



Instruction manual
AIR HEATER
TYPE EH

Version: EH - EN - v00.02



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1 Introduction

This manual is intended for the gas, 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.

⚠ CAUTION Cover the air heater while spreading sawdust on the floor. This prevents large amounts of dust from accumulating on the heater.

⚠ CAUTION The air heater can be used in a dusty environment (e.g. a poultry shed) 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.

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, unless 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 IP00B classification.

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

2.4 Children and vulnerable users

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.

⚠ WARNING Children shall not play with the air heater.

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

3 Technical specifications

3.1 Performance

Technical specification	Unit	Type EH				
		EH10	EH15	EH25	EH30	EH40
Heat output (max.)	kW	9,9	15,0	24,9	29,7	39,6
Heat output (min.)	kW	3,3	7,5	9,9	9,9	19,8
Nominal Power	kW	10,1	15,2	25,1	29,9	39,8
Max. el. current per phase	A	15,5	22,9	37,2	44,2	59,0
Air output (warm.)	m ³ /h	3.100	3.100	3.000	3.000	4.400
Throw horizontal (max.)	m	23	23	22	22	28
Electrical connection (50 Hz)	V	400V+N	400V+N	400V+N	400V+N	400V+N
Weight	kg	25	26	28	30	34
Sound level (@5 m)	dB(A)	55-58	55-58	55-58	55-58	57-60

3.2 Dimensions

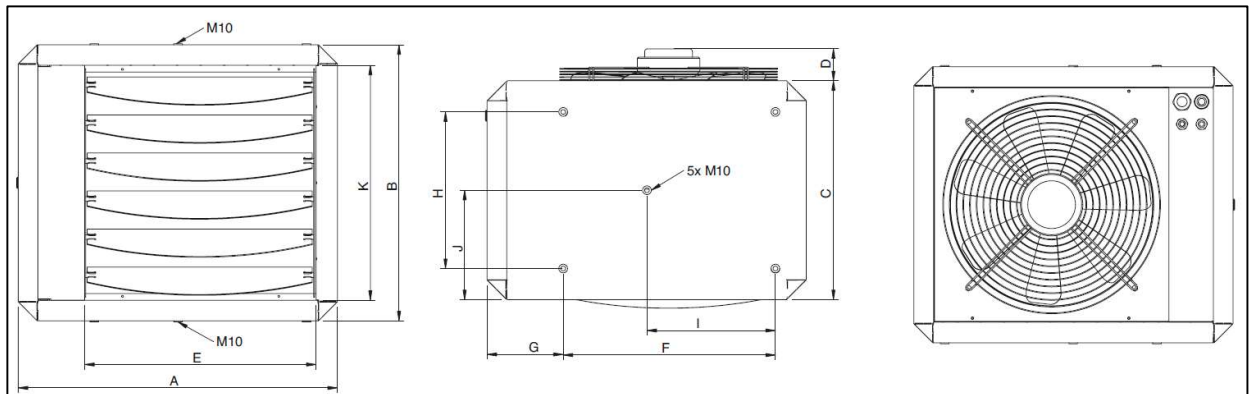


Figure 1 – Dimensions of the EH 10-40

Type	A	B	C	D	E	F	G	H	I	J	K
EH 10-30	570	490	390	125	420	380	140	280	230	195	420
EH 40	650	490	530	125	490	490	100	380	325	245	420

4. Installations

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 (gas type, gas pressure, electrical supply etc).

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 type of gas 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 Gas Safety regulations, 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 door of the air heater.
- Make sure the wall can support the air heater.

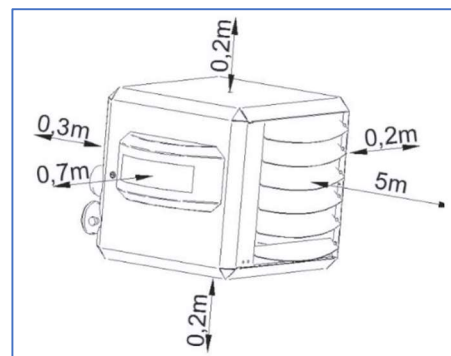


Figure 2 - Minimum clearances around the air heater.

