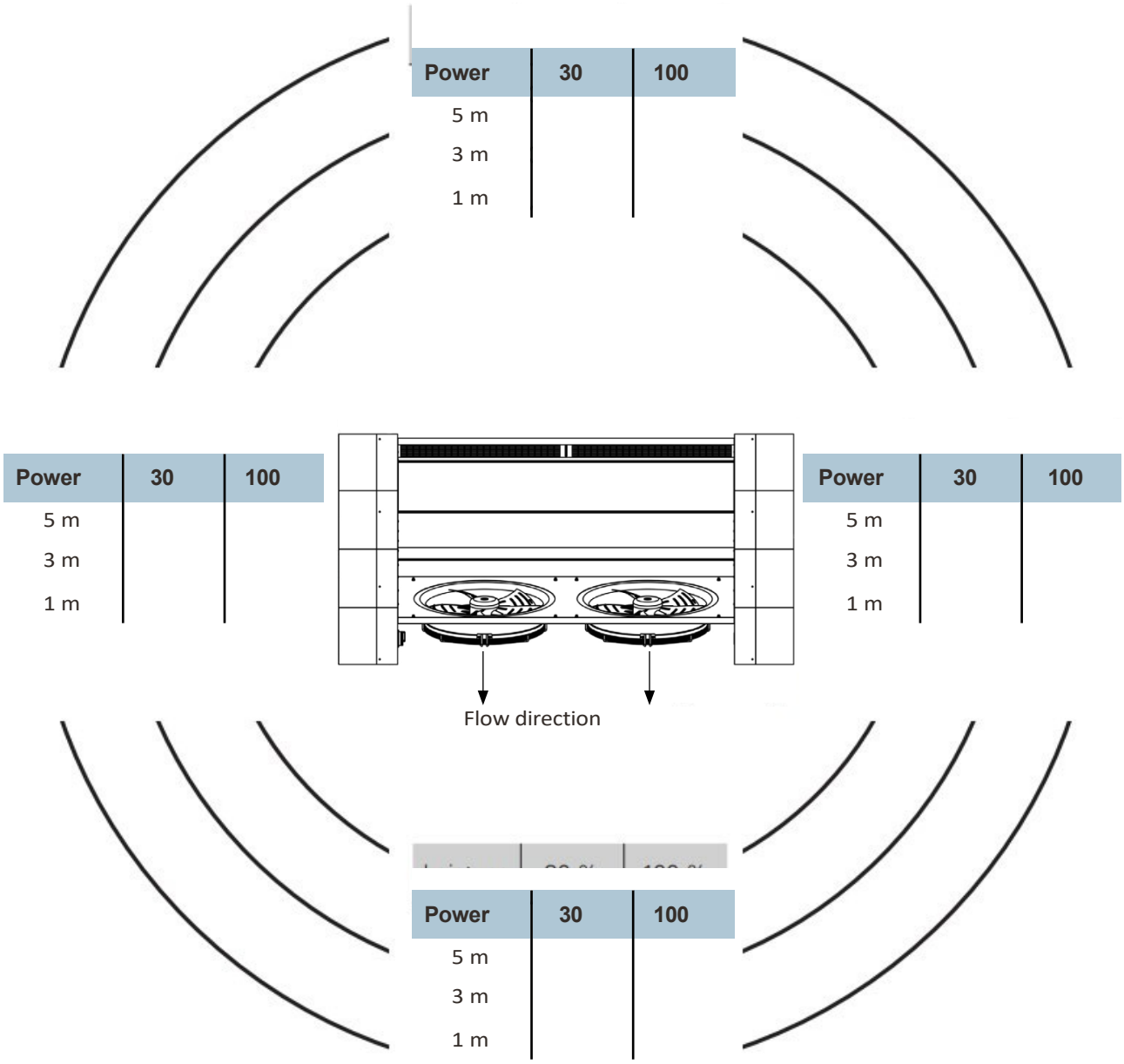
Power	30	100
5 m	30.5 dB	30.8 dB
3 m	30.5 dB	31.0 dB
1 m	30.5 dB	33.0 dB



Power	30	100
5 m	30.5 dB	30.8 dB
3 m	30.5 dB	31.0 dB
1 m	30.5 dB	33.0 dB

Power	30	100
5 m	30.5 dB	32.4 dB
3 m	30.6 dB	33.5 dB
1 m	30.6 dB	39.2 dB

4.5 NOISE POLLUTION SAT 40



4.6 CONTROL LOGIC

The brine outdoor unit is designed to supplement or serve as the sole source for a brine heat pump. It features an air-brine finned heat exchanger, fan, 9 kW heating element for defrosting, bypass for defrosting, a tank heater to protect against icing, and its own control system.

The control system regulates the fan, detects when defrosting is necessary, and performs it accordingly. The heat pump must be deactivated during defrosting. The control system emits the appropriate signals for this. There are two control options. The options and corresponding signals are shown in the table:

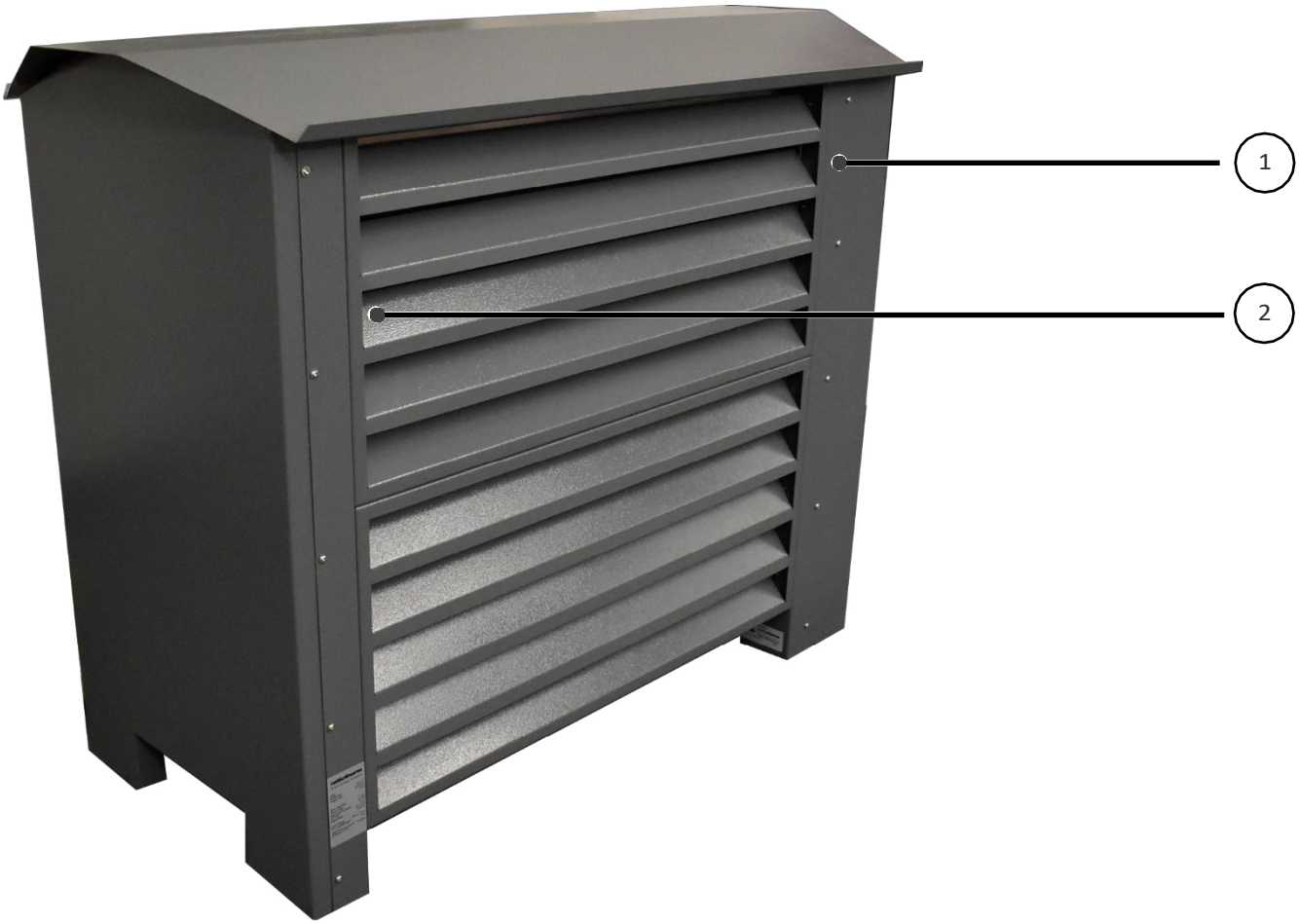
	CAN bus	Analog/digital signals
Activation of outdoor unit (fan)	Digital signal incoming from 11/1	Digital signal to S4
Deactivation of the heat pump during defrosting	Digital signal incoming from 14/2	Digital output at A6 (230V or potential-free)
Fan speed control	Analog signal incoming from 11/4	No option for Always max. speed
Defrost enable	Digital signal incoming from 11/14	Not possible, defrosting is detected automatically and initiated immediately

