

MINI EOLO 283 E

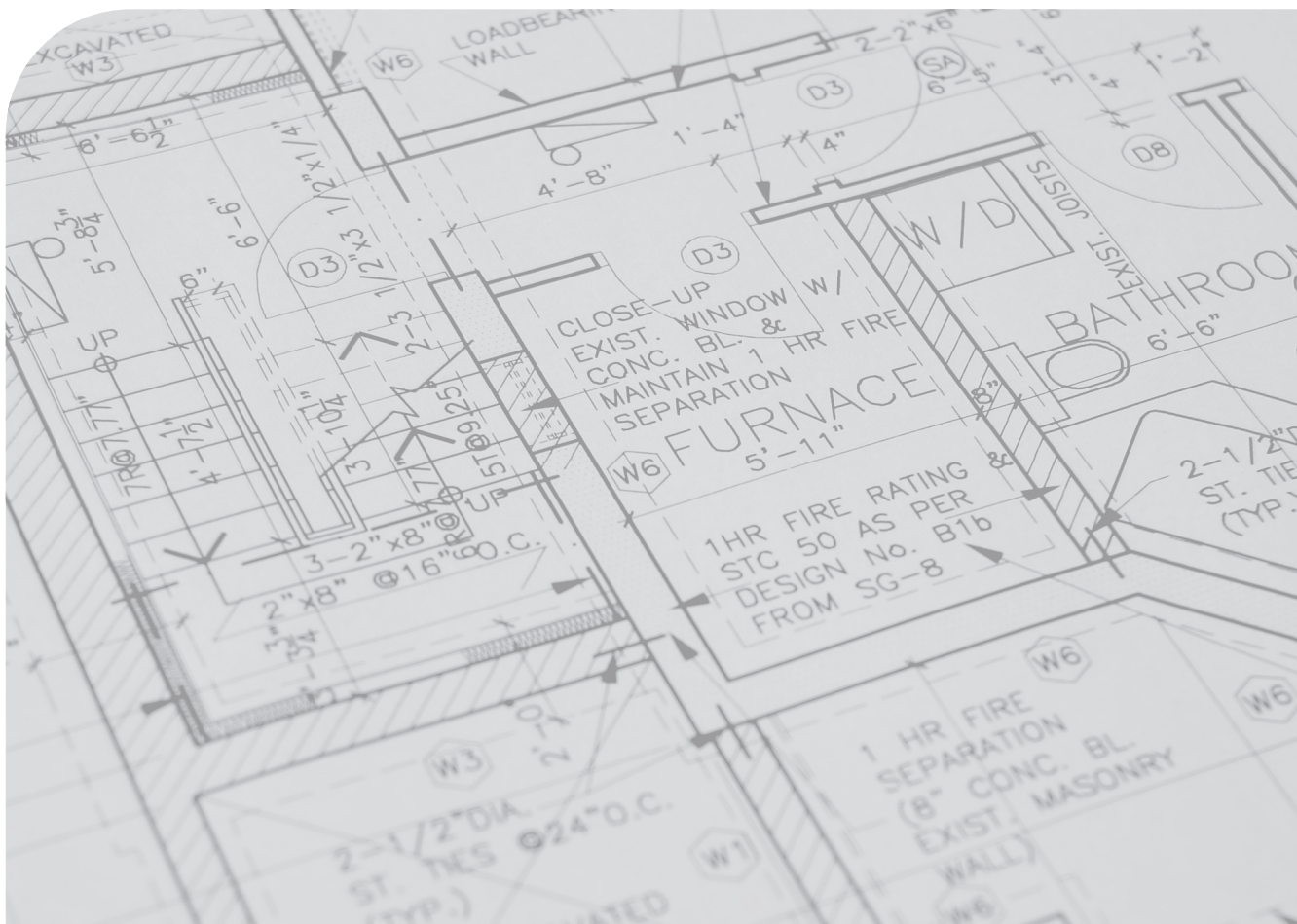
IE

Instructions and recommendations

Installer

User

Maintenance technician



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. Contact our area authorised after-sales centre as soon as possible to request commissioning. Our technician will verify the correct functioning conditions; he will perform the necessary calibrations and will demonstrate the correct use of the generator.

For assistance and scheduled maintenance contact Authorised 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 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.

Product not intended for EU countries

The manufacturer declines all liability due to printing or transcription errors, reserving the right to make any modifications to its technical and commercial documents without forewarning.

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1 BOILER INSTALLATION

1.1 INSTALLATION RECOMMENDATIONS.

The Mini Eolo 28 3 E boiler has been designed for wall mounted installation; they must be used to heat environments, to produce domestic hot water and similar purposes. In the case of wall installation 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
- **Type C boiler** 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 qualified heating/plumbing technicians are authorised to install Immergas gas appliances. Installation must be carried out according to the standards, current legislation and in compliance with local technical regulations and the required technical procedures. Installation of the Mini Eolo 28 3 E 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).

