

MINI EOLO

Instruction and
warning book

IE

1.038773ENG



 **IMMERGAS**

MINI EOLO
24 3E



Dear Client,

Our compliments for having chosen a top-quality Immergas product, able to assure well-being and safety for a long period of time. As an Immergas customer you can also count on a qualified after-sales service, prepared and updated to guarantee constant efficiency of your boiler. Read the following pages carefully: you will be able to draw useful suggestions regarding the correct use of the appliance, the respect of which, will confirm your satisfaction for the Immergas product. For assistance and scheduled maintenance contact Authorised Immergas After-Sales centres: they have original spare parts and are specifically trained directly by the manufacturer.

General recommendations

All Immergas products are protected with suitable transport packaging.

The material must be stored in dry environments protected against bad weather.

The instruction book is an integral and essential part of the product and must be consigned to the new user also in the case of transfer or succession of ownership.

It must be stored with care and consulted carefully, as all of the warnings provide important safety indications for installation, use and maintenance stages.

This instruction manual provides technical information for installing the Immergas kit. As for the other issues related to boiler installation (e.g. safety in the work site, environment protection, injury prevention), it is necessary to comply with the provisions specified in the current regulation and technical standards.

In compliance with legislation in force, the systems must be designed by qualified professionals, within the dimensional limits established by the Law. Installation and maintenance must be performed in compliance with the regulations in force, according to the manufacturer's instructions and by professionally qualified staff, intending staff with specific technical skills in the plant sector, as envisioned by the Law.

Improper installation or assembly of the Immergas appliance and/or components, accessories, kit and devices can cause unexpected problem to persons, animals and objects. Read the instructions provided with the product carefully to ensure a proper installation.

Maintenance must be carried out by skilled technical staff. The Immergas Authorised After-sales Service represents a guarantee of qualifications and professionalism.

The appliance must only be destined for the use for which it has been expressly declared. Any other use will be considered improper and therefore potentially dangerous.

If errors occur during installation, operation and maintenance, due to non compliance with technical laws in force, standards or instructions contained in this book (or however supplied by the manufacturer), the manufacturer is excluded from any contractual and extra-contractual liability for any damages and the appliance warranty is invalidated.

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1 INSTALLATION BOILER

1.1 INSTALLATION RECOMMENDATIONS.

The Mini Eolo 24 3E boiler has been designed for wall mounted installation only; for heating environments and production of domestic hot water for domestic use and similar purposes.

The place of installation of the appliance and relative Immergas accessories must have suitable features (technical and structural) such to allow (always in safety, efficiency and easy conditions):

- installation (according to the provisions of technical legislation and technical regulations);
- maintenance operations (including scheduled, periodic, routine, special);
- removal (to outdoors in the place for loading and transporting the appliances and components) as well as the eventual replacement of those with appliances and/or equivalent components.

The wall surface must be smooth, without any protrusions or recesses enabling access to the rear part. They are NOT designed to be installed on plinths or floors (Fig. 1-1).

By varying the type of installation the classification of the boiler also varies, precisely:

- **Boiler type B22**, if installed without the 2 intake caps and with the top cover kit.
- **Boiler type C**, if installed using concentric pipes or other types of pipes envisioned for the sealed chamber boiler for intake of air and expulsion of fumes.

Only professionally enabled heating/plumbing technicians are authorised to install Immergas gas appliances. Installation must be carried out according to regulation standards, current legislation and in compliance with local technical regulations and the required technical procedures. Installation of the Mini Eolo 24 3E boiler when powered by LPG must comply with the rules regarding gases with a greater density than air (remember, as an example, that it is prohibited to install plants powered with the above-mentioned gas in rooms where the floor is at a lower quota than the average external country one). Before installing the appliance, ensure that it is delivered in perfect condition; if in doubt, contact the supplier immediately. Packing materials (staples, nails, plastic bags, polystyrene foam, etc.) constitute a hazard and must be kept out of the reach of children. If the appliance is installed inside or between cabinets, ensure sufficient space for normal servicing; therefore it is advisable to leave clearance of at

least 3 cm between the boiler casing and the vertical sides of the cabinet. Leave adequate space above the boiler for possible water and flue removal connections.

Keep all flammable objects away from the appliance (paper, rags, plastic, polystyrene, etc.). Do not place household appliances underneath the boiler as they could be damaged if the safety valve intervenes with obstructed conveying system (the safety valve must be conveyed away by a draining funnel), or if there are leaks from the hydraulic connections; on the contrary, the manufacturer cannot be held responsible for any damage caused to the household appliances. For the aforementioned reasons, we recommend not placing furnishes, furniture, etc. under the boiler. In the event of malfunctions, faults or incorrect operation, turn the appliance off immediately and contact a qualified technician (e.g. the Immergas Technical After-Sales Centre, which has specifically trained staff and original spare parts) Do not attempt to modify or repair the appliance alone. Failure to comply with the above implies personal responsibility and invalidates the warranty.

• Installation Standards:

- This boiler can be installed outdoors in a partially protected area. A partially protected area is one in which the appliance is not exposed to the direct action of the weather (rain, snow, hail, etc..).

N.B.: a partially protected location is one in which the appliance is not exposed to the direct action of the weather (rain, snow, hail, etc..).

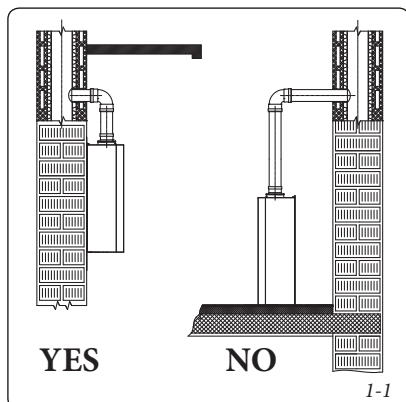
- Installation in places with a fire risk is prohibited (for example: garages, closed parking stalls), gas appliances and relative flue ducts, flue exhaust pipes and combustion air intake pipes.
- Installation is prohibited on the vertical projection of the cooking surface.
- Installation is also prohibited in places/ environments that constitute common parts of office condominiums such as stairs, cellars, entrance halls, attics, lofts, escape routes, etc. if they are not located inside technical compartments under the responsibility of each individual building and only accessible to the user (for the features of the technical rooms, see the regulation in force).

Attention: wall mounting of the boiler must guarantee stable and efficient support for the generator.

The plugs (standard supply) are to be used only in conjunction with the mounting brackets or fixing template to fix the appliance to the wall; they only ensure adequate support if inserted correctly (according to technical standards) in walls made of solid or semi-hollow brick or block. In the case of walls made from hollow brick or block, partitions with limited static properties, or in any case walls other than those indicated, a static test must be carried out to ensure adequate support.

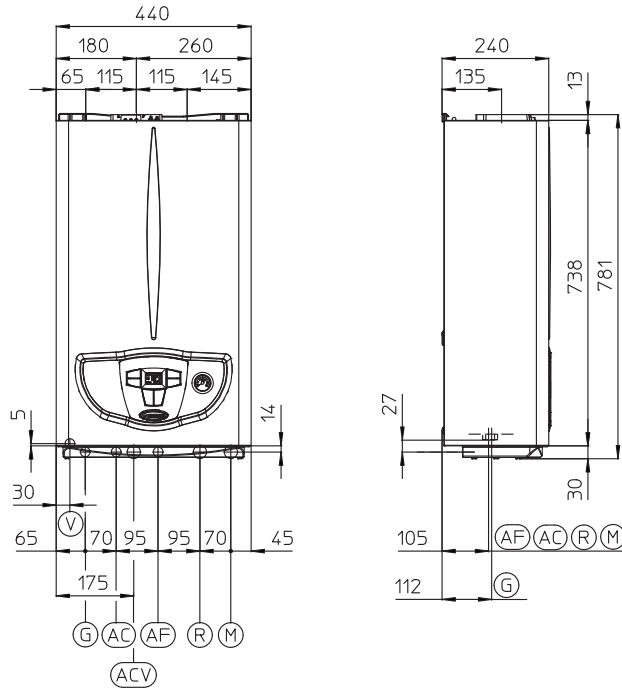
N.B.: the hex head screws supplied in the blister pack are to be used exclusively to fix the relative mounting bracket to the wall.

These boilers are used to heat water to below boiling temperature in atmospheric pressure. They must be attached to a heating system suitable for their capacity and voltage.



1.2 MAIN DIMENSIONS.

1-2



Key:

- G - Gas supply
- AC - Domestic hot water outlet
- ACV - Solar valve kit DHW inlet (Optional)
- AF - Domestic cold water inlet
- R - System return
- M - System flow
- V - Electrical connection

N.B.: connection group (Optional)

Height (mm)	Width (mm)	Depth (mm)
781	440	240
CONNECTIONS		
GAS	DOMESTIC HOT WATER	SYSTEM
G	AC AF	R M
3/4"	1/2" 1/2"	3/4" 3/4"

1.3 ANTI-FREEZE PROTECTION.

Minimum temperature -5°C. Minimum temperature -5°C. The boiler is supplied with an anti/freeze function as standard that activates the pump and burner when the system water temperature in the boiler falls below 4°C.

The anti-freeze function is only guaranteed if:

- the boiler is correctly connected to gas and electricity power supply circuits;
- the boiler is powered constantly;
- the boiler is not in 'no ignition block' mode (Par. 2.5);
- the boiler essential components are not faulty.

In these conditions the boiler is protected against freezing to an ambient temperature of -5°C.

Minimum temperature -15°C. If the boiler is installed in a place where the temperature falls below -5°C and in the event there is no gas (or the boiler goes into ignition block), the appliance can freeze.

To prevent the risk of freezing follow the instructions below:

- protects the central heating circuit from freezing by introducing a top quality anti-freeze liquid into this circuit, which is not noxious to health. The instructions of the manufacturer of this liquid must be followed scrupulously regarding the percentage necessary with respect to the minimum temperature at which the system must be kept. An aqueous solution must be made with potential pollution class of water 2.

The materials used for the central heating circuit of Immergas boilers resist ethylene and propylene glycol based antifreeze liquids (if the mixtures are prepared perfectly).

For life and possible disposal, follow the supplier's instructions.

- Protect the condensate drain trap and circuit board against freezing by using an accessory that is supplied on request (anti-freeze kit) comprising two electric heating elements, the relevant cables and a control thermostat (carefully read the installation instructions contained in the accessory kit pack).

Boiler anti-freeze protection is thus ensured only if:

- the boiler is correctly connected to electricity power supply circuits;
- the main switch is on;
- the anti-freeze kit components are efficient.

In these conditions the boiler is protected against freezing to temperature of -15°C.

The warranty does not cover damage due to interruption of the electrical power supply and failure to comply with that stated on the previous page.

N.B.: if the boiler is installed in places where the temperature falls below 0°C, the heating attachment pipes must be insulated.

1.4 CONNECTIONS.

Gas connection

(Appliance category II_{2H3+}).

Our boilers are designed to operate with methane gas (G20) or LPG. Supply pipes must be the same as or larger than the 3/4" G boiler fitting. Before connecting the gas line, carefully clean inside all the fuel feed system pipes to remove any residue that could impair boiler efficiency. Also make sure the gas corresponds to that for which the boiler is prepared (see boiler data-plate). If different, the appliance must be converted for operation with the other type of gas (see converting appliance for other gas types). The dynamic gas supply (methane or LPG) pressure must also be checked according to the type used in the boiler, which must be in compliance, as insufficient levels can reduce generator output and cause malfunctions.

Ensure correct gas cock connection. The gas supply pipe must be suitably dimensioned according to current regulations in order to guarantee correct gas flow to the burner even in conditions of maximum generator output and to guarantee appliance efficiency (technical specifications). The coupling system must conform to standards.

Fuel gas quality. The appliance has been designed to operate with gas free of impurities; otherwise it is advisable to fit special filters upstream from the appliance to restore the purity of the gas.

Storage tanks (in case of supply from LPG depot).

- New LPG storage tanks may contain residual inert gases (nitrogen) that degrade the mixture delivered to the appliance causing functioning anomalies.
- Due to the composition of the LPG mixture, layering of the mixture components may occur during the period of storage in the tanks. This can cause a variation in the heating power of the mixture delivered to the appliance, with subsequent change in its performance.

Hydraulic connection.

Attention: In order not to void the warranty before making the boiler connections, carefully clean the heating system (pipes, radiators, etc.) with special pickling or de-scaling products to remove any deposits that could compromise correct boiler operation.


A chemical treatment of the thermal system water is required, in compliance with the technical standards in force, in order to protect the system and the appliance from deposits (e.g., lime scale), slurry or other hazardous deposits.

Water connections must be made in a rational way using the couplings on the boiler template. The boiler safety valve outlet must be connected to a draining funnel. Otherwise, the manufacturer declines any responsibility in case of flooding if the drain valve cuts in.

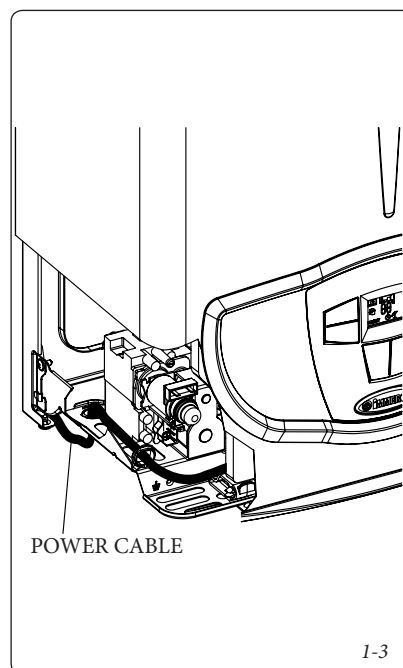
Attention: to preserve the duration of appliance efficiency features, in the presence of water whose features can lead to the deposit of lime scale, installation of the "polyphosphate dispenser" kit is recommended.

Electrical connection. The "Mini Eolo 24 3E" boiler has an IPX5D protection rating for the entire appliance. Electrical safety of the appliance is reached only when it is correctly connected to an efficient earthing system as specified by current safety standards.

Attention: Immergas S.p.A. declines any responsibility for damage or physical injury caused by failure to connect the boiler to an efficient earth system or failure to comply with the reference standards.

Also ensure that the electrical installation corresponds to maximum absorbed power specifications as shown on the boiler data-plate. Boilers are supplied complete with a special "X" type power cable without plug. The power supply cable must be connected to a 230V $\pm 10\%$ / 50Hz mains supply respecting L-N polarity and earth connection ; this network must also have a multi-pole circuit breaker with class III over-voltage category. When replacing the power supply cable, contact a qualified technician (e.g. the Immergas After-Sales Technical Assistance Service). The power cable must be laid as shown (Fig. 1-3).

In the event of mains fuses replacement on the connection board, use a 3.15A quick-blow fuses. For the main power supply to the appliance, never use adapters, multiple sockets or extension leads.



1.5 REMOTE CONTROLS AND ROOM CHRONO-THERMOSTATS (OPTIONAL).

The boiler is prepared for the application of room chrono-thermostats or remote controls, which are available as optional kits (Fig. 1-4).

All Immergas chrono-thermostats are connected with 2 wires only. Carefully read the user and assembly instructions contained in the accessory kit.

- On/Off digital chrono-thermostat. The chrono-thermostat allows:
 - set two room temperature value: one for day (comfort temperature) and one for night (lower temperature);
 - set a weekly programme with four daily switch on and switch off times;
 - selecting the required function mode from the various possible alternatives:
 - manual mode (with adjustable temperature).
 - automatic mode (with set programme).
 - forced automatic mode (momentarily changing the temperature of the automatic programme).

The chrono-thermostat is powered by two 1.5V LR 6 type alkaline batteries.

- Comando Amico Remoto Remote Control Device^{V2} (CAR^{V2}) with climate chrono-thermostat function. In addition to the functions described in the previous point, the CAR^{V2} panel enables the user to control all the important information regarding operation of the appliance and the heating system with the opportunity of easily intervening on the previously set parameters without having to go to the place where the appliance is installed. The panel is provided with self-diagnosis to display any boiler functioning anomalies. The climate chrono-thermostat incorporated into the remote panel enables the system flow temperature to be adjusted to the actual needs of the room being heated, in order to obtain the desired room temperature with extreme precision and therefore with evident saving in

running costs. The chrono-thermostat is fed directly by the boiler by means of the same 2 wires used for the transmission of data between boiler and chrono-thermostat.