The control must be switched via a fixed value (F4, "Self-defrosting"). If this is active, the outdoor unit operates as a stand-alone unit and immediately triggers defrosting without waiting for feedback from the heat pump (recommended for use with third-party products). The fixed value is active as standard. In combination with a ratiotherm heat pump, the fixed value must be deactivated. The heat pump first deactivates itself and the source pump and then releases the defrosting.

The maximum fan speed can be set using the fixed value F1, "Fan speed day." Level 20 corresponds to 10.00 V, level 10 corresponds to 5.00 V. Level 11 is set as standard, which results in a fan speed of 5.50 V. If the outdoor unit is used in combination with a ratiotherm heat pump, the fan speed varies according to the compressor speed in the range from 3.00 V to max. fan speed.

4.7 SAFETY DEVICES

The unit is equipped with various safety devices. The safety devices are shown in the following illustration:



1	Protective enclosure or housing	**2**	External sensor

5. TRANSPORT, ASSEMBLY, AND INSTALLATION

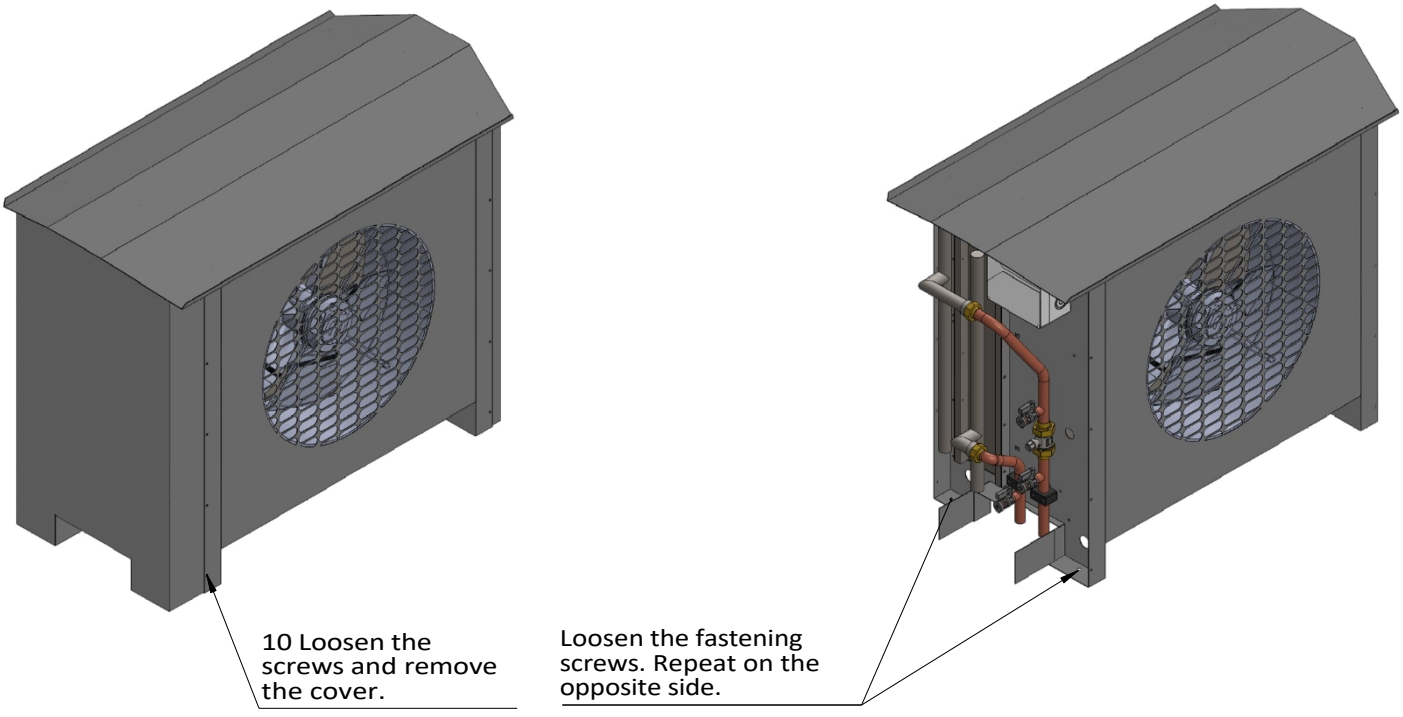
5.1 TRANSPORT AND UNPACKING

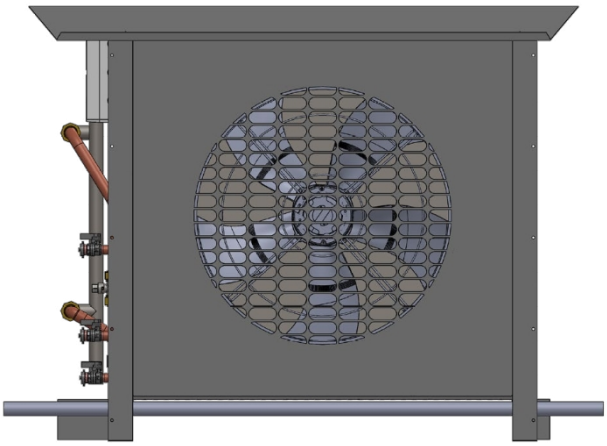
The following instructions for transporting the device must be observed:

