



Original operating instructions

WP Max-HiQ pF67 & WP Max-LoQ pF67 Indoor Installation

As of July 2026

INFORMATION

These operating instructions form part of the technical documentation for the unit in accordance with:

- Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the 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 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment

These operating instructions are intended for the operator and must be provided to staff who come into contact with the equipment. The operator must ensure that the information contained in these operating instructions and the accompanying documents is read and understood.

NOTE

In case of the slightest doubt, the operating instructions must be consulted and kept in a known and easily accessible place.

The manufacturer accepts no liability for damage to persons, animals, property or the equipment itself resulting from:

- improper use,
- failure to observe instructions,
- insufficient attention

of the safety guidelines contained herein, or caused by:

- modification of the device,
- the use of unsuitable spare parts.

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ratiotherm

Smart Energy Systems

ratiotherm GmbH & Co. KG

Wellheimer Straße 34

91795 Dollnstein, Germany

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For ease of reading, the generic masculine form is used in this original operating manual. The terms used to refer to persons apply to all genders.

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1. INFORMATION ABOUT THIS DOCUMENT

The following notes serve as a guide through the complete documentation. Other documents are valid in conjunction with these operating instructions. These operating instructions for specialist fitters form an integral part of the ratiotherm WP Max-HiQ/LoQ pF67 heat pump. The ratiotherm WP Max-HiQ/LoQ pF67 heat pump must not be operated without this document.

The operating instructions must be made available to the operator and the qualified installer at all times for reference. Should the ratiotherm WP Max-HiQ/LoQ pF67 heat pump be sold, the instructions must be supplied with it. ratiotherm GmbH & Co. KG accepts no liability for damage resulting from failure to comply with these instructions.

1.1 SAFETY AND WARNING NOTICES

Signal words and colours

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

Signal word	Explanation
DANGER	Indicates a dangerous situation which, if ignored, will result in death or serious injury.
WARNING	Indicates a dangerous situation which, if ignored, may result in death or serious injury.
CAUTION	Indicates a hazardous situation which, if ignored, may result in minor injuries and damage to property.
NOTE	Indicates tips for easier operation and cross-references. A note excludes the risk of property damage or injury.

1.2 SAFETY SYMBOLS

1.2.1 OTHER SYMBOLS IN ACCORDANCE WITH DIN EN ISO 7010

Some of the following specific safety symbols in accordance with DIN EN ISO 7010 and DIN ISO 3864 are used at the relevant points in this operating manual and, depending on the combination of signal word and graphic symbol, require special attention. Please note the distinction between:

- Mandatory signs ⇨ prescribe an action (e.g. 'Use eye protection').
- Warning signs ⇨ depict a source of danger and accompany a warning message.
- Prohibition signs ⇨ prohibit certain actions.

Symbol	Explanation	Symbol	Explanation
	General warning sign		Warning: flammable substances
	Warning of electrical voltage		General prohibition sign
	Warning: hot surfaces		No entry
	Follow instructions		General mandatory sign
	Disconnect before maintenance or repair		Use hand protection

1.2.2 OTHER SIGNS IN ACCORDANCE WITH DIN ISO 7000

Symbol	Explanation	Symbol	Explanation
	Please refer to the user manual (operating instructions)		Service indicator, Refer to the user manual (operating instructions)
	User guide/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 DATA

Product designation: Heat pump (brine/water); Heat pump (water/water) Type: WP
 Max-HiQ pF67; WP Max-LoQ pF67
 Year of manufacture: see type plate
 Country of origin: Germany

2.2 INTENDED USE

The WP Max-HiQ/LoQ pF67 unit utilises ambient heat from various possible sources to provide direct heating support and hot water supply. Any other or extended use of the unit is considered improper and therefore incorrect. In such cases, the unit's safety and protective functions may be compromised. ratiotherm GmbH & Co. KG accepts no liability for any damage resulting therefrom. Intended use also includes:



- following all instructions in this operating manual,
- obeying all warnings, and
- adhering to the inspection and maintenance requirements.



The WP Max-HiQ/LoQ pF67 unit incorporates the latest state-of-the-art technology and has been manufactured in accordance with recognised safety standards. The unit is intended exclusively for domestic and/or commercial use for hot water supply (domestic hot water) and for heating or cooling.

Improper or unauthorised use may pose a risk to the life and limb of the user or third parties. Furthermore, damage to the appliance and other property may result. The WP Max-HiQ/LoQ pF67 unit is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or by persons with a lack of experience and/or knowledge. The risk is borne solely by the operator and the owner.

2.3 TARGET GROUPS

For safety reasons, the design of the device does not permit its use by people with disabilities (e.g. visual impairments).

DANGER Only carry out tasks for which  you are authorised.

2.3.1 TARGET GROUP MATRIX

Tasks	Operators and users	Qualified personnel
Transport/storage		X
Assembly/Installation		X
Commissioning/Adjustment		X
Automatic operation (control)	X	X
Set-up/Conversion/Technical Modification		X
Maintenance/inspections/repairs		X
Cleaning	X	X
Troubleshooting/Fault rectification		X
Decommissioning/Dismantling/Disposal		X

2.3.2 TARGET AUDIENCE DEFINITION

Users and operators

A person who has purchased the appliance for use in an existing system for direct heating support and domestic hot water production. The person must have knowledge of the necessary safety devices and protective measures.

Qualifications: Of legal age and physically and mentally capable of carrying out work on the appliance

Knowledge of how to operate the product, provided by qualified personnel and the operating instructions

Qualified personnel

A person employed by a qualified specialist company for heating systems and domestic hot water supply. The qualified personnel must have acquired specialist knowledge and experience through professional training. The person must have knowledge of relevant standards, be able to assess the tasks assigned to them (e.g. instructing staff, switching on, programming and switching off) and identify potential hazardous situations.

Qualifications: Of legal age and physically and mentally fit to carry out work on the appliance

Knowledge and several years' experience of working on heating and hot water supply systems

2.4 MISUSE

2.4.1 REASONABLY FORESEEABLE MISUSES

Reasonably foreseeable misuse that poses a risk to personnel, third parties or the equipment applies to all operating modes:

- Using the equipment contrary to its intended use
- Feeding in 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 equipment, as well as additions and alterations, 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 whilst it is clearly malfunctioning
- Operating the appliance by persons with reduced physical, sensory or mental capabilities, or by children



DANGER

Unauthorised modifications to the equipment

Unauthorised modifications pose a risk of death or injury.

Do not carry out any unauthorised modifications to the appliance without prior approval from ratiotherm GmbH & Co. KG.

2.4.2 UNFORESEEABLE INCORRECT USE/MISUSE

Unforeseeable misuse may occur as a result of:

- disasters,
- the impact of foreign objects and/or
- force majeure.

2.5 WARRANTY, LIABILITY, GUIDELINES, STANDARDS AND LAWS

In principle, the 'General Terms and Conditions of Sale and Delivery' of ratiotherm GmbH & Co. KG apply. The 'General Terms and Conditions of Sale and Delivery' are made available to the operator no later than upon conclusion of the contract. 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 appliance
- Improper handling of the appliance
- Operation of the appliance whilst safety devices are defective
- Failure to observe the safety and warning instructions in the operating instructions
- Unauthorised structural modifications to the equipment
- Failure to carry out the specified maintenance measures
- Disasters involving foreign objects or force majeure

The operating instructions must be read before handling the equipment. The operating instructions familiarise staff with the handling of the equipment and provide details on all stages of the equipment's service life.

The operating instructions must be accessible to staff at all times. The safety and warning instructions in the operating instructions and on the appliance must be observed and complied with. For any further questions beyond the scope of these operating instructions, please contact ratiotherm GmbH & Co. KG.

When using the appliance in Germany, the following directives, standards and laws must be observed in particular:

- VDE and electricity supply company regulations and provisions (in particular VDE 0100)
- Regulations and provisions of the local utility companies
- DVGW Worksheet W 382 'Installation and operation of pressure-reducing valves in drinking water consumption systems'
- DIN 1988 – TRWI Technical Rules for Drinking Water Installations
- DIN 4753 – Water heating systems for drinking water and service water
- DIN 8947 – Ready-to-connect heat pumps for water heating with electrically driven compressors
- Accident Prevention Regulations VGB 20 'Refrigeration Systems' with implementation instructions
- Energy Saving Ordinance (EnEV) – Ordinance on energy-saving thermal insulation and energy-saving building services equipment in buildings, 2009



NOTE

Guidelines, standards and legislation

Further guidelines, standards and laws, e.g. building regulations, may apply locally. As a general rule, the statutory guidelines, standards and laws applicable in the respective country must be observed.

2.6 BUILDING DRYING/SCREED HEATING

The WP Max-HiQ/LoQ pF67 heat pump must not be used for screed drying. A heat pump is designed to heat a building efficiently. During building drying, the high moisture content in the structure requires a consistently higher heating output. The ratiotherm heat pump is not designed for this and will reach its performance limits.



NOTE

Should a ratiotherm heat pump nevertheless be used for screed heating, the unit's warranty will be void with immediate effect.

3. SAFETY INSTRUCTIONS

DANGER

Read and follow the operating instructions before you start working on or with the unit.

Despite all the precautions taken, there may still be residual risks that are not immediately apparent. You can reduce these residual risks by observing and complying with the general safety instructions and warnings, as well as by using the appliance for its intended purpose.

3.1 GENERAL SAFETY INSTRUCTIONS

Observe the following general safety instructions:

- The volume of water increases during the heating process. Therefore, never block the safety valve's discharge pipe.
- Hot water may escape from the relief pipe.
- If you notice any leaks in the vicinity of the appliance, switch it off and isolate it from the rest of the heating system. The leaks must then be rectified immediately.
- To prevent corrosion of the appliance, do not use the following products: sprays, solvents, chlorine-based cleaning agents, paints, adhesives, etc.
- Components that have not been tested with the appliance may cause damage to it or impair its functions. Use only original spare parts and original wear parts.
- Have the assembly, installation, commissioning and adjustment of the unit carried out only by qualified personnel.
- Observe the applicable regulations, rules and guidelines, as well as local installation requirements.
- To prevent injuries of any kind, the general accident prevention regulations must be observed at all times 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 to welding on load-bearing parts. Safety devices must not be taken out of service. Only original spare parts and original accessories from the manufacturer must be used.

3.2 ADDITIONAL NOTES

Local accident prevention regulations apply to all work carried out on the equipment. The following must also be observed:

- applicable mandatory regulations on accident prevention
- recognised technical rules for safe and professional working practices
- existing environmental protection regulations
- any other applicable regulations

The outlet temperature at the hot water taps can reach up to 60 °C. Carefully check the water temperature at the hot water taps before placing your hands fully under the water jet.

Do not make any modifications to the following components:

- the heat pump and the pipes for fluids and electricity;
- safety valve;
- structural conditions that may affect the operational safety of the appliance;
- structural conditions in the vicinity of the appliance, insofar as these may affect the operational safety of the appliance.

3.3 SAFETY INSTRUCTIONS FOR REFRIGERANT R290



WARNING

- This unit operates using the environmentally friendly refrigerant R290 (propane, ODP of 0, GWP of 0.02), which is a flammable gas and must be serviced by an authorised person.
- R290 is non-toxic, but odourless and colourless. A refrigerant leak can only be detected using a gas detector.
- Fire hazard/flammable material: In the event of a refrigerant leak, check that the unit has switched to safety mode (i.e. all non-safety-related components within the heat pump switch off, whilst the fan continues to run and ventilate the refrigeration compartment). Check that there are no sources of ignition nearby and contact your specialist contractor or ratiotherm customer service immediately.
- Chemicals or flammable materials must not be stored or used near the unit.

3.4 RESIDUAL RISK



WARNING

Interventions/work carried out by unauthorised/unqualified personnel

Measures/work carried out on the unit and/or its components and connections by unauthorised/unqualified personnel pose a risk of serious injury.

In the event of a fault, allow only qualified personnel to carry out work on the unit and/or its components and connections.



WARNING

Damaged insulation

Damaged insulation poses a serious risk of burns from 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 carrying out any work. Replace any damaged insulation.



WARNING

Ignition sources in the hazard zone

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

Keep ignition sources away from the hazard zone.

4. DESIGN AND FUNCTION

4.1 TECHNICAL SPECIFICATIONS

	WP Max-HiQ pF67	WP Max-LoQ pF67	Unit
Performance data – heating mode			
	W10/W35	S0/W35	
Heating capacity	21.3 to 145.5	15.1 to 121.8	kW
Power consumption	2.9 to 26.2	2.9 to 26.3	kW
COP at rated capacity	5.54 to 7.28	4.63 to 5.22	
Space heating energy efficiency for low-temperature applications under average climatic conditions	242.9	193.7	%
Performance data – cooling mode			
W15/L40			
Cooling capacity	17.0 to 90.0		kW
Power consumption	2.7 to 19.9		kW
EER at rated output	6.0		
Compressor			
Type	Fully hermetic, scroll, inverter		
Speed	1740 to 6960		rpm
Max. operating current	29		A
Starting current	29		A
Lock-up current LRA	-		A
Oil volume	1.7		litres
Evaporator			
Type	copper-brazed plate heat exchanger		
Material	Stainless steel, copper		
Flow rate (water or brine)	4 to 20		m³/h
Pressure drop	max. 0.3		bar
Test pressure	45		bar
Operating range	-196 to 200		°C
min./max. swelling temperature	10 to 55	-25 to 30	°C
Source connection size	2 1/2-inch male thread, tapered		
Source pump	Wilo Stratos PARA-C 50-240-08-T21		
Residual head	4		H/m
Condenser			
Type	Copper-brazed plate heat exchanger		
Material	Stainless steel, copper		
Water flow rate (parallel)	2 to 11.6		m³/h
Pressure drop	max. 0.3		bar
Temperature difference	10		K
Test pressure	45		bar
Operating range	-196 to 200		°C
min./max. cooling temperature	25 to 72		°C
Connection size, sink	2-inch male thread, tapered		

