



®

FLEXIHEAT UK

CE 0461CN1002

*Condensing Unit
Heater - Natural Gas
or Propane*

FHFHCAU 30/40/50/70



FHFHCAU EN

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This range of products are constantly being updated and refined. We reserve the right to change our products and their relevant technical data contained in this publication at any time and without prior notice.

NOTICE

CE marking

Concerning the technical demands that are required, the CE marking is the official recognition of the quality of design, manufacture and performance of this device. Its long lifetime and its performance will be at optimum level if its use and its maintenance are properly carried out and the regulations in force.

Responsibility

This equipment must be used expressly for the purpose for which **FLEXIHEAT** has designed and manufactured it. Any contractual liability of **FLEXIHEAT** is therefore excluded in case of damage undergone by persons, animals or goods, following errors in installation, settings, maintenance and inappropriate use.

The devices must be equipped exclusively with genuine accessories. **FLEXIHEAT** will not be held responsible for any damage whatsoever arising from the use of an accessory which is inappropriate to the device.

The devices must be installed by qualified professional workers, respecting the regulations and decrees in force, and in accordance with the instructions shown in this instruction manual. The installer is required to establish installation conformity certificates produced by the ministries responsible for the construction and safety of gas. References to standards, rules and directives mentioned in this manual are given for information purposes and are only valid at the date of printing this manual.

FLEXIHEAT is responsible for the conformity of the device to the rules, directives and standards of construction in force at the time of marketing. Knowledge and respect for the legal provisions as well as the standards inherent in the design, implantation, installation, commissioning and maintenance are exclusively the responsibility of the study bureau, of the installer and of the user.

Reception – Storage

The gas unit heater is delivered on a wooden pallet, protected by cardboard packing and a plastic film. It is essential to check the condition of the equipment delivered (even if the packing is intact) and its conformity compared to the order.

In case of damage or missing parts, you must report the observations on the transport company's receipt form in the most precise way possible, "subject to unpacking" has no legal value, and then you must confirm those reservations by registered letter within 48h to the transport company. We remind you that it is the responsibility of the buyer to check the delivered merchandise, no recourse will be possible if this procedure is not respected.

Store the equipment in a clean and dry room, away from shocks, vibration, divergences in temperature and in an ambient environment with a rate of hygrometry lower than 90%.

Guarantee

Your device benefits from a contractual guarantee against any manufacturing defect, the duration of that guarantee is shown in our catalogue.

Our liability as a manufacturer cannot be committed when incorrect use of a device has occurred, where there is a defect or of an insufficiency in the maintenance of that device, or an incorrect installation of the device (it is your responsibility, as regards this, to check that the latter is carried out by qualified professionals).

In particular we will not be held responsible for material damage, intangible losses or bodily injury resulting from an installation which does not conform:

- to the legal and regulatory provisions or those imposed by local authorities,
- to the national or local or particular provisions governing the installation,
- to our instructions and recommendations for installation, in particular the regular maintenance of the devices,
- to the rules of the trade.

Our guarantee is limited to the exchange or repair of only those parts which are recognised as being defective by our technical departments, excluding the cost of labour, travel and transport.

Our guarantee does not cover the replacement or repair of parts as a result of, in particular, normal wear, incorrect utilisation, service visits by unqualified third parties, a defect in or insufficiency of maintenance or surveillance, non-conforming electrical supply and the use of a fuel which is inappropriate or of bad quality.

Sub-assemblies, such as motors, pumps, electric valves, etc. ..., are only guaranteed if they have never been removed. The rights established under the European directive 99/44/CEE, transferred by the legislative decree No. 24 of 2 February 2002 published on the Official Journal No. 57 of 8 March 2002, remain valid.

PLEASE READ CAREFULLY BEFORE CONTINUING



This technical manual must be kept in good condition inside the unit.



The specifications, illustrations and description contained in this manual are, to our knowledge, accurate at the time of the approval to print. We reserve the right to stop offering some characteristics or to stop the production of a model without notice it, do not constitute an firm agreement of our share.

Safety rules

- It is forbidden to plug and/or reduce the aeration openings of the installation room or the device,
- Never obstruct the smoke evacuation or the new air intake,
- Never make any modifications to the settings made by qualified personnel,
- Never spray water on the unit heater, or touch the device with parts of the body which are wet and/or with naked feet,
- Never touch hot parts of the unit heater, and/or moving parts,
- Never put or hook any object onto the device,
- Any operation on the device is forbidden unless it has been disconnected from the electricity network and the gas supply has been cut off.
- Do not modify the type of gas used, the settings of the device, the safety systems and regulation systems, since that could create dangerous situations.

Warn the after-sales technician in the case of changing the gas, the gas pressure or modifying the supply voltage.

In the case of a long period of non-operation, disconnect the electrical supply from the device. When starting the operation again, you are advised to call on qualified personnel. As a general rule all repair and/or maintenance visits must be carried out exclusively by authorised and qualified personnel.

The taking out of a maintenance contract is strongly recommended “see this with your installer”.



Cautionary note

Electrical components, drive mechanism and combustible gas can FHCAUse injuries. To protect from those risks during the installation or the maintenance, the power supply must be cut and the gas valve closed. Any person involve in the installation or maintenance of this equipment must respect the health and safety standards.



What should you do if you detect a gas smell :

- Close the outside gas valve and the eletrical supply then, inform a technician for maintenance.
- Do not try to switch on the device
- Do not switch on the power supply, do not use phone inside the building.
- Call your gas supplier from another phone. Follow the instructions given by your supplier.
- If you cannot contact them, call the fire department.



1-GENERAL INFORMATION

1-1 General recommendations

Gas condensation unit heaters of the **FHCAU** range are intended for the heating of industrial and service industrial areas, only for use indoors.

These devices can only be installed in rooms which are sufficiently ventilated, unless the device has a sealed connection.

The correct operation of the unit heater depends on correct installation and commissioning.

Installation and maintenance must be carried out by qualified personnel in conformity with the regulatory texts and the rules in force in the trade.

Non respect of those rules will immediately cause the rejection of all responsibility on the part of the manufacturer.

DO NOT INSTALL GAS CONDENSATION UNIT HEATERS IN:

- Rooms which have a risk of explosion,
- Rooms containing chlorinated combination steam,
- Rooms which are excessively humid (electrical danger).

It is the responsibility of the installer, after having checked that the installation respects the recommendations of this notice,

1) to inform the user:

- that it cannot carry out itself any modifications to the design of the devices or the method of carrying out the installation; the least modification (exchange, withdrawal....) of safety components or parts which influence the efficiency of the device or the hygiene of combustion will systematically cause the withdrawal of the EC marking for the device.

- that it is indispensable to have the recommended cleaning and maintenance operations carried out. An annual preventive maintenance service is compulsory.

2) to give these instructions to the user, they form an integral part of the device and therefore must be retained and must always accompany the device, even in the case of sale to another owner or user.

Being always intent on improving the quality of our products, we seek to improve them on a permanent basis. We therefore reserve the right, at any moment, to modify the specifications shown in this document.

1- Description of equipment

The **FHCAU** condensation gas unit heater is an independent hot air generator, running on natural gas and on propane; it is in conformity with the European directives 2009/142/CE and 2009/142/CE applicable to gas devices (EN1050:2009 and EN1196:2011 Standard), certificate n° 0461CN1002 of the 25/10/2012.

It consists of a "direct" gas heating system. For the entire range described in these instructions, the transfer of combustion products outside the room is done by a fan placed upstream of the combustion chamber. The combustion air can then be taken from within the ambient environment or outside. These heaters can be connected to a nozzle, type C13-C33-C53, or to a chimney output, type B23.

The **FHCAU** condensation gas unit heater works with different gas indicated on the identification plate in conformity with the European directive.

1-2 Operation

The *FHCAU* gas condensation unit heaters are devices designed to provide heating in industrial rooms and industrial service rooms.

The *FHCAU* unit heaters consist of a water condensation gas heater and a hot water distributor placed in the air flow.

The fan or the turbine motor blows the air through the distributor to increase its temperature.

This technique enables perfect homogeneity of the blowing temperature to be maintained.

Contrary to a traditional heat exchanger, the partial or total reduction of the air flow or a cut in the electrical supply during the operation will not damage the device.

The combustion part is totally isolated from the air circuit, which guarantees the impossibility of pollution of the heated air flow.

The heater is equipped with a low NO_x premix burner.

The air combustion is sucked in by a variable flow fan and then passes through a venturi system which draws in the correct quantity of gas in accordance with the air flow.

The air/gas mixture is then routed to the burner located in the middle of a stainless steel tubular heat exchanger.

The flame and the combustion gases will pass through the heat exchanger two times in order to dissipate the maximum number of calories. This technology enables a minimum efficiency of 98 % to be obtained at maximum power and 108 % in modulation.

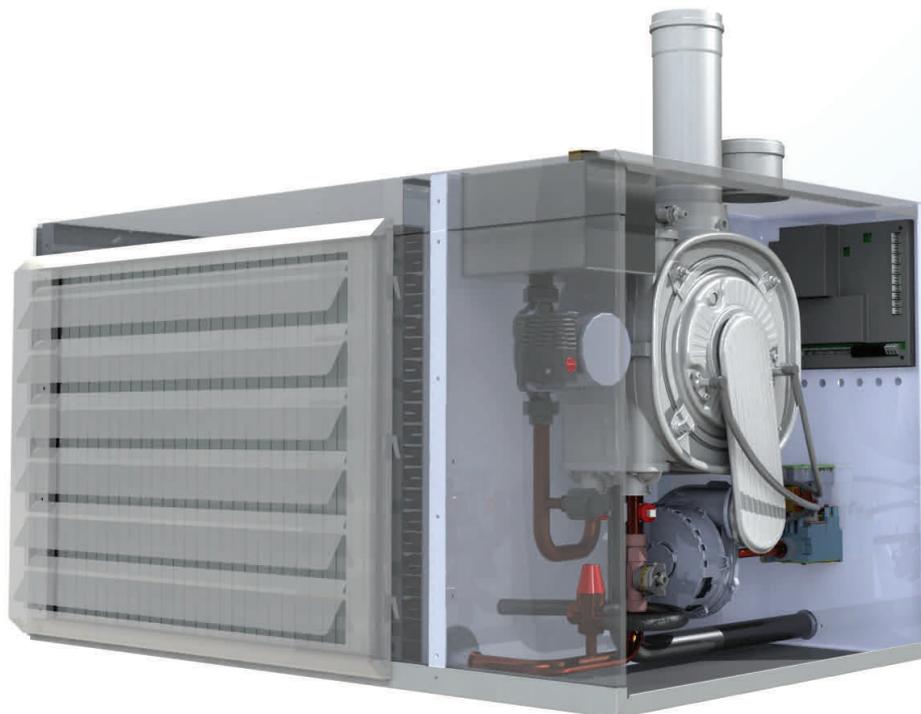
The optimisation of a condensation system performance is linked to its regulation.

The more the power of the unit heater is based on its needs, the more it will condense.

The modulation ratio of the *FHCAU* is up to 25% of the maximal power.

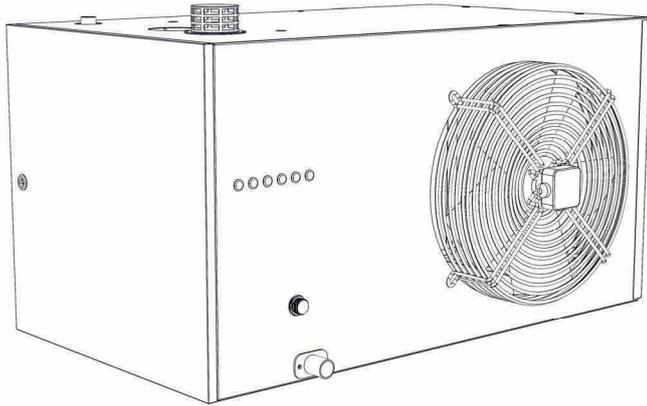
The unit heater electronic card associated with the heating optimizer provides continuous modulation of the thermal power between the minimum and maximum values. The function which modulates the *FHCAU* unit power guarantees its perfect adaptation to the real needs of the building.

For versions equipped with a variable flow fan, the flow of air can also be varied.



2- TECHNICAL SPECIFICATIONS

2-1 Presentation of the Axial range



Axial model

The condensation gas unit heaters are equipped with a axial fan meeting the new requirements of the new European directive 2009/125/EC.

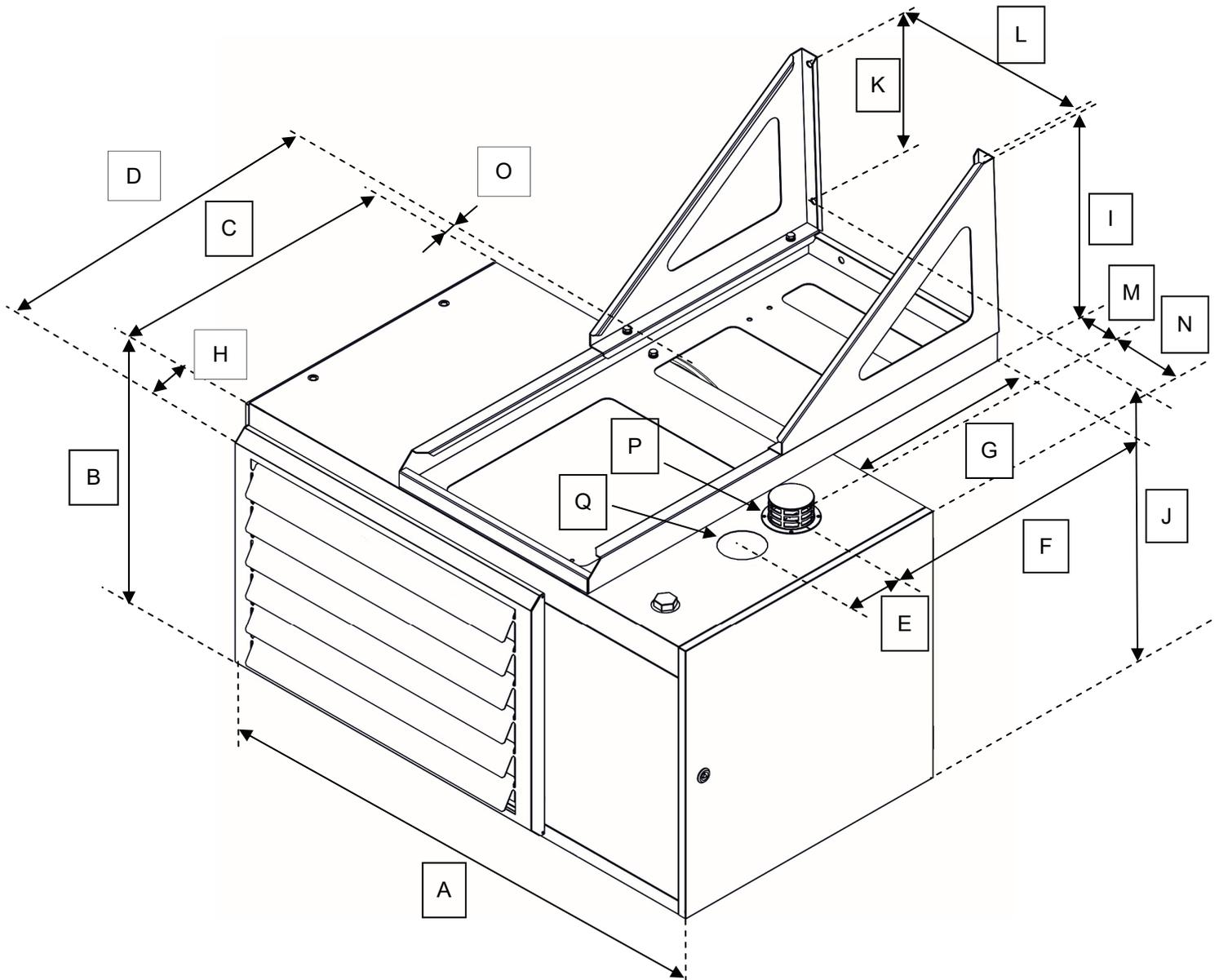
They are designed for direct blowing equipped as standard with a grill with horizontal slats.

