IMMERGAS

EOLO Maior @

Wall-hung instant room-sealed fan assisted boilers (type C)

User's Manual

Installer
User
Technician

Dear Customer,

Congratulations on your purchase of a high quality Immergas product designed to ensure prolonged comfort and safety. As an Immergas customer you can count on a professional Authorised Service Centre, professional personnel to guarantee constant efficiency of your boiler.

Read the following pages carefully as they contain important information on the correct use of your boiler, observe all instructions to make the most of Immergas products.

*Contact our local Authorised Service Centre as soon as possible to request the preliminary test (required to **validate the guarantee**). Our technician will verify correct operating conditions, make the necessary adjustments and will show you how to use the appliance correctly.*

In the event of problems or maintenance requirements, contact our Authorised Service Centre to ensure use of original spare parts and professional service.

General warnings

This instruction booklet is considered an integral part of the product and must be delivered to the user with the appliance.

Store the booklet in a safe place and read carefully before using the appliance as it contains important information to ensure safe installation operation and maintenance.

Installation and maintenance must be performed in compliance with current standards according to the manufacturer's instructions and by qualified personnel.

Incorrect installation can cause damage or physical injury and the manufacturer declines all liability for failure to observe instructions and standards. Maintenance must be performed by qualified personnel. In this case, an Authorised Immergas Service Centre represents a guarantee of professional and qualified services.

The appliance must be used according to the applications as specified in design. Any other use is considered improper and therefore hazardous.

The manufacturer declines all contractual or non-contractual liability for damage caused by incorrect installation or operation and failure to observe relative instructions.

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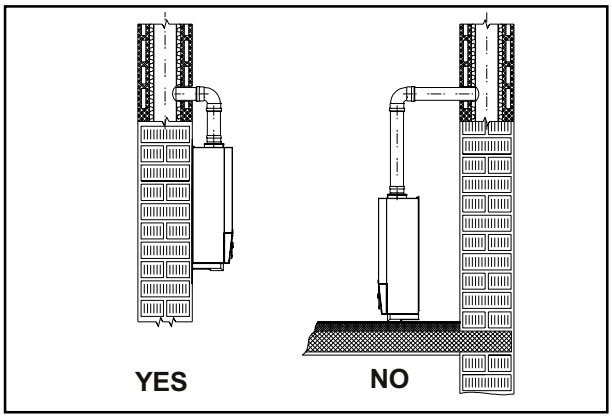
1 BOILER INSTALLATION

1.1 Warnings.

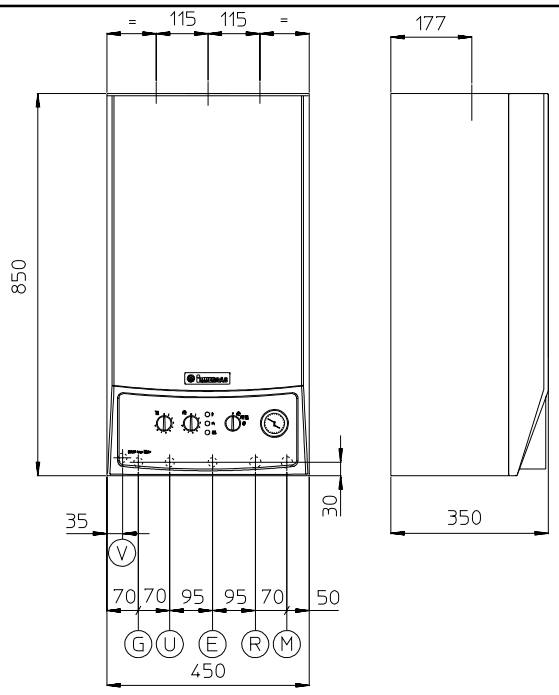
Immergas gas appliances must be installed exclusively by a professionally qualified and authorised technician.
Installation must be performed in compliance with standards UNI and CEI, current legislation and in observance with local technical standards according to a professional code of practice.
The following standards must be observed in particular: UNI-CIG 7129 and 7131 and CEI 64-8 and 64-9.
Before installing the appliance, ensure that it is delivered in perfect condition; if in doubt, contact the supplier immediately. Packaging materials (staples, nails, plastic bags, expanded polystyrene etc.) constitute a hazard and must be kept out of the reach of children.
If the appliance must be installed inside or between other cabinets or items of furniture, ensure that sufficient space is left for maintenance; a clearance of 2÷3 cm between the boiler casing and the sides of the cabinet is recommended. Keep all flammable objects well away from the appliance (paper, cloths, plastic, polystyrene, etc.).
In the event of malfunctions, faults or incorrect operation, switch the appliance off immediately and contact a qualified technician (e.g. from the Immergas Service centre to ensure use of original spare parts).
Never attempt to modify or repair the appliance alone.
Failure to observe the above implies personal responsibility and renders the guarantee null and void.

- Installation standards: these boilers are designed exclusively for wall-mounted installation; they must be used for room heating and the production of domestic hot water for household and similar uses. The wall surface must be smooth, i.e. without any protrusions or cavities enabling access to the back part. They are NOT designed for installation on plinths or floors (see figure).



Caution: installation of the boiler on the wall must guarantee a stable and efficient support for the generator. The plugs supplied with the appliance ensure adequate support only if inserted correctly (according to technical standards) in walls comprising bricks or breeze blocks, partitions with limited static properties, or other provided that a static test is performed to ensure adequate support.
These boilers are used to heat water to below boiling temperature in atmospheric pressure.
The appliance must be connected to a heating circuit and domestic water distribution circuit in correspondence to performance and power specifications.
It must also be installed in an ambient temperature that does not fall below 0°C, and must not be exposed to atmospheric agents.

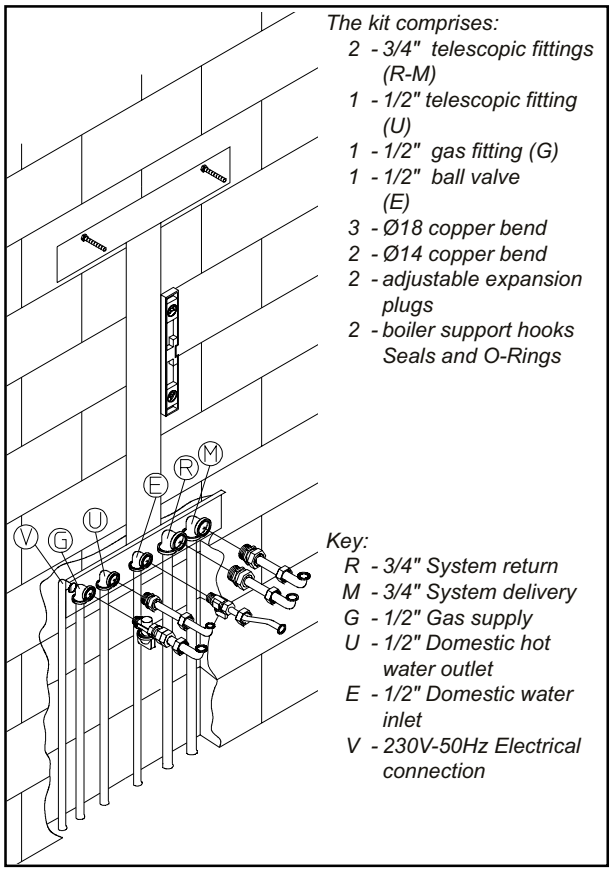
1.2 Main dimensions.



Height (mm)	Width (mm)		Depth (mm)	
850	450		350	
Couplings				
GAS	DOMESTIC WATER		HEATING	
G	U	E	R	M
1/2"	1/2"	1/2"	3/4"	3/4"

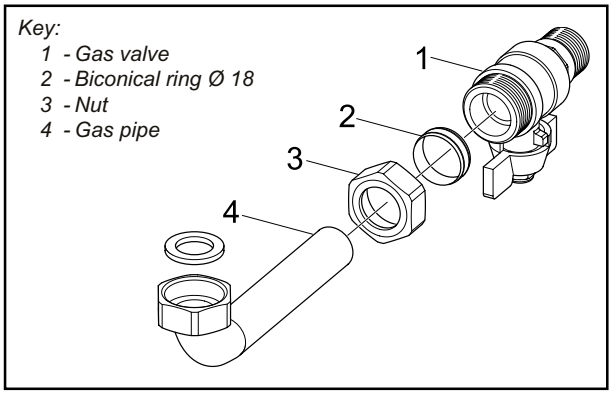
Key:
G - Gas supply
U - Hot domestic water outlet
E - Domestic water inlet
R - System return
M - System delivery
V - Electrical connection

1.3 Connection unit (supplied as standards with the boiler).



Gas connection (Appliance category II_{2H3+}).
Our boilers are built to operate on methane gas (G20) and LPG. Feed piping must be the same as or larger than the 1/2"G boiler fitting. Before making the gas connection, carefully clean inside all the fuel feed system piping in order to remove any residuals that could impair good boiler operation. Also make sure the gas corresponds to boiler specifications (see boiler dataplate). If different, the boiler must be converted for operation with the other type of gas (see unit conversion in case of gas change). It is also important to check the dynamic pressure of the gas supply (natural gas or LPG) to be used for feeding the boiler which must conform to UNI EN 437 and relative attachments, as insufficient pressures can reduce generator power, causing the user inconveniences.
Ensure that the gas cock connection is carried out correctly, following the assembly sequence shown in the figure. The gas supply pipe must be suitably dimensioned according to current standards (UNI7129) in order to guarantee correct gas delivery to the boiler even in conditions of maximum generator output and to guarantee the unit's performance (technical data). The coupling system must conform to standards UNI 7129 and UNI EN 1775.

Gas quality. The unit is designed to operate with fuel gas free of impurities; otherwise, suitable filters should be installed ahead of the unit in order to restore fuel purity.



Storage tanks (in case of feed from LPG tank).
- New LPG storage tanks can contain residuals of inert gases (nitrogen) which weaken the mixture delivered to the unit, causing anomalous operation.
- Due to the composition of the LPG mixture, layering of the mixture's components can occur during the period of storage in the tanks. This can cause a change in the heating power of the mixture delivered to the unit, with subsequent variation in its performance.

Water connection. Before making the connections, all system piping must be carefully cleaned to remove any residuals that could impair boiler efficiency. In order to prevent scaling in the heating system, the provisions contained in standard UNI 8065, concerning the treatment of water in heating systems for civil use, must be complied with. Water connections must be made in a rational way, using the connections on the boiler template. The boiler safety valve outlet must be connected to a discharge funnel. Otherwise, the manufacturer declines any responsibility in case of flooding if the drain valve cuts in.

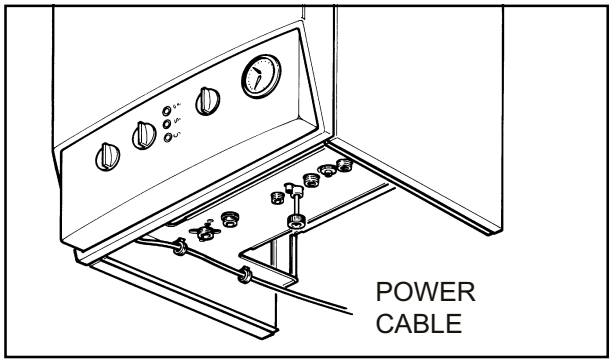
Important: *to preserve the life and efficiency of the domestic circuit exchanger, it is advisable to install the "polyphosphate proportioner" kit in the presence of water whose characteristics can give rise scale deposits (in particular, and for example, the kit is recommended when water hardness is higher than 25 degrees French).*

Electrical Connection. The Eolo Maior @ boiler is designed with IPX4D protection rating. Electrical safety of the unit is guaranteed when correctly connected to an efficient earthing system as specified by current safety standards.

Caution: Immergas S.p.A. declines all liability for damage or physical injury caused by failure to connect the boiler to an efficient earthing system or failure to observe CEI reference standards.

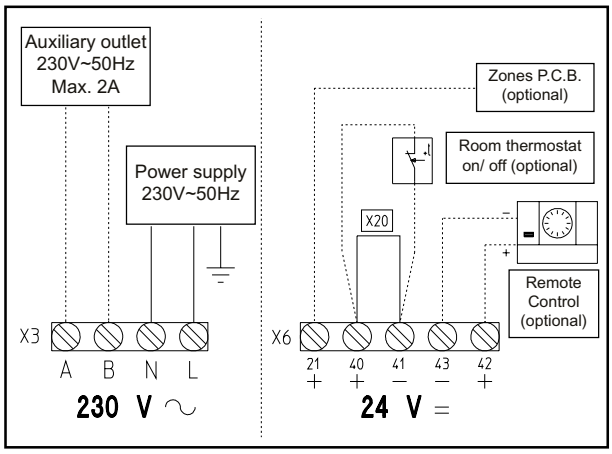
Also ensure that the electrical installation corresponds to maximum absorbed power specifications as shown on the boiler dataplate.
Boilers are supplied complete with an "X" type power cable without plug. The power plug must be connected to a 230V±10%-50Hz mains with the correct pole sequence L-N and the earth connection; the

mains must also be equipped with a multi-pole circuit breaker with a contact opening gap of at least 3 mm.
In the event of power cable replacement, contact an authorised technician (e.g. Immergas Technical Service).
The power cable must be laid as shown in the figure below.

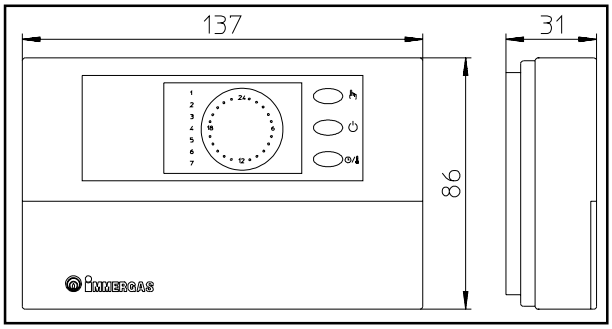


In the event of mains fuse replacement on the control card, use a 3,15A quick blow fuse. For the main power supply to the appliance, never use adapters, multiple sockets or extension leads.

N.W.: when connecting the appliance, if the correct L-N polarity is not observed the boiler does not detect the flame and inhibits start-up. Also in the same case, if the neutral is powered with residual voltage over 30V, the boiler will probably operate, but only temporarily. Measure the voltage readings with suitable tools; avoid the use of mains tester screwdriver. If the power supply is phase-phase type at 230V, to guarantee safe conditions equivalent to existing conditions when the boiler is powered with a Phase-Neutral mains, an adaptor kit must be fitted on the boiler for Phase-Phase mains, available on request. Contact an Authorised Immergas Service Centre for installation of the kit.

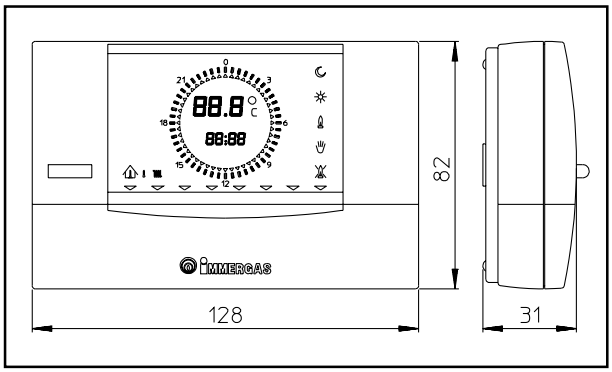


Timer room thermostats (Optional).
The boiler is designed for use with room thermostats. These Immergas components are optional available and provided when requested. All Immergas timer room thermostats are connectable with 2 wires only. Read, keeping attention, the instructions for mounting and use, contained in the optional kits.



- Digital timer room thermostat on/off. The thermostat gives the following possibility:
  - to adjust two different values of room temperature: one for the day-hours (comfort temperature) and one for night-hours (reduced temperature);
  - to set until four different weekly programs for ignitions and switches-off;
  - to select the wished operation, choosing between many possibilities:
  - permanent operation at comfort temperature,
  - permanent operation at reduced temperature,
  - permanent operation at anti-freeze temperature.

  The thermostat is supplied by two alkaline batteries of 1,5 V type LR6.



- Amico Remote Control with climatic timer room thermostat functioning. Amico Remote Control panel allows to the user, besides the functions explained on the above mentioned point, to control all overall information about the boiler and the heating system functioning, having the possibility to control the boiler comfortably from a distance. The panel of Amico Remote Control is equipped with auto-diagnosis system that shows by the display (through some error-code) any possible anomaly of the boiler. The timer room thermostat incorporated in the remote panel, allows to adequate the flow temperature to the radiators in base of the real necessity of the ambient, in order to

obtain the wished room temperature value with extreme precision and saving money. The timer room thermostat is supplied directly by the boiler with 2 wires, useful for the transmission of data between boiler and room thermostat.

