Installation manual

Water heater
Type JET

CE

EN - v1.2 / 10-2024

ORIGINAL INSTRUCTIONS

Contents

1. Introduction 3
   - 1.1. Symbols used in this manual 3
   - 1.2. Warranty 3

2. Safety instructions 4
   - 2.1. Installation 4
   - 2.2. Use 4
   - 2.3. Maintenance & Cleaning 4
   - 2.4. Children and vulnerable users 4

3. Technical specifications 5
   - 3.1. Performance 5

4. Installation 7
   - 4.1. Preparation 7
   - 4.2. Positioning the air heater 7
   - 4.3 Water connection 7
   - 4.3. Electrical connection 8
   - 4.4. Controlling the heater via 0-10V 9
   - 4.5 Controlling the heater via Modbus 9
   - 4.5. Heat pump 10
   - 5.1. Fan speed regulation 11
   - 5.2. Area adaption 11
   - 7.1. Safe operation 12
   - 7.2 Frost damage 12
   - 7.3 Calculating the power with other water temperatures 12
   - 7.4 Control via Smart Controller 12
   - 7.5 Control via Modbus 12

8. Electrical wiring diagram 13

9. Spare parts 14

10. Disposal and recycling 15

11. Declaration of conformity 15

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.

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.

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.

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.

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 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.

WARNING! Children shall not clean and maintain this air heater without supervision.

2.5 Usability restrictions

Work pressure :max. 5 bar.

Water temperature:max. 100°C; min 4°C .

(freezing danger!)

Environment temp.:max. 40°C; min 4°C.

(freezing danger!)

Protection grade: IP20B

WARNING! Frost can cause the internal copper tubes in the exchanger to burst, the exchanger will leak. No warranty on this!

WARNING! The JET is not suitable for cooling!

3. Technical specifications

3.1. Performance

Technical specification	Unit	JET220S	JET220M	JET330S	JET330M	JET340S	JET340M
Heat output (max.) (35°/30°C) (*)	kW	14.0	14.0	20.0	20.0	25.5	25.5
Heat output (max.) (80°/60°C) (*)	kW	44.8	44.8	64.0	64.0	81.6	81.6
Nominal power fan	kW	0.840	0.840	0.640	0.640	1.100	1.100
Stand-by power consumption	W	4	5	4	5	4	5
Current per phase (max.) (1F)	A	4.2	4.2	3.3	3.3	-	-
Current per phase (max.) (3F)	A	-	-	-	-	1.8	1.8
Air output (max.)	m^3/h	4200	4200	5500	5500	8000	8000
Throw vertical (max.)	m	12	12	14	14	16	16
Electrical connection (50 Hz)	V	230 V (1F + N	230 V (1F + N)	230 V (1F + N)	230 V (1F + N)	400 V (3F + N)	400 V (3F + N)
Sound level (at 5 m)	dB(A)	47-63	47-63	47-63	47-63	47-63	47-63
Water connection	G"	1"M	1"M	1"M	1"M	1"M	1"M
Water volume	l	3.9	3.9	6.6	6.6	6.6	6.6
Weight (incl. water)	kg	58	58	93	93	93	93
Minimum installation height	m	5	5	8	8	11	11
(*) Measured at 15°C room temperature							