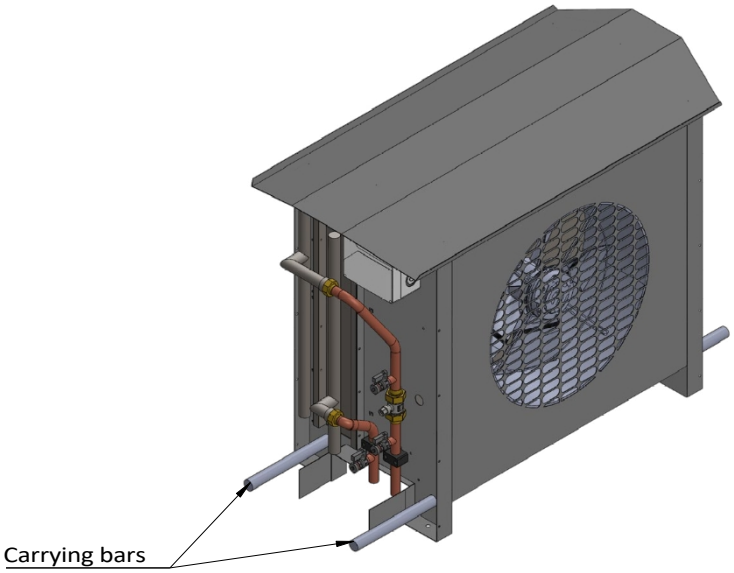
- Only allow qualified personnel to carry out the transport.
- Protect yourself with PPE (e.g., safety shoes, etc.).
- Take the weight of the device (approx. 140 kg or 220 kg) into account when selecting the appropriate lifting equipment (forklift truck, pallet truck, etc.).
- Take the center of gravity of the device into account.
- Remove all packaging materials.
  NOTE: Do not damage the device when removing the packaging materials.
- When disposing of the transport and storage packaging, comply with local disposal regulations and applicable environmental protection laws.
- When unpacking the device, check that the delivery is complete.
- Use the delivery notes and packing lists provided to check the contents.

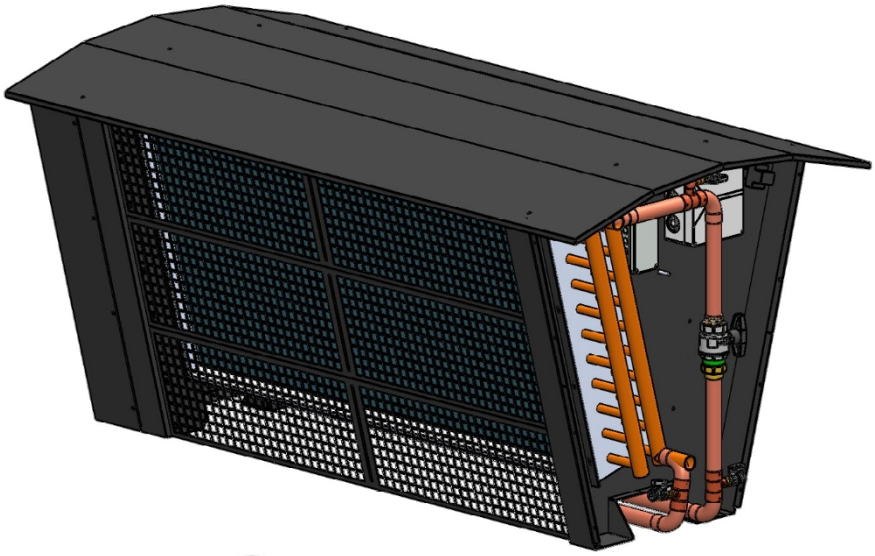
The responsible specialist technician (qualified personnel) must ensure the following measures are taken:

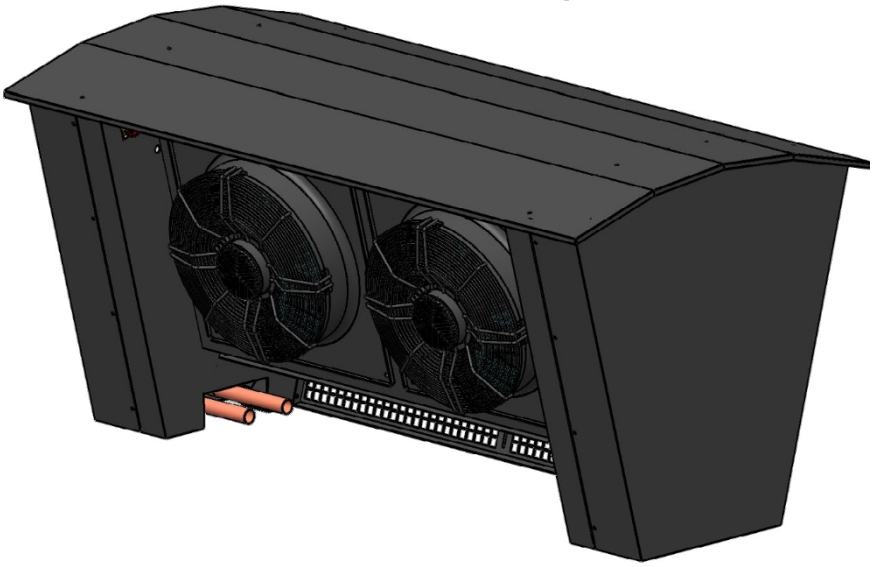
- Illuminate the danger zone for assembly and installation with additional lighting units if necessary.
- The personnel have the necessary qualifications and receive the necessary training.
- The personnel have read and understood the operating instructions.
- The personnel have access to the operating instructions at all times.
- Local accident prevention and environmental regulations are implemented and complied with.
- The personnel are instructed by the responsible supervisor and unauthorized persons are kept away from the device.
- The device is only handed over and operated in a safe and functional condition, and damage to the heat pump is repaired immediately or the damaged heat pump is shut down immediately.