	WP Max-HiQ pF67	WP Max-LoQ pF67	Unit
Condensate pump	Wilo Stratos PARA-C 40-220-08-T21		
Residual head	4		H / m
Refrigeration circuit			
Refrigerant	R290		
Filling quantity	2 x 4.9		kg
Max. operating pressure	31		bar
Safety class	A3: low toxicity, higher flammability		
Electrical system: compressor			
Mains connection	2 x 400 V / 3-phase / 50 Hz		
Fuse protection	2x B32		A
Residual current circuit breaker	2x Type B, 10 ms instantaneous, 300 mA		
Max. operating current of compressor	2 x 29		A
Start-up current	2 x 29		A
Max. compressor power consumption	2 x 18.5		kW
Electrical: Control voltage			
Mains connection	400 V / 3-phase / 50 Hz		
Fuse rating	B16		A
Residual current circuit breaker	Type A, 30 mA		
Max. power consumption	4.0		kW
Product data			
Sound pressure level, internal unit at a distance of 5 m	43 (provisional)		dB(A)
Sound power level, indoor unit L-WA (for W10/W55)	52.1		dB(A)
Maximum L-WA	63.9		dB(A)
L-WA (noise-reduced)	54.8		dB(A)
Outdoor unit dimensions	1400 x 1637 x 1115		WxHxD (mm)
Weight of outdoor unit	750		kg
Max. operating water pressure	3		bar
Max. VL temperature	72		°C

4.2 FUNCTIONAL DESCRIPTION

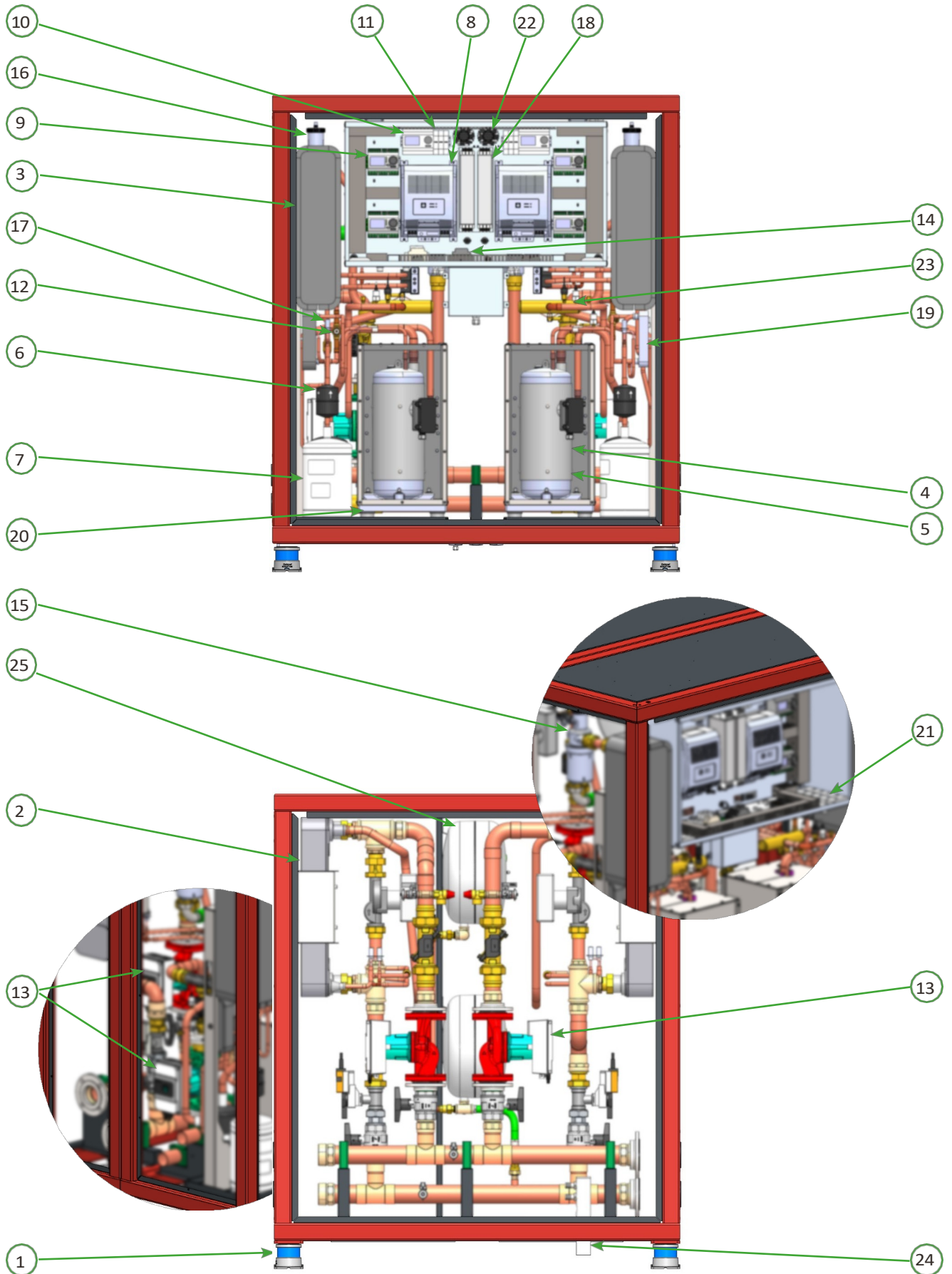
The WP Max-HiQ/LoQ pF67 is a speed-controlled heat pump in a monoblock design for indoor installation. The unit is designed for water-to-water or brine-to-water applications and uses the natural and environmentally friendly refrigerant R290 (propane). The WP Max-LoQ pF67 heat pump allows for source temperatures ranging from -25 to +30 degrees Celsius, whilst the WP Max-HiQ pF67 is suitable for widely varying source temperatures in the range from +10 to +55 degrees Celsius. Thanks to several patented processes, the heat pump is able to consistently achieve the optimum operating point and maximum operational reliability despite fluctuating source temperatures. This makes the unit suitable for a wide variety of sources such as ground probes, waste heat, groundwater or PVT (photovoltaic thermal). The system comprises two independent refrigeration circuits, which are linked via an intelligent cascade control system and housed in a single enclosure. They share a common hydraulic and electrical connection. Hydraulically, the refrigeration circuits can be connected either in series or in parallel, enabling a water-side temperature spread of up to 20 Kelvin. The refrigeration circuits are filled ready for operation, meaning no refrigerant certificate is required for installation. The safety valve and microbubble separator integrated into the indoor unit ensure that, in the event of a leak, the flammable refrigerant is prevented from entering the boiler room. Thanks to the heat pump's speed control, it covers a wide performance range and thus adapts to various loads and conditions. Furthermore, it is ideally suited for utilising fluctuating energy supplies and enables intelligent load control across all energy ranges. Optionally, the unit can be ordered as an AllQ version with a significantly extended source range.



ADVANTAGES

- Flow temperatures of up to 72 °C possible
- Maximum flexibility thanks to speed-controlled inverter operation
- Capable of utilising highly fluctuating energy sources
- Integrated energy management (Smart Grid-compatible)
- Simple installation thanks to complete pre-assembly at the factory; no refrigeration licence required
- With ratiotherm components, a fully coordinated, future-proof system

4.3 CONSTRUCTION AND SPARE PARTS



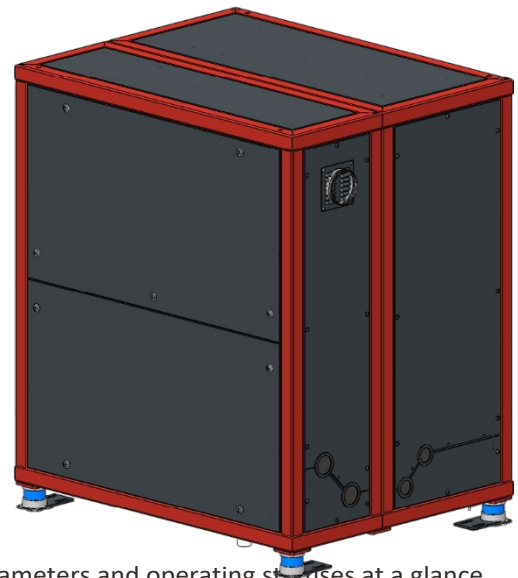
Item no.	Description	Description	Quantity
1	Adjustable foot	ra/15288	6
2	Evaporator (plate heat exchanger)	ra/15371	2
3	Condenser (plate heat exchanger)	ra/10111	2
4	Compressor	ra/10870	2
5	Heating tape (compressor)	ra/15292	2
6	Filter drier	ra/14661	2
7	Collector	ra/14665	2
8	Frequency converter	ra/14242	2
9	UVR610S	ra/14658	4
10	CAN-EZ3 Energy Meter	ra/14445	1
		ra/95.10.3225	1
11	Circuit breaker	ra/15277	8
12	Expansion valves	ra/13037	10
13	<i>Parallel</i>		
	Wilo Stratos PARA-C-40 pump	ra/15146 (sink)	2
	Wilo Stratos PARA-C-50 pump	ra/14838 (supply, optional)	2
	<i>Series</i>		
	Wilo Stratos PARA-C-40 pump	ra/15146 (sink)	1
	Wilo Stratos PARA-C-50 pump	ra/14838 (source, optional)	2
	<i>HiQ or AllQ</i>		
	Wilo Para Maxo 1-8	ra/14838	2
14	C.M.I.	ra/95.10.3218	1
15	Microbubble separator	ra/10140	2
16	Safety valve		2
17	Cartridge pressure switch	ra/14591	2
18	Interference suppression filter	ra/15284	2
19	Economiser	ra/10110	2
20	Vibration damper	ra/14467	5
21	Control component SMS-14	ra/13047	10
22	Housing fan	ra/14481	2
23	4-way valve	ra/15136	2
		ra/15061	
24	Discharge pipe		
25	18-litre diaphragm expansion vessel (source, optional)		2
-	Pressure sensor 10 bar	ra/14383	2
-	Pressure sensor 35 bar	ra/10922	4
-	Non-return valve	ra/14624	7
-	Sight glass	ra/14660	2
-	Contact sensor	ra/12859	2
-	Contact probe	ra/44.01.12007	4
-	Volume flow sensor	ra/15182	2
-	Liquid separator	ra/15296	2
-	Switched-mode power supply	ra/14481	1
-	Heating tape (liquid separator)	ra/14690	2
-	Propane detector	ra/10232	1
-	Safety vent (optional)		1

Design

The ratiotherm WP Max-HiQ/LoQ pF67 heat pump has two complete refrigeration circuits and can be powered by a wide variety of energy sources. The monoblock heat pump is designed for indoor installation.

The refrigeration circuit is a hermetically sealed system comprising a scroll compressor, a condenser (plate heat exchanger), an evaporator (plate heat exchanger) and five electronic expansion valves, which control the flow of refrigerant. The natural refrigerant R290 is used. The WP Max-HiQ/LoQ pF67 heat pump is shipped ready for operation with fully charged refrigeration circuits. The heat pump can be controlled by the ratiotherm rZR 16x2 central controller or by a third-party controller. If the unit is controlled by a third-party system, an external

display can be fitted in the boiler room to provide an overview of all parameters and operating statuses at a glance.



The ratiotherm heat pump can be operated in conjunction with most electric, gas or oil boilers.

Design of the WP Max-HiQ/LoQ pF67 heat pump:

- sturdy, attractively designed, insulated and powder-coated steel casing, suitable for lifting by crane
- 2 x factory-prepared refrigeration circuits (no refrigeration licence required)
- 2 x sound-insulated, fully hermetic scroll compressors with EVI injection
- 2 x highly efficient, remotely readable variable-frequency drives, including mains filters to comply with the EMC Directive
- 4 x copper-brazed stainless steel plate heat exchangers acting as condensers and evaporators
- Condensate drain for safety valve and blow-off pipe
- 10 x electronic expansion valves
- Economiser to increase the COP
- Pressure and temperature monitoring of the refrigeration and hydraulic circuits
- C.M.I.: Remote maintenance/interface module (ModBus TCP; C.M.I. is always the master)
- Power-to-Heat and Smart Grid-compatible

Casing colours:

4.4 OPTIONAL EQUIPMENT

- External CAN-MTx2 display: On-site operation of the system
- ModBus RTU interface extension: Option to control the heat pump via ModBus RTU
- AllQ source temperature extension: with this extension, source temperatures can range from -25 to +55 °C. This enables, for example, the use of PVT (photovoltaic-thermal) as a heat source all year round
- Wilo Stratos PARA-C-50 source pump: 2 source pumps installed inside the housing
- Diaphragm expansion vessels: 2 x 18-litre diaphragm expansion vessels installed inside the housing for the source circuit

RAL 7016
Anthracite grey

RAL 3000
Fire red

4.5 CONTROL LOGIC AND OPERATION

Control logic in conjunction with the ratiotherm rZR 16x2 central controller:

- The heat pump controller communicates with the rZR via CAN bus.
- The central controller activates the heat pump and sets a corresponding setpoint temperature.
- In heating mode, the heat pump automatically regulates its output according to the specified setpoint temperature.
- Consequently, it is entirely possible that the heat pump may run for very long periods at low output. This is intended and does not affect the service life.
- In domestic hot water mode, the compressor runs at a constant speed. The setpoint speed can be adjusted via a fixed value (factory setting 75%).
- Cooling is also activated by the central controller. In cooling mode, the heat pump regulates to the set outlet temperature, which is defined via a fixed value.



Control logic in conjunction with external controllers:

- Requests via external controllers take priority over the ratiotherm controllers (keyword: Power-to-Heat).
- The heat pump can be activated via a digital signal.
- In addition, a 0–10 V input is available. If no 0–10 V signal is present, the heat pump regulates itself to a setpoint temperature. This is set via a fixed value (factory setting 50 °C).
- If a 0–10 V signal is present, the fixed value '0–10 V temperature setpoint' can be used to determine whether a setpoint speed or a setpoint temperature is transmitted (factory setting = off: the 0–10 V signal is interpreted as a setpoint speed).
- The setpoint temperature is defined as: 0 V = 0 °C, 10 V = 100 °C
- A digital input is also available, which can be used to activate cooling.
- Here too, the heat pump regulates itself to a fixed setpoint temperature.