3.2 Dimensions

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

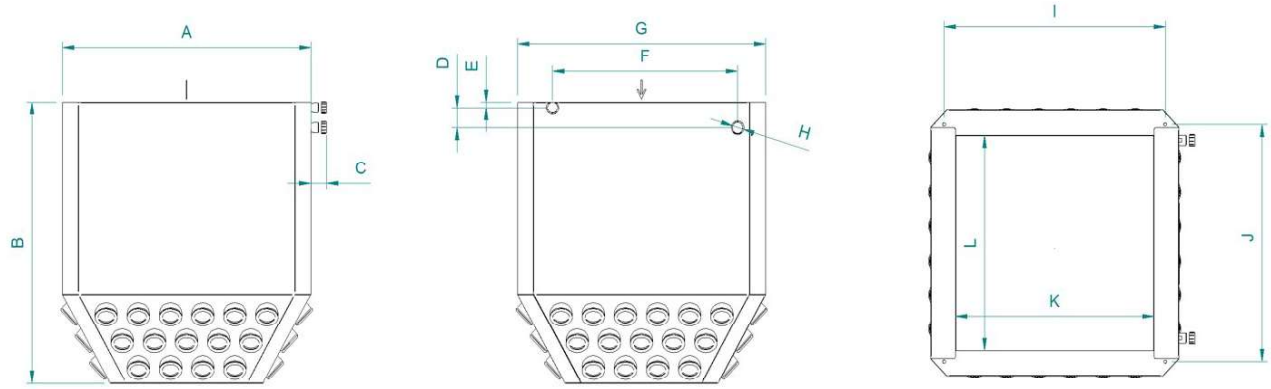

Figure 1 - Dimensions of the JET

Model(s)	JET220M/S	JET330M/S	JET340M/S
A	695	865	865
B	820	920	920
C	35	30	30
D	65	65	65
E	20	20	20
F	495	645	645
G	695	865	865
H	1"	1"	1"
I	615	770	770
J	615	770	770
K	535	690	690
L	550	700	700

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.

- 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 service door of the air heater.
- Make sure the ceiling or supporting construction can support the air heater.

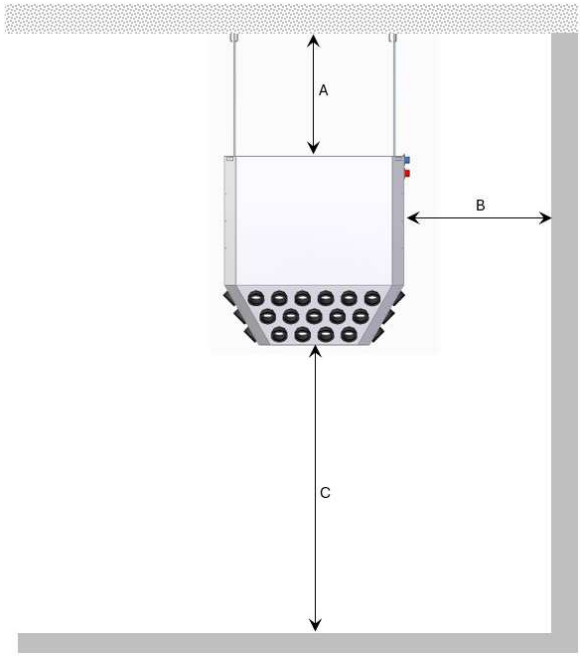

Figure 2 - Minimum clearances around the air heater

Model(s)	JEM220M/S	JET330M/S	JET340M/S
A (mm)	200	300	300
B (m)	3	3	3
C (m)	> 5	> 8	> 11

4.3 Water connection

Connections for hot water supply and return (two times 1 inch) are marked with a red and a blue sticker. Red is water supply and blue is water return. Do not twist these connections, the heater will not give the desired output.

The JET is not provided with a standard venting. There is the possibility to place one when it is desired.

WARNING! Prevent damage to the heater, hold the connections with pliers to avoid twisting of welded parts of the connections. Do not put excessive force! Internal welds may break and cause leakage