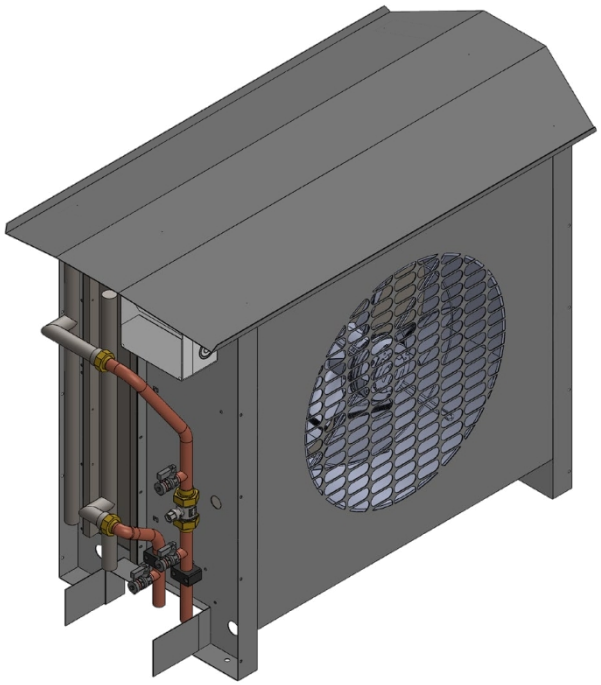

Carrying bars

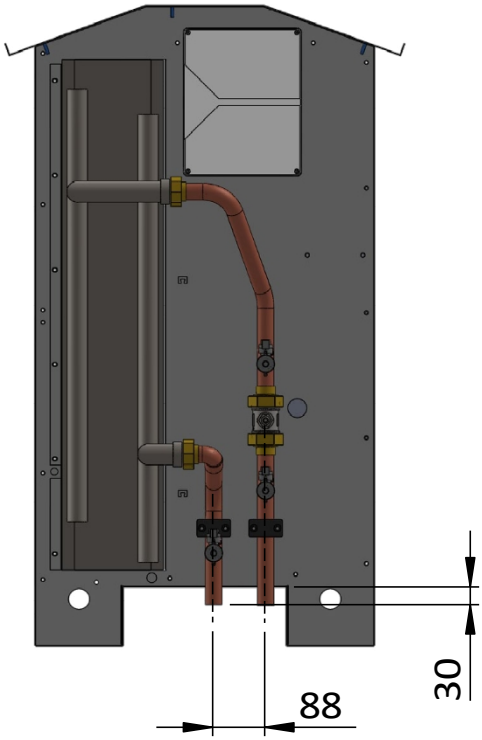


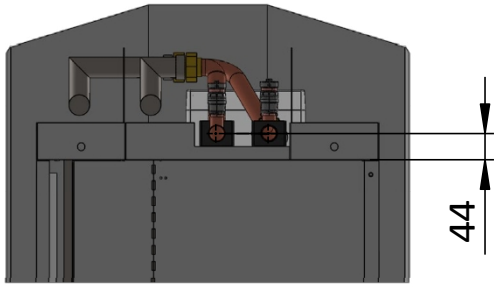


5.1.1 OUTDOOR UNIT

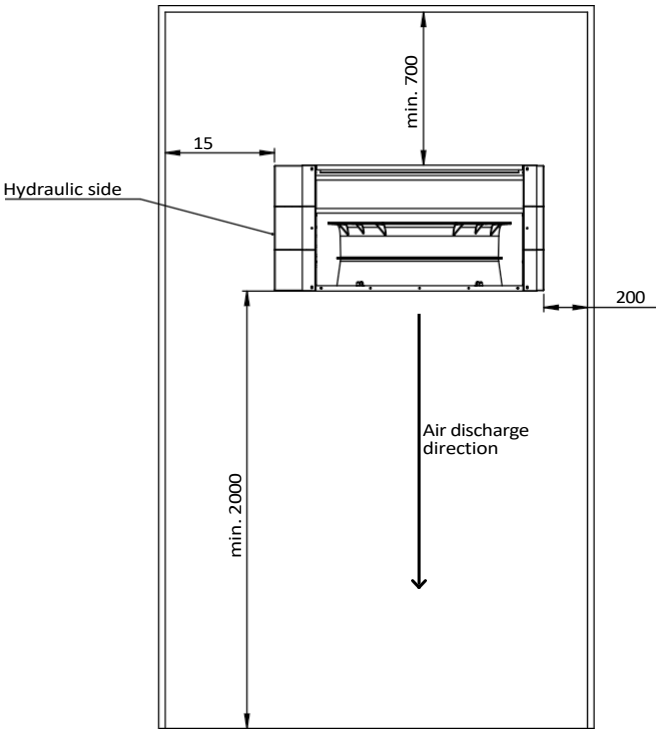
- If the SAT system is installed close to a wall, a **minimum distance** of 0.70 meters must be maintained (sound reflection).
- A free air flow (5000 or 15000 m³/h) must be ensured. The outdoor unit must not be enclosed or covered.
- Before installing the SAT system, a suitable **foundation** must be constructed (see SAT system dimensions and foundation plan).
- Since heat pump operation produces a certain **amount of condensate** depending on the output and humidity (approx. 1 l/h), a drain must be provided for the condensate if the ground beneath the SAT system is impermeable.
- The SAT system can be installed at a **maximum** distance **of 20 m** (single pipe length) from the indoor unit as standard; longer pipe lengths are only possible after consultation with ratiotherm.