Attention: the manufacturer declines all liability for damages caused by boilers removed from other systems or for any non-conformities of such equipment.

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 (if not conveyed away by a discharge funnel), or if there are leaks from the connections; on the contrary, the manufacturer cannot be held responsible for any damage caused to the household appliances.

In the event of malfunctions, faults or incorrect operation, turn the appliance off immediately and contact a qualified technician (e.g. the Authorized 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 regulations:** this boiler can be installed outside in a partially protected area. A partially protected location is one in which the appliance is not exposed to the direct action of the weather (rain, snow, hail, etc.).

Important: 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.

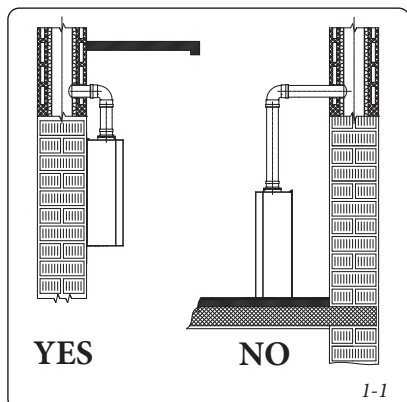
These boilers are used to heat water to below boiling temperature in atmospheric pressure. They must be attached to a heating system suitable for their capacity and voltage.

They cannot be connected directly to low-temperature systems.

INSTALLER

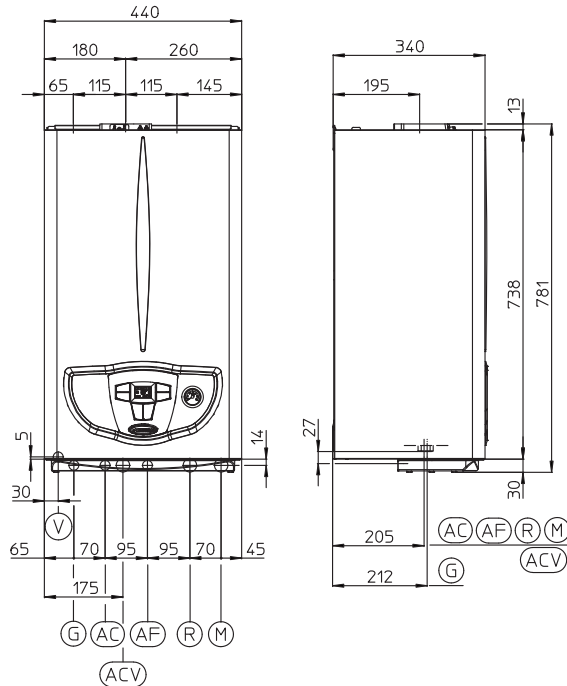
USER

MAINTENANCE TECHNICIAN



1.2 MAIN DIMENSIONS.

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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		340	
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. The boiler is supplied with an antifreeze 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 (Par. 2.5);
- the boiler essential components are not faulty.

In these conditions the boiler is protected against freezing to an environmental 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:

- Protect the heating circuit from freezing by adding a high quality anti-freeze liquid that is not considered a health hazard. It is necessary to carefully follow manufacturer instructions regarding this liquid when considering the percentage necessary that depends on the minimum temperature the system is to be protected from. An aqueous solution must be prepared with a potential water pollution potential of 2 (EN 1717:2002).

The materials that Immergas boilers are made from are resistant to ethylene and propylene glycol-based anti-freeze liquids (If the mixtures have been prepared according to industry standards).

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

- Protect the domestic hot water circuit 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;
- main switch is inserted;
- 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) and 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, 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.

Important: 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.

In compliance with Standards in force it is mandatory to treat the water in the heating system chemically in order to protect the system and appliance from deposits of lime scale.


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

Important: the manufacturer declines all liability in the event of damage caused by the installation of an automatic filling system.

Important: 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 28 3 E" boiler has an IPX5D protection rating for the entire appliance. Electrical safety of the unit is reached when it is correctly connected to an efficient earthing system as specified by current safety standards.

Important: the manufacturer 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 an "X" type power cable without plug. The power supply cable must be connected to a 230V $\pm 10\%$ / 50Hz network respecting the L-N polarity and the earth connection . An omnipolar disconnection must be envisioned on this network with a class III overvoltage category. When replacing the power supply cable, contact a qualified technician (e.g. the After-Sales Technical Assistance Service). The power cable must be laid as shown.

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 TIMER THERMOSTAT (OPTIONAL).

The boiler is prepared for the application of room chronothermostats or remote controls, which are available as optional kits (Fig. 1-3).

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

- On/Off digital chronothermostat. The timer thermostat allows:
 - to set two room temperature values: one for day (comfort temperature) and one for night (lower temperature);
 - to set up to four on/off differential weekly programs;
 - to select the required operating mode from the various possible alternatives:
 - permanent functioning in comfort temp;
 - permanent functioning in reduced temp;
 - permanent functioning in adjustable anti-freeze temp.