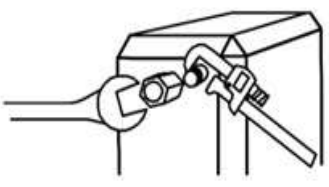

Figure 3 - Water pipe installation

4.2.1. Suspension

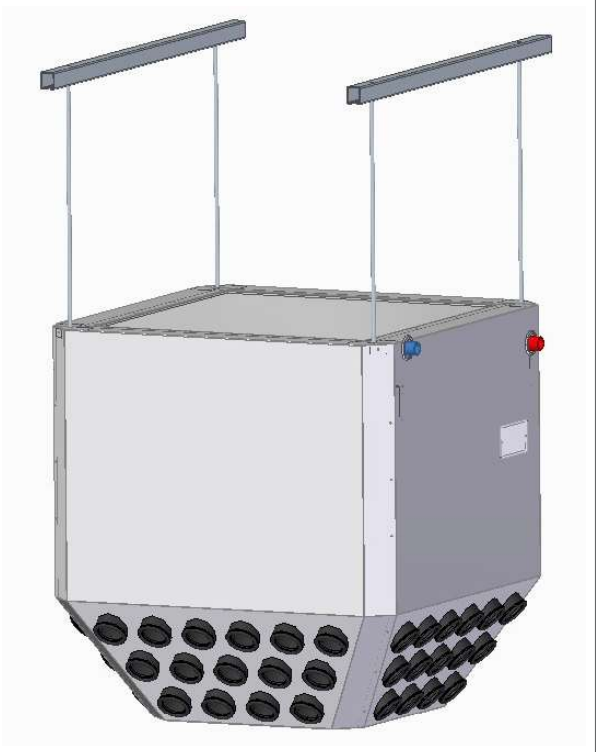

Figure 4 - Suspension JET

The air heater is equipped with threaded M10 sockets to suspend the unit. See the dimensions for the different models in the table below and figure 5.

Model(s)	JET220S/M	JET330/340S/M
A (mm)	615	770
B (mm)	615	770

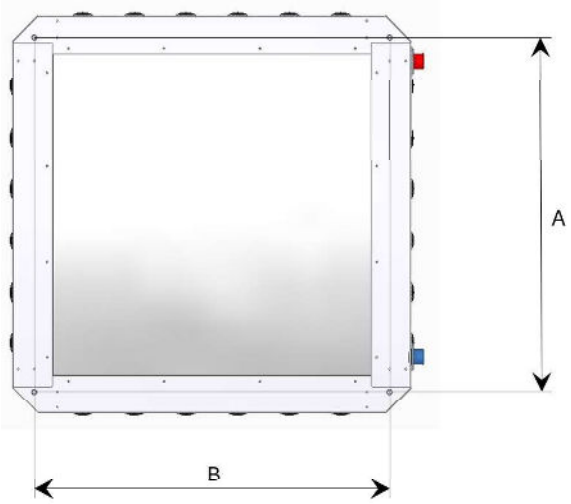

Figure 5 - Suspension dimensions

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 230 V/AC or 400 V/AC (three phases), depending on the model. See the table below.

Model(s)	JET220/330S	JET220/330M	JET340S/M
230V/AC	6-pole connector	3 pole connector	-
400V/AC + N	-	-	Safety switch

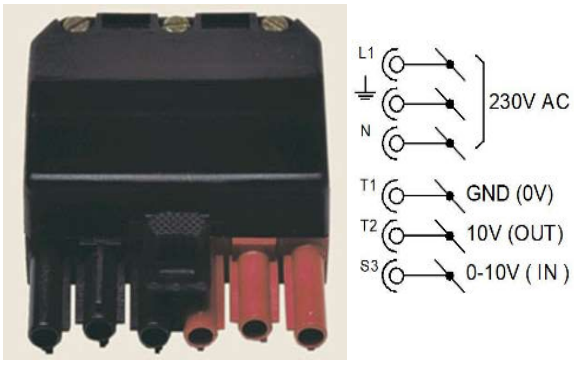

Figure 6 - Power connection JET220S/330S

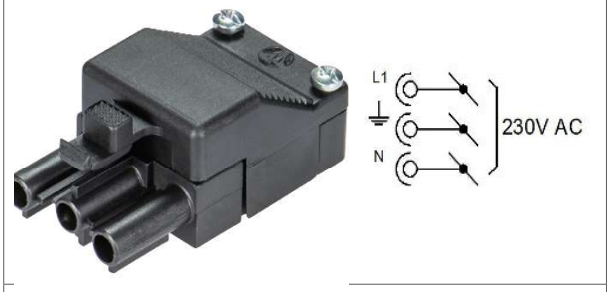

Figure 7 - Voedingsstekker JET220M/330M

- 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.

