



Installation manual

Air heater

Type QSE



EN - v3.1 / 12-2025

ORIGINAL INSTRUCTIONS

Contents

1. Introduction	3	6. Commissioning the air heater	18
1.1. Symbols used in this manual	3	6.1. Adjusting the settings	18
1.2. Warranty	3	6.2. Commissioning the air heater	18
1.3. Disclaimer	3		
2. Safety instructions	4	7. Troubleshooting	19
		7.1. Volatile lock outs	19
		7.2. Temporary errors	19
		7.3. Warnings	20
		7.4. Instructions	20
3. Technical specifications	6	8. Maintenance	21
3.1. Performance	6	8.1. Preparation	21
3.2. Dimensions	7	8.2. Basic maintenance	21
4. Installation	8	9. Electrical wiring diagram	22
4.1. Preparation	8		
4.2. Positioning the air heater	8	10. Exploded view, spare parts and accessories	24
4.3. Electrical connection	9	10.1. Exploded view and spare parts	24
4.4. Room thermostat	11	10.2. Table with accessories QSG	25
4.5. Heat pump	11		
4.6. Condensate drain	12	11. Disposal and recycling	26
4.7. Water connection	12		
5. Operating the air heater	17	12. Declaration of conformity	27
5.1. Minimum heating time	17		
5.2. Delta-T-regulation	17		
5.3. Summer ventilation	17		
5.4. Overheating protection	17		

1. Introduction

This manual is intended for the electrical and mechanical installer.

This document gives instructions on how to use and maintain the air heater. It is most important to follow the instructions in this document for safe operation of this air heater.

It is important to read this document before starting the installation process. Store this document close to the air heater for quick reference.

1.1. Symbols used in this manual

DANGER! Indicates a dangerous situation that would lead to death or severe injury.

WARNING! Indicates a potentially dangerous situation that could lead to death, severe injury or serious product damage.

CAUTION! Indicates a potentially dangerous situation that could lead to injury or product damage.

NOTICE Indicates important information that is not directly related to safety.

1.2. Warranty

NOTICE Using, installing or maintaining this air heater in any other way than described in this manual may cause damage that voids the warranty.

NOTICE Failing to follow the safety instructions in this manual can lead to damage to the air heater or the installation and void the warranty.

1.3. Disclaimer

All rights reserved. No part of this installation manual may be reproduced or published by means of print, photocopy, microfilm, or in any other way, without the prior written permission of Winterwarm B.V.. This also applies to any accompanying drawings, diagrams, and appendices. The information in this manual is based on the most recently available data. Winterwarm B.V. reserves the right to modify or improve parts at any time without prior notice to the customer. The contents of this installation manual may be changed without prior notice. This manual has been compiled with care. Nevertheless, Winterwarm B.V. accepts no liability for any errors or their consequences.

2. Safety instructions

Always follow the safety instructions in this chapter when installing, using or performing maintenance on this air heater.

2.1. Installation

CAUTION! This air heater must be installed and maintained by an authorized, qualified and competent installer, using calibrated equipment.

NOTICE This air heater must be installed and maintained in accordance with this manual, national and local building regulations and local health and safety regulations.

2.1.1. Protection against dust

CAUTION! Do not use the air heater in a very dusty environment. Dust may accumulate and cause a defect of the heater. This is also the case for the room thermostat.

CAUTION! The air heater can be used in a dusty environment if they are cleaned and maintained more frequently.

2.1.2. Temperature

CAUTION! Do not install the heater in places where the temperature can rise above 35°C. Higher temperatures cause the internal components to degrade much faster.

Use restrictions	
Operating pressure	max. 5 bar
Water temperature (risk of freezing!)	min. 4°C - max. 100°C
Environmental temperature (risk of freezing!)	min. 4°C - max. 35°C

WARNING! In case of freezing, the copper tubes of the heat exchanger might get damaged, causing the heat exchanger to leak. This is not covered by the warranty.

2.2. Use

CAUTION! Make sure the area around the air heater is dry when performing maintenance on the air heater.

CAUTION! Always close the doors and inspection hatches of the air heater, except when adjusting and checking the appliance.

CAUTION! Do NOT cover de heater when it is in use to prevent overheating!

2.3. Maintenance & Cleaning

Frequent maintenance and cleaning of the air heater is necessary to ensure safe and proper operation. Failure to do so could lead to damage to the heater or its surroundings and void the warranty.

2.3.1. Protection from water (IP class)

WARNING! Never use water when cleaning electrical parts.

This air heater is not waterproof and has an IP20B classification.

WARNING! Do not expose the air heater to rain, spray or dripping water.

2.4. Children and vulnerable users

WARNING! Children under the age of 3 should be kept away from the air heater unless they are under supervision.

WARNING! Children aged from 3 years and less than 8 years shall only switch on/off the appliance provided that it has been placed or installed in its intended normal operating position and they have

been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children aged from 3 years and less than 8 years shall not plug in, regulate and clean the appliance or perform user maintenance.

WARNING! This air heater can be used by children aged 8 years and above and by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, if they are supervised or instructed concerning use of the appliance in a safe way and understand the hazards involved.

CAUTION! Some parts of this product can become very hot and cause burns. Particular attention has to be given where children and vulnerable people are present.

WARNING! Children shall not play with the air heater.

3. Technical specifications

3.1. Performance

Technical specification	Unit	Type QSE									
		QSE6 + 10	QSE6 + 15	QSE12 + 15	QSE12 + 30	QSE16 + 5	QSE16 + 10	QSE16 + 15	QSE16 + 20	QSE16 + 30	QSE16 + 40
Total heating power QSE, including heat pump	kW	15.9	21	27	41.7	20.7	25.6	30.7	35.5	45.4	55.3
Total electric power QSE, excluding heat pump	kW	10.075	15.175	15.375	30.075	5.750	10.650	15.750	20.550	30.450	40.350
Maximum heating capacity heat pump*	kW	6	6	12	12	15.7	15.7	15.7	15.7	15.7	15.7
Minimum heating capacity heat pump*	kW	2.4	2.4	4.8	4.8	6.28	6.28	6.28	6.28	6.28	6.28
Maximum power booster	kW	9.9	15	15	29.7	5	9.9	15	19.8	29.7	39.6
Minimum power booster	kW	3.3	7.5	7.5	10	2.5	3.3	7.5	10	10	20
Cooling power **	kW	6.5	6.5	12	12	15.4	15.4	15.4	15.4	15.4	15.4
Air output at full load	m ³ /h	1800	1800	4500	4500	6700	6700	6700	6700	6700	6700
Air output at minimum load (booster off)	m ³ /h	324	324	810	810	1206	1206	1206	1206	1206	1206
Type heat pump	HPX	06A	06A	12A	12A	16A	16A	16A	16A	16A	16A
Electrical current heat pump per phase	A	11.0 (1ph.)	11.0 (1ph.)	11.5 (3ph.)	11.5 (3ph.)	12.5 (3ph.)	12.5 (3ph.)	12.5 (3ph.)	12.5 (3ph.)	12.5 (3ph.)	12.5 (3ph.)
Electrical power heat pump	kW	1.11	1.11	2.49	2.49	3.57	3.57	3.57	3.57	3.57	3.57
Throw horizontal (max.)	m	15	15	20	20	25	25	25	25	25	25
Voltage inner unit (50 Hz)	V	230 V or 400 V + N	400 V + N	400 V + N	230 V or 400 V + N	230 V or 400 V + N	400 V + N	400 V + N	400 V + N	400 V + N	400 V + N
Maximum electrical current inner unit per phase	A	15.8	23.2	23.3	44.6	14.1	17.5	24.9	31.9	46.2	60.6
Maximum electrical current inner unit one phase	A	44.5	-	-	-	24.9	46.2	-	-	-	-
Standby power	W	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Maximum fan power	W	175	175	375	375	750	750	750	750	750	750
Maximum fan current	A	1.5	1.5	1.6	1.6	3.2	3.2	3.2	3.2	3.2	3.2
Dimensions (W x H x D)	mm	716 x 495 x 663		884 x 670 x 795		1083 x 670 x 794					
Weight	kg	47	48	83	88	100					
Water connection	G"	3/4" M	3/4" M	1" M	1" M	1" M	1" M	1" M	1" M	1" M	1" M
Water contents	L	2	2	3.9	3.9	6.6	6.6	6.6	6.6	6.6	6.6
Sound level	dBA	35 - 54	35 - 54	35 - 63	35 - 63	35 - 62	35 - 62	35 - 62	35 - 62	35 - 62	35 - 62
Enclosure heat loss F _{env}	%	0	0	0	0	0	0	0	0	0	0
Emission efficiency (η _s , flow)	%	92.55	92.13	94.19	93.71	95.22	95.11	95.00	94.89	94.68	94.46
Seasonal Energy Efficiency of Space Heating η _{s,h}	%	37.0	36.9	37.7	37.5	38.1	38.0	38.0	38.0	37.9	37.8
Modulating EC fan		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* At supply temperature (35 - 30°C), room temperature 20°C.