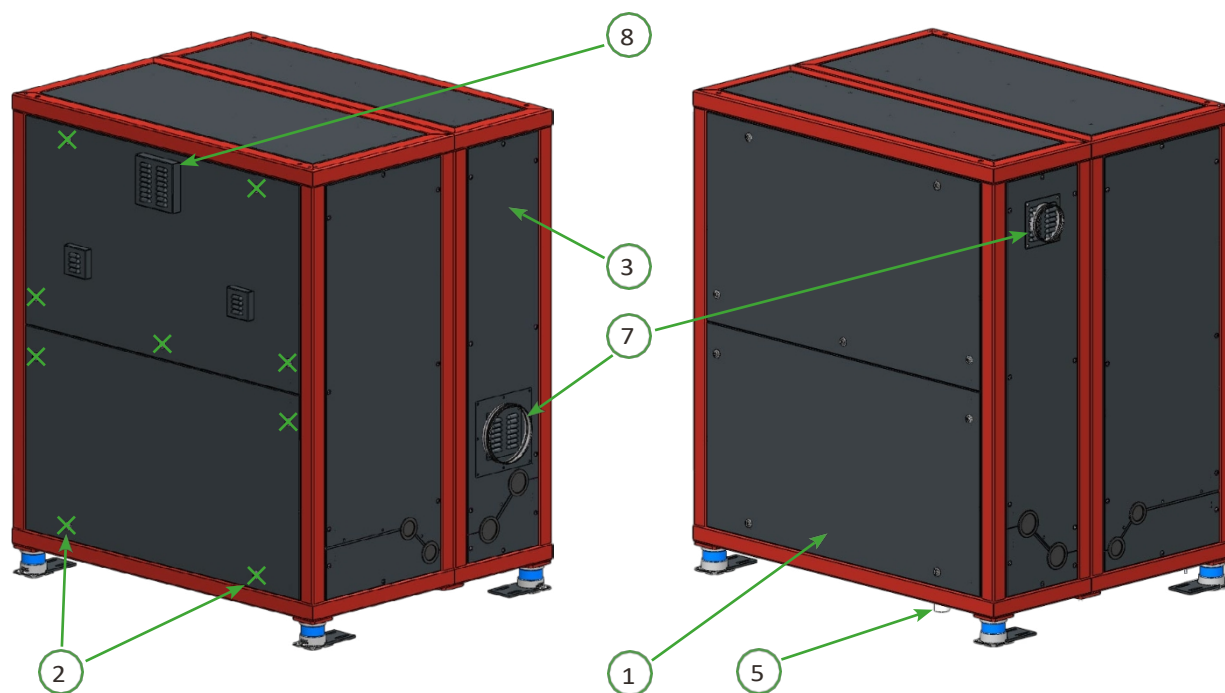
Internal control logic:

- The heat pump is activated via a potential-free digital signal. This activates the pumps and valves. After 45 seconds, the compressor starts up. From model year 20/45 onwards, the heat pump is also activated when a 0–10 V signal is applied to X3.2. This gives the user the choice of whether to activate the system digitally or via a 0–10 V signal.
- Once the system is activated, the minimum running time is 5 minutes. A fault will switch the system off immediately.
- The setpoint speed of the compressor or the setpoint outlet temperature (adjustable via a fixed value) can be specified by an external control unit using a 0–10 V signal.
- If no 0–10 V signal is present, the compressor runs at a constant, adjustable speed (factory setting: 75 per cent).
- If a 0–10 V signal of less than 1.9 V is present, the heat pump is started in cooling mode. If fitted, the 4-way valve is activated and the compressor speed is regulated to the setpoint cooling temperature.
- The compressor speed is limited during the start-up phase, which is why full speed is only reached after 4 x 1.5 minutes.
- If the source temperature within the evaporator falls below a settable value (factory setting: 11 °C) for longer than 1 minute, the system is shut down to prevent frost damage. If the evaporator temperature exceeds 55 °C, start-up is also prevented. Once the temperatures return to normal, the unit starts up as normal.
- If the temperature on the source side falls below 8 °C for water/water systems or below a settable value for brine/water systems, a frost protection fault is triggered and the system is blocked for 7 minutes or, if the fault occurs repeatedly, shut down.

- The condenser pump regulates based on the temperature difference (ΔT) between the heating flow and return (factory setting 6 K).
- If the heating flow temperature rises above 69 °C, the pump begins to increase its speed to prevent the system from shutting down.
- If the heating flow temperature exceeds 72 °C, the system switches off automatically for 20 minutes. If the temperature drops during this time, the system restarts after the 20-minute waiting period.
- The evaporator pump is controlled by the temperature difference (ΔT) between the source inlet and outlet (factory setting 3 K).
- If an anomaly is detected (high pressure, low pressure, antifreeze), a fault is triggered and the system is blocked for 5 or 7 minutes. This cannot be reset using the reset button! If the same fault occurs three times within an hour, the system is locked. The lock can be released using the reset button.
- To prevent an anomaly, high-pressure, low-pressure and compressor temperature are monitored and, if necessary, the speed is reduced for at least 8 minutes.

4.6 SAFETY DEVICES

The unit is fitted with various safety devices. The safety devices are shown in the following diagram:



- 1 Protective enclosure or housing
- 2 Mechanical locks (9) ✕
- 3 Protective door
- 4 Pressure and temperature monitoring of the refrigeration and hydraulic circuits (internal)
- 5 Pressure relief for the hydraulic circuit: safety valve, microbubble separator (internal) and vent pipe (to be extended on site) (see chapter 'Construction and Spare Parts': points 15, 16, 24)
- 6 Propane detector (internal)
- 7 Ventilation of the refrigeration circuit (to be fitted on site) with optional internal fan
- 8 Separate electrical compartment with permanent overpressure (internal)

**NOTE****Potential risk to life due to faulty safety devices**

- Before starting work, all safety devices must be checked to ensure they are functioning correctly.
- Never disable safety devices.
- All safety devices must be fully installed before the unit is put into operation.
- The power supply to the unit must not be interrupted, as this will render the safety devices inactive. The power supply may only be interrupted if an external propane sensor and external ventilation are in use.
- If the heat pump is to be left idle for a prolonged period, the unit must only be authorised to restart. The system must not be switched off or disconnected from the power supply. Even when not in use, e.g. during the summer months, the safety devices must remain active. If the system is left idle during the winter months, the sump must be drained.

Normal operation of the heat pump: Safety fans run at 40 per cent of the specified air flow rate in accordance with EN 378 and ventilate the refrigeration area.

Gas sensor detects a refrigerant leak: Safety fans run at 100 per cent and ventilate the refrigeration area; all other electronic devices switch off; an alarm sounds (optional); notification emails are sent (optional).

Procedure in the event of leaks:

- There is a possibility that propane may leak into the interior.
- Keep all ignition sources away from the hazard area or deactivate them.
- Ventilate the interior as thoroughly as possible; set up a fan if it is Ex-rated.
- Leave the interior.
- Notify a service technician.

5. TRANSPORT, ASSEMBLY AND INSTALLATION

5.1 TRANSPORT AND UNPACKING

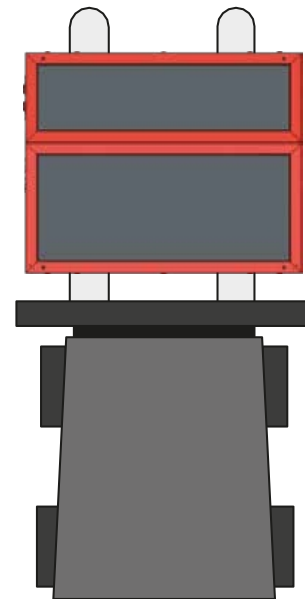
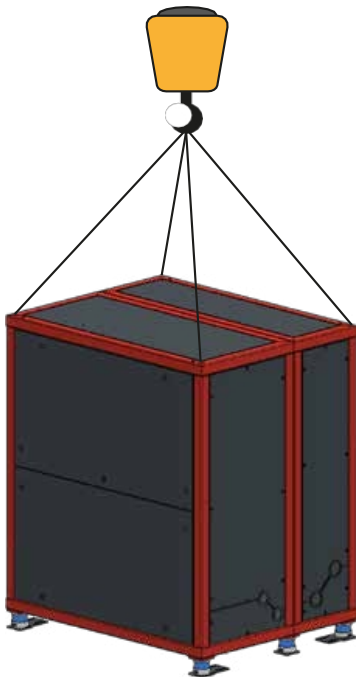
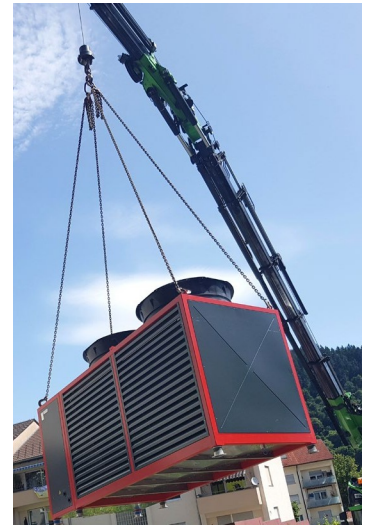
The following instructions for transporting the unit must be observed:

- Only allow qualified specialist personnel to carry out the transport.
- Protect yourself by wearing PPE (e.g. safety footwear, etc.).
- Take the unit's weight (approx. 750 kg) into account when selecting the appropriate lifting equipment (crane, forklift, pallet truck, etc.).
- Take the device's centre of gravity into account.
- Remove all packaging materials.

NOTE Do not damage the unit when removing the packaging materials.

- When disposing of the transport and storage packaging, comply with local waste disposal regulations and applicable environmental protection laws.
- When unpacking the unit, check that the delivery is complete.
- Use the delivery notes and packing lists supplied to check the contents.
- The unit may be tilted by a maximum of 45° in any direction. After tilting, the unit must be left to stand undisturbed for 6 hours before being put into operation. Excessive tilting may damage the refrigeration circuit.

- The unit can be lifted by crane. Crane operations must be carried out by qualified personnel in accordance with the DGUV regulations for cranes.
- The unit can be accessed from the long side.



All dimensions are given in millimetres.

Storage conditions:

- Ensure that the product is stored in a frost-free environment.
- The unit must only be stored outdoors or in well-ventilated rooms; storage in enclosed or underground spaces is not permitted.
- Do not store the device near sources of ignition.
- If the unit has been damaged during transport, it must not be stored.

5.2 INDOOR INSTALLATION OF THE HEAT PUMP

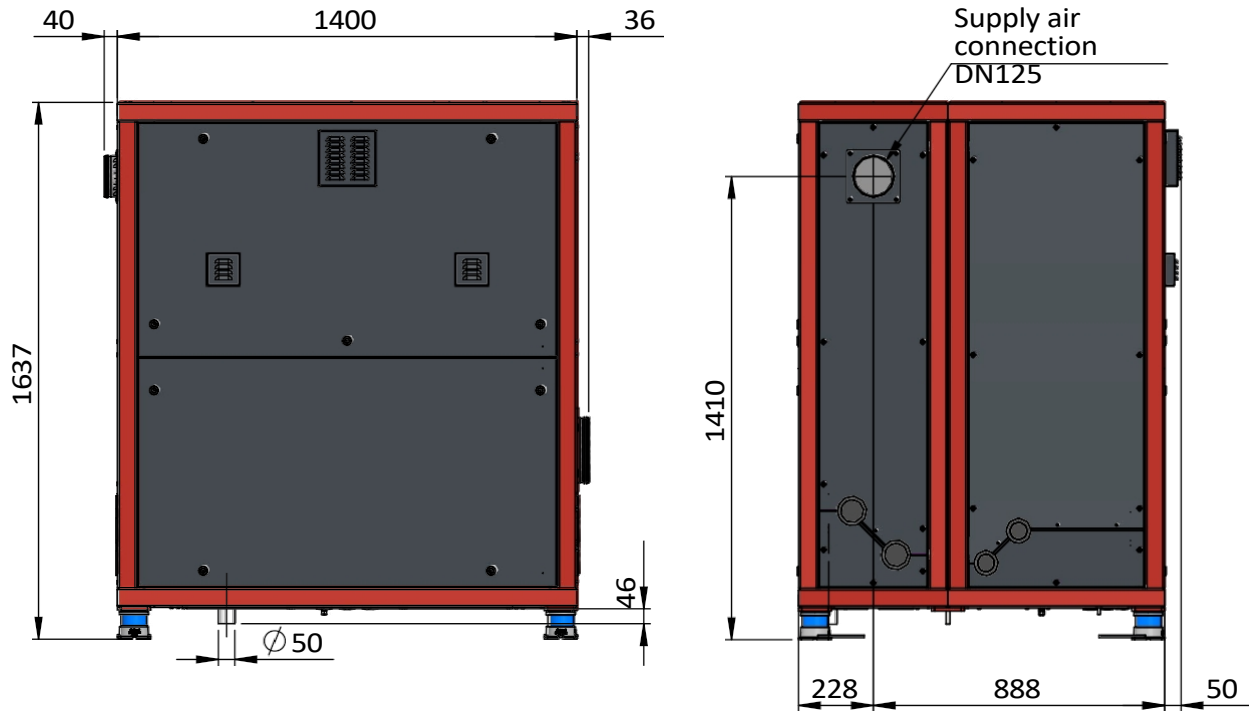
Installation conditions:

- Installation may only take place indoors if all additional safety measures (ventilation, etc.) are properly implemented.
- A floor drain with a siphon must be provided to protect against water damage.
- The unit must be installed in a clean, well-ventilated and dry location. The ambient temperature must be consistently $> 10\text{ }^{\circ}\text{C}$ and $< 35\text{ }^{\circ}\text{C}$.
- The minimum clearances must be observed for maintenance purposes: sufficient space must be available for any maintenance or repairs.
- In installation rooms with hard, reflective walls, operating noise can be significantly amplified. Fire-resistant acoustic insulation applied to the relevant surfaces can help to mitigate this.
- To prevent the transmission of vibrations, we recommend installing the unit on bare concrete. If this is not possible, the screed at the installation site should be removed and a concrete plinth constructed on the bare concrete. If this is also not possible, the use of a vibration-isolated base is recommended.
- Safety clearances: the heat pump operates using the refrigerant R290 (propane), which is highly flammable and can form explosive mixtures when combined with air. It is contained within hermetically sealed refrigeration circuits in the heat pump, and further safety measures both inside and outside the unit prevent the refrigerant from escaping into the boiler room (should a leak occur).
- The minimum distances specified in EN 62305 must be observed in relation to an external lightning protection system.
- Where possible, there should be no other electrical appliances or strong ignition sources (such as electric boilers) in the room where the heat pump is installed, or they should be positioned as far away from the heat pump as possible.
- The heat pump must be fitted with suitable ventilation and other safety devices.
- The unit must not be modified or enclosed.
- Before installing the heat pump, the load-bearing capacity of the subfloor must be checked (weight of the heat pump approx. 750 kg).
- As standard, the heat pump can be installed up to 20 metres away from the storage tank.
- In the event of an emergency, the refrigeration engineer must be able to evacuate easily.