4.4. Controlling the heater via 0-10V

The JET220S, 330S and 340S can be controlled via a 0-10V d.c. input signal, directly to the fan.

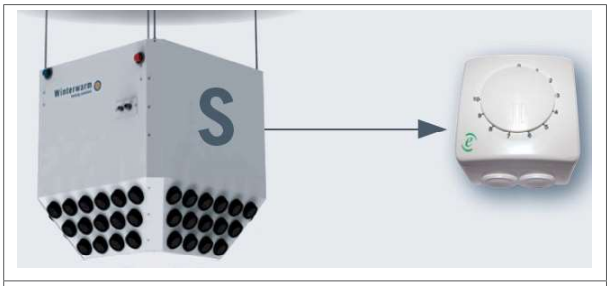

Figure 8 - 0-10V control via speed regulator

This can be done via the 6-pole connector, see figure 5. In case of an external 0-10V power source, only GND (0V) and 0-10V (IN) need to be connected. If there is no external power source available, the 10V (OUT) can be used, combined with a voltage regulator (potentiometer), like GA3955. If two or more heaters are controleld by a single regulator, make sure only ONE 10V (OUT) source is used.

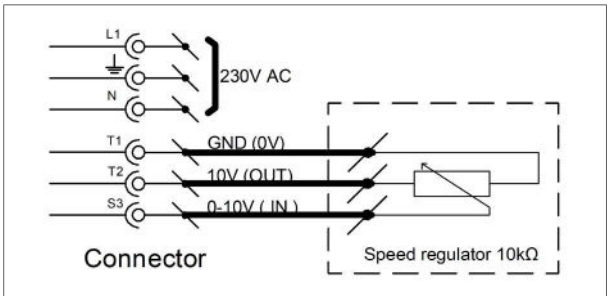

Figure 9 - 0-10V control via speed regulator

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 and twisted.
  - Minimum dimensions: 1 x 2 x Ø0.8 mm^2.
  - Maximum length: 200 m.

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

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

4.5 Controlling the heater via Modbus

The JET220M, 330M and 340M can be controlled via Modbus 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 manual of the **Modbus extension kit GA8010.**

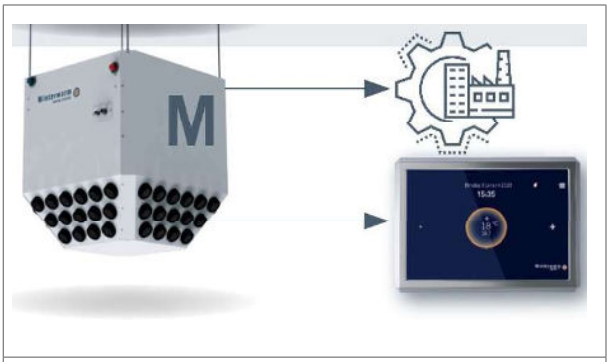

Figure 10 - Modbus control

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 §8.). 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 and twisted.
  - Minimum dimensions: 4 × Ø0.34 mm^2.
  - Maximum length: 200 m.

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

CAUTION! Connect the cable's earth shield only 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.

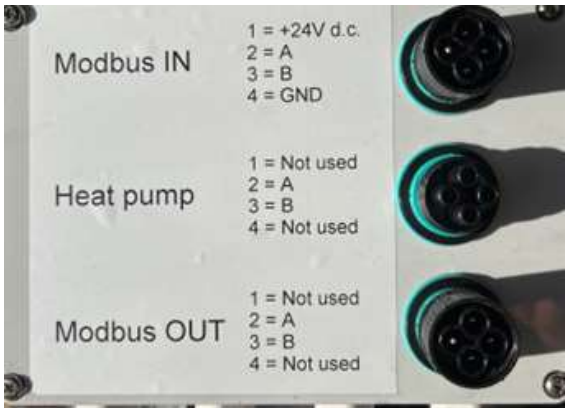

Figure 11 - Modbus connection

The Modbus IN input should be connected to the Smart Controller or the building management system. The Modbus OUT is in parallel to this input, and can be used to connect other appliances.