Variable air flow versions are equipped with efficient fan motors EC (electronically commutated motors) .

2-2 Performances of axial models

TYPES		FHCAU30H		FHCAU40 H		FHCAU50 H		FHCAU70H	
		maxi	mini	maxi	mini	maxi	mini	maxi	mini
Calorific output	kW	30	8.5	40	12	50	14	70	19
Usable power	kW	27	7.7	36	10.8	45	12.6	63	17
Nominal power maxi	kW	26.5	8.2	34.9	11.5	44.1	13.6	61.7	18.3
Efficiency LHV	%	98	108	98	108	98	108	98	108
ΔT of air flow	°C	28.5	8	29	8	28.2	8	33	9
NOx's Class	Val.	5		5		5		5	
Gas flow at 15°C									
Naturel G20	20 mbar	2.86 m3/h		3.82 m3/h		4.77 m3/h		6.68 m3/h	
Groningue G25	25 mbar	3.16 m3/h		4.21 m3/h		5.26 m3/h		7.37 m3/h	
Propane G31	37 mbar	2.10 kg/h		2.81 kg/h		3.51 kg/h		4.91 kg/h	
Air flow maxi at 15°C	m ³ /h	2700		3450		4600		5500	
Motor's power / Speed (H)	W/RPM	200 / 1350		200 / 1350		420 / 1350		520 / 910	
Air inlet diameter	mm	80		80		80		80	
Exhaust fume diameter	mm	80		80		80		80	
Gas connection diameter		1/2" M		1/2" M		1/2" M		1/2" M	
Supply voltage		230 V ~ 50Hz							
Electrical power / Amperage	W / A	350 / 1.55		350 / 1.55		550 / 2.4		765 / 3.4	
Water volume (glycol -15°C)	L	6.6		7.2		9.2		11.2	
Operating temperature	°C	-15/+40		-15/+40		-15/+40		-15/+40	
Condensation maxi produced	l/h	1,8		2,4		2,9		5,2	
Weight	Kg	88		99		110		135	

2-3 FHCAU dimensions



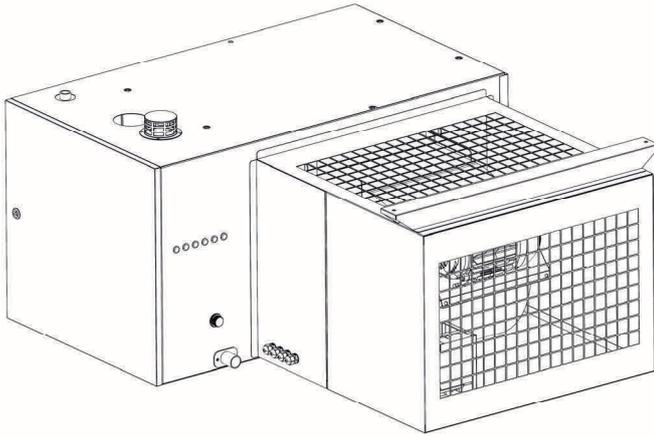
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
FHCAU 30	1078,5	574	606.5	764	120	589	400	33	446	695	300	432	98	160,5
FHCAU 40	1079,5	624	606.5	764	120	589	400	33	446	745	300	432	98	161,5
FHCAU 50	1192	674	606.5	764	120	589	400	33	446	795	300	432	98	224,5
FHCAU 70	1277	774	606.5	769	120	589	400	33	446	895	300	432	98	309

	O	P (air)	Q (fumée)
FHCAU 30	125	80	80
FHCAU 40	125	80	80
FHCAU 50	125	80	80
FHCAU 70	130	80	80

Dimensions are expressed in millimetres (mm)

2- TECHNICAL SPECIFICATIONS

2-4 Presentation of the Centrifugal range



Centrifugal model

The condensation gas unit heaters can be equipped with a centrifugal fan. They come equipped with variable speed control.

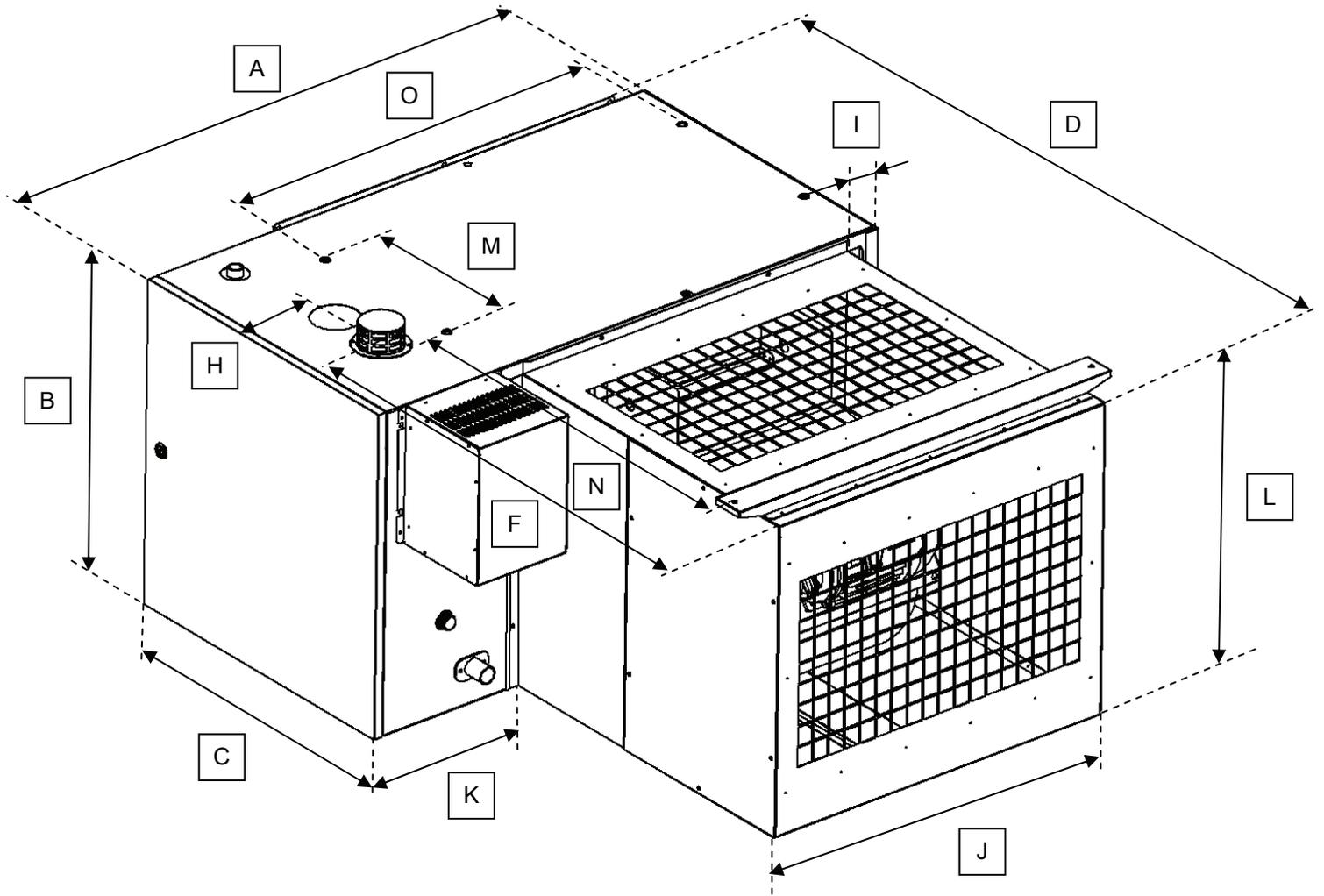
They are designed for direct blowing or by air distribution duct.

2-5 Performances of centrifugal models

TYPES		FHCAU30 C		FHCAU40 C		FHCAU50 C		FHCAU70 C	
		maxi	mini	maxi	mini	maxi	mini	maxi	mini
Calorific output	kW	30	8.5	40	12	50	14	70	19
Usable power	kW	27	7.7	36	10.8	45	12.6	63	17
Nominal power maxi	kW	26.5	8.2	34.9	11.5	44.1	13.6	61.7	18.3
Efficiency LHV	%	98	108	98	108	98	108	98	108
NOx's Class	Val.	5							
Gas flow at 15°C									
Naturel G20	20 mbar	2.86 m3/h		3.82 m3/h		4.77 m3/h		6.68 m3/h	
Groningue G25	25 mbar	3.16 m3/h		4.21 m3/h		5.26 m3/h		7.37 m3/h	
Propane G31	37 mbar	2.10 kg/h		2.81 kg/h		3.51 kg/h		4.91 kg/h	
Air flow and pressure available	See curves pressure/airflow on the following page								
Fan		AT 10-10		AT 10-10		AT 12-12		AT 15-15	
Motor power	kW	0.75		1.5		1.5		1.5	
Air inlet diameter	mm	80		80		80		80	
Exhaust fume diameter	mm	80		80		80		80	
Gas connection diameter		1/2" M		1/2" M		1/2" M		1/2" M	
Supply voltage		230 V ~ 50Hz							
Electrical power / Amperage (except ventilation)	W / A	130 / 1.8		130 / 1.8		130 / 1.8		290 / 1.25	
Water volume (glycol -15°C)	L	6.6		7.2		9.2		11.2	
Operating temperature	°C	-10/+40		-10/+40		-10/+40		-10/+40	
Condensation maxi produced	l/h	1,8		2,4		2,9		5,2	
Weight	kg	128		160		165		195	

Warning : the return air temperature must not be lower than -10 ° C, below this limit the operation of the fan motor and the frequency converters is not guaranteed.

2-6 FHCAUC dimensions



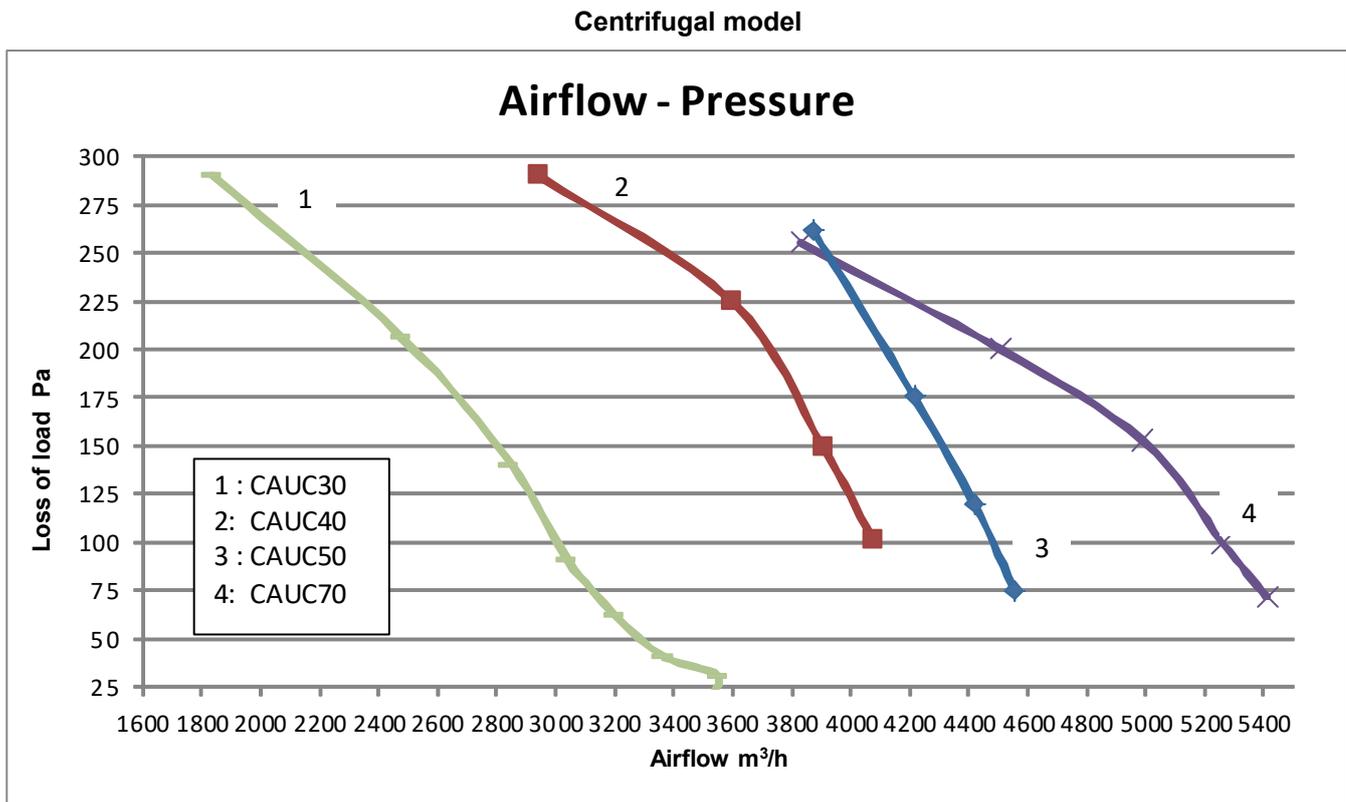
	A	B	C	D	E (*)	F	H	I
FHCAU 30C	1078,5	574	639,5	1366	120	866	160	66
FHCAU 40C	1079,5	624	639,5	1366	120	866	160	66
FHCAU 50C	1192	674	639,5	1431	120	931	224	66
FHCAU 70C	1277	774	639,5	1460.5	120	961	309	66