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

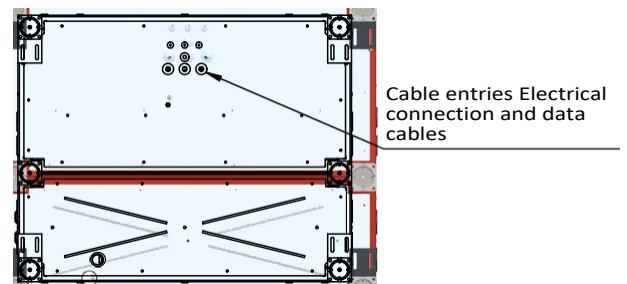
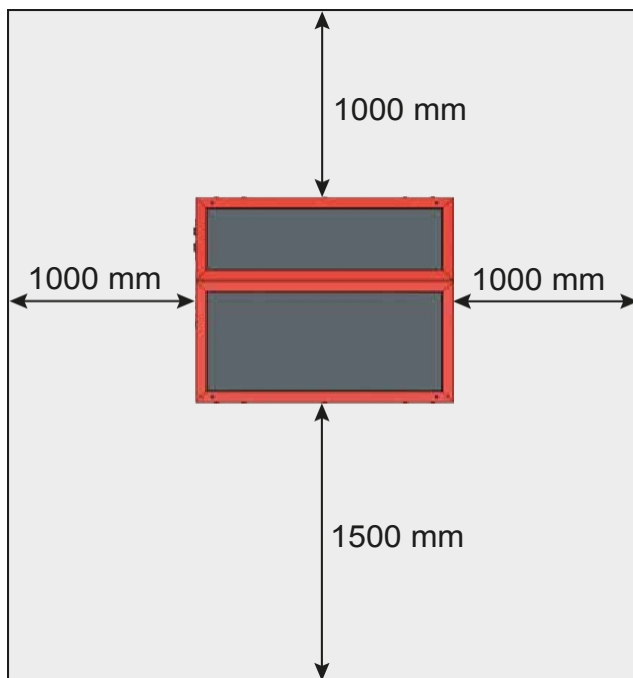
- The work area for assembly and installation must be well lit.
- Staff must possess the necessary qualifications, have received the required training and be briefed by the relevant supervisor.
- Staff must have read and understood the operating instructions.
- Staff must have access to the operating instructions at all times.
- Local health and safety and environmental regulations must be implemented and complied with.
- Unauthorised persons must be kept away from the unit.
- The unit must only be handed over and operated when it is in a safe and serviceable condition. Any damage to the heat pump must be rectified immediately, or the heat pump must be taken out of service.

5.2.2 DIMENSIONS



5.2.1 MAINTENANCE AREA

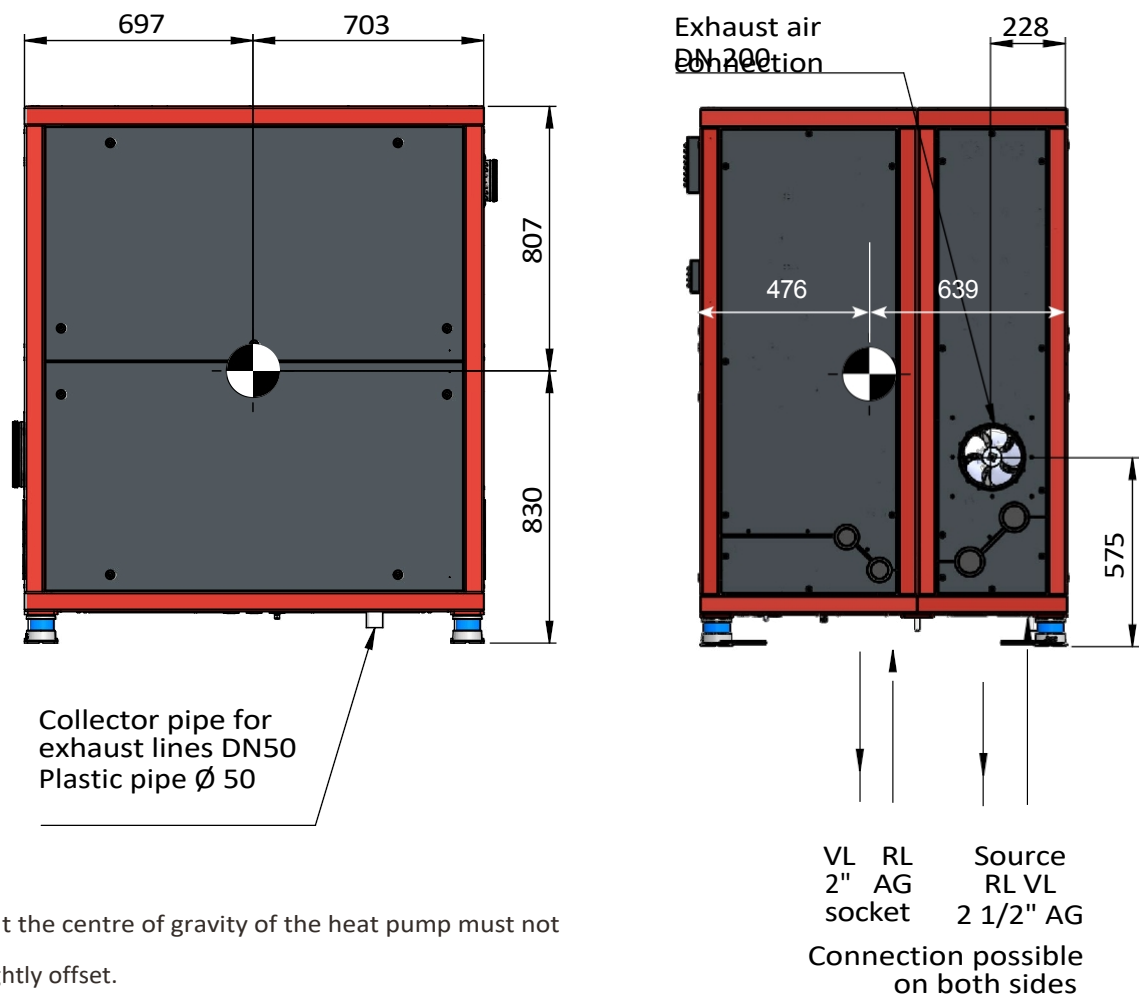
Top view



These clearances must be strictly observed to ensure smooth maintenance.

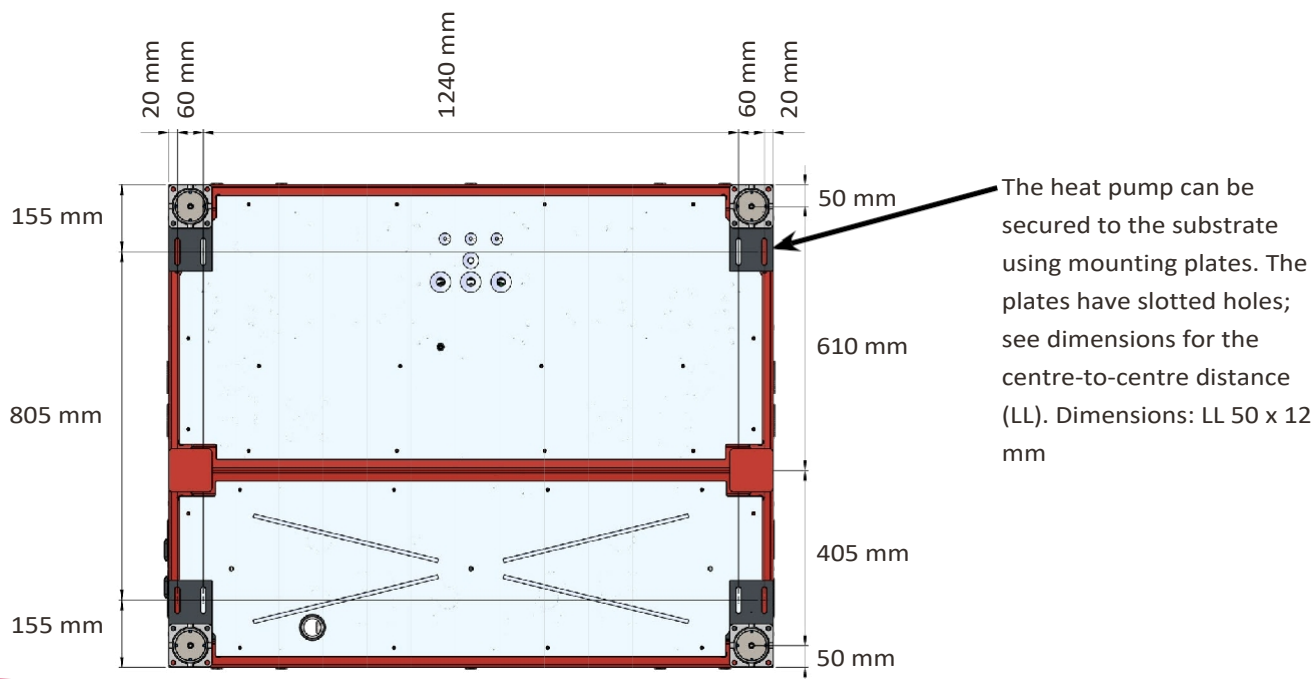
All dimensions are given in millimetres.

5.2.3 HEAT PUMP CENTRE OF GRAVITY

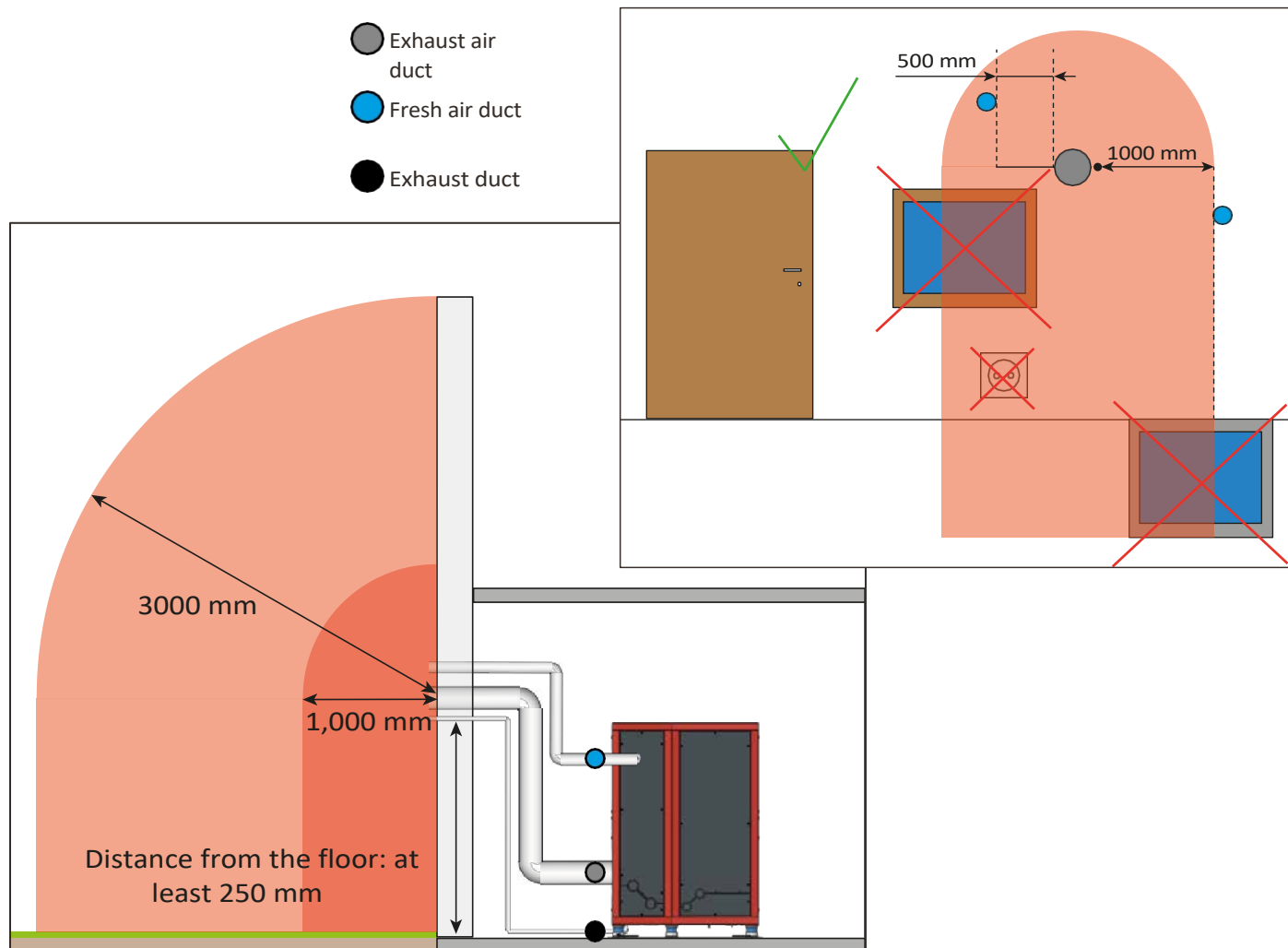


Please note that the centre of gravity of the heat pump must not be centred, but slightly offset.
All dimensions are given in millimetres.

5.2.4 MOUNTING OPTIONS



5.2.5 PROTECTIVE ZONE AROUND EXHAUST AND VENT PIPES



The WP Max-HiQ/LoQ pF67 heat pump operates using the flammable refrigerant R290. For this reason, a safety and protection zone (Ex Zone 2) must be maintained at all times around the exhaust air vent and the outlet of the vent pipe.