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 Jet heaters.

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

NOTICE The Modbus Extension Kit GA8010 has an internal jumper which connects a 120Ω resistor as an end terminal of the Modbus line. Remove the jumper if the ModbusOUT connector is used to extend the modbus line to other appliances.

Figure 12 - Jumper to connect the 120Ω end terminal

4.5. Heat pump

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

Use the same cable as specified for the thermostat in §4.4 for the connection between the heat pump and JET heater.

Connect the A en B signal of the heatpump with the connector on the JET heater

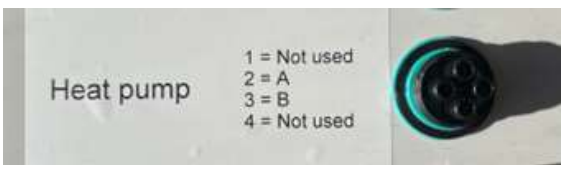

Figure 13 - Heat pump connection on JET heaters

5. Operating the air heater

5.1. Fan speed regulation

The fan speed can be regulated by a 0-10V d.c. signal (S models) or modbus (M models). The speed influences the throw of the heater directly. So if the air speed on floor level is either too high or too low, the fan speed should be adjusted.

The applicable model for each height is stated in the table below:

Model	Applicable height (meters)
JET220S/M	5-8
JET330S/M	7-10
JET340S/M	10-16

5.2. Area adaption

Each individual nozzle can be rotated to direct the airflow 15° upward or downwards on top of the 30° in the appliances. The nozzles can be adjusted +/-15° by rotating them. This influences the area that is covered on floor level, see the table below.

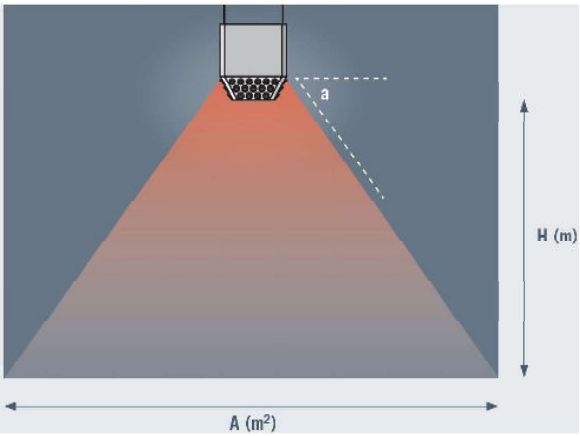

Figure 14 - Area covered by the JET

Model	JET220M/S	JET330M/S	JET340M/S
Angle	15-45°	15-45°	15-45°
h (m)	7-10	9-14	10-16
Diameter (*) (min - max.)	5-25	10-30	10-35
A (m²) (*) (min - max.)	20-500	80-700	80-1000

(*) Dependent on angle on max. height.

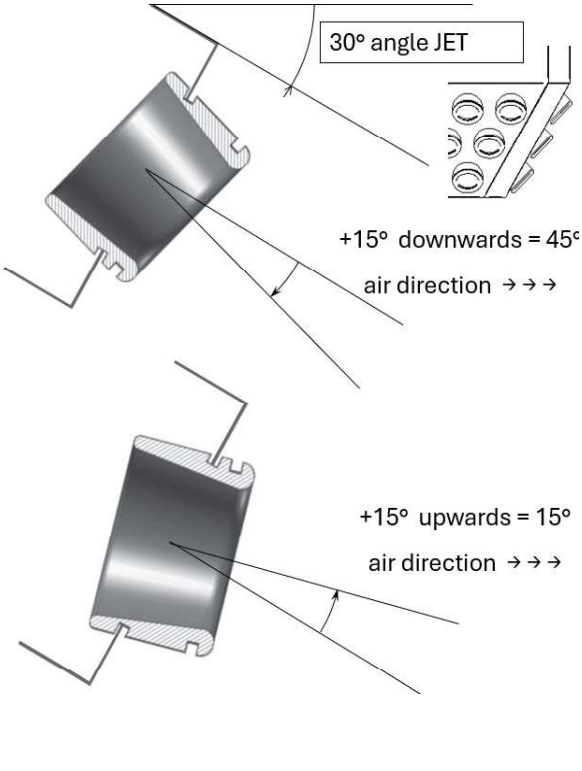

Figure 15- Adjustable angle of nozzles

See the design manual „**Designing JET in high buidlings**“, for calculating the amount of JET heaters in a building, based on detailed calculations and guidelines.