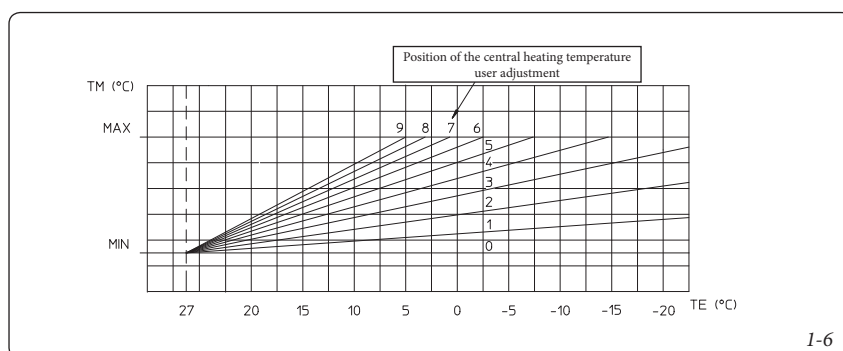
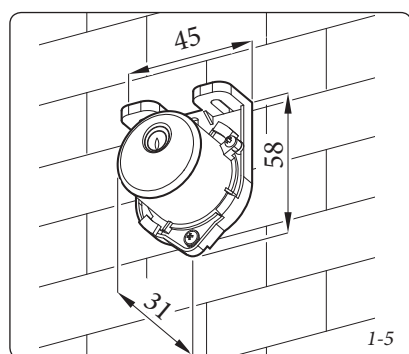
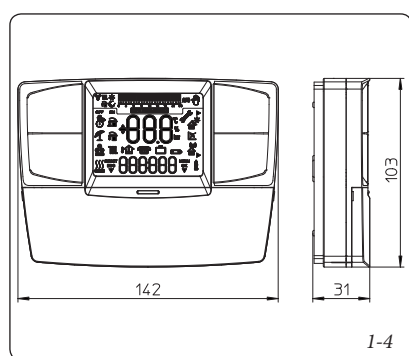
Comando Amico Remoto Remote Control^{V2} or On/Off chrono-thermostat electrical connections (Optional). *The operations described below must be performed after having removed the voltage from the appliance.* Any thermostat or On/Off environment chrono-thermostat must be connected to clamps 40 and 41 eliminating jumper X40 (Fig. 3-2). Make sure that the On/Off thermostat contact is "dry", i.e. independent of the mains supply, otherwise the P.C.B. would be damaged. Any Comando Amico Remoto remote control^{V2} must be connected to clamps 40 and 41 eliminating jumper X40 on the circuit board, paying attention not to invert the connections (Fig. 3-2).

Important: if the Remote Friend Control, remote control^{V2} or any other On/Off chrono-thermostat is used arrange two separate lines in compliance with current regulations regarding electrical systems. No boiler pipes must ever be used to earth the electric system or telephone lines. Ensure elimination of this risk before making the boiler electrical connections.

1.6 EXTERNAL PROBE (OPTIONAL).

The boiler is designed for the application of the Room Thermostat (Fig. 1-5) which is available as an optional kit. Refer to the relative instruction sheet for positioning of the external probe.

The probe can be connected directly to the boiler electrical system and allows the max. system flow temperature to be automatically decreased when the external temperature increases, in order to adjust the heat supplied to the system according to the change in outdoor temperature. The external probe always acts when connected independently from the presence or type of room thermostat used. The correlation between system flow temperature and outdoor temperature is determined by the position of the selector switch on the boiler control panel according to the curves shown in the diagram (Fig. 1-6). The electric connection of the external probe must be made on clamps 38 and 39 on the boiler P.C.B. (Fig. 3-2).



1.7 IMMERGAS FLUE SYSTEMS.

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

Attention: the boiler must only be installed together with an original Immergas air intake and flue gas exhaust system, in compliance with the standards in force. This system can be identified by an identification mark and special distinctive marking bearing the note "not for condensing boilers".

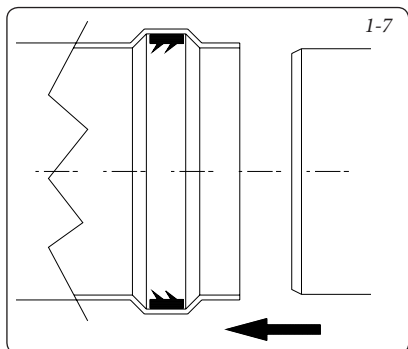
The flue exhaust pipes must not be in contact with or be near to flammable materials. Moreover, they must not pass through buildings or walls made of flammable material.

See following paragraphs for the detailed description of the kits available.

Positioning of double lip seals. For correct positioning of lip seals on elbows and extensions, follow the direction of assembly given in figure (Fig. 1-7).

- Resistance factors and equivalent lengths. Each flue component has a *Resistance Factor* based on experimental tests and specified in the table below. The Resistance Factor for individual components is independent from the type of boiler on which it is installed and has a dimensionless size. It is however, conditioned by the temperature of the fluids that pass through the pipe and therefore, varies according to applications for air intake or flue exhaust. Each single component has a resistance corresponding to a certain length in metres of pipe of the same diameter; the so-called equivalent length, obtained from the ration between the relative Resistance Factors. *All boilers have an experimentally obtainable maximum Resistance Factor equal to 100.* The maximum Resistance Factor allowed corresponds to the resistance encountered with the maximum allowed pipe length for each type of Terminal Kit. This information allows calculations to be made to verify the possibility of setting up various flue configurations.
- Coupling of extension pipes. To install any push-fit extensions with other flue extraction elements, it is necessary to do the following: install the concentric pipe or elbow with the male side (smooth) on the female section (with lip seal) to the end stop on the previously installed element. This will ensure the sealing and joining of the elements correctly.

Attention: 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.



Diaphragm installation.

Attention: based on the boiler model (checking which type of fan is installed), use appropriate diaphragms.

For correct functioning of the boiler it is necessary to install a diaphragm on the outlet of the sealed chamber and before the intake and exhaust pipe. The appropriate diaphragm is chosen based on type of pipe and its maximum extension: this calculation can be made using the tables below:

N.B.: the diaphragms are supplied together with the boiler.

FAN POWER: 30W (Fig. 1-8).

Diaphragm (ref. 1 fig. 1-8)	Pipe extension in metres Ø 60/100 horizontal
Ø 85	From 0 to 0.5
Ø 83	From 0.5 to 1.5
WITHOUT	Exceeding 1.5

Diaphragm (ref. 1 fig. 1-8)	Pipe extension in metres Ø 60/100 vertical
Ø 85	From 0 to 2.2
Ø 83	From 2.2 to 3.7
WITHOUT	Exceeding 3.7

Diaphragm (ref. 1 fig. 1-8)	Pipe extension in metres Ø 80/125 horizontal
Ø 85	From 0 to 0.5
Ø 83	From 0.5 to 4.6
WITHOUT	Exceeding 4.6

Diaphragm (ref. 1 fig. 1-8)	Pipe extension in metres Ø 80/125 vertical
Ø 85	From 0 to 5.4
Ø 83	From 5.4 to 9.5
WITHOUT	Exceeding 9.5

Diaphragm (ref. 2 fig. 1-8)	Pipe extension in metres Ø 80 divided	
	intake	exhaust
Ø 20.5	From 0.5 to 15	1
Ø 15	From 15 to 35	1

Diaphragm (ref. 2 fig. 1-8)	Pipe extension in metres Ø 80 divided	
	intake	exhaust
Ø 20.5	1	From 0.5 to 8
Ø 15	1	From 8 to 16
WITHOUT	1	Exceeding 16

FAN POWER: 33W / 39W (Fig. 1-9).

Diaphragm (fig. 1-9)	Pipe extension in metres Ø 60/100 horizontal
Ø 40	From 0 to 0.5
Ø 41.5	From 0.5 to 1.5
WITHOUT	Over 1.5

Diaphragm (fig. 1-9)	Pipe extension in metres Ø 60/100 vertical
Ø 40	From 0 to 2.2
Ø 41.5	From 2.2 to 3.2
WITHOUT	Over 3.2

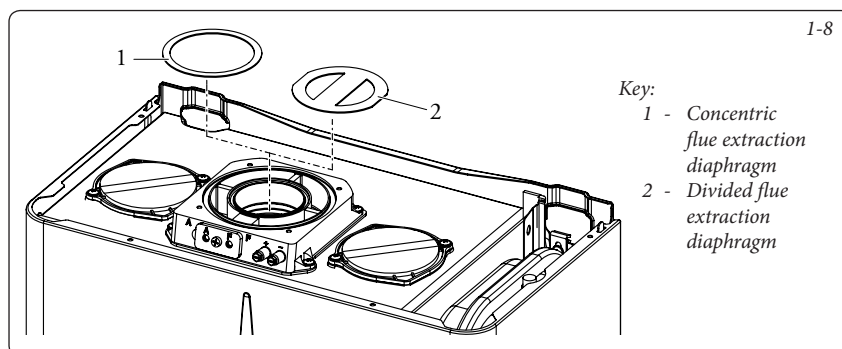
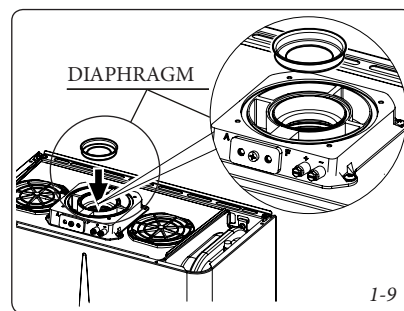
Diaphragm (fig. 1-9)	*Extension in metres horizontal pipe Ø 80 with two bends
Ø 40	From 0 to 17
Ø 41.5	From 17 to 24
WITHOUT	Over 24

Diaphragm (fig. 1-9)	*Extension in metres vertical pipe Ø 80 without bends
Ø 40	From 0 to 22
Ø 41.5	From 22 to 29
WITHOUT	Over 29

Diaphragm (fig. 1-9)	Pipe extension in metres Ø 80/125 horizontal
Ø 40	From 0 to 0.5
Ø 41.5	From 0.5 to 3.3
WITHOUT	Over 3.3

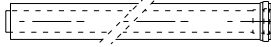


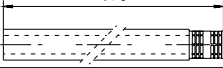

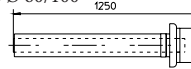
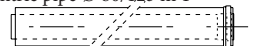


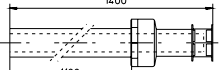
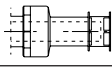
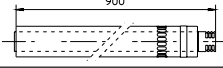
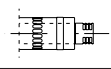


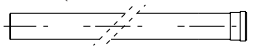
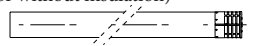




Diaphragm (fig. 1-9)	Pipe extension in metres Ø 80/125 vertical
Ø 40	From 0 to 5.4
Ø 41.5	From 5.4 to 8.1
WITHOUT	Over 8.1

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



Key:
1 - Concentric flue extraction diaphragm
2 - Divided flue extraction diaphragm

1.8 TABLES OF RESISTANCE FACTORS AND EQUIVALENT LENGTHS.

TYPE OF DUCT	Resistance Factor (R)	Equivalent length in m of concentric pipe Ø 60/100	Equivalent length in m of concentric pipe Ø 80/125	Equivalent length in m of pipe Ø 80
Concentric pipe Ø 60/100 m 1 	Intake and Exhaust 16.5	m 1	m 2.8	Intake m 7.1 Exhaust m 5.5
Concentric bend 90° Ø 60/100 	Intake and Exhaust 21	m 1.3	m 3.5	Intake m 9.1 Exhaust m 7.0
Concentric bend 45° Ø 60/100 	Intake and Exhaust 16.5	m 1	m 2.8	Intake m 7.1 Exhaust m 5.5
Terminal complete with intake-exhaust horizontal concentric Ø 60/100 	Intake and Exhaust 46	m 2.8	m 7.6	Intake m 20 Exhaust m 15
Intake-exhaust terminal horizontal concentric Ø 60/100 	Intake and Exhaust 32	m 1.9	m 5.3	Intake m 14 Exhaust m 10.6
Intake-exhaust terminal vertical concentric Ø 60/100 	Intake and Exhaust 41.7	m 2.5	m 7	Intake m 18 Exhaust 14
Concentric pipe Ø 80/125 m 1 	Intake and Exhaust 6	m 0.4	m 1.0	Intake m 2.6 Exhaust m 2.0
Concentric bend 90° Ø 80/125 	Intake and Exhaust 7.5	m 0.5	m 1.3	Intake m 3.3 Exhaust m 2.5
Concentric bend 45° Ø 80/125 	Intake and Exhaust 6	m 0.4	m 1.0	Intake m 2.6 Exhaust m 2.0
Terminal complete with intake-exhaust vertical concentric Ø 80/125 	Intake and Exhaust 33	m 2.0	m 5.5	Intake m 14.3 Exhaust m 11.0
Intake-exhaust terminal vertical concentric Ø 80/125 	Intake and Exhaust 26.5	m 1.6	m 4.4	Intake m 11.5 Exhaust m 8.8
Terminal complete with intake-exhaust horizontal concentric Ø 80/125 	Intake and Exhaust 39	m 2.3	m 6.5	Intake m 16.9 Exhaust m 13
Intake-exhaust terminal horizontal concentric Ø 80/125 	Intake and Exhaust 34	m 2.0	m 5.6	Intake m 14.8 Exhaust m 11.3
Concentric adapter from Ø 60/100 to Ø 80/125 with condensate trap 	Intake and Exhaust 13	m 0.8	m 2.2	Intake m 5.6 Exhaust m 4.3
Concentric adapter from Ø 60/100 to Ø 80/125 	Intake and Exhaust 2	m 0.1	m 0.3	Intake m 0.8 Exhaust m 0.6
Pipe Ø 80 m 1 (with and without insulation) 	Intake 2.3 Exhaust 3	m 0.1 m 0.2	m 0.4 m 0.5	Intake m 1.0 Exhaust m 1.0
Complete intake terminal Ø 80, 1 m (with or without insulation) 	Intake 5	m 0.3	m 0.8	Intake m 2.2
Intake terminal Ø 80 Exhaust terminal Ø 80 	Intake 3 Exhaust 2.5	m 0.2 m 0.1	m 0.5 m 0.4	Intake m 1.3 Exhaust m 0.8
Bend 90° Ø 80 	Intake 5 Exhaust 6.5	m 0.3 m 0.4	m 0.8 m 1.1	Intake m 2.2 Exhaust m 2.1
Bend 45° Ø 80 	Intake 3 Exhaust 4	m 0.2 m 0.2	m 0.5 m 0.6	Intake m 1.3 Exhaust m 1.3
Divided parallel Ø 80 from Ø 60/100 to Ø 80/80 	Intake and Exhaust 8.8	m 0.5	m 1.5	Intake m 3.8 Exhaust m 2.9

1.9 OUTDOOR INSTALLATION IN PARTIALLY PROTECTED AREA.

N.B.: a partially protected location is one in which the appliance is not exposed to the direct action of the weather (rain, snow, hail, etc.).

• Configuration type B, open chamber and forced draught.

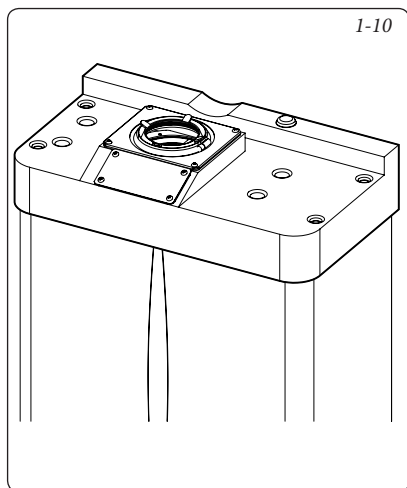
The relevant terminal must be used for this configuration (present in the intake kit for the installation in question), which must be placed on the central hole of the boiler (Fig. 1-12). Air intake takes place directly from the room where the boiler is installed and flue exhaust in an individual flue or directly to the outside.

Boiler with this type of configuration are classified as type B₂₂.

With this configuration:

- air intake takes place directly from the environment in which the appliance is installed (external);
- the flue exhaust must be connected to its own individual flue or channelled directly into the external atmosphere.

Accordingly, technical standards in force must be observed.