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

- Comando Amico Remoto^{V2} Remote Control Device (CAR^{V2}) with climate timer 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 chronothermostat 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 timer thermostat is fed directly by the boiler by means of the same 2 wires used for the transmission of data between boiler and timer thermostat.

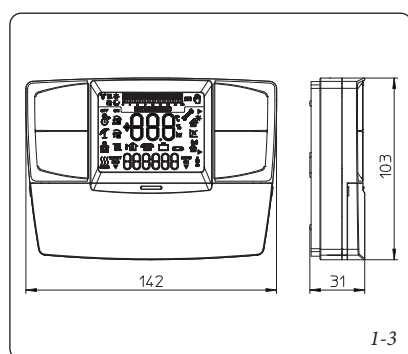
Important: if the system is subdivided into zones using the relevant kit, the CAR^{V2} must be used with its climate thermostat function disabled, i.e. it must be set to On/Off mode.

Comando Amico Remoto remote control^{V2} or On/Off timer 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 chronothermostat must be connected to clamps 40 and 41 eliminating jumper X40 (Fig. 3-2). Make sure that the On/Off thermostat contact is of the “clean” type, i.e. independent of the mains supply, otherwise the electronic adjustment card would be damaged. Any Comando Amico Remoto^{V2} remote control 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).

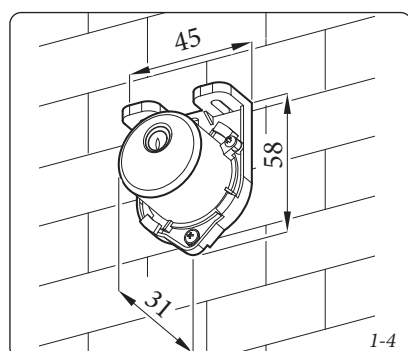
Important: if the Remote Friend Control^{V2}, remote control^{V2} or any other On/Off chronothermostat is used arrange two separate lines in compliance with current regulations regarding electrical systems. No boiler pipes must ever be used to earth the electric system or telephone lines. Ensure elimination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

1.6 EXTERNAL PROBE (OPTIONAL).

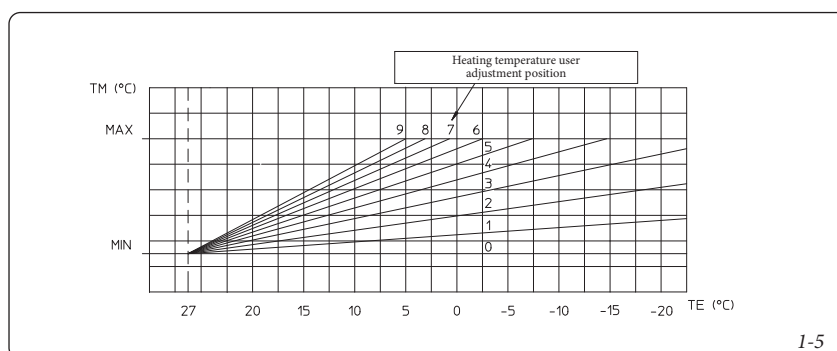
The boiler is prepared for the application of the external probe (Fig. 1-4), which is available as an optional kit. The probe can be connected directly to the boiler electrical system and allows the max. system flow temperature to be automatically decreased when the external temperature increases, in order to adjust the heat supplied to the system according to the change in external 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 external temperature is determined by the position of the selector switch on the boiler control panel according to the curves shown in the diagram (Fig. 1-5). The electric connection of the external probe must be made on clamps 38 and 39 on the boiler P.C.B. (Fig. 3-2).



1-3



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1.7 IMMERGAS FLUE SYSTEMS.

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

Important: The boiler must only be installed together with an original Immergas air intake and flue gas exhaust system. 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. 1-6).

- Resistance factors and equivalent lengths. Each flue extraction system 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 or the actual dimensions. 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 enables calculations to be made in order to verify the possibility of various configurations of flue extraction systems.

1.8 OUTDOOR INSTALLATION IN PARTIALLY PROTECTED AREA.

N.B.: *a partially protected area 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 fan assisted.**

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. 1-8). Air intake takes place directly from the environment in which the boiler is installed and flue exhaust in individual flue or to the outside.

In this configuration the boiler is classified as type B₂₂.

With this configuration:

- air intake takes place directly from the environment in which the boiler is installed and only functions in permanently ventilated rooms;
- the flue exhaust must be connected to its own individual flue or channelled directly into the external atmosphere.

The technical regulations in force must be respected.

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

Max. length of exhaust duct. The flue pipe (vertical or horizontal) can be *extended to a max. length of 12 m straight route, using insulated pipes* (Fig. 1-27). To prevent problems of fume condensate in the exhaust pipe Ø 80, due to fume cooling through the wall, *the length of the pipe (not insulated) must be limited to just 5 m.*

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. 1-9). The term W must only be considered if the balcony above has closed balustrade (W=0 if the balustrade is open).