A safety zone of at least 3 metres horizontally must be maintained in the vicinity of:

- Open flames and sources of sparks (fireplaces, ashtrays, barbecues)

A safety zone of at least 1 metre horizontally must be maintained in the presence of:

- Building openings, windows, doors, flat-roof windows
- Openings in ventilation systems
- Recesses such as light wells and sewer shafts
- Drains passing through a building
- Recreational areas, terraces
- Electrical installations, sockets, lamps, light switches, domestic electrical connections
- Footpaths and driveways

Distances to fresh air inlets:

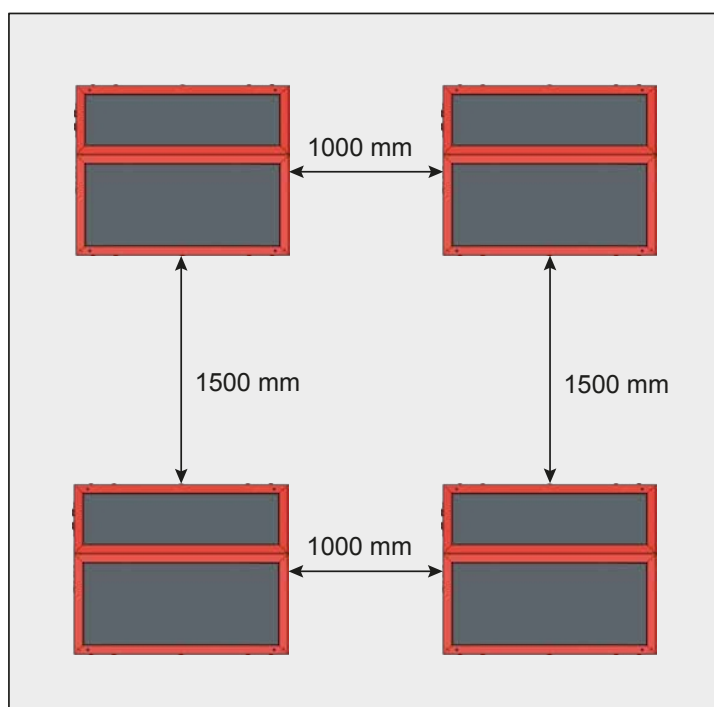
- If the fresh air inlet is above the exhaust air outlet: a horizontal distance of at least 0.5 metres
- If the fresh air inlet is located below the exhaust air outlet: a horizontal distance of at least 1 metre

Further installation instructions:

- The outlets of the ventilation ducts and the exhaust duct must be above ground.
- The openings must be fitted with grilles or similar.
- The openings must be at least 0.25 m above ground level or higher than the expected snow depth, and must always be kept clear (no leaves, dirt or snow must block the openings).
- The heat pump must be installed in such a way that no refrigerant can enter the building or otherwise endanger people.
- A semicircle of 0.5 metres around the exhaust air outlet and the vent pipe opening must be free of obstacles.
- Where this system is used for commercial purposes, a suitable warning sign must be displayed at the outlet (Ex Zone 2).

5.2.6 INSTALLATION OF MULTIPLE HEAT PUMPS

If two or more WP Max-HiQ/LoQ pF67 heat pumps are installed, the distance between the heat pumps must be at least equal to the length of the maintenance area.

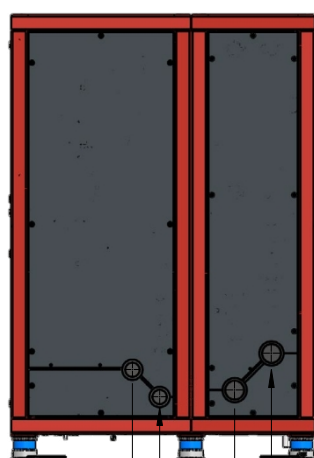


5.3 HYDRAULIC INSTALLATION

5.3.1 CONNECTION DIMENSIONS AND SIZES

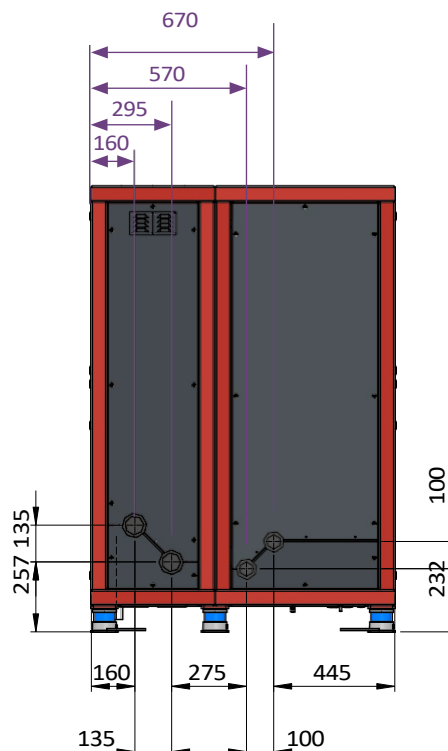
Views from the left and right.

All dimensions are given in millimetres.



VL RL
2" AG
socket 2 1/2" male
thread

Connection possible on both
sides



The following instructions must be observed during the hydraulic installation of the system:

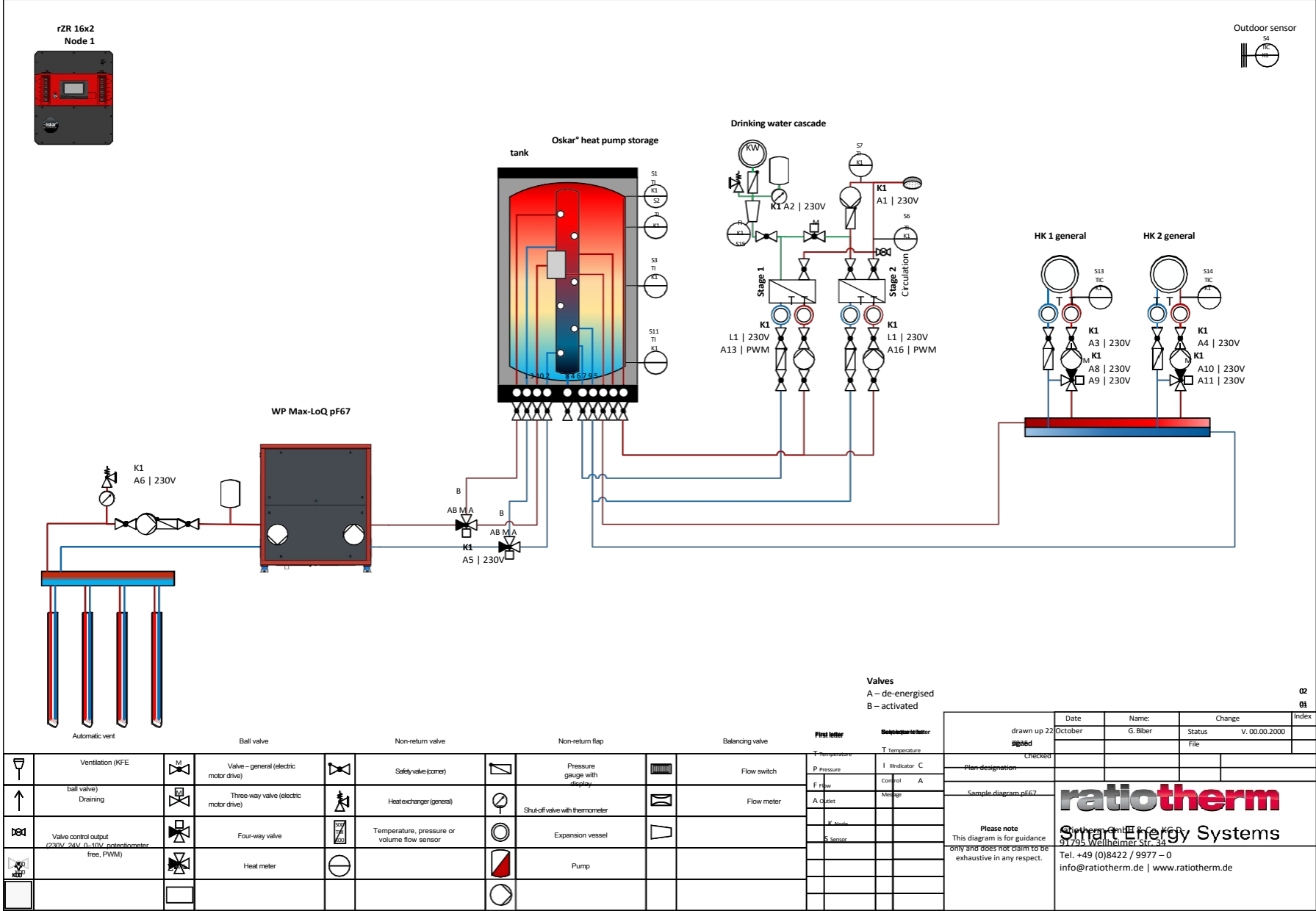
- For safety reasons, no quick-release vent, microbubble separator, safety valve or similar device must be installed between the heat pump and the storage tank. The safety devices are integrated into the heat pump.
- All pipe connections located outdoors must be coated with Fermit or a similar product to prevent leaks caused by condensation.
- If the hydraulic supply pipe is not laid underground or the distance to the building entry point is less than 3 m, acoustic decoupling within the pipe is required. Recommendation: Eckstein TWS 50
- Shut-off valves and venting points (at high points) must be provided by the client.
- A drain must be fitted at the lowest point of the pipe between the outdoor unit and the storage tank. In the event of a prolonged power cut, the system can be drained and is thus protected against frost damage.
- A sludge separator and a magnetite separator must also be provided on site.
- The unit must be filled via the return pipe.
- The condenser/drain pump is integrated into the unit.
- When tightening, please hold the connections in place!

The following dimensions must be used:

Heat pump $\longleftrightarrow$ storage tank	DN40	DN50	DN60
Refrigeration circuits in series	6 m	30 m	-
Refrigeration circuits in parallel	-	8 m	20 m
Source $\longleftrightarrow$ Heat pump		DN60	DN70
		10 m	30 m

- Simple pipe length with a maximum of 4 $\times$ 90° bends
- Available pressure drop over the entire length: 10,000 Pa
- Assumed pipe roughness: 0.0070 mm

5.3.2 HYDRAULIC DIAGRAM



5.3.3 REQUIREMENTS FOR SYSTEM WATER

Parameter	Unit	Concentration	Copper-
pH value	/	< 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^+) ₄	mg/L	< 2	+
		2–20	°
		> 20	-
Alkalinity (HCO_3^-)	mg/L	< 60	+
		60–300	+
		> 300	°
Sulphate (SO_4^{2-}) ₄	mg/L	< 100	+
		100–300	°/-
		> 300	-
$\text{HCO}_3^- / \text{SO}_4^{2-}$ _{3 4}	mg/L	> 1.5	+
Nitrates (NO_3^-) ₃	mg/L	< 1.5	°/-
		< 100	+
Hydrogen sulphide (H_2S) ₂	mg/L	> 100	°
		< 0.05	+
Free carbon dioxide (CO_2)	mg/L	> 0.05	°/-
		< 5	+
		5–20	°
Manganese	mg/L	> 20	-
		< 0.1	+
Iron (Fe)	mg/L	> 0.1	°
		< 0.2	+
Aluminium	mg/L	> 0.2	°
		< 0.2	+

NOTE

- The system water must contain no more than 50% glycol.
- Ensure that the system 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.

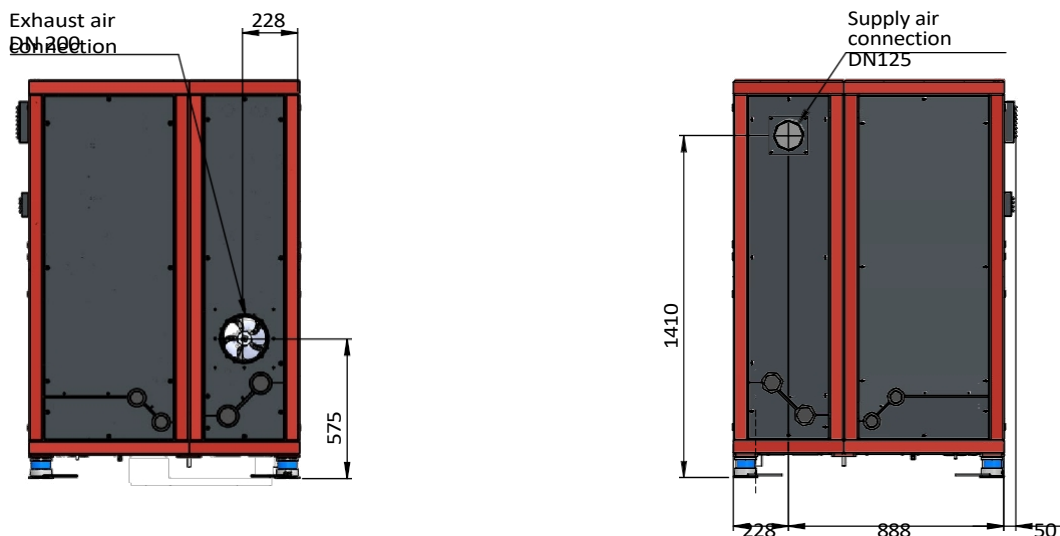
5.3.4 REQUIREMENTS FOR GROUNDWATER

Parameter	Unit	Concentration	Copper-brazed	Stainless steel	Screwed
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 ($(\text{NH}_3, \text{NH}_4^+)$) ₄	mg/L	< 2	+	+	+
		2–20	°	+	+
		> 20	-	+	+
Alkalinity (HCO_3^-)	mg/L	< 60	+	+	+
		60–300	°	+	+
		> 300	+	+	+
Sulphate (SO_4^{2-}) ₄	mg/L	< 100	°/-	+	+
		100–300	-	+	+
		> 300	+	+	+
$\text{HCO}_3^- / \text{SO}_4^{2-}$	mg/L	> 1.5	+	+	+
		< 1.5	°/-	+	+
Nitrates (NO_3^-)	mg/L	< 100	+	+	+
		> 100	°	+	+
Hydrogen sulphide (H_2S)	mg/L	< 0.05	+	+	+
		> 0.05	°/-	+	+
free carbon dioxide (CO_2) ₂	mg/L	< 5	+	+	+
		5–20	°	+	+
		> 20	-	+	+
Manganese	mg/L	< 0.1	+	+	+
		> 0.1	°	+	+
Iron (Fe)	mg/L	< 0.2	+	+	+
		> 0.2	°	+	+
Aluminium	mg/L	< 0.2	+	+	+
		> 0.2	°	+	+

Depending on the water quality of the well, the use of a safety heat exchanger is recommended. Based on the water quality found, the table can be used to determine whether a safety heat exchanger should be used and, if so, which type. If the properties are not optimal (°) for more than two criteria, or if a criterion does not meet the minimum requirement (-), the use of that particular type should be avoided.

5.4 INSTALLATION OF VENT PIPES AND EXHAUST PIPES

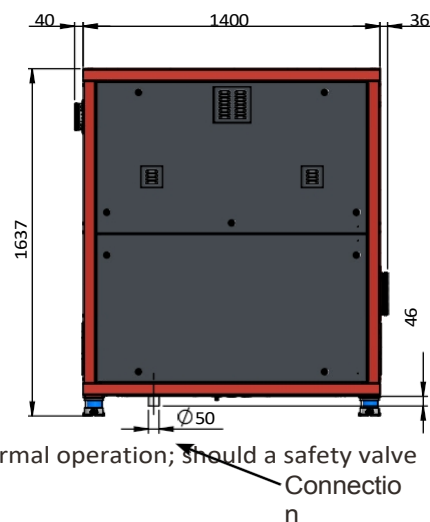
Exhaust and supply air ducts:



- The supply and extract air ductwork must not be too long:
 - Supply air: maximum length is 6 metres with 3 x 90° bends for DN125
 - Exhaust air: maximum length is 6 metres with 3 x 90° bends for DN200
- At the outlet of the exhaust air duct, the air flow rate must comply with EN 378.
- Where there are several heat pumps, the fresh air and exhaust air ducts may be combined. For this purpose, each unit requires shut-off dampers in both ventilation ducts, which must be installed as close as possible to the heat pumps in the direction of flow. The shut-off dampers must be 100% gas-tight.
- The ventilation ducts must be made of a non-combustible and non-static material; the individual duct sections must be earthed using at least two connecting bolts. The earthing must be checked after installation.
- The ducts must be airtight; rubber seals may be required around duct joints.
- The operator is obliged to comply with the ventilation requirements throughout the entire service life.