Electrical connection of Amico Remote Control and Timer Room Thermostat on/off (Optional). *The operations later on described have to be achieved after taken out the power supply of the boiler.* The thermostat or timer room thermostat on/off, has to be connected on the terminals 40 and 41 removing the jumper X20 (see the picture page 5). Control that the contact of Thermostat on/off is of "clean" type, namely independent from the net tension, if not the printed control board should be damaged. Amico Remote Control has to be connected on the terminals 42 and 43 of printed control board, according the polarity (see the picture page 5). The connection with inverted polarity doesn't damage the Amico Remote Control, but doesn't allow his functioning. After the connection is necessary to remove the jumper X20. The boiler will work with functions adjusted on the Amico Remote Control panel only if the main switch of the boiler is positioned on Sanitary/Amico Remote Control position ( ).

Important: In case of use of Amico Remote Control, is obligatory to prearrange two separated lines, according to the local norms concerning electric plants. Boiler pipelines must never be used to earth the electrical or telephone lines. Ensure elimination of this risk before making the boiler electrical connections.

1.4 Installing air intake and flue exhaust terminals.

Immergas supplies various solutions separately from the boiler for the installation of air intake and flue extraction, fundamental for boiler operation.

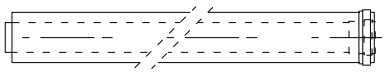
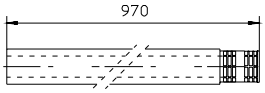
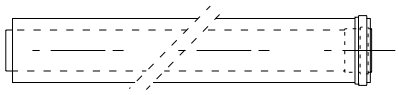
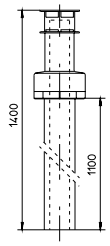
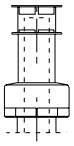
N.B.: The boiler must be installed exclusively with an original Immergas air intake and flue extraction system as specified by standards. This system is identifiable by a special identification mark bearing the note: "not for condensing boilers".

The flue ducts have not to be near or in contact with inflammable materials, and they have not to pass through buildings and walls made of inflammable materials.

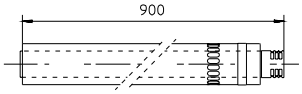
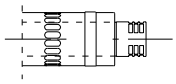
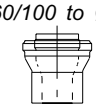
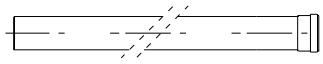
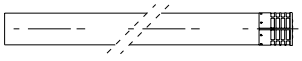
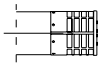
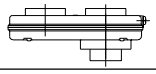
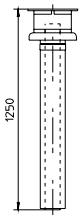
The types of terminals available from Immergas comprise:

- Concentric horizontal intake and exhaust kit. This terminal enables air intake and exhaust of flues directly outside the building. The horizontal kit can be installed with a rear outlet, right-hand outlet, left-hand outlet and front outlet as required (see page 10).
- Concentric vertical air intake and exhaust kit. This terminal enables vertical air intake and flue exhaust directly outside the building (see page 12).
- Separator kit (Ø 80/80). This kit enables air intake to outside the building and flue exhaust via a flue (see page 13). The central duct is used for flue exhaust to the flue and the lateral duct is used for air intake to outside the building (can be mounted on left or right side of central duct). Both ducts can be routed in either direction (see page 13).
- Resistance factors and equivalent lengths. Each flue extraction system component is designed with a *resistance factor* based on preliminary tests and specified in the table below. The resistance factor for individual components does not depend either on the type of boiler on which it is installed or the actual dimensions. It is based on the temperature of fluids conveyed through the ducts and therefore varies according to applications for air intake or flue exhaust. Each component has a resistance corresponding to a specific length in metres of pipe with the same diameter; the so-called equivalent length, based on the ratio between different resistance factors, for example : Ø80 90° bend; resistance factor on intake 5; 1-metre Ø80 pipe; resistance factor on intake 2.3; equivalent length of 90° Ø80 bend = 5: 2.3 = 2.2 m of Ø80 pipe on intake. In the same way each component has a resistance factor corresponding to a specific length in metres of a pipe with a different diameter, for example a concentric 90° bend Ø60/100 Resistance Factor 21; pipe Ø80 m1 on exhaust, Resistance Factor = 3; Equivalent length of 90° bend Ø60/100 = 21 : 3 = 7 m of Ø80 pipe on exhaust. *All boilers have a maximum resistance factor based on testing at 100*. The maximum admissible resistance factor corresponds to the resistance detected with the maximum admissible pipe length with each type of Terminal Kit installed. This information enables calculations to verify the possibility of various configurations of flue extraction systems.

Resistance Factors and Equivalent Lengths.

DUCT TYPE	Resistance Factor (R)	Equivalent length in metres of concentric pipe Ø 60/100	Equivalent length in metres of concentric pipe Ø 80/125	Equivalent length in metres of pipe Ø 80
Concentric pipe Ø 60/100 1 m 	Intake and exhaust 16.5	**m 1**	m 2,8	Intake 7.1m Exhaust 5.5 m
90° bend concentric Ø 60/100 	Intake and exhaust 21	**m 1,3**	m 3,5	Intake 9.1m Exhaust 7.0m
45° bend concentric Ø 60/100 	Intake and exhaust 16.5	**m 1**	m 2,8	Intake m 7.1m Exhaust m 5.5m
Terminal complete with concentric horizontal intake-exhaust Ø 60/100 	Intake and exhaust 46	**m 2,8**	m 7,6	Intake m 20m Exhaust m 15m
Terminal complete with concentric horizontal intake-exhaust Ø 60/100 	Intake and exhaust 32	**m 1,9**	m 5,3	Intake m 14m Exhaust 10.6m
Concentric pipe Ø 80/125 m 1 	Intake and exhaust 6	m 0,4	**m 1,0**	Intake 2.6m Exhaust 2.0m
90° bend concentric Ø 80/125 	Intake and exhaust 7.5	m 0,5	**m 1,3**	Intake 3.3m Exhaust 2.5m
45° bend concentric Ø 80/125 	Intake and exhaust 6	m 0,4	**m 1,0**	Intake 2.6m Exhaust 2.0m
Terminal complete with concentric vertical intake-exhaust Ø 80/125 	Intake and exhaust 33	m 2,0	**m 5,5**	Intake 14.3m Exhaust 11.0m
Terminal complete with concentric vertical intake-exhaust Ø 80/125 	Intake and exhaust 26.5	m 1,6	**m 4,4**	Intake 11.5m Exhaust 8.8m

Resistance Factors and Equivalent Lengths.

DUCT TYPE	Resistance factor (R)	Equivalent length in metres of concentric pipe Ø 60/100	Equivalent length in metres of concentric pipe Ø 80/125	Equivalent length in metres of pipe Ø 80
Terminal complete with concentric horizontal intake-exhaust Ø 80/125 	Intake and exhaust 39	2.3 m	**6.5 m**	Intake 16.9 m Exhaust 13 m
Terminal complete with concentric horizontal intake-exhaust Ø 80/125 	Intake and exhaust 34	2.0 m	**5.6 m**	Intake 14.8 m Exhaust 11.3 m
Concentric adapter from Ø 60/100 to Ø 80/125 with condensate collector 	Intake and exhaust 13	0.8 m	**2.2 m**	Intake 5.6 m Exhaust 4.3 m
Concentric adapter from Ø 60/100 to Ø 80/125 	Intake and exhaust 2	0.1 m	**0.3 m**	Intake 0.8 m Exhaust 0.6 m
Pipe Ø 80 m 1 (with or without insulation) 	Intake 2,3	0.1 m	0.4 m	**Intake 1.0 m**
	Exhaust 3	0.2 m	0.5 m	**Exhaust 1.0 m**
Complete intake terminal Ø 80 m 1 (with or without insulation) 	Intake 5	0.3 m	0.8 m	**Intake 2.2 m**
Intake terminal Ø 80 Exhaust terminal Ø 80 	Intake 3	0.2 m	0.5 m	**Intake 1.3 m**
	Exhaust 2.5	0.1 m	0.4 m	**Exhaust 0.8 m**
90°bend Ø 80 	Intake 5	0.3 m	0.8 m	**Intake 2.2 m**
	Exhaust 6,5	0.4 m	1.1 m	**Exhaust 2.1 m**
45° bend Ø 80 	Intake 3	0.2 m	0.5 m	**Intake 1.3 m**
	Exhaust 4	0.2 m	0.6 m	**Exhaust 1.3 m**
Sdoppiato parallelo Ø 80 da Ø 60/100 a Ø 80/80 	Intake and exhaust 8.8	0.5 m	1.5 m	**Intake 3.8 m** **Exhaust 2,9 m**
Terminal complete with concentric vertical intake-exhaust Ø 60/100 	Intake and exhaust 41.7	**2.5 m**	7 m	Intake 18 m Exhaust 14 m

Eolo 21 Maior @ diaphragm table.

DIAPHRAGM	*Duct length in metres* ***Ø 60/100 horizontal***
Ø 46	*From 0 to 1*
Ø 48	*From 1 to 2*
NONE	*Over 2*

DIAPHRAGM	*Duct length in metres* ***Ø 60/100 vertical***
Ø 46	*From 0 to 2.7*
Ø 48	*From 2.7 to 3.7*
NONE	*Over 3.7*

DIAPHRAGM	*Duct length in metres* ***Ø 80/125 horizontal***
Ø 46	*From 0 to 1.9*
Ø 48	*From 1.9 to 4.6*
NONE	*Over 4.6*

DIAPHRAGM	*Duct length in metres* ***Ø 80/125 vertical***
Ø 46	*From 0 to 6.8*
Ø 48	*From 6.8 to 9.5*
NONE	*Over 9.5*

DIAPHRAGM	**Duct length in metres* ***Ø 80 horizontal duct with two bends***
Ø 46	*From 0 to 20*
Ø 48	*From 20 to 26*
NONE	*Over 26*

DIAPHRAGM	**Duct length in metres* ***Ø 80 vertical duct without bends***
Ø 42,5	*From 0 to 5*
Ø 46	*From 5 to 25*
Ø 48	*From 25 to 33*
NONE	*Over 33*

Eolo 24 Maior @ diaphragm table.

DIAPHRAGM	*Duct length in metres* ***Ø 60/100 horizontal***
Ø 44	*From 0 to 1*
Ø 47	*From 1 to 2*
NONE	*Over 2*

DIAPHRAGM	*Duct length in metres* ***Ø 60/100 vertical***
Ø 44	*From 0 to 2.7*
Ø 47	*From 2.7 to 3.7*
NONE	*Over 3.7*

DIAPHRAGM	*Duct length in metres* ***Ø 80/125 horizontal***
Ø 44	*From 0 to 1.9*
Ø 47	*From 1.9 to 4.6*
NONE	*Over 4.6*

DIAPHRAGM	*Duct length in metres* ***Ø 80/125 vertical***
Ø 44	*From 0 to 6.8*
Ø 47	*From 6.8 to 9.5*
NONE	*Over 9.5*

DIAPHRAGM	**Duct length in metres* ***Ø 80 horizontal duct with two bends***
Ø 44	*From 0 to 16*
Ø 47	*From 16 to 28*
NONE	*Over 28*

DIAPHRAGM	**Duct length in metres* ***Ø 80 vertical duct without bends***
Ø 41,5	*From 0 to 5*
Ø 44	*From 5 to 21*
Ø 47	*From 21 to 33*
NONE	*Over 33*

Eolo 27 Maior @ diaphragm table.

DIAPHRAGM	*Duct length in metres* ***Ø 60/100 horizontal***
Ø 45	*From 0 to 1*
NONE	*Over 1*

DIAPHRAGM	*Duct length in metres* ***Ø 60/100 vertical***
Ø 45	*From 0 to 2,7*
NONE	*Over 2,7*

DIAPHRAGM	*Duct length in metres* ***Ø 80/125 horizontal***
Ø 45	*From 0 to 1,9*
NONE	*Over 1,9*

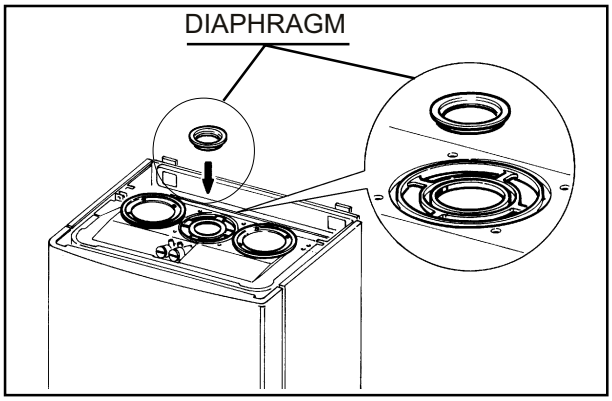
DIAPHRAGM	*Duct length in metres* ***Ø 80/125 vertical***
Ø 45	*From 0 to 6,8*
NONE	*Over 6,8*

DIAPHRAGM	**Duct length in metres* ***Ø 80 horizontal duct with two bends***
Ø 45	*From 0 to 20*
NONE	*Over 20*

DIAPHRAGM	**Duct length in metres* ***Ø 80 vertical duct without bends***
Ø 45	*From 0 to 25*
NONE	*Over 25*

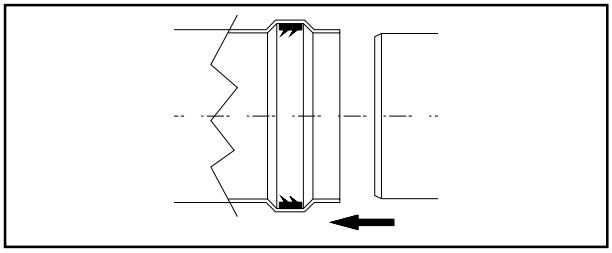
* *The values for maximum length are considered with 1 metre of exhaust pipe and the remaining on intake.*

Diaphragm installation. To ensure correct operation of the boiler, a diaphragm (see figure) must be installed on output of the sealed chamber before the intake and exhaust duct. Selection of a suitable diaphragm depends on the type of ducting used and maximum length: calculations can be made using the values in the tables:

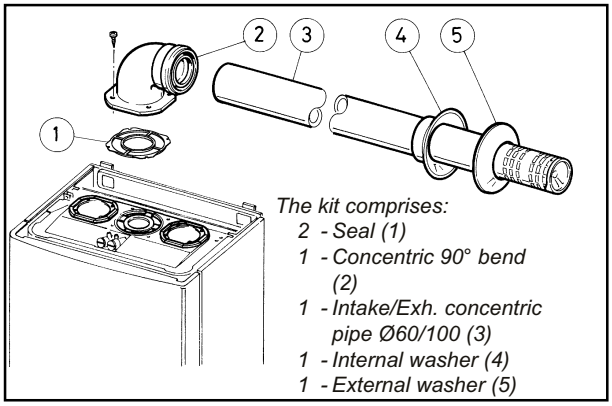


N.W.: Diaphragms are supplied as standard with the boiler.

Positioning of double-lip seals. For correct positioning of the lip seals on elbows and extensions, follow the order of assembly shown in the figure.



Horizontal intake-exhaust kit Ø60/100. Kit assembly: install the bend with flange (2) on the central hole of the boiler taking care to insert the seal (1) and secure by means of the screws supplied with the kit. Join the male end (smooth section) of terminal pipe (3) to the female section (with lip-seal) of bend (2) to the end stop and ensure that the internal and external washers are fitted to achieve perfect sealing of all couplings.

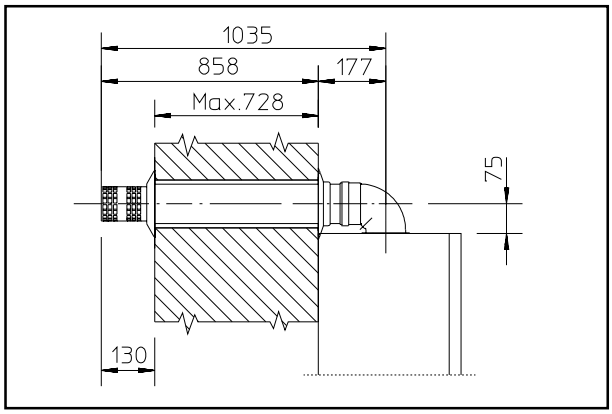


- Snap-fit couplings of concentric pipes or extensions and elbow fittings Ø60/100. To install extension

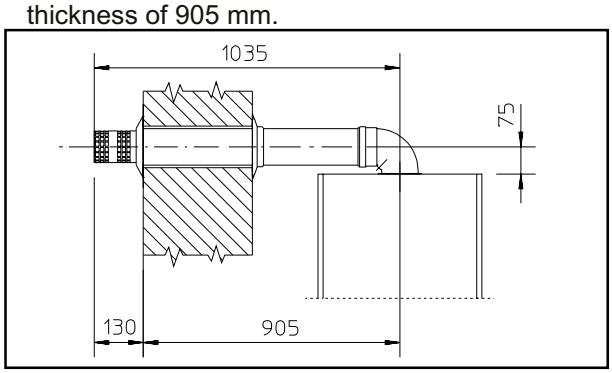
couplings on other flue extraction components, proceed as follows: fit the concentric pipe or concentric elbow with the male section (smooth) on the female section (with lip-seal) of the previously installed component to the end stop to ensure perfect sealing of the coupling.