** Supply temperature (12 - 17°C) 27°C ambient 50% RH.

3.2. Dimensions

The dimensions of this air heater can be found in figure 1.

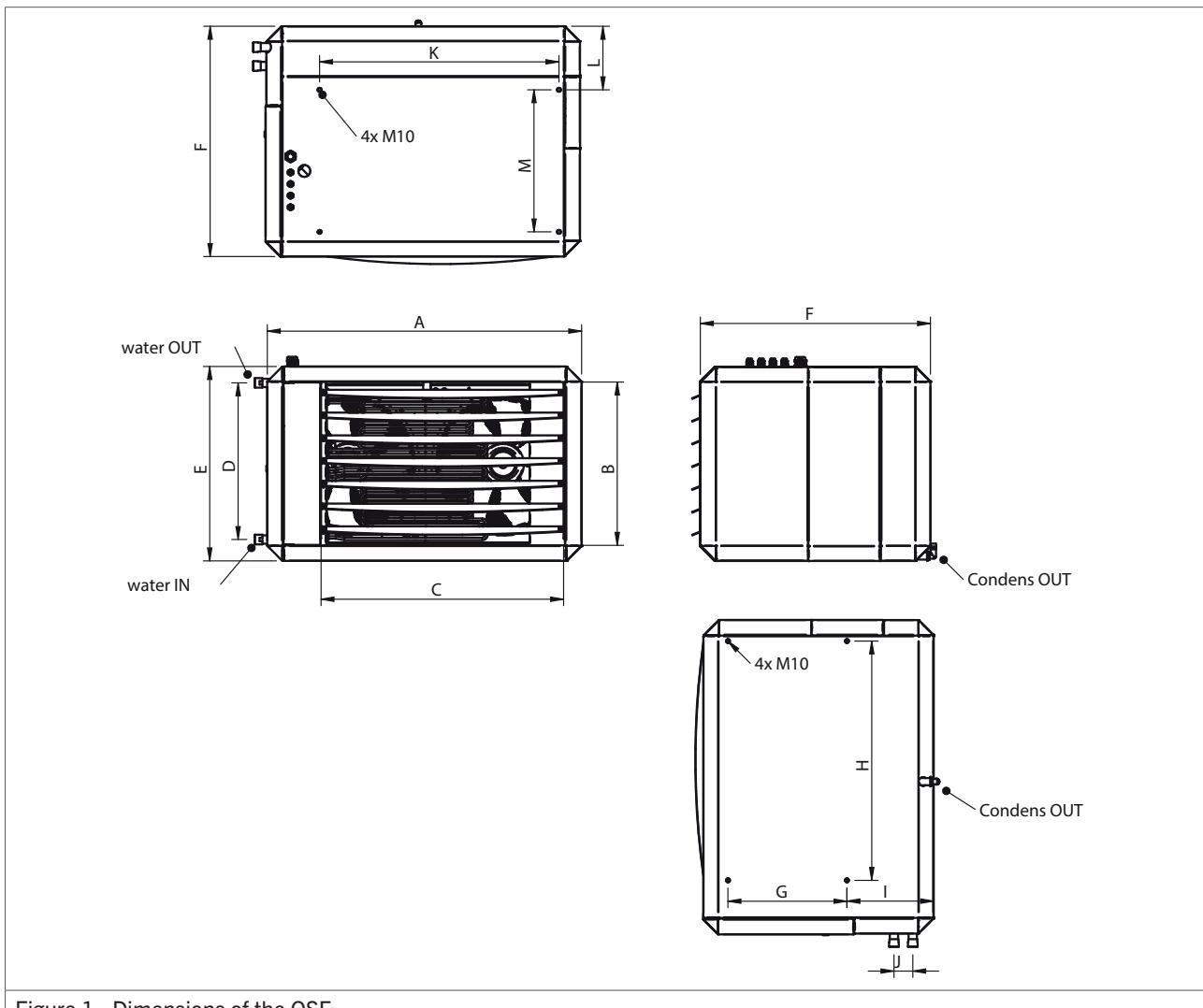


Figure 1 - Dimensions of the QSE

Dimension	Unit	QSE6	QSE12	QSE16
A	mm	716	884	1083
B	mm	422	563	563
C	mm	508	636	836
D	mm	405	540	540
E	mm	495	670	670
F	mm	663	795	794
G	mm	305	410	410
H	mm	465	625	825
I	mm	300	300	299
J	mm	65	65	65
K	mm	465	625	825
L	mm	302	219	219
M	mm	350	490	490
Water connection	G"	3/4" M	1" M	1" M
Condens OUT	G"	1/2	1/2	1/2

4. Installation

4.1. Preparation

Before installation, please use the data badge to check:

- if the heater is in accordance with the order;
- if the heater is suitable for the local present provisions such as the electrical supply.

Before leaving the factory, the air heater has been tested for safety and has been set to the operating settings. It has been configured for the voltage that is stated on the data badge. Should there be any doubt about the settings that apply to your situation, please contact your supplier.

4.1.1. Standards

NOTICE The installation must comply with all applicable local and national standards.

NOTICE The air heater must be installed in accordance with the relevant requirements of the Electrical installation regulations and or other local regulations that may apply.

4.2. Positioning the air heater

Keep the following requirements in mind when choosing a location to install your air heater:

WARNING! Never install an air heater close to flammable materials.

CAUTION! Always keep a minimum distance of 2000 mm between the flue of an air heater and a heat pump (see figure 3). The fumes of the air heater can be sucked in by the heat pump and damage the heat exchanger.

- Keep sufficient distance between the heater and any obstructions. This is both for safety reasons and to allow access for service and maintenance (figure 2).
- Make sure the air flow to and from the heater is free from obstacles at least 5 metres in front of the heater. Also make sure the air intake is free from obstacles.
- Make sure enough space remains to open the door of the air heater.
- Make sure the wall can support the air heater.

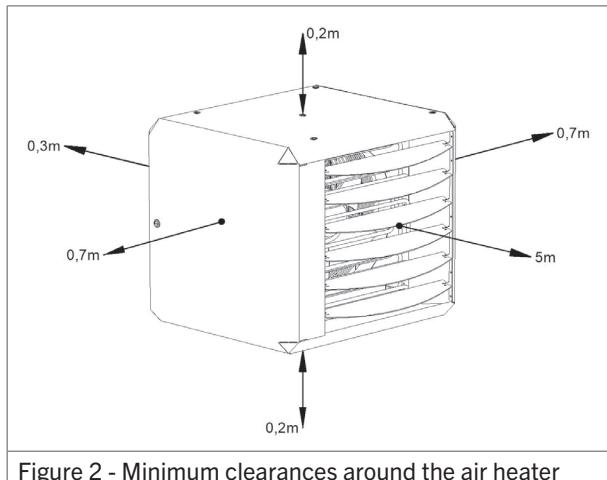


Figure 2 - Minimum clearances around the air heater

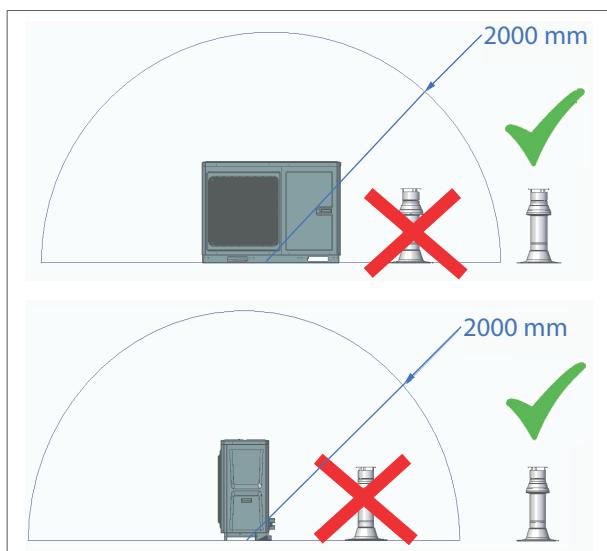


Figure 3 - Minimum distance between the flue of an air heater and a heat pump

4.2.1. Suspension

Depending on the model of your air heater, the following type of wall support can be used:

Model(s)	Wall support	Art. Nr.
QSE6	Wall support	GA8610
QSE12 - QSE16	Wall support	GA8580