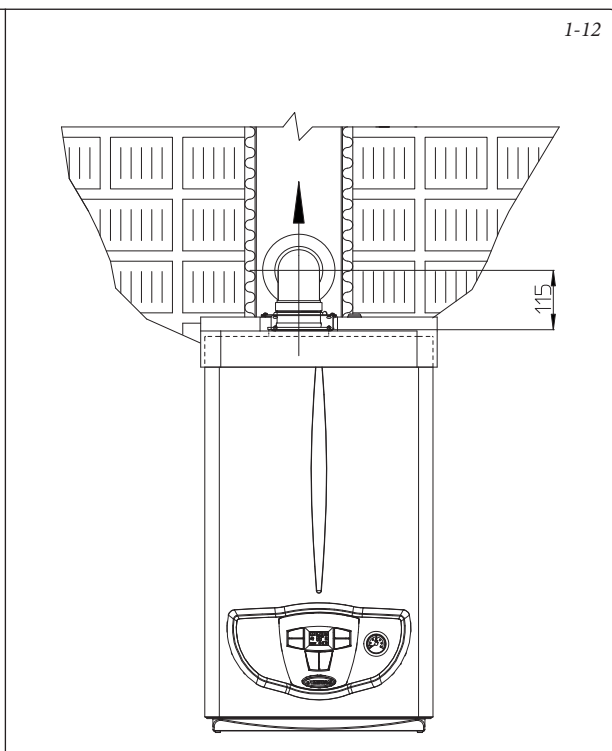
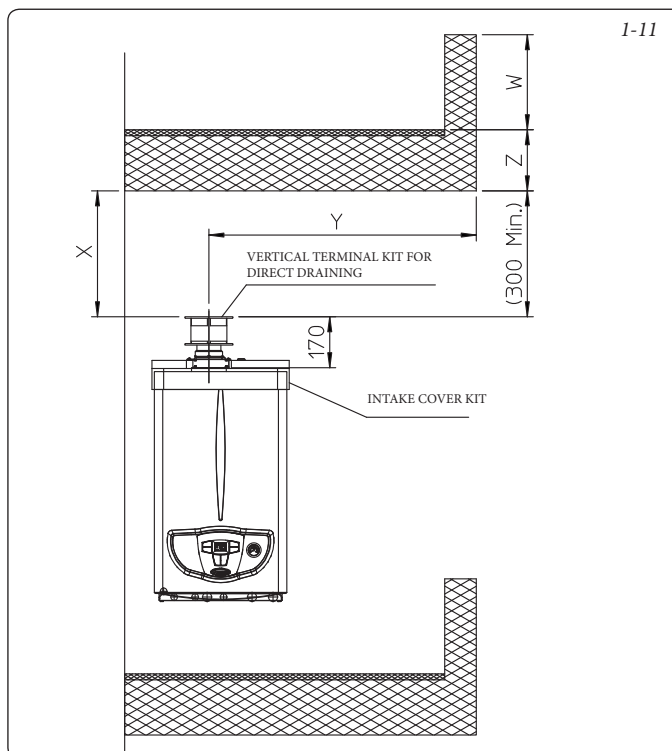
Max. length of exhaust duct. The flue pipe (vertical or horizontal) can be extended to a max. length of 12 linear metres, using insulated pipes (Fig. 1-28) and limit the length of the Ø 80 normal flue pipe (not insulated) to just 5 metres.

Example of installation with direct vertical terminal in partially protected location. When the vertical terminal for direct discharge of combustion fumes is used, a minimum gap of 300 mm must be left between the terminal and the balcony above. The height $X+Y+Z+W$ evaluated with respect to the balcony above, must be equal to or more than 2000 mm. (Fig. 1-11). The term W must only be considered if the balcony above has closed balustrade ($W=0$ if the balustrade is open).

• Configuration without cover kit (boiler type C).

By leaving the side plugs fitted, it is possible to install the appliance externally, in partially covered places, without the cover kit. Installation takes place using the Ø60/100 and Ø80/125 concentric horizontal intake/ exhaust kits. Refer to the paragraph relative to indoor installation. In this configuration the upper cover kit guarantees additional protection for the boiler. It is recommended but not compulsory.

- **Fitting the cover kit.** To assemble and configure the cover kit correctly, please refer to the relative instructions sheet.



1.10 CONCENTRIC HORIZONTAL KIT INSTALLATION.

Type C configuration, sealed chamber and fan assisted.

Installation of this terminal is governed by standards contained in local building regulations, as amended.

N.B.: in addition to the traditional "Ø60/100 horizontal kit" there is also a specific "Ø60/100 Star" version, with the same measurements and equivalent head loss.

This terminal is connected directly to the outside of the building for air intake and flue exhaust. The horizontal kit Ø 60/100 can be installed with the rear, right side, left side or front outlet.

- External grid. **N.B.:** for safety purposes, do not obstruct the boiler intake-exhaust terminal, even temporarily.

Horizontal intake - exhaust kit Ø60/100.

Kit assembly (Fig. 1-13): install the bend with flange (2) onto the central hole of the boiler inserting the gasket (1) and tighten using the screws included in the kit. Couple the terminal pipe (3) with the male end (smooth) into the female end of the bend (with lip seals) up to the stop; making sure that the internal wall sealing plate and external wall sealing plate have been fitted, this will ensure sealing and joining of the elements making up the kit.

- Application with rear outlet (Fig. 1-14). The 970 mm pipe length enables routing through a maximum thickness of 770 mm. Normally the terminal must be shortened. Calculate the measurement by the sum of these values: Wall thickness + indoor extension + outdoor extension. The minimum indispensable projection values are given in the figure.
- Application with side outlet (Fig. 1-15). Using the horizontal intake-exhaust kit, without the special extensions, enables routing through a wall thickness of 725 mm with the left side outlet and 645 with the right side outlet.
- Extensions for horizontal kit. The Ø 60/100 horizontal intake-exhaust kit can be extended up to a *max. horizontal length of 3000 mm*, including the terminal with grille and excluding the concentric bend leaving the boiler. This configuration corresponds to a resistance factor of 100. In these cases the special extensions must be requested.

Connection with 1 extension (Fig. 1-16). Max. distance between vertical boiler axis and external wall is 1855mm.

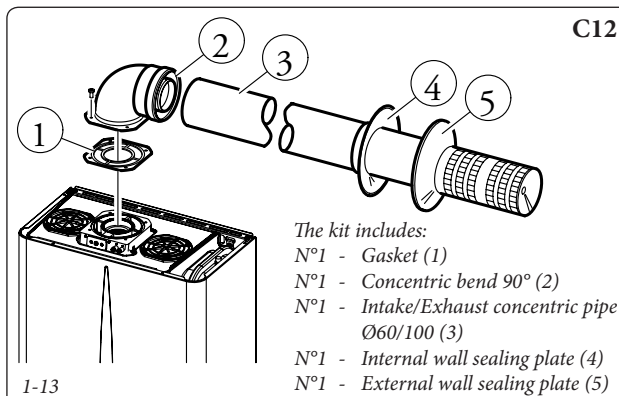
Connection with 2 extensions (Fig. 1-17). Max. distance between vertical boiler axis and external wall is 2805mm.

Horizontal intake - exhaust kit Ø80/125. Kit assembly (Fig. 1-18): install the bend with flange (2) onto the central hole of the boiler inserting the gasket (1) and tighten using the screws included in the kit. Fit the male end (smooth) of the adapter (3) up to the end stop on the female side of the bend (2) (with lip seal). Fit the Ø 80/125 (4) concentric terminal pipe with the male end (smooth) to the female end of the adapter (3) (with lip gasket) up to the stop; making sure that the internal and external wall sealing plates have been fitted; this will ensure sealing and joining of the elements making up the kit.

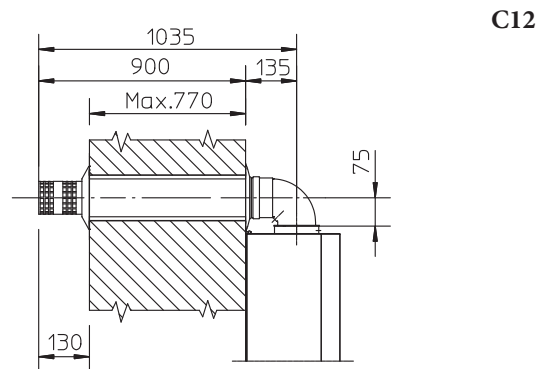
Normally the horizontal intake/exhaust kit Ø 80/125 is used if particularly long extensions are required.

- Extensions for horizontal kit. The Ø 80/125 horizontal intake-exhaust kit can be extended up to a *max. horizontal distance of 7,300 mm* including the terminal with grid and excluding the concentric bend leaving the boiler and the adapter Ø 60/100 in Ø 80/125 (Fig. 1-19). This configuration corresponds to a resistance factor of 100. In these cases the special extensions must be requested.

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

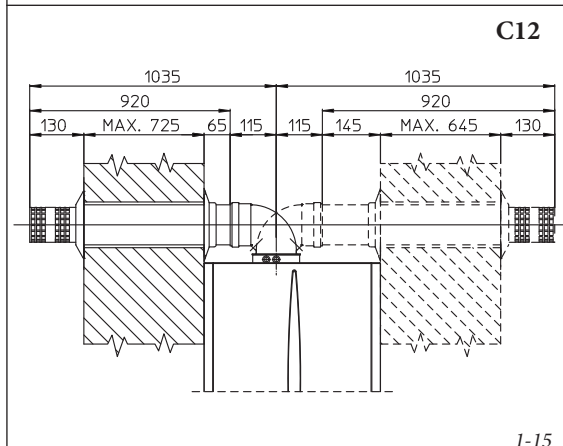


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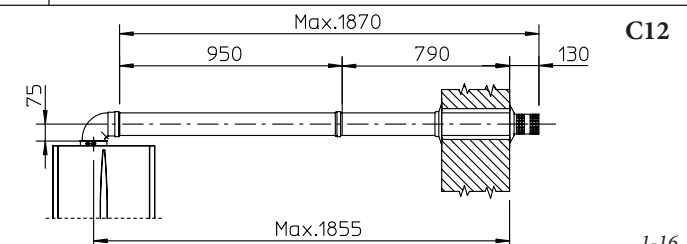
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1-14



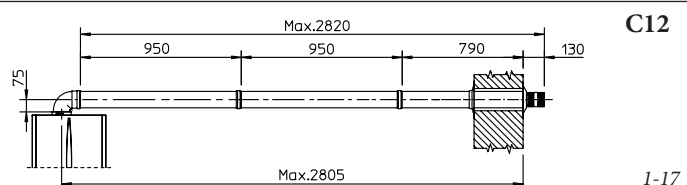
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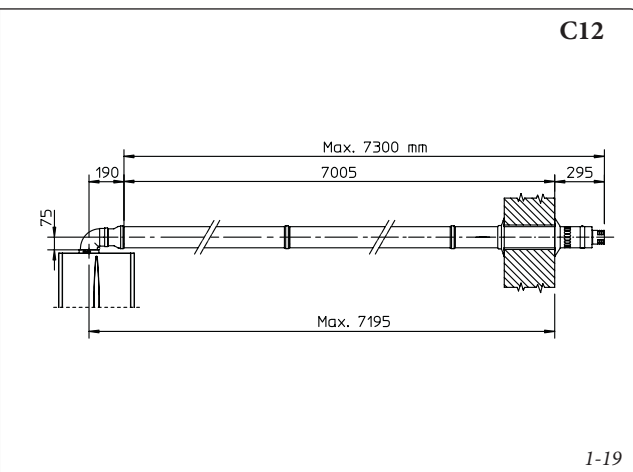
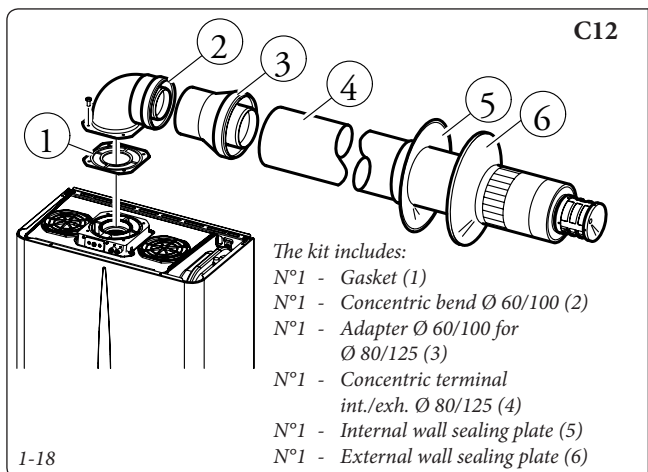
C12

1-16



C12

1-17



1.11 CONCENTRIC VERTICAL KIT INSTALLATION.

Type C configuration, sealed chamber and fan assisted.

Concentric vertical intake and exhaust kit. This vertical terminal is connected directly to the outside of the building for air intake and flue exhaust.

N.B.: the vertical kit with aluminium tile enables installation on terraces and roofs with a maximum slope of 45% (approx 25°) and the height between the terminal cap and half-shell (374 mm) must always be observed.

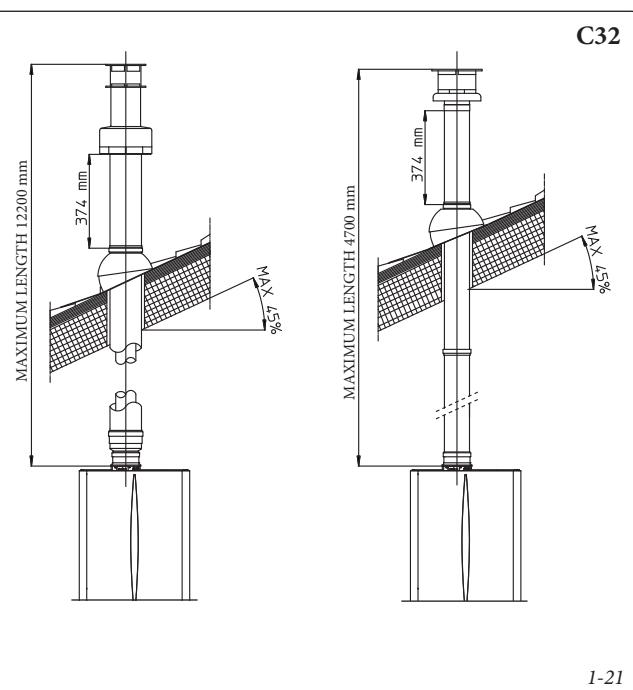
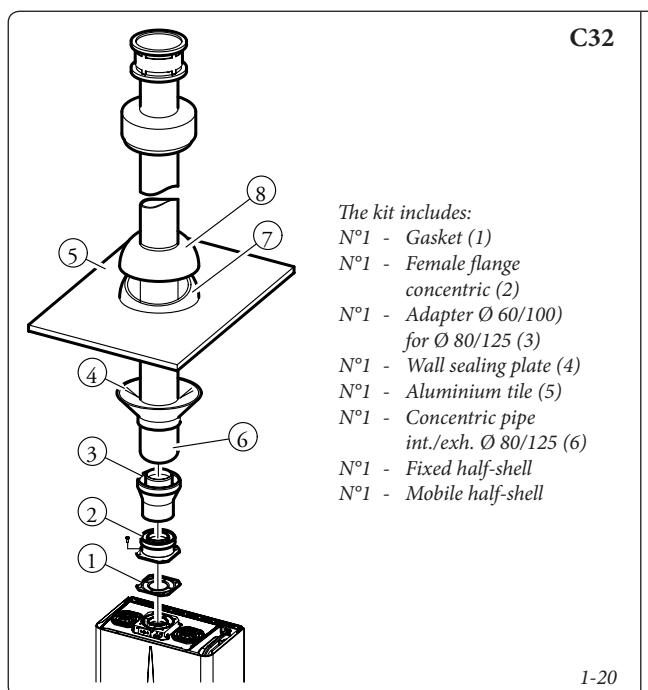
Vertical kit with aluminium tile Ø 80/125. Kit assembly (Fig. 1-20): install the concentric flange (2) on the central hole of the boiler inserting the gasket (1) and tighten using the screws in the kit. Fit the male end (smooth) of the adapter (3) into the female end of the concentric flange (2). Imitation aluminium tile installation. Replace the tile with the aluminium sheet (5), shaping it to ensure that rainwater runs off. Position the fixed half-shell (7) and insert the intake-exhaust pipe (6). Fit the Ø 80/125 concentric terminal pipe with the male end (6) (smooth) to the female end of the adapter (3) (with lip gasket) up to the stop;

making sure that the wall sealing plate (4) has been fitted, this will ensure sealing and joining of the elements making up the kit.

The vertical kit with this configuration can be extended to a *max. straight vertical length of 12200 mm* including the terminal (Fig. 1-21). This configuration corresponds to a resistance factor of 100. In this case the special extensions must be requested.

The terminal Ø 60/100 can also be used for vertical exhaust, in conjunction with concentric flange code 3.011141 (sold separately).

The vertical kit with this configuration can be extended to a *max. straight vertical length of 4700 mm* including the terminal (Fig. 1-21).