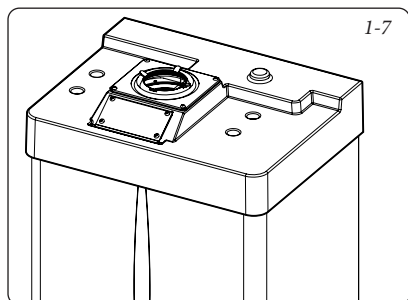
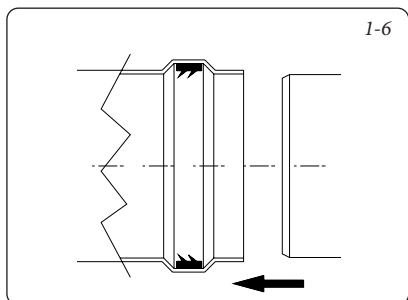
- **Configuration without cover kit (boiler type C).**

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 top cover kit guarantees additional protection for the boiler. It is recommended but not compulsory.

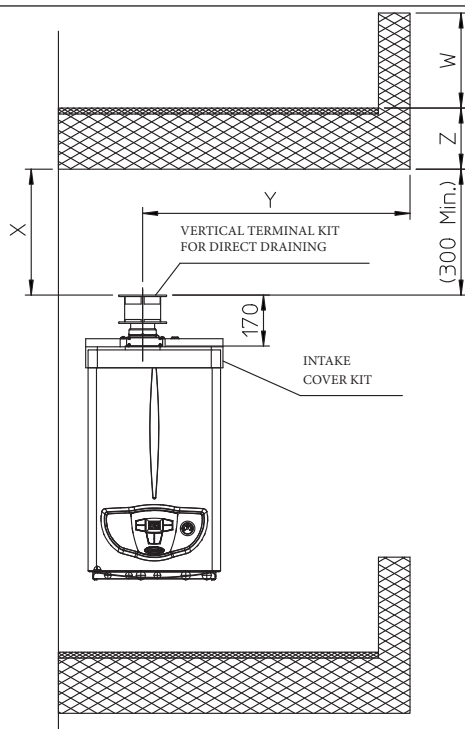
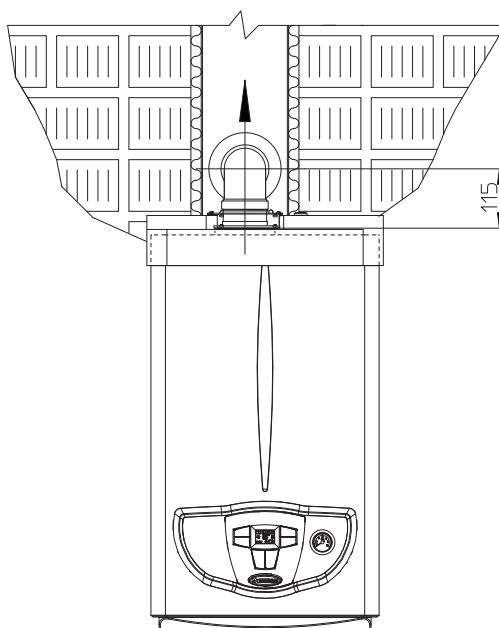
Diaphragm installation. For correct functioning of the boiler it is necessary to install a diaphragm on the outlet of the sealed chamber and before the intake and exhaust pipe (Fig. 1-10). The choice of suitable diaphragm takes place on the basis of the type of pipe and its maximum extension: this calculation can be carried out using the following tables:

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

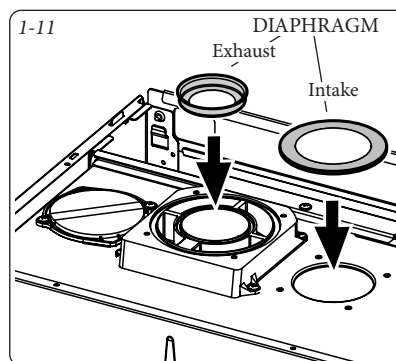
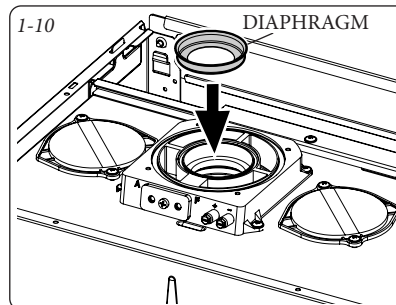
Intake diaphragm installation. For correct boiler functioning with Ø 80 separator kits and drain measuring > 1 m a diaphragm Ø 47 must be installed on the sealed chamber intake hole and before the intake pipe (Fig. 1-11). The choice of suitable diaphragm takes place on the basis of the type of pipe and its maximum extension: this calculation can be carried out using the following tables:



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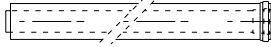


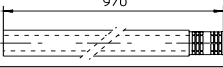

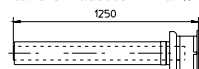
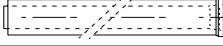




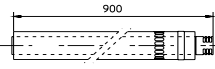
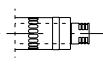