4.2.1 Orientation

Two different wall supports are available:

Model(s)	Wall support	Art. nr
EH 10-40	Wall support	GA8610
EH 10-40	Designconsole	GA8630

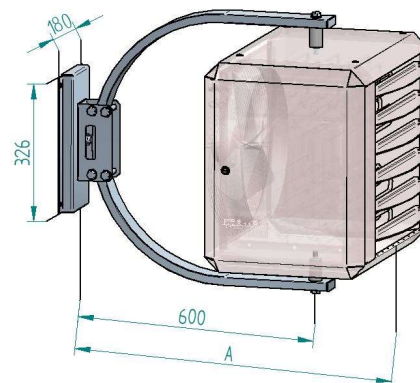


Figure 3 – Designconsole

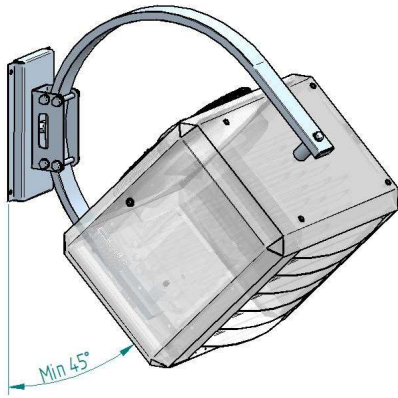


Figure 4 – Design console, minimum 45 degrees

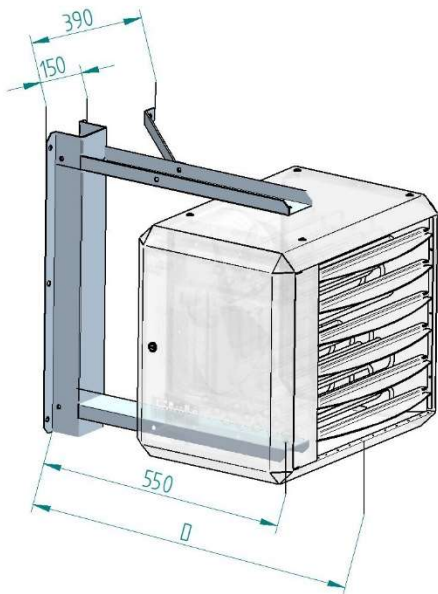


Figure 5 – Wall support

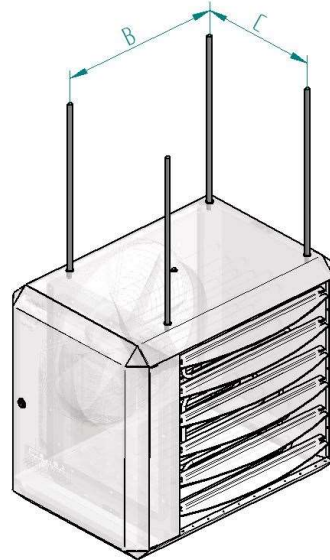


Figure 6 –Suspension with threaded bars M10

The air heater is equipped with threaded sockets to suspend the unit (see the dimension diagram in §3.2).

Use the suspension kit that is compatible with your air heater. The suspension kit is not delivered with the air heater. Contact your supplier.

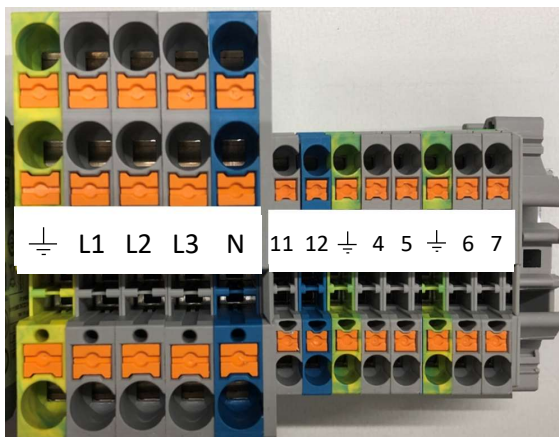
	A	B	C	D
EH 10-30	795	380	280	745
EH 40	845	490	380	795

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. A supply of 400 V/AC + Neutral is optional. The control circuit is a two wire low voltage bus communication.



4.3.2 Fuse

One fuse is present on the air heater's control board (see the electrical wiring diagram in §9).

- When replacing this fuse, always use a fuse of the same type (5AT).

4.4 Room thermostat

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

- **The MTC:** a modulating digital clock thermostat with optimiser.
- **The MTS:** a modulating digital thermostat.
- **ON/OFF thermostat:** a simple on/off thermostat.
- **Interface module;** a specially designed interface module for BMS systems. Contact your supplier for more information.

4.4.1 Installation requirements

Follow 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 two 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 and twisted.
 - Minimum dimensions: 1 x 2 x $\varnothing 0,8$ mm².
 - Maximum length: 200 m.