The horizontal intake-exhaust kit Ø 60/100 can be installed with a rear, right-hand, left-hand, or front outlet as required.

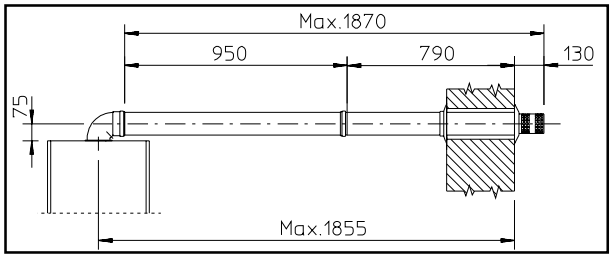
- Application with rear outlet. The 970 mm pipe length enables partial routing through a maximum thickness 728 mm. Normally the terminal should be shortened. Calculate the distance by adding the following: Part thickness + internal protrusion + external protrusion. Minimum protrusion values are given in the figure below.



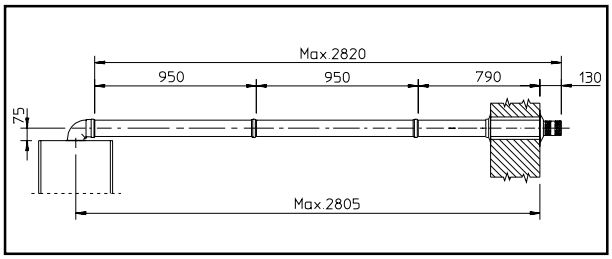
- Application with lateral outlet; using the horizontal intake-exhaust kit only, without the special extensions, enables routing through a wall thickness of 905 mm.



- Extensions for horizontal kit. The horizontal intake-exhaust kit Ø 60/100 can be extended up to a max. horizontal distance of *3000 mm* including the grille terminal and excluding the concentric bend on output of the boiler. This configuration corresponds to a resistance factor of 100. In this case special extensions must be requested.

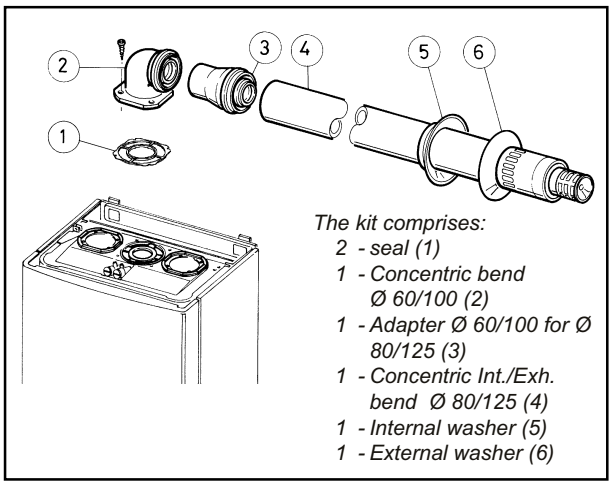


Connection with 1 extension. Max. distance between vertical boiler axis and external wall: 1855 mm.



Connection with 2 extensions. Max. distance between vertical boiler axis and external wall 2805.

Horizontal intake-exhaust kit Ø 80/125. Kit assembly: install the bend with flange (2) on the central hole of the boiler taking care to insert the seal (1) and tighten with the screws supplied in the kit. Fit the adapter (3) with the male section (smooth) in the female section of the bend (2) (with lip seal) to the end stop. Fit the concentric terminal Ø 80/125 (4) with the male section (smooth) in the female section of the adapter (3) (with lip seal) to the end stop, ensuring that the internal and external washers are fitted to ensure sealing efficiency of all couplings.



The kit comprises:
2 - seal (1)
1 - Concentric bend Ø 60/100 (2)
1 - Adapter Ø 60/100 for Ø 80/125 (3)
1 - Concentric Int./Exh. bend Ø 80/125 (4)
1 - Internal washer (5)
1 - External washer (6)

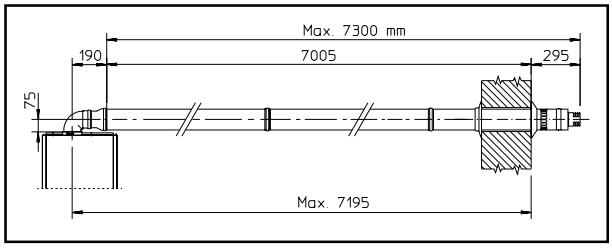
- Snap fit extension pipe fittings and concentric elbows Ø 80/125. To install snap-fit extensions with other elements of the boiler assembly, proceed as follows: fit the concentric pipe or elbow with the male section (smooth) on the female section (with lip seal) to the end stop on the previously installed to ensure sealing efficiency of the coupling.

Caution: if the exhaust terminal and/or extension concentric pipe needs shortening, consider that the internal duct must always protrude by 5 mm with respect to the external duct.

Normally the horizontal intake/exhaust kit Ø 80/125 is used in the event of using particularly long extensions; the kit Ø 80/125 can be installed with a rear, right-hand, left-hand or front outlet.

- Extensions for horizontal kit. The horizontal intake/exhaust kit Ø 80/125 can be extended up to a

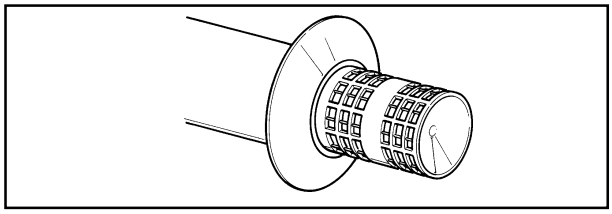
maximum horizontal length of 7300 mm including the terminal grille and excluding the concentric bend on output of the boiler and the adapter Ø 60/100 in Ø 80/125 (see figure page 12). This configuration corresponds to a resistance factor of 100. In these cases specific extensions must be requested.



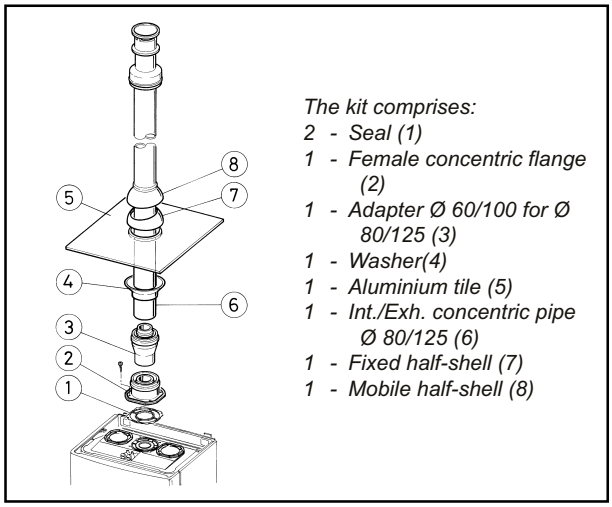
N.W.: when installing the ducts, a section clamp with pin must be installed every 3 metres.

- External grille. The intake/exhaust terminal models Ø 60/100 and Ø 80/125, if correctly installed, blend with external building aesthetics. Ensure that the silicon washer is fitted snugly against the external wall.

  N.W.: for safety purposes, do not totally or partially obstruct the boiler intake/exhaust terminal even temporarily.



Vertical kit with aluminium tile Ø 80/125. Kit assembly: install the concentric flange (2) on the central hole of the boiler taking care to insert the seal (1) supplied with the kit and tighten by means of the screws supplied with the boiler. Fit the male section (smooth) of the adapter (3) coin the female section of the concentric flange (2). Installing the imitation aluminium tile. Replace the tile with the aluminium sheet (5), shaping it to ensure off-flow of rainwater. Position the fixed half-shell (7) on the aluminium tile and insert the intake/exhaust pipe (6). Fit the concentric terminal Ø 80/125 with the male section (6) (smooth), in the female section of the adapter (3) (with lip seal) to the end stop, ensuring that washer (4) si already fitted to ensure sealing efficiency of all couplings.



The kit comprises:
2 - Seal (1)
1 - Female concentric flange (2)
1 - Adapter Ø 60/100 for Ø 80/125 (3)
1 - Washer(4)
1 - Aluminium tile (5)
1 - Int./Exh. concentric pipe Ø 80/125 (6)
1 - Fixed half-shell (7)
1 - Mobile half-shell (8)

- Snap fit extension pipe fittings and concentric elbows Ø 80/125. To install snap-fit extensions with other elements of the boiler assembly, proceed as follows: fit the concentric pipe or elbow with the male section (smooth) on the female section (with lip seal) to the end stop on the previously installed to ensure sealing efficiency of the couplings.

Caution: if the exhaust terminal and/or extension concentric pipe needs shortening, consider that the internal duct must always protrude by 5 mm with respect to the external duct.

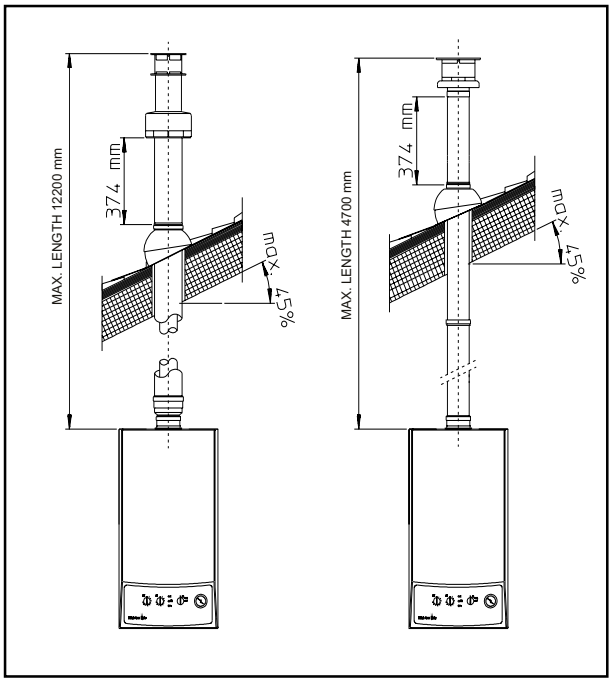
This specific terminal enables flue exhaust and air intake in a vertical direction.

N.W.: the vertical kit Ø 80/125 with aluminium tile enables installation on terraces and roofs with maximum gradient of 45% (24°) and the height between the terminal cap and half-shell (374 mm) must be strictly observed.

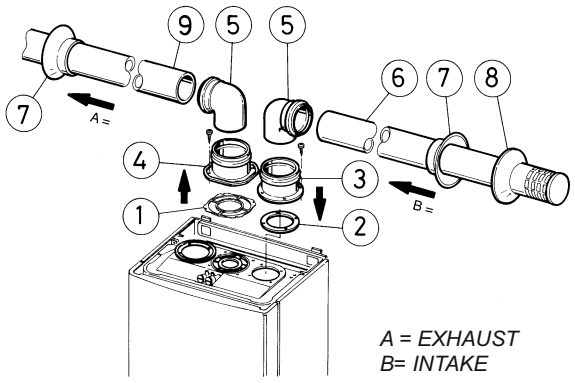
This vertical kit configuration can be extended to a *maximum length of 12200 mm* in a vertical straight route, including the terminal (see figure below). This configuration corresponds to a resistance factor of 100. In this case specific extensions must be requested.

Terminal Ø 60/100 can also be used for vertical exhaust, in conjunction with concentric flange code no. 3.011141 (sold separately). height between the terminal cap and half-shell (374 mm) must be strictly observed (see drawing below).

This vertical kit configuration can be extended to a *maximum length of 4700 mm* in a vertical straight line, including the terminal (see figure below).



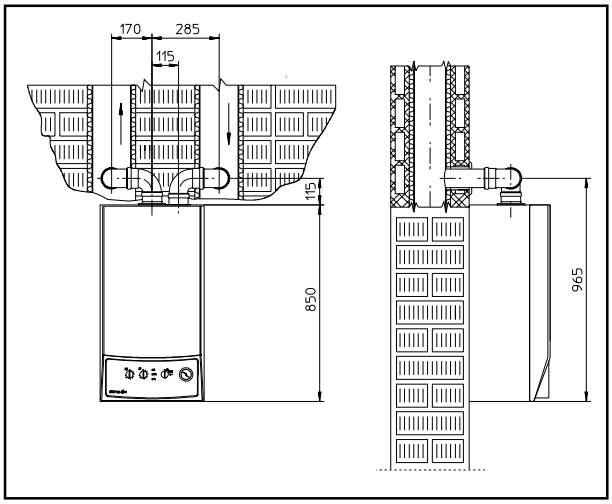
Separator kit Ø 80/80. The separator kit Ø 80/80, enables the division of the flue exhaust pipes and air intake pipes according to the diagram shown in the figure. Combustion products are expelled from duct (A). Air is taken in through duct (B) for combustion. Intake duct (B) can be installed either on the right or left hand side of the central exhaust duct (A). Both ducts can be routed in any direction.



A = EXHAUST
B= INTAKE

The kit comprises:
2 Seal (1)
1 - Female intake flange (3)
1 - Flange seal (2)
1 - Female exhaust flange (4)
2 - 90° bend Ø 80 (5)
1 - Intake terminal Ø 80 (6)
2 - Internal washers (7)
1 - External washer (8)
1 - Exhaust pipe Ø 80 (9)

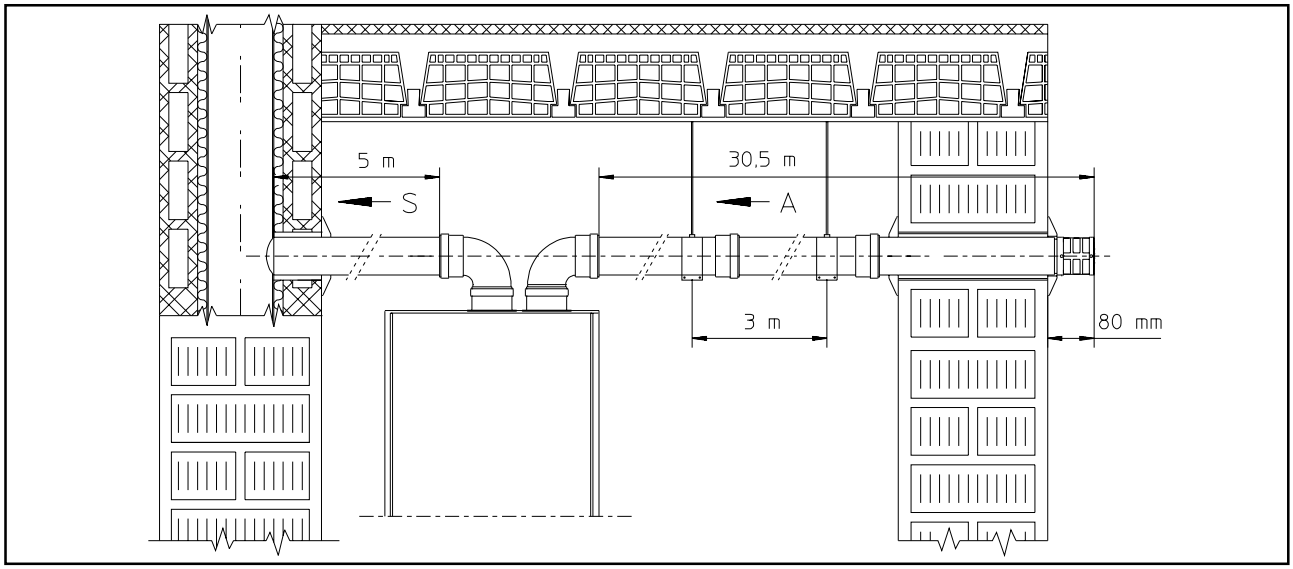
- Assembly of separator kit Ø 80/80. Install flange (4) on the central hole of the boiler taking care to insert seal (1) supplied with the kit and tighten by means of the screws on the boiler. Remove the flat flange on the lateral hole (depending on installation requirements) and replace with flange (3) inserting seal (2) already fitted on the boiler and tighten with the screws supplied. Joins bends (5) with the male section (smooth) in the female section of the flanges (3 and 4). Fit the intake terminal (6) with the male section (smooth) in the female section of the flange (5) to the end stop with the internal and external washers inserted. Join the exhaust pipe (9) with the male section (smooth) in the female section of the bend (5) to the end stop ensuring that the internal washer is fitted and to ensure sealing efficiency of the couplings.
- Snap fit extension pipe fittings and elbows. To install snap-fit extensions with other elements of the boiler assembly, proceed as follows: fit the pipe or elbow with the male section (smooth) on the female section (with lip seal) to the end stop on the previously installed to ensure sealing efficiency of the couplings.
- Installation clearances. The following figure shows the minimum installation clearances for the terminal separator kit Ø 80/80 in maximum admissible conditions.