	J	K	L	M	N	O	Air	Fumes
FHCAU 30C	704	308,5	548	320	756	770,5	80	80
FHCAU 40C	704	308,5	598	320	756	770,5	80	80
FHCAU 50C	755	373	648	320	831	820	80	80
FHCAU 70C	755	457	748	320	835.5	820	80	80

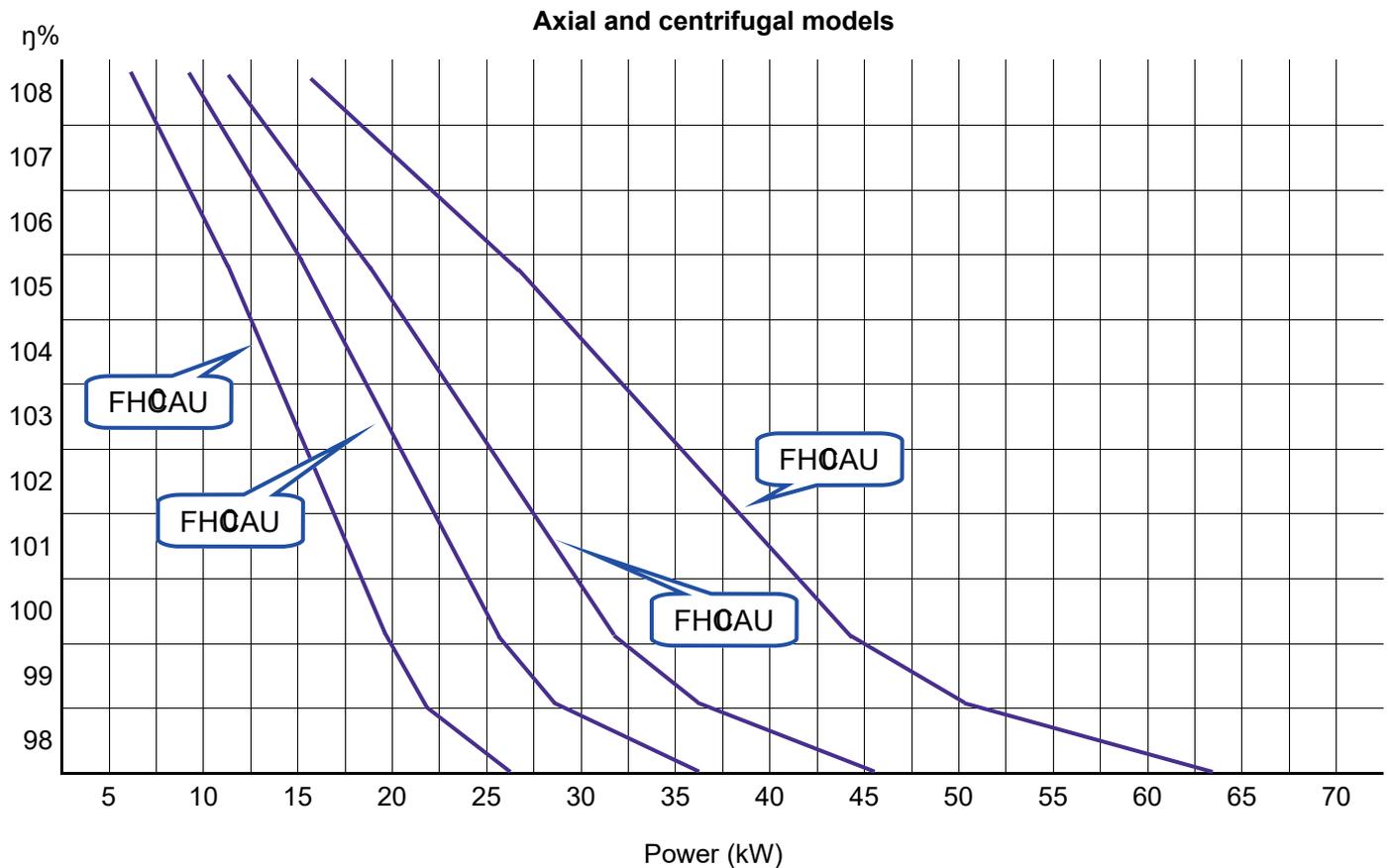
Dimensions are shown in millimetres (mm)

(*) Distance between fumes exhaust and air inlet

2-7 Curves pressure/ airflow



2-8 Curves power / efficiency



Power is given according to the air intake temperature of 18°C.

Efficiency is determined based on boiler water regimes of 54°C / 80°C at maximal power and 29°C / 38°C at minimal power.

The efficiency change according to the air intake temperature.

Water regime allows to establish the efficiency in influencing the fumes temperature.

3- INSTALLATION

The installation of condensing gas unit heater must be realised by a qualified person. It depends on the local characteristics, the volume, the place, the flue connections or the ventilation system of the building.

3-1 General rules

The condensing gas unit heater can be installed directly in the locale to heat. However, this installation must be in conformity with the safety national rules depending on the combustible type used and the country where the equipment is installed. In case of doubt, request information from inspection or safety bodies.

Ventilation:

In order to install a unit working with gas, the premises must be ventilated permanently according to the rules in force in the country of the installation.

Drainage of the condensed water :

The heater is delivered with a siphon to drain the condensed water. The siphon is an integral part of the unit, it is a component of the safety system, any replacement by another type non-approved is strictly prohibited.

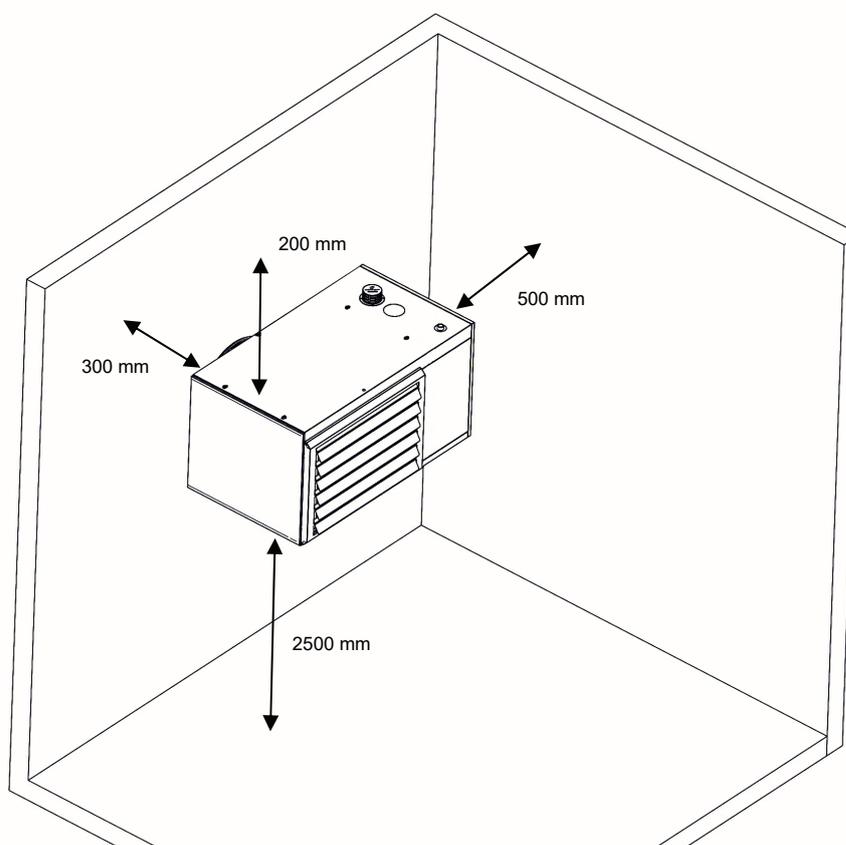
Exhaust of the condensation water must be size in conformity with the existing rules in the country of installation of the unit heater.

Gas connection:

Before installing the device, it is necessary to check that the conditions of local distribution (type of gas, pressure) are compatible with the setting of the device to be installed.

CAUTION:

Minimum distance required for maintenance and safety of the device.



3-2 Fix the unit

Devices connected and supplied by a rigid gas piping must be immobilized.

To facilitate installation, we recommend you to use our adjustable support hanging device. They are perfectly adapted to the device and position it so as to respect the minimum dimensions of the distance away from the wall.

INSTALLATION: always refer to the instructions supplied with the hanging device.

Before mounting the device, it is necessary to make sure of the support's strength.

Step 1:

- Assemble the various items of the hanging device, see the instructions delivered with the product.
- Mount the hanging device to the wall, use a fixing which is suitable for the material constituting the wall and proceed of a strength test so it can bear twice the mass of the unit.
- **Make sure that the size and the type of the screws which are used, comply with the type of wall and are enough to hold twice the weight of the device.**

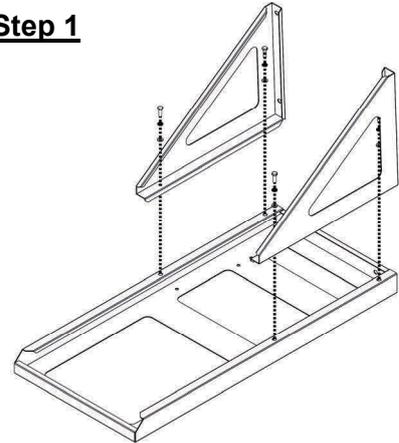
Step 2:

- Mount the unit heater under the hanging device with the screws supplied, block them.
- Adjust the unit, screw in or unscrew the M8 adjustment screws.

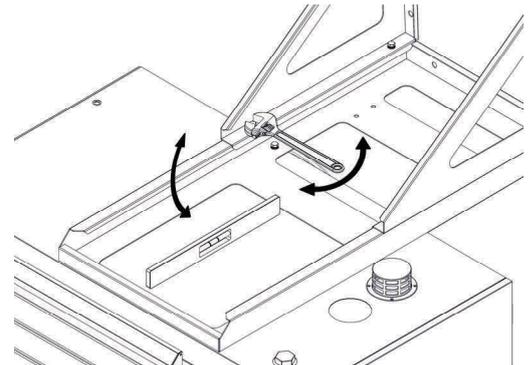
Step 3:

- Open the louver of the grille at the front of the unit at least at 45° so the air can go through them freely.

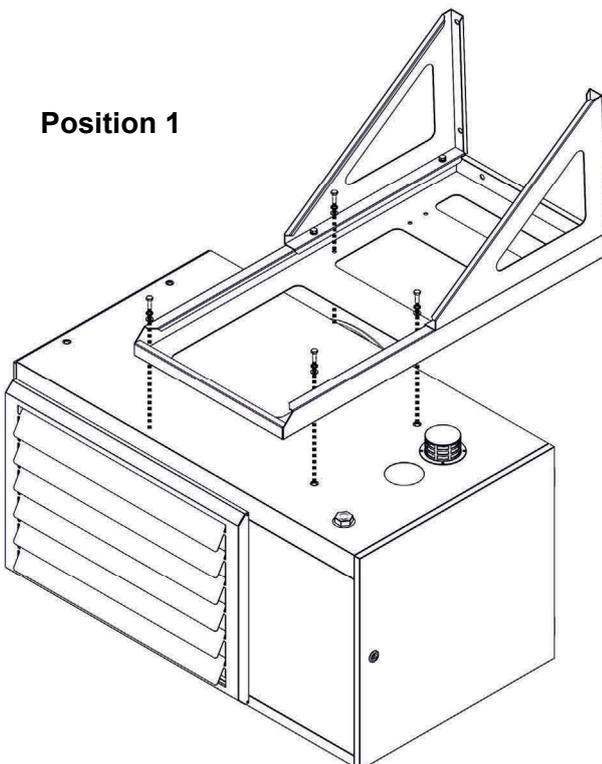
Step 1



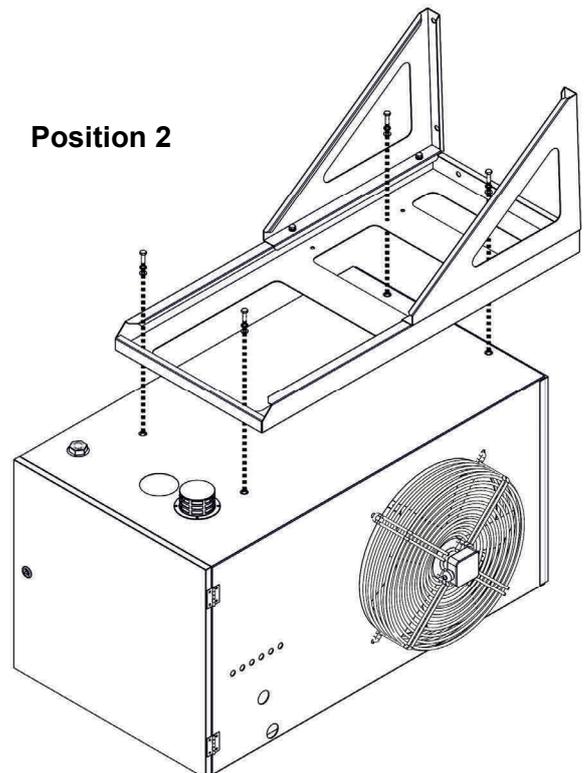
Step 2 (levelling appliance)



Position 1



Position 2



3-3 Connection of fumes evacuation pipes

The combustion product evacuation systems represented in these technical instructions are those which are normally used in the market. However, some of them cannot be used in all countries. It is the responsibility of the installer or the owner to make sure that the smoke exhaust system chosen is indeed in accordance with the local installation rules.

The connection of the evacuation pipes for fuel air smoke/inlet, can be done in the following way:

- by drawing in of fuel air from outside (type "C")
- by drawing in of fuel air in the room where the unit heater is installed (type "B").

The unit heater is approved for these types of connections: C13-C33-C53-B23.

The pipes, terminals and heater fitting must be manufactured in a material which resists the condensate contained in the "cold" smoke, between 35 and 100°C, produced by condensation. Only pipes of polypropylene PP and/or stainless steel 316L, are authorised.

The pipes, terminals and accessories used on the heater unit must compulsorily be approved, use only inlet terminals and exhaust referenced by FLEXIHEAT, the use of non approved equipment causes the void of the manufacturer's guarantee.