NOTICE Keep the thermostat cable separated from the mains cables.

NOTICE 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.
A cable with a thickness of less than 0.8mm will result in a poor signal.

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

4.4.2 Modulating room thermostat installation

To connect the air heater to an MTC or MTS thermostat, do the following:

1. Connect the two control wires to terminals 4 and 5 (see figures 7 & the electrical wiring diagram in §9).
2. Set the S1 and J14 switches on the control unit as follows (figure 8/9):
 - a. Set S1 to 1.
 - b. Set J14 to 1.

NOTICE The air heater must be switched off when setting the switches. Otherwise the settings will have no effect

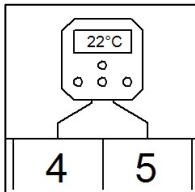


Figure 7 - Modulating thermostat connection.

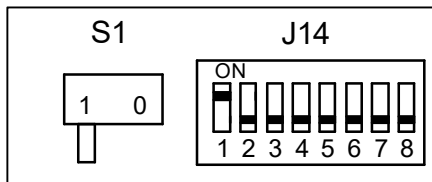


Figure 8 – Positions of the S1 and J14 switches

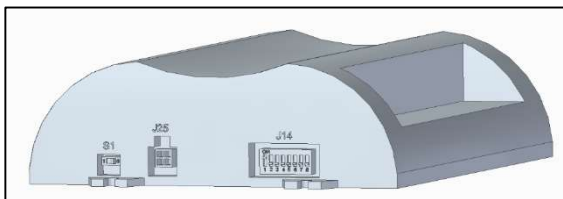


Figure 9 - Location of the S1 and J14 switches

4.4.3 Installation of multiple heaters on one control unit

An MTC, MTS room thermostat or Interface module can control up to 8 air heaters. To connect the air heaters, do the following (figure 9):

NOTICE This functionality does not apply to an ON/OFF thermostat.

1. Connect the two wires of the thermostat to terminals 4 and 5 of the first air heater.
2. Connect the first air heater to the second air heater.
3. Repeat for each subsequent air heater.

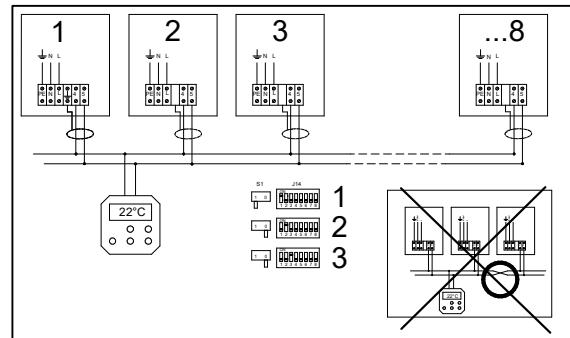


Figure 9 – Connection of multiple air heaters to a modulating room thermostat.

Each air heater needs an unique number to be recognised by the room thermostat. This number can be set with the J14 switch on the control unit of each air heater:

1. Set the S1 and J14 switches on the control unit as follows (figure 13):
 - a. Set the S1 switch of the first air heater to 1
 - b. Set the S1 switch of the other air heaters to 2.
 - c. Set the J14 switch of the first air heater to 1
 - d. Set the J14 switch of the second air heater to 2, etc.

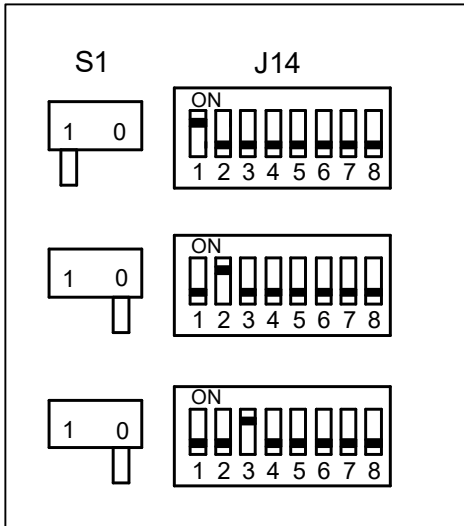


Figure 10 - Positions of the S1 and J14 switches for the first three air heaters in a system.

NOTICE If the J14 switch of more than one air heater is set to the same number, the system will not work.

NOTICE The air heater must be switched off when setting the switches. Otherwise the settings will have no effect.

5. Operating the air heater

5.1. Minimum firing time

The heater will always fire for a minimum of 4 minutes, even if the heat demand stops. This is to avoid a large number of start and stops.

