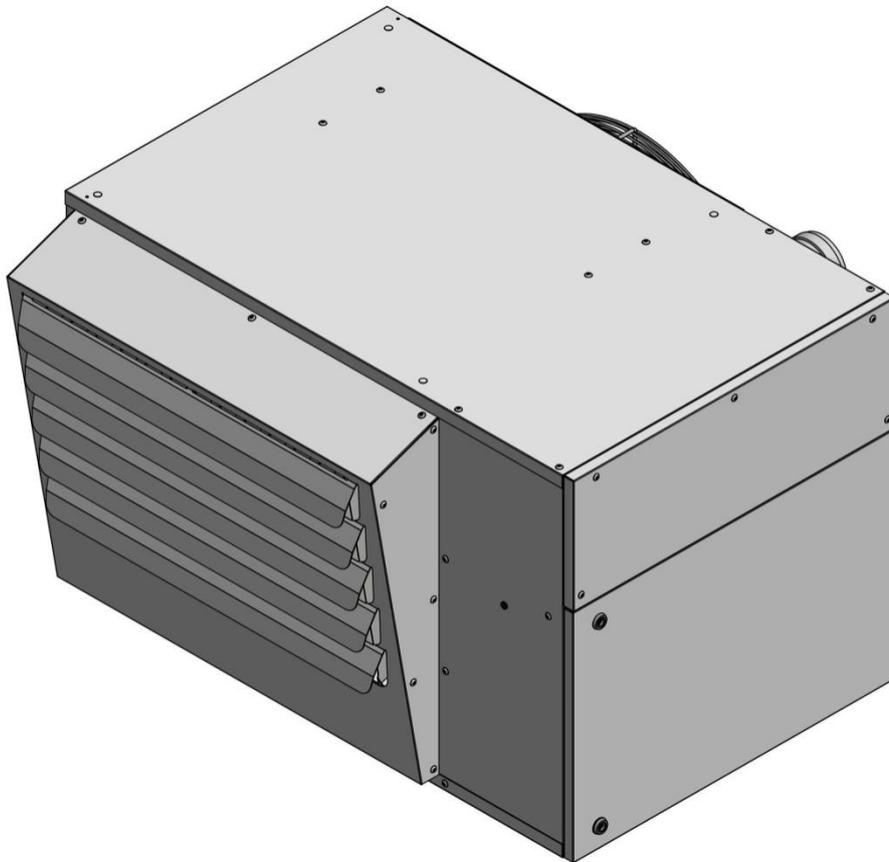


INSTALATION AND MAINTENANCE USER MANUAL

**Modulating gas boiler and condensating warm air heaters
with helical fan for the direct air diffusion**

PMX SERIES



FLEXIHEAT UK LTD

Flexible Heating & Dehumidification Solutions

01202 822221

www.flexiheatuk.com

Dear Customer,

Thank you for choosing a **PMX** series appliance, an innovative modern and high-efficiency product, which provides comfort, unparalleled noiselessness and safety for a long time; in particular, if the appliance is serviced by a professional heating technician who are specifically qualified and trained to keep it at its maximum efficiency level, with reduced operating costs, and, when needed, they can also provide original spare parts.

This User Manual includes important instructions and recommendations that should be complied with, in order to easily install and to better use the **PMX** series appliance.

Thank you.

Flexiheat UK Ltd

COMPLIANCE AND PIN NUMBER

The appliance is compliant with the Directives, Standards and Regulations listed in the Declaration of Conformity that can be requested from the Manufacturer. The possible certification PIN number **CE** is included in the technical data plate.

RANGE

This manual includes references to the TYPE. The following table shows the series and the correspondence between the TYPE and the TRADE NAME.

TYPE	TRADE NAME
1	PMX 30
2	PMX 40
3	PMX 50
4	PMX 60
5	PMX 90
6	PMX 120

WARRANTY

The **PMX** series appliance is covered by a **SPECIFIC WARRANTY**, starting from the equipment purchase date, which the user shall prove; otherwise, the warranty will start from the equipment manufacturing date. The warranty conditions are specified in the **WARRANTY CERTIFICATE**, provided together with the machine. We suggest reading it carefully.

DISPOSAL INSTRUCTIONS



For disposal methods, refer to the local laws in force relating to special waste.

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In the manual, the following symbols are used:



WARNING = operations requiring **APPROPRIATE CARE** and **PREPARATION**



FORBIDDEN = operations that **MUST NOT** be performed, in any case

GENERAL WARNINGS

This manual is an integral part of the machine, therefore it should always be carefully kept and it should always be provided together with the machine, if it is transferred to another owner or user. In case of damage or loss of this booklet, request another copy from your local Technical Assistance Service or Manufacturer.

The installation of the unit should be performed by a qualified company that, at the end of the work, must give the owner a declaration of conformity of the installation, performed according to the book, that is in compliance with the National and Local Standards in force and the instructions provided in this instruction booklet.

The heaters have been manufactured for room heating and they must be used for this purpose, compatibly with their performance characteristics.

Any contractual or extra-contract liability of the Producer in respect of damages caused to people, animal or things by an incorrect installation, setting or maintenance or by the improper use of the machine is excluded.

If the temperature is too high, it might harm people's health and it is a pointless waste of energy.

Do not leave the rooms closed for a long time. Periodically open the windows to ensure proper ventilation.

During the initial start-up, there may be the formation of odours and fumes due to the evaporation of any liquid added to protect the heat exchanger during storage; this is normal and it will disappear after a short period. It is recommended to suitably ventilate the room.

If you will not be using the unit for long periods, carry out the following operations:

- turn the main switch of the unit and the general switch of the plant to "OFF";
- close the main fuel supply valve.

In case of long periods during which the unit is not operated, it is recommended to contact either After-Sales Technical Assistance Service or anyhow professionally qualified personnel for its new start-up.

The unit shall be fitted only with original accessory. The manufacturer shall not be held responsible for any damage deriving from improper use of the unit or from the use of non-original materials and accessories.

References to Laws, Regulations, Directives and Technical Rules mentioned in this manual are provided only for information purposes and as they are in force when the manual is printed. The coming into force of new regulations or of changes to the current ones shall not generate a Manufacturer's duty towards third persons.

Repairs or maintenance must be performed by the Technical Assistance Service or by qualified personnel in accordance with this manual. Do not modify or tamper with the unit as dangerous situations can be created and the manufacturer will not be liable for any damage caused.

The systems that are to be carried out (gas pipes, power supply, etc.) must be suitable secured and must not be dangerous with the risk of tripping.

The Producer is responsible for the product compliance with Laws, Directives or Construction Rules in force when the product is marketed. The knowledge and observance of the laws and standards regarding plant design, installation, operation and maintenance are the sole responsibility of the designer, installer and user.

The Producer shall not be held responsible for failure to comply with the instructions of this manual, for the consequences of any operations carried out and not specifically provided for or for translations open to misinterpretation.

An operation with variable thermal capacity is provided also in condensate regime of the combustion products.

This unit must be installed according to the Standards in force and it must be used only in a sufficiently ventilated room. Read the instructions before installing and using this unit.

MAIN SAFETY RULES



Bear in mind that if you use products powered through electric power, gas, diesel, etc., you should comply with some basic rules, such as:

- This unit cannot be used by people (including children) with reduced physical, sensory or mental abilities or lack of experience and knowledge, unless they are supervised or trained on the use of the unit by the person who is responsible for its safety.
- Do not touch the unit barefoot or when parts of the body are wet or damp.
- Do not wash the heater with water or other liquids.
- The exhaust duct should not be touched, since during normal operations it might reach high temperatures, being therefore dangerous to be touched.
- No object should be placed over the machine nor inserted through its case grill or through the combustion product exhaust ducts.
- The warm air heater should not be installed outside and it should not be directly exposed to bad weather.
- The warm air heater shall not be directly installed in small areas lacking proper ventilation, since the air intake might cause a remarkable depression within the room, causing serious problems.
- Do not install the unit near flammable material, or in rooms with an aggressive atmosphere.
- Do not operate electrical devices such as switches, electrical appliances, etc. if you can smell fuel.
 - In this case:
 - open the doors and windows to aerate the room;
 - close the fuel control device;
 - call in quickly the After Sales Service or other professionally qualified personnel.
- Do not clean or perform maintenance before disconnecting the unit from the electrical power supply by turning the main switch of the system to "OFF", and shutting-off the fuel.
- Do not modify the safety or adjustment systems without authorization and the instructions of the manufacturer of the unit.
- Do not open the access doors to the inside of the unit, without turning the main switch of the unit to "OFF".
- Do not use adaptors, power strips and extension cables for the electrical connection of the unit.
- Do not install the unit beyond the limits of use and operation shown in the instruction manual.
- Do not pull, disconnect and twist the electrical cables coming from the unit, even if it is disconnected from the electrical power supply.
- Do not dispose of, abandon or leave within the reach of children, the packaging materials (cardboard, staples, plastic bags, etc.), as they may be potentially dangerous.
- Do not distribute the product in different countries from the one for which it was designed since the documents and preparation must be modified.
- Do not keep the documentation inside the unit as a potential fire and/or obstruction danger of the air passage might occur.

IDENTIFICATION

The units can be identified by means:

- the **technical plate**, applied on the unit, specifying the main technical-performance data;
- the **packaging label**, applied on the outside of the unit.



WARNING

In case of damage or loss, request a duplicate of the technical **data plate** from Technical Assistance.

ACCESSORIES

Specific accessories are available upon request. To install them, follow the instructions included in the relevant package.



WARNING

Auxiliary devices, kits and accessories should only be original products.

RECEIVING THE PRODUCT

The unit is delivered with:

- Document envelope including:
 - Installation and maintenance user manual;
 - Warranty certificate;
 - Gas conversion kit;
 - Label with barcode;
- Condensate drain syphon.

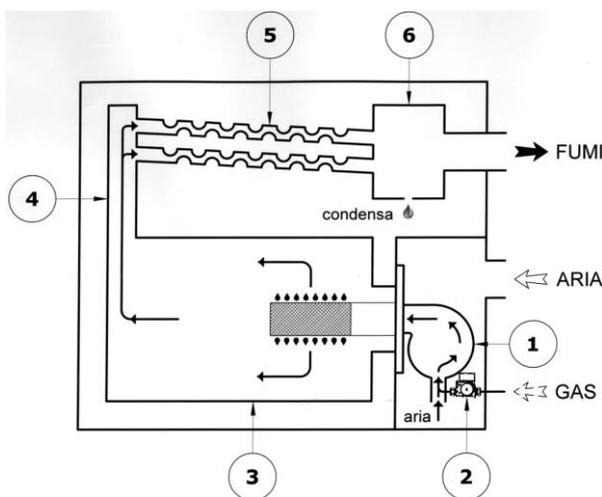
OPERATING PRINCIPLE DIAGRAM

The fan of the premixed gas burner (1) intakes the optimal fuel gas and combustion air mixture; the right quantities are guaranteed by the dedicated mixer and gas solenoid valve (2).

Inside the feed screw of the fan of the premixed burner (1) a subsequent mixture of the fuel with the combustion air occurs; this mixture is then immersed in the burner tubular. On the external surfaces of the burner tubular, a radial evolution flame is formed.

Before being expelled by means of the flue system connection, the combustion products overheat the combustion chamber (3), the rear smoke manifold (4), the smoke pipes (5) and the front smoke manifold (6).

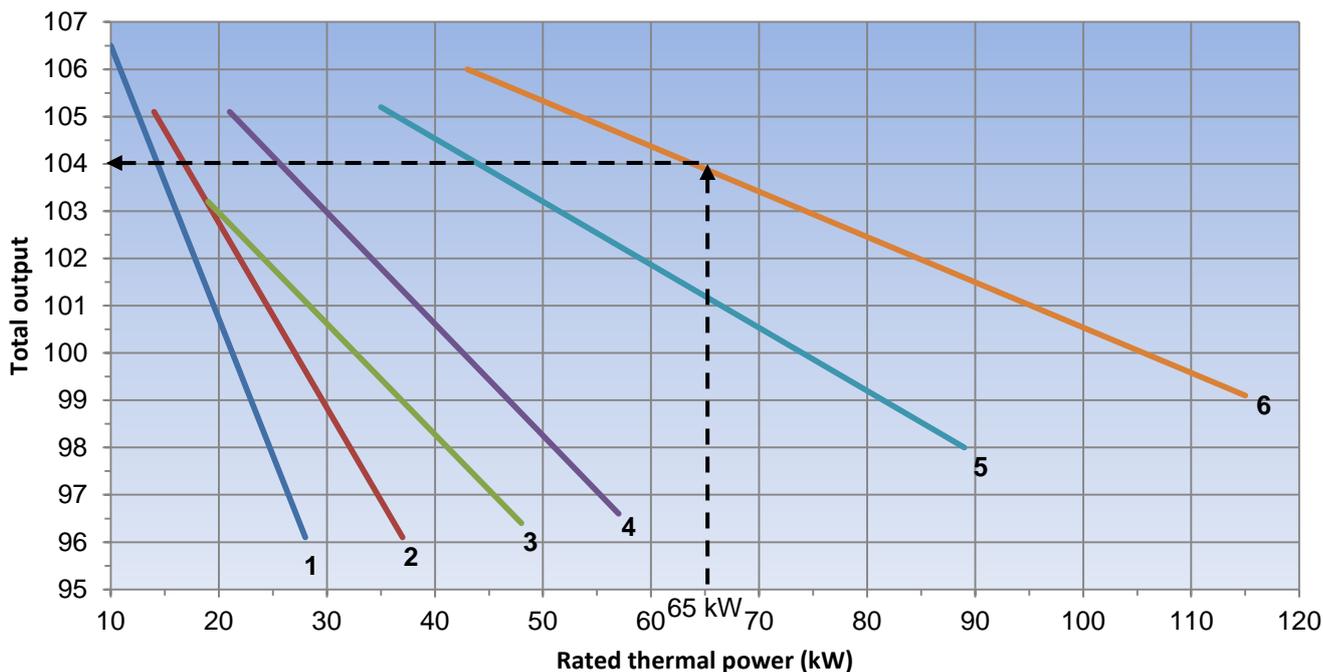
The temperature of the combustion products while passing through the smoke pipes (5) is lowered under the dew point recovering the latent energy from the water vapour normally generated during a combustion process. The condensation produced is collected in the rear flue collector (6) and released outside.



PERFORMANCES

The modulating warm air heater was designed for heating industrial and commercial environments. The unit is characterised by operation with variable thermal capacity and continuous modulation, controlled automatically by a remote control panel with integrated or remote environment temperature probe. Thus, a quick pre-heating of the environment to treat and a subsequent maintenance at the desired temperature without oscillations and with a maximum operation economy are ensured.

Thanks to the continuous modulation of the thermal capacity, as the demand for heat from the environment decreases, the warm air heater reaches efficiency values up to 104% consuming less gas. A graph presenting the relation between the supplied thermal power and the total output for all six types of unit is provided below.



Example of the reading the graph above:

During the operation at a thermal power of **65 kW**, the total output of the TYPE 6 unit is about 104%.

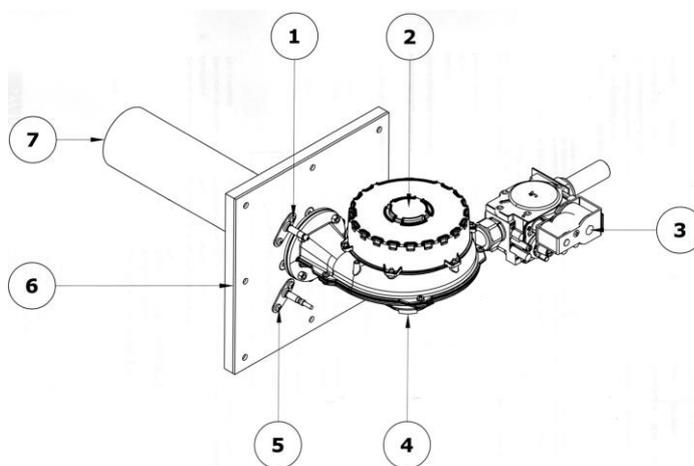
PREMIXED GAS BURNER

The thermal power of the premixed burner is of the modulating type and with a high adjustment range (from 100% to 30%). The gas valve delivers the fuel in relation with the combustion air flow rate according to a default factory setting. The carbon dioxide concentration (CO₂), contrary to the atmosphere type burners, remains almost constant in the entire work field, allowing the increase of the output by reducing the supplied thermal power. A perfect mixing of the fuel gas with the combustion air combined with a semi-radiant flame, contributes to obtain a hygienic combustion with very low emissions of carbon monoxide (CO) and nitrogen oxides (NO_x).