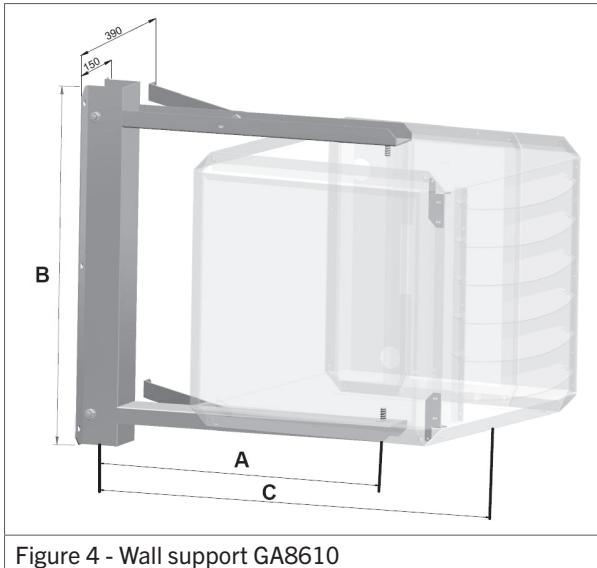


Figure 4 - Wall support GA8610

Model(s)	A	B	C
QSE6	550	640	915

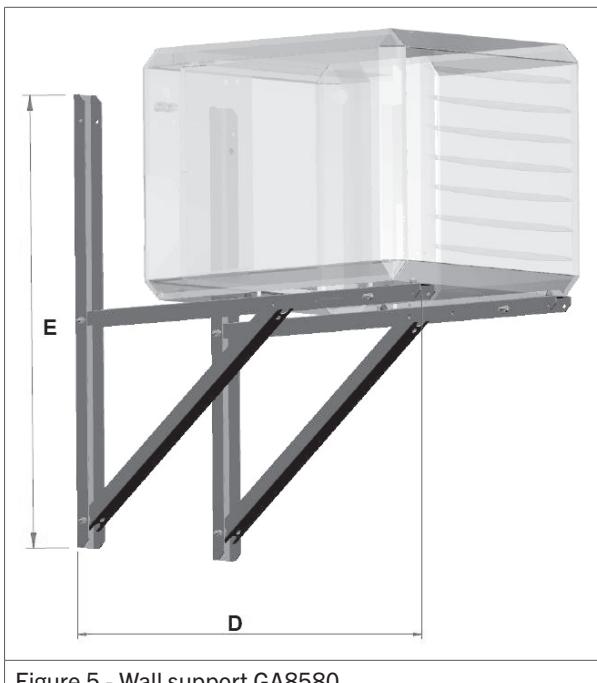


Figure 5 - Wall support GA8580

Model(s)	D	E
QSE12 - QSE16	1200	1200

The air heater is equipped with threaded M10 sockets to suspend the unit. For dimensions, see the table at figure 1.

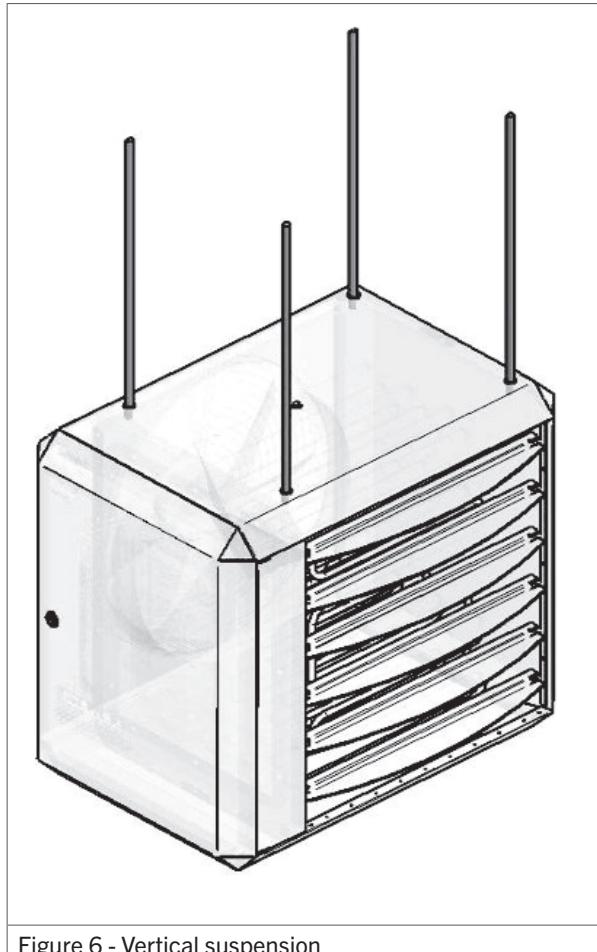


Figure 6 - Vertical suspension

NOTICE The water connections of the air heater must always remain horizontal due to venting of the internal pipes. Position the heater so that the return connection (cold water) is the lowest. Place the vent in the pipe close to the air heater.

4.3. Electrical connection

The electrical installation must comply with local and national requirements as well as IEE regulations.

4.3.1. Power supply

The air heater requires an earthed power supply of 400 V/AC **WITH NEUTRAL** (three phases).

A supply of 230 V/AC + Neutral (1 Phase) is **OPTIONAL** FOR THE QSE6+10, QSE16+5 and QSE16+10 ONLY.

For combining the three phases, two jumpers have been included, which can be inserted in the main connection terminal. Press the jumpers firmly into the terminals and use the middle connection (L2), to supply the power.

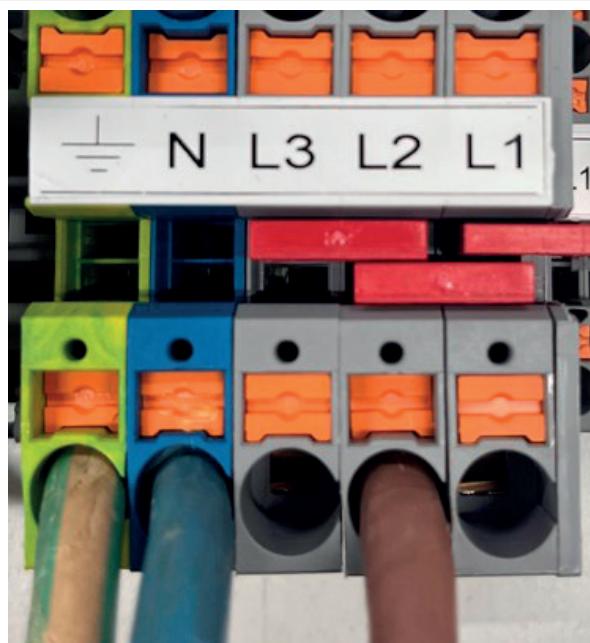


Figure 7 - EH5-10 jumper

A supply of 230 V/AC + Neutral (1 Phase) is OPTIONAL FOR THE QSE6+10, QSE16+5 and QSE16+10 ONLY.

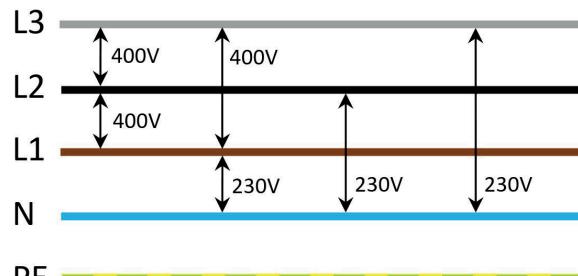


Figure 8 - The air heater's connection clamps

The connection clamps in the heater are suitable for the following wire diameters:

Appliance	Connector	Stranded and solid wire	Uninsulated and insulated ferrule
		See figure 9.	See figure 9.
EH5-30	PT10 Twin	0,5 mm ² ... 16 mm ²	0,5 mm ² ... 10 mm ²
EH40	PT16 Twin	0,5 mm ² ... 25 mm ²	0,5 mm ² ... 16 mm ²

	Stranded wire
	Solid wire

Figure 9 - Stranded and solid wire

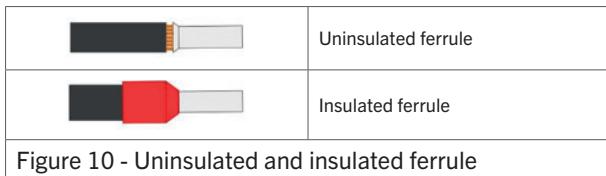


Figure 10 - Uninsulated and insulated ferrule

Note: The connection clamps are suitable for both uninsulated stranded wire (with or without ferrules) or solid wire.

WARNING! The minimum required wire cross section, strongly depends on the power of the heater, the type of cable used and the length. Only rely on proper wire calculations which align with local requirements, before installing the heater.

- The heater must be electrically isolated during servicing. For the installation, use an isolation switch in the fixed wiring with a minimum contact opening gap of 3 mm, a power plug or a non-switched fuse spur, to provide full disconnection of all poles of the supply under overvoltage category III. See the electrical wiring diagram in chapter 9.

4.4. Room thermostat

The heater can only be controlled with one of the following room thermostats:

- **The Smart Controller:** a Modbus thermostat with touch control, designed specifically for hybrid heaters. For details, refer to the **Smart Controller** manual.
- **A building management system (BMS):** with modbus communication. For details, refer to the **Modbus Controller** manual.

WARNING! Never use a room thermostat to interrupt the electric power supply to the heater.

NOTICE This air heater cannot be controlled with a simple ON/OFF thermostat.