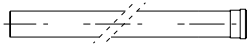
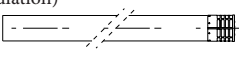



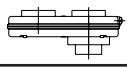


Type of installation (duct length in metres)	Diaphragm			
	Ø 38	Ø 40	Ø 42,5	WITHOUT
Ø 60/100 horizontal concentric kit	From 0 to 0.5	From 0.5 to 1.5	-	From 1.5 to 3.0
Ø 60/100 vertical concentric kit	From 0 to 2.2	From 2.2 to 3.7	-	From 3.7 to 4.7
Ø 80/125 horizontal concentric kit	From 0 to 0.5	From 0.5 to 4.6	-	From 4.6 to 7.4
Ø 80/125 vertical concentric kit	From 0 to 5.4	From 5.4 to 9.5	-	From 9.5 to 12.2
Ø 80 vertical separator kit without bends	*From 0 to 20	*From 20 to 40	**From 0 to 22	** From 22 to 33
Ø 80 horizontal separator kit with two bend	*From 0 to 16	*From 16 to 35	**From 0 to 17	** From 17 to 28
Direct intake kit and Ø 80 drain in B ₂₂ configuration	From 0 to 0.5	-	From 0.5 to 15	-

* These maximum extension values are considered intake with 1 metre drain pipe

** These maximum extension values are considered in draining with 1 metre intake pipe and Ø 47 diaphragm on the intake hole.

Tables of Resistance Factors and Equivalent Lengths.

DUCT TYPE	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 metres 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 concentric horizontal intake-exhaust Ø 60/100 	Intake and Exhaust 46	m 2.8	m 7.6	Intake m 20 Exhaust m 15
Concentric horizontal intake-exhaust terminal Ø 60/100 	Intake and Exhaust 32	m 1.9	m 5.3	Intake m 14 Exhaust m 10.6
Concentric vertical intake-exhaust terminal 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 concentric vertical intake-exhaust Ø 80/125 	Intake and Exhaust 33	m 2.0	m 5.5	Intake m 14.3 Exhaust m 11.0
Concentric vertical intake-exhaust terminal 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 concentric horizontal intake-exhaust Ø 80/125 	Intake and Exhaust 39	m 2.3	m 6.5	Intake m 16.9 Exhaust m 13
Concentric horizontal intake-exhaust terminal 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 air intake terminal Ø 80 m 1 (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
Split 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

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1.9 INDOOR INSTALLATION.

- **Type C configuration, sealed chamber and fan assisted.**

Horizontal intake - exhaust kit Ø60/100. Kit assembly (Fig. 1-12): install the bend with flange (2) onto the central hole of the boiler inserting the gasket (1) and tighten using the screws 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.

Note: when the boiler is installed in areas where very rigid temperatures can be reached, a special anti-freeze kit is available that can be installed as an alternative to the standard kit.

- Coupling extension pipes and concentric elbows Ø 60/100. To snap-fit extensions with other elements of the flue extraction elements, operate as follows engage the concentric pipe or elbow with the male side (smooth) on the female section (with lip seal) up to the stop on the previously installed element. This will ensure sealing and joining of the elements correctly.

The Ø 60/100 horizontal intake/exhaust kit can be installed with the rear, right side, left side and front outlet.

- Application with rear outlet (Fig. 1-13). The 970 mm pipe length enables routing through a maximum thickness of 710 mm. Normally the terminal must be shortened. Calculate the distance by adding the following values: Part thickness + internal projection + external

projection. The minimum indispensable projection values are given in the figure.

- Application with side outlet (Fig. 1-14); 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 horizontal intake-exhaust kit Ø 60/100 can be extended up to a *max. horizontal distance of 3,000 mm* including the terminal with grid 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 N°1 extension (Fig. 1-15). Max. distance between vertical boiler axis and external wall is 1855 mm.

Connection with N°2 extensions (Fig. 1-16). Max. distance between vertical boiler axis and external wall is 2805 mm.

Horizontal intake-exhaust kit Ø 80/125. Kit assembly (Fig. 1-17): install the bend with flange (2) onto 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) up to the stop on the female end 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 wall sealing plate and external wall sealing plate have been fitted, this will ensure sealing and joining of the elements making up the kit.

- Coupling extension pipes and concentric elbows Ø 80/125. To snap-fit extensions with other elements of the flue extraction elements, operate as follows engage the concentric pipe or elbow with the male side (smooth) on the female section (with lip seal) up to the stop on the previously installed element. This will ensure sealing and joining of the elements correctly.