In case of reduction of the combustion air (e.g. obstructions and/or friction losses of the smoke exhaust and combustion air suction pipes), the solenoid valve automatically reduces the gas maintaining the combustion parameters at optimal levels. In case of insufficient combustion air, the solenoid valve closes and no longer supplies gas.

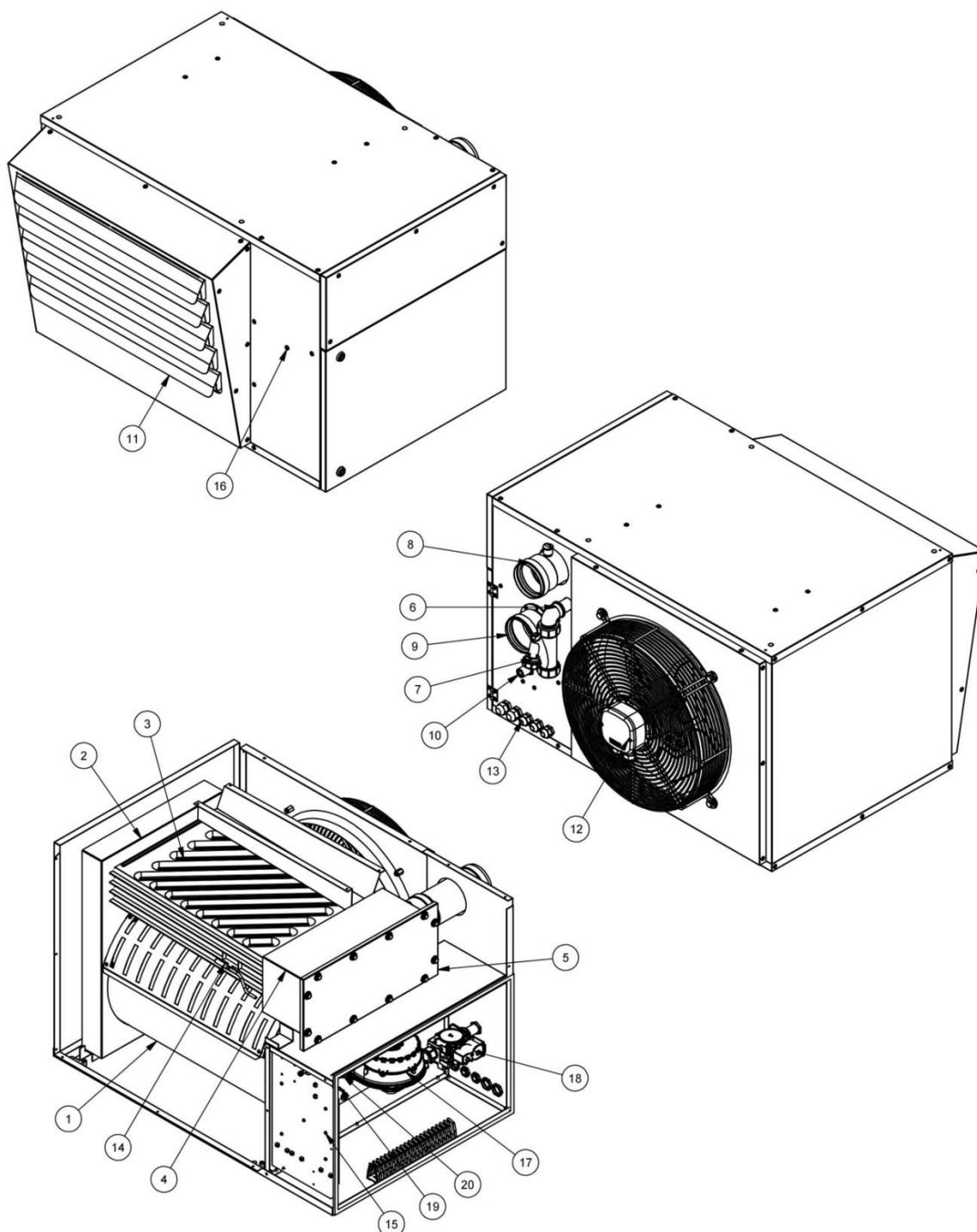
The drawing represents the type 3.

- 1. Ignition electrode.
- 2. DC Brushless fan
- 3. Gas-air control gas solenoid valve.
- 4. Mixer.
- 5. Ionization electrode.
- 6. Burner plate with thermal insulation.
- 7. Tubular coated with metal fibre mesh.



IDENTIFICATION OF MAIN COMPONENTS

The drawing represents the type 3



- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Combustion chamber. 2. Rear smoke manifold. 3. Smoke pipes. 4. Front smoke manifold. 5. Front smoke manifold inspection door 6. Condensate drainage connector. 7. Condensate drain syphon. 8. Smoke exhaust connection with smoke analysis socket. 9. Combustion intake air spigot. 10. Gas inlet connection. | <ol style="list-style-type: none"> 11. Installation panel with adjustable wings. 12. Helical fan. 13. Cable grips. 14. Multifunction temperature probe. 15. Circuit board. 16. Multifunction indicator light. 17. Premixed burner fan. 18. Gas solenoid valve. 19. Ignition electrode. 20. Ionization electrode. |
|---|--|

TECHNICAL SPECIFICATIONS

DESCRIPTION	Unit	TYPE 1		TYPE 2		TYPE 3	
		Max	Min	Max	Min	Max	Min
Thermal capacity ¹ (burned)	kW	29.1	9.4	38.5	13.3	49.8	18.4
	kcal/h	25,057	8,075	33,111	11,456	42,822	15,833
Heat capacity ¹ (net)	kW	28.0	10.0	37.0	14.0	48.0	19.0
	kcal/h	24,080	8,600	31,820	12,040	41,280	16,340
Total yield ²	%	96.1	106.5	96.1	105.1	96.4	103.2
Condensation produced ³	l/h	0.2	1.0	0.1	1.5	0.3	1.5
Air flow rate	m ³ /h	3,200		4,400		5,500	
Air thermal difference (Δt)	°K	26	9	25	9	26	10
Available smoke exhaust press. ⁴	mbar	10		19		11	
Class NOx ⁵		5	5	5	5	5	5
Limits of use							
temperature	°C	-15/+40					
relative humidity non condensing	%	75					
Unit type		B ₂₃ – C ₁₃ – C ₃₃ – C ₆₃					
Category		Please see the unit name plate					
Country of destination		Please see the unit name plate					
Certification	P.I.N.	Please see the unit name plate					
Electrical power supply	V/Hz	Single-phase 230/50/1		Single-phase 230/50/1		Single-phase 230/50/1	
Electric protection degree							
warm air heater	IP	40					
helical fan	IP	54		54		54	
Helical fan							
quantity	No.	1		1		2	
polarity	No.	4		4		4	
total electrical current	A	0.82		1.4		1.64	
total electrical power	kW	0.17		0.31		0.34	
condenser	microF	6.3		8.0		6.3	
Sound emission							
Sound pressure (Lp) ⁶	dB(A)	53		55		56	
Air delivery ⁷	m	20		28		32	
Max.instantaneous consumption ¹							
Methane G20	Nm ³ /h	3.1	1.0	4.1	1.4	5.3	1.9
Methane G25	Nm ³ /h	3.6	1.2	4.7	1.6	6.1	2.3
Propane G31	Nm ³ /h	1.2	0.4	1.6	0.5	2.0	0.8

- 1) G20 methane gas Hi = 34.02 MJ/Nm³
Methane gas G25: Hi = 29.25 MJ/Nm³
Propane gas G31: Hi = 88.00 MJ/Nm³

- 2) Referred to lower heat power (Hi) with latent vaporization heat recovery.
3) Indicative variable value depending on the environmental conditions.
4) Maximum pressure available at the max. thermal capacity before the stop of the burner.
5) Reference Standard UNI EN 1020 with methane gas G20.
6) Measured in free field at a distance of 6 metres.
7) Referred to air temperature +20°C – residual speed 0.2 m/s.

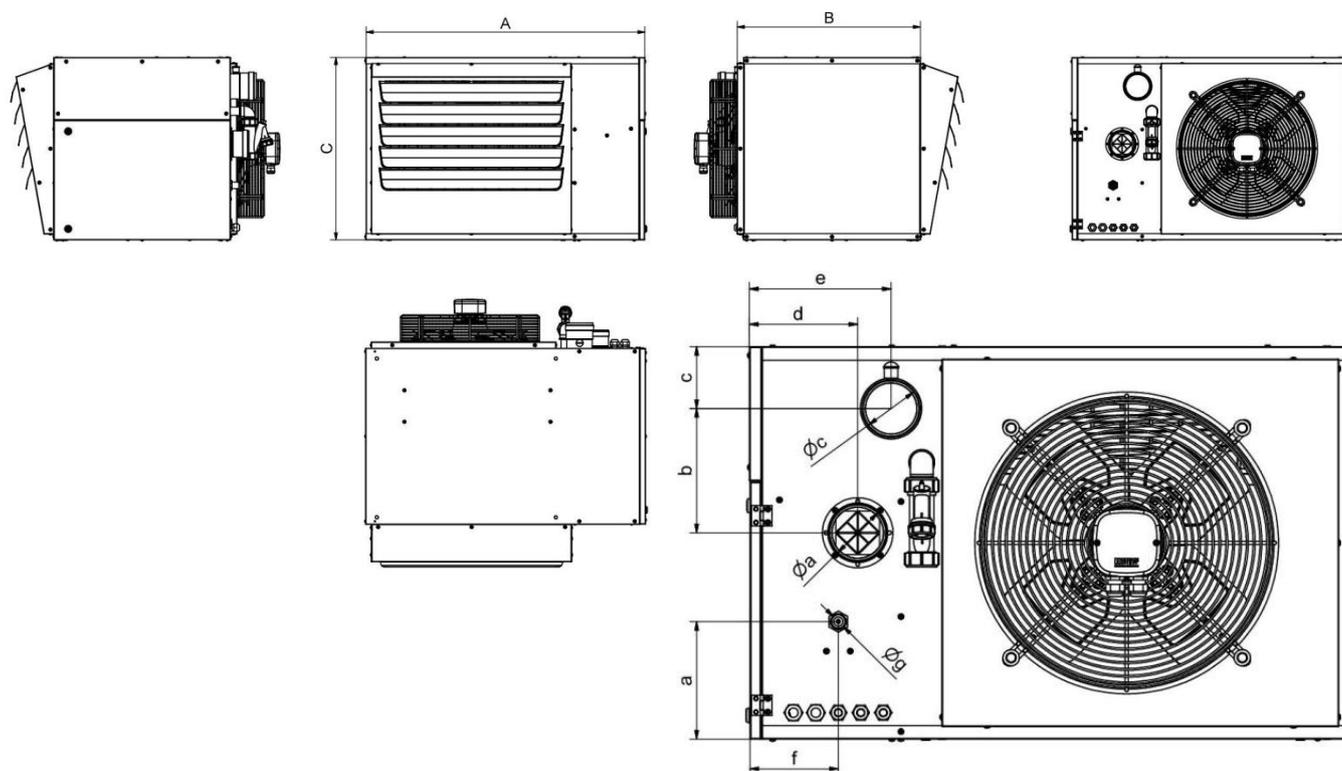
DESCRIPTION	Unit	TYPE 4		TYPE 5		TYPE 6	
		Max	Min	Max	Min	Max	Min
Thermal capacity ¹ (burned)	kW	59.0	20.0	90.8	33.3	116.0	40.6
	kcal/h	50,745	17,184	78,102	28,612	99,760	34,887
Heat capacity ¹ (net)	kW	57.0	21.0	89.0	35.0	115.0	43.0
	kcal/h	49,020	18,060	76,540	30,100	98,900	36,980
Total yield ²	%	96.6	105.1	98.0	105.2	99.1	106.0
Condensation produced ³	l/h	0.2	1.6	1.9	3.8	2.7	4.3
Air flow rate	m ³ /h	6,500		10,000		13,000	
Air thermal difference (Δt)	°K	26	10	26	10	26	10
Available smoke exhaust press. ⁴	Pa	14		11		17	
Class NOx ⁵		5	5	5	5	5	5
Limits of use							
temperature	°C	-15/+40					
relative humidity non condensing	%	75					
Unit type		B ₂₃ – C ₁₃ – C ₃₃ – C ₆₃					
Category		Please see the unit name plate					
Country of destination		Please see the unit name plate					
Certification	P.I.N.	Please see the unit name plate					
Electrical power supply	V/Hz	Single-phase 230/50/1		Single-phase 230/50/1		Three-phase 400/50/3N	
Electric protection degree							
warm air heater	IP	40					
helical fan	IP	54		54		54	
Helical fan							
quantity	No.	2		2		2	
polarity	No.	4		6		6	
total electrical current	A	1.8		3.0		1.84	
total electrical power	kW	0.4		0.66		0.74	
condenser	microF	6.3		6.3		-	
Sound emission							
Sound pressure (Lp) ⁶	dB(A)	57		56		60	
Air delivery ⁷	m	35		39		42	
Max.instantaneous consumption ¹							
Methane G20	Nm ³ /h	6.2	2.1	9.6	3.5	12.3	4.3
Methane G25	Nm ³ /h	7.3	2.5	11.2	4.1	14.3	5.0
Propane G31	Nm ³ /h	2.4	0.8	3.7	1.4	4.7	1.7

- 1) G20 methane gas: Hi = 34.02 MJ/Nm³
Methane gas G25: Hi = 29.25 MJ/Nm³
Propane gas G31: Hi = 88.00 MJ/Nm³

- 2) Referred to lower heat power (Hi) with latent vaporization heat recovery.
3) Indicative variable value depending on the environmental conditions.
4) Maximum pressure available at the max. thermal capacity before the stop of the burner.
5) Reference Standard UNI EN 1020 with methane gas G20.
6) Measured in free field at a distance of 6 metres.
7) Referred to air temperature +20°C – residual speed 0.2 m/s.

DIMENSIONS AND WEIGHT

The drawing represents the type 2



Dimensions and weight table:

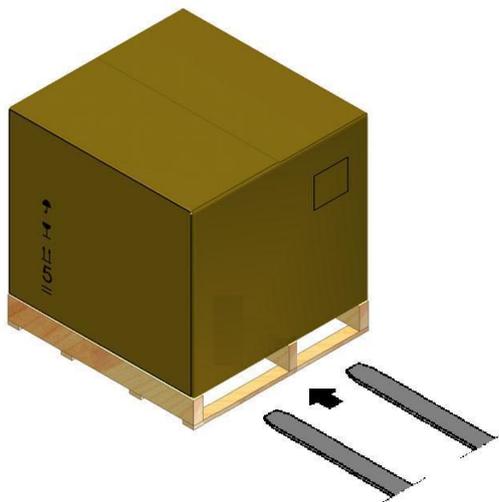
TYPE	Unit	1	2	3	4	5	6
A	mm	882	882	1,225	1,225	1,775	1,775
B	mm	580	580	630	630	710	710
C	mm	580	580	650	650	800	800
a	mm	174	174	199	199	198	198
b	mm	183	183	185	185	190	190
c	mm	91	91	121	121	231	231
d	mm	158	158	113	113	117	117
e	mm	208	208	159	159	142	142
f	mm	129	129	129	129	110	110
Ø c (stack) female	mm	80	80	80	80	100	100
Ø a (air intake) female	mm	80	80	80	80	100	100
Ø g (fuel gas) male	inch	1/2 G	1/2 G	1/2 G	1/2 G	3/4 G	3/4 G
NET WEIGHT	kg	65	75	90	95	205	215

INSTALLATION INSTRUCTIONS

The installation and adjustment instructions of the heater are reserved only to qualified personnel. Read the safety warnings.

TRANSPORTATION AND HANDLING

The warm air heater is delivered placed and fixed on a wood pallet and covered with an adequately fixed cardboard box. Handling must be done by properly equipped personnel and with devices fit for the unit weight. If a fork-lift is used, pitchfork the machine in the lower part using the appropriate ways in the wood bedplate.



WARNING!!!

Shipping and handling must be carried out with extreme care, so as to avoid damage to the unit and danger to the people involved.

After unpacking the product, check its integrity and wholeness. Otherwise, contact the Agency that sold the unit.

During transportation and handling, it is forbidden to stand near the unit.

Use forklift forks with a minimum length equal to the width of the machine.

Should it be necessary to place more than one unit on top of each other, observe the index indicated on the packaging itself and be very careful when aligning the packages so as not to create unstable stacks.

If the unit needs to be handled manually, make sure that there is enough workforce available in proportion with the weight indicated in the section "**Dimensions and weight**" and depending on the distance to cover.

It is recommended that you use personal protective equipment.