Installation of the air inlet female flange

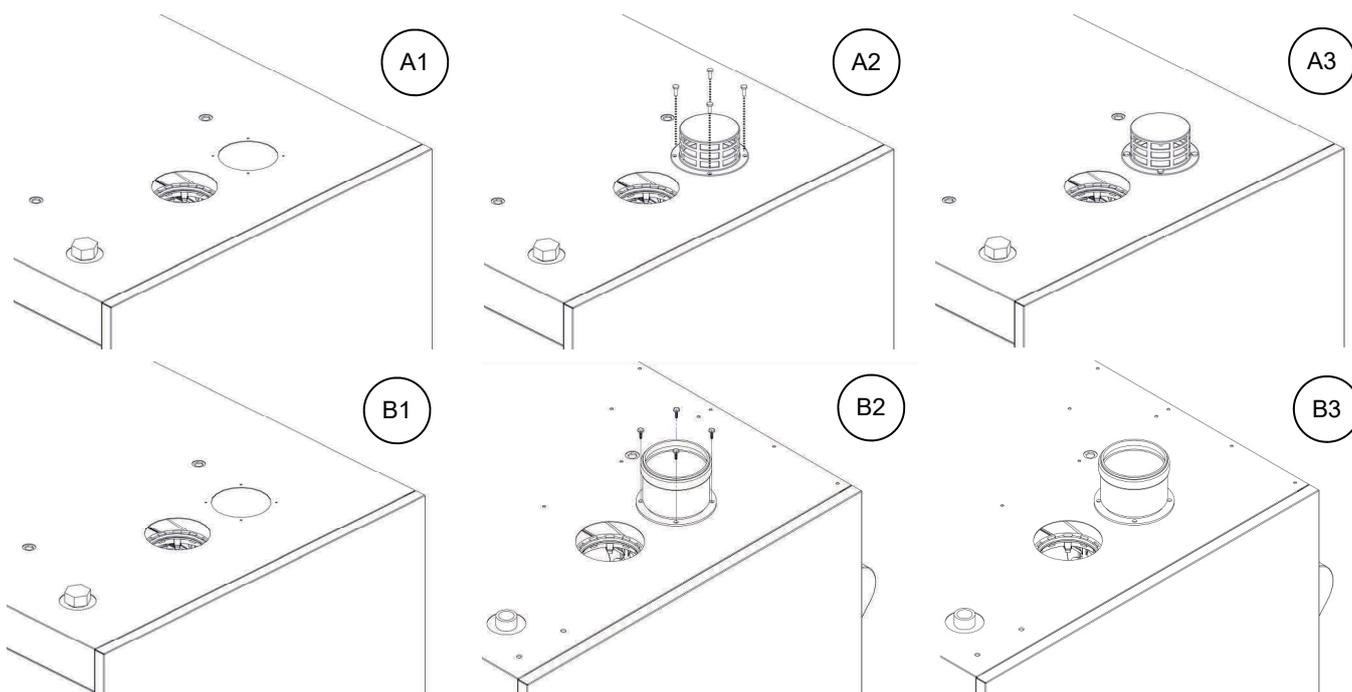
The devices using "free air" are equipped with an air inlet flange. For a sealed installation, known as suction, it is necessary to mount :

- for "B23" connection type, be sure to mount the protective air inlet capon the unit top (figures A).

Be sure to provide sufficient ventilation in the room, the new air supply required for the combustion must be at least 100 m³/h per unit.

- for sealed connection type C33, C13 and C53, be sure to mount the air inlet sealed flange on the unit top (figures B).

The use of sealed pipes implies perfect sealing of the junctions, also to facilitate the installation, it is indispensable to use a non aggressive lubricant for the sealing joint such as soapy water.

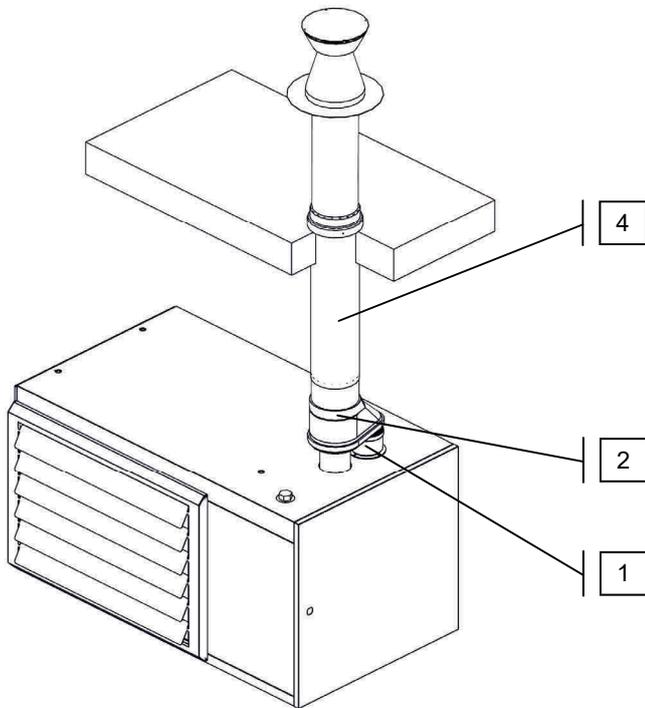


Connection of evacuation pipe type C33 and C13

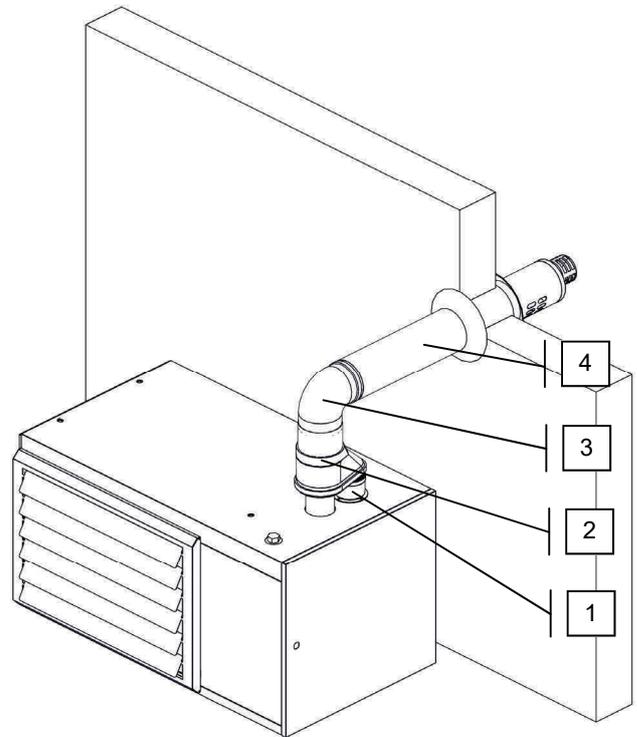
Combustion circuit sealed in relation to the ambient environment.

The combustion air inlet and smoke evacuation connections are installed horizontally or vertically towards the outside of the room. The evacuation connection pipe must not pass through any other room than the one in which the device is installed.

C33 Concentric roof fume evacuation



C13 Concentric wall fume evacuation



Typical installation:

- 1) Female flange \varnothing 80
- 2) Concentric pipe reduction 2x \varnothing 80 concentric \varnothing 80/125
- 3) Concentric elbow \varnothing 80/125 à 90°
- 4) Concentric wall or roof terminal \varnothing 80/125

It is possible to extend or to change the direction of the air vent using approved accessories. The sections of the pipes must be at least equal to the departure diameter from the device. Never reduce the diameter of the pipes or block the aerations of the room.

Do not place the air vent terminal:

- at less than 2 metres from a ventilation or an opening,
- in an area where persons pass by,
- less than 2 metres from the ground or directly accessible (risk of obstruction, use of a terminal protection device – accessory not supplied).

WARNING

The junction must be sealed and rigid, make sure that the sealing joints are present.

The total length must not exceed 8 metres, in the knowledge that: 1 elbow at 90° or 45° = 1 meter of pipe. In the case of the horizontal part, make sure that there is always a slope towards the heater to prevent the risk of retaining condensate.

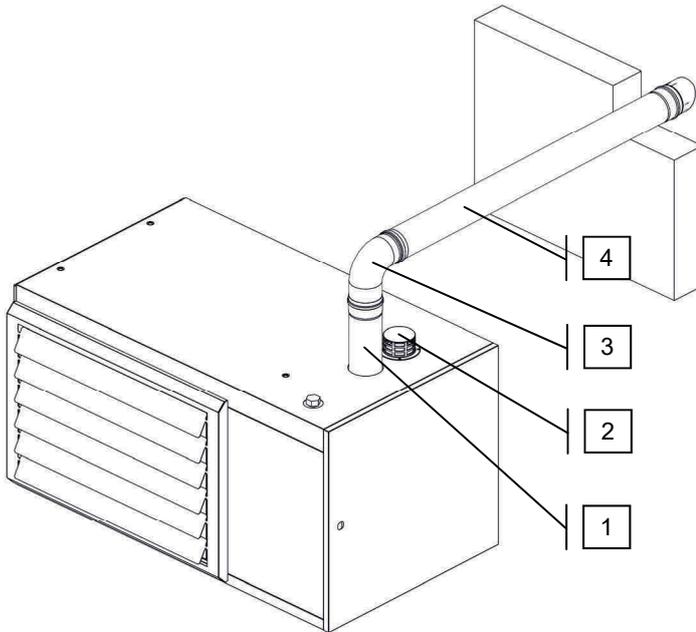
Connection of evacuation pipe type B23

Combustion circuit sealed in relation to the ambient environment.

Air for combustion is taken in the room and smoke evacuation connection is installed horizontally or vertically towards the outside of the room.

The combustion air inlet and smoke evacuation connections are installed horizontally or vertically towards the outside of the room. The evacuation connection pipe must not pass through any other room than the one in which the device is installed.

B23 Horizontal



Typical installation:

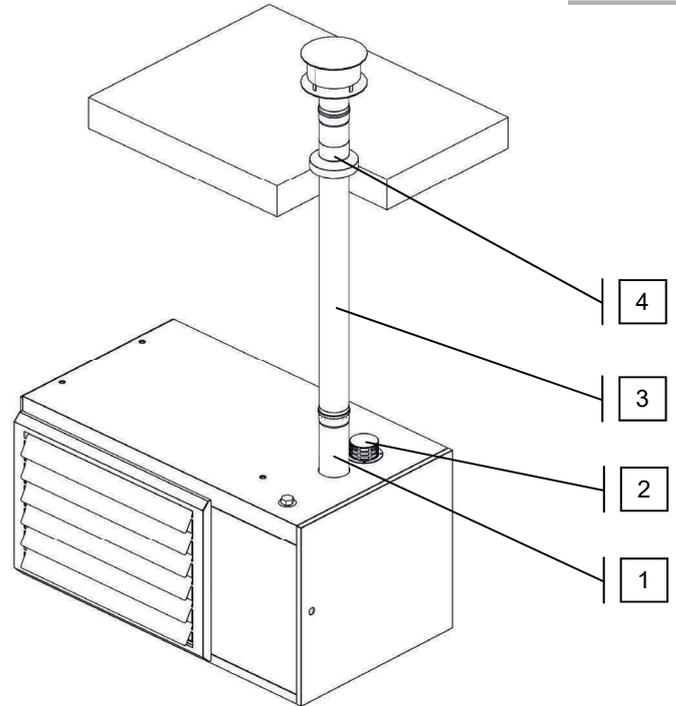
- 1) Sealed tube \varnothing 80 length 250 mm (1)
- 2) Protective air inlet
- 3) Pealed elbow \varnothing 80 to 90° (2)
- 4) Wall terminal monotube \varnothing 80 (3)

It is possible to extend or to change the direction of the air vent using approved accessories. The sections of the pipes must be at least equal to the departure diameter from the device. Never reduce the diameter of the pipe or block the aerations of the room. It's advised to use the elbows 45°.

Do not place wall evacuation :

- at less than 2 meters from a ventilation or an opening from the ground or in an area where persons pass by.

B23 Vertical



Typical installation:

- 1) Sealed tube \varnothing 80 length 250 mm (1)
- 2) Protective air inlet
- 3) Flashing (sliding moulding is not supplied)
- 4) Roof terminal monotube \varnothing 80 (3)

It is possible to extend or to change the direction of the air vent using approved accessories. The sections of the pipes must be at least equal to the departure diameter from the device. Never reduce the diameter of the pipe or block the aerations of the room. It's advised to use the elbows 45°.

WARNING

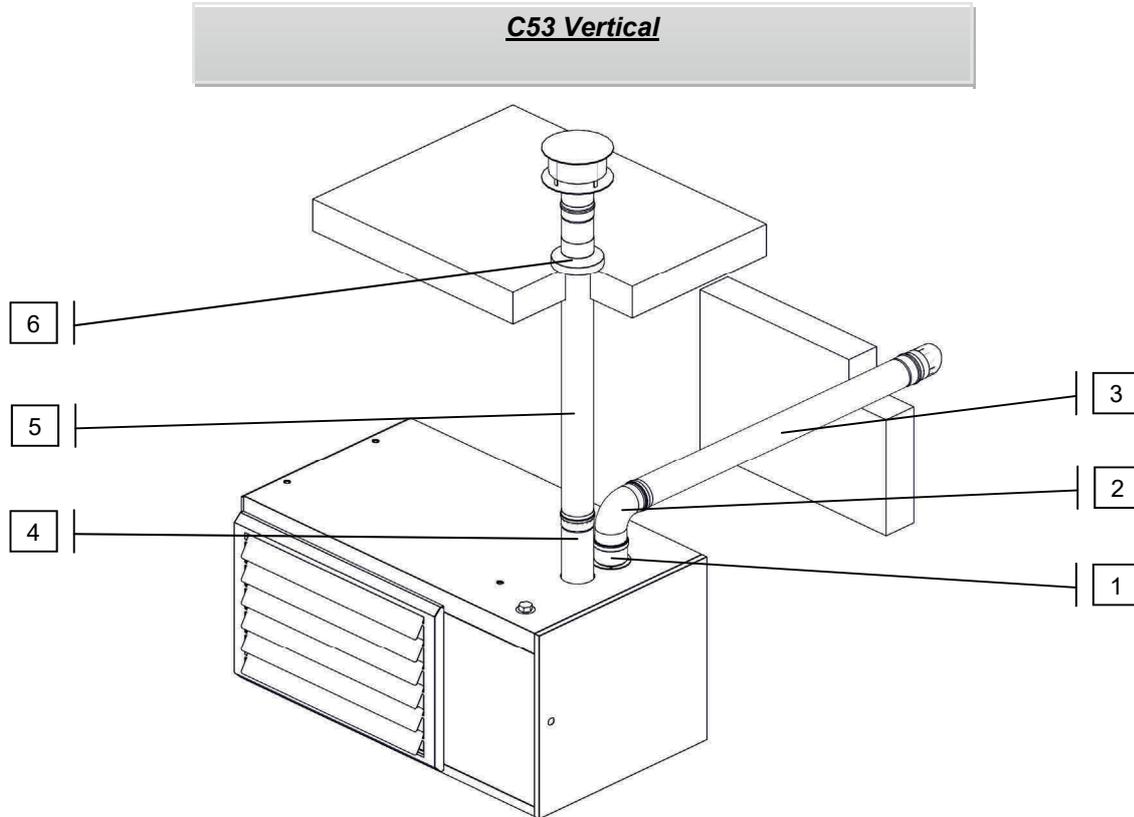
The junction must be sealed and rigid, make sure that the sealing joints are present.