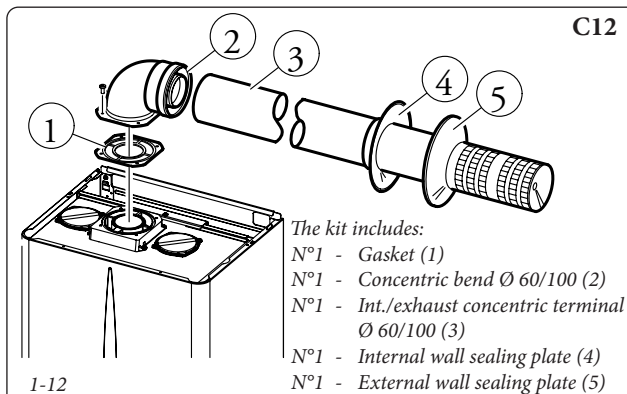
Important: if the exhaust terminal and/or extension concentric pipe needs shortening, consider that the internal pipe must always protrude by 5 mm with respect to the external pipe.

Normally the Ø 80/125 horizontal intake-exhaust kit is used if particularly long extensions are required; the Ø 80/125 kit can be installed with.

- 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. 1-18). This configuration corresponds to a resistance factor of 100. In these cases the special extensions must be requested.

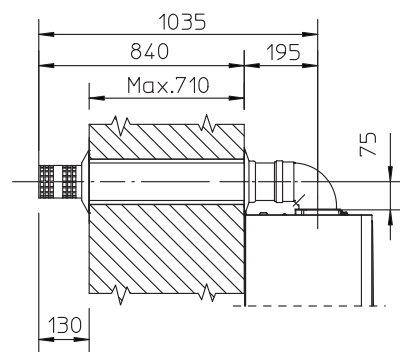
N.B.: when installing the ducts, a section clamp with pin must be installed every 3 metres.

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



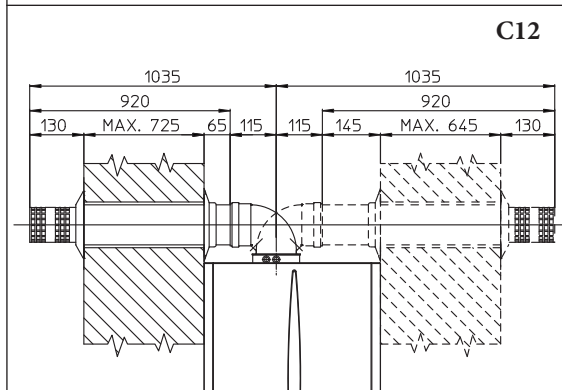
C12

1-12



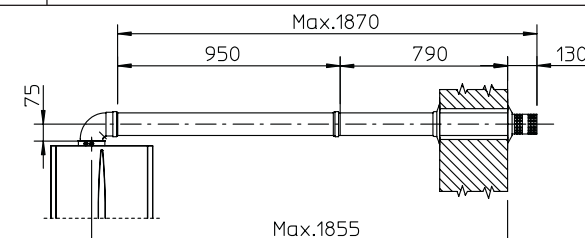
C12

1-13



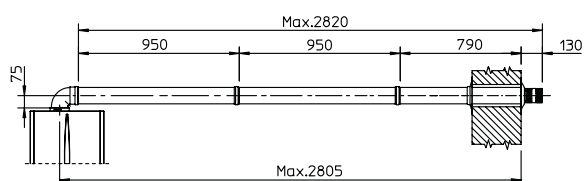
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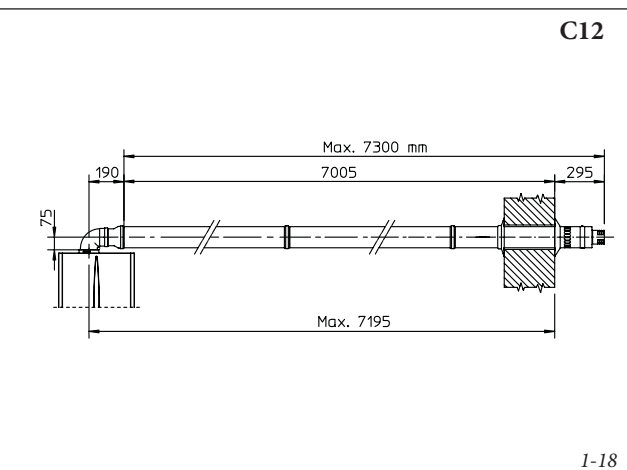
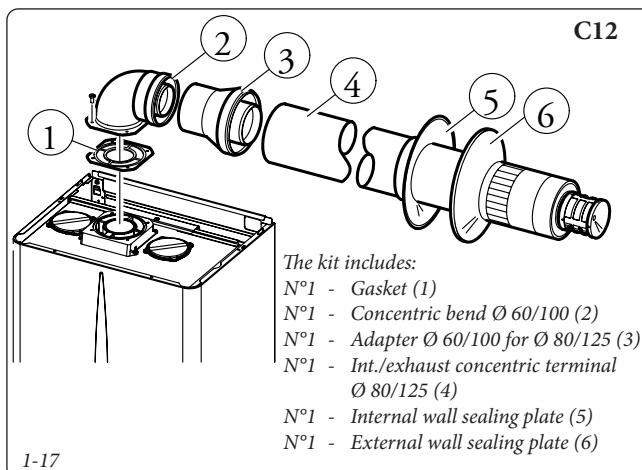
C12

1-15



C12

1-16



Vertical kit with aluminium tile Ø 80/125. Kit assembly (Fig. 1-19): 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) on the aluminium tile 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 has been fitted, this will ensure sealing and joining of the elements making up the kit.