- Extension for separator kit Ø 80/80. The maximum straight length (without bends) on a vertical route, for intake and exhaust pipes Ø80 is 41 metres, 40 of which on intake and 1 on exhaust. This total length corresponds to a resistance factor of 100. The total effective length, obtained by adding the length of intake and exhaust pipes Ø 80 must not exceed the maximum values specified in the table below. If *mixed accessories or components* are used (e.g. changing from a separator Ø 80/80 to a concentric pipe), the maximum extension can be calculated by using the resistance factor for each component or the *equivalent length*. The total of the resistance factors must not exceed 100.
- Temperature drops in flue ducts. To avoid the problem of flue condensation in the exhaust pipe Ø 80, due to cooling through the walls, the *length of the duct must be restricted to within 5 metres.* If longer distances have to be covered, use pipe diameters Ø 80 with insulation (see insulated separator kit Ø 80/80).

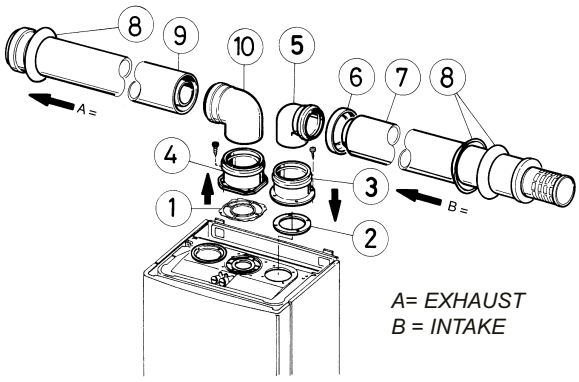
Maximum effective lengths (including intake terminal with grille and two 90° bends)			
NON-INSULATED DUCT		INSULATED DUCT	
Exhaust (metres)	Intake (metres)	Exhaust (metres)	Intake (metres)
1	36.0*	6	29.5*
2	34.5*	7	28.0*
3	33.0*	8	26.5*
4	32.0*	9	25.5*
5	30.5*	10	24.0*
		11	22.5*
		12	21.5*

* *The intake duct can be increased by 2.5 metres if the bend on exhaust is eliminated, 2 metres if the intake bend is eliminated or 4 metres of both bends are removed.*



N.W.: when installing the Ø 80 ducts, a section clamp with pin must be installed every 3 metres.

Insulated separator kit Ø 80/80. Kit assembly: Install flange (4) on the central hole of the boiler taking care to insert seal (1) supplied with the kit and tighten by means of the screws on the boiler. Remove the flat flange on the lateral hole (depending on installation requirements) and replace with flange (3) inserting seal (2) already fitted on the boiler and tighten with the screws supplied. Insert and slide cap (6) onto bend (5) on the male section (smooth) and join bends (5) with the male section (smooth in the female section of flange (3). Fit bend (10) with the male section (smooth) in the female section of flange (4). Join the intake terminal (7) with the male section (smooth in the female section of bend (5) to the end stop, ensuring that washers (8) are inserted to achieve correct installation between the pipe and wall and fit the end cap (6) on terminal (7). Join the exhaust pipe (9) with the male section (smooth) in the female section of the bend (10) to the end stop, ensuring that the washer (8) is already inserted for correct installation between the pipe and flue.



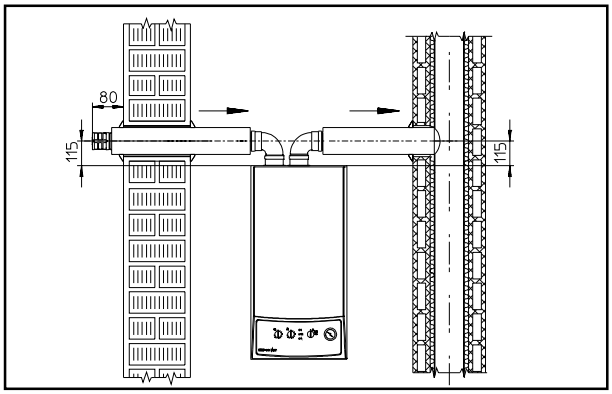
The kit comprises:
- *2 - Seal (1)*
- *1 - Flange seal (2)*
- *1 - Female intake flange (3)*
- *1 - Female exhaust flange (4)*
- *1 - 90° bend Ø 80 (5)*
- *1 - Pipe end cap (6)*
- *1 - Insulated intake terminal Ø 80 (7)*
- *3 - Washers (8)*
- *1 - Insulated exhaust pipe Ø 80 (9)*
- *1 - Concentric 90° bend Ø 80/125 (10)*

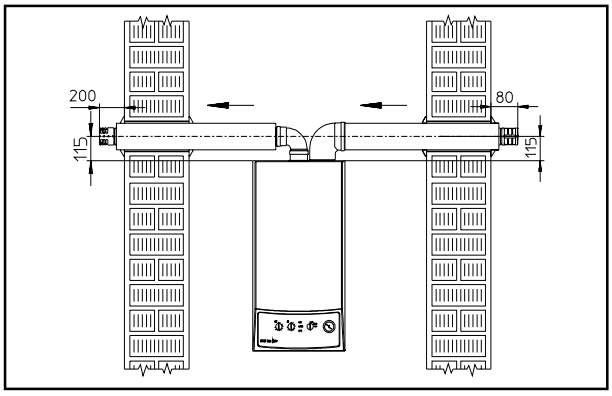
- Snap fit extension pipe fittings and elbows. To install snap-fit extensions with other elements of the boiler assembly, proceed as follows: fit the concentric pipe or elbow with the male section (smooth)

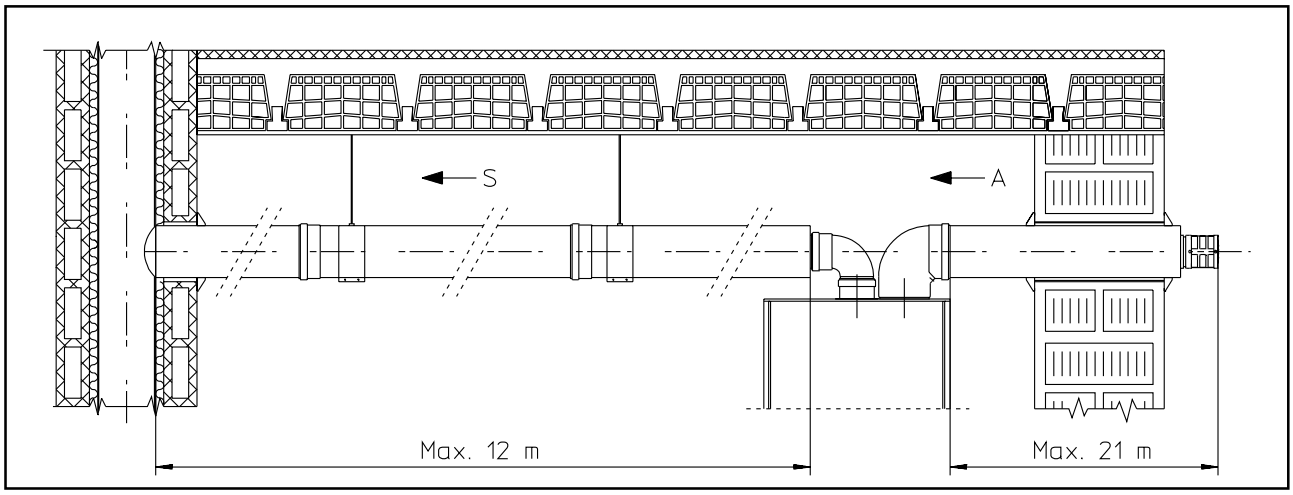
on the female section (with lip seal) to the end stop on the previously installed to ensure sealing efficiency of the couplings.

- Insulation of separator terminal. In the event of problems of condensation of flues inside the exhaust pipes or on the outside surface of the intake pipes, on request Immergas supplies insulated intake and exhaust pipes. Insulation may be necessary on exhaust pipes due to excessive drops in temperature of flues during conveyance from the boiler and on the intake pipes as air on input (cold) may cause the external pipe temperature lower than the dew point of the ambient air. The figures below illustrate different applications of insulated pipes.

  Insulated pipes comprise an internal Ø 80 concentric pipe and a Ø 125 external pipe with static air jacket. Technically it is not possible to start with both Ø 80 elbows insulated as clearances will not allow this type of installation. However an insulated elbow can be used by selecting either the intake or exhaust pipe. If an insulated intake pipe is used, the flange must be inserted to the end stop on the flue extraction flange to ensure that the height of the two intake and exhaust outlets is aligned.







- Temperature loss in insulated ducting. To avoid the problem of flue condensation in insulated exhaust Ø 80 pipes, due to cooling via the wall, *the exhaust pipe length must be restricted to 12 metres.* The figure above illustrates a typical insulation application in which the intake pipe is short and the exhaust pipe very long (over 5 m). The entire intake pipe is insulated to prevent condensation of humid air in the boiler environment in contact with the cooled pipe conveying cool outdoor air. The entire exhaust pipe is insulated with the exception of the elbow on output of the splitter, to reduce heat dispersion from the duct and prevent formation of flue condensate.

  N.W.: when installing the insulated ducts, a section clamp with pin must be installed every 2 metres.

1.5 Flue exhaust via flues.

Flue exhaust does not necessarily have to be connected a branched type traditional flue and can be connected to a special LAS type multiple flue. Flues must be specially designed according to specifications in the standard by qualified professional personnel.

Chimney or flue sections for connection of the exhaust pipe must comply with requirements as laid down in standards.

1.6 Existing ducting flues.

With a specific “ducting system” it is possible to reuse existing flues, chimneys and technical slots to discharge the boiler fumes. Ducting requires the use of ducts declared suitable for the purpose by the manufacturer, following the installation and operation instructions provided by the manufacturer, and the requirements of UNI 10845 standard.

1.7 Chimneys/Flues.

General notes. A chimney/flue used to exhaust combustion products must be designed as follows:

- *ducting must ensure sealing of combustion products, be waterproof and insulated*;
- construction in incombustible material suitable to resist normal mechanical stress, heat and action of combustion products or condensation;
- ducting routed vertically without reductions/throttles;
- adequate insulation to avoid condensation or cooling of flue gas, in particular if installed outside the building or in rooms without heating;
- be adequately spaced, or, be fitted with an air jacket for insulation from zones with combustible and/or easily flammable materials;
- *installation of a solid materials collection unit below the first flue channel at a height of at least 500mm*, fitted with a metal airtight door;
- designed with an internal circular, square or rectangular section (in that latter two cases with rounded angles with a radius no less than 20 mm). Hydraulically equivalent sections are also admitted;
- installation of a chimney terminal at the top of the flue in compliance with specifications below and in compliance with standards;
- without mechanical suction devices installed at the top of the duct;
- in flues routed inside or against inhabited buildings, there must be no risk of pressure surges.

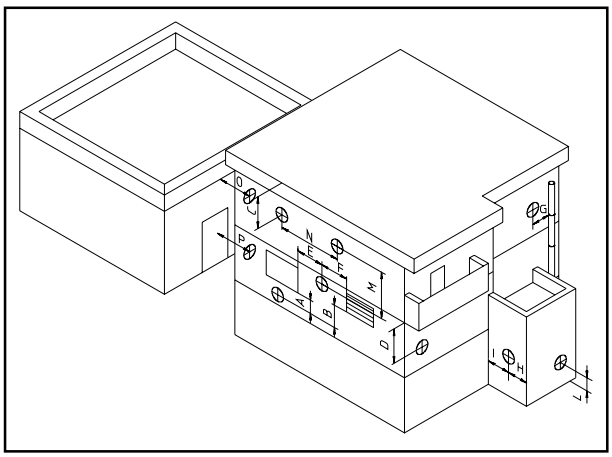
Chimney caps. These devices are installed on single or multiple flues, to facilitate dispersion of combustion products also in adverse weather conditions and prevent deposit of foreign matter. Chimney caps must meet the following requirements:

- useful output section no less than double that of the flue/chimney;
- suitably designed to prevent penetration of rain or snow in the flue/chimney;
- designed to ensure constant exhaust of combustion products with any direction or angle of wind.

The outlet height, corresponding to the height of the top of the flue/chimney, regardless of chimney caps, must be outside the “backflow zone”, to avoid the risk of counterpressure that prevents the free release of combustion products into the atmosphere. Therefore always observe the minimum heights indicated in the figures in standards.

Positioning the draft terminals. Draft terminals must:

- be installed on external perimeter walls of the building;
- be positioned (see figure) according to the minimum distances specified in current technical standards.



Fumes exhaust on natural draught appliances in open top closed environments. In spaces closed on all sides with open tops (ventilation pits, light wells, inner courtyards, etc.), direct discharge of fumes is allowed for natural or forced draught gas appliances with a heat output from 4 to 35 kW, provided the specifications of current technical standardsare complied with (UNI 7129 par. 4.7).

1.8 System filling.

Once the boiler is connected, proceed with system filling via the filling valve (see figure page 20).
Filling is performed at low speed to ensure release of air bubbles in the water via the boiler and heating system vents.
The boiler is equipped with an automatic air vent positioned on the expansion vessel, that is in the rear side of combustion sealed chamber. <u>*Check that the cap is loosened*</u> and open the vent valves on the radiators and close only when water is delivered.
Close the filling valve when the boiler pressure gauge indicates approx. 1,2 bar.

N.W.: During this operation, activate the circulation pump at regular intervals by means of the main switch on the control panel. *Vent the circulation pump by loosening the front cap and keeping the motor running.*
Tighten the cap on completion.

1.9 Gas system start-up.

To start up the system proceed as follows:

- open windows and doors;
- avoid presence of sparks or naked flames;
- vent all air from pipelines;
- check gas intake sealing efficiency with the boiler gas shutoff valve closed, checking that there is no gas transfer for at least 10 minutes.

1.10 Boiler start-up (ignition).

The following conditions are required for boiler start-up:

- ensure gas intake sealing efficiency with the shutoff valves closed and subsequently open with gas valve closed over an interval of 10 minutes in which

no gas transfer must be detected by the meter;

- ensure that the type of gas used corresponds to boiler settings;
- switch on the boiler and ensure correct ignition;
- ensure that the gas flow rate and pressure values correspond to manual specifications (see page 30-31);
- ensure that the safety device is engaged in the event of gas supply failure and check activation time;
- check activation of the main circuit-breaker switch upstream of the boiler and on the unit;
- check that the concentric intake/exhaust terminal (if fitted) is not blocked.

The boiler must not be started up in the event of failure to comply with any of the above.
Preliminary boiler testing must be performed by qualified personnel (e.g. free of charge by an Authorised Immergas Service Centre). The boiler guarantee is valid as of the date of testing.

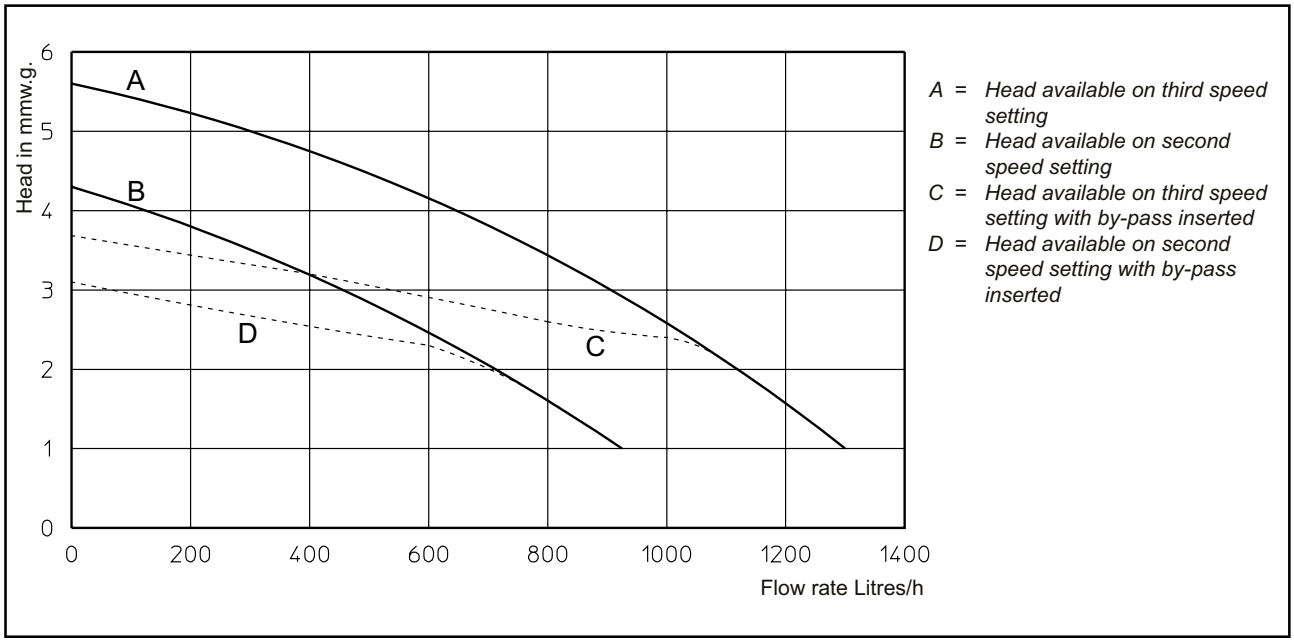
The test certificate and guarantee is issued to the user on completion.