The total length must not exceed 8 metres, in the knowledge that: 1 elbow at 90° or 45° = 1 meter of pipe. In the case of the horizontal part, make sure that there is always a slope towards the heater to prevent the risk of retaining condensate.

Connection of evacuation pipe type C53

Combustion circuit sealed in relation to the ambient environment.

The combustion air inlet is installed horizontally and smoke evacuation connection is installed vertically towards the outside of the room. The evacuation connection pipe must not pass through any other room than the one in which the device is installed.



Typical installation:

- 1 Sealed flange \varnothing 80 (1)
- 2 Sealed elbow \varnothing 80 to 90° (2)
- 3 Wall terminal monotube \varnothing 80 (3)
- 4 Sealed tube \varnothing 80 length 250 mm (4)
- 5 Roof terminal monotube \varnothing 80 (5)
- 6 Flashing (sliding moulding is not supplied)

It is possible to extend or to change the direction of the air vent using approved accessories. The sections of the pipes must be at least equal to the departure diameter from the device. Never reduce the diameter of the pipe or block the aerations of the room.

It is recommended to use 45° elbows instead of 90° ones. If using 90° elbows is inevitable, do not use more than two.

WARNING

The junction must be sealed and rigid, make sure that the sealing joints are present.

The total length must not exceed 8 metres, in the knowledge that: 1 elbow at 90° or 45° = 1 meter of pipe. In the case of the horizontal part, make sure that there is always a slope towards the heater to prevent the risk of retaining condensate.

3-4 Condensate connection

The gas condensation unit heaters are equipped with a siphon which provides for the flow of condensation water at the back of the device, the siphon is delivered separately, to be installed during installation.

Caution, evacuation must be carried out using materials which resist acid water with a PH of 3.

Never use tubes in copper or in zinc plated iron.

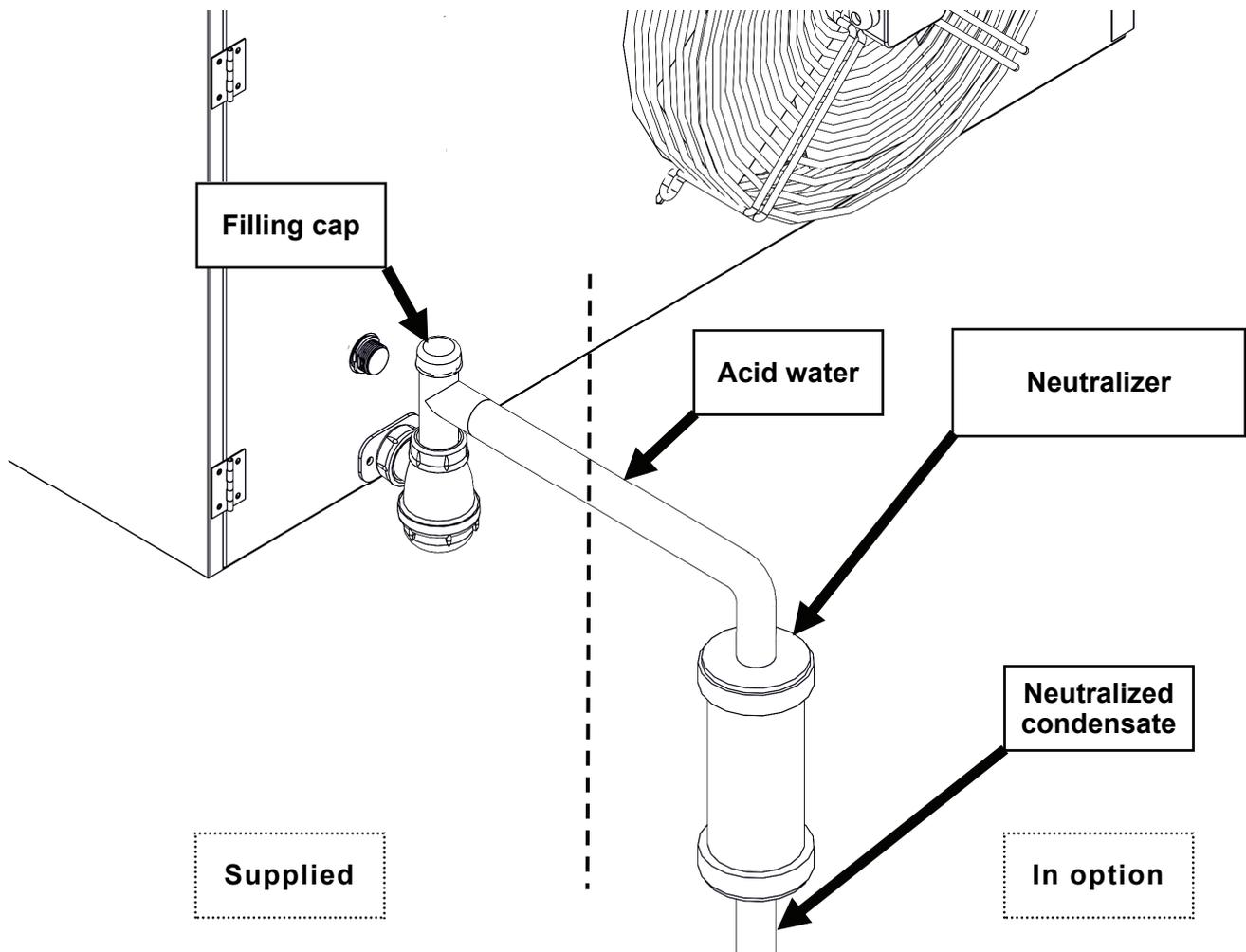
- For the condensation water follow system, use pipes in PVC of a diameter of at least equal to that of the device (PVC Ø 32). Make sure that the piping is always installed lower than the high point of the siphon.
- Check the sealing of the condensation water evacuation pipes.
- **Before using the device**, fill the siphon with water via the filling plug. This will prevent the output of smoke in the waste water during commissioning.

Anti-freeze protection

The evacuation of condensates, including the siphon, must be protected from frost. It is preferable to keep the evacuation piping wherever possible inside a frost-free room. If it is outside the building, it is necessary that the piping part behind the siphon is open to avoid any formation of ice which would block the flow. Take all necessary measures in order to avoid such an incident, this would risk causing irreversible damage to the unit heater.

Neutralising the condensation water

The acidity of the water obtained from the natural gas combustion is 3.5-3.8 PH. Certain interpretations of regulation on polluting waste impose the treatment of condensate. In this case, provide a condensation water neutralisation kit. Contact the after sales service for more information.



3-5 Gas connection

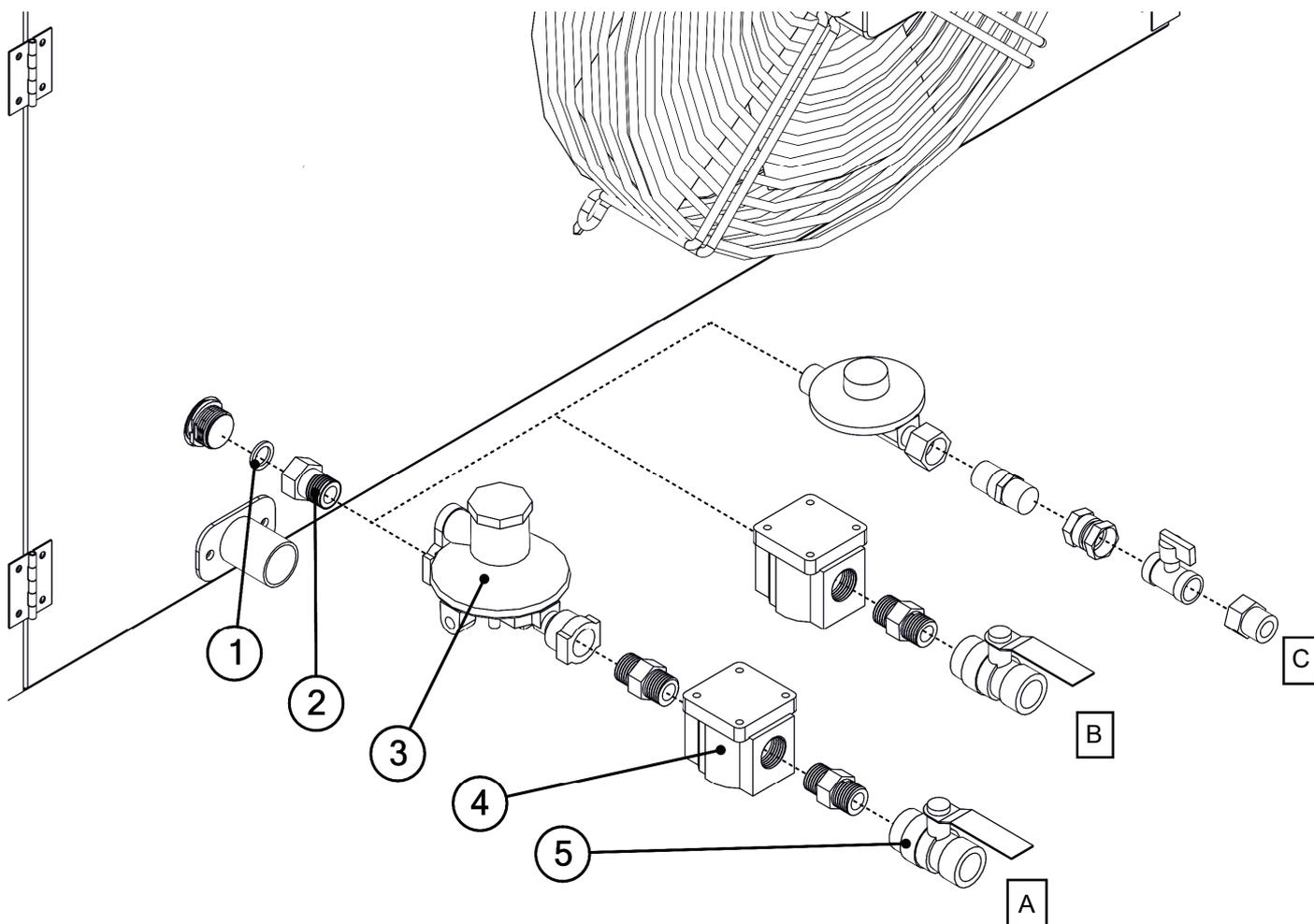
First of all it is necessary to check that the device that you have received is in conformity with the type of gas distributed. For this purpose, you must refer to the indications shown on the generator manufacturer's plate.

The gas supply must be appropriate to the power of the generator and to be equipped with all the security and inspection devices required by current standards.

A precise study must be carried out on the diameters of the piping depending on the type, of the gas flow and on the length of the piping. It is necessary to make sure that pressure drops in the piping do not exceed 5 % of the supply pressure.

The gas connections must be made in conformity with the recommendations relative to internal installations whatever may be the type of gas, by qualified personnel holder of the necessary approvals.

Caution: before opening the gas network, check the sealing up to the unit heater solenoid valve



Gas connection:

- A–Over 50mbar natural gas supply
- B– Under 50 mbar natural gas supply
- C– LPG supply

Gas connection kit*:

- 1– Gasket (supplied)
- 2– Connection with air heater (supplied)
- 3– Gas regulator
- 4– Filter
- 5– Gas valve

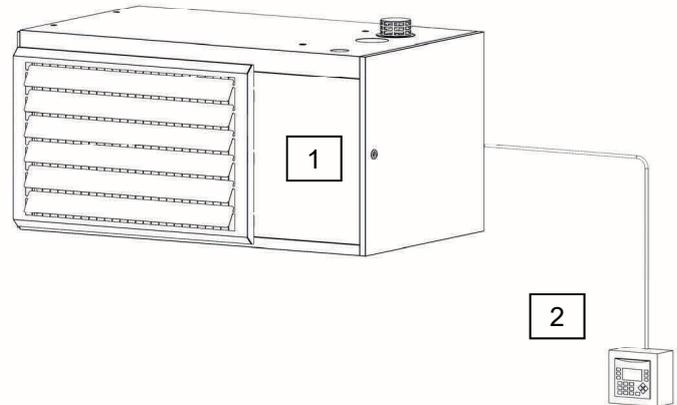
*To know more about this kit, please refer to the instruction manual supplied.

4- Control system and electrical connection

4-1 Independent heating controller REG402 and REG410

Individual controller for one single heater :

Centralized heating control system, REG402 (2), is a smart heating controller for up to 6 heating units (1) with **one** temperature and time frame area. Communication between heating control system and the heating units is done by a 2 pairs shielded telephone cable.



- 1- Condensing gas heater
- 2- Individual controller

Controller with remote connection for Internet wireless router:

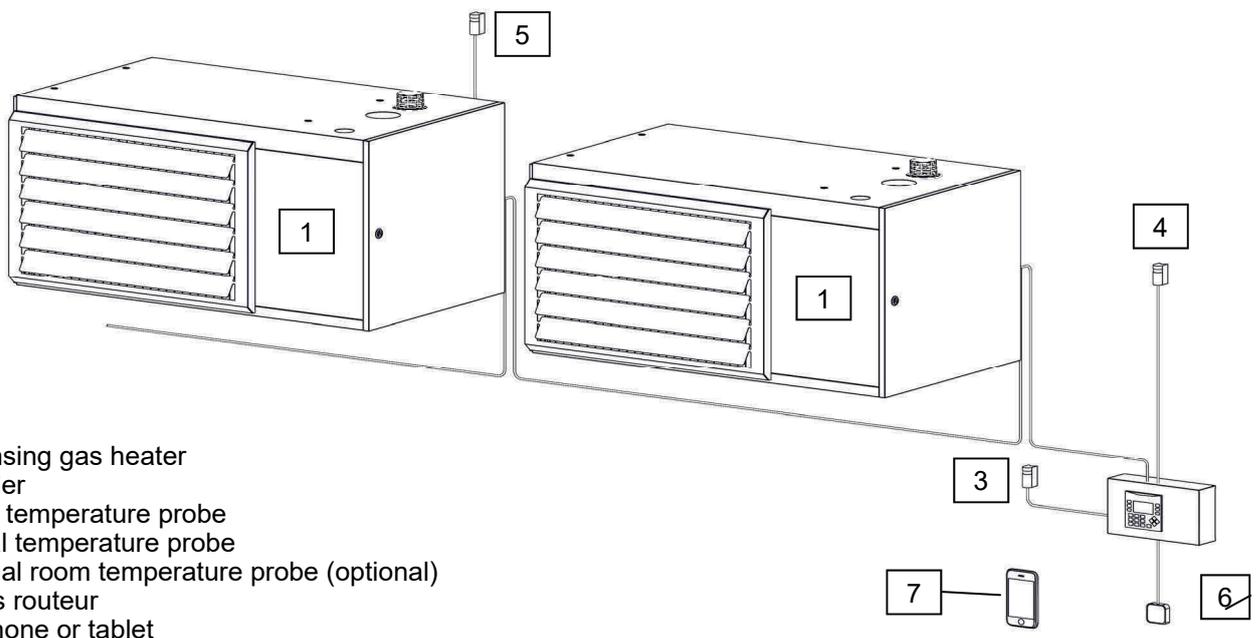
Centralized heating control system, REG410 (2), is a smart heating controller for up to 16 heating units (1) with up to **two** temperature and time frame area for heating and **one** temperature and time frame area for fresh air supply. Communication between heating control system and the heating units is done by a 2 pairs shielded telephone cable. The length of this cable must not exceed 200 meters.