NOTICE maximum heights can only be used when using a water temperature of 35°C.

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.

6. Maintenance

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, instructions in this chapter to fix the air heater.

CAUTION! Make sure that you have turned off the power of the heaters that you are working on. The heater must be electrically isolated during servicing.

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

CAUTION! Sufficient maintenance is critical in circumstances such as high humidity, dust, high switching on/off frequency, etc. If the heat exchanger is heavily covered by dust-traps it will not displace the heat sufficiently. Use a vacuum cleaner or compressed air. Avoid damage to the fins. Clean also the fan.

7. Operation

7.1. Safe operation

The heater is controlled by a 0-10V input signal, the Smart Controller or via Modbus via a building management system. There are no controls on the heater itself. Depending on the installation, the user can make following settings:

- Control main or isolation switch (JET 340S/M).

- Change fan speed with voltage regulator or external 0-10V signal (JET S models).

- Turn up and down Smart Controller.

- Change fan speed via Modbus or Building Management System.

Adjusting direction of the air outlet. see 5.2, is normally no user's action, this is done by the installer.

7.2 Frost damage

CAUTION! frost damage!

Do not set the room thermostat lower than 5°C. Freezing of the exchanger or the tubes will cause irrevocable damage to the installation. A constant supply of hot water from the heat source should be available. Frost damage is not covered bt warranty.

7.3 Calculating the power with other water temperatures

In situations where other inlet- and outlet water temperatures are applied, the original (registered) heater capacity (calculated at 15°C environment and watertemperatures 35-30°C) should be multiplied with the value in the table below.

Watertemperature	Room air temperature					
	0°C	5°C	10°C	15°C	18°C	20°C
35-30°C	1.9	1.6	1.3	1.0	0.8	0.7
40-35°C	2.0	1.7	1.4	1.1	0.9	0.8
45-35°C	2.4	2.0	1.7	1.4	1.2	1.1
70-50°C	3.5	3.2	2.9	2.6	2.4	2.2
80-60°C	4.2	3.9	3.5	3.2	3.0	2.9

7.4 Control via Smart Controller

See the user manual of the Smart Controller for detailed settings.

7.5 Control via Modbus

The Modbus settings are:

Communication	
Modbus addresses	1-128 (digital, dip switches at 0)/ 15 via dip switches)
Standard address	1, digitally set (all dip switches on 0)
Baudrate	19200 (standard) or 9600
Databits	8
Parity	None
Stop bits	2
Read (multiple) register	0x03
Write (single) register	0x06

See the manual Modbus Controller for detailed settings.