1.11 Circulation pump.

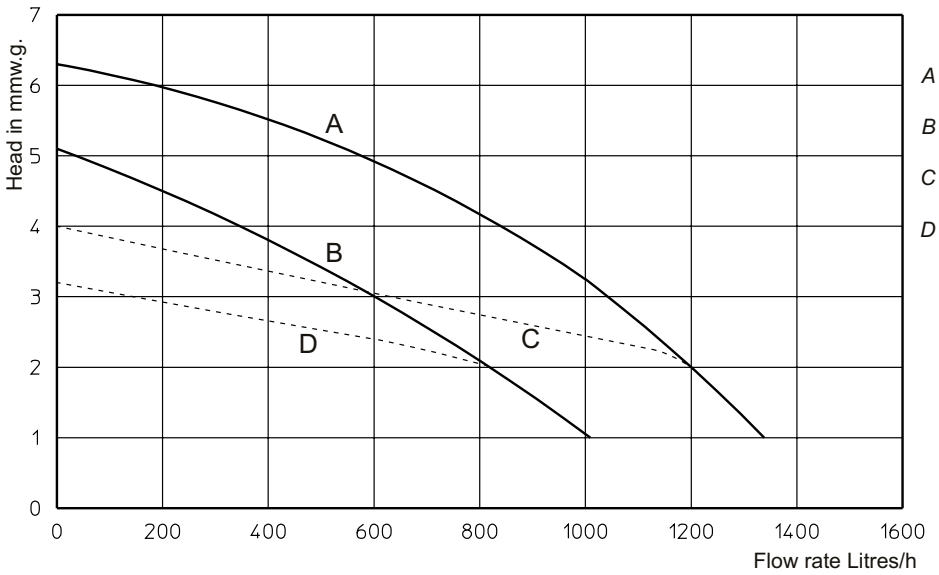
Eolo Maior @ boilers are supplied with a built-in circulation pump with 3-position electric speed control. If the circulating pump is adjusted on the first speed, the boiler doesn't operate correctly.
To ensure optimal boiler operation, in the case of new systems (single pipe and modul) use the circulation pump at maximum speed (third setting). The circulation pump is already fitted with a capacitor.

Pump release (when required). After a prolonged period of disuse, if the pump is blocked, loosen the front cap and rotate the motor using a screwdriver. Take great care during this operation to avoid damage to the motor.

System pump head Eolo 21 Maior @.

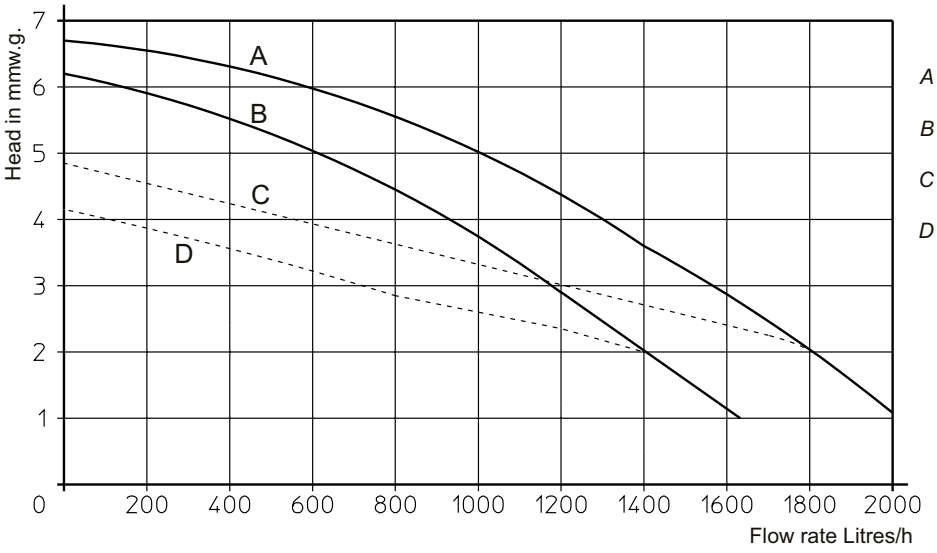


System pump head Eolo 24 Maior @.



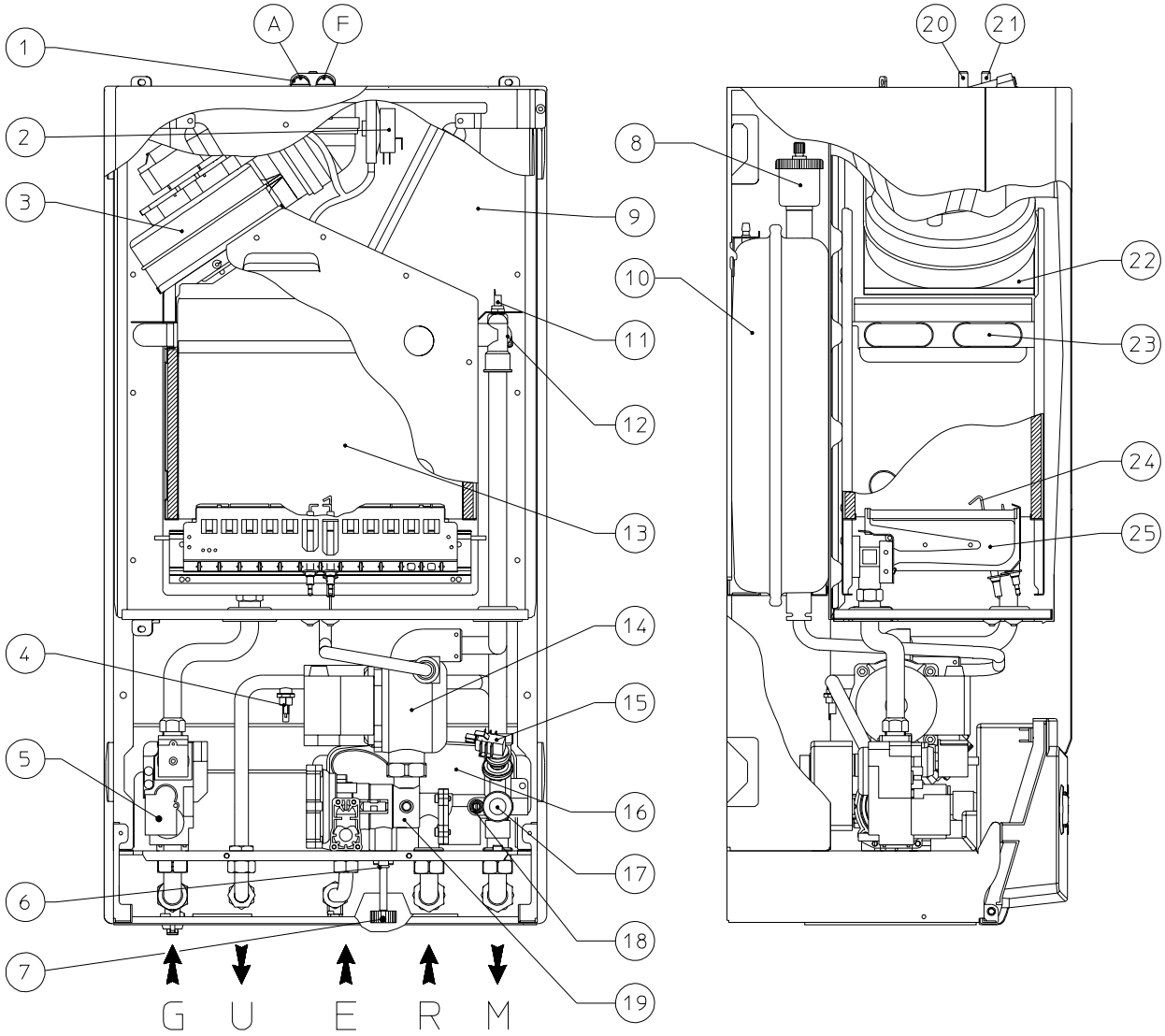
A = Head available on third speed setting
B = Head available on second speed setting
C = Head available on third speed setting with by-pass inserted
D = Head available on second speed setting with by-pass inserted

System pump head Eolo 27 Maior @.



A = Head available on third speed setting
B = Head available on second speed setting
C = Head available on third speed setting with by-pass inserted
D = Head available on second speed setting with by-pass inserted

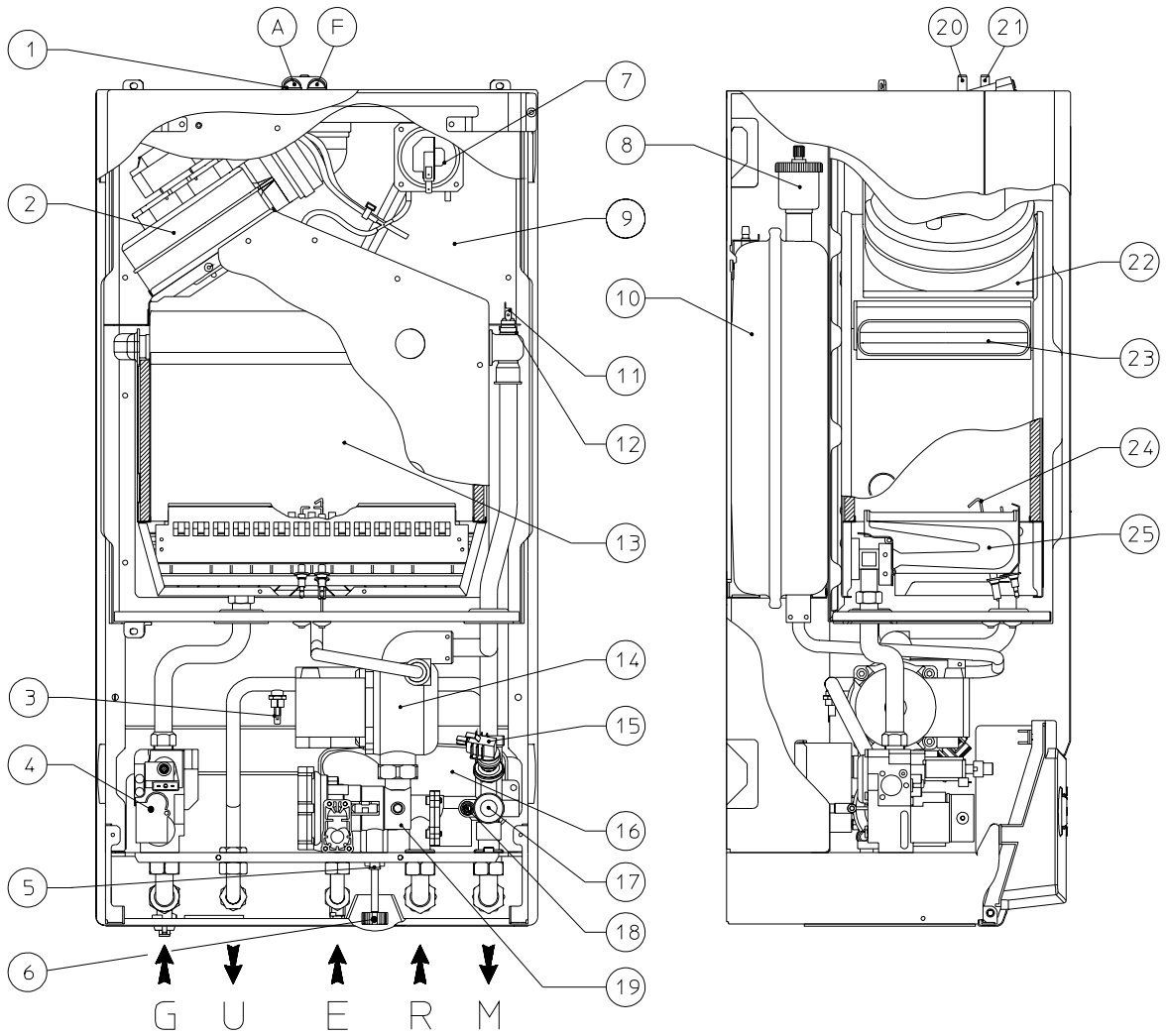
1.12 Eolo 21-24 Maior @ boiler components.



Key:

1 - Air/flue intake sockets (A air) - (F flue)
2 - Fan safety pressure switch
3 - Flue extraction fan
4 - Domestic hot water NTC thermistor
5 - Gas valve
6 - Draining valve
7 - Central heating filling valve
8 - Automatic air vent valve
9 - Sealed chamber
10 - Expansion vessel
11 - Central heating NTC thermistor
12 - Over heat safety thermostat
13 - Combustion chamber
14 - Circulating pump
15 - Water pressure switch
16 - Plated heat exchanger
17 - 3 bar safety valve
18 - Automatic by-pass exclusion stem
19 - 3 way hydraulic valve
20 - Positive signal pressure socket
21 - Negative signal pressure socket
22 - Flue hood
23 - Primary heat exchanger
24 - Ignition / detection electrodes
25 - Burner

1.13 Eolo 27 Maior @ boiler components.



Key:

1 - Air/flue intake sockets (A air) - (F flue)
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18 - Automatic by-pass exclusion stem
19 - 3 way hydraulic valve
20 - Positive signal pressure socket
21 - Negative signal pressure socket
22 - Flue hood
23 - Primary heat exchanger
24 - Ignition / detection electrodes
25 - Burner

1.14 Kits available on request.

- Kit of system shutoff valves (on request). The boiler is designed for installation of system shutoff valves for insertion on delivery and return pipelines on the connection assembly. This kit is particularly useful as it enables draining of the boiler separately from the entire system.
- Zoned heating systems kit (on request). In case of choice of an heating system divided in more zones (three at maximum) in order to control separately with independent regulations and to maintain high the flow of water of every zone, Immergas supplies when requested the zoned heating system kit.
- Polyphosphate batching kit (on request). The polyphosphate batching unit prevents the formation of limescale over time and maintains constant heat exchange conditions and production of domestic hot water. The boiler is designed for application of the polyphosphate batching unit.

The above kits are supplied complete with instructions for assembly and use.

2 OPERATION AND MAINTENANCE INSTRUCTIONS

2.1 Preliminary testing.

On completion of all installation instructions (including system filling) within maximum 30 days, contact an authorised technician (such as the immergas Authorised Technical Services). Immergas Service Centres performs a preliminary test on the boiler and supplies the user with all instructions for boiler use.

N.W.: preliminary testing by qualified personnel is indispensable for boiler efficiency and guarantee validity; the test ensures optimal Immergas boiler efficiency; reliability, efficiency and energy savings.

2.2 Cleaning and Maintenance.

Caution: Is suggest for the user to perform at least annual maintenance of the heating system and at least a bi-annual check of combustion ("flue test").
This ensures that the optimal safety, performance and operation characteristics of the boiler remain unchanged over time.

2.3 General Warnings.

Never expose the wall-mounted boiler to direct vapours from a cooking surface.
Use of the boiler by unskilled persons or children is strictly prohibited.
Never touch the flue extraction terminal (if fitted) due to the risk of burning caused by high temperatures;
For safety purposes, check that the concentric air intake/flue exhaust terminal (if fitted), is not blocked.

If temporary shutdown of the boiler is required, proceed as follows:

a) drain the heating system if anti-freeze is not used;

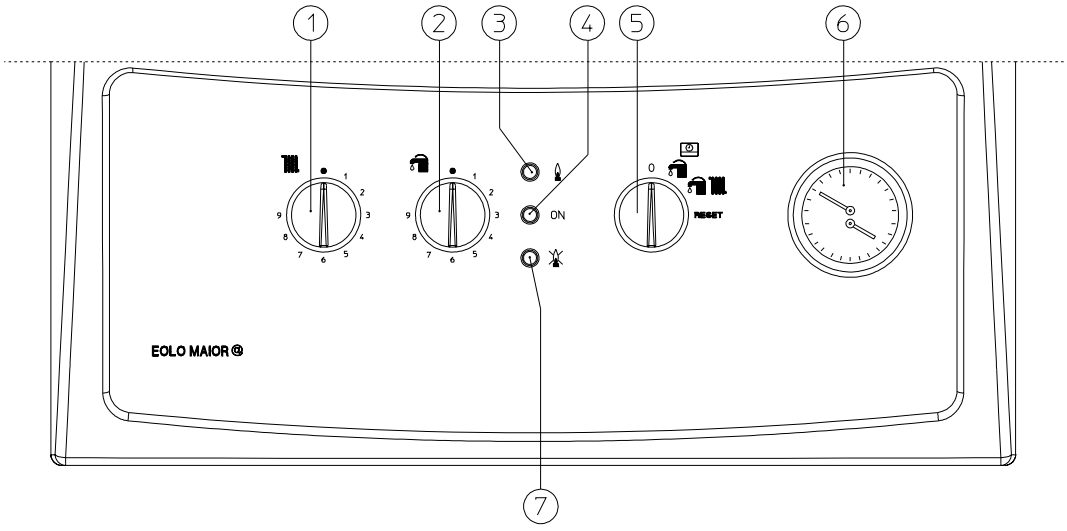
b) shut off all electrical, water and gas supplies.