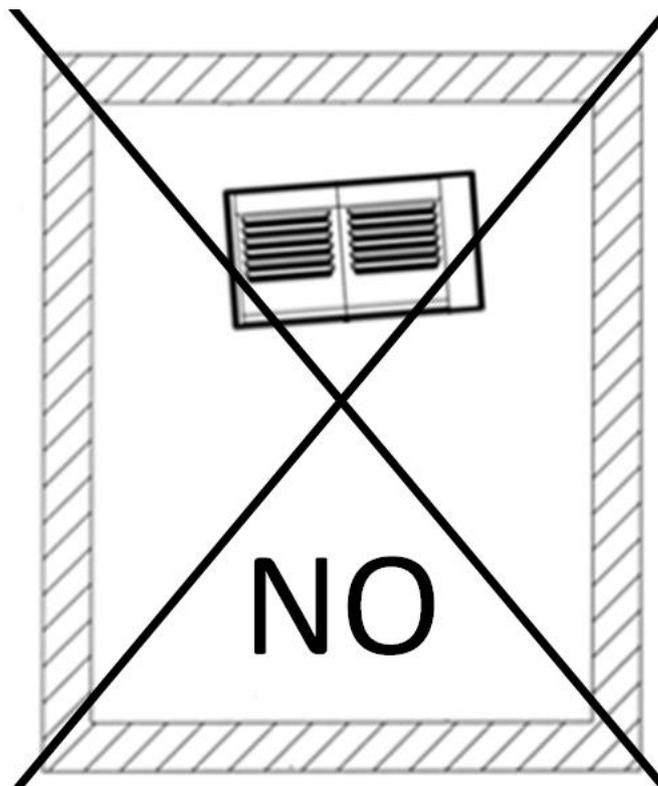
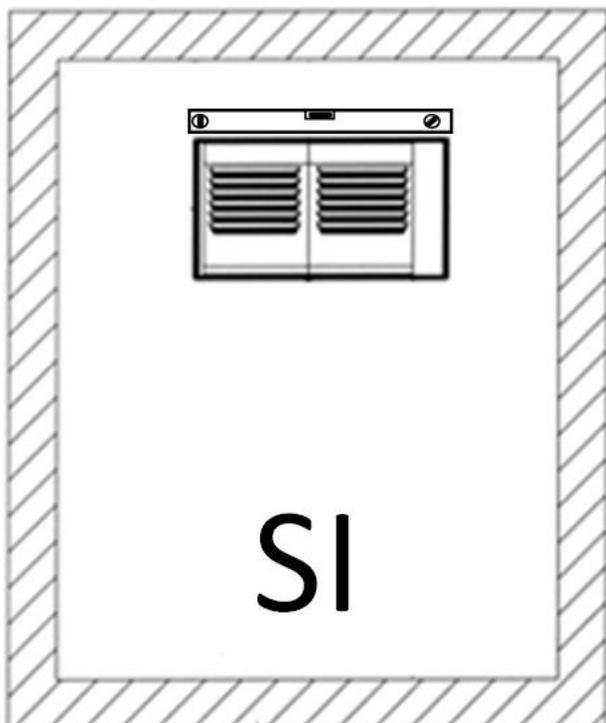
INSTALLATION PLACE

The location for the unit must be determined by the system designer or a competent person and it must take into account the technical requirements and the standards and regulations in force; generally, special permissions need to be obtained. (e.g.: regulations concerning zoning, architecture, fires, environmental pollution, noise emission, etc.)

It is therefore advisable, before installing the unit, to request and obtain the necessary permissions.

**WARNING!!!**

IT IS VERY IMPORTANT TO PLACE THE UNIT ON A LEVELLED SURFACE.



To properly install the machine, bear in mind that the heaters should:

- respect the distances in order to allow for a correct flow of air and normal cleaning, control and maintenance operations;
- maintain the safety distances from flammable material;
- be easily connectible to the stack;
- be easily connectible to any combustion air intake duct;
- be easily connectible to the gas distribution network;
- easily evacuate condensation;
- be close to an electric socket;
- allow for all maintenance operations and inspections to be carried out easily;
- be fitted with the ventilation openings required by the relevant regulations;

It is also necessary to make sure that:

- the combustion gas flow and pressure are compatible with the layout of the unit and with the data from the section "**Technical specifications**" and "**Gas categories**";
- the range of the temperatures of use varies between -15 and +40°C.

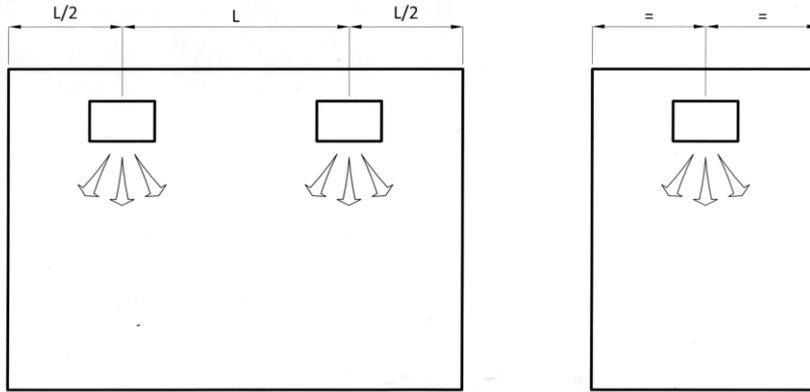


It is forbidden to install it:

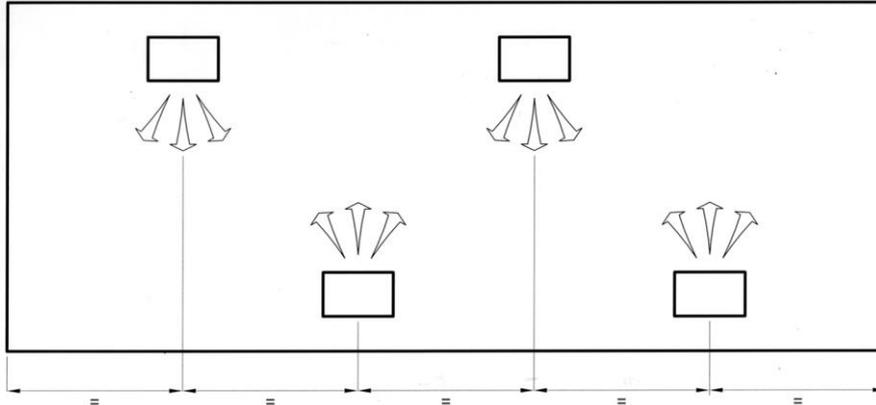
- in places where there are aggressive atmospheres;
- in narrow places where the noise created by the generator could be amplified by reverb or resonance;
- in corners where there is a deposit of dust, leaves and anything that may reduce the efficiency of the unit by blocking the air passage.
- in pressurized places;
- in depressurized places;
- outdoors, if not provided with a protection against bad weather conditions.

The warm air heater is fitted with a helical fan, thus it is not fit to be connected to sewage systems. For special requirements, consult the Manufacturer.

Example of positioning in small and medium rooms:



Example of positioning in a large room/area:



SAFETY AREA

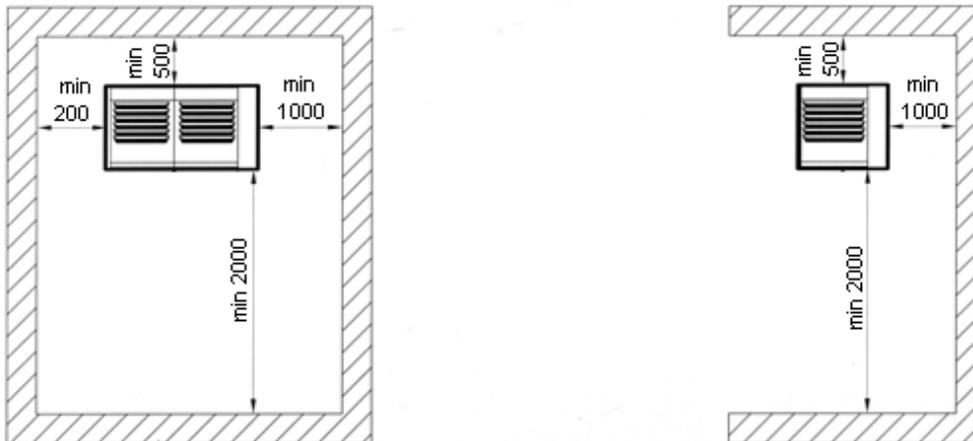
The unit must be easily and safely accessible without the need for special equipment. Around the unit it is also necessary to respect the minimum distances to allow normal control and/or maintenance operations and not to create obstacles to the flow of air.



WARNING!!!

Any restrictions deriving from specific Laws and regulations must also be observed (for example regarding fires). Refer to the designer of the system.

Installation height and minimum distances between the walls and the ceiling:



FIXED PROTECTIONS

In order to avoid the accidental contact with the movable parts of the machine, check if the following fixed protections have been properly installed:

- Grill – fan network.
- Access door(s) to the burner unit and the electric panel.

FUEL CONNECTION

The connection of the heater to the gas supply, both methane G20 and G25 and propane gas G31, must be performed in accordance with the installation regulations by a qualified person. The warm air heater is delivered tested and pre-set for operation with methane gas H (G20) and it comes with a kit for conversion to methane gas (G25) and propane gas (G31).

Before connecting the heater it is necessary to make sure that.:

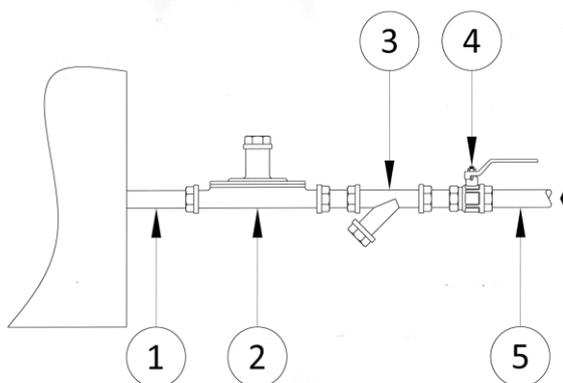
- the type of gas is the one the unit is designed for;
- the pipes have been thoroughly cleaned and vented;
- the size of the distribution network is correct, so as to ensure the proper flow, according to the section "**Technical specifications**" and pressure of the fuel, in accordance with the section "**Gas categories**";
- the gas supply pipe is of a size equal to or greater than the connection pipe of the unit.



WARNING!!!

Once the installation has been completed, check that the connections are sealed, in accordance with the installation regulations.

Gas Installation:



1. **Male threaded connection** of the unit.
2. **Pressure stabilizer*** (necessary to ensure the correct supply pressure of the fuel gas). This component is not essential in the case of methane gas G20 distribution networks with a stable nominal pressure.
3. **Filter*** (necessary to prevent impurities that may be present in the gas line from reaching the unit and to allow for simple maintenance and inspections).
4. **Manual shutter*** (necessary to isolate the unit during maintenance operations or for prolonged periods of inactivity).
5. Gas line **duct***

(*) Not included when the unit is to be installed by the Customer.

As far as gas burners are concerned, we suggest placing a leak detector near them, which will operate an electro valve that will stop the gas supply in case of any accidental leak.

The gas supply line should be constructed by a skilled and qualified person, in compliance with all the relevant Laws, Regulations and Rules. Refer to the designer of the system.

For supply with propane gas G31 it is recommended to install the first pressure reducer near the liquid gas tank to reduce the pressure to 1.5 bar and the second pressure reducer near the heater but outside the building in order to bring the pressure from 1.5 bar to 40 mbar **as requested by the applicable standard**. A third reducer, installed in proximity of the unit, will assure the proper supply pressure.

For high fuel flows, contact the supplier of the tank to see if it is necessary to mount a vaporizer.

To prevent problems that may occur while emptying the tank (soot or failure to start), it is advisable to mount a pressure switch.

GAS CATEGORIES

The unit is certified in EU countries and in the countries that will soon enter the EU, according to the gas categories shown below:

COUNTRY	CATEGORY	TYPE OF GAS AND PRESSURE (mbar)						
		G20		G25		G31		
		20	25	20	25	30	37	50
AL, LT, TR, GR, MK, SI	II _{2H3P}	●					●	
DK, EE, NO, SE	II _{2H3B/P}	●						
AT	II _{2H3P}	●						●
DE	II _{2E3B/P}	●						●
PL	I _{2E3B/P}	●					●	
FR	II _{2E+3+}	●	●	●	●		●	
HU	II _{2HS3B/P}		●					
PT	II _{2H3+}	●					●	
CZ	II _{2H3+}	●				●		
IT, ES	II _{2H3P}	●					●	
GB ^a , IE, HR	II _{2H3P}	●					●	
LU	II _{2E3P}	●						
FI, RO	II _{2H3P}	●				●		
CH	II _{2H3P}	●					●	●
NL	II _{2L3B/P}				●	●	●	●
SK	II _{2H3P}	●					●	●
IS	I _{3P}						●	
LV	I _{2H}	●						
BE	I _{2E+}	●			●			
	I ₃₊						●	

^a For non-residential applications: G20 - 17.5 mbar.

CONDENSATE DRAIN SYPHON

To prevent the leakage of combustion products through the condensate drain and the return of fumes from the sewer system, the heater is fitted with a syphon with internal floater.



WARNING!!!

The condensate disposal system must be made in compliance with the European, National and Local Reference Standards, verifying the need for a neutralization treatment if necessary.



WARNING!!!

While starting-up for the first time, fill the container of the condensate drain syphon with water.

**WARNING!!!**

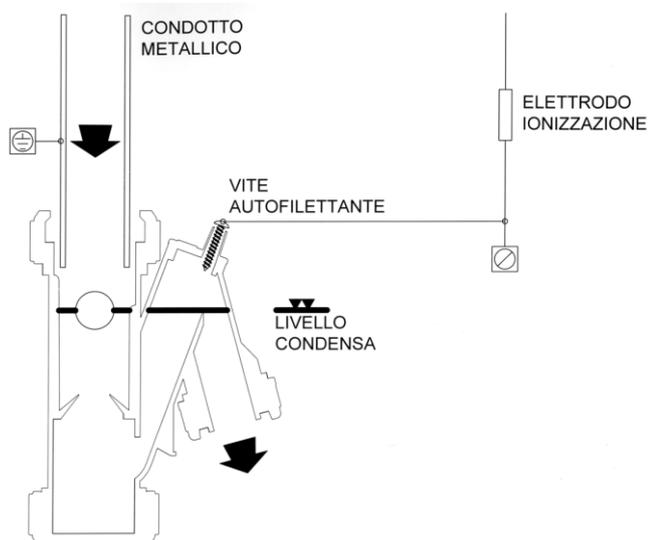
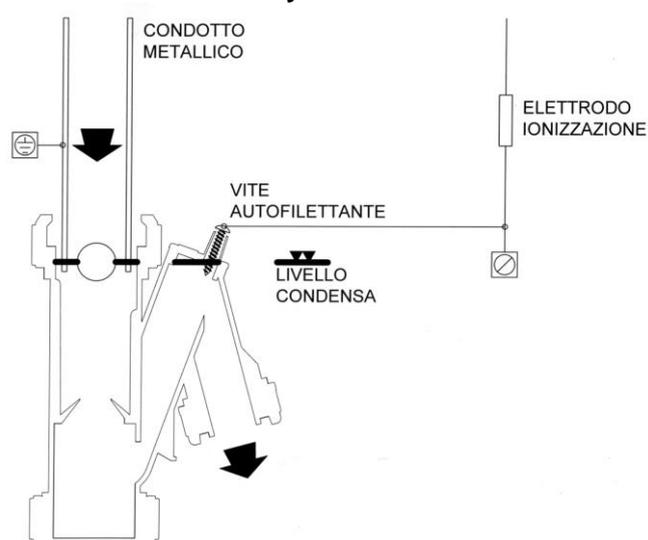
An inadequate drain compromises the correct operation of the unit. Take into account the following points:

- The condensate disposal system, including the syphon, must be **protected adequately so that the condensate from the circuit does not freeze**. It is recommended to perform a condensate collection system inside the heated areas.
- The total weight of the condensate drain system must not weigh on the unit, and must be suitably and separately mounted.
- The condensate drain system must be inclined suitably. It is forbidden to install pipes that are levelled and/or not inclined;
- All the condensate drain pipes should be connected independently, avoiding their convoy.
- The configuration of the condensate discharge system must allow for the easy removal of the various inspection panels.
- The condensate discharge system must be easily removable, for any inspection and/or maintenance operations.
- For the size of the condensate drain system, as a reference, consider what is indicated in Standard UNI EN 1196, section 6.6.1:
 - for natural gas 2 l/h of water per m³/h of natural gas.
 - for propane gas 3 l/h of water per m³/h of propane gas.
 - for butane gas 4 l/h of water per m³/h of butane gas.