4.4.1. Installation requirements

Following these requirements when placing the thermostat to ensure the heater functions correctly:

- Make sure that air can circulate around the thermostat.
- Make sure the sun does not shine directly upon the thermostat.
- Do not place the thermostat on a cold wall.
- Place the thermostat on an inner wall free from draught.
- Never place the thermostat within the throw of the heater.
- Never mount the thermostat near the aerials of

internal communication networks. These emit radiation that can disturb the thermostat. Keep several meters distance.

In all cases, the communication between the heater and the thermostat is based on a four wire, low-voltage connection. (see the electrical wiring diagram in §9). Follow these instructions to prevent malfunction of the installation and damage to the thermostat or air heater:

- Use a cable with the following specifications:
 - Signal cable.
 - Shielded.
 - Minimum dimensions: $4 \times \varnothing 0.34 \text{ mm}^2$.
 - Maximum length: 200 m.

CAUTION! Keep the thermostat cable separated from the mains cables.

CAUTION! Only connect the cable's earth shield to the earth terminal inside the air heater. Do not connect the other end of the cable's earth shield.

NOTICE A cable with a thickness of less than 0.34 mm^2 will result in a poor signal.

NOTICE A cable that is not shielded may result in a disturbed communication in an EMC-unfriendly environment.

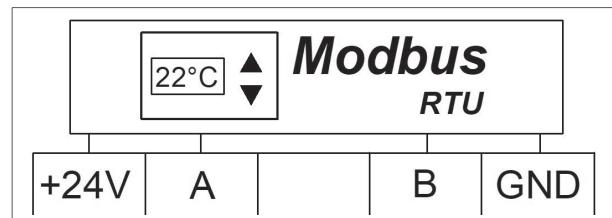


Figure 11 - Modbus connection

4.4.2. Installation of multiple appliances on one single Smart Controller or Building Management System

One single Smart Controller or Building Management System can control multiple hybrid heaters.

Consult the user manual of the Smart Controller for further information.

4.5. Heat pump

NOTICE Make sure that a heat pump is connected with the right power corresponding to the hybrid heater.

Use the same cable as specified for the thermostat in §4.4.1 for the connection between the heat pump and hybrid heater but only $2 \times \varnothing 0.34 \text{ mm}^2$.

CAUTION! Do not exchange the connection to the heat pump with the thermostat connection mentioned above. This will damage the heat pump!

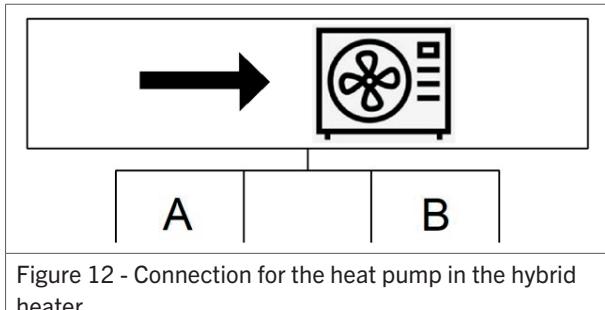


Figure 12 - Connection for the heat pump in the hybrid heater

The heat pump has a similar connection inside. The connections of the wires have to correspond for a proper communication.

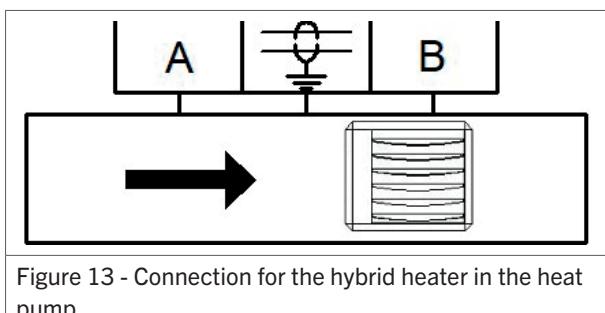


Figure 13 - Connection for the hybrid heater in the heat pump

4.6. Condensate drain

The condensate drain at the rear side is connected to a condensate collector below the heat exchanger. If the lower temperature of the heat exchanger is not set lower than 15°C, no condensate will be formed. With lower

temperatures the change of condensate increase and a drainage hose may be installed in these cases.

4.7. Water connection

The water connections for supply and return (both 3/4" for QSE6 and both 1" for QSE12 and QSE16) are marked with a blue and red label. Red indicates supply and blue indicates return. If return and supply are exchanged, the appliance will not deliver the desired capacity.

The air heater does not come with built-in venting for the water circuit. Separate vents should be installed in both the supply and return lines.

CAUTION! Avoid mechanical stress on the supply and return connections, as this can damage the heat exchanger and lead to leakage.

Use a wrench to support the connections while installing the fittings to avoid damage. Internal welds may become loose if too much force is applied!

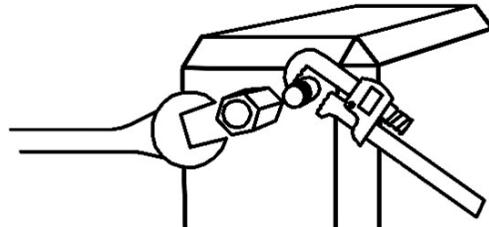


Figure 14 - Use a wrench to support the water connection during installation

Water piping installation diagram. For details, consult the manual of the heat pump.

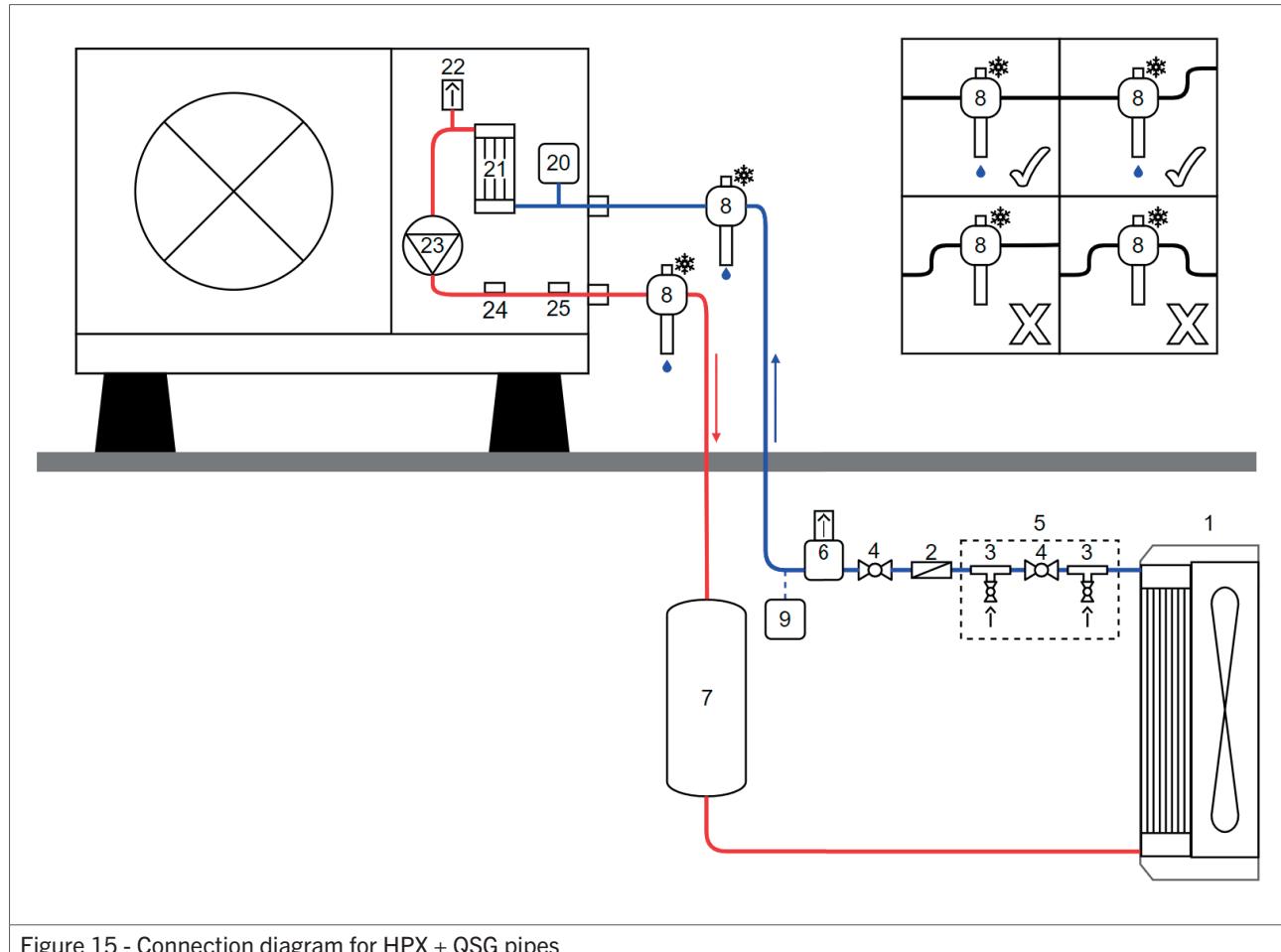


Figure 15 - Connection diagram for HPX + QSG pipes

Part number	Description
1	Indoor unit
2	Water filter
3	Filling point
4	Ball valve
5	Fill & Rinse combination
6	Air separator (flow-through air vent)
7	Buffer tank
8	Frost protection valves
9	Expansion tank
20	Expansion tank (in HPX)
21	Plate heat exchanger (in HPX)
22	Automatic air vent (in HPX)
23	Water pump (in HPX)
24	Water flow sensor (in HPX)
25	Pressure relief valve (in HPX)

4.7.1. Explanation of the components

5 **Filling accessory:** Installing this accessory eases flushing the system until all air is removed, which prevents trapping air into the system during the filling process. The filling accessory can be constructed with a main valve and two T-pieces with small valves.