8. Electrical wiring diagram

The connection diagram of the fan can be found in figure 16

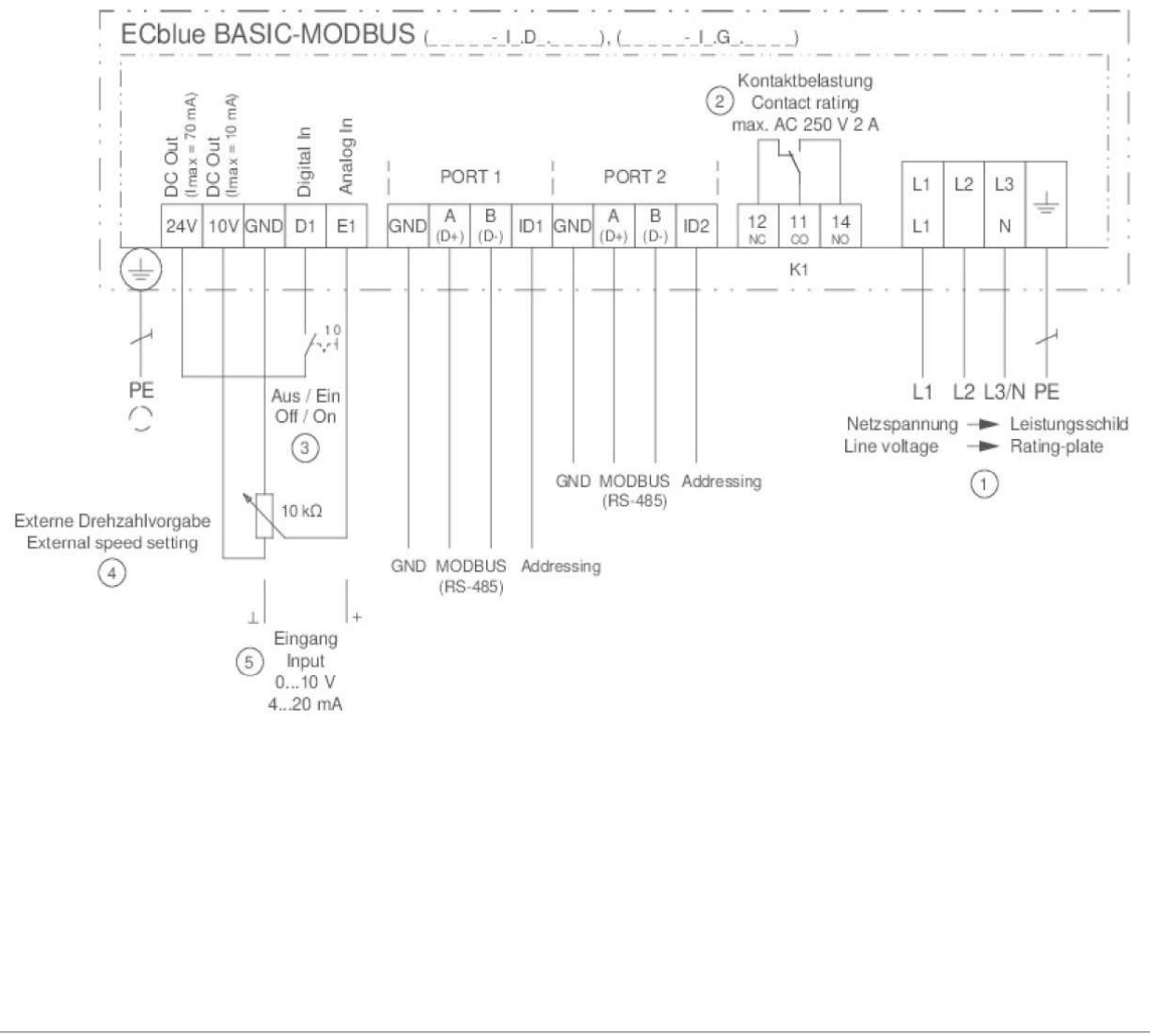

Figure 16 - Electrical wiring diagram fan JET

9. Spare parts

The parts of the air heater are shown in an exploded view in figure 17. The table below describes each part and shows the correct article number for a replacement part.

No.	Description	JET220S	JET220M	JET330S	JET30M	JET340S	JET340M
1	System fan	IX4239	IX4239	IX4239	IX4239	IX4244	IX4244
2	Modbus router	-	IW8010	-	IW8010	-	IW8010
3	Rubber nozzle	IK5293	IK5293	IK5293	IK5293	IK5293	IK5293
4	Heat exchanger	IH4016	IH4016	IH4020	IH4020	IH4020	IH4020