For the connection of the syphon to the condensate disposal system, use a PVC or silicone tube. It is recommended to perform the pipework composing the condensate disposal system with pipes of an internal diameter not lower than 20 mm.

Under normal operation conditions, the syphon condensate level does not reach the level of the self-tapping screw placed adequately and the warm air heater operates regularly.

In case of accidental obstruction of the drain network, the condensate level rises in order to reach the self-tapping screw placed adequately. In this condition, the ionisation electrode is grounded and the burner turns off immediately. The manual re-start-up occurs only when the correct operating conditions are resumed.

Normal operating condition:**Operating condition with accidental obstruction of the condensate drain system:**

ELECTRICAL CONNECTIONS

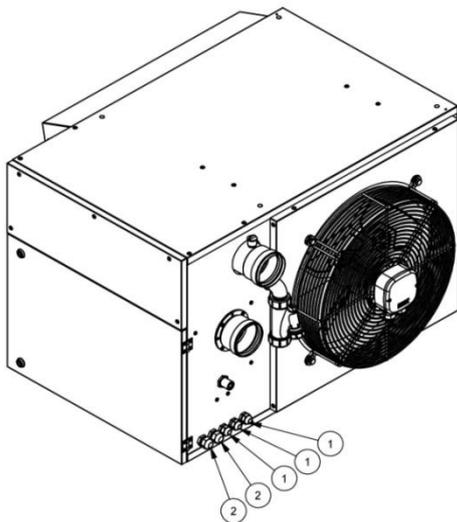
The electrical connections must be made by qualified personnel in compliance with the Regulations in force, using the terminal boards supplied. For any electrical work, refer to the electrical wiring diagrams included in this booklet.



WARNING!!!

- Install upstream of the unit a differential magneto thermal circuit breaker suitably sized according to the regulations in force.
- Always connect the earthing system, taking care to leave the earth wire slightly longer than the other wires, so that, in case of accidental pulling, the latter is the last one to be removed.
- Get qualified personnel to check that the section of the cables and the electrical system are suitable for the maximum power absorbed by the unit indicated on the information plate.
- The unit must be connected to an efficient earthing system. The manufacturer shall not be held responsible for any damage caused by failure to earth the unit.
- The electrical cables must be positioned so as not to come into contact with hot and/or cold surfaces, or with sharp edges.
- In accordance with the Standards regarding the installation of electrical components, a device that ensures disconnection from the mains with an opening distance between contacts that guarantees complete disconnection in overvoltage conditions III (Standard EN 60335-1) must be included.
- It is forbidden to use water pipes or gas pipes to earth the unit.
- Use appropriate cable glands for the power cables and control cables of the unit.

The warm air heaters leave the factory with the electric panel mounted, wired and they require a connection to the electric power supply of the multifunction electronic board and of the remote control board (one or several warm air heaters in parallel).



1. Cable grips PG 9 (remote control board)
2. Cable grips 13.5 (general power supply/multifunction electronic board)

INSTRUCTIONS:

1. Pose the connection cables to the remote control board using the adequate cable grip PG9 ①
2. Pose the electric power supply cables using the adequate cable grip PG13.5 ②
3. Connect the electric cables:
 - to the connection terminal boards of the multifunction electronic board strictly observing the electric diagram from the reference section for the types 1, 2, 3, 4 and 5.
 - to the connection terminal boards as shown in the electric diagram from the reference section for type 6.

It is preferable to observe the phase-neutral polarity.



For Type 6, the power supply is three-phase. Pose the cable using the cable grip PG13,5 and connect to the adequate connection terminal board of the electric power supply.

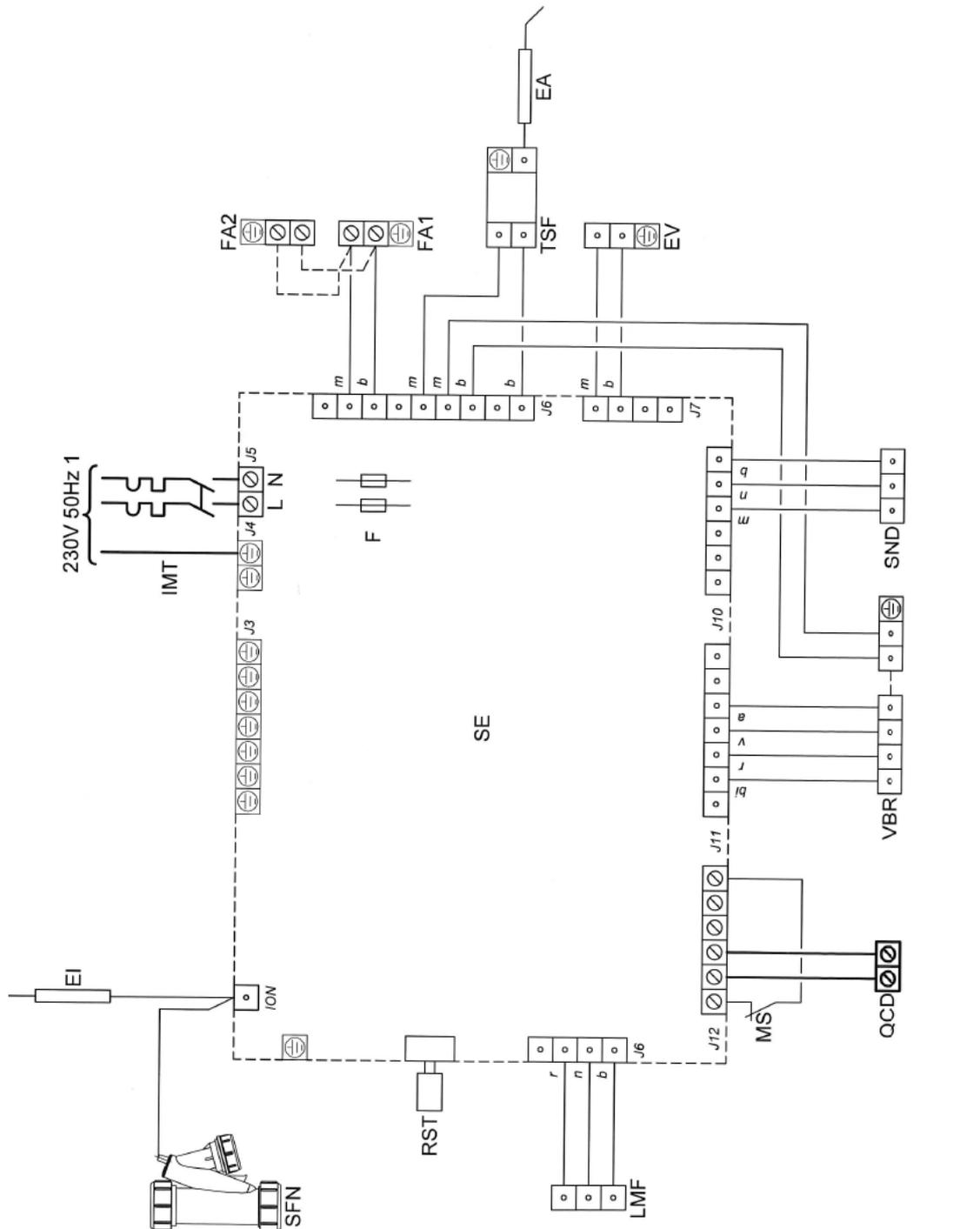


Observe the applicable national and European standards (e.g. EN60335-2/prEN50165) on electrical safety. Before starting the device, check the cables; incorrect wiring may damage the devices and compromise the safety of the system.

WIRING DIAGRAMS

An easily readable paper copy of the wiring diagram is placed in the electric panel and it is an integral part of this manual. We recommend keeping it carefully together with the other documents.

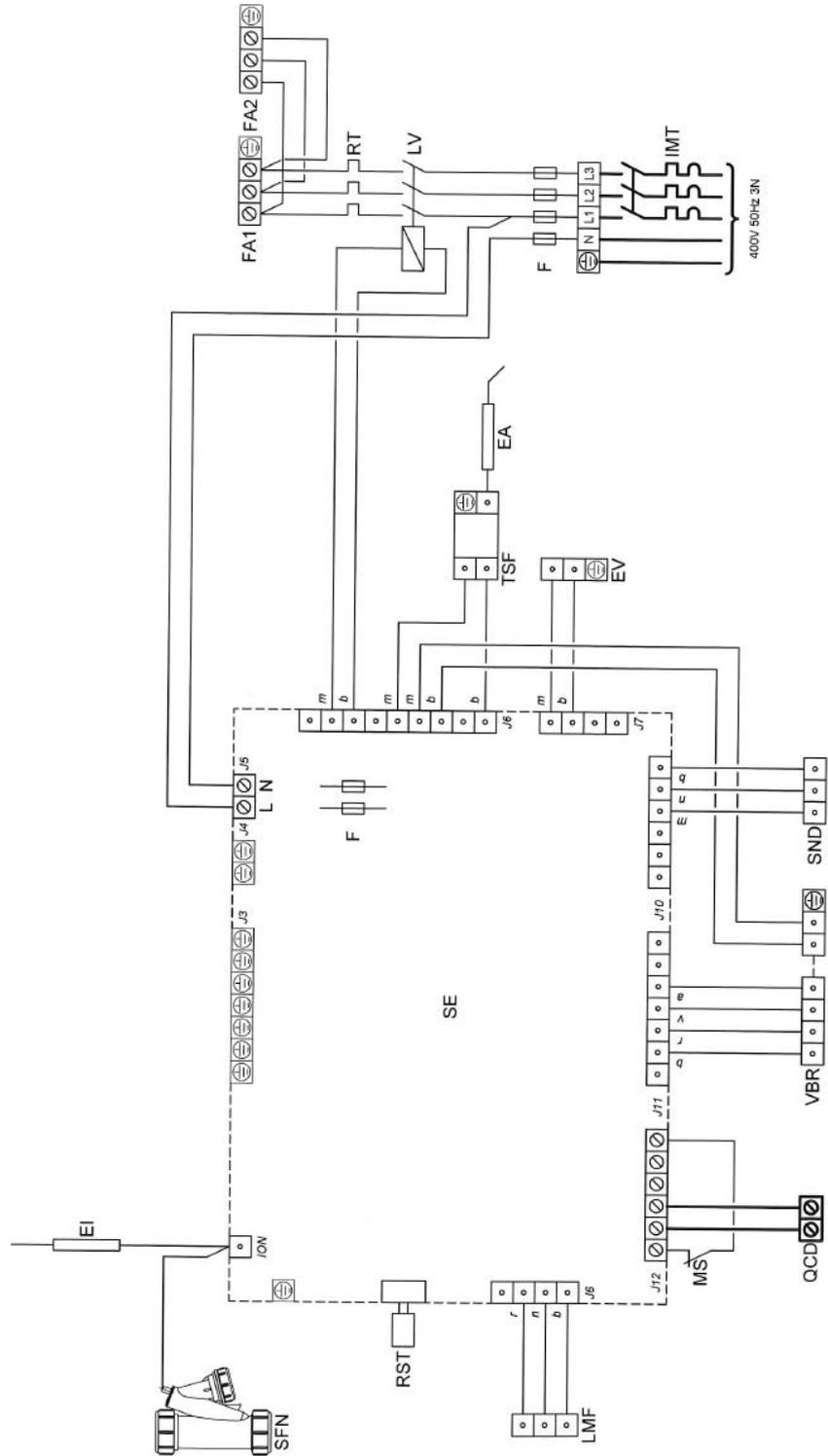
MONOPHASE POWER SUPPLY - TYPES 1-2-3-4-5



- RST** RESET BUTTON
- F** FUSES
- SFN** CONDENSATE DRAIN SYPHON
- SE** WIRING DIAGRAM
- FA1** FAN 1
- FA2** FAN 2 (IF PRESENT)
- TSF** IGNITION TRANSFORMER
- EI** IONIZATION ELECTRODE

- EA** IGNITION ELECTRODE
- EV** GAS SOLENOID VALVE (EV1 + EV2)
- SND** TEMPERATURE PROBE
- VBR** BURNER FAN
- LMF** MULTIFUNCTION LED
- MS** FIRE DAMPER BRIDGE
- IMT^(*)** MAGNETO THERMAL SWITCH
- QCD^(*)** REMOTE CONTROL BOARD
- ^(*) OUTSIDE THE UNIT

THREE-PHASE POWER SUPPLY - TYPE 6



- RT** THERMAL RELAY
- LV** FAN CONTACTOR
- RST** RESET BUTTON
- F** FUSES
- SFN** CONDENSATE DRAIN SYPHON
- SE** WIRING DIAGRAM
- FA1** FAN 1
- FA2** FAN 2
- TSF** IGNITION TRANSFORMER
- EI** IONIZATION ELECTRODE

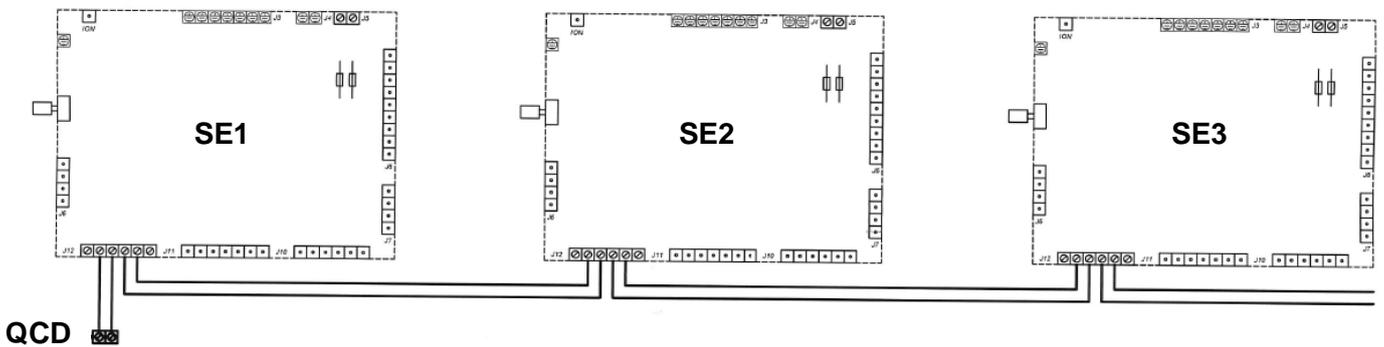
- EI** IONIZATION ELECTRODE
- EA** IGNITION ELECTRODE
- EV** GAS SOLENOID VALVE (EV1 + EV2)
- SND** TEMPERATURE PROBE
- VBR** BURNER FAN
- LMF** MULTIFUNCTION LED
- MS** FIRE DAMPER BRIDGE
- IMT^(*)** MAGNETO THERMAL SWITCH
- QCD^(*)** REMOTE CONTROL BOARD
- ^(*) OUTSIDE THE UNIT

If lost, you can ask the manufacturer for another copy, indicating the serial number of the unit.

- In case of doubts, do not perform any operation on the unit. Please, contact the Manufacturer for further clarifications.
- In accordance with the Standards regarding the installation of electrical components, a device that ensures disconnection from the mains with an opening distance between contacts that guarantees complete disconnection in overvoltage conditions III (Standard EN 60335-1) must be included.

A FEW EXAMPLES OF ELECTRICAL CONNECTIONS

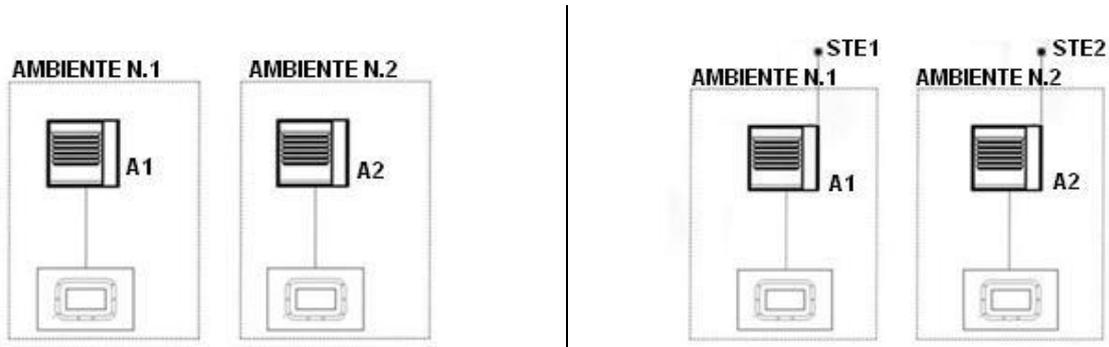
Communication between the remote control board (acting as master) and the multifunctional electronic boards (slave) of the warm air heaters takes place by means of a non-polarized two-wire cable. Especially, each remote control board can manage up to **10 warm air heaters**, connected between themselves by means of a cable with a maximum length of 50 m, please see the figure below.