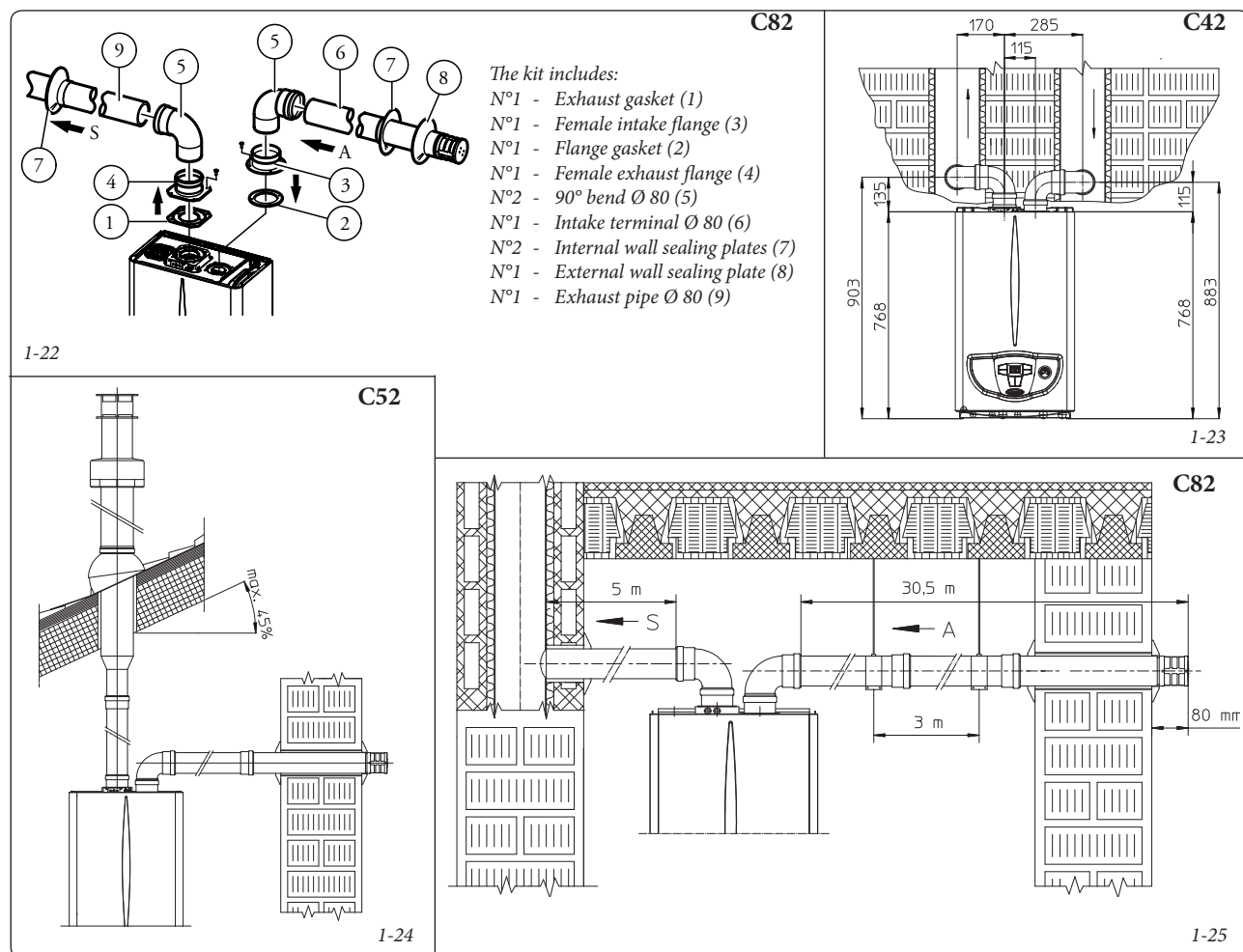
1.12 SEPARATOR KIT INSTALLATION. Type C configuration, sealed chamber and fan assisted.

This kit allows air to come in from outside the building and the exhaust to exit from the chimney or flue through divided flue exhaust and air intake pipes. Combustion products are expelled from pipe (S). The required amount of air is taken in through pipe (A) for combustion. The intake pipe (A) can be installed either on the right or left hand side of the central exhaust pipe (S). Both ducts can be routed in any direction.

- **Separator kit Ø 80/80.** Kit assembly (Fig. 1-22): install the flange (4) on the central hole of the boiler, interposing the gasket (1) and tighten with the flat-tipped hex screws included in the kit. Remove the flat flange present in the lateral hole with respect to the central one (according to needs) and replace it with the flange (3), positioning the gasket (2) already present in the boiler and tighten using the supplied self-threading screws. Fit the male end (smooth) to the bends (5) in the female end of the flanges (3 and 4). Fit the intake terminal (6) with the male section (smooth) in the female section of the bend (5) up to the stop, ensuring that the internal and external wall sealing plates are fitted. Fit the exhaust pipe (9) with the male end

(smooth) to the female end of the bend (5) up to the stop; making sure that the internal wall sealing plate has been fitted, this will ensure sealing and joining of the elements making up the kit.

- Installation clearances. Figure 1-23 gives the min. installation space dimensions of the Ø 80/80 separator terminal kit in limited conditions.
- Figure 1-24 shows the configuration with vertical exhaust and horizontal intake.
- Extensions for separator kit Ø 80/80. The max. vertical linear length (without bends) usable for Ø 80 intake and exhaust pipes is 41 metres of which 40 intake and 1 exhaust. This total



Maximum usable lengths (including intake terminal with grill and two 90° bends)			
NON-INSULATED PIPE		INSULATED PIPE	
Drain (metres)	Intake (metres)	Drain (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*
* The air intake pipe can be increased to 2.5 metres if the exhaust bend is eliminated, 2 metres if the air intake bend is eliminated, 4.5 metres eliminating both bends.		11	22.5*
		12	21.5*

Attention: the boiler is designed to evacuate the combustion products up to a maximum extension of 27 linear metres from the exhaust, with 1 m plus 90° bend at the intake. If the

installation requests a development of the flue to the discharge that exceeds the recommended 12 m, due consideration must be given to the formation of condensate that could take place

inside the pipe and Immergas insulated “Blue Series” flue kits must be used.

length corresponds to a resistance factor of 100. The total usable length obtained by the sum of the Ø 80 intake and exhaust pipe lengths can reach, as a maximum, the values provided in the following table. If *mixed accessories or components are used*, the maximum extension can be calculated by using a resistance factor for each component or its *equivalent length*. The sum of these resistance factors must not exceed 100.

- Temperature loss in flue ducts. To prevent problems of flue gas condensate in the exhaust pipe Ø 80, due to fume cooling through the wall, *the length of the pipe must be limited to just 5 m. Fig. 1-25*. If longer distances must be covered, use Ø 80 pipes with insulation (see insulated separator kit Ø 80/80 chapter).

N.B.: when installing the Ø 80 ducts, a dividing strip with gusset must be installed every 3 metres.

- **Insulated separator kit Ø 80/80.** Kit assembly (Fig. 1-26): install the flange (4) on the central hole of the boiler, interposing the gasket (1) and tighten with the flat-tipped hex screws included in the kit. Remove the flat flange present in the lateral hole with respect to the central one (according to needs) and replace it with the flange (3), positioning the gasket (2) already present in the boiler and tighten using the supplied self-threading screws. Insert and slide cap (6) onto bend (5) from the male side (smooth), and join bends (5) with the male side (smooth) in the female side of flange (3). Fit bend (11) with the male side (smooth) into the female side of flange (4). Fit the male end (smooth) of the intake terminal (7) up to the stop on the female end of the bend (5), making sure you have already inserted the wall sealing plates (8 and 9) that ensure correct installation between pipe and wall, then fix the closing cap (6) on the terminal (7). Join the exhaust pipe

(10) with the male side (smooth) in the female side of the bend (11) to the end stop, ensuring that the wall sealing plate (8) is already inserted for correct installation between the pipe and flue.

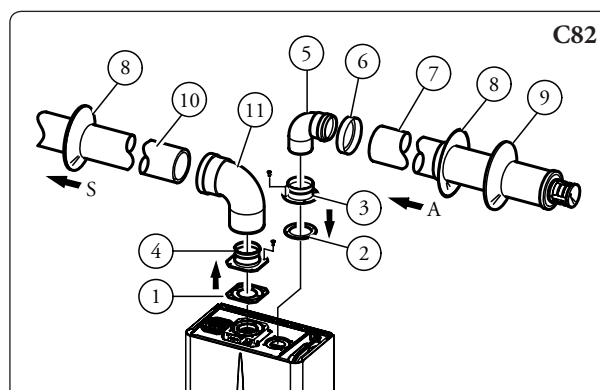
- Insulation of separator terminal kit. Whenever there are flue gas condensate problems in the exhaust pipes or on the external surface of the intake pipes, on request Immergas supplies insulated intake-exhaust pipes. Insulation may be necessary on the exhaust pipe, due to excessive loss of temperature of the flue gas on their route. Insulation may be necessary on the intake pipe as the air entering (if very cold) may cause the outside of the pipe to fall below the dew point of the environmental air. The figures (Fig. 1-27 and 1-28) illustrate different applications of insulated pipes.

Insulated pipes are formed of a Ø 80 internal concentric pipe and a Ø 125 external pipe with static air space. It is not technically possible to start with both Ø 80 elbows insulated, as clearances will not allow it. However starting with an insulated elbow is possible by choosing either the intake or exhaust pipe. When starting with the insulated intake bend it must be engaged on its flange until it is taken up to stop on the flue gas exhaust flange, a situation that takes the two intake flue gas exhaust outlets to the same height.

- Temperature loss in insulated flue ducting. To prevent problems of flue gas condensate in the exhaust pipe Ø 80, due to flue gas cooling through the wall, *the length of the pipe must be limited to 12 m*. The figure (Fig. 1-28) illustrates a typical insulation application in which the intake pipe is short and the exhaust pipe is very long (over 5 m). The entire intake pipe is insulated to prevent moist air in the place where the boiler is installed, in contact with the pipe

cooled by air entering from the outside. The entire exhaust pipe, except the elbow leaving the splitter is insulated to reduce heat loss from the pipe, thus preventing the formation of fume condensate.

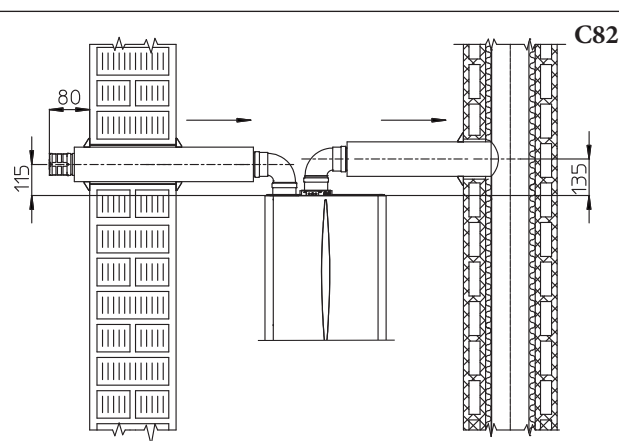
N.B.: when installing the insulated pipes, a section clamp with pin must be installed every 2 metres.



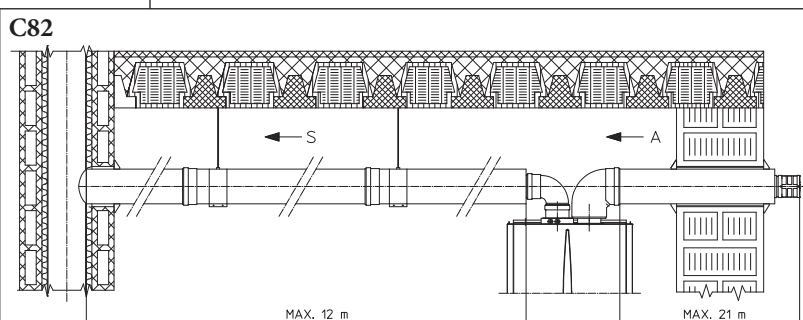
The kit includes:

- N°1 - Exhaust gasket (1)
- N°1 - Flange gasket (2)
- N°1 - Female intake flange (3)
- N°1 - Female exhaust flange (4)
- N°1 - Bend 90° Ø 80 (5)
- N°1 - Pipe closure cap (6)
- N°1 - Intake terminal Ø 80 insulated (7)
- N°2 - Internal wall sealing plates (8)
- N°1 - External wall sealing plate (9)
- N°1 - Discharge pipe Ø 80 insulated (10)
- N°1 - Concentric bend 90° Ø 80/125 (11)

1-26



1-27



1-28

1.13 CONFIGURATION TYPE B, OPEN CHAMBER AND FORCED DRAUGHT FOR INDOORS.

The appliance can be installed inside buildings in B mode; in this case, all technical rules, and national and local regulations in force, must be complied with.

- Type B open chamber boilers must not be installed in places where commercial, artisan or industrial activities take place, which use products that may develop volatile vapours or substances (e.g. acid vapours, glues, paints, solvents, combustibles, etc.), as well as dusts (e.g. dust deriving from the working of wood, coal fines, cement, etc.), which may be damaging for the components of the appliance and jeopardise functioning.
- In configuration type B, the boilers must not be installed in bedrooms, bathrooms or in bedsits.
- The installation of appliances in configuration B is only recommended outdoors (in a partially protected place) or in places that are not lived in and which are permanently ventilated.

1.14 FLUE EXHAUST TO FLUE/CHIMNEY.

Flue exhaust does not necessarily have to be connected to a branched type traditional flue. The flue exhaust can be connected to a special LAS type multiple flue. Multiple and combined flues must be specially designed according to the calculation method and requirements of the standards, by professionally qualified technical staff. Chimney or flue sections for connection of the exhaust pipe must comply with requisites of technical standards in force.

1.15 DUCTING OF FLUES OR TECHNICAL SLOTS.

Ducting is an operation through which by the introduction of one or more relevant pipes, a system is realised for the evacuation of the combustion products of a gas appliance made up from the coupling of an existing or new ducting pipe with a chimney, flue or technical slot (also in new buildings). Ducting requires the use of ducts declared to be suitable for the purpose by the manufacturer. Follow the installation and user instructions provided by the manufacturer and the requirements set forth by standards.

1.16 FLUES, CHIMNEYS AND CHIMNEY CAPS.

The flues, chimneys and chimney caps for the evacuation of combustion products must be in compliance with applicable standards. Chimneys and roof-installed exhaust terminals must comply with the outlet height and with the distance from technical volumes set forth by the technical standards in force.

Positioning the wall exhaust terminals. The exhaust terminals must:

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

Combustion products exhaust of natural or fan assisted appliances in open-top closed environments. In spaces closed on all sides with open tops (ventilation pits, courtyards etc.), direct flue gas exhaust is allowed for natural or forced draught gas appliances with a heating power range from 4 to 35 kW, provided the conditions as per the current technical standards are respected.

1.17 SYSTEM FILLING.

Once the boiler is connected, proceed with system filling via the filling valve (Fig. 2-2). Filling is performed at low speed to ensure release of air bubbles in the water via the boiler and heating system vents.

The boiler has a built-in automatic venting valve on the circulator. *Check if the cap is loose.* Open the radiator vent valves. Close radiator vent valves when only water escapes from them. Close the filling valve when the boiler manometer indicates approx. 1.2 bar.

N.B.: during these operations turn on the circulation pump at intervals, by means of the stand-by/summer winter button (2) positioned on the control panel. *Vent the circulation pump by loosening the front cap and keeping the motor running.*

Tighten the cap after the operation.

1.18 GAS SYSTEM START-UP.

To start up the system, refer to the standard in force.

In particular, for new gas systems:

- open windows and doors;
- avoid presence of sparks or naked flames;
- bleed all air from pipelines;
- check that the internal system is properly sealed according to specifications.

1.19 BOILER START UP (IGNITION).

For issue of the Declaration of Conformity provided for by Italian Law, the following must be performed for boiler start-up:

- check that the internal system is properly sealed according to specifications;
- ensure that the type of gas used corresponds to boiler settings;
- switch the boiler on and ensure correct ignition;
- make sure that the gas flow rate and relevant pressure values comply with those given in the manual (Par. 3.18 / 3.21);
- ensure that the safety device is engaged in the event of gas supply failure and check activation time;
- check activation of the main switch located upstream from the boiler;
- check that the concentric intake-exhaust terminal (if fitted) is not blocked.

The boiler must not be started up even if only one of the checks should be negative.

N.B.: the preliminary boiler check must be carried out by a qualified technician. The standard boiler warranty is valid from the date of inspection.

The test certificate and warranty is issued to the user.

1.20 CIRCULATION PUMP.

The boilers are supplied with a built-in circulation pump with 3-position electric speed control. The boiler does not operate correctly with the circulation pump on first speed. To ensure optimal boiler operation, in the case of new systems (single pipe and module) it is recommended to use the pump at maximum speed. The circulation pump is already fitted with a capacitor.

Pump release. If, after a prolonged period of inactivity, the circulation pump is blocked, unscrew the front cap and turn the motor shaft using a screwdriver. Take great care during this operation to avoid damage to the motor.

By-pass Regulation (part. 25 Fig. 1-30). If necessary, the by-pass can be regulated according to system requirements from a minimum (by-pass excluded) to a maximum (by-pass inserted) represented by the graphics (Fig. 1-29). Make the regulation using a flat head screwdriver, turn clockwise and insert the by-pass, anti-clockwise it is excluded.