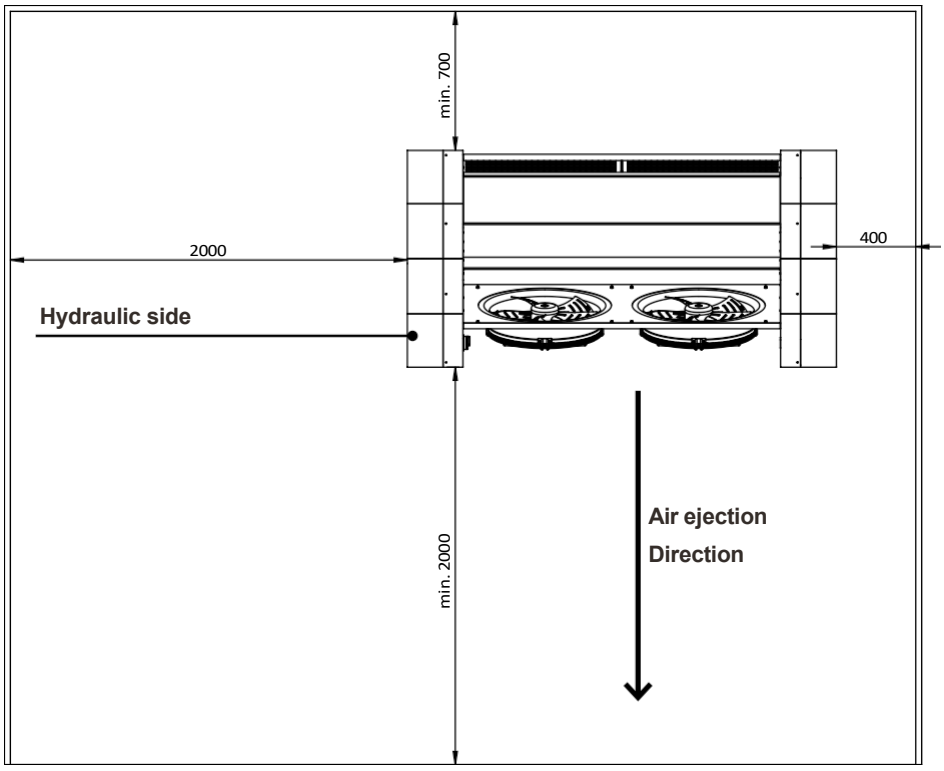




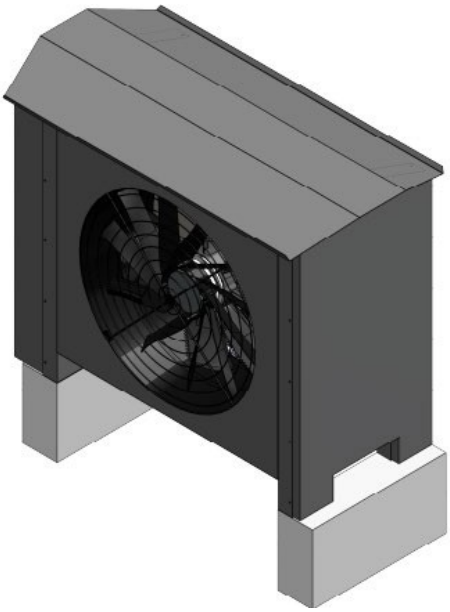
5.2 SAT 15 MAINTENANCE AREA

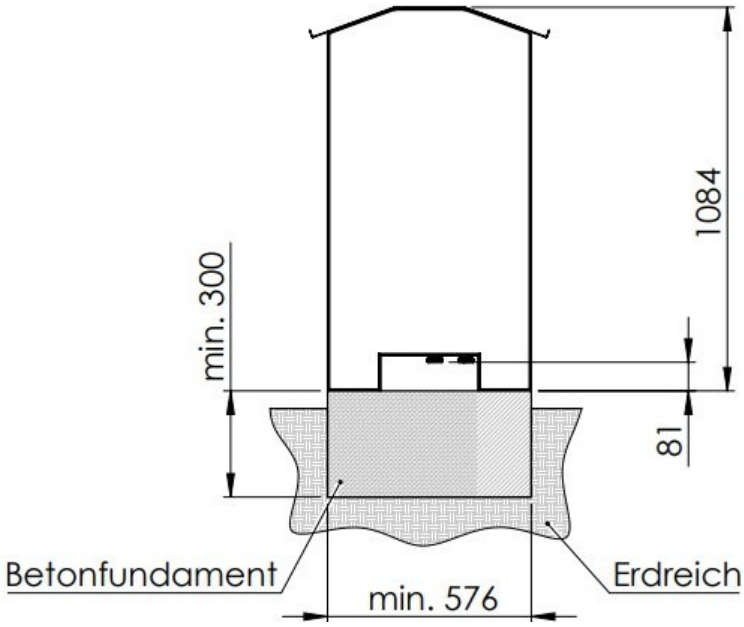


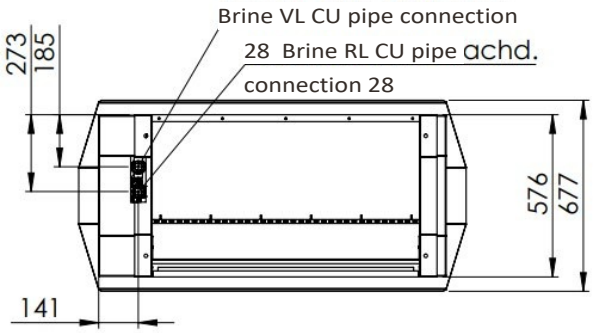
5.3 MAINTENANCE RANGE SAT 40

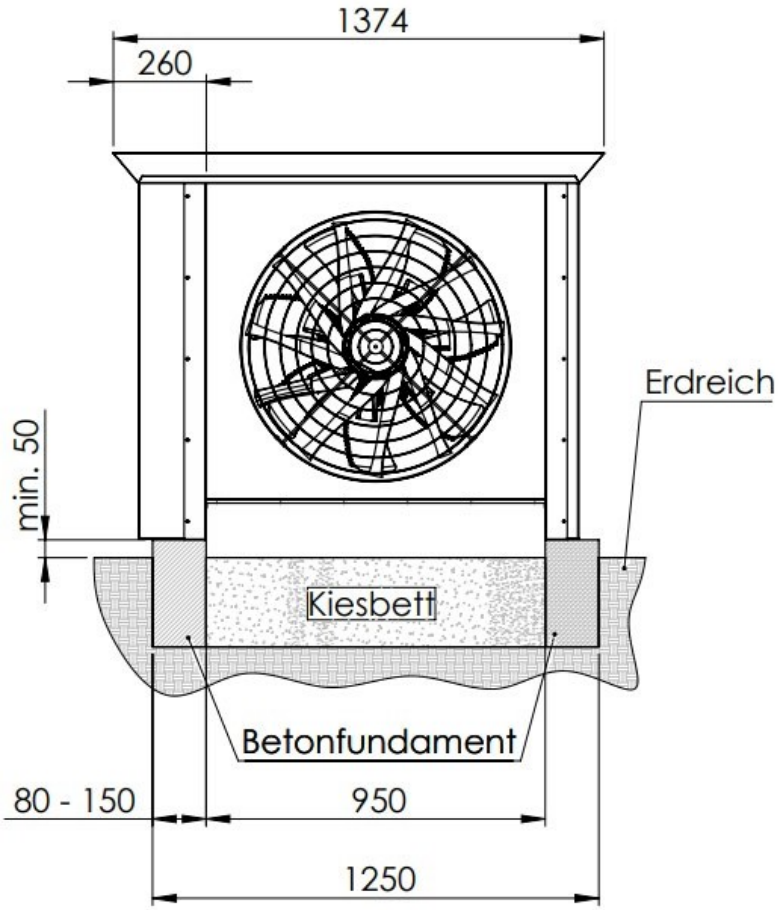


5.4 FOUNDATION SAT 15

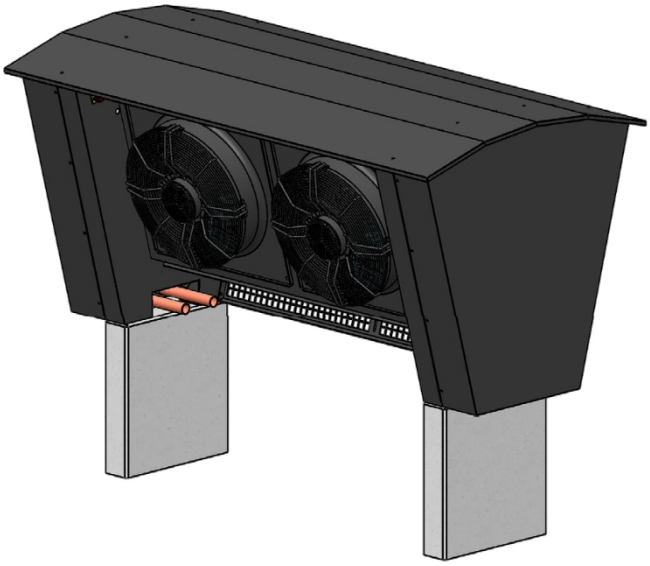


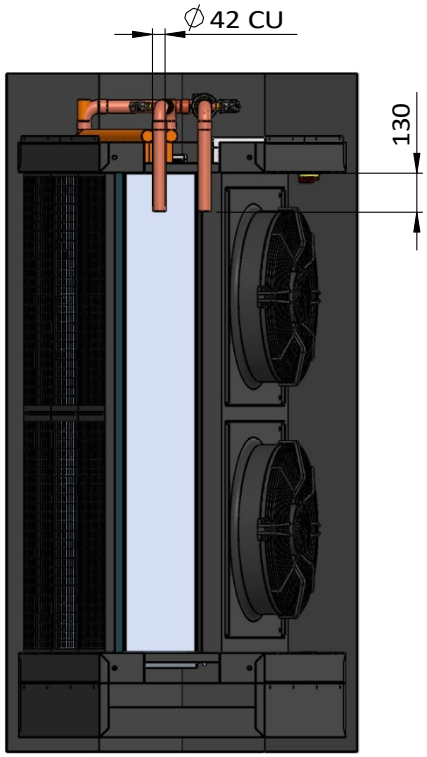


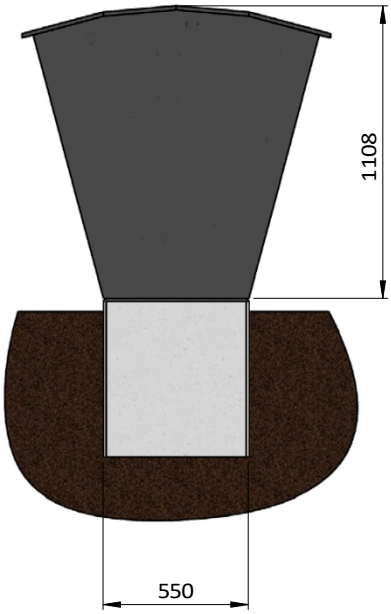


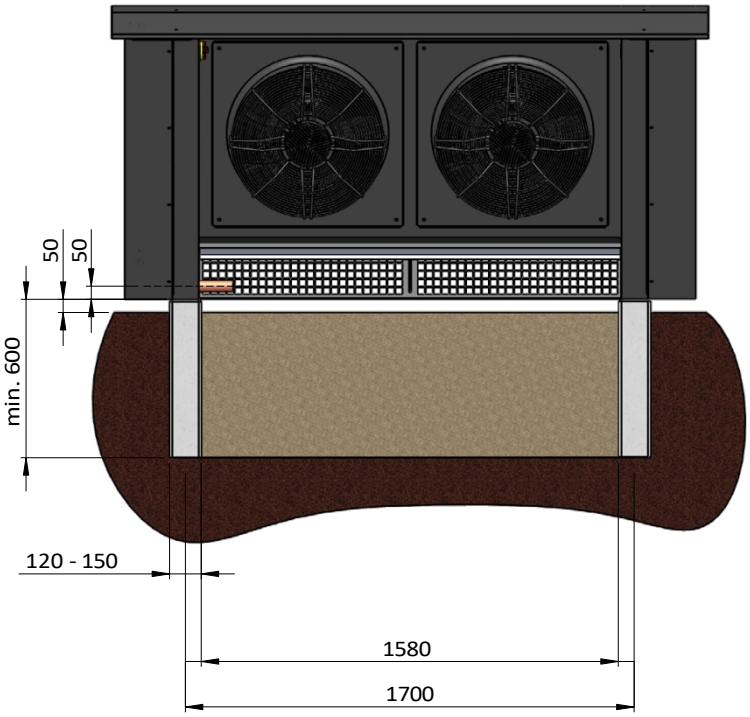


5.5 FOUNDATION SAT 40









5.6 HYDRAULIC INSTALLATION

The following information must be observed:

1. Primary side: Outdoor unit to indoor unit

- The circuit between the indoor and outdoor units must be protected with antifreeze up to -30°C.
  Recommendation: Aqua Concept coracon WT 6N-30
- Hold the connections in place when tightening.
- Flat-sealing connections must be sealed against condensation ingress.