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 room thermostat, with a temperature 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 thermostat 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 room thermostat. See the user manual of the special Room thermostat for more information.

NOTICE Delta-T regulation is automatically switched off when the delta-T sensor (sensor terminal J6) is disconnected.

5.3 Summer ventilation

The fan can be set to run in the summer. Follow the instructions in the user manual of the special Room thermostat.

5.4 Overheating protection

The air heater's heating elements are protected from excessive temperatures.

5.4.1 Heating Elements

An NTC sensor is located near (or on) the heating element. This sensor monitors the heating element's temperature.

If the heating element 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: Burner stop, followed by an automatic restart when cooled down.
- Step 3: Burner stop, followed by a Lock Out. A manual reset is required.

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. In general, the heater does not need to be adjusted after installation. 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.

2. Instruct the end user of the about a safe use of the air heater:
 - a. The location of the maintenance switch.
3. Instruct the end user about the operation of the heater:
 - a. Lock-out indication.
 - b. Reset

4. Instruct end user about the necessary maintenance.
5. Leave this manual with the end user.

6.1.1 First use – thermostat

To commission the air heater via the room thermostat, do the following:

- Put the thermostat in the highest position. The start sequence is always the same.
- The air heater will burn 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; the signals of the LEDs and the code on the display. Do not react too soon.

7.1 Volatile lock outs

The table below describes the volatile locks outs that can occur. These can only be reset by hand through the thermostat or by means of the reset button on the control unit of the appliance.

This 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, 2 and 3	Internal error	Internal error	13
L-4	E-error	E-error for more than 24 uur	12
L-8-12	Internal error	Internal error	13
L-15	Overheating	Heating Element sensor is overheated	3
L-17-19	Internal error	Internal error	13
L-25	Sensor Error	Heating Element sensor failure	4
L-27-31	Internal error	Internal error	13
L32	Sensor error	Heating Element sensor failure	4
L-33-38	Internal error	Internal error	13
L-43	Overheat error	Too many heating element sensor is overheated alerts	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 typ	Description	Case #
E-00 to 04	Internal error	Internal error	13
E-05	Overheating	Heating Element sensor is overheated	3
E-06 to 13	Internal error	Internal error	13
E14	Relays error	Relays has switched while it shouldn't have	16
E15 to 20	Internal error	Internal error	13
E-21 and 22	Heating Element sensor error	Heating Element sensor error	4
E-27 and 28	Heating Element sensor error	Heating Element sensor short-circuit	4
E-34	Reset button error	Too many reset actions in a short timespan	9
E-36	Overheating	Heating Element sensor is overheated	3
E-38 and 39	Heating Element sensor error	Heating Element sensor not detected	4
E-47 and 48	Heating Element sensor error	Heating Element sensor short-circuit	4
E-49 -64	Internal error	Internal error	13
E-65	Voltage too low	Supply voltage too low for over 1 minute	
E-66	Voltage too low	Supply voltage too high for over 1 minute	

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	Description	Case #
A-07	Overheating	Heating Element sensor is overheated	3

7.4 Instructions

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

7.5 Additional troubleshooting

Case 3: Heating Element sensor is overheated

- Check if the connector J12 / J6 has been plugged in correctly and if the connection J12[1-4] (optional overheat protection) has been connected properly.
- Check if the system fan supplies enough air.

Case 4: Heating Element sensor is overheated, has not been detected or has been short-circuited.

The Heating Element 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 K Ω at 25°C and 25 K Ω at 20°C.
- If the measured values differ too much, replace 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 13: Internal error

- Isolate the electrical supply and reenergise.

- If this does not help, replace the burner control unit.

Case 16: Relay error

- Isolate the electrical supply. Check if one of the relay has stuck while it was switched. If yes; replace the relays.
- Reenergise the appliance . Check if one of the relays switches at ones/too soon. If yes: replacet the burner control unit.

8. Maintenance

NOTICE

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

8.1 Preparation

CAUTION

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

Before performing maintenance on an air heater that has already been 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.