SE1 UNIT ELECTRONIC BOARD 1 **SE3** UNIT ELECTRONIC BOARD 3
SE2 UNIT ELECTRONIC BOARD 2 **QCD** REMOTE CONTROL BOARD

EXAMPLES OF POSSIBLE CONNECTIONS

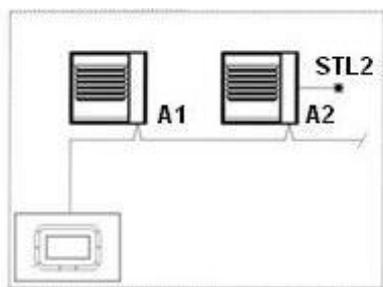
Should it be necessary to have temperature control and a weekly operation program for each room, the unit is managed by a dedicated remote control board.



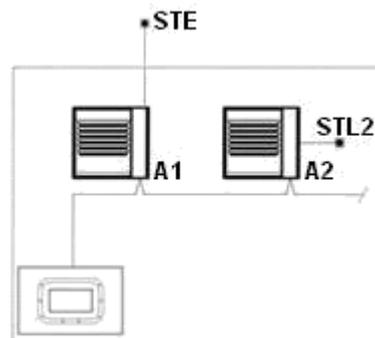
Standard solution without additional temperature probes.

Solution with external temperature probes STE1 and STE2 (optional) which allow for the maximum output power to the calibrated.

In large volumes and if a different temperature control and weekly operating program are not required, several units are connected in parallel and are managed by a single remote control board.



Both of the units are controlled by a single remote control panel with the difference that **A2** is equipped with a local temperature probe STL2 (optional) which communicates with the remote control panel for a dedicated power modulation.



Both of the units are controlled by a single remote control panel with the difference that **A2** is equipped with a local temperature probe STL2 (optional) which communicates with the remote control panel for a dedicated power modulation.

Moreover, the external temperature probe STE (optional) allows for the maximum output power of both units to be adjusted.

SMOKE EXHAUST AND COMBUSTION AIR INTAKE

The legislations in force establish that these units can be installed according to one of the following four types of canalization of the combustion products and of the combustion air intake that are indicated by the abbreviations: **B₂₃ - C₁₃ - C₃₃ - C₆₃**.



FORBIDDEN!!!

It is strictly forbidden to use plastic materials on the smoke exhaust pipe.

WARNINGS AND GENERAL INFORMATION

- **All the components of the exhaust system should compulsorily be EEC certified.**
- The exhaust pipe and the flue connector should be made in compliance with the Regulations and Laws in force. They should be made up of metal and stiff ducts, capable of resisting to mechanical, thermal and chemical stress caused by the combustion.
- In order to perform a smoke exhaust, taking into account that the warm air heaters are with condensation, one of the following materials should be used:
 - Aluminium;
 - Stainless steel.
- **Use ducts with sealing gasket in order to prevent that the smokes leave the tubes; the gasket should be adequate to withstand the smoke temperature.**
- **In order to prevent the condensate from flowing back from the flue to the warm air heater, a condensate discharge should be compulsorily placed in the lowest part.**
- The weight of the pipe should not be wholly borne by the warm air heater.
- Non insulated exhaust pipes might be a source of dangers.
- Unsuitable or wrongly sized flues or smoke pipes might amplify the burning noise and affect negatively the combustion parameters.

- If walls and/or covers have to be crossed, this operation should be perfectly carried out, preventing seepage or fire risks.

Moreover, we suggest:

- **using ducts with smooth internal surface, resistant to combustion products thermal and chemical stress, with a diameter equivalent to or bigger than the joint of the unit;**
- avoiding narrow bends and section reductions;
- properly anchoring the smoke discharge pipe;
- having a proper end cover to prevent rainwater seepage into the machine and significant friction losses.



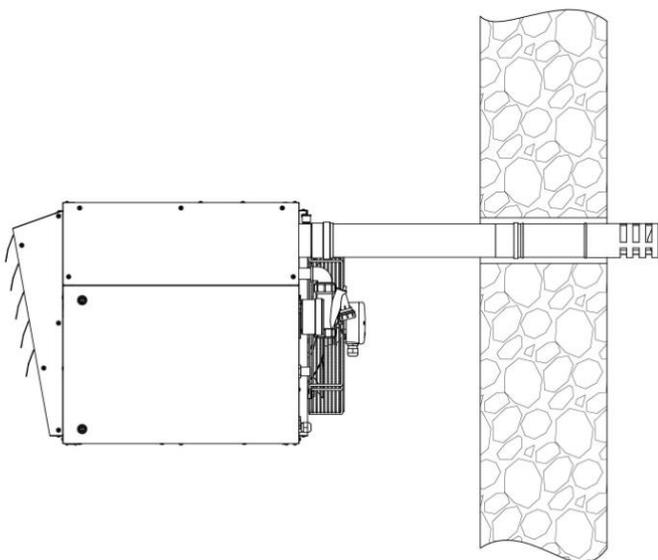
WARNING!!!

The horizontal stacks that compose the smoke discharge must be slightly installed towards the heater so that the condensate created inside the smoke ducts is reported in the heater;
 Vice versa, the combustion air suction tube, when coming out horizontally from the wall, should be slightly inclined towards the wall so that the rain does not enter the control unit of the heater.

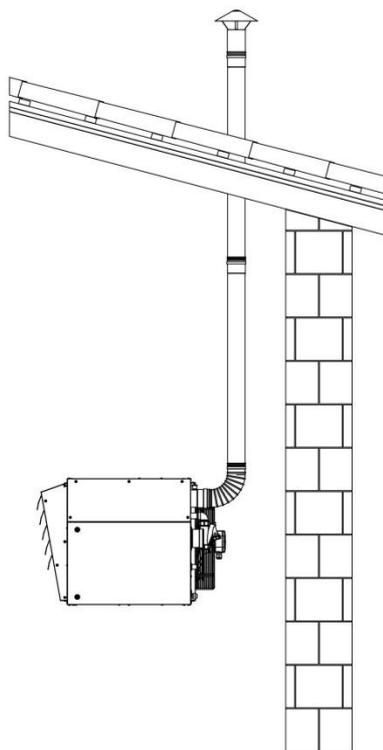
TYPE B₂₃

In this configuration, the unit is connected to a single flue pipe to discharge the products of combustion outside the building. Instead, the combustion air is taken from inside the unit connection area.

Wall exhaust configuration:



Roof exhaust configuration:



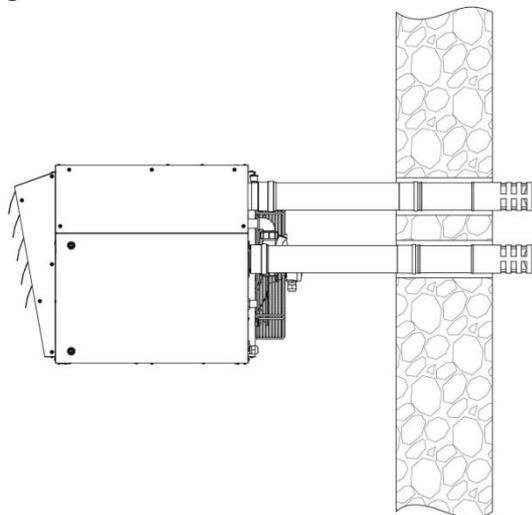
WARNING!!!

In this configuration, it is mandatory to mount an IP20 protection network that should prevent the passage of a solid with a diameter higher than 12 mm [positions 28 and 29], on the combustion air return; at the same time, the passage network should have a mesh higher than 8 mm.

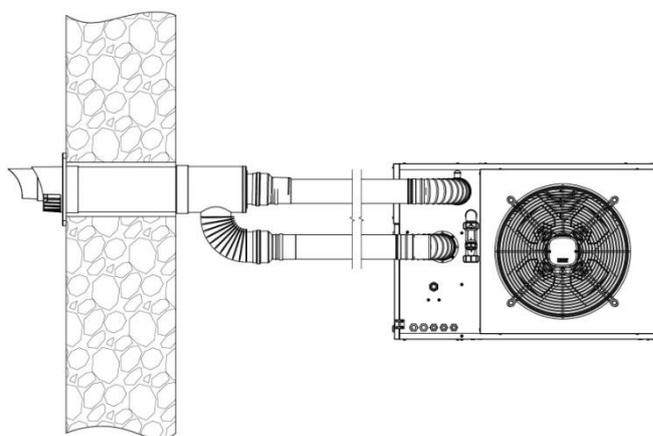
TYPE C₁₃

In this configuration, the unit has two ducts, one for the exhaust of combustion products and the other for the combustion air intake, communicating with the environment from the outside of the connection area. The exit should be on the wall and it can be performed either with two different pipes or with two co-axial ducts.

Configuration of different exhausts on the wall:



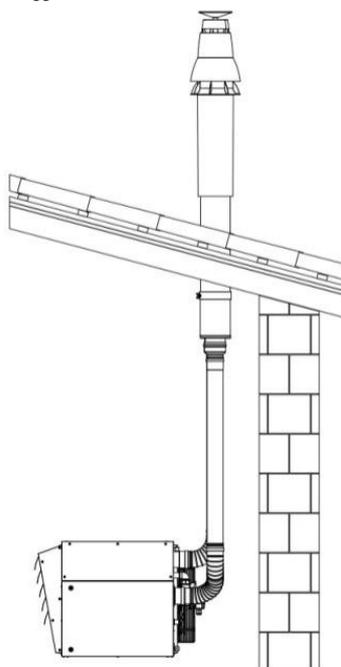
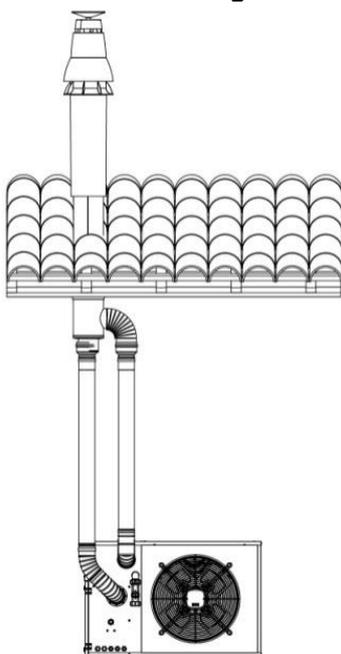
Configuration of co-axial exhausts on the wall:



TYPE C₃₃

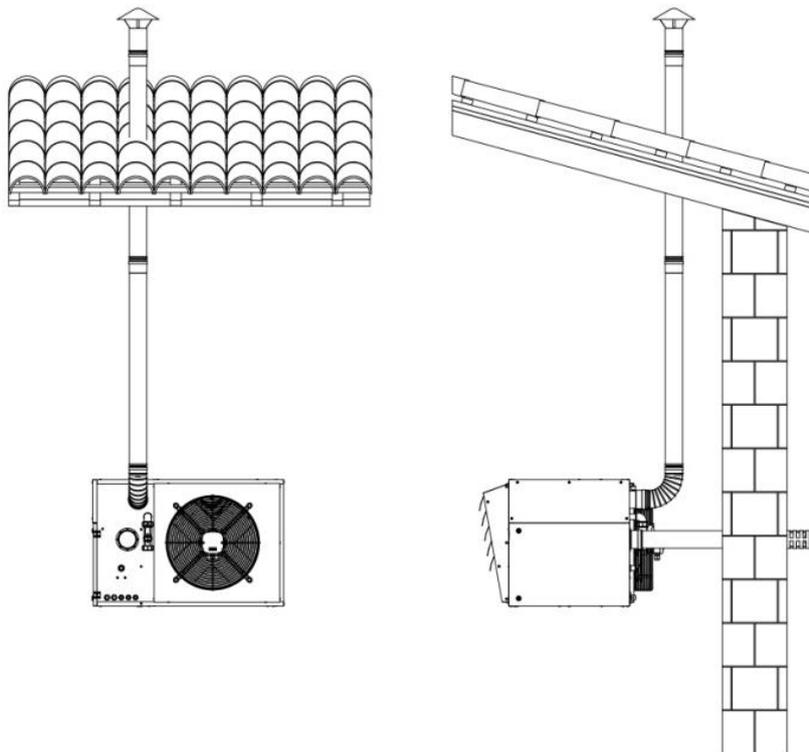
In this configuration, the unit is connected to two ducts, one for the exhaust of combustion products and the other for the combustion air intake, with a co-axial terminal communicating with the environment from the outside of the connection area of the roof.

Roof exhaust configuration TYPE C₃₃:



TYPE C₆₃

In this configuration, the unit is connected with two different ducts communicated with the outside area. The one for the exhaust of the combustion products performs the exhaust passing through the roof, while the one for combustion air performs the collection passing through the wall.

Roof exhaust configuration TYPE C₆₃:**PREPARING FOR FIRST START-UP**

The initial start-up of the unit must be carried out by the authorized Technical Assistance Service who will then validate the Warranty Certificate. Before turning the unit on and performing the functional testing of the generator, check that:

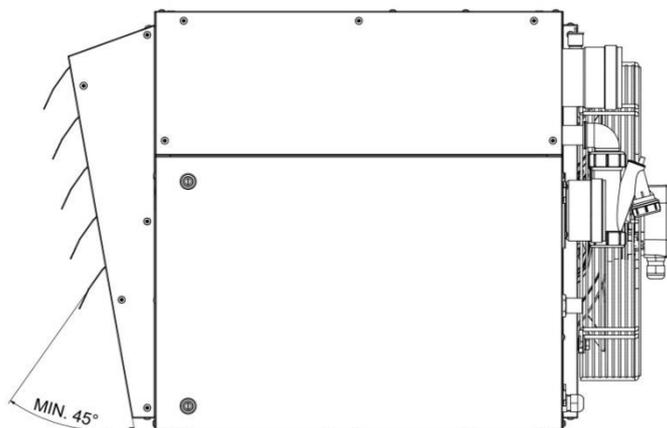
- all safety conditions have been complied with;
- the PVC film was removed from the pre-painted panels;
- adjust the flow directing fins as explained below.
- the device has been properly placed;
- there is enough space around the unit;
- all the connections to the fuel have been made correctly;
- the flue exhaust pipes and combustion air intake have been installed correctly;
- all the valves of the various circuits are open;
- all the electrical connections have been made correctly;
- there is compatibility between the fuel and the set up of the machine.

**WARNING!!!**

During the initial start-up, there may be the formation of odours and fumes due to the evaporation of the liquid added to protect the heat exchanger during storage; this is normal and it will disappear after a short period. It is recommended to suitably ventilate the room.

The warm air delivery vent is fitted with horizontal wings pre-sheared in the delivery panel, with individual orientation. The vertical wings that can be orientated are installed inside the unit as well so that in case of special flow direction requirements, they can be orientated differently from the factory pre-adjustment.

Manually adjust the individual horizontal wings in order to adapt the warm air distribution vertically depending on the area to treat.



A proper air capacity is a basic condition to ideally heat the room, moreover it is necessary to properly cool the heat exchanger.

For this reason, it is essential that the air flow generated by the fan encounters no resistance; therefore no obstacles must be present in the air delivery and return path and the dielectric flow fins are open.



WARNING!!!

The horizontal dielectric flow fins must be open and they should not be inclined to more than 45° from the air flow direction (see the above figure).

FIRST-TIME START-UP

For the first-time start-up of the warm air heater, it is necessary to operate the **remote control board** in order to turn on the unit and check its correct operation. Check especially the correct operation in "**Ventilation**" mode in order to verify the operation of the fan and the "**Heating**" mode in order to verify if the burner is turned on.

After electrically power supplying the unit, in order to access various operation modes, set the language and the current date and time in the remote control board.

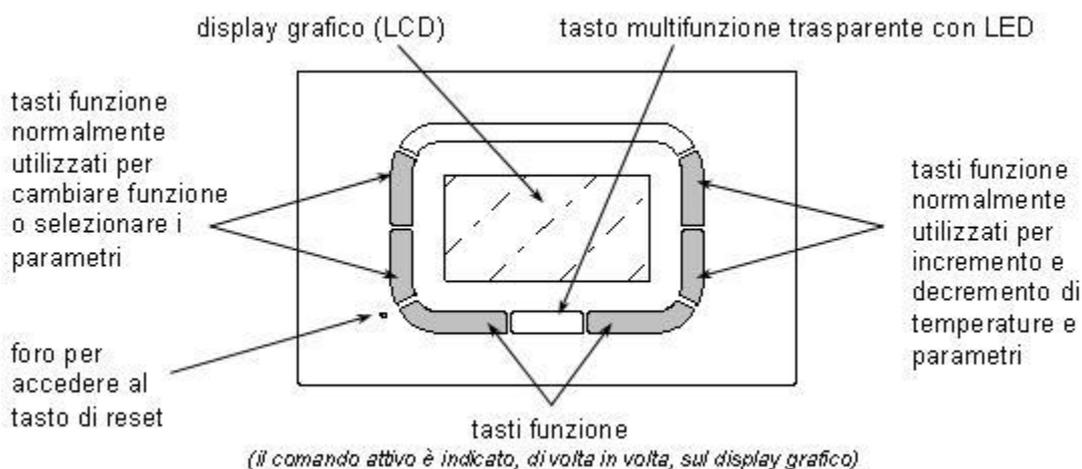


WARNING!!!