Safety valve discharge pipe:

- The diameter of the relief pipe must be at least equal to the diameter of the safety valve's connection.
- Safety valves with the same set pressure may be connected to a single vent pipe. This unit comprises four safety valves, each with a set pressure of 2.5 bar, which are connected to a pipe with a diameter of 50 mm.
- The pressure drop across the vent pipe must not exceed 10 per cent of the valve's set pressure.
- The maximum length of the vent pipe is:
 - 10 m and 8 x 90° bends for DN32
 - 25 m and 15 x 90° bends for DN40
- The outlet of the vent pipe must be no more than 3 m above the valves.
- A drain must be fitted at the lowest point of the pipe. This is closed during normal operation; should a safety valve activate, the pipe can be drained.
- The pipe must be made of non-combustible and non-static materials.
- The operator is obliged to comply with the specifications for the safety valve blow-off pipe throughout its entire service life.



5.5 ELECTRICAL INSTALLATION



DANGER

- The power supply to the heater is sourced from the building's distribution board and must be protected by separate residual current circuit breakers:
 - each of the two refrigeration circuits must be protected by a Type B residual current device (RCD) with a tripping current of 300 mA, a 10 ms short-time delay and a suitably rated capacity. Recommendation: ABB F204B-40/0.3;
 - the control voltage must be protected by a Type A residual current circuit breaker (RCD) with a tripping current of 30 mA and an appropriately rated capacity. Recommendation: ABB F204A-40/0.03.
- The residual current circuit breakers must be labelled separately for the heater, e.g. as 'WP: Compressor 1'; 'WP: Control voltage'. Please ensure the correct assignment of phase and neutral conductors during cabling.
- Ensure that the rotating field is clockwise.
- The unit must be earthed.
- Use cable cross-sections appropriate to the heater's power rating.
- The electrical installation must comply with the applicable standards and generally accepted rules of good engineering practice.
- Never carry out work on the unit's hydraulic or mechanical systems whilst it is live.
- The same applies when filling the system or pressurising it subsequently.
- To completely isolate the unit from the mains supply, the RCDs in the control cabinet must be switched off.
- Maintenance work must only be carried out by an authorised person.
- Never short-circuit the heat pump's safety pressure relief valve.

5.5.1 ELECTRICAL CONNECTION SPECIFICATIONS

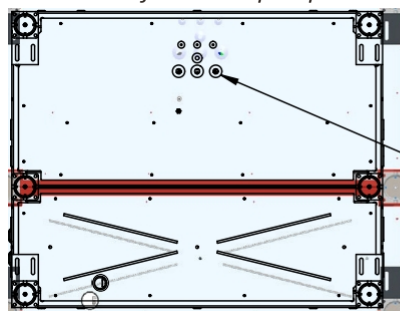
WARNING

- Have the installation and wiring carried out only by authorised specialist personnel.
- We reserve the right to make errors and changes to all specifications, images and drawings.
- The generally applicable and recognised rules of good engineering practice, as well as any local regulations, must be strictly observed!
- The values given apply to installation in conduits with a cable length of up to 100 m and should be regarded as recommendations!

WP Max-HiQ/LoQ pF67

Compressor 1	FI	Type B
	Fuse	B32 3-pole
	Cable cross-section	5G 6 mm ²
Compressor 2	FI	Type B
	Fuse	B32 3-pole
	Cable cross-section	5G 6 mm ²
Control voltage	RCD	Type A
	Fuse	B16 3-pole
	Cable cross-section	5G 2.5 mm ²

Underside of the heat pump



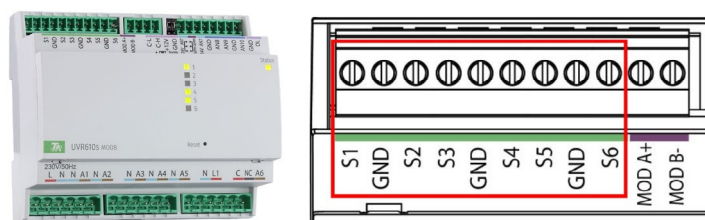
Cable entries: Electrical connection and data cables

5.5.2 TERMINAL DIAGRAM AND DESCRIPTION

X1.1					X1.2				
L1	L2	L3	N	PE	L1	L2	L3	N	PE
400 V mains supply, compressor 1 (B32, 5G6)					400 V mains supply, compressor 2 (B32, 5G6)				

X1.3							
L1	L1	L2	L3	N	N	PE	PE
400 V mains control voltage (B16, 5G2.5)							

Connect X3 and X4 directly to the UVR610S controller using terminal number K29:



X3									X4	
S1	GND	S2	S3	GND	S4	S5	GND	S6	MOD A+	MOD B-
Smart Grid 1 / Utility		Smart Grid 2		Requirement		0–10 V		Cooling	Connection for Modbus devices	

X5					
CAN-L	CAN-H	12 V	GND	CAN-L	CAN-H
CAN bus (CAN-IN)			CAN bus (CAN-OUT)		

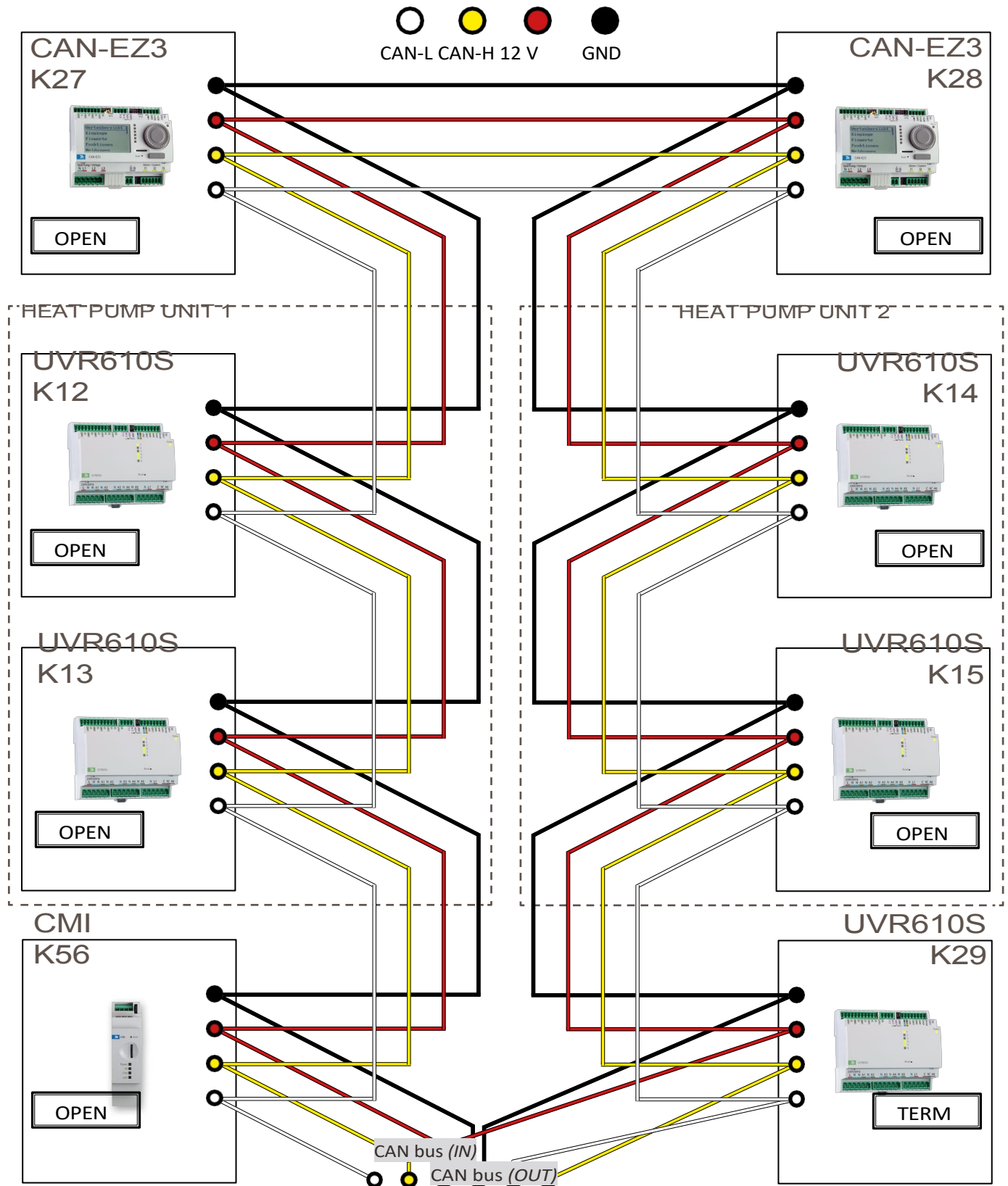
- Recommended fuses for the outdoor unit: 2 x 3-pole B32 and 1 x 3-pole B16,
- X3.1 and X3.4 are not required when using the rZR 16x2 from ratiotherm as the main controller! However, parallel use for Power-to-Heat is possible.
- X3.2 and X3.3 are used to process a signal from the network operator/energy supplier. X3.2 is backwards compatible with the EVU contact.
- Please wire the EVU contact as a normally open contact (closed when the EVU lock is active).

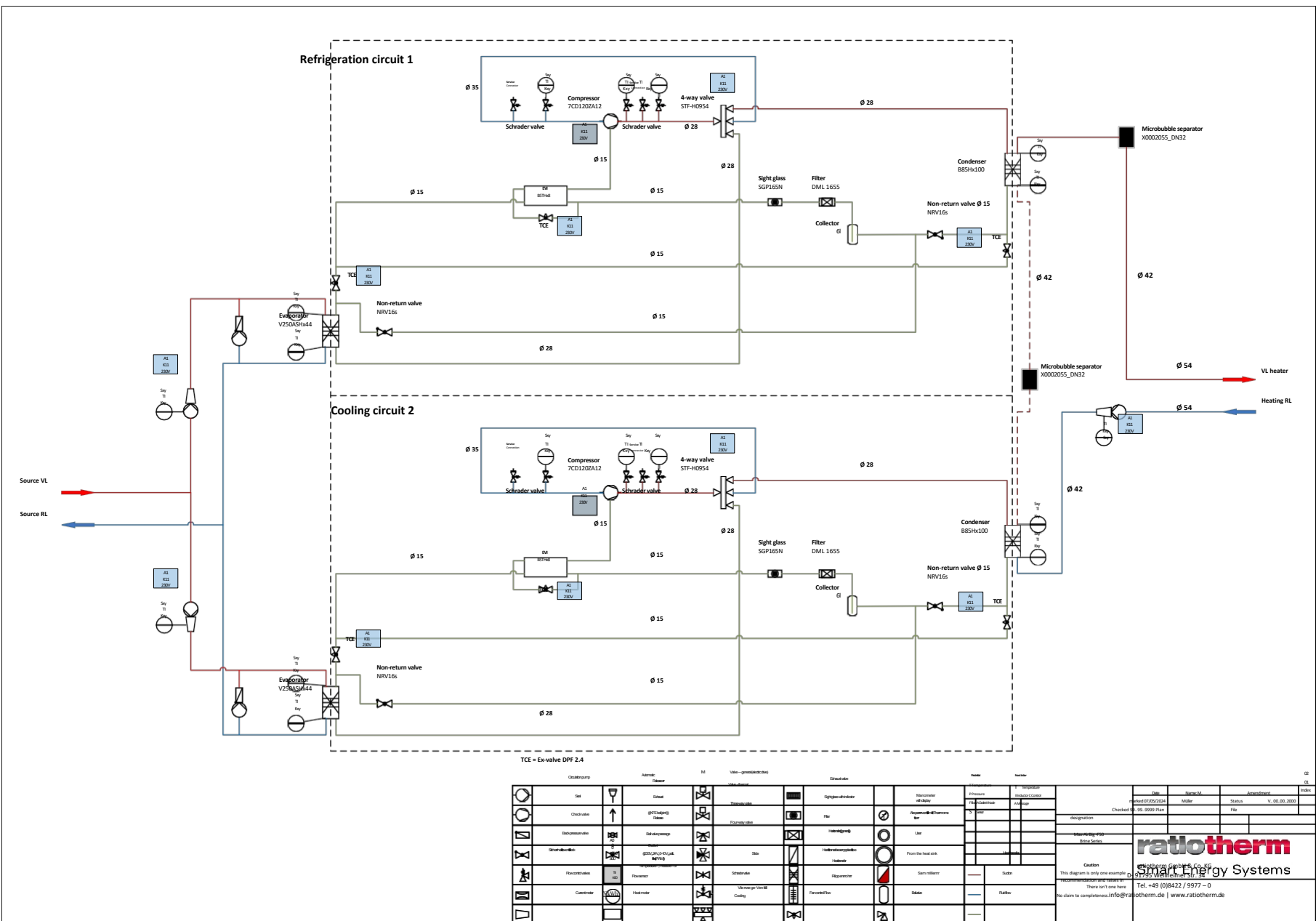
5.5.3 CAN BUS DIAGRAM

NOTE

- Ensure the CAN bus is wired correctly! Do not use a star-shaped network! Configure the network as a daisy chain.
- The total load of all devices must not exceed 6 watts.
- For the first and last CAN bus participants, the termination jumper must be set to TERM. Participants in between must be set to OPEN. One end is connected to the outdoor unit (K15), the other end to the rZR 16x2.