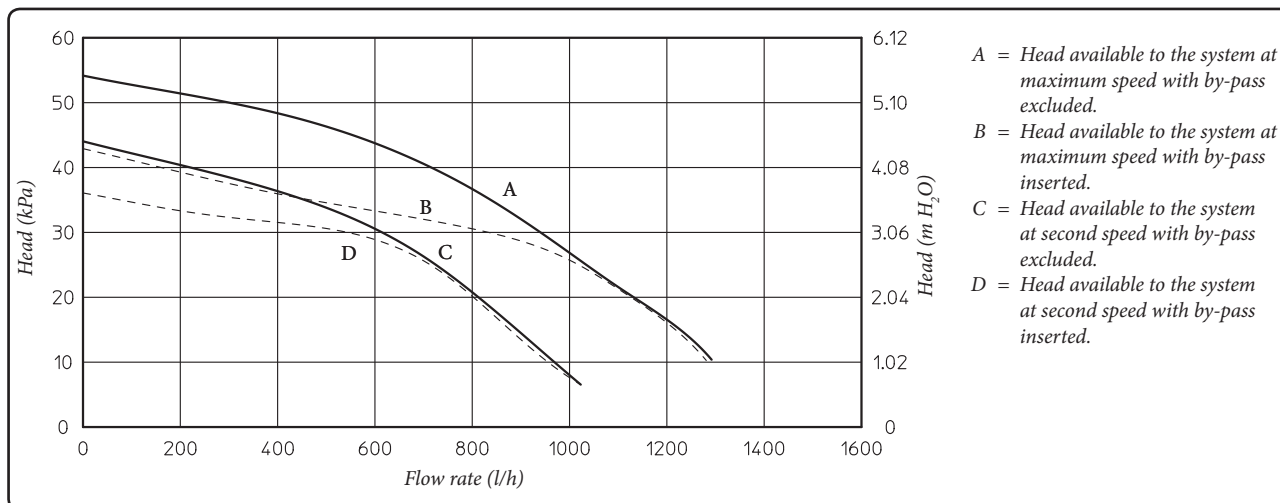
1.21 KITS AVAILABLE ON REQUEST.

- System cut-off valves kit. The boiler is designed for installation of system interception cocks to be placed on flow and return pipes of the connection assembly. This kit is particularly useful for maintenance as it allows the boiler to be drained separately without having to empty the entire system.
- Polyphosphate dispenser kit. The polyphosphate dispenser reduces the formation of lime-scale and preserves the original heat exchange and domestic hot water production conditions. The boiler is prepared for application of the polyphosphate dispenser kit.
- Covering kit. If installed outdoors in a partially sheltered place with direct air intake, it is compulsory to mount the appropriate top protection cover for the correct functioning of the boiler and to protect it from adverse weather conditions (Fig. 1-10); or, if installed indoors in configuration type B, it is compulsory to mount the appropriate top protection cover along with the flue exhaust kit.

- Anti freeze kit with resistance (on request). If the boiler is installed in a place where the temperature drops below -5°C and if the gas supply fails, the appliance may freeze. To prevent freezing of the domestic hot water system, an anti freeze kit with an electrical resistance can be fitted from the relative cable and from a control thermostat.

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

Head available to the system.



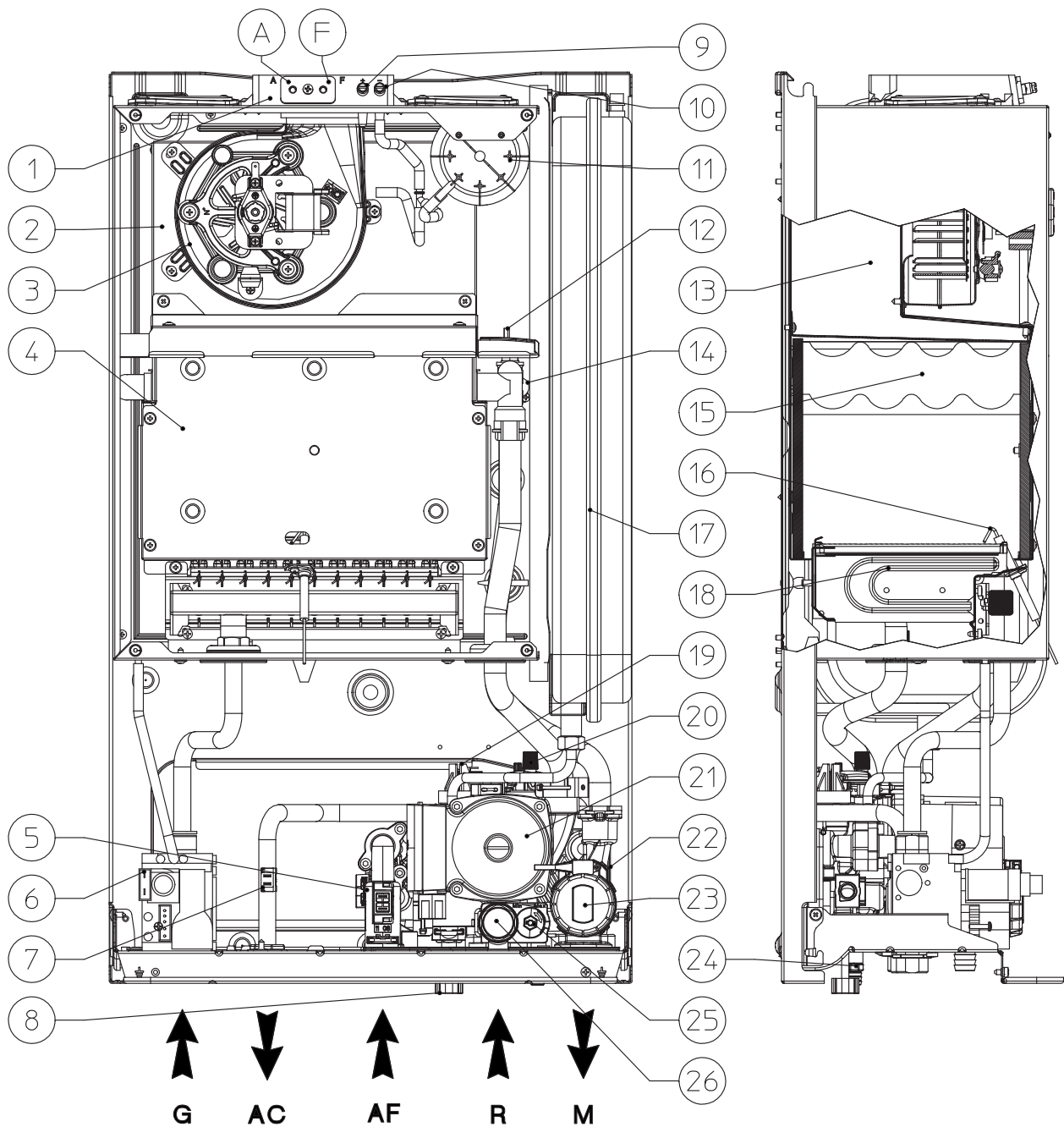
1.22 BOILER COMPONENTS.

1- 30

INSTALLER

USER

MAINTENANCE TECHNICIAN



Key:

- 1 - Sample points (air A) - (flue gases F)
- 2 - Sealed chamber
- 3 - Fan
- 4 - Combustion chamber
- 5 - Domestic hot water flow switch
- 6 - Gas valve
- 7 - Domestic hot water probe
- 8 - System filling valve
- 9 - Positive signal pressure point

- 10 - Negative signal pressure point
- 11 - Flue pressure switch
- 12 - Flow probe
- 13 - Flue hood
- 14 - Safety thermostat
- 15 - Primary heat exchanger
- 16 - Ignition and detection electrodes
- 17 - System expansion vessel
- 18 - Burner
- 19 - System pressure switch

- 20 - Air vent valve
- 21 - Boiler pump
- 22 - Plate heat exchanger
- 23 - 3-way valve (motorised)
- 24 - System draining valve
- 25 - By-pass
- 26 - 3 bar safety valve

N.B.: connection group (Optional)

2 INSTRUCTIONS FOR USE AND MAINTENANCE

2.1 CLEANING AND MAINTENANCE.

Attention: the heating systems must undergo periodical maintenance (regarding this, see the section dedicated to the technician, relative to “yearly control and maintenance of the appliance”) and regular checks of energy efficiency in compliance with national, regional or local provisions in force. This ensures that the optimal safety, performance and operation characteristics of the boiler remain unchanged over time.

2.2 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.

Do not touch the flue gas exhaust terminal (if present) due to the high temperatures it can reach.

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.

• **Attention:** the use of components involving use of electrical power requires some fundamental rules to be observed:

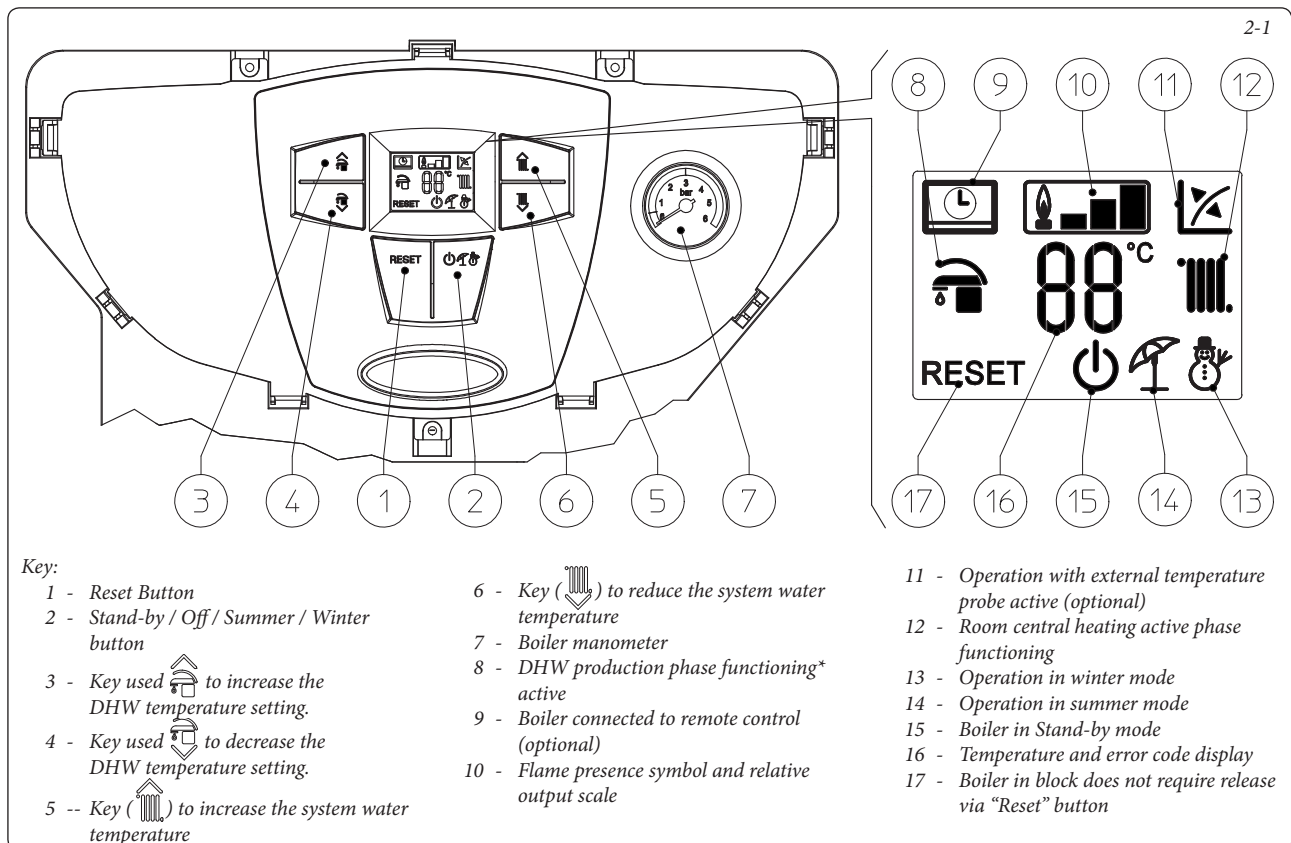
- do not touch the appliance with wet or moist parts of the body; do not touch when barefoot;
- never pull electrical cables or leave the appliance exposed to atmospheric agents (rain, sunlight, etc.);
- the appliance power cable must not be replaced by the user;
- in the event of damage to the cable, switch off the appliance and contact exclusively qualified staff for replacement;
- if the appliance is not to be used for a certain period, disconnect the main power switch.

INSTALLER

USER

MAINTENANCE TECHNICIAN

2.3 CONTROL PANEL.



2.4 USING THE BOILER.

Before ignition make sure the heating system is filled with water and that the manometer (7) indicates a pressure of $1 \div 1.2$ bar.

- Open the gas cock upstream from the boiler.

- Press the button (2) until the display switches on, after which press the button in sequence (2) and take the boiler to the summer (☀) or winter (❄) position.

• **Summer (☀):** in this mode the boiler functions only to produce the DHW, the temperature is set via the buttons (3-4) and the relative temperature is shown on the display via the indicator (16).

• **Winter (❄):** in this mode the boiler functions both for producing domestic hot water and heating the environment. The temperature of the DHW is always regulated via buttons (3-4), the heating temperature is regulated via buttons (5-6) and the relative temperature is shown on the display via the indicator (16).

From this moment the boiler functions automatically. With no demand for heat (heating or domestic hot water production) the boiler goes to "standby" function, equivalent to the boiler being powered without presence of flame. Each time the burner ignites, the relative flame present symbol is displayed (10) with relative output scale.

• **Operation with Comando Amico Remoto^{V2} (CAR^{V2}) (Optional).** If the CAR^{V2} is connected, the (☺) symbol will appear on the display. The boiler regulation parameters can be set via the CAR^{V2} control panel and the reset button (1) remains active on the boiler control panel, along with the switch-off button (2) ("off" mode only) and the display where the functioning state is shown.

Attention: if the boiler is put into "off" mode, the "ERR>CM" connection error symbol will appear on the CARCAR^{V2}. The CAR^{V2} is however powered constantly so as not to lose memorised programs.

• **Operation with optional external probe (📡).** In the case of a system with optional external probe, the boiler flow temperature for room central heating is managed by the external probe depending on the external temperature measured (Par. 1.6). The flow temperature can be modified by selecting the functioning curve via buttons (5 and 6), selecting a value from "0 to 9" (Fig. 1-6).

With external probe present, the relative symbol (12) will appear on the display. In the central heating phase, if the temperature of the water contained in the system is sufficient to heat the radiators, the boiler can only function with the activation of the pump.

• **"Stand-by" mode.** Press button (2) in succession until the (🔌) symbol appears. The boiler remains active from this moment and the anti-freeze function, pump anti-block function and 3-way and signalling of any anomalies is guaranteed.

N.B.: in these conditions the boiler is considered still powered.

• **"Off" mode.** By holding the button (2) down for 8 seconds, the display switches-off and the boiler is off completely. The safety functions are not guaranteed in this mode.

N.B.: in these conditions the boiler is considered still live even if there are no functions active.

• **Display functioning.** The display lights up during the use of the control panel, after 15 seconds inactivity, the brightness drops until just the active symbols are displayed. The lighting mode can be varied via parameter P2 in the circuit board customisation menu.

2.5 FAULT AND ANOMALY SIGNALS.

The boiler signals out anomalies by flashing on the display and relative error codes, listed on the table, are displayed.

Anomaly signalled	code displayed (flashing)
No ignition block	01
Safety thermostat block (overheating), flame control anomaly	02
Fan anomaly	03
Generic boiler P.C.B. anomaly	04
Flow probe anomaly	05
Domestic hot water probe anomaly	06
Maximum N° of reset	08
Insufficient system pressure	10
Flue pressure switch failure	11
Configuration error	15
Parasite flame	20
Push button control panel anomaly	24
Insufficient circulation	27
Loss of remote control communication.	31
Low power supply voltage	37
Loss of flame signal	38
Block due to loss of continuous flame signal	43

Attention: the Anomaly can be reset 5 times consecutively, after which the function is inhibited for at least one hour. One attempt is gained every hour for a maximum of 5 attempts. By switching the appliance on and off the 5 attempts are re-acquired.

Ignition block. The boiler ignites automatically with each demand for room heating or hot water production. If this does not occur within 10 seconds, the boiler goes into ignition block (code 01). To eliminate "ignition block" the Reset button (1) must be pressed. On commissioning or after extended downtime, it may be necessary to eliminate the "ignition block". If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas After-Sales Technical Assistance Service).

Overheating thermostat block. During normal functioning, if a fault causes excessive overheating internally, the boiler goes into overheating block (code 02). After allowing to cool, eliminate the "overtemperature block" by pressing the Reset key (1). If this phenomenon occurs frequently, contact a qualified technician for assistance

(e.g. Immergas After-Sales Technical Assistance Service).