In the case of work or maintenance to structures located in the vicinity of ducting or devices for flue extraction and relative accessories, switch off the appliance and on completion of operations ensure that a qualified technician checks efficiency of the ducting or other devices.
Never clean the appliance or connected parts with easily flammable substances.
Never leave containers or flammable substances in the same environment as the appliance.

- **Caution:** use of components involving use of electrical power requires observance of the following rules:

- never touch the appliance with wet hands or other parts of the body and never touch when barefoot;
- never pull electrical cables or leave the appliance exposed to atmospheric agents (rain, sunlight, etc.);
- the appliance power supply cable must never be replaced by the user;
- in the event of damage to the cable, switch off the appliance and contact exclusively qualified personnel for replacement;
- in the event of prolonged periods of disuse, turn off the main power switch.

2.4 Eolo Maior @ - Control Panel.



Key:

1 - Heating temperature selector
2 - Domestic hot water temperature selector
3 - Flame presence yellow indicator lamp
4 - Tension presence green indicator lamp
5 - Switch 0-Domestic/Remote Control-Domestic and Heating-Reset
6 - Boiler pressure/temperature gauge
7 - Boiler block red indicator lamp

Boiler ignition. Before switching on the boiler, check that the system is filled with water and that gauge (6) indicates a pressure of 1÷1,2 bar.

- Open the gas valve downstream of the boiler.
- Turn the main switch (5) to Domestic hot water/ Remote control ( ) or to Domestic hot water / Central heating ( ) position.

N.W.: When the main switch (5) is positioned on the above mentioned positions, the green indicating lamp (4) that signals tension presence to the boiler, will stay always on.

- Functioning with Amico Remote Control (Optional). With the main switch (5) set on position ( ) and the Amico Remote Control connected to the boiler, the two selectors (1) and (2) are inhibited. The functioning parameters of the boiler are settable directly on the Amico Remote Control panel.
- Functioning without Amico Remote Control. With the main switch (5) set to ( ) position, the heating temperature selector (1) is inhibited, the domestic hot water temperature is controlled by selector (2). With the main switch (5) set to ( ) position, the heating temperature selector (1) is used to adjust the temperature of radiators, while selector (2) is used to adjust the domestic hot water temperature. Rotate clockwise to increase the temperature and counterclockwise to decrease.

Now the boiler works automatically. Without heating demands (heating system and domestic hot water), the boiler moves on stand-by position, equivalent to boiler supplied without flame presence (indicating lamp number 4 ignited). Every time the burner works, this situation is indicated through the yellow indicating lamp of flame presence (3) on the control panel.

2.5 Breakdowns and anomalies signaling.

Signalled function	Yellow lamp (3)	Red lamp (7)	Green lamp (4)	Remote control display
Boiler OFF	OFF	OFF	OFF	-
Boiler on stand-by	OFF	OFF	ON	-
Flame presence	ON	OFF	ON	-
Ignition lock	OFF	ON	ON	E01
Over heat lock	OFF	Flashing	ON	E02
Anomaly of central heating NTC	Flashing	OFF	ON	E05
Anomaly of sanitary NTC	Flashing	OFF	ON	E06
Water lack	Alternative Flashing		ON	E10
Anomaly of flue pressure switch / ignition problems	Simultaneous Flashing		ON	E14
Insufficient water circulation	Flashing	ON	ON	E27
Anomaly of A.R.C. off line / not compatible	ON	Flashing	ON	E31

Ignition block. Each time heating or hot water production is required the boiler is activated automatically. If this does not occur within 10 seconds, the boiler activates an “ignition block” (indicator lamp 7). To eliminate the block, rotate the main switch (5) temporarily to the Reset position. On initial ignition or following a prolonged period of disuse the ignition block may need to be inhibited. If this function is activated repeatedly, contact a qualified technician for assistance (e.g. Immergas Technical Services Centre).

Temperature overload block. During operation, if a fault causes a temperature overload condition, the boiler operation is shut-off (indicating lamp 7 flashing). To eliminate the over heat lock is necessary to turn momentary the main switch (5) to Reset position. If the problem is frequent, contact an authorised technician (e.g. Immergas Technical Service).

Air pressure switch activation failure / ignition control box breakdown. It is verified when the air inlet or flue exhaust ducts are obstructed, when the fan is blocked or when the ignition-detection control box is defected. If normal conditions are restored, the boiler re-start to work without requiring reset. If anomalies persists contact the authorised technician (e.g. Immergas Technical Service).

Central heating NTC sensor fault. If ignition control box detects a fault of central heating NTC, the boiler does not start; is necessary to call an authorised technician (e.g. Immergas Technical Service).

Sanitary NTC sensor fault. If ignition control box detects a fault of sanitary NTC, the boiler does not produces domestic hot water; is necessary to contact an authorised technician (e.g. Immergas Technical Service).

Water lack in the circuit. Inside the central heating circuit is not detected a sufficient water pressure to permit the boiler to work correctly. Verify that the

gauge (6) read a system pressure between 1 and 1,2 bar.

Insufficient water circulation. It is verified if there is an over heat condition of the boiler, caused by an insufficient water circulation inside the system; causes may be the following:

- scarce water circulation on system; verify that there is not a closed intercepting valve along the heating circuit and that the system is completely without air;
- blocked circulating pump; the circulating pump must be de-blocked.

If the problem is frequent, contact an authorised technician (e.g. Immergas Technical Service)

Remote control not compatible. It is verified if is connected a Remote Control not compatible with the boiler, or if the data interchange between Amico Remote Control and boiler is interrupted. Try the connection procedure turning-off the boiler and reset the switch (5) to ( ) position. In case contact a qualified technician (e.g. Immergas Technical Service).

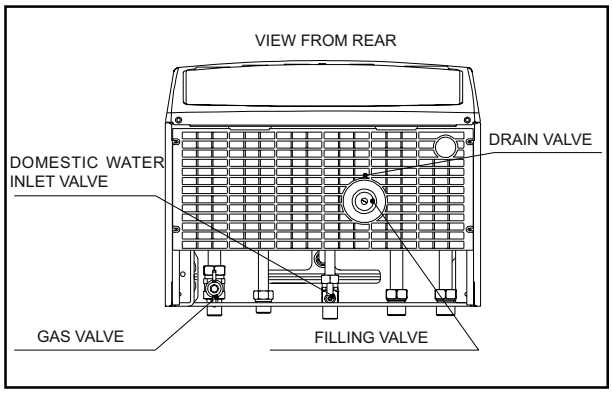
Boiler diagnosis signalling - Display of Amico Remote Control (Optional). During normal operation of the boiler, on the A.R.C. display the room temperature is showed; in case of fault or anomaly, the display of temperature is replaced by the comparative error-code showed on page 22.

2.6 Boiler shutdown.
Turn off the main switch (5) by setting to “0” (green indicator lamp 4 OFF) and close the gas supply valve upstream of the appliance. Never leave the boiler switched on if left unused for prolonged periods.

2.7 Heating system pressure.
Periodically check the system water pressure. The boiler pressure gauge should read a pressure between 1 and 1,2 bar.
If the pressure falls below 1 bar (with the circuit cool) restore normal pressure via the valve located at the bottom of the boiler (see figure).

N.W.: close the valve on completion.
If pressure values reach around 3 bar the safety valve may be activated.
In this case contact a professional technician for assistance.

In the event of frequent pressure drops, contact qualified personnel for assistance to eliminate system leakage.



2.8 Draining the system.
To drain the system completely, use the drain valve (see figure above and on page 19-20).
Before draining, ensure that the filling valve is closed.

2.9 Anti-freeze protection.
The boiler is equipped as standard with an anti-freeze function that activates the pump and burner when system water temperature falls below 4°C and deactivates once temperatures reach 42°C. The anti-freeze function is guaranteed if the boiler is totally operative and not in “block” status, when connected to the electrical power supply and the main switch is set to Summer or Winter mode. To avoid continued operation in the event of prolonged absence, the system must be drained completely or anti-freeze substances should be added to the heating system water. In both cases the domestic water circuit in the boiler must be drained. In appliances subject to frequent draining, the system must be refilled with suitably treated water to eliminate hardness that may cause limescale formation.

2.10 Casing cleaning.
Use damp cloths and neutral detergent to clean the boiler casing. Never use abrasive or powder detergents.

2.11 Decommissioning.
In the event of permanent shutdown of the boiler, contact professional personnel for the procedures and ensure that the electrical, water and gas supply lines are shut off and disconnected.

3 BOILER START-UP (PRELIMINARY TESTING)

To start up the boiler, proceed as follows:

- ensure that the declaration of conformity of installation is supplied with the appliance;
- ensure sealing efficiency of the gas intake circuit with the shutoff valves closed and then with the valves open and the gas valve deactivated (closed); the meter must not indicate gas transfer for at least ten minutes;
- ensure that the gas used corresponds to specifications for the boiler;
- ensure connection to a 30V-50Hz power mains, correct L-N polarity and the earthing connection;
- verify if heating system is water filled, checking that manometer pointer indicate 1÷1,2 bar of pressure;
- verify if automatic air vent cap is open and that heating system is well degasified;
- switch on the boiler and ensure correct ignition;
- ensure that the maximum, intermediate and minimum gas flow rate and relative pressure values conform to specifications in the booklet on page 30-31;
- ensure activation of the safety device in the event of gas supply failure, as well as the relative activation time;
- ensure activation of the main switch downstream of the boiler and inside the boiler;
- check that the intake and/or exhaust terminals are not blocked;
- ensure activation of the safety pressure switch in the event of air supply failure;
- ensure activation of all regulation devices;
- seal the gas flow rate regulation devices (if settings are modified);
- ensure production of hot domestic water;
- ensure sealing efficiency of water circuits.
- ensure adequate ventilation and/or aeration of the boiler environment.

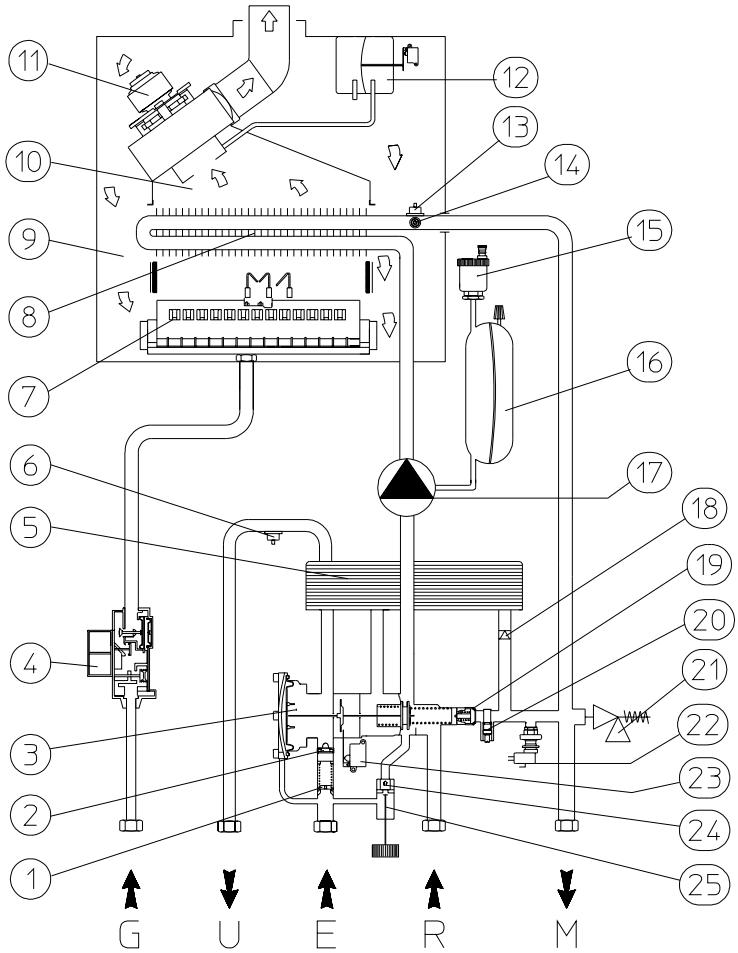
If any checks/inspection give negative results, do not start the boiler.

3.1 Eolo Maior @ hydraulic circuit diagram.

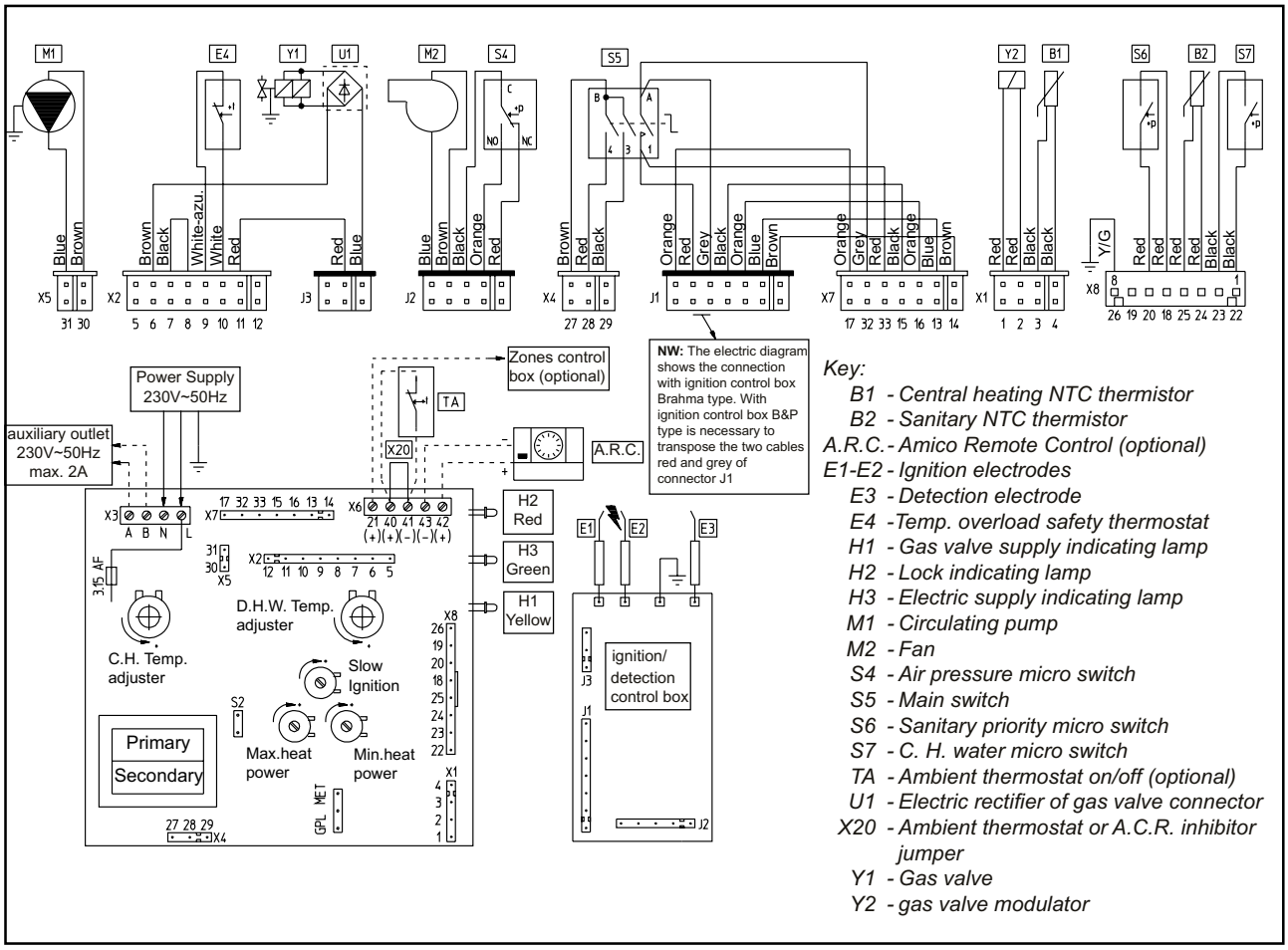
Key:

1 - Sanitary min. flow shutter
2 - Flow limiter
3 - 3 way hydraulic valve
4 - Gas valve
5 - Sanitary heat exchanger
6 - Sanitary NTC sensor sensor
7 - Main burner
8 - Primary heat exchanger
9 - Sealed chamber
10 - Flue hood
11 - Flue extraction fan
12 - Fan safety pressure switch
13 - Central heating NTC sensor
14 - Over heat safety thermostat
15 - Automatic air vent valve
16 - Expansion vessel
17 - Circulating pump
18 - One-way valve
19 - Automatic by-pass
20 - Automatic by-pass exclusion stem
21 - 3 bar safety valve
22 - Water pressure switch
23 - Sanitary micro switch
24 - Filling group

G - Gas supply
U - Hot domestic water outlet
E - Domestic water inlet
R - System return
M - System delivery



3.2 Eolo Maior @ electrical circuit diagram.



Key:

- *B1 - Central heating NTC thermistor*
- *B2 - Sanitary NTC thermistor*
- *A.R.C. - Amico Remote Control (optional)*
- *E1-E2 - Ignition electrodes*
- *E3 - Detection electrode*
- *E4 - Temp. overload safety thermostat*
- *H1 - Gas valve supply indicating lamp*
- *H2 - Lock indicating lamp*
- *H3 - Electric supply indicating lamp*
- *M1 - Circulating pump*
- *M2 - Fan*
- *S4 - Air pressure micro switch*
- *S5 - Main switch*
- *S6 - Sanitary priority micro switch*
- *S7 - C. H. water micro switch*
- *TA - Ambient thermostat on/off (optional)*
- *U1 - Electric rectifier of gas valve connector*
- *X20 - Ambient thermostat or A.C.R. inhibitor jumper*
- *Y1 - Gas valve*
- *Y2 - gas valve modulator*

Room thermostat or Amico Remote Control: the boiler is designed for application of a room thermostat (TA) or of Amico Remote Control (A.R.C.). Connect the room thermostat TA to terminals 40 and 41 removing jumper X20. Amico Remote Control has to be connected to terminals 42 and 43 of printed control board respecting polarity and removing jumper X20.