Figure 16 - Filling accessory



Figure 17 - A main valve and two T-pieces with small valves



Figure 18 - Air vent

- 7 **Buffer tank:** Buffer tank is necessary in case of short piping, where the water volume of the system is less than the value in the table in XREF.
- 8 **Anti-Frost valve:** Place outside, with the opening AND outlet of the heat pump. Place these valves lower than the opening and outlet of the heat pump. The valve will open when the water temperature is below the set value. This low temperature will only be caused by a large electrical breakdown. If glycol or any other means is used to prevent freezing, frost valves do not need to be installed.
- 20 **Expansion tank:** The heat pump has a small internal expansion tank. If the water content of the system is too high, then an extra expansion tank will be needed. Expansion vessel is necessary when exceeding a certain length only. See the manual of the heat pump for details.
- 21 **Pressure meter:** To check if there is sufficient water pressure in the system, install a pressure gauge. (The pressure cannot be digitally read from the thermostat).
- 22 **Automatic venting:**

PAY ATTENTION! Air in the pipes is a common cause of disruption. Use an automatic vent that removes small air bubbles from the water. Simple cheap vents will usually not do the job. One quality vent should be enough, but optionally a vent in both the supply and return line are recommended.

25 **Expansion Valve:** The heat pump is provided with a pressure safety valve that opens when the water pressure becomes too high. For extra safety measures, install an extra expansion valve.

4.7.2. Expansion tank and water content

The heat pump has an internal expansion tank. The storage of this expansion tank is not very large, but generally sufficient to create a good installation. An extra expansion tank will not be needed. Read below when it is required to install an extra expansion tank.

Table for deciding whether an extra expansion tank is required:

Type	Built-in expansion tank	Maximum system storage without extra expansion tank	Maximum stretched-out 1" pipe length	Maximum stretched-out 1.5" pipe length
HPX06A	2 litres	35 litres	70 metres	-
HPX12A - HPX16A	3 litres	55 litres	100 metres	-
HPX30A	10 litres	205 litres	-	180 metres

Minimum system capacity: for the pump to function properly and to ensure a reliable defrost cycle for the outdoor unit in winter, the MINIMUM system capacity specified below must be maintained. These values do NOT include the capacity of the built-in expansion vessel. They refer to the capacity of all pipes, the delivery system and any buffer tank.

Model	Minimum system capacity (L)
HPX06	20
HPX12	30
HPX16	40
HPX30	70

Maximum system storage: Do not take the contents of the heat pump and the distribution system in this calculation. This only refers to the piping and any additional fittings. If the system capacity is exceeded, an extra expansion tank must be installed.

Maximum stretched pipe length: The total length of the supply and return pipes combined. If the pipe diameter is larger than 1 inch (HPX06A- HPX16A) or 1.5 inch (HPX30A), the volume should be calculated and checked against the maximum system capacity. If the system capacity is exceeded, an additional expansion tank must be installed.

4.7.3. Pipe diameter

Do not use pipe diameters smaller than 1 inch (HPX06A- HPX16A) or 1.5 inch (HPX30A). The heat pump moves a large volume of water. If the pipe diameter is too small, it will create excessive flow resistance and cause malfunctions in the heat pump.

IMPORTANT! the dimensions of 1" and 1.5" are INNER DIAMETERS.

4.7.4. Filling pressure

The expansion tank in the unit has a pre-pressure of 1.5 bar. The system filling pressure should preferably be between 1.5 and 2 bar. The device has a hydraulic working range of 0.5-2.5 bar. If the pressure exceeds 2.5 bar, the safety mechanism will be triggered, and water will be discharged.

4.7.5. If the air heater is installed at a higher location than the heat pump

If the air heater is installed 12 metres higher than the heat pump, the pressure in the built-in expansion tank will be too low. The pressure will need to be increased in such cases. Please contact your distributor if this applies to your installation. It is possible that the installation may not be feasible.

4.7.6. Maximum resistance pipe system and delivery height of the internal water pump

The heat pump is equipped with an internal modulating water pump. The maximum flow required by this pump to function properly is:

Type	Minimum flow (m ³ /h)	Maximum resistance pipe system (mwk)
HPX06A	1.1	7.7
HPX12A	1.5	7.1
HPX16A	2.0	5.6
HPX30A	3.4	13.8

CAUTION! If the maximum flow is not achieved, the heat pump will not be at its full capacity and might malfunction.

4.7.7. Available external static pressure on the exhaust pipe

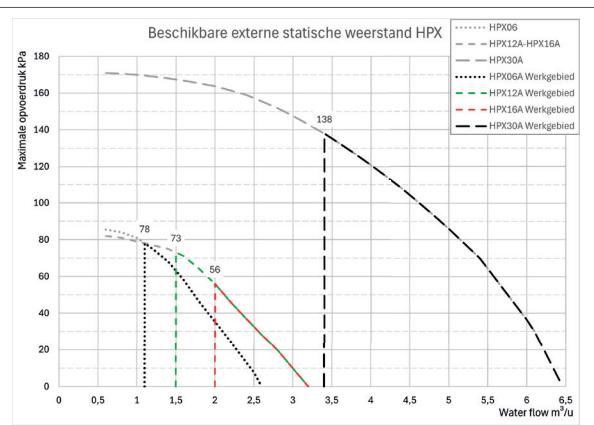


Figure 19 - Available external static resistance

Note: See the curve above for the maximum external static pressure. The water pump has a variable frequency. While operating the water pump will change the power based on the actual loading.

4.7.8. Requirements for water quality

To prevent issues in the water circuit, the water has to meet the quality criteria below.

Parameter	Parameter value	Unit
pH (25°C)	6.8 - 8.0	-
Turbidity	< 1	NTU
Chloride	< 50	mg/L
Fluoride	< 1	mg/L
Iron	< 3	mg/L
Sulfate	< 50	mg/L
SiO ₂	< 30%	mg/L
Hardness (CaCO ₃)	< 70	mg/L
Nitrate (telling N)	< 10	mg/L
Conductivity (25°C)	< 300	µs/cm
Ammonia (number N)	< 0.5	mg/L
Alkalinity (amount CaCO ₃)	< 50	mg/L
Sulfide	Under the range of detectability	mg/L
Oxygen	< 3	mg/L
Sodium	< 150	mg/L

Note: When the circulation water does not meet the criteria in the table, add a water softener.

4.7.9. Filling procedure

NOTE Before commissioning, the dust cap on the automatic air vent must be loosened by two turns. However, in the event of leakage, it must be tightened.

PAY ATTENTION! This is an automatic air vent, not a pressure relief valve!



Figure 20 - Cap automatic air vent

Open all air vents and start filling the system with water or water mixed with antifreeze.

Use a filling accessory as in figure 16 and 17. Open both the supply and return valve and close the middle valve. Keep supplying water until no more air comes out of the return valve to make sure the system is air-free. Then close both the supply and return valve and open the intermediate valve.

5. Operating the air heater

5.1. Minimum heating time

The electric part of the hybrid air heater will always run for at least 10 seconds, even if the heat demand stops. This is to prevent frequent starts and stops. The hybrid heater will always continue ventilating for 3 minutes after the electric part turns off again.

5.2. Delta-T-regulation

The air heater can function as a de-stratification fan. This is called delta-T regulation and it is done via the Smart Controller, with a temperate measurement sensor that is located on the air heater.

The system fan is activated when the temperature-difference between the sensor on the heater (the delta-T NTC sensor) and the sensor in the Smart Controller is bigger than 8 °C (standard factory setting). This procedure ensures an even distribution of temperature throughout the building, thus acting as a fully automatic de-stratification fan.

5.2.1. Switch off delta-T-regulation

Delta-T regulation can be switched off when it is not desired (e.g. when it causes discomfort). This can be done in the **Settings** menu on the Smart Controller. See the user manual of the Smart Controller for more information.

5.3. Summer ventilation

The fan can be set to run in the summer. Follow the instructions in the user manual of the Smart Controller or set the ventilation via the building management system.

5.4. Overheating protection

The air heater's heat exchanger is protected from excessive temperatures.

5.4.1. Heat exchanger

An NTC sensor is located near (or on) the heat exchanger. This sensor monitors the heat exchanger temperature.