Fan anomaly. This occurs if the fan is blocked or if the intake or drain pipes are obstructed. If normal conditions are restored the boiler restarts without having to be reset. If this anomaly persists, contact a qualified technician for assistance (e.g. Immergas After-Sales Service).

Generic boiler P.C.B. anomaly. This happens when a signal is incorrectly recognised by the boiler P.C.B. microprocessor (code 04). To eliminate "boiler P.C.B. generic anomaly block" the Reset button (1) must be pressed. If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas After-Sales Technical Assistance Service).

Delivery probe anomaly. If the board detects an anomaly on the delivery probe (code 05), the boiler will not start; contact a qualified technician for assistance (e.g. Immergas After-Sales Technical Assistance Service).

Domestic hot water probe anomaly. If the board detects an anomaly on the domestic hot water NTC probe, the boiler signals the anomaly. In this case the boiler continues to produce domestic hot water but not with optimal performance. Moreover, the DHW anti-freeze function is prevented and an authorised technician must be called (e.g. Immergas After-Sales Service).

Maximum N° of reset. Number of allowed resets that have already been used.

Insufficient system pressure. Water pressure inside the heating system (code 10), sufficient to guarantee the correct functioning of the boiler, is not detected. Check that the system pressure is between $1 \div 1.2$ bar.

Flue gas pressure switch failure. It occurs in the case of an error on the circuit board that gives consent for fan start-up incorrectly or in the case of flue-gas pressure switch fault (code 11). If normal conditions are restored the boiler restarts without having to be reset. If this anomaly persists, contact a qualified technician for assistance (e.g. Immergas After-Sales Service).

Configuration error. If the board detects an anomaly or incongruity on the electric wiring, the boiler will not start. If normal conditions are restored the boiler restarts without having to be reset. If this anomaly persists, contact a qualified technician for assistance (e.g. Immergas After-Sales Service).

Parasite flame. This occurs in case of a leak on the detection circuit or anomaly in the flame control unit.(code 20), try to reset the boiler. If the anomaly continues contact a qualified technician (e.g. Immergas After-Sales Technical Assistance Service).

Push button control panel anomaly. This occurs when the P.C.B. detects an anomaly on the push button control panel. If normal conditions are restored the boiler restarts without having to be reset. If this anomaly persists, contact a qualified technician for assistance (e.g. Immergas After-Sales Service).

Insufficient circulation. This occurs if the boiler overheats due to insufficient water circulating in the primary circuit (code 27); the causes can be:

- low system circulation; check that no shut-off devices are closed on the heating circuit and that the system is free of air (deaerated);
- circulating pump blocked; free the circulating pump.

If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas After-Sales Technical Assistance Service).

Loss of Remote Control communication. This occurs 1 minute after communication loss between the boiler and the remote control (code 31). To reset the error code, switch voltage to the boiler off and then back on again. If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas After-Sales Technical Assistance Service).

Low power supply voltage. This occurs when the power supply voltage is lower than the allowed limits for the correct functioning of the boiler. If normal conditions are restored, the boiler re-starts without having to be reset. If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas After-Sales Technical Assistance Service).

Loss of flame signal. This occurs when the boiler is ignited correctly and the burner flame switches off unexpectedly; a new attempt at ignition is performed and if normal conditions are restored, the boiler does not have to be reset. If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas After-Sales Technical Assistance Service).

Block due to loss of continuous flame signal. This occurs if the "Flame signal loss" error occurs 6 times consecutively in 8.5 minutes (38). To eliminate the block, the Reset button (1) must be pressed. If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas After-Sales Technical Assistance Service).

2.6 BOILER SHUTDOWN

For complete boiler switch-off, press the "off" button, disconnect the onnipolar switch outside of the boiler and close the gas cock upstream from the appliance. Never leave the boiler switched on if left unused for prolonged periods.

2.7 RESTORE HEATING SYSTEM PRESSURE

Periodically check the system water pressure. The boiler manometer should read a pressure between 1 and 1.2 bar.

If the pressure is below 1 bar (with the circuit cool) restore normal pressure via the cock located in the lower part of the boiler (Fig. 2-2).

N.B.: close the cock after the operation.

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 staff for assistance to eliminate the possible system leakage.

2.8 DRAINING THE SYSTEM.

To drain the boiler, use the special draining valve (Fig. 2-2).

Before draining, ensure that the filling valve is closed.

2.9 ANTI-FREEZE PROTECTION.

The boiler has an anti-freeze function that switches on automatically when the temperature falls below 4°C (standard protection to minimum temperature of -5°C). In order to guarantee the integrity of the appliance and the domestic hot water heating system in zones where the temperature falls below zero, we recommend the heating system is protected using anti-freeze liquid and installation of the Immergas Anti-freeze Kit in the boiler (Par. 1.3). In the case of prolonged inactivity (second case), we also recommend that:

- the electric power supply is disconnected;
- the heating circuit and boiler domestic water circuit must be drained. In systems that are drained frequently, filling must be carried out with suitably treated water to eliminate hardness that can cause lime-scale.

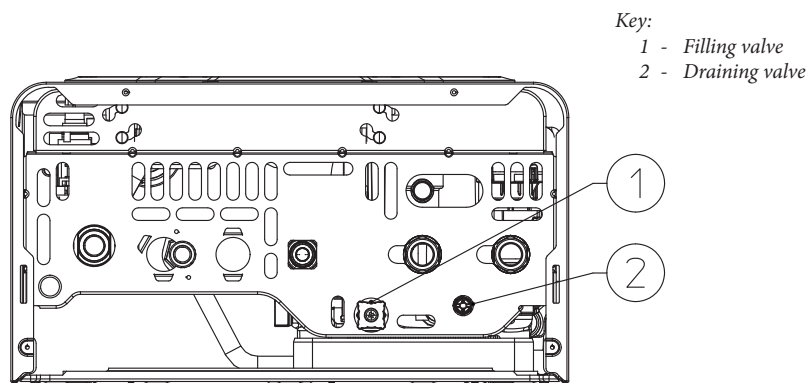
2.10 CASE CLEANING.

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 staff for the procedures and ensure that the electrical, water and gas supply lines are shut off and disconnected.

Bottom view.



3 COMMISSIONING THE BOILER (INITIAL CHECK)

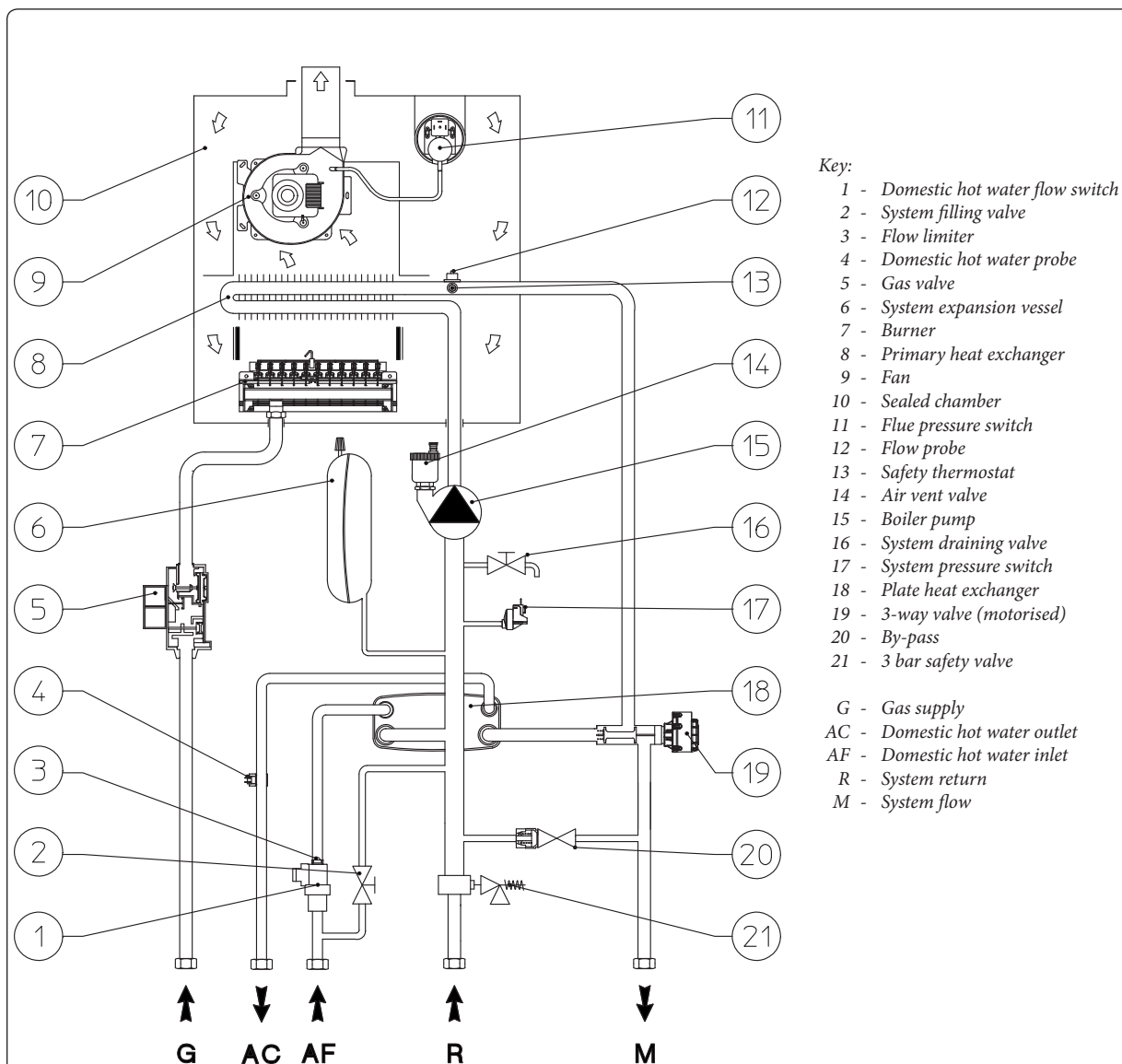
To commission the boiler:

- ensure that the type of gas used corresponds to boiler settings;
- check connection to a 230V-50Hz power mains, correct L-N polarity and the earthing connection;
- make sure the heating system is filled with water and that the manometer indicates a pressure of $1 \div 1.2$ bar;
- make sure the air valve cap is open and that the system is well deaerated;
- switch the boiler on and ensure correct ignition;
- make sure the gas maximum, medium and minimum flow rate and pressure values correspond to those given in the handbook (Paragraph 3.18 / 3.21);
- check activation of the safety device in the event of no gas, as well as the relative activation time;
- check activation of the main switch located upstream from the boiler;
- check that the intake and/or exhaust terminals are not blocked;
- check activation of the "no air" safety pressure switch;
- ensure activation of all adjustment devices;
- seal the gas flow rate regulation devices (if settings are modified);
- ensure production of domestic hot water;

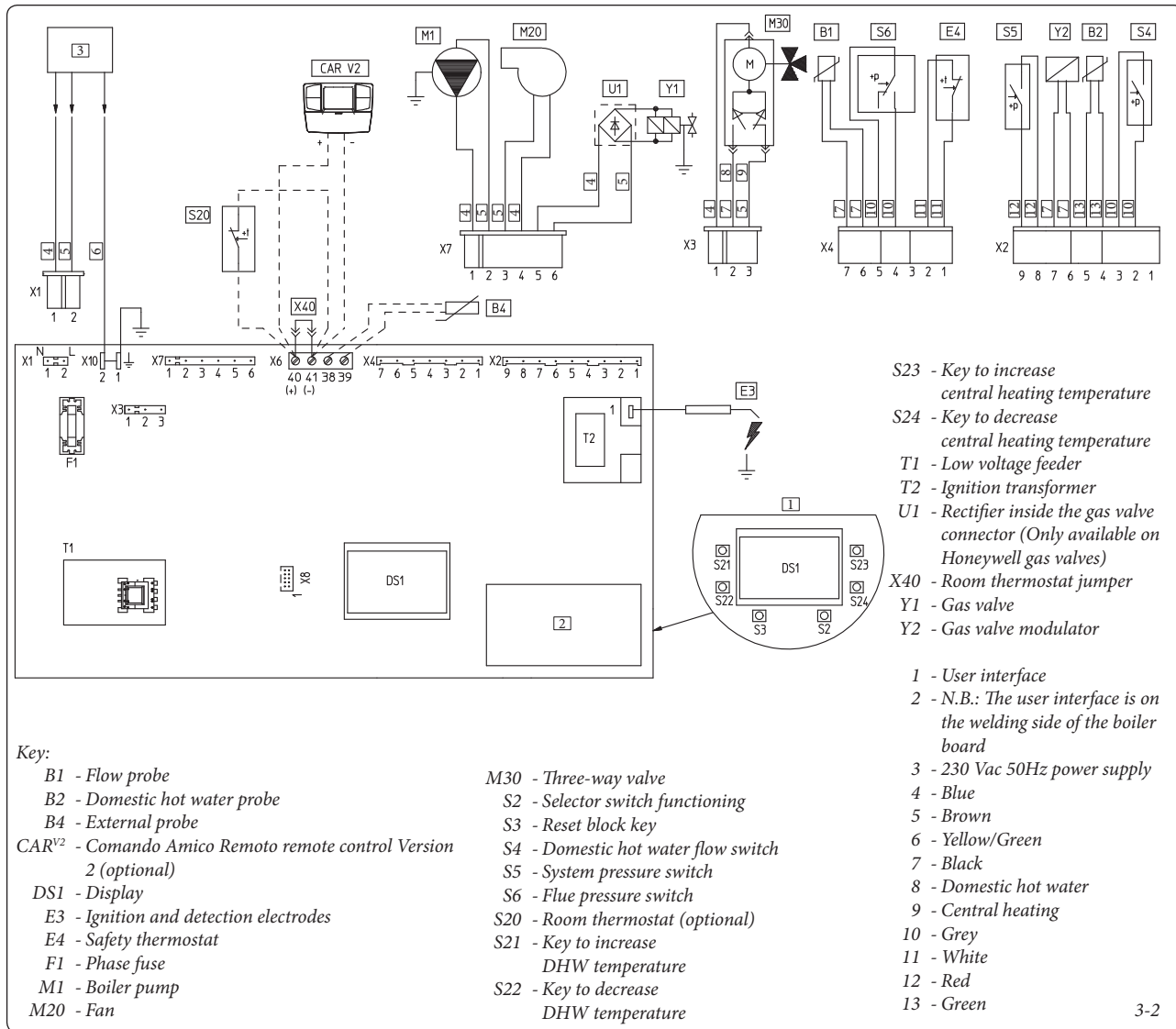
- ensure sealing efficiency of water circuits;
- check ventilation and/or aeration of the installation room where provided.

If even only a single safety check offers a negative result, do not commission the system.

3.1 HYDRAULIC DIAGRAM.



3.2 WIRING DIAGRAM.



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The boiler is designed for application of a room thermostat (S20), an On/Off room chronothermostat, a program timer or a Comando Amico Remoto remote control^{V2} (CAR^{V2}). Connect to clamps 40 - 41 eliminating the jumper X40, paying attention not to invert the polarity if the CAR^{V2} is installed.

The connector X8 is used for the connection of the Virgilio Palmtop in the microprocessor software updating operation.

3.3 TROUBLESHOOTING

N.B.: maintenance interventions must be carried out by a qualified technician (e.g. Immergas After-Sales Technical Assistance Service).

- Smell of gas. Caused by leakage from gas circuit pipelines. Check sealing efficiency of gas intake circuit.
- The fan works but ignition discharge does not occur on the burner ramp. The fan may start but the safety air pressure switch does not switch the contact over. Make sure:

- 1) the intake-exhaust duct is not too long (over allowed length).
- 2) the intake-exhaust pipe is not partially blocked (on the exhaust or intake side).

- 3) the diaphragm of the fume exhaust is adequate for the length of the intake-exhaust duct.
- 4) that the sealed chamber is kept in good conditions.

- 5) the fan power supply voltage is not less than 196 V.

- Irregular combustion (red or yellow flame). Can be caused by: dirty burner, incorrect combustion parameters, intake - exhaust terminal not correctly installed. Clean the above components and ensure correct installation of the terminal.

- Frequent activation of the temperature overload thermostat. It can depend on reduced water pressure in the boiler, little circulation in the heating system, the blocked pump or an anomaly of the boiler P.C.B. Check on the manometer that the system pressure is within established limits. Check that radiator valves are not all closed.

- Presence of air in the system. Check opening of the special air vent valve cap (Fig. 1-30). Make sure the system pressure and expansion vessel factory-set pressure values are within the set limits; the factory-set value for the expansion vessel must be 1.0 bar, and system pressure between 1 and 1.2 bar.