After completing the language, current date and time setting, wait until the ambient temperature is shown on the display. If the temperature is not shown immediately, press the reset key on the remote terminal (see section "Remote control board" - Image of remote control and controls).

SETTING THE LANGUAGE, CURRENT DATE AND TIME

Upon the first start-up, the language selection menu appears. The keys on the left, see the following figure, allow the selection while the OK key confirms the selection. This selection can be changed later, if required, via the "set-up menu". Then, the current time can be entered. In this case too, the keys on the left allow you to select the various items of the menu, while the keys on the right are used to change the value; the OK key saves the settings while the ESC key allows you to continue without changing the time.

Image of remote control and controls:**“VENTILATION” MODE OF OPERATION**

By pressing the key from the left, marked with the arrow ▼, browse the menu pages of the remote control board until reaching the “SUMMER” operation mode marked with the sun icon ☀.

- In order to start this mode of operation, press the OK key to allow it.
- Check the start-up and the good operation of the fan that inserts into the environment an air flow at ambient temperature.
- In order to turn off the fan, operate the button from the left corresponding to the down arrow symbol ▼ and press OK in order to allow the turn off.

**WARNING!!!**

For the type of unit 6, check the rotation direction of the fans as indicated by the arrow on the adhesive label placed near the fan.

**WARNING!!!**

While starting-up for the first time, fill the container of the condensate drain syphon with water.

“HEATING” MODE OF OPERATION

By pressing the key from the left, marked with the arrow ▼, browse the menu pages of the remote control board until reaching the “MANUAL” operation mode marked with a hand icon ✋.

- Set a start-up “desired temperature” that should be higher than the ambient temperature by pressing the keys + and - on the right side of the display;
- At this point, the unit electrically powers the blowing unit and, after the pre-washing of the combustion chamber, the flame is turned on. About 30 seconds after, the fan starts and warm air is sent into the environment to be heated. If the ambient temperature is far from the temperature set on the ambient thermostat, the unit operates at maximum regime (the flame symbol appears 🔥 near the operation mode), and then it is gradually reduced while the temperature increases (according to the power level 🔥 🔥 🔥 the flame symbol will appear in various sizes);
If the temperature increases the desired start-up temperature, the burner turns off and after about 3 minutes, the fan stops as well.



WARNING!!!

In order to avoid the inter-start-up issues of the burner, the start-up of the burner occurs always, and for a few seconds, at maximum regime (reduced regime).

Before starting the installation of the remote control board on the wall, insert the buffer batteries into the adequate compartment (2 size AAA LR03 alkaline 1.5V batteries, not supplied).

Every time you operate the remote control board changing the parameters/settings, it is necessary to wait about ten seconds before seeing a response from the unit.



FORBIDDEN!!!

It is forbidden to stop the heater by disconnecting the general electric voltage of the unit as the thermal energy accumulated in the exchanger can allow the intervention of the LIMIT safety thermostat with the subsequent need of manual unblocking. Moreover, such operation, if repeated, can cause dangerous overheatings of the heat exchanger.

INSTRUCTIONS FOR THE USER

The warm air heater is a unit for heating the ambient air using the thermal energy generated by the combustion.

The thermal exchange occurs by lightly touching the surfaces of the heat exchanger with the air flow generated by one or several helical fans, without using any intermediary liquid.

Directional, easily adjustable, fins allowing the orientation of the warm air flow according to the specific installation requirements.

With this system, the plant costs can be remarkably reduced and a reliable operating economy can be reached; therefore, it is particularly fit for those cases where it will be used occasionally and discontinuously.

By performing the combustion air intake towards the outside, the combustion circuit is airtight and this allows using these units for also heating environments, if requested.

The appliance is designed also to ventilate the environments during summer.



WARNING!!!

The specific unit was designed to operate in CONDENSATION regime of the combustion products. The smoke temperature, descending under the dew point, allows the recovery of latent energy from the water vapour normally generated during a combustion process.

For a maximum environmental comfort, a premixed burner with modulating thermal flow, allows adapting the operation of the unit to the immediate usage requirements.

REMOTE CONTROL BOARD



The unit is characterised by operation with variable thermal capacity and continuous modulation, controlled automatically by a remote control panel.

The remote control boards integrates, in a single interface, in addition to the functions of room thermostat also those of remote control of the heating system with warm air heaters, allowing for the operating parameters to be managed and the release of even several heaters, with the relative control boards connected in parallel. It is possible to select various thermo-regulation modes, also using any external temperature probe (connected to one of the heaters) in order to adjust the maximum supplied power. The weekly program is particularly versatile and it can be adapted to any need for the comfort of the user. The remote control panel can display a graph, easy to read, of the daily program set.

The main specifications of the control panel and the user instructions are presented hereinafter.

GENERAL SPECIFICATIONS:

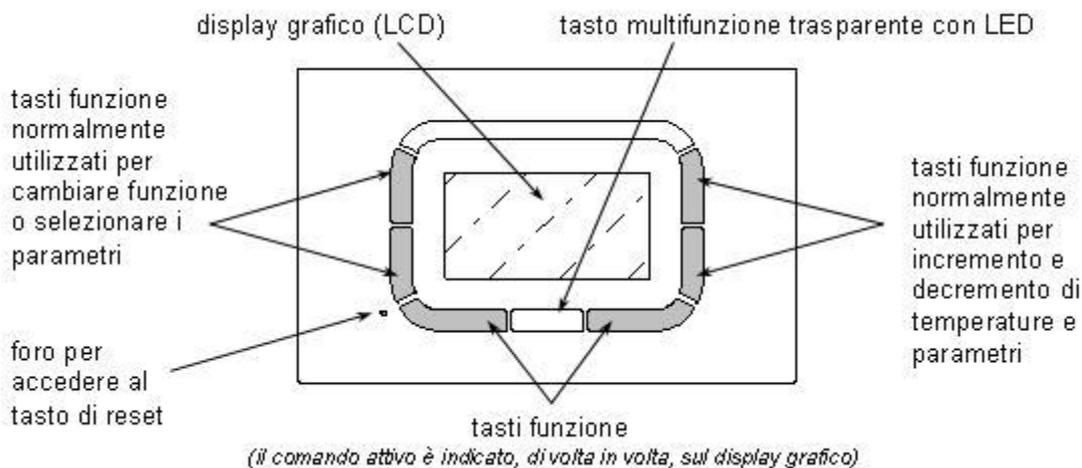
- 128x64 dot graphical LCD
- 20 s backlight timer
- LED for diagnosis/warning
- 7 variable function keys

- weekly programming
- 4 temperature levels (T0, T1, T2, T3)
- settable ambient temperature resolution: 0.5°C
- measured ambient temperature resolution: 0.1°C
- minimum programming range: 15 minutes
- SELV (Safety Extra Low Voltage) type insulation
- simple connection (not polarised) to the control board with two-wire cable
- compatible protocol OpenTherm™ v3.0 Smart Power Mode – Medium Power

TECHNICAL SPECIFICATIONS:

- Operating temperature: 0°C +50°C
- Humidity: 95% maximum at 40°C
- Power supply: low voltage (3 V), obtained from communication with the control board
- Degree of protection: IP30
- Dimensions: 140x90x32 mm
- Compliant: with the directive on electromagnetic compatibility (2004/108/EC) and to the Low Voltage Directive LVD (2006/95/EC)

Image of remote control and controls:



To display the parameters and interact with the heating system, the thermostat offers the user an LCD graphic display and a series of silicone rubber keys, as well as a transparent key that also acts as a window for a warning LED.

In particular, the **vertical keys to the left** of the display are typically used to navigate through the set-up menu or to select the parameters with which to interact (▲/▼).

The **vertical keys to the right** of the display, at the same time, allow varying parameters and temperatures with the classic increase/decrease (+/-) function.

The **horizontal keys at the bottom** are used, in most cases, to confirm or cancel the settings or to enter and exit the various sub menus.



WARNING!!!

Note that the transparent plastic **key in the middle**, which has specific functions such as "RELEASE", also acts as a window for the underlying warning LED:

- **red light (flashing): one or more heaters stopped;**
- green light: on (even for several seconds) while the remote control board is resuming operation after a power failure.

The functions that are most frequently used by the user are easily available in the main or first level menu, where it is possible to rapidly browse through the various pages to set, for example, the room temperature control or the maximum relative power (%) provided by the warm air heaters.

REMOTE CONTROL BOARD PROGRAMMING

SETTING THE LANGUAGE, CURRENT DATE AND TIME

When turning on for the first time or after resetting the thermostat, the language selection menu will appear. The keys on the left are to select while the OK key confirms the selection. This selection can be changed later, if required, via the "set-up menu". Then, the current time can be entered. In this case too, the keys on the left allow you to select the various items of the menu, while the keys on the right are used to change the value; the OK key saves the settings while the ESC key allows you to continue without changing the time.

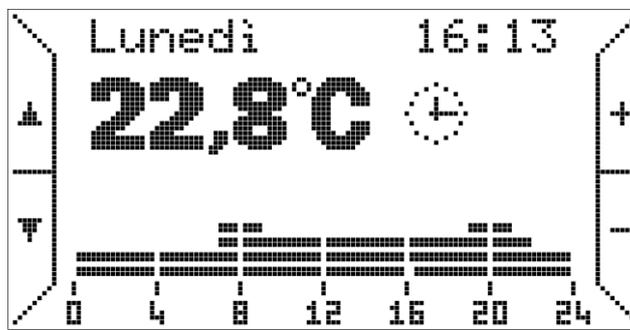


WARNING!!!

After completing the language, current date and time setting, wait until the ambient temperature is shown on the display. If the temperature is not shown immediately, press the reset key on the remote terminal (see section "Remote control board" - Image of remote control and controls).

DISPLAY STAND-BY SCREEN

When the thermostat is connected to a heater equipped with a special electronic control board, the following screen will be displayed.



On top, the **day of the week** and the **current time** will be displayed; these indications are flashing if they must be updated.

Below, the **ambient temperature measured** appears; next to it there is an icon indicating the **temperature control function that is currently active**: in this case the face of a clock indicates the "automatic" mode. In automatic mode, the remote control board executes the temperature control program set for the current day, the **graph** of which is displayed at the bottom. This graph is divided into time intervals of 15 minutes, corresponding to one pixel in horizontal, and into the four programmable temperature levels.

Next to the active temperature control icon there is, in certain conditions, another icon relating to the heating system which indicates that the burner is on (flame symbol of different sizes depending on the power level 🔥 🔥 🔥) or that there is an interruption or anomaly (corresponding to the symbols 🛑 !, respectively) or even a communication error (icon ?).

In the example screen there are no icons, therefore the system is in stand-by (no request for heating) and there are no faults.



WARNING!!!

Under the indication of the ambient temperature there may also be a line of text that provides information to the user in particular cases, such as the presence of an interruption or error.

Here is an example (not exhaustive) of the text that may appear:

```
Connection...
Communication error
Stop code 123 - Slave num. 1
Error - ambient probe
Error - external probe
```

MAIN MENU

By pressing the **key on the left**, marked with the arrow ▼, it is possible to navigate the main menu pages that allow either setting an operation mode or accessing a secondary sub-menu.

ICON	PAGE	BRIEF DESCRIPTION
	Automatic	Temperature control according to the weekly program set by the user. Current day program displayed as a graph.
	Manual	Room temperature control according to a temperature selected by the user (thermostat function).
	Summer	Room heating function disabled. Summer ventilation can be activated manually
	Off	Temperature control and ventilation functions off
-	Settings	Please see the secondary submenu section.
100%	MAX power	It is possible to limit the power level required by the thermostat from the heaters to heat the room.
-	Parameters	Please see the secondary submenu section.
-	Control panel	This submenu is available for a quick supervision of the operation of one or several units.

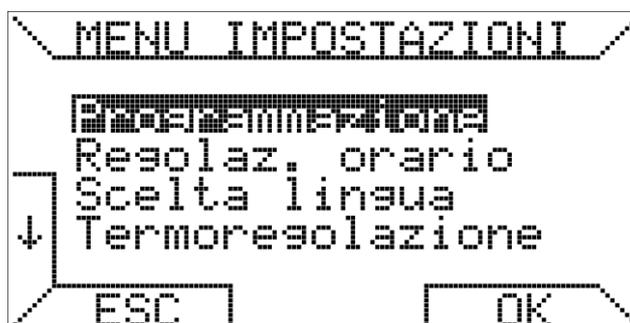
Note that the screens can also be accessed by pressing the key ▲; in this case, since the main menu is "circular", the selection order of the screens will be reversed.

The options from the pages mentioned above wait for a selection on part of the user for 20 seconds, after which the display goes back to a "normal" view which depends only on the temperature control mode selected (manual, automatic, summer, off). The single exception is the page "Control panel" which remains displayed until the user presses ESC or changes the menu page with the keys ▼ and ▲.

In this case, the **keys on the right**, marked by + and -, allow changing the temperatures for the automatic program (T0, T1, T2, T3), while in "manual" mode (icon ) the local temperature changes.

SECONDARY SUBMENU - SETTINGS

This sub menu is dedicated to the "local" parameters of the thermostat, such as current time, temperature control temperatures and weekly program.



Programming

The first page of the sub menu suggests the "**Programming**" item, which is highlighted. By choosing this option by pressing the OK button, you enter another sub menu dedicated to the weekly program.

By choosing the **Temperatures** item, you enter the screen where T0, T1, T2 and T3 can be set. To select the temperatures you want to change, use the keys ↓ and ↑, whereas the keys + and – are used to change the value.

A graduated bar, on the right, shows the relative position of the current value compared to the minimum (1°C) and maximum (30°C) values which can correspond to the room temperature value. Also, in order to respect the programming logic which expects an association of the highest temperature to T3 and the lowest temperature to T0, the thermostat observes the following restriction: “T0 lower/equal to T1 lower/equal to T2 lower/equal to T3 ” and therefore resized, all the temperatures inputted by the user.

Instead, by selecting the **Program day** item, the day to be programmed will be highlighted and it can be changed by pressing the + and - keys, while below the corresponding daily program is shown as a reminder.

Supposing you want to program a day, by pressing OK you enter the programming of the **time slots**. The slots are programmed in three steps: start, desired temperature and end.

In the first step, enter the **starting time** using the keys + and -, at intervals of at least 15 minutes, and confirm by pressing OK. If, instead, you want to leave the programming of the selected day and change the day, simply press ESC. Then select **which of the four programmed temperatures** you want to associate to this slot, by moving on the screen using the keys ► and ◀ to select and press OK to confirm or ESC to change the starting time.

In the last step, select the **ending time** of the slot and confirm with OK. This time cannot be before the starting time of the slot; by selecting two values that coincide for the start and end, the program will not be changed.

The last item of the programming menu, **Copy day**, allows you to copy the program from one day to another. Select the source day at the top and the destination at the bottom; it is possible to use a programmed day for the whole week in order to use the same program every day: to do this simply select as a destination the item "ALL". Once you have pressed the OK key, a message will confirm the copying of the program.

Time setting

The second page of the submenu proposes the "**Time setting**" item and allows setting the current day of the week and time. Like on the other menu pages, select using the keys ↓ and ↑, while the keys + and – allow you to change the value. It is also necessary to confirm by pressing the OK key for the changes to take effect.

Select language

Another possible setting of the submenu is "**Select language**" for the menu and, in general, for all the texts displayed by the remote control board. This setting is required when starting the thermostat for the first time and after resetting it; afterwards, it can be changed at will.

Temperature control

The last item concerns the "**Temperature control**" mode used by the remote control board to manage room comfort.

On this screen it is possible to set the **temperature differential**, which can vary between 0.2°C and 5.0°C (default value: 2.0°C).

d is called the thermal differential, **Max** the maximum percentage of power requested by the remote control board and **T_i** and **T_a**, respectively, the set and measured ambient temperature, the percentage power request **P** is calculated as follows:

When the ambient temperature (**T_a**) is under (**T_i – d**), the unit operates at the maximum thermal capacity, ensuring a quick pre-heating of the room.