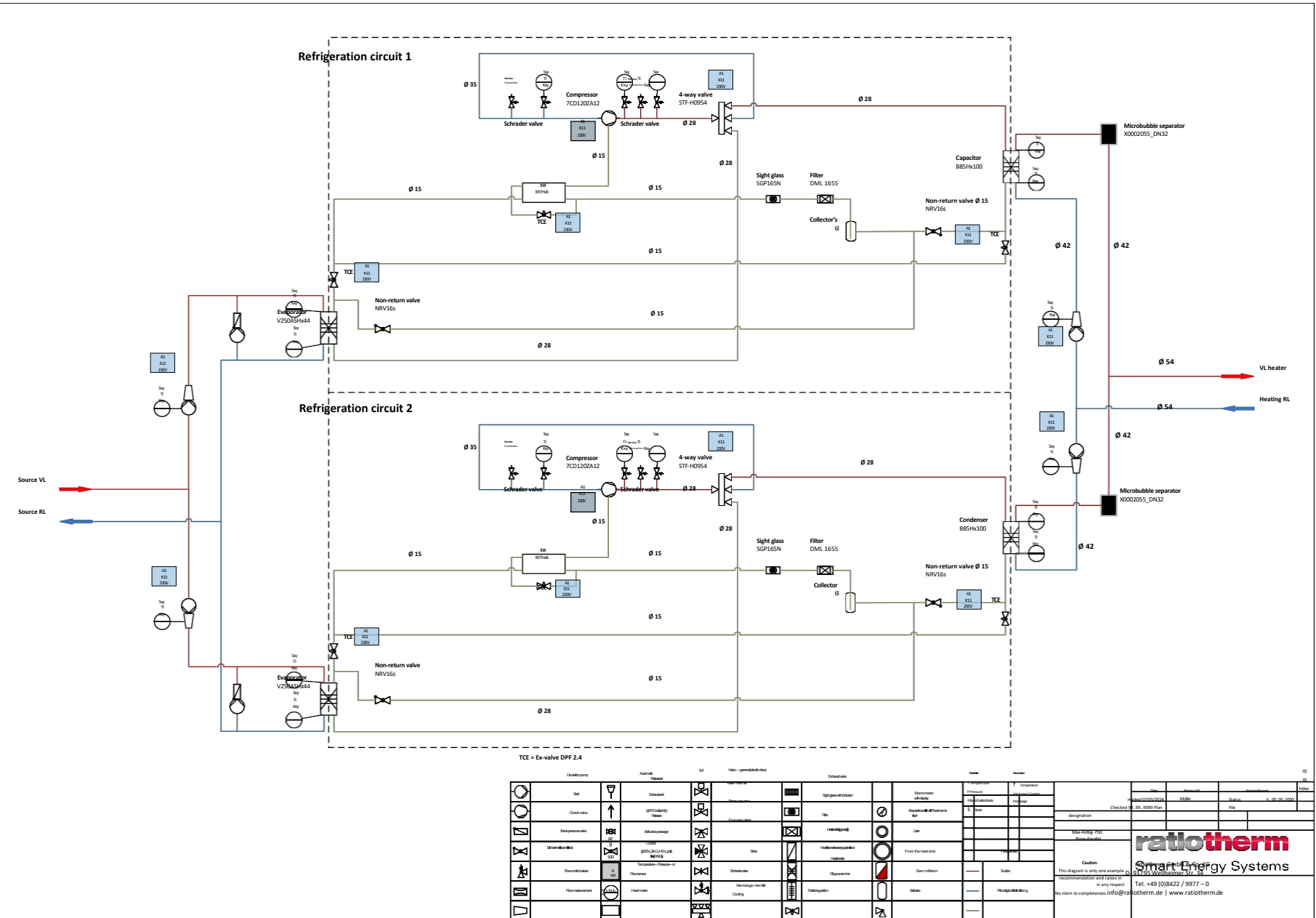
- If a ratiotherm central controller is not being used, the jumper on the C.M.I. must be set to TERM.
- Use a shielded, 4-core cable! Recommended cable: Unitronic Bus CAN FD P 2x2x0.5



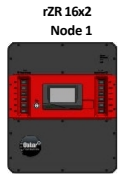


5.7 REFRIGERATION CIRCUITS

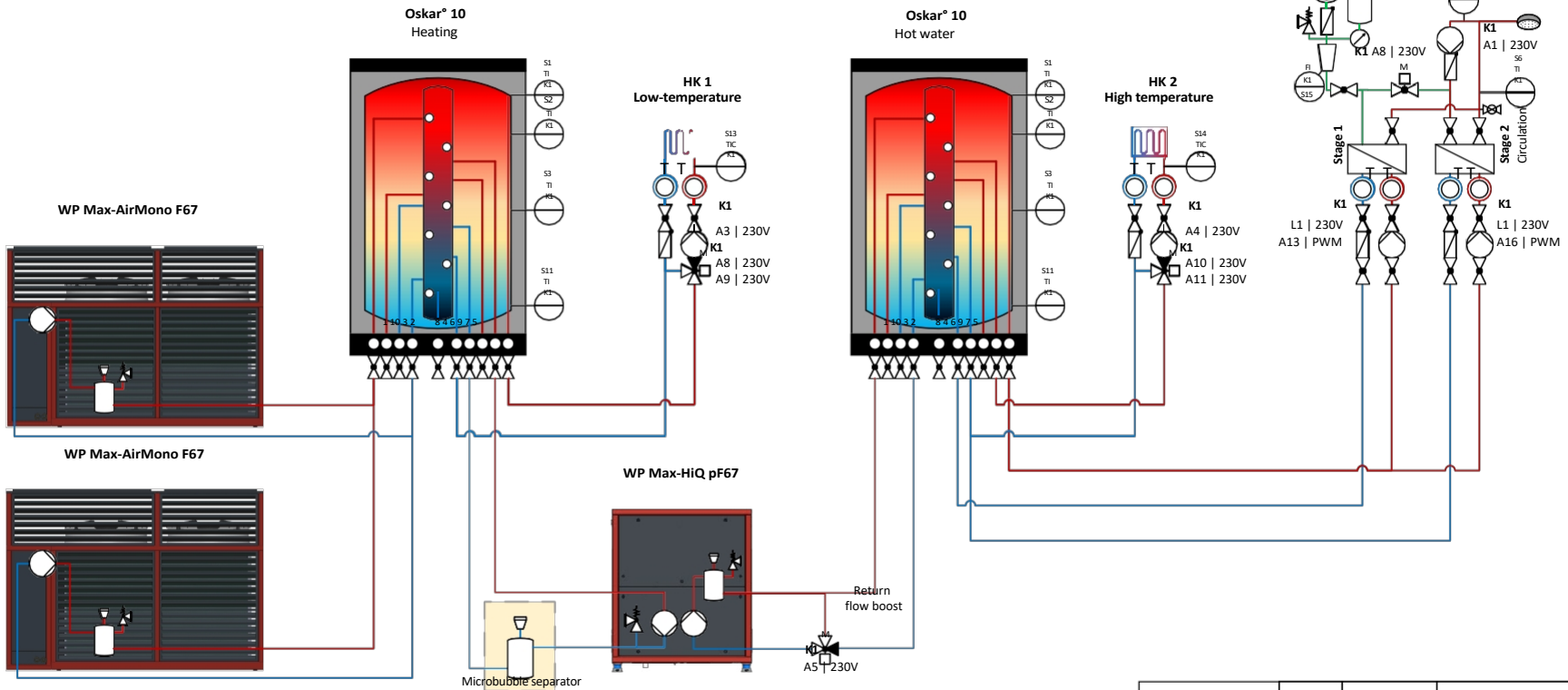
DIAGRAM: PARALLEL



5.8 USE AS A BOOSTER HEAT PUMP



When used as a booster heat pump, a microbubble separator must be installed on the source side by the client. The outlet of the separator must be integrated into the heat pump's safety venting system.



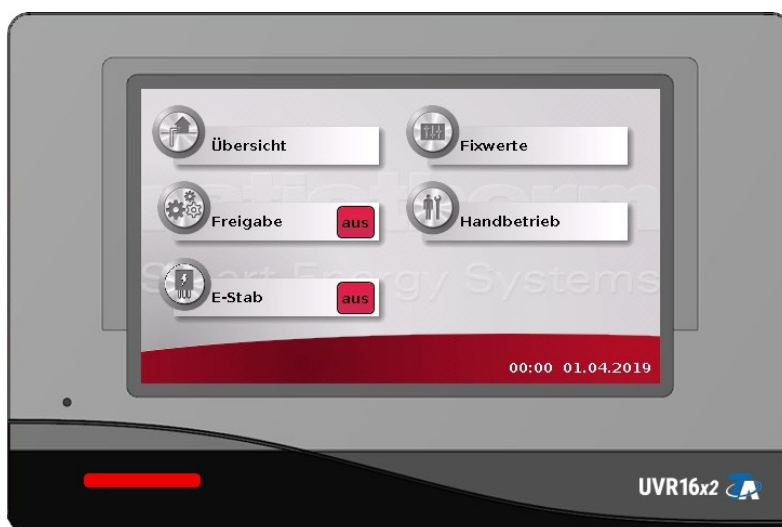
Automatic air vent		Ball valve		Non-return valve		Non-return flap		Balancing valve		First letter	Subsequent letter
	Ventilation (KFE)		Valve – general (electric motor drive)		Safety valve (corner)		Pressure gauge with display		Flow switch	T Temperature	T Temperature
	ball valve)		Three-way valve (electric motor drive)		Heat exchanger (general)		Shut-off valve with thermometer		Flow meter	P Pressure	I Indicator C
	Draining		Four-way valve		Temperature, pressure or volume flow sensor		Expansion vessel		Flow meter	F Flow	Control A
	Valve control, through-type		Heat meter		Pump					A Output	Message
	output (230V, 24V, 0–10V, pulse/motor, freq., PWM)									K Noise	
										E Error	

signed 17 June 2026	Date	Name: G. Sibir	Amendment
Checked	File	Status	V-00.00.2000
designation			
Example diagram: pF67 as a booster			
Caution This outline is merely a recommendation and does not claim to be exhaustive in any respect.			

Smart Energy Systems
91795 Wellheimer Str. 34
Tel. +49 (0)8422 / 9977 – 0
info@ratiotherm.de | www.ratiotherm.de

6. OPERATION

6.1 CONTROLLER OPERATION



- The heat pump can be operated via the ratiotherm central controller, via a web portal or via an optional 4.3" touch screen.
- Selecting one of the windows takes you to the corresponding sub-menu.

The indicator light can display various statuses:

- **Steady red light** – The controller is booting (= start-up routine after switching on, a reset or an update) or a message is displayed that has not yet been cleared.
- **Steady orange light** – Hardware initialisation following boot-up.
- **Steady green light** – Normal operation of the controller.
- **Green 'flashing'** – After hardware initialisation, the controller waits for approx. 30 seconds to receive all the information required for operation (sensor values, network inputs).

Controls:



Previous page

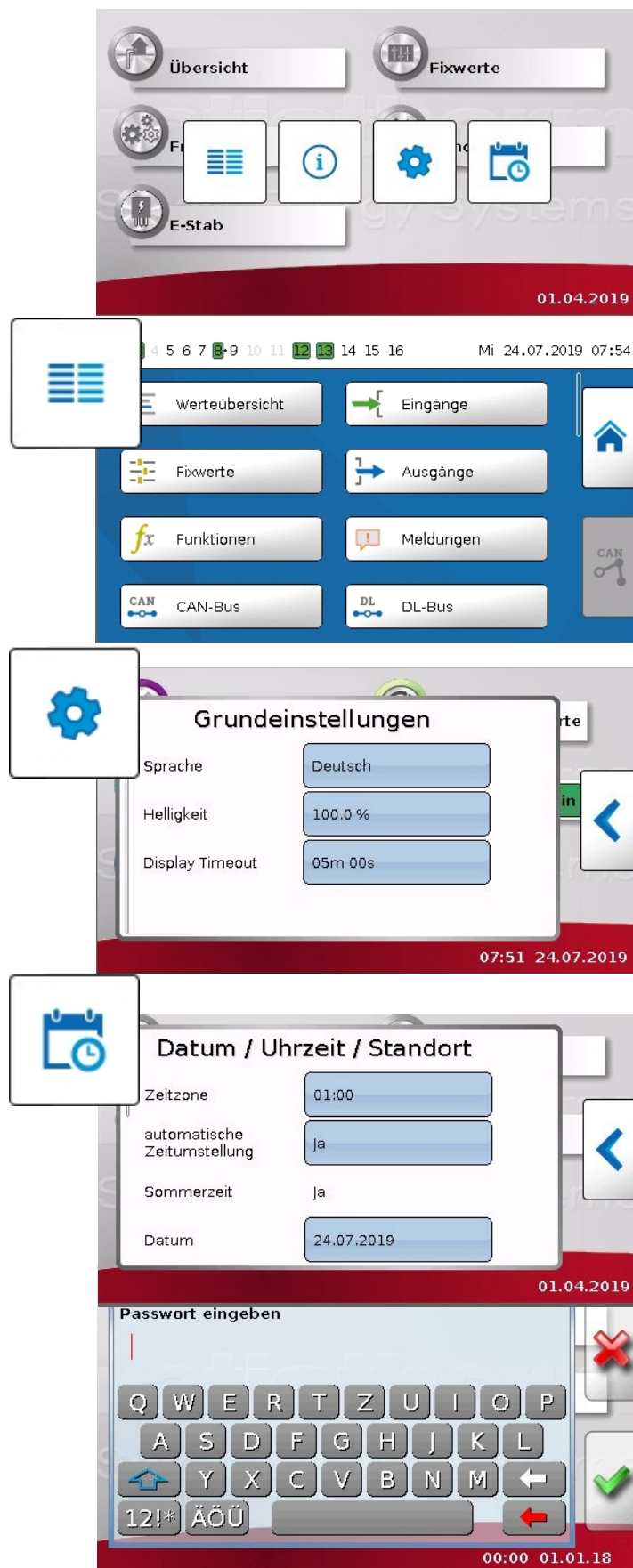


Main menu



Next page

6.2 BASIC SETTINGS



Sub-menu

By pressing and holding the display for 5 seconds, you will access the sub-menu, which allows you to adjust the basic settings or switch to the control menu.

Controller menu

Shortcut to the controller menu

Basic settings

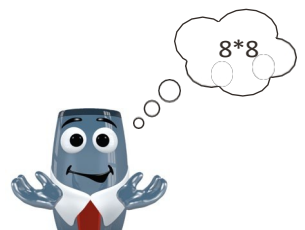
You can set the language, brightness and display timeout

Date/Time/Location

Allows you to set the time zone and date

Enter password

Enter the technician password to access the technician menu.



7. MAINTENANCE

Regular inspection of the appliance by a recognised, qualified and ratiotherm-authorized specialist is essential to ensure long-term operational readiness, 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 appliance can result in a serious risk of injury. Never attempt to carry out maintenance work and/or repairs on the appliance yourself.

For maintenance work, commission a recognised, qualified and ratiotherm GmbH & Co. KG-authorized specialist tradesman (qualified personnel).