- Ignition block see par. 2.5 and 1.4 (electric connection).

3.4 INFORMATION MENU.

Pressing the buttons (3 and 4) for 5 seconds, the "Information menu" is activated, which allows to display some boiler functioning parameters. To scroll through the various parameters, press (3 and 4), to exit from the menu press buttons (3 and 4) again for 5 seconds or press button (2) for 5 seconds or wait for 60 seconds.

List of parameters.

N° parameter	Description
d1	Displays the flame signal (uA)
d2	Displays the primary exchanger output instant heating flow temperature
d3	Displays the instant output temperature from the DHW exchanger
d4	Displays the temperature set for the central heating set (if remote control is present)
d5	Displays the temperature set for the DHW set (if remote control is present)
d6	Displays the external environment temperature (if the external probe is present) If the temperature is below zero, the value is displayed flashing.

3.5 PROGRAMMING THE P.C.B.

The boiler is prepared for possible programming of several operation parameters. By modifying these parameters as described below, the boiler can be adapted according to specific needs.

To access the programming phase, proceed as follows:

- press keys (1) and (2) at the same time for approximately 8 seconds;
- Using keys (3) and (4), select the parameter to be changed indicated in the following table:

List of parameters	Description
P1	Boiler mode (DO NOT USE)
P2	Display lighting
P3	DHW thermostat
P4	Minimum CH output
P5	Maximum CH output
P6	Central heating ignitions timer
P7	Central heating ramp timer
P8	Heating switch-on delay request from room thermostat and remote control.
P9	Solar mode

- adjust the corresponding value consulting the table using buttons (5) and (6);
- confirm the set value pressing the Reset button (1) for approximately 3 seconds; by pressing keys (3) + and (4) - at the same time exit the function without memorising the modifications made.

N.B.: after a period of time, without touching any keys, the operation cancels automatically.

Boiler mode. It establishes whether the boiler functions in instant or storage mode.

Boiler mode (P1)	
Range of values which can be set	Standard setting
0 - instant boiler	0
1 - Boiler with storage tank	

Display lighting. Establishes the display lighting mode:

Display lighting (P2)	
Range of values which can be set	Standard setting
0 - Off	1
1 - Auto	
2 - On	

- **Off:** the display is always lit with low intensity.
- **Auto:** the display lights up during use and lowers after 15 seconds of inactivity. In the case of anomaly the display flashes.
- **On:** the display is always lit with high intensity.

DHW thermostat. With the "correlated" thermostat setting, boiler switch-off takes place on the basis of the temperature set. While with the setting of the "fixed" DHW thermostat the switch-off temperature is fixed at the maximum value independently from the value set on the control panel.

DHW thermostat (P3)	
Range of values which can be set	Standard setting
0 - Fixed	1
1 - Correlated	

Heating output. The boiler also has electronic modulation that adapts the boiler potentiality to the effective heating demand of the house. Then the boiler works normally in a variable gas pressure field between the minimum heating output and the maximum heating output depending on the system's heating load.

N.B.: the boiler is produced and calibrated in the central heating phase at nominal output. Approximately 10 minutes are needed to reach the nominal heat output, which can be changed using the parameter (P5).

N.B.: the selection of the "Minimum heating output" and "Maximum heating output" parameters, in the presence of a heating request, allows switch-on of the boiler and power supply of the modulator with current equal to the value of the respective set value.

Minimum central heating output (P4)	
Range of values which can be set	Standard setting
0 - 63 %	Set according to factory inspection

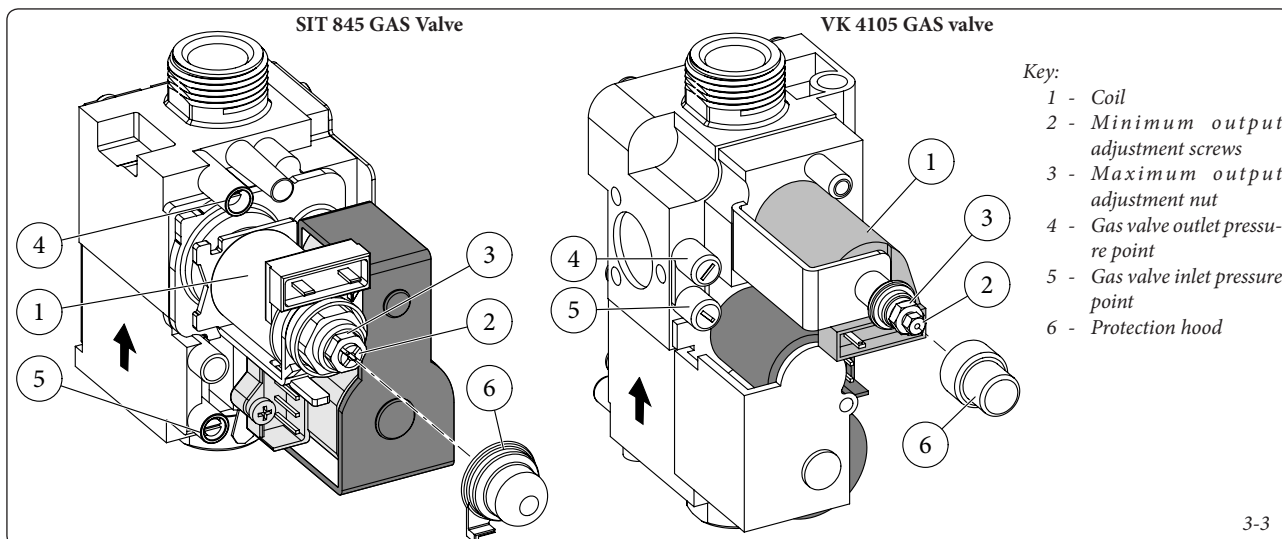
Maximum heating output (P5)	
Range of values which can be set	Standard setting
0 - 99 %	99

Central heating ignitions timer. The boiler has electronic timing, which prevents the burner from igniting too often in central heating mode.

Central heating ignitions timer (P6)	
Range of values which can be set	Standard setting
0 - 20 (0 - 10 minutes) (01 equals 30 seconds)	6 (3')

Central heating ramp timing. In the ignition phase, the boiler performs an ignition ramp in order to arrive at the set maximum output.

Central heating ramp timer (P7)	
Range of values which can be set	Parameter
0 - 28 (0 - 14 minutes) (01 equals 30 seconds)	28 (14')



3-3

Heating switch-on delay request from room thermostat and remote control. The boiler is set to switch-on immediately after a request. In the case of particular systems (e.g. area systems with motorised thermostatic valves etc.) it may be necessary to delay ignition.

Heating switch-on delay request from room thermostat and remote control (P8)	
Range of values which can be set	Parameter
0 - 20 (0 - 10 minutes) (01 equals 30 seconds)	0 (0')

DHW ignition delay. The boiler is set to switch-on immediately after a request for DHW. In the case of coupling with solar storage tanks positioned upstream from the boiler, it is possible to compensate the distance of the storage tank in order to allow the hot water to reach the utility, setting the necessary time and therefore verifying that the water is hot enough (see Par. Solar panels coupling)

Solar mode (P9)	
Range of values which can be set	Standard setting
0 - 20 seconds	0

Gas type selection. The setting of this function is used to adjust the boiler so that it can operate with the correct type of gas

To access this regulation, once having entered the programming mode, press the button (2) for 4 seconds. To exit, press button (2) again 4 seconds.

Gas type selection (G1)	
Range of values which can be set	Standard setting
nG - Methane lG - LPG Ci - China	The same as the type of gas being used

Ignition output (G2)	
Range of values which can be set	Standard setting
0 - 70 %	Set according to factory inspection

3.6 CONVERTING THE BOILER TO OTHER TYPES OF GAS.

If the boiler has to be converted to a different gas type to that specified on the data plate, request the relative conversion kit for quick and easy conversion.

Boiler conversion must be carried out by a qualified technician (e.g. Immergas After-Sales Technical Assistance Service).

To convert to another type of gas the following operations are required:

- remove the voltage from the appliance;
- replace the main burner injectors, making sure to insert the special seal rings supplied in the kit, between the gas manifold and the injectors;
- apply voltage to the appliance;
- from the push button panel on the boiler, select the type of gas (G1) and then select (Ng) if it runs on Methane or (Lg) if it runs on LPG;
- adjust the boiler nominal heat output;
- adjust the boiler minimum heat output;
- adjust the boiler nominal heat output in heating phase;
- adjust (eventually) the maximum heating output;

- adjust the "Ignition power" with the same value as "Minimum heating output";
- seal the gas flow rate devices (if adjusted);
- after completing conversion, apply the sticker, present in the conversion kit, near the data-plate. 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 (Par. 3.18 / 3.21).

3.7 CHECKS FOLLOWING CONVERSION TO ANOTHER TYPE OF GAS.

After making sure that conversion was carried out with a nozzle of suitable diameter for the type of gas used and the settings are made at the correct pressure, check that:

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

N.B.: all boiler adjustment operations must be carried out by a qualified technician (e.g. Immergas After-Sales Technical Assistance). Burner adjustment must be carried out using a differential "U" or digital type pressure gauge connected to the pressure socket located above the sealed chamber (part. 9 Fig. 1-30) and the gas valve pressure outlet (part. 4 Fig. 3-3), keeping to the pressure value given in the table (Par. 3.18 / 3.21) according to the type of gas for which the boiler is prepared.

3.8 POSSIBLE ADJUSTMENTS

N.B.: to adjust the gas valve, remove the plastic cap (6); after adjusting, refit the cap.

- Preliminary calibration operations.
 - Set parameter P4 at 0 %.
 - Set parameter P5 at 99 %.
- Activate the chimney sweep function.
 - Enter the "DHW chimney sweep" mode, opening a DHW cock.
- Adjustment of boiler nominal thermal heat output.
 - Set the maximum output (99%) using the buttons (5 and 6 Fig. 2-1).
 - From the brass nut (3 Fig. 3-3) adjust the boiler nominal output, observing the maximum pressure values stated in the table (Par. 3.18 / 3.21) according to the type of gas; by turning clockwise the heat potential increases, anti-clockwise it decreases.
- Adjustment of boiler minimum thermal heat output.

N.B.: only proceed after having calibrated the nominal pressure.

- Set the minimum output (0%) using the buttons (5 and 6 Fig. 2-1).
- Adjust the minimum thermal input by operating on the cross plastic screws (2) on the gas valve maintaining the brass nut blocked (3);

Exit the "Chimney sweep" mode and keep the boiler functioning.

- Adjustment of the boiler minimum heat output in heating phase.

N.B.: only proceed after having calibrated the minimum boiler pressure.



- To adjust the minimum heat output during the heating phase, change parameter (P4), increasing the value the pressure increases, reducing it the pressure drops.
- The pressure to which the boiler minimum heat output must be adjusted, must not be lower than that stated in the tables (Par. 3.18 / 3.21).
- Adjustment (any) of the boiler maximum heat output in heating phase.
 - To adjust the maximum heat output during the heating phase, change parameter (P5), increasing the value the pressure increases, reducing it the pressure drops.
 - The pressure to which the boiler maximum heat output must be adjusted in central heating phase, must not be carried out in reference to that stated in the tables (Par. 3.18 / 3.21).

3.9 AUTOMATIC SLOW IGNITION FUNCTION WITH TIMED RAMP DELIVERY.



In ignition phase, the P.C.B. supplies constant gas with pressure proportional to the parameter "G2" set.

3.10 "CHIMNEY SWEEP FUNCTION".

When activated, this function forces the boiler to variable output for 15 minutes.

In this state all adjustments are excluded and only the safety thermostat and the limit thermostat remain active. To activate the chimney sweep function, press the Reset button (1) for 8 seconds in absence of DHW requests, its activation is signalled by the indication of the flow temperature and the flashing  and  symbols.

This function allows the technician to check the combustion parameters. Once the function is activated, it is possible to select whether to perform the check in CH status, regulating the parameters with buttons (5 and 6) or in DHW mode opening any DHW cock and always regulate the parameters with the buttons (5 and 6).

Functioning in CH or DHW mode is visualised by the relative flashing symbols  or .

On completion of the checks, deactivate the function by pressing the Reset button (1) for 8 seconds.

3.11 PUMP ANTI-BLOCK FUNCTION.

The boiler has a function that starts the pump once every 24 hours for the duration of 30 seconds in order to reduce the risk of the pump becoming blocked due to prolonged inactivity.

3.12 THREE-WAY ANTI-BLOCK SYSTEM.

The boiler is supplied with a function that activates the motorised three-way unit every 24 hours, carrying out a complete cycle in order to reduce the risk of three-way block due to prolonged inactivity.

3.13 RADIATORS ANTI-FREEZE FUNCTION.

If the system return water is below 4°C, the boiler starts up until reaching 42°C.

3.14 P.C.B. PERIODICAL SELF-CHECK.

During functioning in heating mode or with boiler in standby, the function activates every 18 hours after the last boiler check/power supply. In case of functioning in domestic hot water mode the self-check starts within 10 minutes after the end of the withdrawing in progress, for duration of approx. 10 seconds.

N.B.: during self-check, the boiler remains off, including signalling.

3.15 SOLAR PANELS COUPLING FUNCTION.

The boiler is set-up to receive pre-heated water from a system of solar panels up to a maximum temperature of 65°C. In all cases, it is always necessary to install a mixing valve on the hydraulic circuit upstream from the boiler on the cold water inlet.

Note: for good functioning of the boiler; the temperature selected on the solar valve must be 5°C greater with respect to the temperature selected on the boiler control panel.

For correct use of the boiler in this condition, parameter P3 (DHW thermostat) must be set at "1" and the parameter P9 (DHW ignition delay) at a temperature sufficient to receive water from a storage tank situated upstream from the boiler. The greater the distance from the storage tank, the longer the stand-by time to be set. When these regulations have been performed, when the boiler inlet water is at the same or greater temperature with respect to that set by the DHW selector switch, the boiler does not switch on.

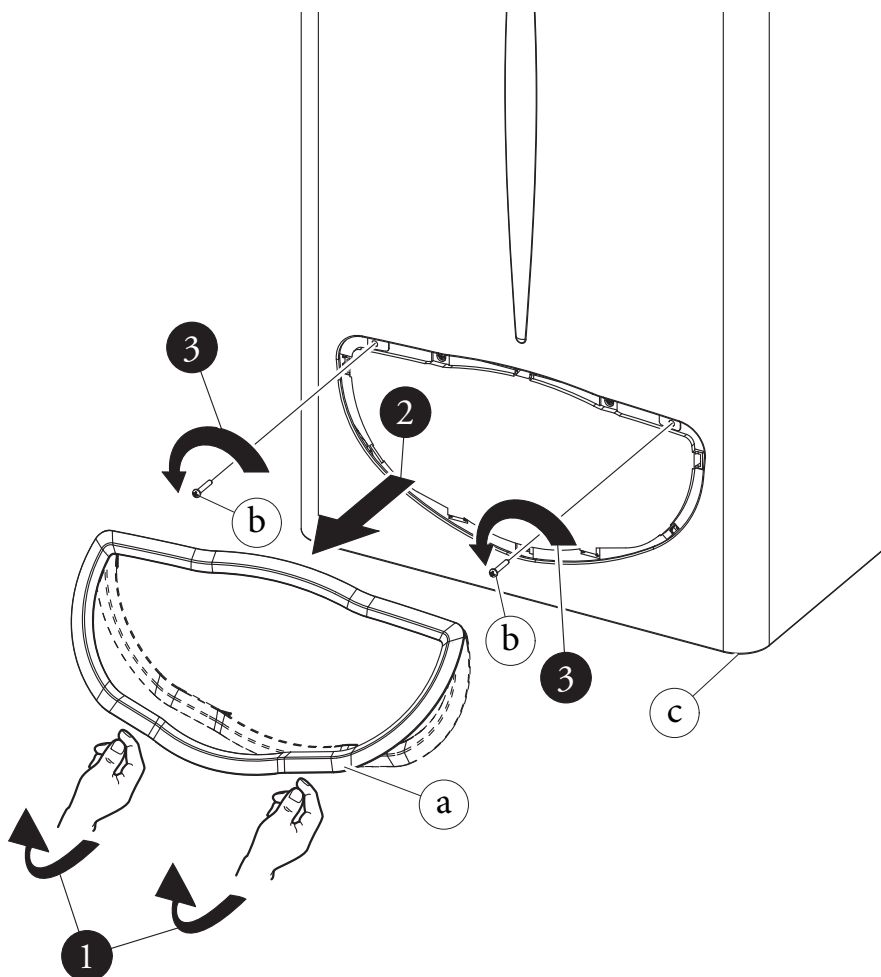
3.16 CASING REMOVAL.