- Coupling extension pipes and concentric elbows. To install push-fitting extensions with other elements of the flue extraction elements assembly, proceed as follows: engage the concentric pipe or elbow with the male side (smooth) on the female section (with lip seal) up to the stop on the previously installed element. This will ensure sealing and joining of the elements correctly.

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

This specific terminal enables flue exhaust and air intake, necessary for combustion, in a vertical direction.

N.B.: The Ø 80/125 vertical kit with aluminium tile enables installation on terraces and roofs with a maximum slope of 45% (25°) and the height between the terminal cap and half-shell (374 mm) must always be respected.

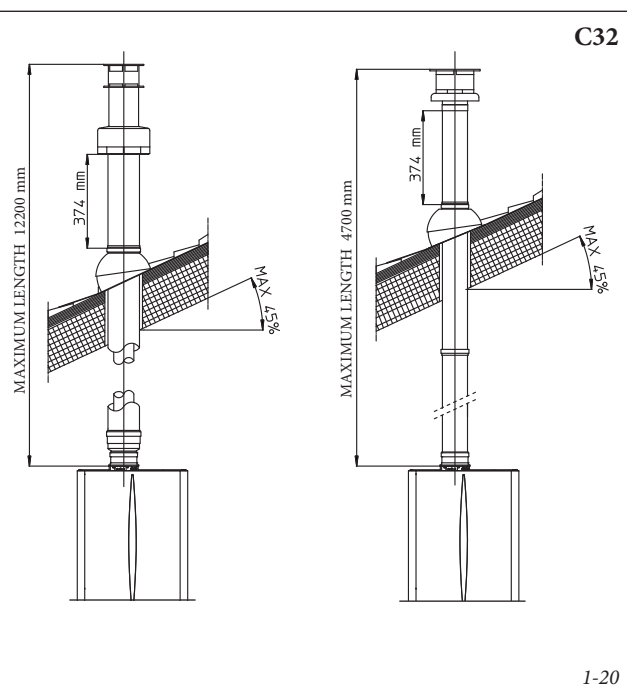
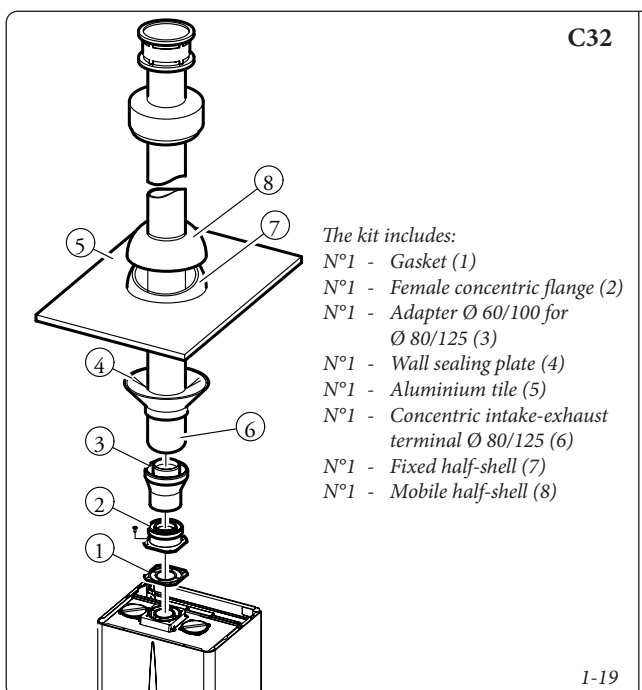
The vertical kit with this configuration can be extended up to a *maximum of 12,200 mm* vertical rectilinear, with the terminal included (Fig. 1-20). This configuration corresponds to a resistance factor of 100. In this case the special extensions must be requested.

The terminal Ø 60/100 can also be used for vertical exhaust, in conjunction with concentric flange code 3.011141 (sold separately). The height between the terminal cap and half-shell (374 mm) must always be respected.

The vertical kit with this configuration can be extended up to a *maximum of 4,700 mm* vertical rectilinear, with the terminal included (Fig. 1-20).

Separator kit Ø 80/80. The Ø 80/80 separator kit, allows separation of the exhaust flues and air intake pipes according to the diagram shown in the figure. Combustion products are expelled from pipe (S). 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.

- Kit assembly (Fig. 1-21): install flange (4) on the central hole of the boiler, fitting 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.