The controller is driven by two temperature probes. The first one control the internal temperature (3), the second one, the external temperature (4).

Individual probe (5) can be added to the unit in order to be independent. This unit will be driven by his own probe creating its own temperature control area. This type of control can be extended on all units.

With the smartphone controller, parameters modification and communication between units are done :

- directly on the controller, thanks to the numerical keypad or
- on a Smartphone (7), within the wireless router (6).



- 1- Condensing gas heater
- 2- Controller
- 3- Internal temperature probe
- 4- External temperature probe
- 5- Individual room temperature probe (optional)
- 6- Wireless router
- 7- Smartphone or tablet

Controller with remote connection for Internet customer red :

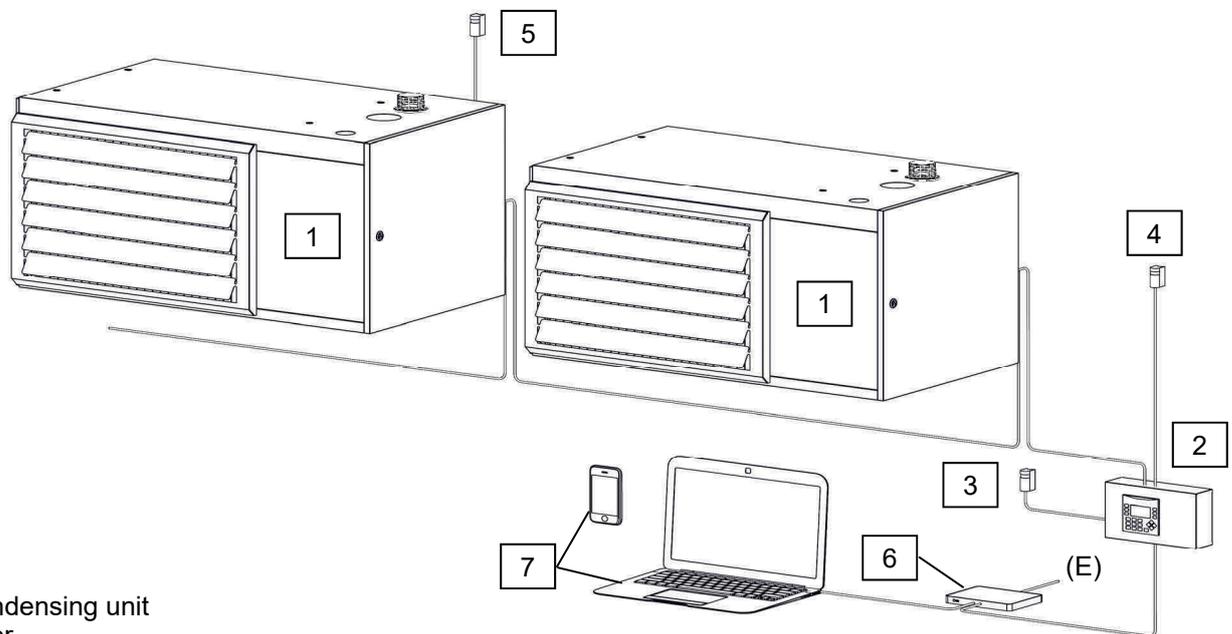
Centralized heating control system, REG410 (2), is a smart heating controller for up to 16 heating units (1) with up to **two** temperature and time frame area for heating and **one** temperature and time frame area for fresh ai supply. Communication between heating control system and the heating units is done by a 2 pairs shielded telephone cable. The length of this cable must not exceed 200 meters.

The controller is driven by two temperature probes. The first one control the internal temperature (3), the second one, the external temperature (4).

Individual probe (5) can be added to the unit in order to be independent. This unit will be driven by his own probe creating it own temperature control area. This type of control can be extended on all unit.

With the smartphone controller, parameters modification and communication between units are done :

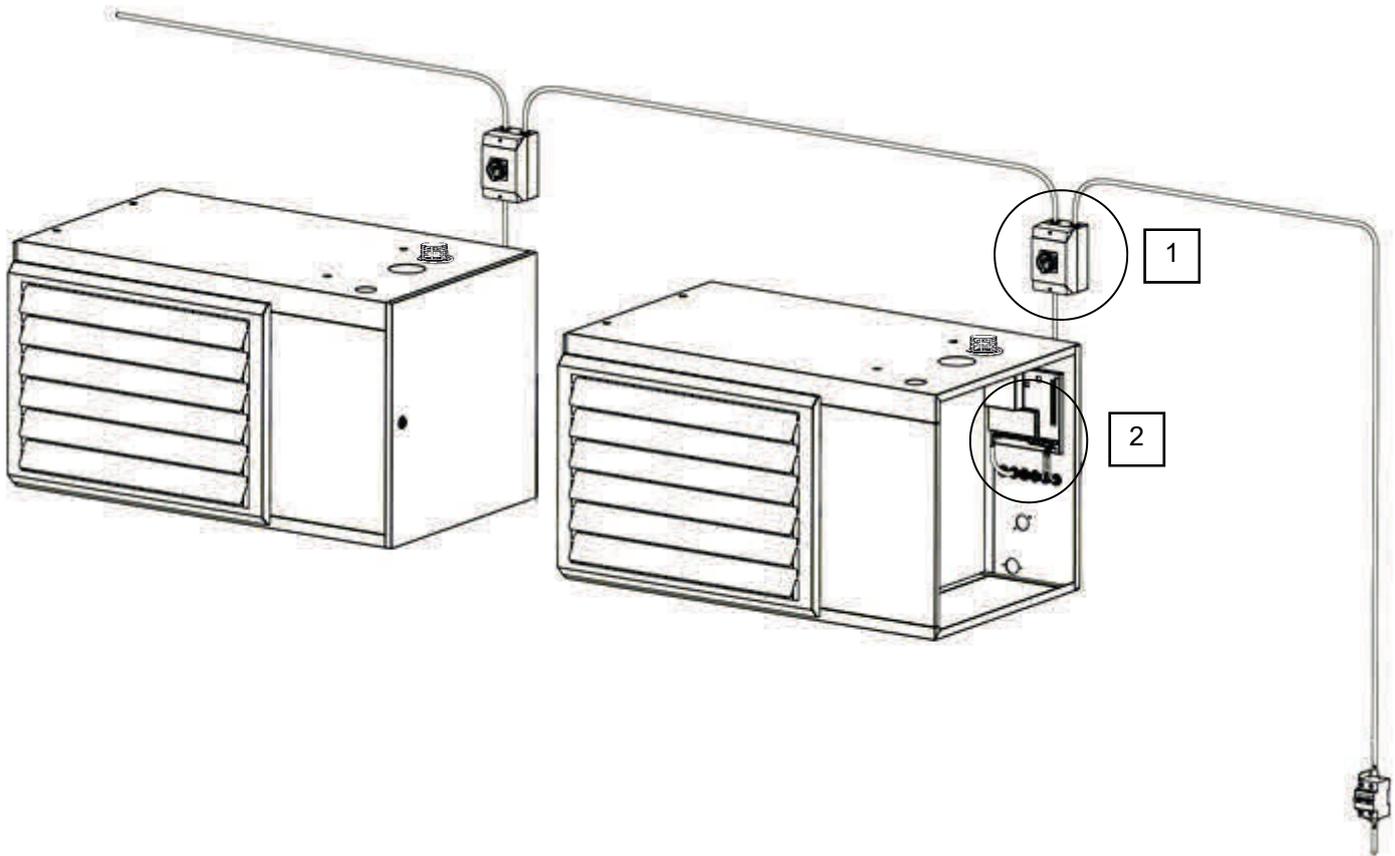
- directly on the controller, thanks to the numerical keypad or
- via an Internet connection, only if the controller is connected (6) to the Internet customer red (E) and if the computer (7) is equipped with an interactive software.



- 1- Gas condensing unit
- 2-Controller
- 3- Internal temperature probe
- 4- External temperature probe
- 5- Individual room temperature probe (optional)
- 6- Network switch connected to customer red (E)
- 7- Ordinateur ou Smartphone du client

For further information on the above products, please refer to the manual of the controller.

4-2 Electrical connection

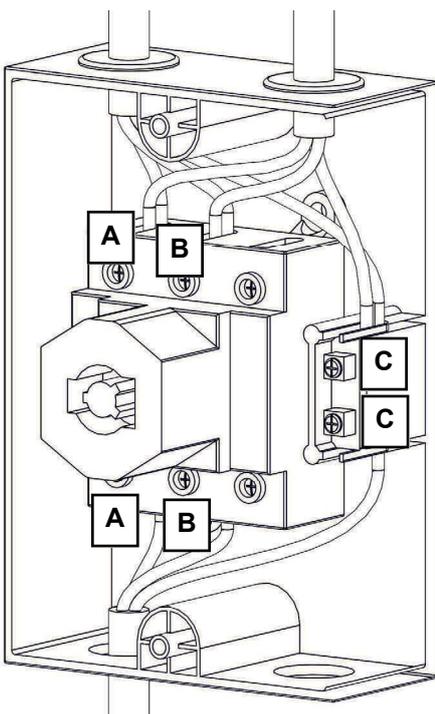


Units are powered with fused cable single phase 230V . Cable section and its protection should be sized accordingly to the number of the units connected and its length.

Units and heating control system are connected a 2 pairs shielded telephone cable. Connect the controller to the first heater, then connect the first heater to second and proceed in the same for the others until the last one.

Please refer to the controller manual for connections.

1/ 230V power switch



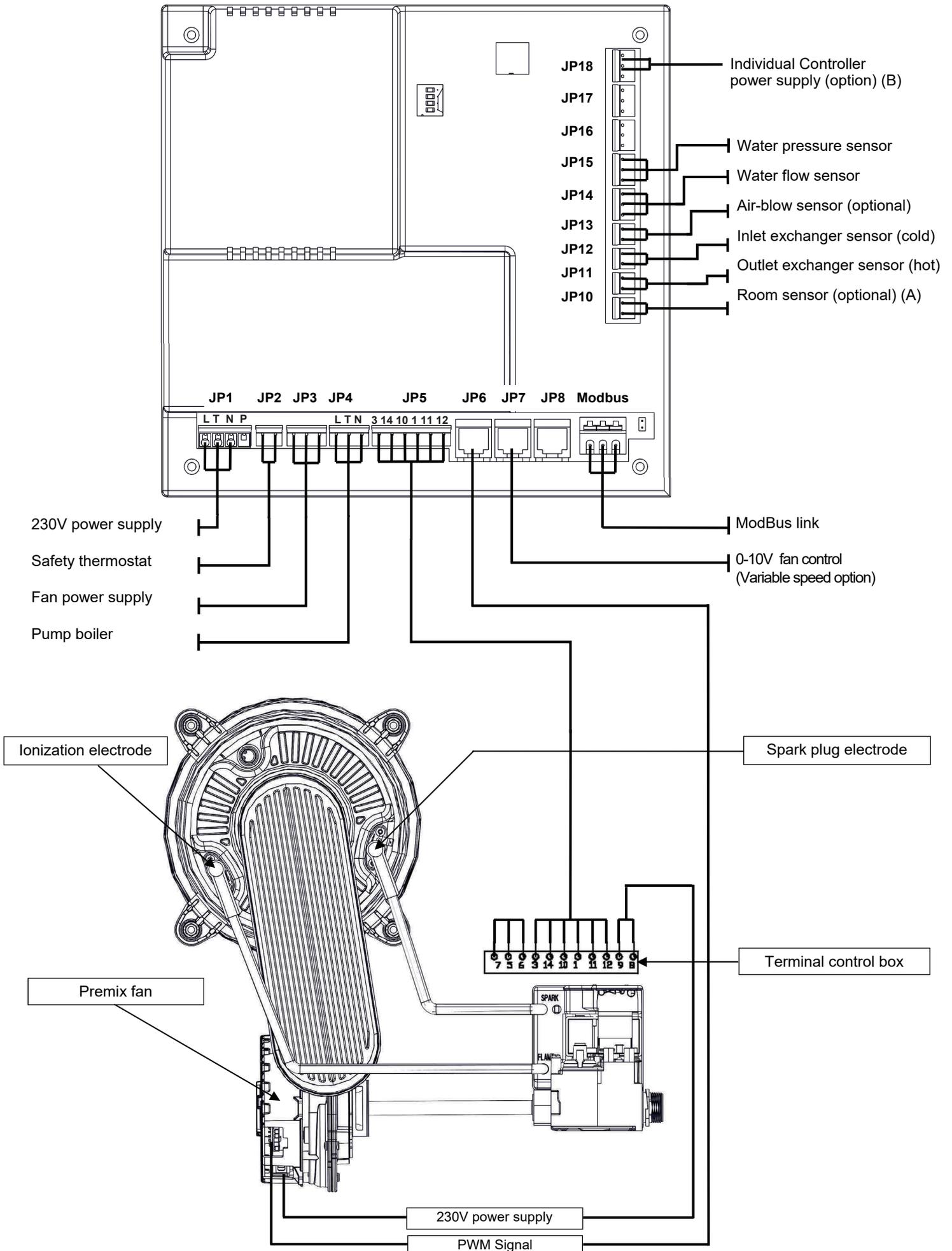
Proximity switch is highly recommended for safety reasons.

Electrical connection has to be done by authorized technician.

A: Phase
B: Neutral
C: Earth

Attention: Be sure that general power supply is cut off before any operation on the line. Electrocutation hazard.