When the ambient temperature (T_a) increases and it is ranging between ($T_i - d$) and T_i , the unit operates in modulating regime, the percentage of which is calculated based on the following formula, until the minimum value is reached:

$$P_{\%} = \frac{T_i - T_a}{d} \times \text{Max}$$

When the ambient temperature (T_a) increases subsequently and reaches and/or exceeds the T_i value, the unit turns off; if the ambient temperature should reduce the **hysteresis** value, the unit is turned on again with the modulation percentage calculated as above.

On the same page it is possible to enter the **hysteresis value** (asymmetric) in order to prevent, in some cases, frequent re-ignitions of the heaters for short intervals.

The hysteresis can vary in steps of 0.1°C between 0.1°C and 50% of the set differential value (rounded down to the tenth of a degree Celsius).

Once the set value T_i has been reached, the thermostat turns the heaters off: they will be turned on again only if the room temperature drops to $T_i - \text{hysteresis}$, that is the set temperature value minus the hysteresis.

The default hysteresis value is 0.1°C; in this case the effect is void because the hysteresis is equal to the resolution of the temperature measured by the thermostat, therefore it is re-ignited as soon as the room temperature is lower than the set value by a tenth of a degree.

SECONDARY SUBMENU - PARAMETERS

This submenu allows remotely managing a few technical operating parameters of the air heaters. For this reason, it should be studied in-depth only during a technical assistance intervention and not for the normal use of the unit.

Unlocking function

The single item that can be of interest for the user is the second one, **Unlock**, and allows using the unlocking command. In case of an interruption of a heater, it is possible to send a remote unlocking request, by selecting the command "Unbl." and pressing SEND, see figure below.

Since it is a safety function, the actual unlocking of the heater can occur only with the consent of the safety logic of the control board.

Also note that, in the event of interruption, a "quick connection" is available on the display in normal operation (automatic, manual, etc.), which can be selected by means of the transparent key in the middle, allowing the user to rapidly reach the page without going through all the pages of the submenus.



CONTROLS

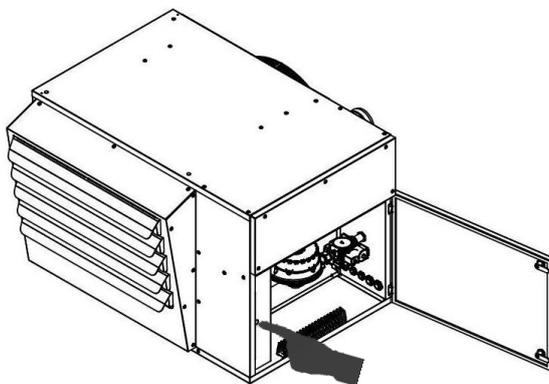
BURNER RESET BUTTON:

Placed either on the unit (multifunction electronic board, see figure below) or on the remote control board (see paragraph "**Remote control board**", section "Parameter menu"), it has the function to reset the operation of the unit after a failed start-up of the burner.



WARNING!!!

Do not use screwdrivers or sharp objects to reset the multifunction board.



LIMIT THERMOSTAT RESET BUTTON:

Placed either on the unit (multifunction electronic board, see figure above) or on the remote control board (see paragraph "**Remote control board**", section "Parameter menu"), it has the function to reset the operation of the unit after an interruption occurred due to overtemperature.

REMOTE CONTROL BOARD:

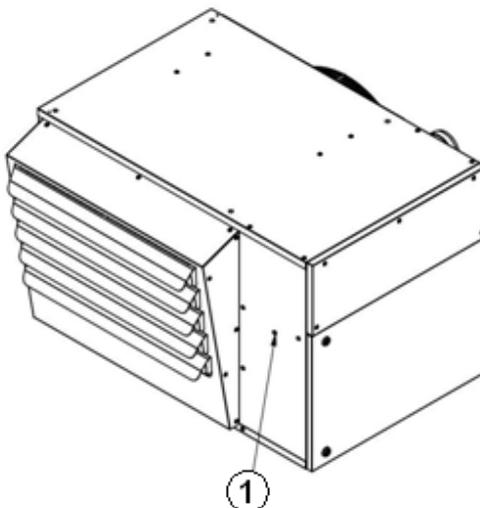
It has the function to manage the operation of the unit, see previous paragraph.



WARNING!!!

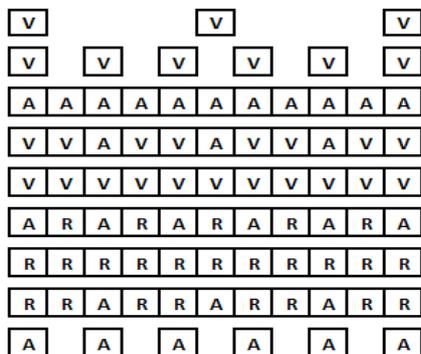
Before restoring any device, the problem that has triggered the safety protection should be detected and solved. In case of doubt, please contact the closest Authorized Assistance Centre, which will provide you with the necessary technical assistance.

MULTIFUNCTION LED AND ALARM CODES



1. Multifunction led

The unit is able to warn by means of a two-colour LED and on the remote control board its own operation status or the presence of main anomalies. The following figure presents the possible colour combinations shown by the LED.



LEGENDA:
 V LED colore verde
 A LED colore arancione
 R LED colore rosso

- STAND-BY
- PREVENTILAZIONE
- ACCENSIONE
- REGIME RIDOTTO ALL'ACCENSIONE
- REGIME
- APERTURA CONTATTO SERRANDA TAGLIAFUOCO (SFT)
- BLOCCO PER MANCATA ACCENSIONE
- BLOCCO PER SOVRATEMPERATURA (LIMIT)
- PRESENZA DI FIAMMA PARASSITA / ERRORE SONDA DI TEMP. (SR)

In the table, all alarm codes that might appear on the display of the remote control board are presented:

Code	Description
F001	Internal fault (contact technical assistance)
F002	
F003	
F004	
F005	
F007	
F006	
F010	Interruption because not turned on
F017	General interruption (may be displayed when the device is turned on for the first time)
F019	Interruption caused by overtemperature (exceeded manually resettable temperature limit)
F025	Error at the SR adjustment temperature probe
F026	
F027	
F060	Presence of parasite flame warning
F081	Internal communication error (contact technical assistance)
F082	Faulty external temperature probe
F084	DC Brushless fan motor not connected or faulty
F085	Feed-back error on mains frequency: FAN treated air motor not connected or faulty
F086	STF contact of the fire damper open
F087	Exceeded automatically resettable temperature limit

INSTRUCTIONS FOR ASSISTANCE

The assistance for the warm air heater shall be performed by qualified technical personnel.

In order to ensure that the unit works properly, some basic parameters should be checked. Start the unit and **make sure the fan assembly is started about 30 seconds after the burner ignition.**

While the warm air heater is normally working (after approx. 20 minutes of uninterrupted working), perform the following operations:

- Check the correct adjustment of the horizontal wings.
- Check for possible fuel leaks.
- Check the gas pressure upstream from the solenoid valve.
- Check the correct fuel flow rate via the meter.
- Perform a combustion analysis.
- On the remote control panel, lower the set-point to a value lower than the ambient temperature and make sure that only the burner turns off and that the fan unit does not turn off at the same time.
- check that the engine electric absorption value does not exceed the value specified in the plate
- Make sure the fan works for about 2 more minutes and a half after the burner has gone out, before it stops.
- Check that the air flow is equal to the nominal air flow specified in the “**Technical specifications**” paragraph.
- Make sure the condensate discharge system works.
- Check that the condensate discharge syphon works properly.



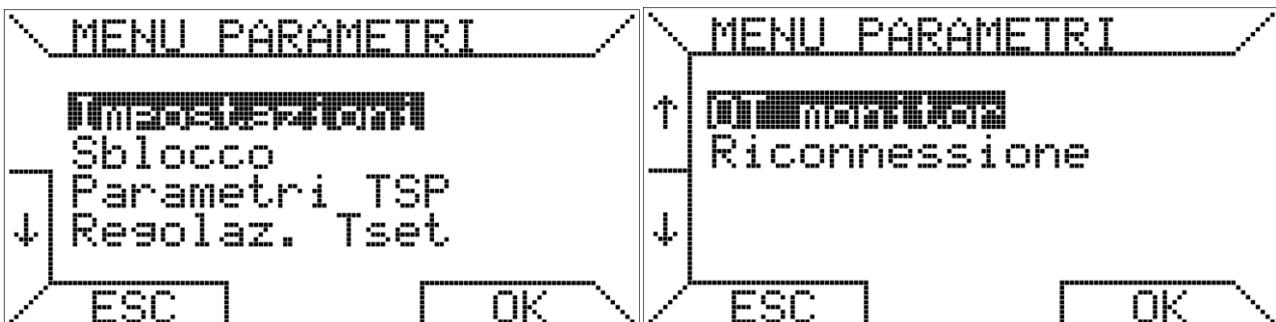
WARNING!!!

All the inspections mentioned above must be carried out in all operating conditions (max and min).

REMOTE CONTROL BOARD PARAMETER MENU

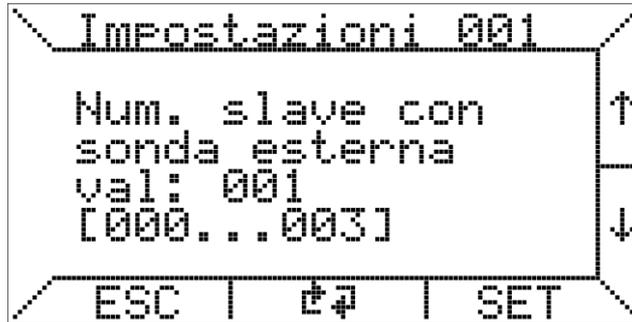
The **Parameter menu** is an important secondary submenu of the program of the remote control board and it is the one allowing the remote management of the technical operation parameters of the air heaters.

It is possible to scroll through the various items using the keys ↓ and ↑: in this case the selection menu covers two pages and it goes from one to the other automatically by selecting the items at the bottom (or at the top, to go back to the previous page).



PARAMETER MENU - SETTINGS

The first item “**Settings**” allows displaying and setting the remote **TSP transparent parameters** of the system. Press OK to activate the first parameter page.



From this page, shown above, it is possible to go on to the others by pressing the keys ↓ and ↑.

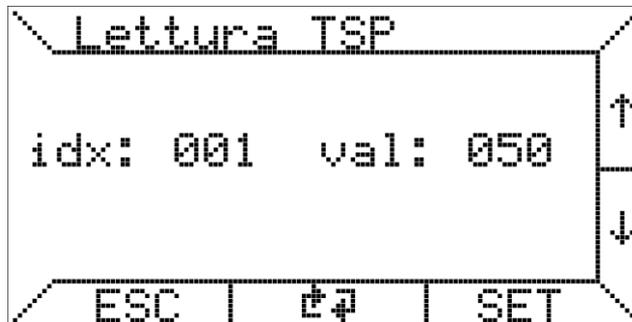
**WARNING!!!**

The parameters are read-only, each setting will be ignored by the board and the subsequent communication of this parameter will restore the value set by the board. In order to change the parameters, it will be required to insert a password that can be issued by the assistance service of the area or by the manufacturer of the warm air heater.

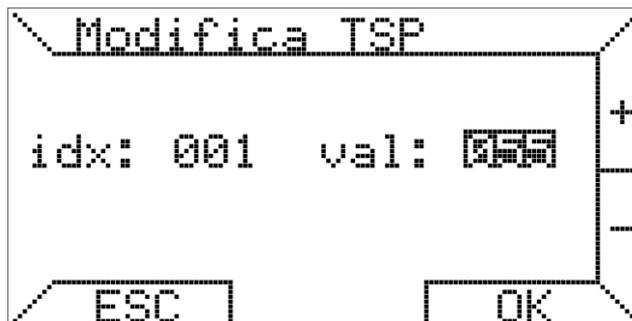
In order to change a TSP parameter, go to the desired settings page (with the keys ↑ and ↓) and press SET. Then, insert using the keys + and -, on the page that is displayed, the chosen value between the minimum and maximum limits, indicated between square brackets.

PARAMETER MENU - TSP PARAMETERS

It is possible to operate directly on the “**TSP Parameters**” (transparent parameters) by selecting the third item of the “PARAMETER MENU”:



The functions made available by the thermostat are the reading of the TSP parameters, as shown in the figure above, and their modification. To change a TSP parameter move onto the desired index “idx”, using the keys ↑ and ↓, and press the SET key. The following page will appear:



where it is possible to enter, with the keys + and -, the desired value. If the board does not include the writing of this TSP parameter (read only), the changes made will have no effect. The number of TSP parameters is bound by the control board of the warm air heater.

In order to input the operation parameters indicated in the following table; the TSP transparent parameters corresponding to the rotation speed of the fan of the premixed burner.

Blowing unit parameter table

TSP PARAMETER	TYPE 1			TYPE 2			TYPE 3		
	[rpm]			[rpm]			[rpm]		
	G20	G25	G31	G20	G25	G31	G20	G25	G31
MAX SPEED	5,175			6,525			4,275		
MIN SPEED	1,950			2,325			1,800		
IGNITION SPEED	3,075			3,900			2,625		
TSP PARAMETER	TYPE 4			TYPE 5			TYPE 6		
	[rpm]			[rpm]			[rpm]		
	G20	G25	G31	G20	G25	G31	G20	G25	G31
MAX SPEED	4,800			4,575			5,925		
MIN SPEED	1,725			1,950			2,325		
IGNITION SPEED	3,000			2,850			2,850		

PARAMETER MENU - Tset ADJUSTMENT

The forth item of the "Tset adjustment" item allows inputting the Tset temperature value equivalent with the external minimum design temperature. It is about a function that is supported by the control board and it should be taken into account when the system would include the external temperature probe. This parameter has an effect on the value of the final percentage power and allows a climatic type adjustment.

The last two items of the "PARAMETER MENU" are reserved to technical interventions on the thermostat. These functions are useful especially during installation or maintenance of the electronic control system.

PARAMETER MENU - OT MONITOR

The item "OT monitor" is dedicated to the advanced diagnostics of the OpenTherm communication, since it makes visible the data exchanged between the thermostat and the control boards and it shows the analysis of the communication made by the thermostat (master).

PARAMETER MENU - RECONNECT

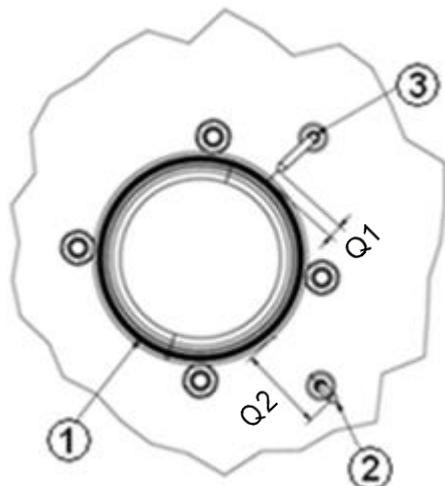
The "Reconnect" function, instead, is used to reconfigure the thermostat after hardware/software interventions performed without disconnecting the power supply on the control board of a slave, in the event that these operations can change the configuration of the system.

Activating the reconnection is equivalent to physically unplugging the communication connector from the thermostat and reinserting it.

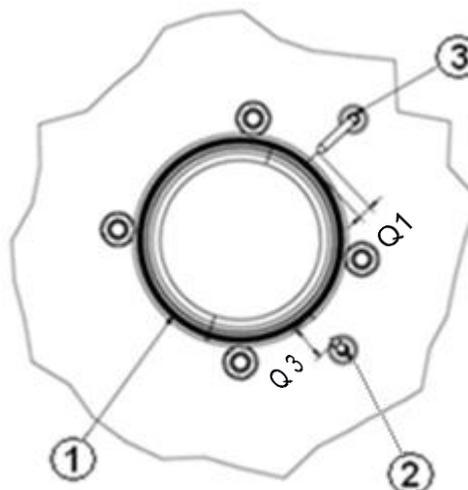
POSITIONING OF ELECTRODES

For a correct ignition and operation of the unit, it is important to check the exact position of the ignition and ionization electrodes.

TIPO 2 - 3 - 4



TIPO 1 - 5 - 6



1. Burner
2. Ionization electrode
3. Ignition electrode

NOTE:

- Q1.** Distance between the ignition electrode and the burner equal to **6 mm** for all the models.
Q2. Distance between the ionization electrode and the burner equal to **30 mm** for the models **2-3-4**.
Q3. Distance between the ionization electrode and the burner equal to **21 mm** for the models **1-5-6**.