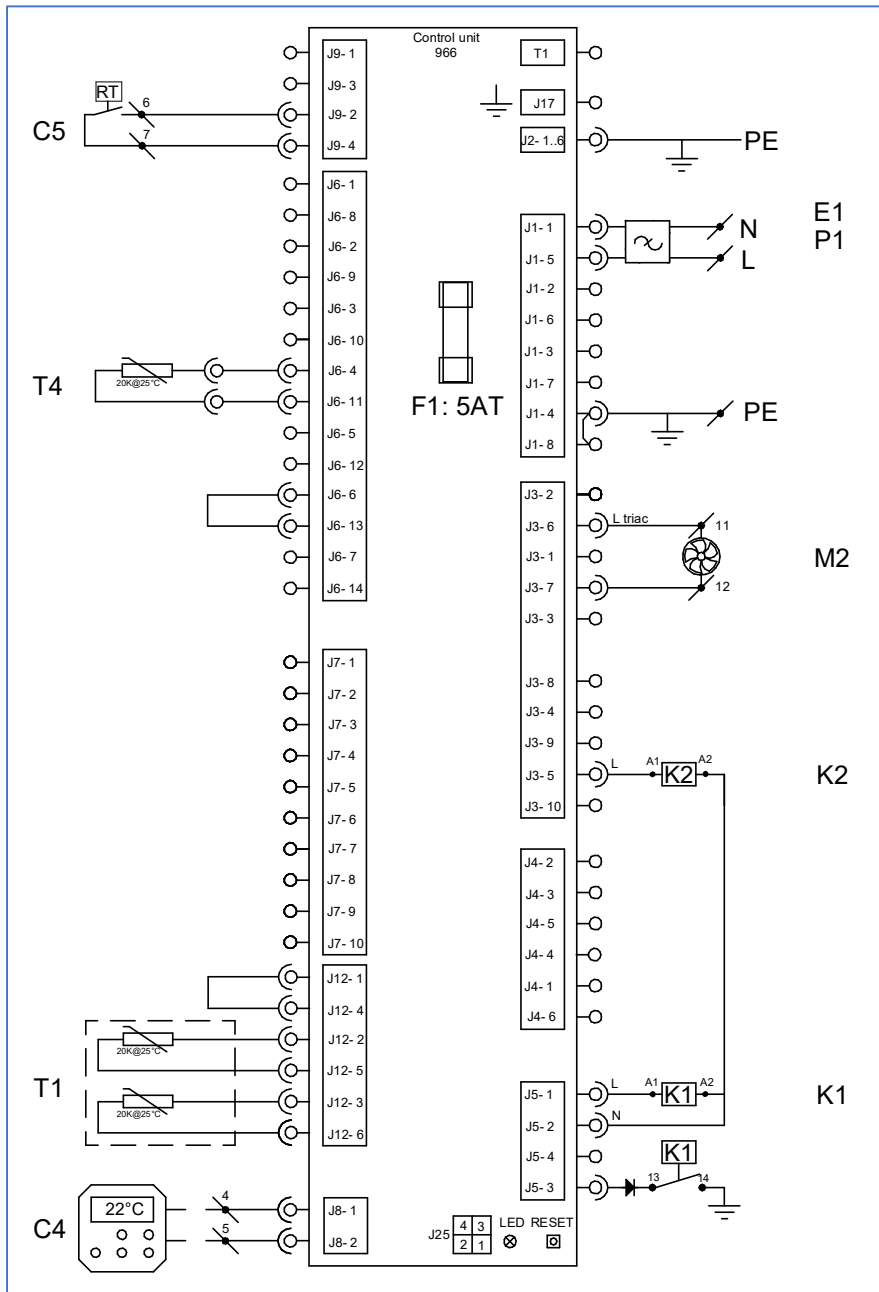
1. Inspect the heating elements.
2. Clean the fan guard on the outside of the heater. Clean the fan blades if required.
3. Open the access panel.
4. Clean the inside of the air heater.
Focus on the following parts:
 - a. Body
 - b. Fan blades and motor
 - c. Heating elements
 - d. Temperature sensor
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. 1. Reconnect the air heater to the power supply.
2. Switch on the air heater.
3. Check if the heater operates without problems. See chapter 9 if any errors occur.

9 Electrical wiring diagram

A complete electrical wiring diagram is shown in figure 11. The connections that are most important to the installation process are shown in figure 12.