2/ Electrical diagram



3/ Individual room sensor connection

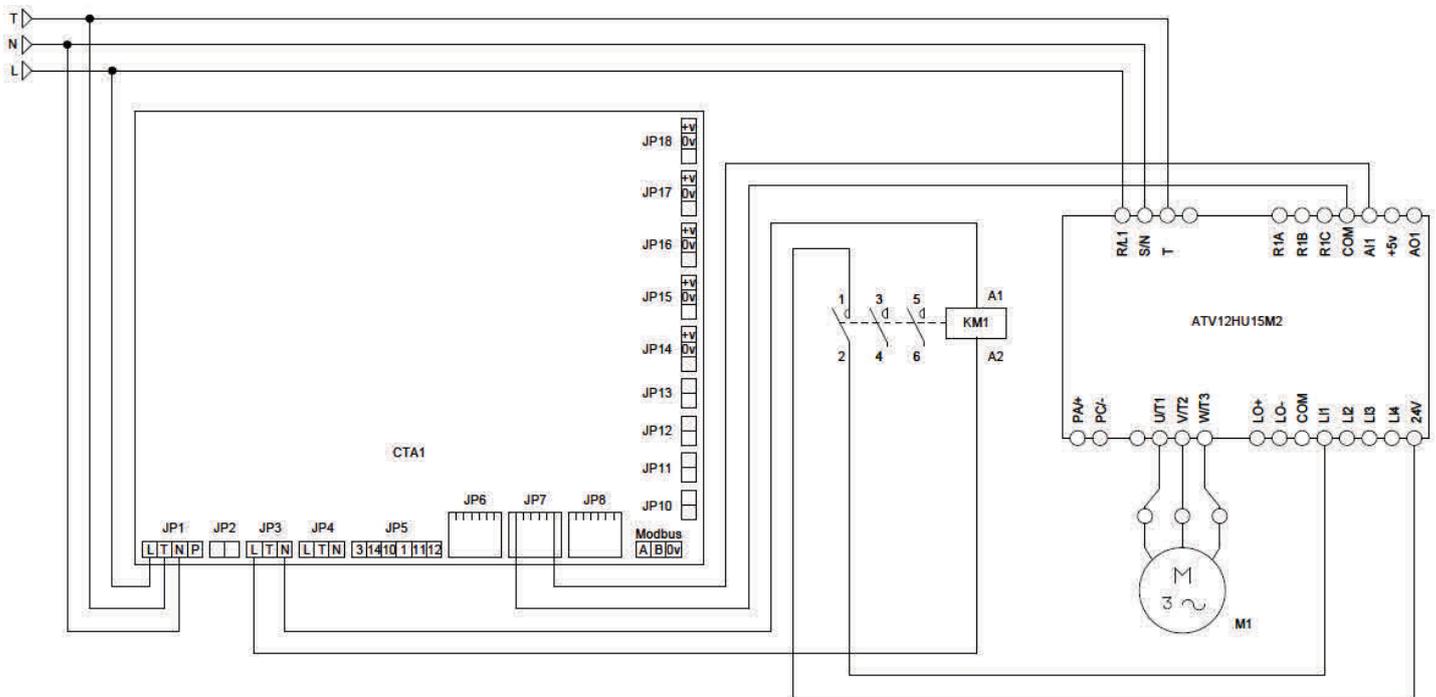
To have an individual controlled area, it is necessary to install a temperature probe for the concerned units.

In that case, connect the probe to the connector JP10 of the control card (see diagram on previous page (A)). The length of this cable may not exceed 25 meters.

4/ Controller connection on the unit

Refer to the controller technical manual

5/ Variable speed drive connection (variable airflow model)



On the variable airflow models with centrifugal fan, the variation is done by the variable speed drive.

Accessibility by four screws on the retaining plate.

5 - COMMISSIONING

5-1 Commissioning

- Before beginning, be sure to switch off on the unit heater, check that the various connections have been indeed carried out as defined in the following chapters:

- "Evacuation pipes connection", page 13-16
- "Condensate connection", page 17
- "Gas connection", page 18
- "Electrical connection", page 21-23

Also check the following:

- That the protective film installed on the panels has been removed
- That the distances around the generator are respected
- That all the electrical connections of the components have been made
- That the connection to earth is effective

2- Check the supply voltage to the terminals of the unit heater. These must be between 210 V and 230 V alternating. Caution: respect Phase Neutral polarity. In the case of an impeding neutral, provide a non-polarised control box. Caution: the use of this box diminishes the reading of the ionisation signal and does not enable an optimal modulation ratio to be attained (refer to the manufacturer for more information).

3- Check the condensate drain, it has to stay under the height of the heat exchanger, otherwise it will be flooded. In this case, use a condensate removal pump to avoid this problem.

4- Assign a coding No. on the communication card of each device, refer to page 21.

Caution: you must not have several devices with the same code (that would cause a malfunction of communication). The heating control system can accept up to 16 devices.

5- Check that the type of gas and the supply pressure correspond correctly to the device, maximum pressure 50 mbar, see pressure flow tables page 25.

6 Check on the optimizer that the communication between the unit heater operates and that no detector is missing

7- Switch on the unit heaters.

- Check that the general gas valve is indeed open, purge the gas piping. Open the closing tap located upstream of each device.
- Check that the electrical proximity section switches of the devices are indeed switched on.
- Check that the blowing blades are indeed open, minimum at 45°
- On regulation, increase the temperature instruction to a value higher by more than 1°C than the temperature of the room, then change to automatic mode (see heating optimizer brochure).
- The unit heaters start and change to full speed.

Note: the devices are pre-set at the factory, however setting values can be corrected. This correction can be necessary when the devices are installed at altitudes higher than 500 metres. Since the air pressure is lower, the combustion quality is affected. For this operation, refer to burner regulation, page 23.

8- Adjust the optimizer and set it to automatic mode, see heating optimizer brochure.

5-2 Burner setting

Those appliances are designed to work with different type of gas. his operation must be carried out by a qualified professional person and equipped with a combustion analyser.

Belgium and Luxembourg : *Change of gas is forbidden. The manufacturer is the only one allowed to modify the settings of the burner.*

Before any servicing, switch off the electrical and gas supplies.

When changing gas, the "gas setting" label located inside the unit heater door, must be changed so as to indicate the new setting.

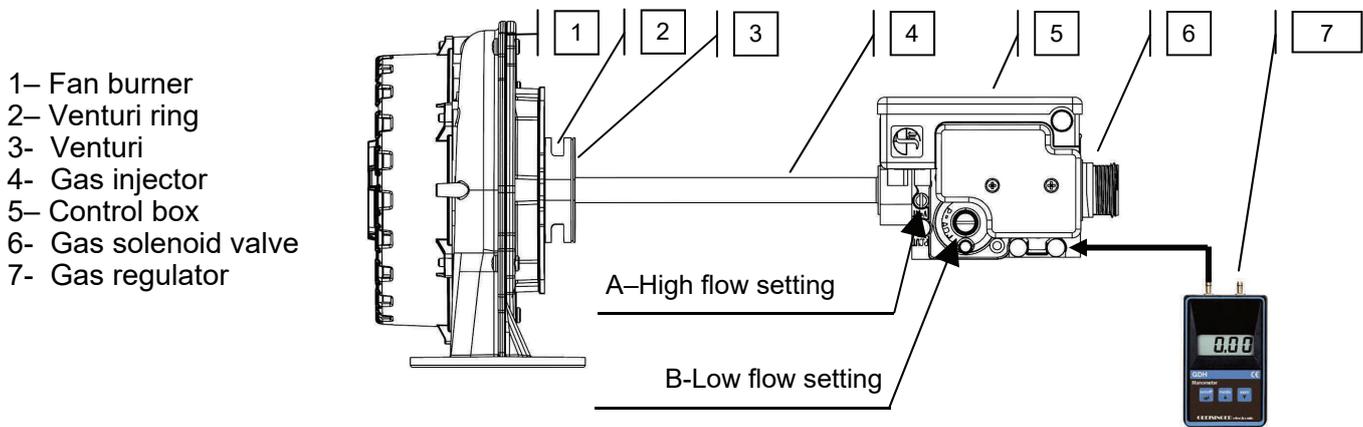
Check the sealing of the gas circuit after each servicing.

Necessary tooling:

- Hexagonal male wrench of 2.5 (High flow air gas ratio setting)
- Hexagonal male wrench of 4 (Low flow air gas ratio setting)
- Combustion analyser (CO₂/ CO – Smoke temperature)
- Pressure gauge showing gas pressure maximum 50 mBar

Procedure for inspecting and setting of the burner using premix:

- 1) Calibrate your combustion analyser and place the rod in the smoke pipe.
- 2) Check the gas supply pressure before lighting, when stopped and when running (see table).
- 3) Start the unit heater.
 - Start the heater at maximum power (see optimizer maintenance function)
 - After 2 minutes operation, check the CO₂ value
 - Adjust the value using the screw A in accordance with the table below. Turn clockwise to lower the value of CO₂ and in the opposite direction to increase it.
 - Change to minimum power (see optimizer maintenance function)
 - Adjust the value with the screw B in accordance with the table below. Turn clockwise to increase the value of CO₂ and in the opposite direction to reduce it.
 - Once the small flow adjustment has been made, change the optimizer to normal mode.



Gas type	Cut-off pressure	Service pressure	O ₂ % at max power Vis A	O ₂ % at min power Vis B	CO max PPM	
					GN	GPL
G20 (Natural gas)	From 20 to 50 mbar	Min 18 mbar	5%	5.5%	160	200
G25 (Natural gas)	From 25 to 50 mbar	Min 20 mbar	5%	5.5%	160	200
G31 (LPG)	From 28 to 50 mbar	Min 25 mbar	5%	5.5%	160	200

Venturi's ring color

Model	FHCAU30	FHCAU40	FHCAU50	FHCAU70
Ring Color / Ring	White / 6mm	White / 6mm	Red / -	Red / -

6- TROUBLESHOOTING

6-1 Troubleshooting

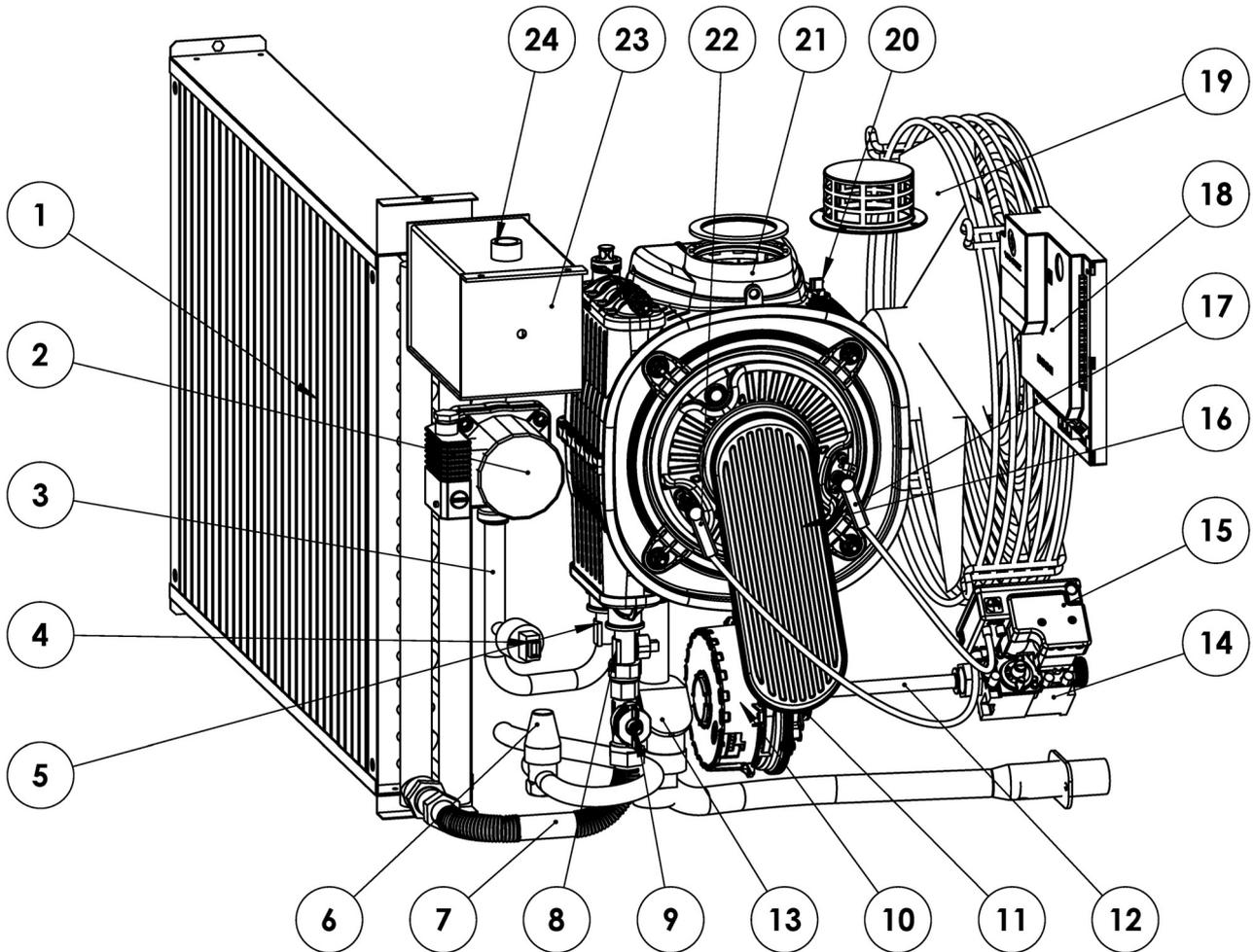
In case of problems, the conditions prior to operating the unit heater must be fulfilled.

CAUTION: all electrical or mechanical servicing operations must be done when the electrical supply is cut off and the gas supply is closed.