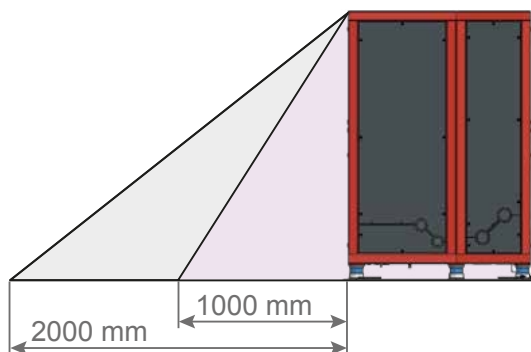
7.1 MAINTENANCE IN INDOOR AREAS

When carrying out maintenance, repairs or inspections on heat pumps using the refrigerant R290 indoors, temporary safety zones must be established around the open doors of the unit, as explosive atmospheres may form.

A distinction must be made between whether or not the refrigerant circuit is being accessed:

Work not involving the refrigerant circuit:

- A safety zone of 1 metre around the open doors of the heat pump
- Refrigeration engineers must have documented specialist knowledge of the work to be carried out
- Refrigeration engineers must not leave the work area whilst carrying out the work
- Check that there is no propane gas present using a suitable propane sensor
- The safety zone must be free from ignition sources. Electrical equipment must be disconnected from the mains.
- Ventilation of the heat pump within the housing must be operational.
- Ventilate the work area as effectively as possible.



Work involving intervention in the refrigerant circuit:

- A safety zone of 2 metres around the open doors of the heat pump
- Refrigeration engineers must have documented specialist knowledge of the work to be carried out
- Refrigeration engineers must not leave the work area whilst carrying out the work
- Check that there is no propane gas present using a suitable propane sensor
- The safety zone must be free from ignition sources. Electrical equipment must be disconnected from the mains.
- Ventilation of the heat pump within the housing must be operational.
- Ventilate the work area as effectively as possible.
- All persons working in or near potentially explosive areas must obtain written authorisation before commencing work.
- The safety zone must be continuously ventilated using a portable fan (marked 'Ex').
- Access to a Class C fire extinguisher must be provided.

7.2 TROUBLESHOOTING

Fault and error messages may occur whilst the heat pump is in operation. In many cases, the unit can clear a fault message automatically. Should fault messages occur, the system will lock and must be unlocked manually. This is done by pressing the reset button on the heat pump's display or in the unit's menu.

Fault messages may be reset once. Should the fault reoccur, please contact your specialist contractor or ratiotherm customer service.

7.2.1 HIGH PRESSURE

Error message	HD fault	HD fault
Fault description	The high-pressure protection on the refrigeration circuit has tripped.	
Heat pump behaviour	• System locked for 5 minutes • If 3 faults occur within 60 minutes, switch to high-pressure fault	• System lockout • Unlock by pressing the reset switch
Cause of fault	• Lack of heat dissipation • Blockage in the refrigeration circuit • Heat sink too hot	
Troubleshooting	• Check the heat sink temperature or setpoint temperatures • Temperatures below the maximum water temperature stated on the type plate • Check the heat transfer to the medium (pump, heat exchanger) • Bleed the system and check the heating pressure • Refrigeration inspection	

7.2.2 LOW PRESSURE

Error message	LP error	LP fault
Fault description	The low-pressure protection on the refrigeration circuit has tripped.	
Behaviour of the heat pump	• System locked out for 5 minutes • If 3 faults occur within 60 minutes, switch to high-pressure fault	• System lockout • Unlock by pressing the reset switch
Cause of fault	• Insufficient heat absorption • Insufficient refrigerant charge • Blockage in the refrigeration circuit	
Troubleshooting	• Check the sink temperature or setpoint temperatures • Temperatures below the maximum water temperature stated on the type plate • Check the heat absorption at the evaporator (flow rate, temperature) • Bleed the system and check the heating pressure • Refrigeration check	

7.2.3 INVERTER

Fault code Fault description	Inverter fault
	The inverter's fault contact is not closing.
Behaviour of the heat pump	• System lockout • Unlock by pressing the reset switch
Cause of fault	• No power supply • Other inverter fault
Troubleshooting	• Check the power supply (right-hand rotating field, phase failure) • Check the fault code (see appendix)

7.2.4 FAN (FOR AIR-COOLED OUTDOOR UNIT)

Fault message Fault description	Fan fault
	The fan fault contact is not closing.
Behaviour of the heat pump	• System lockout • Unlock by pressing the reset switch
Cause of fault	• No power supply • Fan impeller jammed • Other fan fault
Troubleshooting	• Check the power supply • Check that the fan impeller is free to rotate • Replacing the fan

7.2.5 HOT GAS

Fault message Fault description	Hot gas
	Compressor outlet temperature has been too high for 20 minutes
Behaviour of the heat pump	• System lockout
Cause of fault	• Unlock by pressing the reset switch • Compressor outlet temperature too high for 20 minutes
Troubleshooting	• Check sensor validity • Refrigeration system check

7.2.6 FROST PROTECTION

Error message Fault description	Frost protection fault	Frost protection fault
	The hydraulic circuit's frost protection limit has been triggered	
Heat pump behaviour	• System lockout for 10 minutes • If 3 faults occur within 60 minutes, switch to frost protection fault	• System lockout • Unlock by pressing the reset switch
Cause of fault	• Lack of heat absorption at the indoor unit • Heat source too cold	
Troubleshooting	• Check the heat source (temperatures, pumps, heat exchangers) • Bleed the system	

7.2.7 INCREASED GAS CONTENT

Fault message	Fault: increased gas content
Fault description	The gas sensor detects a refrigerant leak.
Heat pump behaviour	• System lockout • Switch to safety mode: start fan • Unlock by pressing the reset switch: may be pressed once; if the propane concentration remains too high, the system remains locked • In this case, the system may only be unlocked by a specialist company once the leak has been repaired
Cause of fault	• Propane sensor detects escaping refrigerant
Troubleshooting	• Leak detection using a suitable propane detector

7.2.8 PRESSURE CHECK

Fault message	Fault description	Pressure check Fault
		The pressure on the hydraulic side is too high or too low.
Behaviour of the heat pump		• System lockout • Unlock by pressing the reset switch
Cause of fault		• Damage to the condenser • Refrigerant is flowing into the load circuit • Safety valve on the sink side opens • Leak in the sink circuit; heating water leaks out
Troubleshooting		• Check the heating pressure • Check for leaks using a suitable propan detector • Replace the condenser • Replace the safety valve • Flushing the heating circuit

7.2.9 FLOW CHECK

Fault message	Fault description	Flow control fault
		Flow on the hydraulic side is too low.
Behaviour of the heat pump		• System lockout • Unlock by pressing the reset switch
Cause of fault		• Leak on the lowering side • Incorrectly switched or closed valves/components in the lowering circuit • Safety valve on the lowering side was open • Air in the hydraulic circuit
Troubleshooting		• Check the hydraulic circuit • Repair the leak • Replace the safety valve • Bleeding the hydraulic circuit

7.2.10 NEGATIVE PRESSURE

Fault message	Fault
description	Fault: Negative pressure Negative pressure in the housing is no longer present
Behaviour of the heat pump	• System lockout
Cause of fault	• Unlock by pressing the reset switch • The cabinet doors have been opened • Leak in the refrigeration circuit • Fan failure • The housing is no longer airtight
Troubleshooting	• Leak detection using a suitable propane detector • Test the fan for proper operation • Check the housing for leaks

7.3 CLEANING

7.3.1 CLEANING THE HEATING SIDE

- Cleaning: to be carried out by a plumber
- Flushing unit: Connect to the condenser's supply and return pipes
- Condenser: Flush against the normal direction of flow (take the gravity brake into account)

7.3.2 CLEANING THE HEAT PUMP

- The units can be cleaned using a standard household cleaner (see below for exceptions).
- Check the air inlets and outlets (regularly check the grilles on the intake and exhaust hoods for trapped leaves and other debris).
- Brush away any dirt. The fan should not be running whilst you are brushing, as the dirt could otherwise be sucked into the unit (if an external air unit is fitted).



NOTE

Improper cleaning

Using the wrong cleaning products can damage the unit's surfaces. Please note the following:

- Do not use abrasive cleaners or cleaning agents that could damage the plastic casing, fittings or controls.
- Do not use sprays, solvents or chlorine-based cleaning agents.
- 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 deposits

Limescale deposits can cause the safety valve to become stuck.

Operate the heating system's safety valve manually once a month.

7.4 HEAT PUMP LEAK TEST

In accordance with Regulation (EC) No 842/2006 on certain fluorinated greenhouse gases, the heat pump must be checked regularly for leaks. This check may be carried out by a recognised and qualified specialist tradesman (who has passed an examination as a refrigeration engineer or is a state-certified technician specialising in refrigeration technology). The following must be observed:

- DIN EN 378:2000 'Refrigerating systems and heat pumps – Safety and environmental requirements'
- VDMA Standard Sheet 24243 (August 2005) "Refrigeration Machinery and Systems – Leak-tightness of Refrigeration Systems and Heat Pumps – Leak Detection/Leak Testing"



NOTE

Leak test

The test must be carried out in accordance with the system logbook. The results of the test must be documented in accordance with the regulations and retained for at least 5 years. A system log is provided for this purpose in the 'System Logbook for Heat Pumps'.

7.5 SYMBOLS ON THE UNIT

To provide staff with important information and warnings, standardised safety symbols based on the standards DIN EN ISO 7010, DIN ISO 3864 and DIN ISO 7000 have been used.

These safety symbols are affixed in a position clearly visible to all, must be kept in a recognisable and legible condition, and must be replaced when necessary.

As the design of the equipment and the complexity of the production processes do not permit the use of people with disabilities (e.g. those with visual impairments) for safety reasons, the manufacturer has chosen not to include tactile symbols. The requirements for staff and the professional qualifications required to operate the equipment are set out in Chapter 2.3 'Target Groups'.

7.6 MAINTENANCE SCHEDULE

DANGER! Do not put the equipment into operation if any faults are found.

Maintenance work:	Measures	Interval
Operators and operators		
Visual and functional inspection	- Check the unit for any visible external defects and mechanical damage. - Carry out a visual inspection of the control elements. - Carry out a visual and functional inspection of all safety devices.	Monthly
Cleaning the unit	Follow the instructions in section 7.2 'Cleaning'.	As required
Qualified personnel		
Inspection of electrical components	- Check the electrical components for damage. - Carry out any necessary repairs.	annually
Inspection of hydraulic components	- Check the hydraulic components for damage. - Carry out any necessary repairs.	y
Inspection of refrigeration components	- Check the refrigeration components for damage. - Carry out any necessary repairs.	annually
Inspection of safety devices	- Carry out a visual and functional inspection of all safety devices. - Document these checks.	y
Inspection of symbols on the unit	- Check the symbols on the unit. - Replace the symbols if necessary.	annually
Inspection of third-party components	Follow the manufacturer's documentation for third-party components.	y
		annually
		annually
		annually

8. DECOMMISSIONING

When the heat pump is taken out of service, dismantling of the unit must only be carried out by qualified personnel. Hazardous substances and waste must be disposed of properly. When dismantling the heat pump, follow the instructions at the start of the original operating manual and the safety instructions listed below.



DANGER

Fatal electric shock

There is a risk of fatal electric shock from the electrical components.

Disconnect the unit from the mains before taking it out of service or dismantling it.

Secure the unit to prevent it from being switched on again.

8.1 TEMPORARY TAKING OUT OF SERVICE

This unit contains the flammable refrigerant R290 and must therefore not be taken out of service temporarily. The safety devices (such as the gas sensor, ventilation of the refrigeration compartment, pressure monitoring, etc.) must remain switched on at all times, even if the heat pump is not required, e.g. in summer. The heat pump must only be authorised to start up.



NOTE

Improper decommissioning

Improper deactivation of the unit may result in damage to components, impaired functionality and safety risks.

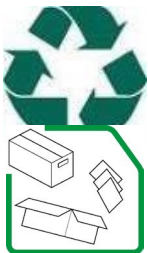
Do not disconnect the unit from the mains.

Please observe the following instructions:

- Frost may cause damage to the device.
- Water freezes at outdoor temperatures below 0 °C.
- Taking the unit out of service without draining the heating circuit is only permitted at temperatures above 0 °C.
- Refrigerant leaks cannot be detected when the unit is disconnected from the mains.

8.2 FINAL DECOMMISSIONING AND DISPOSAL

Only a specialist company may carry out the final decommissioning/disposal. Environmental requirements regarding the recovery, reuse and disposal of operating fluids and components in accordance with current standards must be observed. The refrigerant must first be extracted and the refrigeration circuit properly evacuated before the system is disconnected from the mains.



NOTE

Improper disposal

Improper disposal of the unit may result in environmental pollution and/or damage.

Dispose of electrical and electronic components, as well as the heat pump's refrigerant, correctly 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: info@ratiotherm.de
Telephone: +49 (0) 8422/9977-0
Website: www.ratiotherm.de

that the device:

Device designation: **WP Max-HiQ pF67 and WP Max-LoQ pF67**
Year of manufacture: see type plate
Intended use: The heat pump uses ambient heat to provide supplementary heating and domestic hot water supply.

In the version supplied, it complies with the directives

- Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the 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 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment

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

Harmonised standards applied:

- DIN EN 378-1-4
- DIN EN ISO 12100
- DIN EN 60204-1
- DIN EN 60335-1
- DIN EN 60335-2-40

- DIN EN 80079-36
- DIN EN 1127
- DIN EN 60079

Relevant EC Directives & Regulations

- Directive 2014/30/EU
- Directive 2014/35/EU
- Directive 2014/68/EU
- Directive 2009/125/EC
- Directive 2011/65/EU
- Directive 1999/92/EU
- Directive 2014/34/EU
- Directive 2006/42/EC
- Regulation 2024/573
- Regulation 2023/988

Technical documentation is available. Name and address of the person authorised to compile the technical documentation and to issue this declaration on behalf of the manufacturer or their authorised representative:

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 standard DIN EN ISO/IEC 17050-1 'Conformity assessment – Supplier's declaration of conformity – Part 1: General requirements' have been observed in issuing this declaration of conformity. Should any modification be made to the equipment without our prior agreement, this declaration shall cease to be valid. Any unauthorised modification of this nature shall exclude any liability on our part.

Dollnstein, on _____ Signature of authorised representative: _____

You can find us here



ratiotherm

Smart Energy Systems

ratiotherm GmbH & Co. KG
Wellheimer Straße 34
91795 Dollnstein

Direct contact:
T +49 (0) 8422 9977-0
info@ratiotherm.de www.ratiotherm.de