Nrt.	Connection type
C4	Modulating thermostat
C5	ON/OFF thermostat
E1	Power line EMI filter
K1	Relay low
K2	Relay high
M2	Modulated system fan (triac)
P1	Power supply 230V
T1	Temperature sensor (heating element)
T4	Temperature sensor (delta-T)

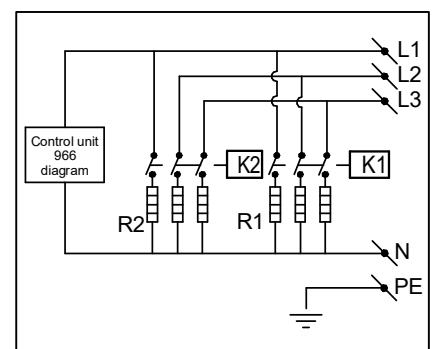


Figure 11 -- Electrical wiring diagram EH

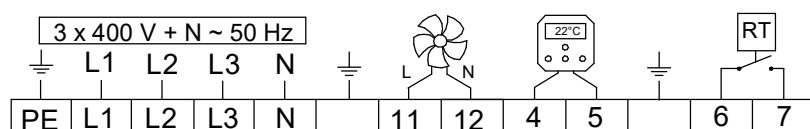
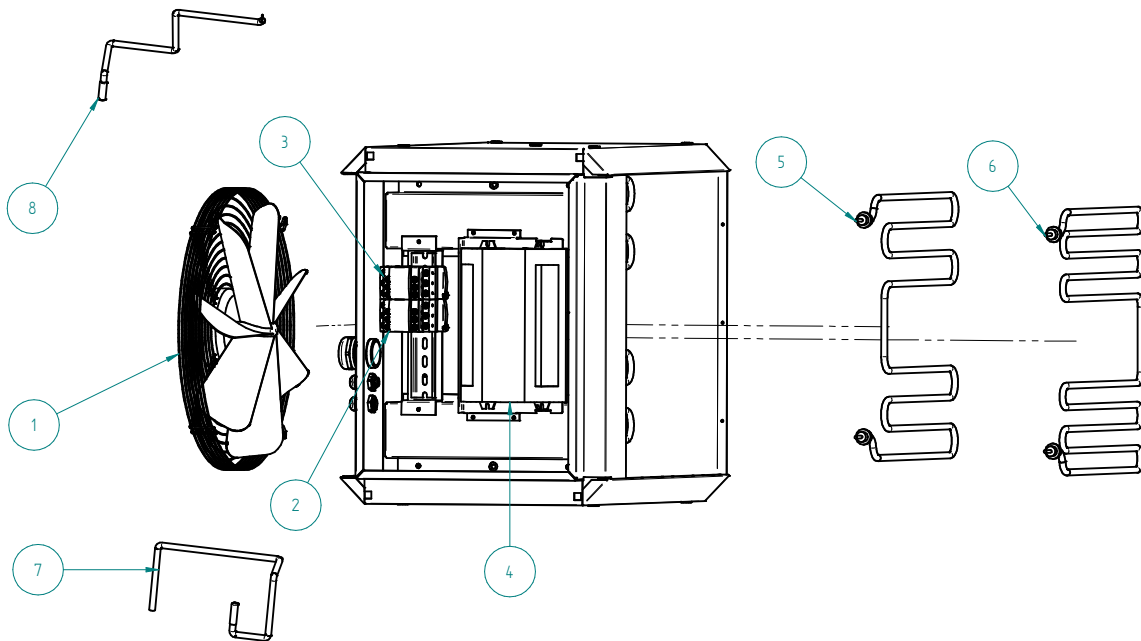


Figure 12 -- Main connections for installation

10 Exploded view and spare parts



No.	Description	EH10	EH15	EH25	EH30	EH40
1	System fan	IX4201	IX4201	IX4201	IX4201	IX4204
2	Relay low	IE5201	IE5201	IE5201	IE5201	IE5202
3	Relay high	IE5201	IE5201	IE5202	IE5202	IE5202
4	Burner control unit	GE5903	GE5903	GE5903	GE5903	GE5903
5	H. Element 2,5 kW		IE2510	IE2510		
6	H. Element 3,3 kW	IE2512		IE2512	IE2512	IE2512
7	Sensor h. element	GY3932	GY3932	GY3932	GY3932	GY3932
8	Delta-T sensor	GY3931	GY3931	GY3931	GY3931	GY3931

11. Declaration of conformity

Winterwarm Heating Solutions B.V.

Winterwarm 
heating solutions

Industrieweg 8

7102 DZ Winterswijk

The Netherlands



- **Declares that Hot Air Heaters types:**
- EH10, EH15, EH25, EH30 en EH40

- 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 the electromagnetic compatibility
- 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, 1 augustus 2020

Ir. M. Fiselier
Manager Research and Development.

WINTERWARM HEATING
SOLUTIONS B.V.
Industrieweg 8
7102 DZ Winterswijk
Tel. 0543 - 546300
Fax. 0543 - 546310

A large, handwritten signature in blue ink is written over the printed company name and address information.