  Recommendation:
  - Lubricate the thread and sealing surface thoroughly with Fermit.
  - Alternatively, seal the screw connection with silicone.

The following dimensions must be used:

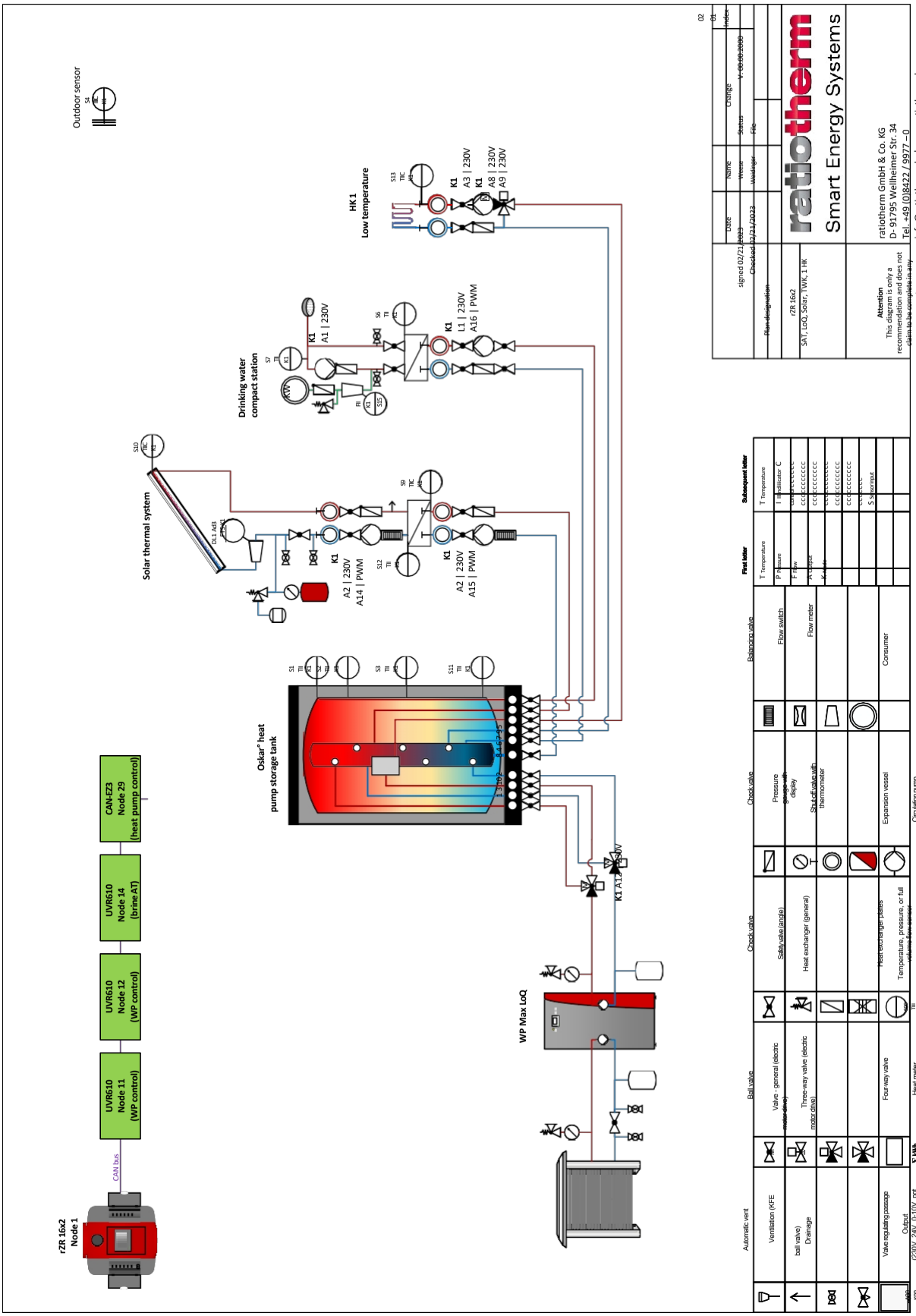
	DN32 (carbon steel: d_a 35 x s 1.5 = 32 d_i) (PE pipe: d_a 40 x s 3.7 = 32.6 d_i)	DN40 (Carbon steel: d_a 42 x s 1.5 = 40 d_i) (PE pipe: d_a 50 x s 4.6 = 40.8 d_i)	DN50 (Carbon steel: d_a 52 x s 1.5 = 50 d_i) (PE pipe: d_a 63 x s 5.8 = 51.4 d_i)
SAT 15	up to 11 m	up to 30 m	x
SAT 40	x	up to 5 m	up to 20 m

* 3k Spread, at rated power

* Available pressure drop over entire length: 10000 PA, assumed pipe roughness 0.0070 mm

d_a = outer diameter d_i = inner diameter s = wall thickness

5.6.1 HYDRAULIC DIAGRAM: STANDARD WITH SOLAR



5.6.2 WATER REQUIREMENTS

NOTE: The system water may contain a maximum of 50% glycol.