3.3 Troubleshooting.

N.B.: maintenance operations must be performed by a qualified technician (e.g. Immergas Technical Assistance Service).

- Smell of gas. Caused by leakage from gas circuit pipes. Check tightness of the gas delivery circuit.
- The fan works but the ignition discharge on the burner train does not occur. The fan may start but the safety air pressure switch does not change the contact. Check:

1) that the intake-exhaust duct is not too long (over permissible length).
2) that the intake-exhaust duct is not partially blocked (on the exhaust or intake side).
3) that the diaphragm on the fume outlet is adequate for the length of the intake/exhaust ducting.
4) that the sealed chamber is perfectly tight.
5) that the fan feed voltage is not less than 196 V.

- Irregular combustion (red or yellow flame). This may be caused by a dirty burner, blocked reed valve, or incorrect installation of the intake-exhaust terminal. Clean the abovementioned components and check correct installation of the terminal.
- Frequent cut-in of the temperature-rise safety thermostat. This may be due to low water pressure in the boiler, insufficient water circulation in the heating circuit, blocked circulating pump or by an anomaly in the boiler control card. Check on the pressure gauge that values are within the set limits. Check that radiator valves are not all closed.
- Presence of air in the system. Check opening of the cap on the special air valve (see fig. page 19). Ensure that pressure of the system and expansion vessel preload are are within the set limits; the preload value for the expansion vessel must be 1.0 bar, and system pressure between 1 and 1.2 bar.
- Ignition block; see pages 22 and 4 (electrical connection).

3.4 Converting the boiler in case of gas change.

If the unit has to be adapted for a different gas to that specified on the dataplate, the relative conversion kit must be requested for quick and easy conversion.
Boiler conversion must be performed by a qualified technician (e.g. Immergas Technical Assistance Service).
To convert to another type of gas:

- replace the main burner nozzle;
- move the jumper (13 page 28) to the correct position for the type of gas required (Natural or LPG);
- adjust maximum boiler heat output;
- adjust minimum boiler heat output;
- adjust (if necessary) heating power;
- adjust the first slow f burner ignition step;
- seal the gas flow control devices (if modified);
- after completing conversion, apply the sticker, present in the conversion kit, near the dataplate. Using an indelible marker pen, cancel the data relative to the old type of gas.

These adjustments must be made with reference to the type of gas used, following that given in the table on page 30-31.

3.5 Checks following conversion to other type of gas.

After ensuring that conversion has been made with nozzles of the diameter required for the type of gas used and adjustment has been made to the set pressure, check:

- that there is no flame return in the combustion chamber;
- that the burner flame is not too high or low and is stable (does not detach from burner);
- that the pressure testers used for setting are perfectly closed and there are no leaks from the gas circuit.

N.B.: all boiler adjustment operations must be performed by a qualified technician (e.g. Immergas Technical Assistance Service). Burner adjustment must be carried out using a differential “U” or digital type pressure gauge, connected to the pressure point on the sealed chamber (detail 20 page 19) and the gas valve outlet pressure point (detail 6 page 28), keeping to the pressure value given in the table on page 30-31 for the type of gas required by the boiler

3.6 Possible adjustments for Eolo Maior @.

• Adjustment of boiler rated heat output (see fig. page 28).

- Turn the domestic hot water temperature selector (2 page 21) to the maximum setting;
- open the hot domestic water valve to avoid modulation;
- adjust boiler rated heat output by means of the brass nut (3), keeping to the max. pressure values given in the tables on page 30-31 according to the type of gas used;
- turn clockwise to increase heating power, and counterclockwise to decrease.

• Adjustment of boiler min. heat output (see fig. page 28).

N.B.: proceed only after setting the rated pressure.

Minimum heat output is adjusted by means of the brass nut (4) on the gas valve, keeping the brass nut (3) locked.

- shut off power supply to the modulating coil (simply detach a faston); turn the screw clockwise to increase the pressure, and counterclockwise to decrease. On completion of adjustment, reconnect

the feed to the modulating coil. Boiler minimum heat output pressure must not be adjusted to below the values given in the tables on page 30-31 according to the type of gas.

- Adjustment of boiler min. heat output, to be carried out ONLY for boilers with output of 27,000 kcal/h (see fig. page 28). Adjust minimum heat output for room heating, by operating the trimmer (11 page 28) located on the boiler modulation electronic card, as follows:

- close the domestic hot water cock and turn the switch (5 page 21) to pos. ( );
- within 1 minute of boiler lighting, adjust minimum heat output by turning the trimmer (11 page 28) on the modulation card, keeping to the values given in the tables on page 30-31 for boiler variable heat output. Turn the trimmer clockwise to increase the pressure and counterclockwise to decrease.

- Adjustment of heat output, to be made for all boiler models with outputs from 21,000 to 27,000 kcal/h (see fig. page 28). To adjust maximum heat output for room heating, operate the trimmer (12 page 28) located on the boiler modulation electronic card, as follows:

- close the domestic hot water cock and turn the switch (5 page 21) to pos. ( );
- set the heating control selector (1 page 20) to maximum temperature to prevent modulation;
- adjust maximum heating output by turning the trimmer (12 page 28) on the modulation card, keeping to the values given in the tables on page 30-31 for boiler variable heat output. Turn the trimmer clockwise to increase the pressure and counterclockwise to decrease.

N.B.: to adjust the gas valve, remove the plastic cap (5), after adjusting refit the cap.

N.B.: the Eolo Maior @ boiler is fitted with electronic modulation that adapts boiler power to actual room heating requirements. Therefore the boiler operates normally in a variable gas pressure range between the minimum and maximum heating power according to the system thermal load.

N.B.: the Eolo Maior @ boiler is produced and set to rated power during heating, however, about 15 minutes are required to reach rated heating power; since boiler models with outputs from 21,000 to 24,000 kcal/h are factory-set, the minimum heating trimmer (11) does not have to adjusted.

3.7 Eolo Maior @ boiler slow ignition adjustment.

After setting the minimum and maximum heating settings for the unit, the first slow ignition step can be set for the gas valve. To carry out this adjustment operate the Trimmer (10 page 28) located on the boiler electronic modulation card. Turn it clockwise to increase pressure and counterclockwise to decrease. To obtain slow or gradual inter-ignition of the burner, we recommend setting the first step for slow ignition at 25 mm H_20 for boilers operating with natural gas and 60 mm H_2O for boilers operating with LPG.

N.B.: do not go below the boiler minimum heat output when setting the slow ignition.

3.8 Permanent reduction in timing.

The “Eolo Maior @” boiler is equipped with an electronic timer which prevents too frequent burner lighting in the heating phase. The boiler comes standard with the timer adjusted to 3 minutes. To bring the timer to 30 seconds, remove the jumper (14) (see page 28).

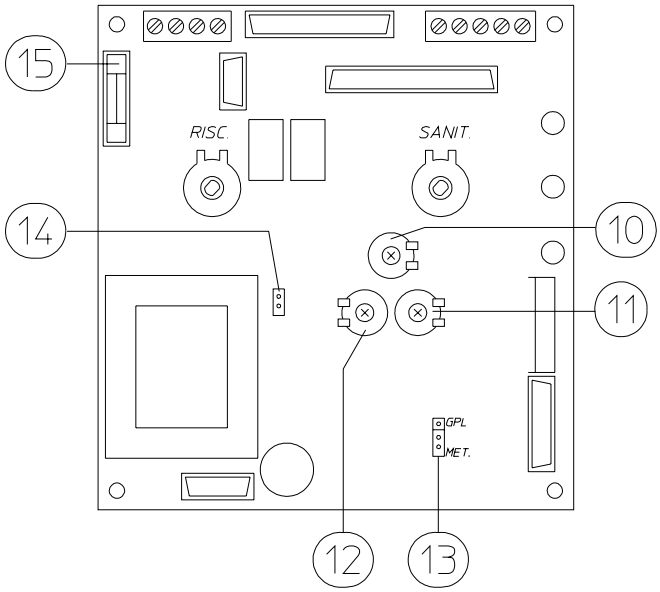
3.9 Pump antiblock function.

During the “Summer” phase the boiler is equipped with a function that starts the pump at least once every 24 hours for the duration of 2.5 minutes in order to reduce the risk of the pump becoming blocked due to prolonged inactivity.

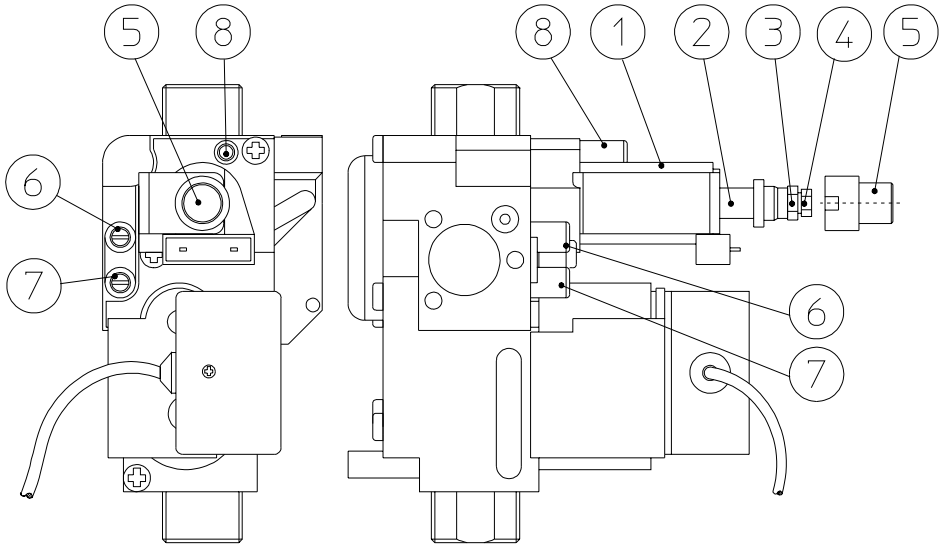
3.10 Radiator antifreeze function.

During the “Winter” phase the boiler is equipped with a function that starts the pump at least once every 3 hours for the duration of 2.5 minutes.
If the system’s return water is at a temperature of below 4°C, the boiler starts up until reaching 42°C.

Eolo Maior @ electronic card



GAS VK 4105 valve for Eolo Maior @



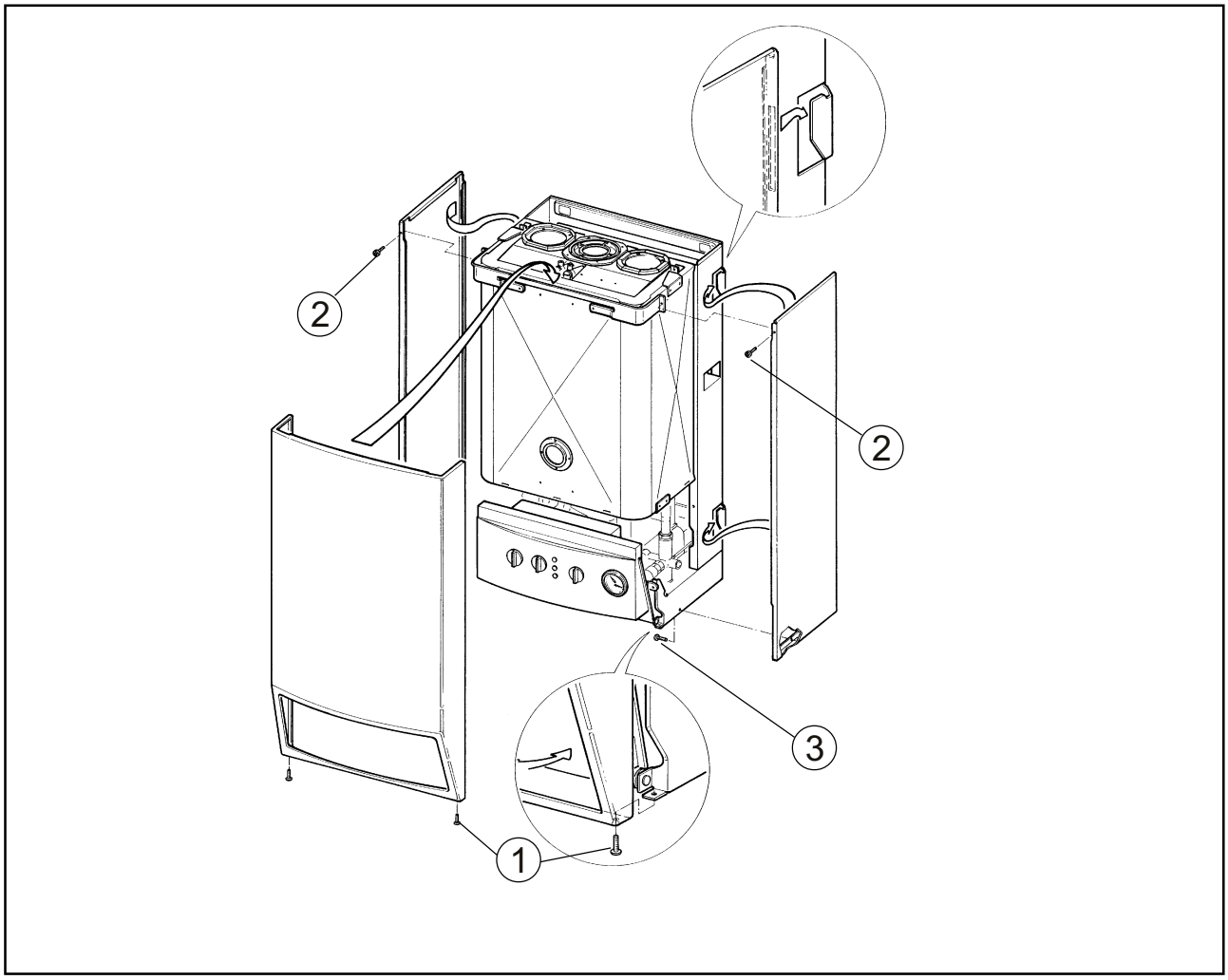
Key:

1 - Coil
2 - Coil pin
3 - Maximum power adjustment screw
4 - Minimum power adjustment screw
5 - Protection hood
6 - Gas valve outlet pressure socket
7 - Gas valve inlet pressure socket
8 - Air pressure socket hose connector
10 - Slow ignition adjustment trimmer
11 - Minimum heating power adjustment trimmer
12 - Maximum heating power adjustment trimmer
13 - Jumper for operation with natural gas or LPG
14 - Jumper for timer heating re-start
15 - 3,15A fuse

3.11 Casing disassembly.

To facilitate boiler maintenance the casing can be disassembled as follows:

- remove the lower plastic grate of protection;
- unscrew the screws (1) situated on the lower side of front casing;
- pull slightly the lower part of front casing and contemporary push up;
- unscrew the screws (2) situated on the upper side of casing supporting bracket (see the figure);
- unscrew the screws (3) situated on the side lower and push up to free the left and right sides of casing.