If the heat exchanger becomes too hot, this sensor will cause the heating process to stop. Depending on the temperature, the air heater performs the following actions:

- Step 1: Power reduction (when possible).
- Step 2: The heat emission stops, followed by an automatic restart when cooled down (thermostat display).
- Step 3: The heat emission stops, followed by a Lock Out. A manual reset is required. (thermostat display).

NOTICE A manual reset can be done on the electronic circuit board or remotely with the special room thermostat.

6. Commissioning the air heater

6.1. Adjusting the settings

Prior to packaging, the safety and functioning of each air heater is checked in detail. It is also set to the right combustion efficiency.

In general, the heater does not need to be adjusted after installation. It is only necessary to perform a functional check.

6.2. Commissioning the air heater

Once the unit is installed according to this manual, the unit can be commissioned. To do so, follow these instructions:

1. Switch on the electric supply with the maintenance switch.

You are now able to observe the first start-up and become familiar with the functioning of the heater.

1. Instruct the end user of the about a safe use of the air heater:
 - The location of the maintenance switch
2. Instruct the end user about the operation of the heater:
 - Lock-out indication
 - Reset
3. Instruct end user about the necessary maintenance.
4. Leave this manual with the end user.

6.2.1. First use – modbus

To commission the air heater via the Smart Controller or the Building Management System, do the following:

- Create a heat-request. The hybrid air heater will activate the heat pump first. After the heat pump has started, the water will start to circulate and the fan of the hybrid heater will start.
- When the heat request remains active, and the difference between the set temperature and the actual temperature is large enough, the electrical booster will start after a while too. The booster remains activated for the minimal firing time (see §5.1 for more information).

7. Troubleshooting

If the air heater malfunctions, first check if the problem is caused by external circumstances (e.g. no supply power). If the problem is not caused by external circumstances, use the tables and instructions in this chapter to fix the air heater.

NOTICE Please remember the built in waiting times of the air heater. Do not react too soon.

The error codes below, refer to the booster of the hybrid air heater. The error codes of the connected heat pump are visible in the Smart Controller too. Consult the manual of the heat pump for details.

7.1. Volatile lock outs

The table below describes the volatile lock outs that can occur. These can only be reset by hand.

NOTICE The reset button is located underneath the LED of the control board. This LED will light up green during normal function or in stand-by mode, red in case of an error.

Display	Error type	Description	Case #
L-0	Internal error	Internal error	13
L-1	Internal error	Relay in low position not activated	1
L-2 and 3	Internal error	Internal error	13
L-4	E-error	E-error for more than 24 hours	12
L-8 to 12	Internal error	Internal error	13
L-15	Overheating	Heat exchange sensor is overheated	3
L-17 to 19	Internal error	Internal error	13
L-25	Sensor error	Heat exchange sensor failure	4
L-27 to 31	Internal error	Internal error	13
L-32	Sensor error	Heat exchange sensor failure	4
L-33 to 38	Internal error	Internal error	13
L-43	Overheating	Heat exchange sensor is overheated too often	3

7.2. Temporary errors

The table below describes the temporary errors that can occur. These will disappear automatically after the cause has been resolved.

Display	Error type	Description	Case #
E-00 to 04	Internal error	Internal error	13
E-05	Overheating	Heat exchange sensor is overheated	3
E-06 to 13	Internal error	Internal error	13
E-14	Internal error	Incorrect closure of low power relay.	16
E-15 to 20	Internal error	Internal error	13
E-21 and 22	Heat exchanger sensor error	Heat exchanger sensor not detected	4
E-27 and 28	Heat exchanger sensor error	Heat exchanger sensor short-circuit	4
E-34	Reset button error	Too many reset actions in a short timespan	9
E-36	Overheating	Heat exchange sensor is overheated	3
E-38 and 39	Heat exchanger sensor error	Heat exchanger sensor not detected	4
E-47 and 48	Heat exchanger sensor error	Heat exchange sensor short-circuit	4
E-49 to 64	Internal error	Internal error	13
E-65	Voltage too low	Supply voltage is too low for over 1 minute	-
E-66	Voltage too high	Supply voltage is too high for over 1 minute	-
E-69	Configuration error	Heater configuration error	19
E-70	ADC error	Sensor value is measured incorrectly	13

7.3. Warnings

The table below describes the temporary warnings that can occur. The heater may still be working, or stops until the cause has been resolved.

Display	Error type	Description	Case #
A-00	Communication error	Communication error for more than 4 minutes	20
A-07	Overheating	Heat exchange sensor is almost overheated	3
A-02	Configuration error	Heater configuration error	19

7.4. Instructions

After identifying the problem, use the Case number to find the possible cause in this paragraph.

Case 1: Low-level relay does not close

- Check if the relay is closing.
- Check that plug J5 is fitted properly.
- Check if the wires on contacts 13 and 14 of the low-level relay are properly connected.

Case 3: Heat exchange sensor or flue sensor is overheated.

- Check if the connectors J12 and J6 are plugged in correctly and if the connection J12[1-4] (optional overheating protection) is closed.
- Check if the system fan supplies enough air.

Case 4: Heat exchange sensor or flue sensor not detected, or short circuit.

- The heat exchange sensor consists of two internal sensors. The readings of these sensors may differ too much:
 - Measure the resistance of each sensor. The resistance should be 20 KΩ at 25 °C and 25 KΩ at 20 °C.
 - If the measured values differ too much, replace the sensor.

Case 9: Too many reset actions in a short timespan.

- This error will disappear after some time or if the main power is disconnected for a while.

Case 12: E-error for more than 24 hours.

- Switch the air heater off and on and check the error code.

Case 13: Internal error.

- Isolate the electrical supply and reenergise. If this does not help:
 - Replace the burner control unit.

Case 16: Safety relay error.

1. Isolate the electrical supply.
2. Check if one of the relays got stuck when it was switched. If so:
 - Replace the relays.
3. Reenergise the appliance.
4. Check if any of the relays switches on at once (too soon). If so:
 - Replace the control board.

Case 19: Heater configuration error

- The heater does not know which program to run, due to a mismatch between the burner control unit and the display. If so:
 - Contact your supplier.

Case 20: Communication has been interrupted for more than 4 minutes.

- Check if the Smart Controller or Building Management System (BMS) is still operating.

8. Maintenance

CAUTION! The air heater must be inspected and cleaned once a year by a qualified installer with sufficient knowledge about the device.

CAUTION! Sufficient maintenance is critical in circumstances such as high humidity, dust, high switching on/off frequency, etc.

8.1. Preparation

Before performing maintenance on an air heater that is already installed, do the following:

1. Set the thermostat to the lowest setting.
2. Turn off the power supply to the air heater using the maintenance switch.

CAUTION! Do not use water when cleaning the air heater.

CAUTION! The heater must be electrically isolated during servicing.

8.2. Basic maintenance

To perform basic maintenance on the air heater, do the following:

CAUTION! When cleaning parts of the air heater, use a dry cloth, brush, compressed air or a vacuum cleaner. Never use a steel brush.

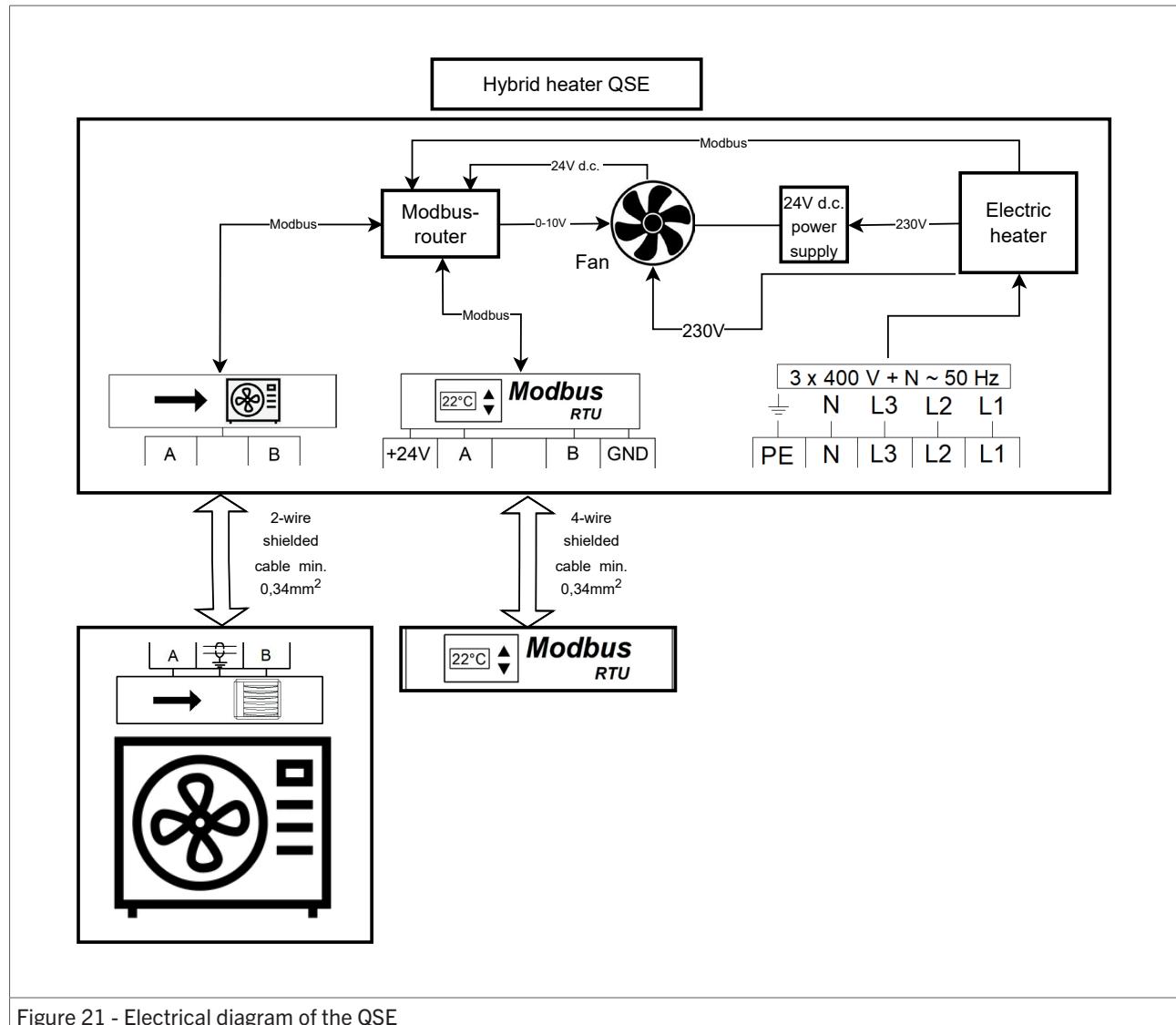
1. Inspect the heating elements.
2. Clean the fan guard on the outside of the heater. Clean the fan blades if required.
3. Open the access panel.
4. Clean the inside of the air heater. Focus on the following parts:
 - Body
 - Fan blades and motor
 - Heat exchanger
 - Temperature sensor
5. Check if the wiring, nuts and bolts are properly secured and tightened.