NOTE: Ensure that the device water meets all requirements. If the properties are not optimal (°) for more than two criteria or if a criterion does not meet the minimum requirement (-), **no** warranty claim can be made.

Parameters	Unit	Concentration	Copper
pH	/	< 6.0 6.0 - 7.5 7.5 - 8.5 8.5 - 10.0 > 10	- ° + ° °
Conductivity	µS/cm	< 10 10 - 500 500 - 1,000 > 1,000	+ + ° -
Chloride	mg/L	< 10 10 - 50 50 - 80 80 - 100 100 - 1,000 > 1,000	+ + + + ° -
Free chlorine	mg/L	< 0.5 0.5 - 1.0 1.0 - 5.0 > 5.0	+ + ° -
Total hardness	°dH	< 5 5 - 15 15 - 30 > 30	+ + ° -
Ammonia (NH_3 , NH^+_4)	mg/L	< 2 2 - 20 > 20	+ ° -
Alkalinity (HCO_3)	mg/L	< 60 60 - 300 > 300	+ + °
Sulfate (SO^{2-}_4)	mg/L	< 100 100 - 300 > 300	+ °/- -
HCO_3 / SO^{2-}_4	mg/L	> 1.5 < 1.5	+ °/-
Nitrates (NO_3)	mg/L	< 100 > 100	+ °
Hydrogen sulfide (H_2S)	mg/L	< 0.05 > 0.05	+ °/-
Free carbon dioxide (CO_2)	mg/L	< 5 5 - 20 > 20	+ ° -
Manganese	mg/L	< 0.1 > 0.1	+ °
Iron (Fe)	mg/L	< 0.2 > 0.2	+ °
Aluminum	mg/L	< 0.2 > 0.2	+ °

5.7 ELECTRICAL INSTALLATION

⚠ DANGER!

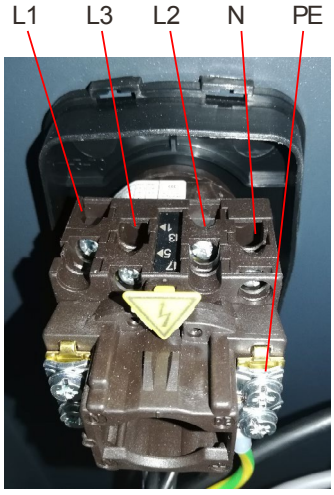
- The power supply to the heater comes from the control cabinet and must be protected by a separate type B residual current device with a maximum tripping current of **300 mA (RCD), a 10 ms short-time delay**, and suitable power rating. Recommendation: ABB F204B-80/0.3
- A separate RCD must be provided for each outdoor and indoor unit!
- The RCD must be marked separately for the heater, e.g., as "WP." Please ensure that the phase/neutral conductor is correctly assigned during wiring.
- Ensure that the rotating field is clockwise.
- The device must be earthed.
- Use cables with a cross-section suitable for the power rating of the heater.
- The electrical installation must comply with the applicable standards and generally accepted rules of technology.
- Never work on the hydraulics or mechanics of the device while it is live.
- The same applies when filling or subsequently pressurizing.
- Even if the main switch of the device is turned off, the cable terminal is still live.
- To completely disconnect the device from the mains, the RCD in the control cabinet must be switched off.
- Maintenance work may only be carried out by an authorized person.
- Never short-circuit the safety pressure limiter of the heat pump.

5.7.1 TERMINAL DIAGRAM AND DESCRIPTION

- Recommended fuse for outdoor unit: B16 3-pole.
- Ensure correct wiring of the CAN bus! No star-shaped network! Use shielded, 4-pole cable! Follow the instructions for the technical alternative. One end at the outdoor unit, the other end at rZR 16x2.

X5					X6			
L1	L2	L3	N	PE	GND	12V	CAN-H	CAN-L
400 V mains					CAN bus (connection to internal components)			

- Non-binding cable recommendation: Unitronic Bus CAN FD P 2x2x0.5
- **Note:** For SAT-40, connect directly to **the emergency stop switch**. A strain relief must be provided on site.



1 = L1
3 = L2
5 = L3
7 = N

5.7.2 ELECTRICAL CONNECTION RATINGS

WARNING! Only authorized specialists should perform installation and wiring.

- All information, images, and drawings are subject to errors and changes.
- The generally applicable and recognized rules of technology and any local regulations must be observed! Values apply to installation in conduits up to 100 m cable length.

Type	SAT 15	SAT 40
Fuse:	B16 3-pole	B16 3-pole
Cable cross-section:	5G 2.5 mm²	5G 4 mm²

6. OPERATION

6.1 SETTINGS

Fixed values	Description	Setting options	Default
Fan speed during the day	Maximum speed level	Levels 8 to 20	Level 11
Self-defrosting	Automatic defrosting of the heat pump	OFF/ON	OFF
Fan speed Defrost	Fan speed during defrosting	0.0% to 100.0%	10.0
Fan speed during defrosting	Fan speed after defrosting during the drip phase	0.0% to 100.0%	50.0
T. Defrost activation	Threshold temperature at which the defrost timer starts when the temperature falls below it (reference sensor : T-evaporator).	-20.0 °C to 20.0 °C	0.0°C
T. Defrost deactivation	Setpoint temperature at which defrosting is terminated (reference sensor: T-evaporator).	5.0 °C to 20.0 °C	18.0 °C

7. MAINTENANCE

Regular inspection of the device by a recognized, qualified, and ratiotherm-authorized specialist is a prerequisite for continuous operational readiness and operational safety, reliability, and a long service life. We recommend having maintenance carried out annually.

NOTE: We recommend taking out a maintenance contract.

⚠ WARNING

Improper handling

Improper handling of the device can result in serious injury. **Never attempt to carry out maintenance work and/or repairs on the device yourself.**

For maintenance work, hire a recognized, qualified specialist (qualified personnel) authorized by ratiotherm GmbH & Co. KG.

7.1 TROUBLESHOOTING

Error message	
Error description	**Fan malfunction**
Behavior of the outdoor unit	■ Fan does not start.
Cause	■ Fan not connected to the power supply
Troubleshooting	■ Connect fan to power supply ■ Check fan control

7.2 CLEANING

7.2.1 CLEANING THE HEATING SIDE

- Cleaning: to be carried out by an installer
- Flushing device: connection to the condenser's flow and return pipes
- Condenser: flush against the normal flow direction (note gravity brake)

7.2.2 CLEANING THE HEAT PUMP

- The devices can be cleaned with a standard household cleaner (see below for exceptions).
- Check the air inlets and outlets (regularly check the intake and exhaust hood grilles for adhering leaves and other dirt).
- Sweep away any dirt. The fan should not be running while sweeping, as otherwise the dirt could be sucked into the device.