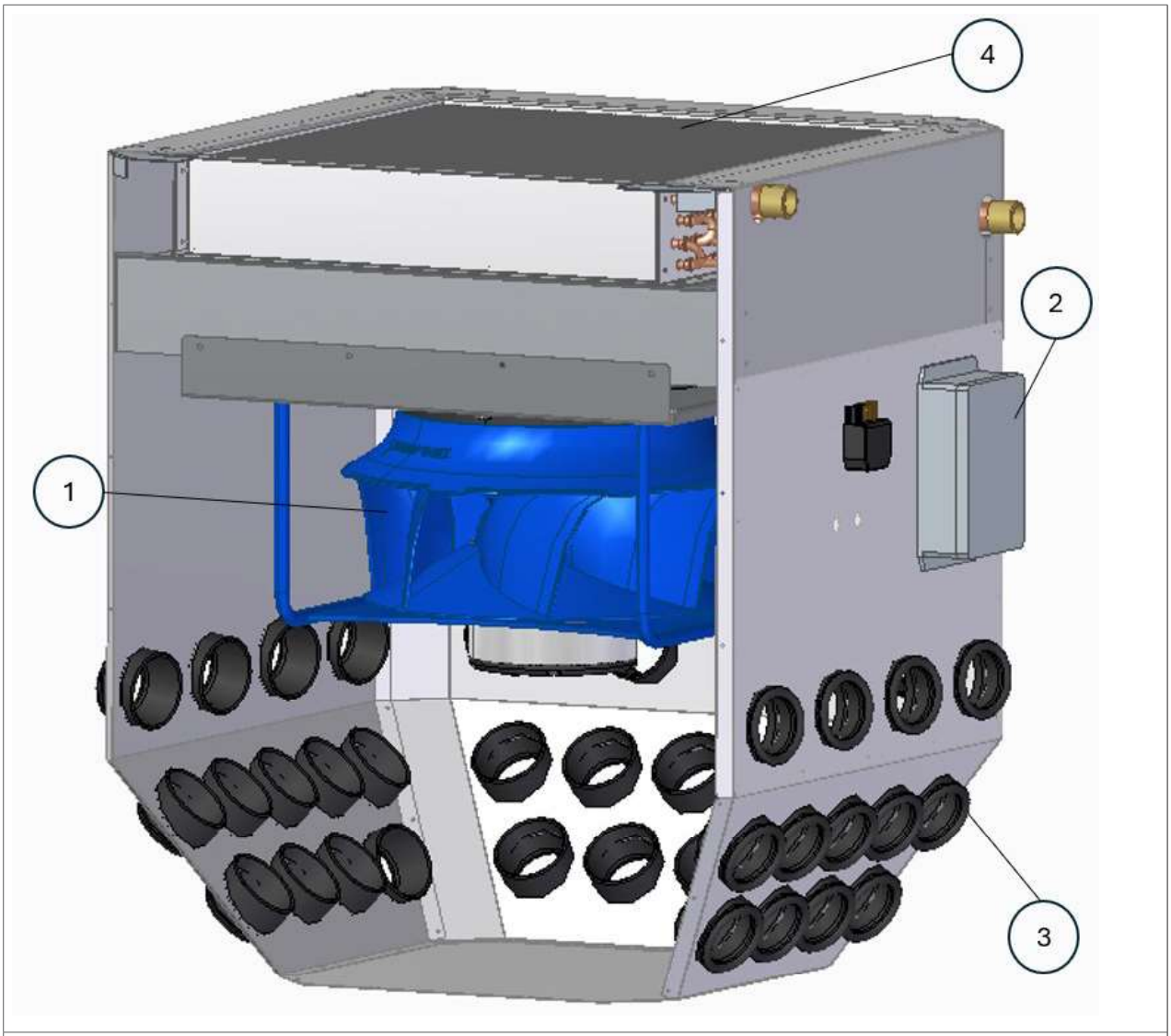

Figure 17 Service parts of JET

10. 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.

11. Declaration of conformity

Winterwarm Heating Solutions B.V.
Olden Goorweg 1
7108 AE, Winterswijk
The Netherlands
Declares that air heater types:

- JET220S, JET220M, JET330S, JET330M, JET340S, JET340M

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
- 2006/42/EG (MD) relating to the safety of machinery

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, November 1st 2024

Ir. M. Fiselier
Technical director