Defect	FHCAUse	Remedy
The device does not start	<ul style="list-style-type: none"> - General switch on OFF - Green indicator lamp off = no voltage - The optimizer indicates a communication defect - The optimizer indicates a detector defect - The optimizer indicates a burner defect - The optimizer indicates a water circuit defect - Burner fan out of service - Incorrect addressing of the device - Optimizer incorrectly configured 	<ul style="list-style-type: none"> - Turn the switch to ON - Check the electrical supply - Check the communication cable - Check and replace the detector - Rearm the burner - Inspect the water level and the pump - Replace it - Check the coding number of the device (Page 19) - Configure the optimizer
The burner fan starts several times without the presence of a flame and the control box goes into safety (Burner defect)	<ul style="list-style-type: none"> - No gas - Air in the piping - Incorrect air/gas setting - Defective gas solenoid valve - Lighting electrode incorrectly set or defective - Defective control box 	<ul style="list-style-type: none"> - Inspect the pressure - Purge the piping - Set the air/gas ratio (Page 25) - Replace it - Adjust it or replace it - Adjust it or replace it
The burner fan is at its maximum speed but the power is not at maximum.	<ul style="list-style-type: none"> - Length of chimney pipe too long - Air inlet pipe or chimney blocked - Incorrect burner setting - Air inlet temperature too high 	<ul style="list-style-type: none"> - Reduce the length or accept - Unplug the pipes - Check the combustion (Page 23) - Room temperature too high
The burner does not modulate and the burner fan speed is at maximum.	<ul style="list-style-type: none"> - Optimizer incorrectly set - Disconnected PWM piloting cable - Defective fan motor - Defective electronic card 	<ul style="list-style-type: none"> - Adjust it (see optimizer instructions) - Check the connection - Replace it - Replace it
The burner starts, the flame develops and the control box changes to safety.	<ul style="list-style-type: none"> - Neutral phase inversion - Electrical supply without neutral - Defective ionisation sensor 	<ul style="list-style-type: none"> - Inverse the phase and the neutral on the electrical supply - Use an SNI inspection box - Replace it
For versions with variable air flow. The air fan does not modulate.	<ul style="list-style-type: none"> - No speed variation setup - Disconnected speed variation cable - Defective motor 	<ul style="list-style-type: none"> - Set the speed in the optimizer - Check the cable - Replace it

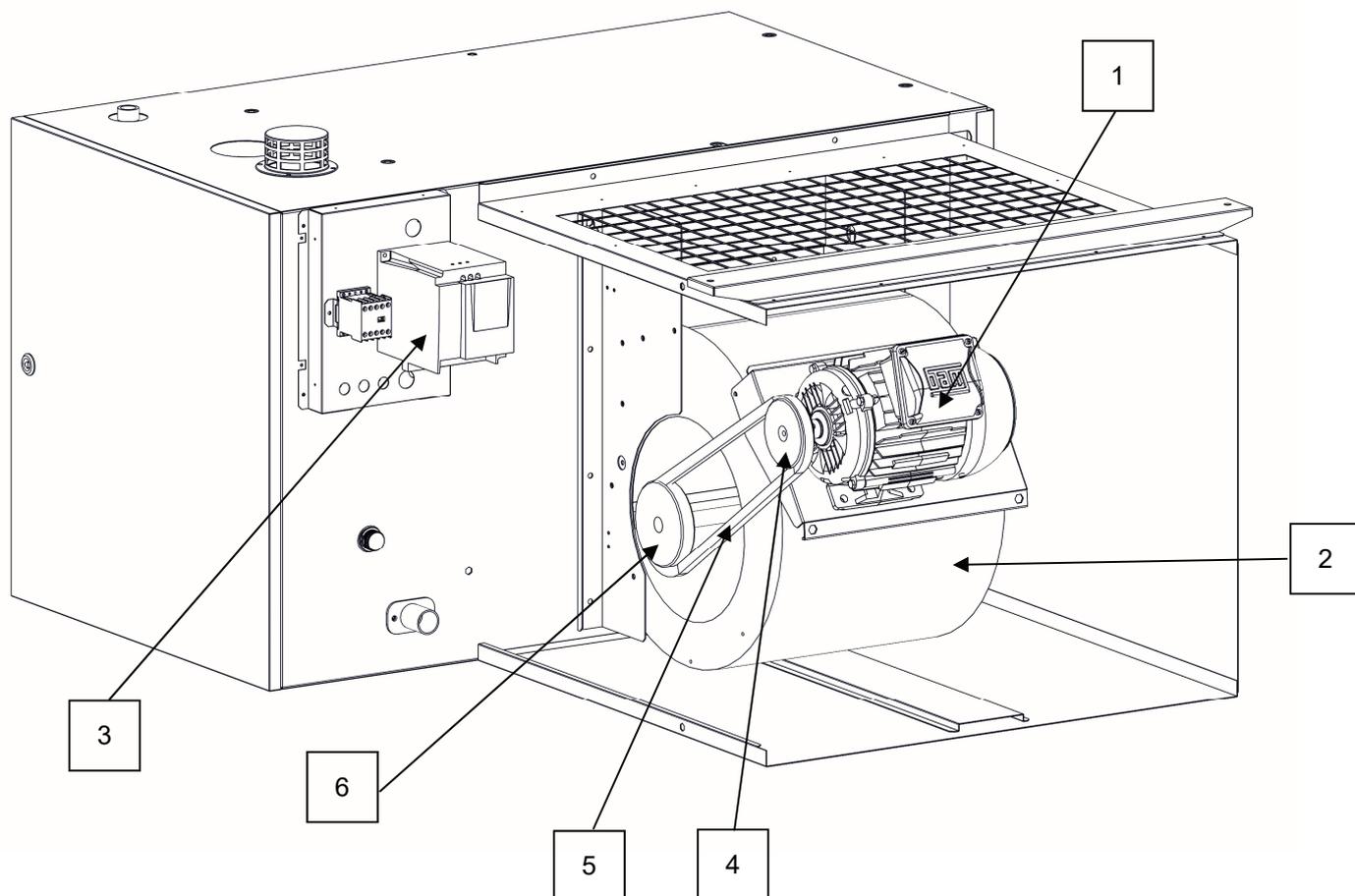
Warning : Only genuine parts from the manufacturer enable the safety of the product and persons to be maintained. The use of parts other than genuine parts commits the liability of the person and voids the product guarantee.

6-2 Bill of material for axial model



N°	Description	Spare parts number			
		FHCAU30	FHCAU40	FHCAU50	FHCAU70
1	Air/Water Heat exchanger	BAT130	BAT140	BAT150	BAT170
2	Pump	POM003			
3	Return pipe	UTC0430			FLEXIND103 + UTC0567
4	Pressure sensor	ATE455			
5	Return temperature probe	ELE0148			
6	3 bars safety valve	PB404			
7	Departure pipe	UTC0431	UTC0432	UTC0433	UTC0434 + UTC0567
8	Departure temperature probe	ELE0148			
9	Water flow meter	UTC0466			UTC0560
10	Premix burner fan	UTC0420			UTC0424
11	Venturi + ring	UTC0403		UTC0402	
12	Gas injector	UTC0423			
13	Condensate connection	UTC0448			
14	Solenoid gas valve	UTC0400			
15	Control box	UTC0410			
16	Cold burner door	UTC0010B	UTC0030B	UTC0020B	UTC0070B
17	Spark plug electrode	UTC449 & CAB0223			
18	Electronic PCB	REG230			
19	Axial fan	ATE803S	ATE803S	ATE804S	ATE808
20	Safety temperature probe	-			
21	Stainless steel exchanger (body)	UTC0010C	UTC0030C	UTC0020C	UTC0070C
22	Ionization electrode	UTC0450 & CAB0222			
23	Expansion tank	UTC0435			
24	Filling cap	PB493			

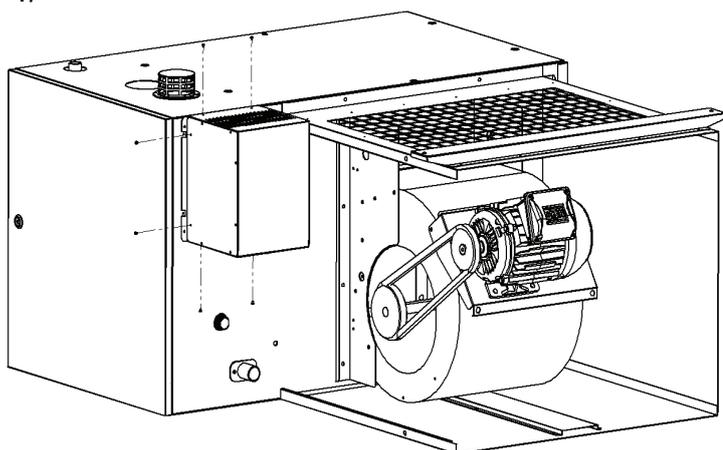
6-3 Bill of material for centrifugal model



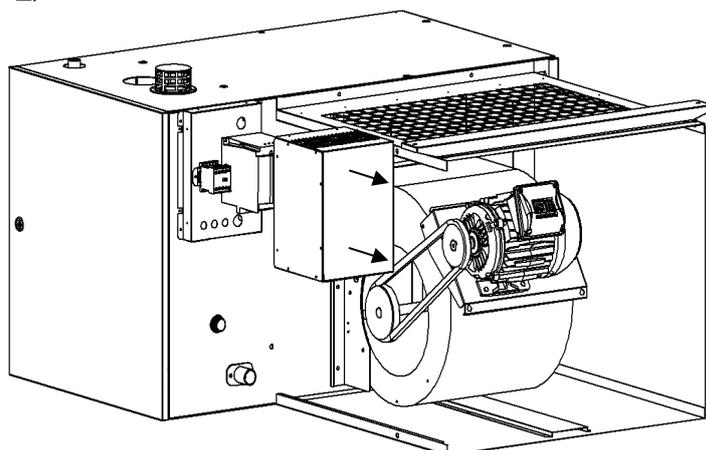
N°	Description	Spare parts number			
		FHCAU 30C	FHCAU 40C	FHCAU 50C	FHCAU 70C
1	Centrifugal fan Motor	MOT001	MOT002	MOT002	MOT002
2	Centrifugal fan	VE0017	VE0017	VE0034	VE0035
3	Variable speed control	VVE009	VVE010	VVE010	VVE010
4	Driving pulley (motor side)	VE0036	VE0036	VE0036	VE0036
4	Motor hub for pulley	VE0048	VE0045	VE0045	VE0045
5	Belt	VE0049	VE0044	VE0050	VE0047
6	Fan pulley	VE0038	VE0038	VE0038	VE0037
6	Fan hub for pulley	VE0040	VE0040	VE0041	VE0041

Accès au variateur:

1/



2/



7- MAINTENANCE

Any inspection and maintenance has to be done by a skilled specialist working according to the state-of-the-art. It is not necessary to do a annual cleaning but for safety questions, it is essential to annually inspect the elements below listed and to carry out the maintenance or replacement if required.

Combustion chamber:

If during the annual inspection, deposits are observed in the combustion chamber, it is necessary to proceed to the aspiration of these deposits while having as a preliminary, if required, brushed the coils of the heat exchanger using a non metal wire flexible brush. Any cleaning of the combustion chamber with acid or alkali products has to be prohibited.

Insulation:

The insulation of the heat exchanger (located at the bottom of the combustion chamber) must be annually inspected. If this insulation shows signs of damage, it must be imperatively replaced. If the siphon has caused a rise of the condensates in the combustion chamber, it must be replaced.

Flue outlet gasket:

If it shows signs of damages, it must be changed.

Burner door and burner gaskets

If they show signs of damages, they must be changed. The silicon burner door gasket must be replaced every two years.

Burner:

If it shows signs of damages, it must be changed.

Electrodes:

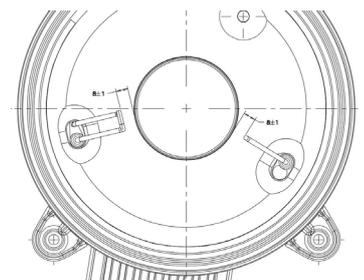
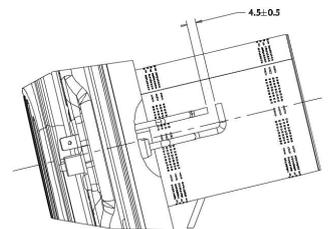
Ignition and flame control cables must be inspected. In case of damages, the cable must be replaced. The absence of alumina deposit, as well as the quality of the insulation must be checked. The replacement of gaskets and electrodes must be made if they show signs of damages.

Check out the space between the spark plug (4 +/- 0.5 mm) and the space between the plug and the burner (8 +/- 1 mm).

Temperature limit probe:

The replacement of the NTC sensor on the field is prohibited. It is the consequence of an overheat of the heat exchanger. This one should be change as a whole.

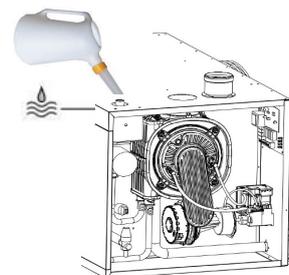
The use of manufacturer's spare parts is the only condition to profit from the continuity of the guarantee



Expansion tank:

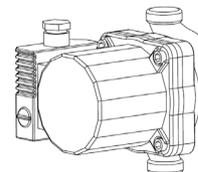
Do not open this if the device is still hot. **Risk of serious burns!**

Check the level, when stopped and cold! The level must be at the height of the plug. Add fluid with antifreeze -15°C to complete the level, only if necessary. Caution, only use antifreeze fluid approved by the manufacturer.



Pump:

Check that the pump operates, any defect in the pump is signalled by the pressure detector. The speed position is the III (3). In the case of prolonged stoppage, it may be necessary, in certain very rare cases, to proceed with “priming”, that is to say unsticking the pump. In this case: turn off the device, unscrew the pump plug, introduce a flat screwdriver in the hole and turn until “unsticking” is completed.



Combustion:

Measure the rate of O_2/CO_2 as well as the fume temperature.

Caution, regulations impose maximum values, contact your distributor or competent local organisation.

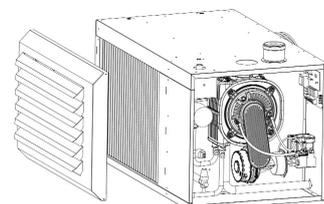
If the values on page 25 are not reached, complete maintenance of the heater is necessary.

Check the flame through the sight glass, it should be stable, its colour should be blue with orange particles around the burner (High power). During inspection, check that the analysis sensor is sealed at the sampling point, since the end of the sensor is in the centre of the smoke evacuation pipe.

Air/water heat exchanger:

Remove the blowing grill and clean the coil using a vacuum cleaner or an air gun.

Check that the coil has no leak.



Siphon:

Check out the siphon, it has to be filled with clean water at the commissioning. Condensate has to flow free.

Evacuation pipe:

Check the new air and fume evacuation pipes.

The pipes must be sealed against smoke and resist corrosion.



Unit heater:

Check the correct operation of all the safety devices and check the tightening of all screws

8 –RECOMMENDATIONS FOR USER

8-1 Safety rules

- It is forbidden to plug and/or reduce the aeration openings of the installation room or the device,
- Never obstruct the smoke evacuation or the new air intake,
- Never make any modifications to the settings made by qualified personnel,
- Never spray water on the unit heater, or touch the device with parts of the body which are wet and/or with naked feet,
- Never touch hot parts of the unit heater, and/or moving parts,
- Never put or hook any object onto the device,
- Any operation on the device is forbidden unless it has been disconnected from the electricity network and the gas supply has been cut off.
- Do not modify the type of gas used, the settings of the device, the safety systems and regulation systems, since that could create dangerous situations.

Warn the after-sales technician in the case of changing the gas, the gas pressure or modifying the supply voltage.

In the case of a long period of non-operation, disconnect the electrical supply from the device. When starting the operation again, you are advised to call on qualified personnel. As a general rule all repair and/or maintenance visits must be carried out exclusively by authorised and qualified personnel.

The taking out of a maintenance contract is strongly recommended “see this with your installer”.

8-2 What should be done in case of problems?

PROBLEM	REMEDY
<i>In case of gas smell</i>	<i>- Close the gas valve outside and cut off the electricity. Call qualified professional technician.</i>
<i>Burner is in security position</i>	<i>- Start up the burner using the regulation box. - If the problem is not solved call a professional technician.</i>



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All performance characteristics are presented as contractual on the commercial brochure available on the website: www.flexiheatuk.com