Some checks can only be performed when the heater is running. Do the following:

1. Reconnect the air heater to the power supply.
2. Switch on the air heater.
3. Check if the heater operates without problems. See §7 if any errors occur.

9. Electrical wiring diagram

A complete electrical wiring diagram is shown in figure 22.



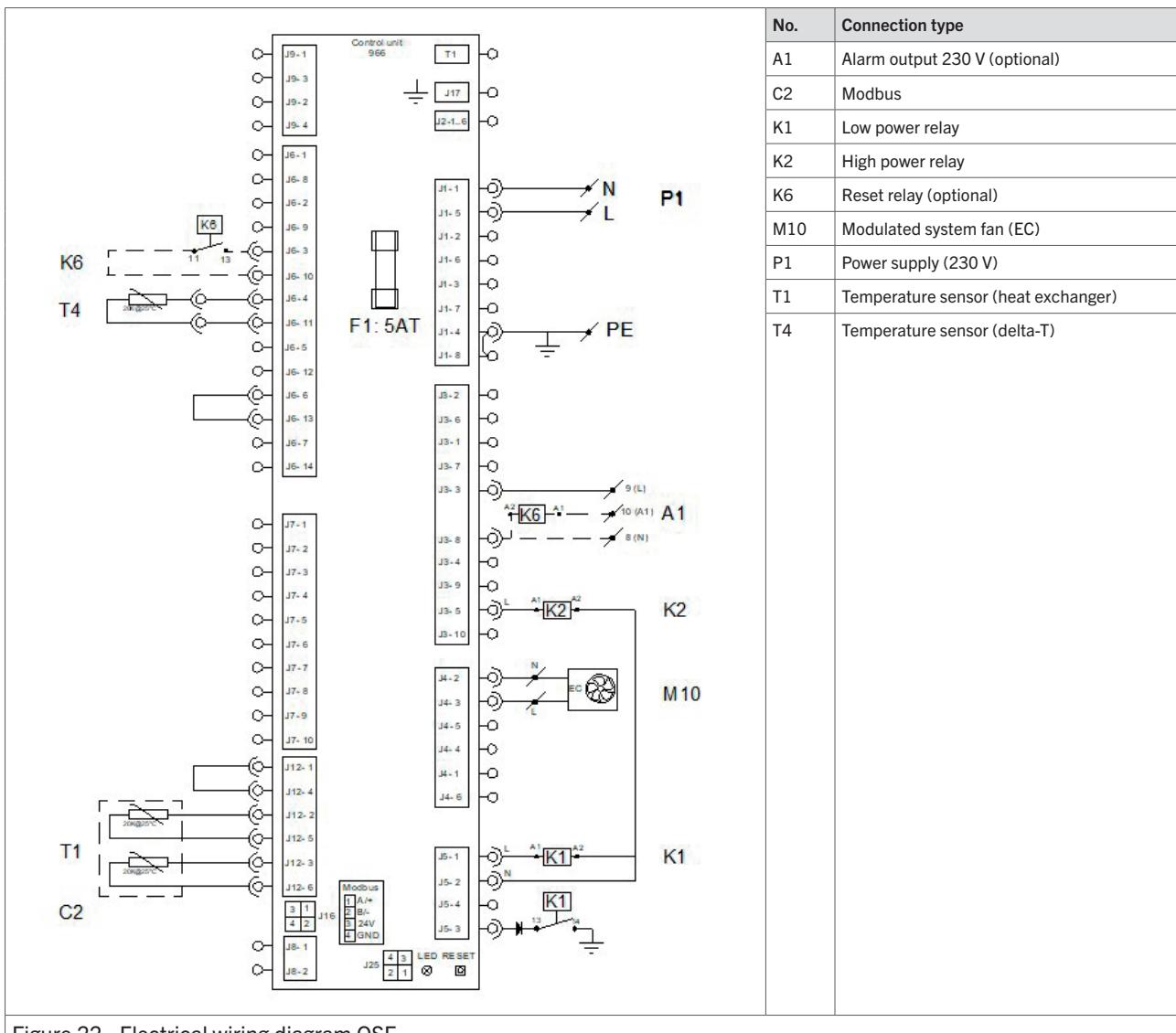


Figure 22 - Electrical wiring diagram QSE

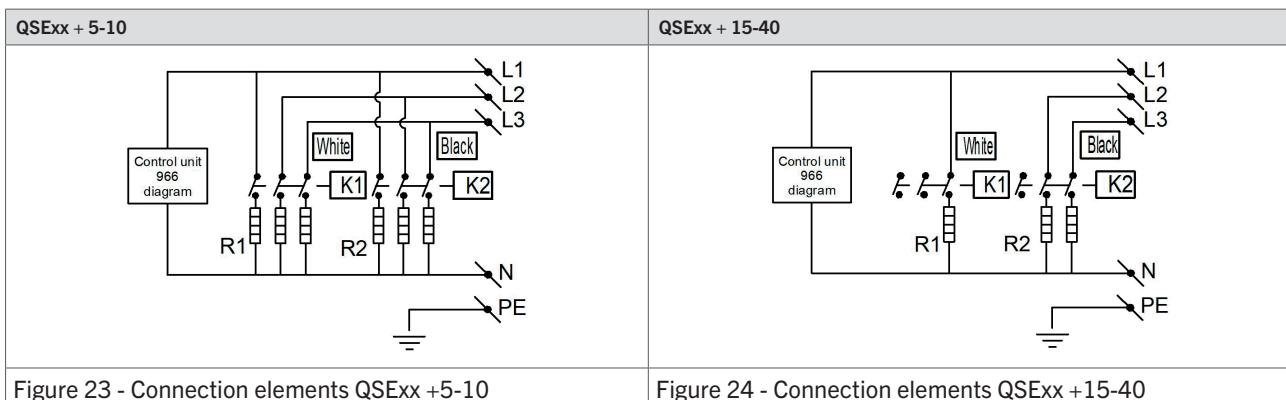


Figure 23 - Connection elements QSExx +5-10

Figure 24 - Connection elements QSExx +15-40

10. Exploded view, spare parts and accessories

10.1. Exploded view and spare parts

The parts of the air heater are shown in an exploded view in figure 25. The table below describes each part and shows the correct article number for a replacement part.