NOTE

Improper cleaning

Using the wrong cleaning agents can damage the appliance surfaces.

Please observe the following instructions.

- Do not use abrasive or cleaning agents that could damage the plastic trim, fittings, or controls.
- Do not use sprays, solvents, or cleaning agents containing chlorine.
- Clean the heat pump casing with a damp cloth and a little soap.
- Avoid placing or leaning objects on or against the heat pump.

NOTE

Limescale

Limescale deposits can cause the safety valve to stick.

Operate the safety valve on the heating system manually once a month.

7.3 LEAK TEST FOR THE HEAT PUMP

In accordance with Regulation (EC) No. 842/2006 on certain fluorinated greenhouse gases, the heat pump must be checked regularly for leaks. This check can be carried out by a recognized and qualified specialist (with certification as a refrigeration engineer or state-certified technician specializing in refrigeration technology). The following must be observed:

- DIN EN 378:2000 "Refrigeration systems and heat pumps - Safety and environmental requirements"
- VDMA Standard Sheet 24243 (August 2005) "Refrigerating machines and systems - Tightness of refrigeration systems and heat pumps - Leak detection/leak testing"

NOTE

Leak testing

The inspection must be carried out in accordance with the asset register. The results of the inspection must be documented in accordance with regulations and retained for at least 5 years. The "Asset register for heat pumps" contains an asset log for this purpose.

7.4 SYMBOLS ON THE DEVICE

In order to provide personnel with important information and warnings, standardized safety symbols based on the DIN EN ISO 7010, DIN ISO 3864, and DIN ISO 7000 standards have been used. These safety symbols are:

- They must be clearly visible to all,
- Must be kept in a recognizable/legible condition, and
- be replaced if necessary.

Since the design of the device and the complexity of the production processes do not allow the use of persons with disabilities (e.g., with visual impairments) for safety reasons, the manufacturer has decided not to affix tactile symbols. The requirements for personnel and the technical qualifications required to operate the device are described in chapter "2.3 Target groups" on page 6.

7.5 MAINTENANCE PLAN

DANGER! Do not operate the device if there are any defects.

Maintenance work	Measures	Interval
Operators and users		
Visual and functional inspection	■ Check the device for visible defects and mechanical damage. ■ Perform a visual inspection of the operating elements. ■ Perform a visual and functional inspection of all safety devices.	Monthly
Cleaning the device	■ Observe the information in Chapter "7.2 Cleaning" on page 51.	As needed
Qualified personnel		
Checking electrical components	■ Check the electrical components for damage. ■ Make repairs if necessary.	Annually
Inspection of hydraulic components	■ Check the hydraulic components for damage. ■ Carry out repairs if necessary.	Annual
Check refrigeration components	■ Check the refrigeration components for damage. ■ Carry out repairs if necessary.	Annually
Inspection of safety devices	■ Perform a visual and functional inspection of all safety devices. ■ Document these checks.	Annually
Check symbols on Device	■ Check the symbols on the device. ■ Renew the symbols if necessary.	Annually
Inspection Purchased components	■ Observe the manufacturer's documentation for the purchased components.	Annually

8. DECOMMISSIONING

When the heat pump is taken out of service, the device may only be dismantled by qualified personnel. Hazardous materials and waste must be disposed of properly. When dismantling the heat pump, observe the instructions at the beginning of the technical documentation and the safety instructions listed below.

⚠ DANGER

Fatal electric shock

There is a risk of death from fatal electric shock when working on electrical equipment.

Disconnect the device from the power supply before taking it out of service/dismantling it.

Secure the device against being switched back on.

8.1 TEMPORARY DECOMMISSIONING

NOTE

Improper decommissioning

Improper decommissioning of the device can result in damage to components and impaired functionality.

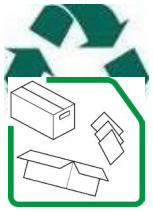
Switch off the device at the main switch.

Please note the following:

- Frost can cause damage to the device.
- Water freezes at outdoor temperatures below 0 °C.
- Decommissioning without draining the heating circuit is only permitted at temperatures above 0 °C.

8.2 FINAL DECOMMISSIONING AND DISPOSAL

Only a specialist company may carry out final decommissioning/disposal. Environmental requirements regarding the recovery, reuse, and disposal of operating materials and components in accordance with current standards must be observed.



NOTE

Improper disposal

Improper disposal of the device can cause environmental pollution and/or damage.

Dispose of electrical and electronic components and the refrigerant from the heat pump properly and in accordance with applicable local regulations.

9. EC DECLARATION OF CONFORMITY

In accordance with the Low Voltage Directive 2014/35/EU, Annex IV, and the Pressure Equipment Directive (2014/68/EU), Annex IV. We hereby declare under our sole responsibility:

Manufacturer		
ratiotherm GmbH & Co. KG Wellheimer Straße 34 91795 Dollnstein	Email: Phone: Website	info@ratiotherm.de +49 (0) 8422/9977-0 www.ratiotherm.de

that the device:

Device name: **WP SAT 15 / SAT 40**

Year of manufacture: see type plate

Intended use: The WP SAT 15 / SAT 40 device is used to utilize environmental heat from the ambient air to provide direct heating support and hot water preparation.

in the version supplied complies with the directives

- Directive 2014/35/EU of the European Parliament and of the Council of February 26, 2014, on the harmonization of the laws of Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.
- Directive 2014/68/EU of the European Parliament and of the Council of May 15, 2014, on the harmonization of the laws of Member States relating to the making available on the market of pressure equipment.

as well as the harmonized standards and directives listed below, to which this declaration refers:

Applied harmonized standards:	Applicable EC directives
■ DIN EN 378-1-4 ■ DIN EN ISO 12100 ■ DIN EN 60204-1 ■ DIN EN 60335-1 ■ DIN EN 60335-2-40	■ Directive 2014/30/EU ■ Directive 2014/35/EU ■ Directive 2014/68/EU ■ Directive 2009/125/EC ■ Directive 2011/65/EU

Technical documentation is available. Name and address of the person authorized to compile the technical documentation:

Name Julian Kruck, Head of Heat Pump Technology

Address: ratiotherm GmbH & Co. KG, Wellheimer Straße 34, 91795 Dollnstein

We hereby certify that the certification procedure has been carried out in accordance with the Low Voltage Directive 2014/35/EU, Annex IV, and the Pressure Equipment Directive (2014/68/EU), and that the provisions of the standard DIN EN ISO/IEC 17050-1 "Conformity assessment – Declaration of conformity by suppliers – Part 1: General requirements" have been observed in issuing this declaration of conformity. This declaration loses its validity if the device is modified without our consent. Any unauthorized modification in this sense excludes any liability on our part.

Dollnstein, _____ Signature of authorized representative: _____

Details of the person authorized to issue this declaration on behalf of the manufacturer or its authorized representative:

Name: _____ Position: _____

Address: ratiotherm GmbH & Co. KG, Wellheimer Straße 34, 91795 Dollnstein

10. NOTES

You can find us here

ratiotherm
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