To facilitate boiler maintenance the casing can be completely removed as follows: (Fig. 3-4 / 3-5):

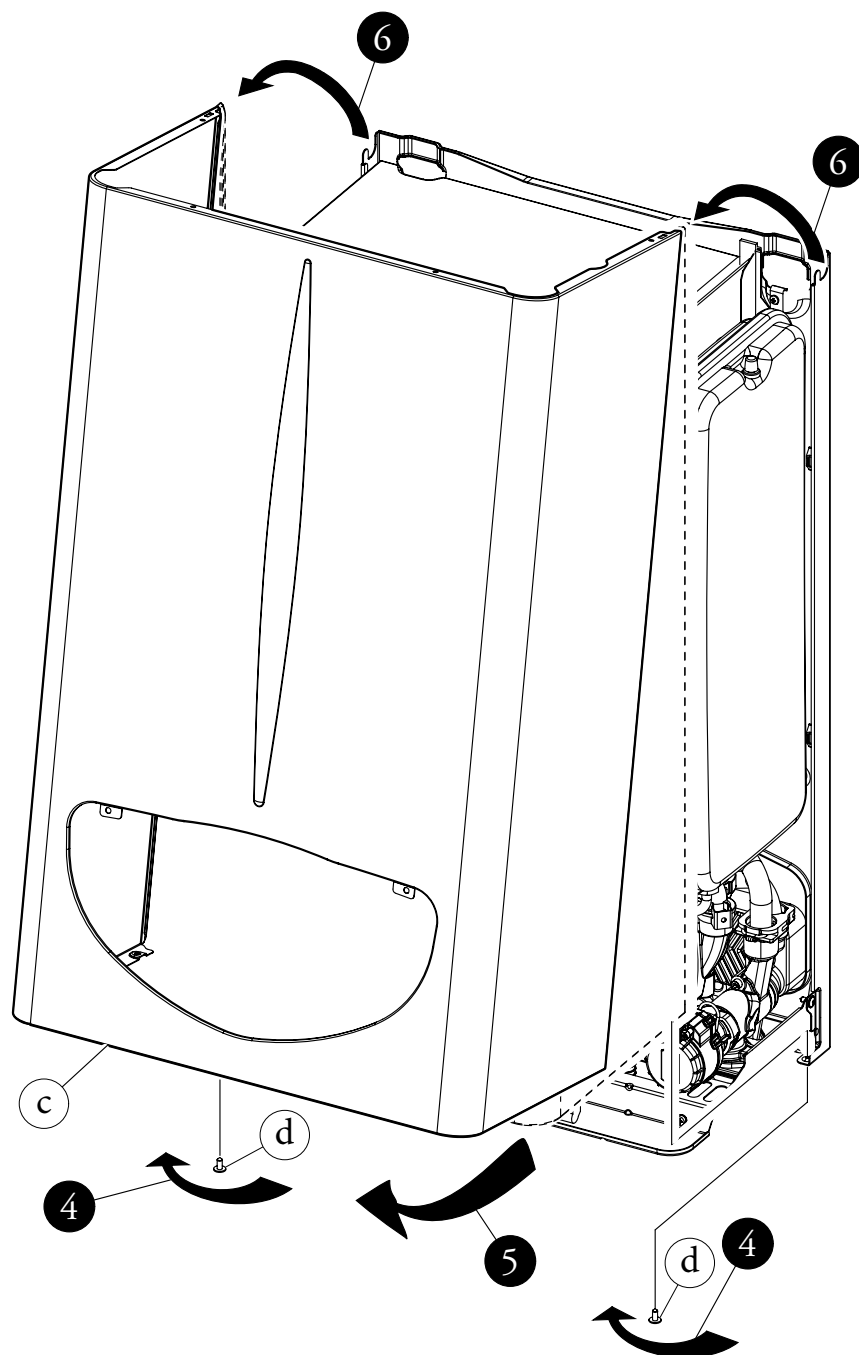
- 1 Unhook the decorative frame (a) from the relative lower retainers.
- 2 Remove the decorative frame (a) from the casing (c).
- 3 Loosen the 2 front screws (b) that fix the casing on.
- 4 Loosen the 2 lower screws (d) that fix the casing on.
- 5 Pull the case towards yourself (c).
- 6 Push the case (c) upwards at the same time to release it from the upper hooks.

Installation drawings key:

- a** Unmistakeable component identification
- 1** Sequential identification of the operation to perform



3-4



3.17 YEARLY APPLIANCE CHECK AND 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.
- Visually check the flue hood for deterioration or corrosion.
- Check correct lighting and operation.
- Ensure correct calibration of the burner in domestic water and heating phases.
- Check correct operation of control and adjustment devices and in particular:
 - intervention of main electrical switch positioned outside of the boiler;
 - system control thermostat intervention;
 - domestic hot water control thermostat intervention.
- Check sealing efficiency of gas circuit and the internal system.
- Check the intervention of the device against no gas ionisation flame control. Intervention time must be less than 10 seconds.
- Visually check for water leaks or oxidation from/on connections.
- Visually check that the water safety drain valve is not blocked.
- Check that, after discharging system pressure and bringing it to zero (read on boiler manometer), the expansion vessel charge is at 1.0 bar.
- Check that the system static pressure (with system cold and after refilling the system by means of 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;
 - water pressure switch;
 - air pressure switch
- Check the condition and integrity of the electrical system and in particular:
 - electrical power cables must be inside the fairleads;
 - there must be no traces of blackening or burning.

N.B.: when performing periodical maintenance of the appliance it is appropriate also to check and perform maintenance on the heating system, in compliance with that indicated by the regulations in force.

3.18 VARIABLE HEAT OUTPUT.

Attention: based on the boiler model (checking which type of fan is installed), use appropriate data.

N.B.: the pressures indicated in the table represent the difference in existing pressures between the gas valve outlet and the combustion chamber. The adjustments should therefore, be carried out using a differential manometer (small "U"-shaped column or digital manometer) with the probes inserted in the pressure test gas valve outlet and on the sealed chamber positive pressure test. The power data in the table has been obtained with intake-exhaust pipe measuring 0.5 m in length. Gas flow rates refer to heating power below a temperature of 15°C and at a pressure of 1013 mbar. Burner pressure values refer to use of gas at 15°C.

FAN POWER: 30W

			METHANE (G20)			BUTANE (G30)			PROPANE (G31)			
HEAT THERMAL	HEAT THERMAL	CH + D.H.W.	GAS FLOW RATE BURNER	PRESS. NOZZLE BURNER		GAS FLOW RATE BURNER	PRESS. NOZZLE BURNER		GAS FLOW RATE BURNER	PRESS. NOZZLE BURNER		
(kW)	(kcal/h)		(m³/h)	(mbar)	(mm H₂O)	(kg/h)	(mbar)	(mm H₂O)	(kg/h)	(mbar)	(mm H₂O)	
24.0	20640		2.71	11.19	114.1	2.03	27.77	283.2	1.99	35.95	366.6	
23.0	19780		2.60	10.39	106.0	1.94	25.32	258.2	1.91	33.35	340.1	
22.5	19353		2.55	10.00	102.0	1.90	24.15	246.3	1.87	32.10	327.4	
21.0	18060		2.39	8.88	90.6	1.78	20.82	212.3	1.75	28.47	290.3	
20.0	17200		2.28	8.17	83.3	1.70	18.76	191.3	1.67	26.18	267.0	
19.0	16340		2.17	7.48	76.3	1.62	16.82	171.6	1.59	23.98	244.6	
18.0	15480		2.06	6.83	69.6	1.54	15.01	153.1	1.52	21.88	223.1	
17.0	14620		1.96	6.20	63.2	1.46	13.32	135.8	1.44	19.86	202.5	
16.0	13760		1.85	5.59	57.0	1.38	11.74	119.7	1.36	17.93	182.8	
15.0	12900		1.74	5.01	51.1	1.30	10.29	104.9	1.28	16.09	164.1	
14.0	12040		1.63	4.46	45.5	1.22	8.94	91.2	1.20	14.33	146.1	
13.0	11180		1.52	3.93	40.1	1.14	7.72	78.7	1.12	12.66	129.1	
12.0	10320		1.41	3.42	34.9	1.06	6.62	67.5	1.04	11.07	112.9	
11.0	9460		1.30	2.94	30.0	0.97	5.63	57.4	0.96	9.57	97.6	
10.0	8600		1.19	2.49	25.4	0.89	4.76	48.6	0.88	8.15	83.1	
9.3	7998		1.11	2.18	22.3	0.83	4.23	43.1	0.82	7.20	73.4	
8.0	6880		D.H.W.	0.97	1.65	16.8	0.72	3.40	34.7	0.71	5.56	56.7
7.2	6192			0.88	1.34	13.7	0.65	3.00	30.6	0.64	4.63	47.2

3.19 COMBUSTION PARAMETERS.

FAN POWER: 30W

		G20	G30	G31
Gas nozzle diameter	mm	1.35	0.79	0.79
Supply pressure	mbar (mm H ₂ O)	20 (204)	29 (296)	37 (377)
Flue flow rate at nominal heat output	kg/h	59	53	54
Flue flow rate at min heat output	kg/h	61	59	52
CO ₂ at Nom Q /Min.	%	6.20 / 1.80	8.00 / 2.20	7.85 / 2.45
CO with 0% O ₂ at Nom Q /Min.	ppm	74 / 138	135 / 152	93 / 123
NO _x with 0% O ₂ at Nom Q /Min.	mg/kWh	95 / 65	127 / 76	115 / 67
Flue temperature at nominal output	°C	96	106	105
Flue temperature at minimum output	°C	86	94	96

3.20 TECHNICAL DATA.

FAN POWER: 30W

Nominal heat input	kW (kcal/h)	25.6 (22051)
DHW minimum heat input	kW (kcal/h)	8.3 (7117)
CH minimum heat input	kW (kcal/h)	10.5 (9057)
Nominal heat output (useful)	kW (kcal/h)	24.0 (20640)
DHW minimum heat output (useful)	kW (kcal/h)	7.2 (6192)
CH minimum heat output (useful)	kW (kcal/h)	9.3 (7998)
Efficiency at nominal heat output	%	93.6
Efficiency at 30% nominal heat output load	%	90.3
Heat loss at case with burner On/Off	%	0.80 / 0.60
Heat loss at flue with burner On/Off	%	5.60 / 0.06
Central heating circuit max. operating pressure	bar	3
Central heating circuit max. operating temperature	°C	90
Adjustable central heating temperature	°C	35 - 85
System expansion vessel total volume	l	4.0
Expansion vessel factory-set pressure	bar	1
Water content in generator	l	2.5
Head available with 1000 l/h flow rate	kPa (m H ₂ O)	24.52 (2.5)
Hot water production useful heat output	kW (kcal/h)	24.0 (20640)
Domestic hot water adjustable temperature	°C	30 - 60
Domestic hot water circuit flow limiter at 2 bar	l/min	7.1
Min. operating pressure (dynamic) domestic hot water circuit	bar	0.3
Max. operating pressure of the DHW circuit	bar	10
Minimum D.H.W. flow rate	l/min	1.5
Specific flow rate (ΔT 30°C)	l/min	11.5
Flow rate capacity in continuous duty (ΔT 30°C)	l/min	11.8
Weight of full boiler	kg	34.5
Weight of empty boiler	kg	32.0
Electrical connection	V/Hz	230/50
Nominal absorption	A	0.66
Installed electric output	W	130
Pump consumption	W	87.0
Fan power consumption	W	35.0
Equipment electrical system protection	-	IPX5D
NO _{x class}	-	3
Weighted NO _x	mg/kWh	138
Weighted CO	mg/kWh	95
Type of appliance	C12 / C32 / C42 / C52 / C82 / B22 / B32	
Category	II2H3+	

- The data relevant 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 to obtain the data declared mixing with cold water is necessary.
- The max. sound level emitted during boiler operation is < 55dBA. The sound level value is referred to semianechoic chamber tests with boiler operating at max. heat output, with extension of flue gas exhaust system according to product standards.

3.21 VARIABLE HEAT OUTPUT. FAN POWER: 33W / 39W

			METHANE (G20)			BUTANE (G30)			PROPANE (G31)		
HEAT THERMAL	HEAT THERMAL		GAS FLOW RATE BURNER	PRESS. NOZZLE BURNER		GAS FLOW RATE BURNER	PRESS. NOZZLE BURNER		GAS FLOW RATE BURNER	PRESS. NOZZLE BURNER	
(kW)	(kcal/h)		(m³/h)	(mbar)	(mm H ₂ O)	(kg/h)	(mbar)	(mm H ₂ O)	(kg/h)	(mbar)	(mm H ₂ O)
24.0	20640	CH + D.H.W.	2.71	12.51	127.6	2.03	29.01	295.8	1.99	36.80	375.3
23.0	19780		2.60	11.53	117.6	1.94	26.65	271.7	1.91	34.07	347.4
22.5	19353		2.55	11.06	112.8	1.90	25.52	260.2	1.87	32.76	334.0
21.0	18060		2.39	9.70	99.0	1.78	22.29	227.3	1.75	28.95	295.2
20.0	17200		2.28	8.86	90.3	1.70	20.28	206.8	1.67	26.55	270.8
19.0	16340		2.17	8.06	82.2	1.62	18.38	187.5	1.59	24.26	247.4
18.0	15480		2.06	7.30	74.4	1.54	16.60	169.2	1.52	22.06	225.0
17.0	14620		1.96	6.58	67.1	1.46	14.92	152.1	1.44	19.97	203.7
16.0	13760		1.85	5.91	60.2	1.38	13.34	136.0	1.36	17.98	183.3
15.0	12900		1.74	5.27	53.7	1.30	11.87	121.1	1.28	16.08	163.9
14.0	12040		1.63	4.68	47.7	1.22	10.51	107.1	1.20	14.27	145.5
13.0	11180		1.52	4.12	42.0	1.14	9.24	94.3	1.12	12.56	128.1
12.0	10320		1.41	3.61	36.8	1.06	8.09	82.5	1.04	10.94	111.6
11.0	9460		1.30	3.13	31.9	0.97	7.03	71.7	0.96	9.42	96.0
10.0	8600		1.19	2.70	27.5	0.89	6.09	62.1	0.88	7.99	81.5
9.3	7998	D.H.W.	1.11	2.42	24.7	0.83	5.49	56.0	0.82	7.05	71.8
8.0	6880		0.97	1.96	20.0	0.72	4.52	46.1	0.71	5.42	55.3
7.2	6192		0.88	1.71	17.4	0.65	4.02	41.0	0.64	4.50	45.9

3.22 COMBUSTION PARAMETERS. FAN POWER: 33W / 39W

		G20	G30	G31
Gas nozzle diameter	mm	1.35	0.79	0.79
Supply pressure	mbar (mm H ₂ O)	20 (204)	29 (296)	37 (377)
Flue flow rate at nominal heat output	kg/h	55	55	56
Flue flow rate at min heat output	kg/h	45	43	42
CO ₂ at Nom Q /Min.	%	6.65 / 2.50	7.70 / 3.00	7.50 / 3.10
CO with 0% O ₂ at Nom Q /Min.	ppm	92 / 80	137 / 95	90 / 80
NO _x with 0% O ₂ at Nom Q /Min.	mg/kWh	180 / 140	260 / 160	240 / 160
Flue temperature at nominal output	°C	101	103	101
Flue temperature at minimum output	°C	94	96	99

3.23 TECHNICAL DATA. FAN POWER: 33W / 39W

Electrical connection	V/Hz	230/50
Nominal absorption	A	0.66
Installed electric output	W	130
Pump consumption	W	87.0
Fan power consumption	W	35.0
Equipment electrical system protection	-	IPX5D
NO _{x class}	-	3
Weighted NO _x	mg/kWh	138
Weighted CO	mg/kWh	95
Type of appliance	C12 / C32 / C42 / C52 / C82 / B22 / B32	
Category	II2H3+	

INSTALLER

USER

MAINTENANCE TECHNICIAN

3.24 DATA PLATE KEY.

Md		Cod. Md	
Sr N°	CHK	Cod. PIN	
Type			
Q _{nw} /Q _n min.	Q _{nw} /Q _n max.	P _n min.	P _n max.
PMS	PMW	D	TM
NO _x Class			

Note: the technical data are shown on the boiler data plate

	IE
Md	Model
Cod. Md	Model code
Sr N°	Serial Number
CHK	Check
Cod. PIN	PIN code
Type	Type of installation
Q _{nw} min.	Minimum heating capacity (domestic)
Q _n min.	Minimum heating capacity (heating)
Q _{nw} max.	Maximum heating capacity (domestic)
Q _n max.	Maximum heating capacity (heating)
P _n min.	Minimum heat output
P _n max.	Maximum heat output
PMS	Maximum pressure (system)
PMW	Maximum pressure (domestic)
D	Specific flow rate
TM	Maximum working temperature
NO _x Class	Nox Class

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