FUEL GAS PRESSURE CONTROL

The unit is configured with modulating thermal capacity, and the input gas pressure to the burner is managed directly by the electronics on board. The correct operating pressures must be checked as follows:

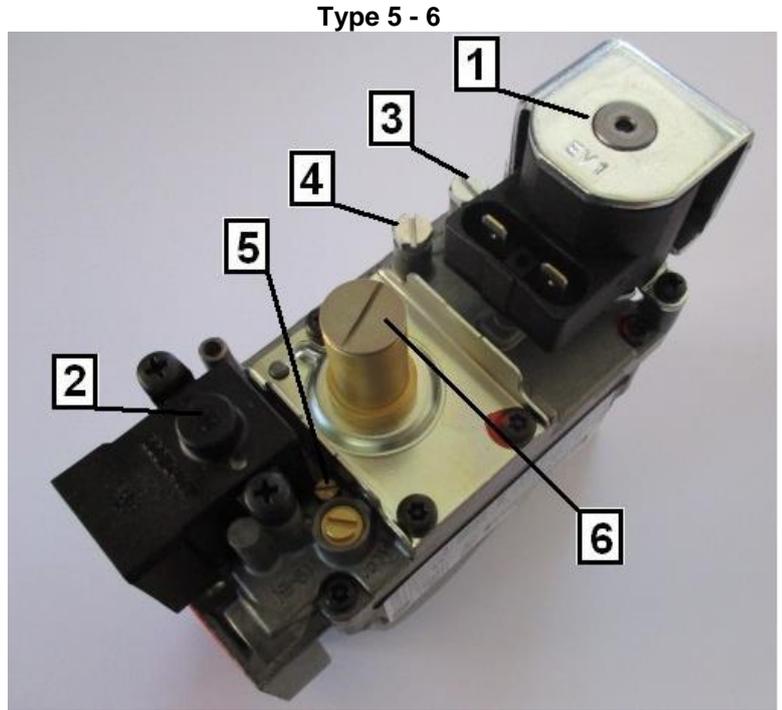
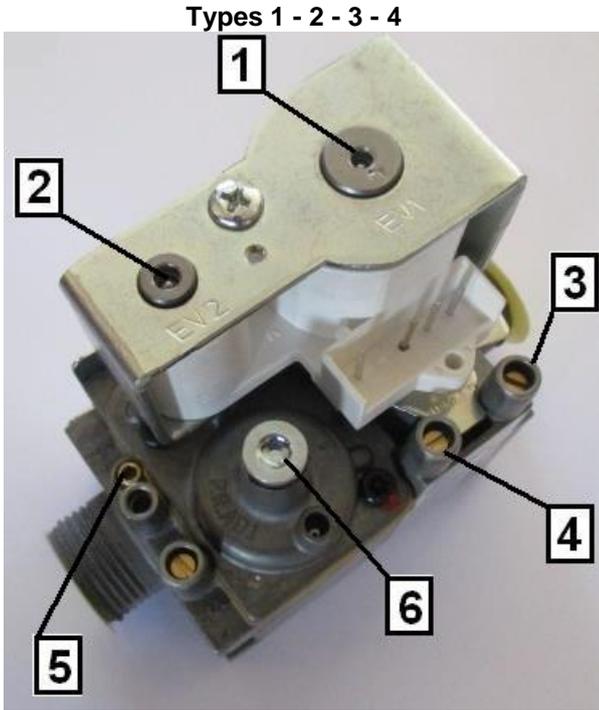
Gas supply pressure inspection and measurement instructions

- Activate the operation of the burner at maximum power, see paragraph "**Remote control board programming**".
- Connect the pressure gauge to the input pressure plug (see the drawings below);
- Check that the network gas pressure is stable and that it corresponds to the data indicated in the paragraph "**Gas categories**";
- Stop the unit and make sure that the pressure does not change.



FORBIDDEN!!!

Under no circumstance, should the gas supply pressure be higher than 60 mbar. If this value is exceeded, an irreparable damage will occur to the gas solenoid valve unit.



1. On-off coil EV1
2. On-off coil EV2
3. Input pressure plug

4. Output pressure plug
5. Pressure adjustment screws at MAX capacity
6. Pressure adjustment screws at MIN capacity



WARNING!!!

TYPE 1 - 2 - 3 - 4, for the adjustment of the pressure at MAX power, use the Allen key tool of 2.5 mm and rotate clockwise in order to reduce the gas flow.
 For the adjustment of the pressure at MIN power, use the Allen key tool of 4 mm and rotate anticlockwise in order to reduce the gas flow.



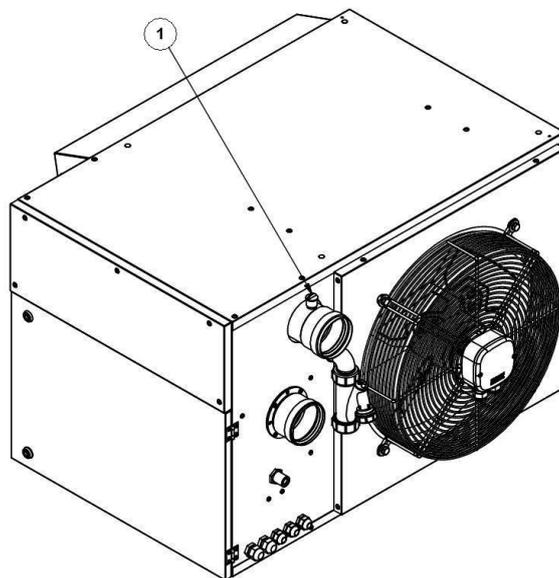
WARNING!!!

TYPE 5 - 6, for the adjustment of the pressure at MAX power, use a small slotted screwdriver and rotate clockwise in order to reduce the gas flow.
 For the adjustment of the pressure at MIN power, use a Phillips screwdriver and rotate anticlockwise in order to reduce the gas flow.

COMBUSTION ANALYSIS

In order to analyse the unit combustion, samples of combustion products should be taken using the supplied collection basin.

For an optimal operation of the unit, check that the carbon dioxide values CO₂ identified in the smoke are close to those mentioned in the following table.



1. Basin for collecting the combustion products.

Table with the reference carbon dioxide content in percentage [%] and with smoke temperature⁽¹⁾ in degrees Celsius [°C]

COMBUSTION GAS	POWER	TYPE 1		TYPE 2		TYPE 3	
		[%]	[°C]	[%]	[°C]	[%]	[°C]
Methane (G20)	MIN	9.0	37.0	9.0	39.0	9.0	42.0
	MAX	9.3	92.5	9.3	111.0	9.3	94.0
Methane (G25)	MIN	9.0	36.0	9.0	42.0	9.0	45.0
	MAX	9.3	90.0	9.3	110.0	9.3	92.0
Propane (G31)	MIN	10.3	35.5	10.3	42.0	10.3	40.0
	MAX	10.6	91.0	10.6	115.0	10.6	92.0
COMBUSTION GAS	POWER	TYPE 4		TYPE 5		TYPE 6	
		[%]	[°C]	[%]	[°C]	[%]	[°C]
Methane (G20)	MIN	9.0	39.5	9.2	30.0	9.2	36.0
	MAX	9.3	89.5	9.5	54.0	9.5	60.0
Methane (G25)	MIN	9.0	38.0	9.2	32.0	9.2	34.0
	MAX	9.3	87.0	9.5	53.0	9.5	56.0
Propane (G31)	MIN	10.3	36.0	10.5	28.0	10.5	33.0
	MAX	10.6	87.0	10.8	51.0	10.8	57.0

⁽¹⁾ Referred to air temperature 15°C.

GAS CONVERSION

The warm air heaters will be delivered fitted for the operation with methane gas H (G20). Inside each unit, kit to convert it to another type of gas is found. This conversion must be performed only by the local Technical Assistance Service or by personnel authorized by the manufacturer and it can be performed also after the thermal unit has been installed, operating as described below.

INSTRUCTIONS FOR CONVERSION

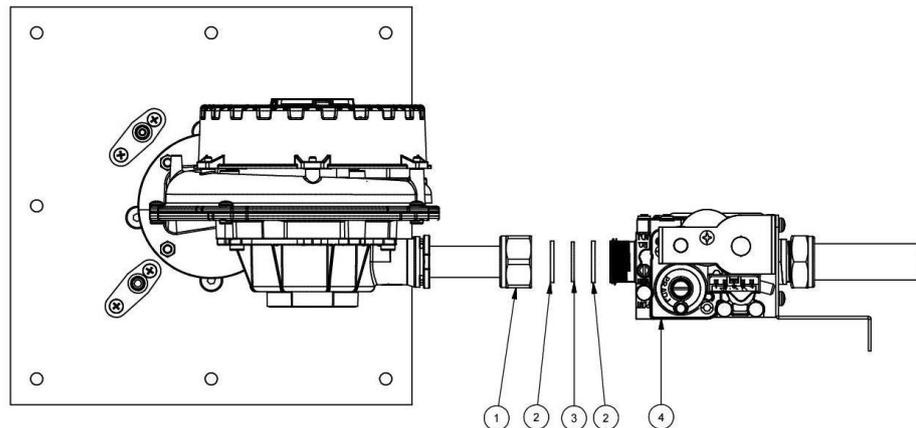
From METHANE GAS G20, to METHANE gas G25 and to PROPANE G31:

1. Disconnect the power supply of the heater and close the gas supply shut-off valve;
2. Replace the gas diaphragm;
3. Power supply the heater and reopen the valve;
4. Check and adjust the gas supply pressure;
5. Perform the combustion analyses and then check the carbon dioxide values from the exhaust smoke;
6. Replace the adhesive label indicating the arrangement;
7. Fill in the table in the instruction manual mentioning the conversion data.

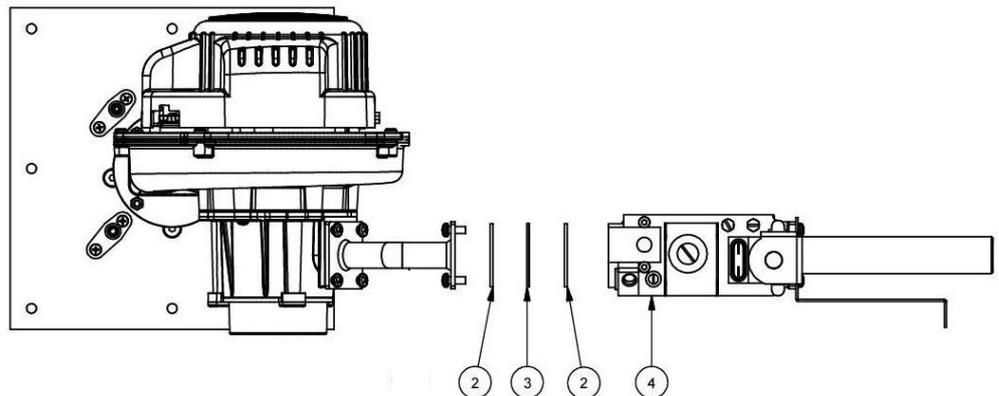
Replace the gas diaphragm

The units are fitted with a gas diaphragm installed as shown in the following figure, proceed with the replacement of the diaphragm with the desired gas kit:

TYPES 1-2-3-4



TYPES 5-6



- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Spherical cap CH-30. 2. Gasket. | <ol style="list-style-type: none"> 3. Gas diaphragm (see reference table). 4. Gas solenoid valve. |
|---|---|

Table with diaphragm diameters for various fuels:

COMBUSTION GAS	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Methane (G20) Factory preassembled KIT	Ø 4.90	Ø 5.00	Ø 8.95	Ø 8.95	Ø 10.75	Ø 10.50
Methane (G25) Supplied KIT	Ø 5.30	Ø 5.50	Ø 15.00	Ø 15.00	Ø 12.40	Ø 12.10
Propane (G31) Supplied KIT	Ø 3.80	Ø 3.85	Ø 6.30	Ø 6.30	Ø 8.20	Ø 8.10

Setting the parameters on the control board

Before proceeding, it is recommended to read the paragraphs "**Remote control board programming**" and "**Remote control board menu**" in order to understand how to navigate the programme and the insertion mode.

Check and adjust the supply pressure

See paragraph "**Check the fuel gas pressure**".

Combustion analysis

See paragraph "**Combustion analysis**".

Replacement of self-adhesive label

The gas conversion kit includes a self-adhesive label which, once the conversion has been achieved, shall be applied on the label previously applied at the factory. The new label shall completely cover the previous one, so that no doubts can arise about unit prearrangement.

Filling in the gas conversion data table

When the conversion has finished, fill the following table.

Conversion data	
Conversion gas type	
Performed by	

INSTRUCTIONS FOR MAINTENANCE

In order for the unit to properly work and be maintained, we suggest performing regular cleaning and maintenance operations.

These types of intervention must be carried out by specialized and qualified personnel while the unit is cold and disconnected from the electrical and fuel supplies.

We suggest using protection gloves.

All the maintenance/cleaning operations requiring the use of ladder or of other means, should be performed with appropriate and completely safe systems.

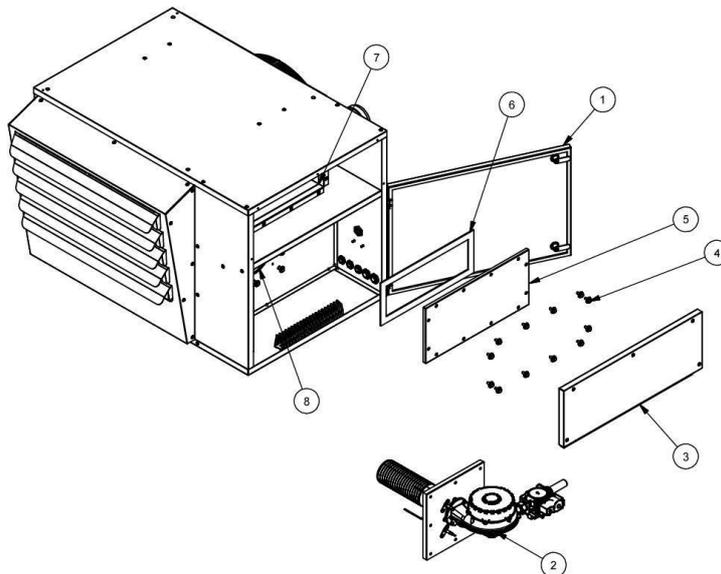
Regularly check that all the screws used to assembly the machine are properly fixed.

**WARNING!!!**

For units installed close to the sea or in difficult conditions, the maintenance intervals shall be halved.

HEAT EXCHANGER INSPECTION

The inspection and cleaning of the heat exchanger should be performed by authorized personnel and in compliance with specific rules. In general, it is recommended to clean it at least once a year, before every winter season. To clean the exchanger, perform the following operations:



1. Disconnect the unit from the electrical connections, from the smoke exhaust and any combustion air ducts, from the gas supply line and place the unit on the ground;
2. Remove the top panel (3);
3. Remove the inspection door from the tube bundle exchanger (5);
4. Inspect the exchange elements and, if necessary, clean and remove the deposits using compressed air or chemical means;
5. Reassemble all the pieces, considering especially the tightness and replacing the various gaskets, if needed.

CLEANING THE CONDENSATE DRAIN SYSTEM

Visually check where possible or with adequate tools the condition of the ducts. Remove the fine dust forming on the air intake terminal.

Clean the syphon on an annual basis, checking the condition of the connections. Make sure that there are no metallic residual traces. In case of formation of metallic residues, increase the number of revisions.

After cleaning the syphon, before restarting the heater, fill the syphon with water and close the adequate cap.

CLEANING THE BURNER

The cleaning of the burner is performed by disconnecting it and removing any deposits on the tube using **exclusively** compressed air. The faulty gaskets will be absolutely replaced.

CLEANING THE ELECTRODES

For a correct ignition and operation of the unit, it is important to clean the ignition and ionization electrodes by removing any deposits and/or oxidations.

CLEANING THE FAN

The cleaning of the fan consists of the mechanical removal of dust or foreign bodies which have deposited on the impeller, motor and protection grill.

CLEANING THE SMOKE EXHAUST AND COMBUSTION AIR INTAKE DUCTS

To clean the smoke exhaust and combustion air intake ducts, mechanically remove dust of any foreign matter deposited inside them.

CLEANING THE EXTERNAL PANELS

This cleaning should only be carried out with damp cloths with soap and water. For stubborn stains, moisten the cloth with a mixture of 50% water and 50% denaturated alcohol or specific products. After cleaning, dry the surfaces carefully.



FORBIDDEN!!!

Do not use sponges impregnated with abrasive products or powder detergents.



FLEXIHEAT UK LTD

Flexible Heating & Dehumidification Solutions

01202 822221

www.flexiheatuk.com

Since the Company is constantly involved in the continuous improvement of all its production, the aesthetic and dimensional features, technical data, equipment and accessories, may be subject to change.