3.12 Annual appliance maintenance.

The following checks and maintenance should be performed at least once a year.

- Clean the flue side of the heat exchanger.
- Clean the main burner.
- Make a visual inspection of the flue extraction hood for wear or corrosion.
- Ensure correct ignition and operation.
- Ensure correct settings of the burner in domestic water and heating phases.
- Verify correct operation and adjustments of the appliance, in particular:
  - activation of the electrical main switch on the boiler;
  - activation of the system control thermostat;
  - activation of the domestic water control thermostat.
- Ensure sealing efficiency of the gas intake circuit; insert a “U” or digital type pressure gauge in the pressure socket upstream of the gas valve and subsequently closing the boiler shutoff valve (cock) and closing the gas valve, no pressure variation must occur in the next five minutes on the gauge.
- Ensure activation of the device for protection against the ionisation flame control gas; activation time must be less than ten seconds.
- Visually inspect to check for leakage of water or oxidation of relative couplings.
- Check visually that the water safety drain valve is not blocked.
- Check that the charge of the expansion vessel after discharging system pressure to the zero setting (check via boiler pressure gauge), is at 1,0 bar.
- Check that the system static pressure (in cold conditions and after system recharging via the filling valve) is between 1 and 1,2 bar.
- Check visually that the safety and control devices have not been tampered with and/or shorted, in particular:
  - temperature safety thermostat;
  - c.h.water switch;
  - air pressure switch.
- Ensure correct maintenance and condition of the electrical installation with particular reference to:
  - electrical cables must be inside the channels;
  - no traces of black marking or burns.

3.13 Eolo 21 Maior @ variable heating power.

		NATURAL GAS (G20)			BUTANE (G30)			PROPANE (G31)		
HEATING POWER (kcal/h)	HEATING POWER (kW)	BURNER GAS FLOW RATE (m^3/h)	BURNER NOZZLE PRESSURE (mbar)	(mmw.g.)	BURNER GAS FLOW RATE (kg/h)	BURNER NOZZLE PRESSURE (mbar)	(mmw.g.)	BURNER GAS FLOW RATE (kg/h)	BURNER NOZZLE PRESSURE (mbar)	(mmw.g.)
21000	24,4	2,81	11,0	112	2,09	29,0	296	2,06	36,0	367
20000	23,3	2,69	10,0	102	2,00	26,5	270	1,97	32,9	335
19000	22,1	2,56	9,1	93	1,91	24,1	246	1,88	29,9	305
18000	20,9	2,44	8,3	84	1,81	21,8	222	1,79	27,1	276
17000	19,8	2,31	7,4	76	1,72	19,6	200	1,70	24,4	248
16000	18,6	2,18	6,7	68	1,63	17,5	179	1,60	21,8	222
15000	17,4	2,06	5,9	60	1,53	15,6	159	1,51	19,3	197
14000	16,3	1,93	5,2	53	1,44	13,7	140	1,42	17,0	173
13000	15,1	1,80	4,5	46	1,34	11,9	122	1,32	14,8	151
12000	14,0	1,67	3,9	40	1,25	10,3	105	1,23	12,8	130
11000	12,8	1,54	3,3	34	1,15	8,8	89	1,13	10,9	111
10000	11,6	1,41	2,8	28	1,05	7,3	75	1,04	9,1	93
9000	10,5	1,28	2,3	23	0,95	6,0	61	0,94	7,5	76
8000	9,3	1,14	2,0	20	0,85	5,6	57	0,84	7,1	72

3.14 Eolo 24 Maior @ variable heating power.

		NATURAL GAS (G20)			BUTANE (G30)			PROPANE (G31)		
HEATING POWER (kcal/h)	HEATING POWER (kW)	BURNER GAS FLOW RATE (m^3/h)	BURNER NOZZLE PRESSURE (mbar)	(mmw.g.)	BURNER GAS FLOW RATE (kg/h)	BURNER NOZZLE PRESSURE (mbar)	(mmw.g.)	BURNER GAS FLOW RATE (kg/h)	BURNER NOZZLE PRESSURE (mbar)	(mmw.g.)
24000	27,9	3,18	11,00	112	2,37	29,70	303	2,33	37,00	377
23000	26,7	3,05	10,14	103	2,27	27,37	279	2,24	34,09	348
22000	25,6	2,93	9,31	95	2,18	25,14	256	2,15	31,33	320
21300	24,8	2,84	8,76	89	2,11	23,65	241	2,08	29,46	301
20000	23,3	2,67	7,78	79	1,99	21,01	214	1,96	26,17	267
19000	22,1	2,55	7,07	72	1,90	19,09	195	1,87	23,78	243
18000	20,9	2,42	6,39	65	1,81	17,26	176	1,78	21,51	219
17000	19,8	2,30	5,75	59	1,71	15,53	158	1,69	19,35	197
16000	18,6	2,17	5,14	52	1,62	13,89	142	1,60	17,30	176
15000	17,4	2,05	4,57	47	1,53	12,33	126	1,50	15,36	157
14000	16,3	1,92	4,02	41	1,43	10,86	111	1,41	13,53	138
13000	15,1	1,80	3,51	36	1,34	9,48	97	1,32	11,81	120
12000	14,0	1,67	3,03	31	1,24	8,19	83	1,23	10,20	104
11000	12,8	1,54	2,58	26	1,15	6,98	71	1,13	8,69	89
10000	11,6	1,41	2,17	22	1,05	5,85	60	1,04	7,29	74
9000	10,5	1,28	1,70	17	0,95	5,20	53	0,94	7,10	72

3.15 Eolo 27 Maior @ variable heating power.

			METURAL GAS (G20)			BUTANE (G30)			PROPANE (G31)		
HEATING POWER (kcal/h)	HEATING POWER (kW)		BURNER GAS FLOW RATE (m^3/h)	BURNER NOZZLE PRESSURE (mbar)	(mmw.g.)	BURNER GAS FLOW RATE (kg/h)	BURNER NOZZLE PRESSURE (mbar)	(mmw.g.)	BURNER GAS FLOW RATE (kg/h)	BURNER NOZZLE PRESSURE (mbar)	(mmw.g.)
27000	31,4		3,63	12,01	122	2,71	27,02	276	2,67	35,02	357
26000	30,2		3,50	11,16	114	2,61	25,09	256	2,57	32,60	333
25000	29,1		3,37	10,35	106	2,51	23,26	237	2,47	30,28	309
24000	27,9		3,24	9,57	98	2,42	21,50	219	2,38	28,06	286
23000	26,7		3,12	8,83	90	2,32	19,82	202	2,29	25,94	265
22000	25,6		2,99	8,12	83	2,23	18,22	186	2,19	23,91	244
21000	24,4		2,86	7,44	76	2,13	16,70	170	2,10	21,97	224
20000	23,3		2,74	6,80	69	2,04	15,24	155	2,01	20,11	205
19000	22,1		2,61	6,18	63	1,94	13,85	141	1,92	18,34	187
18000	20,9		2,48	5,59	57	1,85	12,53	128	1,82	16,64	170
17000	19,8		2,36	5,03	51	1,76	11,27	115	1,73	15,03	153
16000	18,6		2,23	4,49	46	1,66	10,07	103	1,64	13,49	138
15000	17,4		2,11	3,98	41	1,57	8,94	91	1,54	12,02	123
14000	16,3		1,98	3,50	36	1,47	7,87	80	1,45	10,63	108
13000	15,1		1,85	3,04	31	1,38	6,86	70	1,36	9,31	95
12000	14,0		1,72	2,61	27	1,28	5,91	60	1,26	8,06	82
11000	12,8		1,59	2,20	22	1,18	5,02	51	1,17	6,89	70
10750	12,5		1,56	2,10	21	1,16	4,80	49	1,14	6,61	67
7663	8,9	Doestic Water	1,16	1,10	11	0,87	2,80	29	0,85	3,60	37

N.W.: Pressure values specified in the table indicate the difference of pressure values between the gas valve outlet and the combustion chamber. Adjustments are therefore carried out with the differential pressure gauge (“U” or digital type) with the sensors inserted in the test pressure outlet of the modulating adjustable gas valve and on the sealed chamber positive pressure test outlet . Power data specified in the table refer to a 0,5 metre intake/exhaust pipe. Gas flow rates refer to heat power below temperature of 15°C and at a pressure of 1013 mbar. Burner pressure values refer to use of gas at 15°C.

3.16 Eolo 21 Maior @ technical specifications.

Nominal heat input	kW (kcal/h)	26,5 (22826)		
Minimum heat input	kW (kcal/h)	10,8 (9302)		
Nominal heat output	kW (kcal/h)	24,4 (21000)		
Minimum heat output	kW (kcal/h)	9,3 (8000)		
Efficiency at 100%	%	92,0		
Efficiency at 30%	%	90,3		
Heat loss from casing with burner On/Off	%	0,7/0,9		
Heat loss from flue with burner On/Off	%	7,3/0,06		
		G20	G30	G31
Burner nozzles diameter	mm	1,30	0,75	0,75
Delivery pressure	mbar (mmw.g.)	20 (204)	29 (296)	37 (377)
Heating circuit max. operating pressure	bar	3		
Heating circuit max. operating temperature	°C	90		
Heating temperature range	°C	38 - 85		
Total expansion tank volume	l	8		
Expansion tank pre-load	bar	1,0		
Generator water capacity	l	3,5		
Head available with 1000 l/h flow rate	kPa (mw.g.)	23,5 (2,4)		
How water production useful heating power	kW (kcal/h)	24,4 (21000)		
Domestic hot water temperature range	°C	30 - 60		
Flow limiter	l/min	8		
Domestic water circuit minimum pressure (dynamic)	bar	1,0		
Domestic water circuit max. operating pressure	bar	0,4		
Min. domestic hot water demand	l/min	10		
Continuous D.H.W. production (ΔT 30 °C)	l/min	1,83		
D.H.W. production (ΔT 30 °C)	l/min	11,7		
Min. pressure for flow limiter rate	bar	11,3		
Full boiler weight	kg	1		
Empty boiler weight	kg	49		
		45,5		
Electrical connection	V/Hz	230/50		
Rated absorption	A	0,7		
Installed electrical power	W	145		
Circulator absorbed power	W	83		
Fan absorbed power	W	31		
Appliance electrical circuit protection	-	IPX4D		

		G20	G30	G31
Mass flue rate at nominal power	kg/h	60	64	60
Mass flue rate at minimum power	kg/h	63	61	58
CO2 at rated/min. Q.	%	6,3/2,3	6,8/2,8	7,2/2,9
CO at 0% with rated/min. Q.	ppm	38/77	45/81	21/82
Nox at 0% with rated/min. Q.	ppm	72/17	105/9	82/8
Flue temperature at nominal power	°C	114	114	115
Flue temperature at minimum power	°C	93	93	95

Flue temperature values refer to air inlet temperatures of 15°C.

- The data relating to domestic hot water performance refers to a dynamic inlet pressure of 2 bar and an inlet temperature of 15°C; the values are measured directly at the boiler outlet, considering that mixing with cold water is necessary to obtain the declared data.
- The maximum sound level emitted during boiler operation is< 55dBA. The sound level measurement refers to testing in a semianechoic chamber with boiler operating at maximum heat output, with system extension according to product standards.

3.17 Eolo 24 Maior @ technical specifications.

Nominal heat input	kW (kcal/h)	30,0 (25834)		
Minimum heat input	kW (kcal/h)	12,1 (10405)		
Nominal heat output	kW (kcal/h)	27,9 (24000)		
Minimum heat output	kW (kcal/h)	10,5 (9000)		
Efficiency at 100%	%	92,9		
Efficiency at 30%	%	90,9		
Heat loss from casing with burner On/Off	%	0,6/0,82		
Heat loss from flue with burner On/Off	%	6,6/0,05		
		G20	G30	G31
Burner nozzles diameter	mm	1,30	0,75	0,75
Delivery pressure	mbar (mmw.g.)	20 (204)	29 (296)	37 (377)
Heating circuit max. operating pressure	bar	3		
Heating circuit max. operating temperature	°C	90		
Heating temperature range	°C	38 - 85		
Total expansion tank volume	l	8		
Expansion tank pre-load	bar	1,0		
Generator water capacity	l	4,0		
Head available with 1000 l/h flow rate	kPa (mw.g.)	24,5 (2,5)		
How water production useful heating power	kW (kcal/h)	27,9 (24000)		
Domestic hot water temperature range	°C	30 - 60		
Flow limiter	l/min	10		
Domestic water circuit minimum pressure (dynamic)	bar	1,0		
Domestic water circuit max. operating pressure	bar	0,4		
Min. domestic hot water demand	l/min	10		
Continuous D.H.W. production (ΔT 30 °C)	l/min	1,83		
D.H.W. production (ΔT 30 °C)	l/min	13,3		
Min. pressure for flow limiter rate	bar	12,5		
Full boiler weight	kg	52		
Empty boiler weight	kg	48		
Electrical connection	V/Hz	230/50		
Rated absorption	A	0,78		
Installed electrical power	W	155		
Circulator absorbed power	W	88		
Fan absorbed power	W	34		
Appliance electrical circuit protection	-	IPX4D		

		G20	G30	G31
Mass flue rate at nominal power	kg/h	70	67	68
Mass flue rate at minimum power	kg/h	73	68	68
CO2 at rated/min. Q.	%	6,1/2,3	7,4/2,8	7,2/2,8
CO at 0% with rated/min. Q.	ppm	37/110	40/105	21/98
Nox at 0% with rated/min. Q.	ppm	75/17	95/20	92/21
Flue temperature at nominal power	°C	105	116	116
Flue temperature at minimum power	°C	89	93	97

Flue temperature values refer to air inlet temperatures of 15°C.

- The data relating to domestic hot water performance refers to a dynamic inlet pressure of 2 bar and an inlet temperature of 15°C; the values are measured directly at the boiler outlet, considering that mixing with cold water is necessary to obtain the declared data.
- The maximum sound level emitted during boiler operation is< 55dBA. The sound level measurement refers to testing in a semianechoic chamber with boiler operating at maximum heat output, with system extension according to product standards.

3.18 Eolo 27 Maior @ technical specifications.

Nominal heat input	kW (kcal/h)	34,3 (29508)		
Minimum heat input	kW (kcal/h)	14,7 (12647)		
Nominal heat output	kW (kcal/h)	31,4 (27000)		
Minimum heat output	kW (kcal/h)	12,5 (10750)		
Efficiency at 100%	%	91,5		
Efficiency at 30%	%	89,5		
Heat loss from casing with burner On/Off	%	1,0/0,69		
Heat loss from flue with burner On/Off	%	7,5/0,06		
		G20	G30	G31
Burner nozzles diameter	mm	1,30	0,78	0,78
Delivery pressure	mbar (mmw.g.)	20 (204)	29 (296)	37 (377)
Heating circuit max. operating pressure	bar	3		
Heating circuit max. operating temperature	°C	90		
Heating temperature range	°C	38 - 85		
Total expansion tank volume	l	10		
Expansion tank pre-load	bar	1,0		
Generator water capacity	l	4,4		
Head available with 1000 l/h flow rate	kPa (mw.g.)	32,3 (3,3)		
How water production useful heating power	kW (kcal/h)	31,4 (27000)		
Domestic hot water temperature range	°C	30 - 60		
Flow limiter	l/min	12		
Domestic water circuit minimum pressure (dynamic)	bar	1,5		
Domestic water circuit max. operating pressure	bar	0,4		
Min. domestic hot water demand	l/min	10		
Continuous D.H.W. production (ΔT 30 °C)	l/min	1,83		
D.H.W. production (ΔT 30 °C)	l/min	15,0		
Min. pressure for flow limiter rate	bar	14,7		
Full boiler weight	kg	55		
Empty boiler weight	kg	50		
Electrical connection	V/Hz	230/50		
Rated absorption	A	0,95		
Installed electrical power	W	190		
Circulator absorbed power	W	120		
Fan absorbed power	W	49		
Appliance electrical circuit protection	-	IPX4D		

		G20	G30	G31
Mass flue rate at nominal power	kg/h	72	72	73
Mass flue rate at minimum power	kg/h	79	75	76
CO2 at rated/min. Q.	%	6,8/2,5	7,9/3,1	7,8/3,0
CO at 0% with rated/min. Q.	ppm	83/74	147/107	69/70
Nox at 0% with rated/min. Q.	ppm	165/71	230/105	202/106
Flue temperature at nominal power	°C	129	131	130
Flue temperature at minimum power	°C	101	107	105

Flue temperature values refer to air inlet temperatures of 15°C.

- The data relating to domestic hot water performance refers to a dynamic inlet pressure of 2 bar and an inlet temperature of 15°C; the values are measured directly at the boiler outlet, considering that mixing with cold water is necessary to obtain the declared data.
- The maximum sound level emitted during boiler operation is< 55dBA. The sound level measurement refers to testing in a semianechoic chamber with boiler operating at maximum heat output, with system extension according to product standards.

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