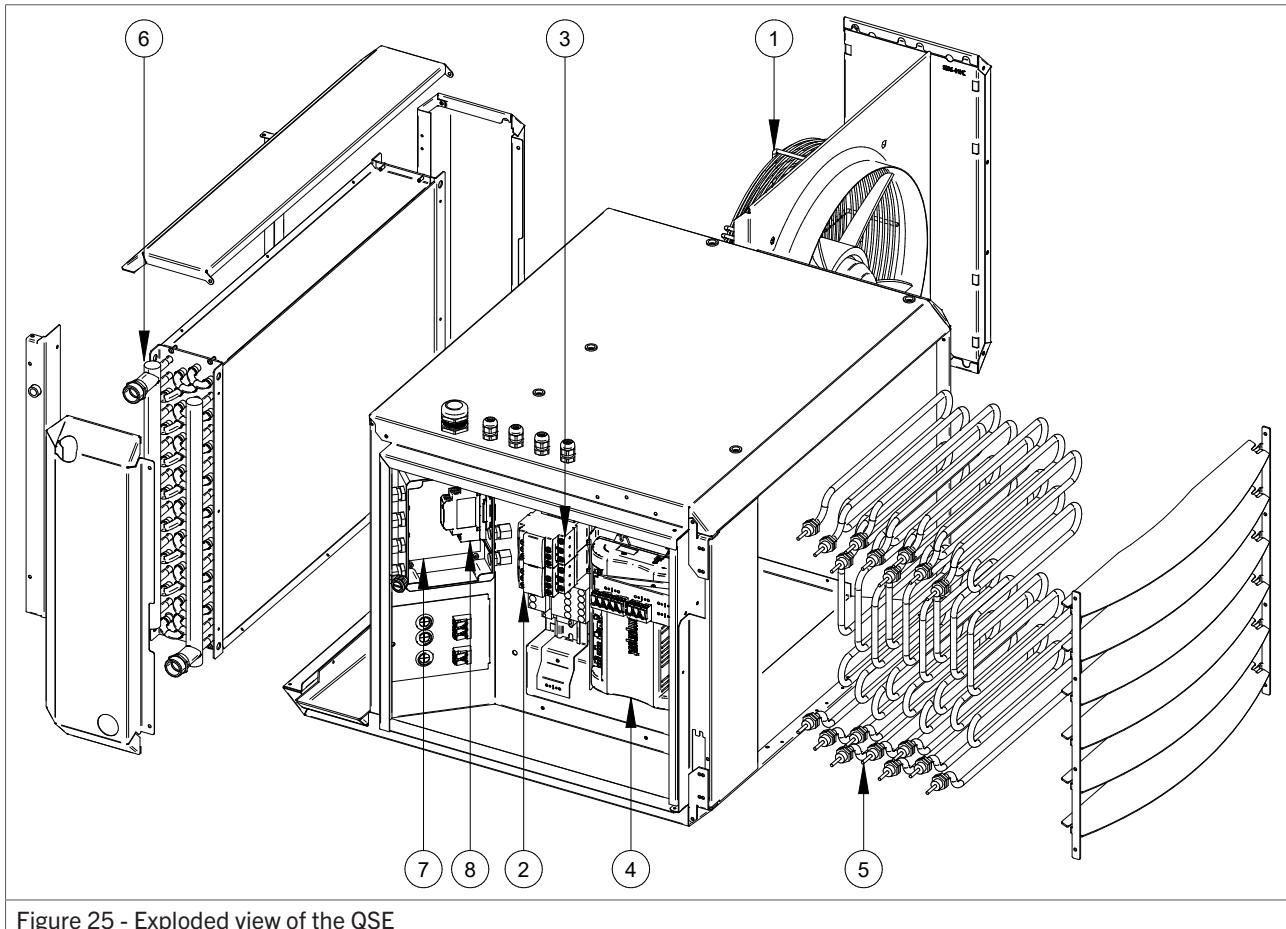


Figure 25 - Exploded view of the QSE

No.	Description	QSE6 + 10	QSE6 + 15	QSE12 + 15	QSE12 + 30	QSE16 + 5	QSE16 + 10	QSE16 + 15	QSE16 + 20	QSE16 + 30	QSE16 + 40
1	EC system fan	GX4223	GX4223	GX4225	GX4225	GX4225 (2x)					
2	Relay	IE5201	IE5202								
3	Relay	IE5201	IE5201	IE5201	IE5202	IE5201	IE5201	IE5201	IE5201	IE5202	IE5202
4	Burner control unit	GE5903									
5	Heating element 2.5 kW	-	-	IE5209 (6x)	-	IE5209 (2x)	-	IE5209 (6x)	-	-	-
5	Heating element 2.5 kW	-	IE2510 (6x)	-	-	-	-	-	-	-	-
5	Heating element 3.3 kW	-	-	-	IE5211 (9x)	-	IE5211 (3x)	-	IE5211 (6x)	IE5211 (9x)	IE5211 (12x)
5	Heating element 3.3 kW	IE2512 (3x)	-	-	-	-	-	-	-	-	-

No.	Description	QSE6 + 10	QSE6 + 15	QSE12 + 15	QSE12 + 30	QSE16 + 5	QSE16 + 10	QSE16 + 15	QSE16 + 20	QSE16 + 30	QSE16 + 40
6	Heat exchanger	IH4024	IH4024	IH4026	IH4026	IH4028	IH4028	IH4028	IH4028	IH4028	IH4028
7	Modbus controller	IW8010	IW8010	IW8010	IW8010	IW8010	IW8010	IW8010	IW8010	IW8010	IW8010
8	Power supply (24 V)	IW8022	IW8022	IW8022	IW8022	IW8022	IW8022	IW8022	IW8022	IW8022	IW8022
	Heat exchanger sensor	GE3900	GE3900	GY3933	GY3933	GY3933	GY3933	GY3933	GY3933	GY3933	GY3933
	Delta-T sensor	GY3931	GY3931	GY3931	GY3931	GY3931	GY3931	GY3931	GY3931	GY3931	GY3931

10.2. Table with accessories QSG

Accessory	QSE6	QSE12	QSE16
Heat pump HPX06A	GHW8000	-	-
Heat pump HPX12A	-	GHW8006	-
Heat pump HPX16A	-	-	GHW8008
Smart Controller (Included)	IW8050	IW8050	IW8050
Power Switch 4 p, 400 V, 25 A	IK5281 (depending on model, check max. power)		
Power Switch 4 p, 400 V, 32 A	IE5209 (depending on model, check max. power)		
Power Switch 4 p, 400 V, 63 A	IE5210 (depending on model, check max. power)		
Roof duct for heat pump 100 mm	IW8032 (depending on the piping used)		
Roof duct for heat pump 140 mm	IW8031 (depending on the piping used)		
Wall support QSE	GA8610	GA8580	GA8580
Wall support HPX06-16A	GA8650	GA8650	GA8650
Wall support HPX30A	-	-	-
Vertical louvre set QSE6 (4 pcs.)	GX2003	-	-
Vertical louvre set QSE12 (4 pcs.)	-	GX4002	-
Vertical louvre set QSE16 (5 pcs.)	-	-	GX6002
Anti-frost valve 1 " x 1 "	IW8040	IW8040	IW8040
Anti-frost valve 1 1/4 " x 1 1/4 "	IW8038	IW8038	IW8038
Anti-frost valve 1 1/2 " x 1 1/2 "	-	-	-
Automatic venting 1 "	IW8472	IW8472	IW8472
Automatic venting 1 1/4 "	IW8473	IW8473	IW8473
Pressure meter	IW8471	IW8471	IW8471
Filter, included	IW8451	IW8451	IW8451
Filling accessory	IW8470	IW8470	IW8470
Buffer tank (20 litres)	IW8475	IW8475	IW8475
Ball valve 1 "	IW8467	IW8467	IW8467
Ball valve 1 1/4 "	IW8468	IW8468	IW8468
Ball valve 1 1/2 "	IW8469	IW8469	IW8469
Rubber setup block + attachments, 2 pcs. L 600 – H 95 mm	IW8043	IW8043	IW8043
Rubber block for extra height, 1 pc. L 600 – H 120 mm	IW8044	IW8044	IW8044

11. Disposal and recycling



The meaning of the symbol on the material, its accessory or packaging indicates that this product shall not be treated as household waste. Please, dispose of this equipment at your applicable collection point for the recycling of electrical and electronic equipments waste. In the European Union and Other European countries which there are separate collection systems for used electrical and electronic product. By ensuring the correct disposal of this product, you will help prevent potential hazards to the environment and to human health, which could otherwise be caused by unsuitable waste handling of this product. The recycling of materials will help conserve natural resources. Please do not therefore dispose of your old electrical and electronic equipment with your household waste.

12. Declaration of conformity

Winterwarm Heating Solutions B.V.

Olden Goorweg 1

7108 AE, Winterswijk

The Netherlands

Declares that air heater types:

- QSE6 + 10, QSE6 + 15, QSE12 + 15, QSE12 + 30, QSE16 + 5, QSE16 + 10, QSE16 + 15, QSE16 + 20, QSE16 + 30 & QSE16 + 40

are in accordance with the essential requirements of the relevant EU directives, being:

- 2014/35/EU (LVD) relating to the electric safety of appliances
- 2014/30/EU (EMC) relating to electromagnetic compatibility of appliances
- 2023/1230 / EU (Machinery regulation)
- 2016/2281/EU (ECO design) relating to ecodesign requirements for air heating products

Goods should be installed and used in accordance with our instructions and with the applicable local and international rules.
Installation should be done by an authorized, qualified and competent installer.

Winterswijk, June 15th 2023



Ir. M. Fiselier
Technical director