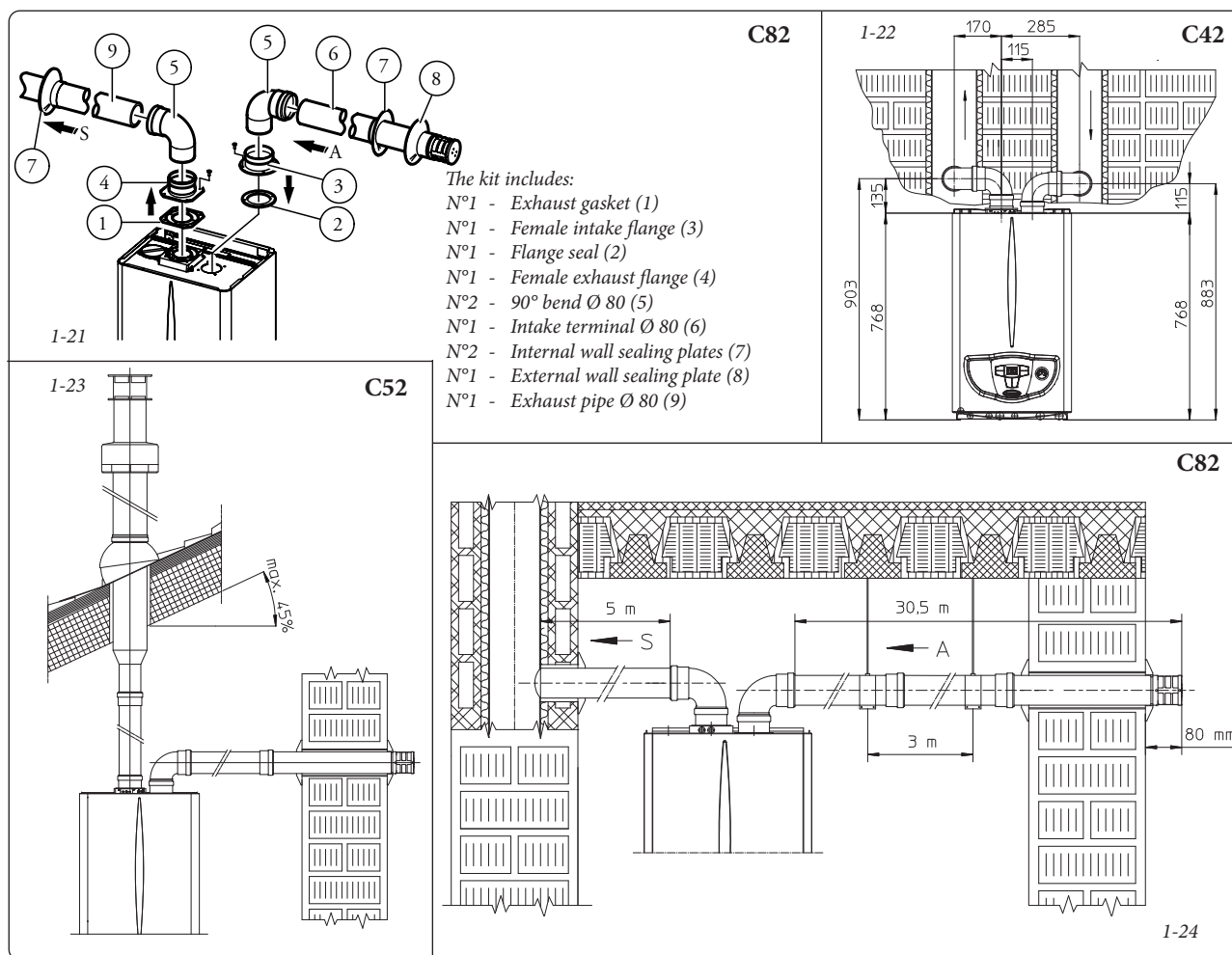
- Coupling of extension pipes and elbows. To install push-fitting extensions with other elements of the flue extraction elements assembly, proceed as follows: engage the pipe or elbow with the male side (smooth) in the female section (with lip seal) up to the stop on the

previously installed element. This will ensure sealing efficiency of the coupling.

- Installation clearances. Figure 1-22 gives the min. installation space dimensions of the Ø 80/80 separator terminal kit in limited conditions.
- Figure 1-23 shows the configuration with vertical exhaust and horizontal intake.
- Extensions for the separator kit Ø 80/80. The max. vertical straight length (without bends) that can be used for Ø 80 intake and exhaust pipes is 41 metres of which 40 intake and 1 exhaust. The total length corresponds to a resistance factor of 100. The total usable length

obtained by adding the length of the intake and exhaust pipes Ø 80, must not exceed the values stated in the following table. If *mixed accessories or components* are used (e.g. changing from a separator Ø 80/80 to a concentric pipe), the maximum extension can be calculated by using a resistance factor for each component or the *equivalent length*. The sum of these resistance factors must not exceed 100.

- Temperature loss in flue ducts. To prevent problems of fume 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. 1-24). If longer distances must



Maximum usable length (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*

Important: if installation requires extending the flue fittings up to the exhaust a length that exceeds the 12 m recommended, it is necessary to properly consider the possibility that condensation may form inside the duct and therefore Immergas "Serie Blu" insulated flue fittings, or other flue fittings with similar characteristics, should be used.

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 section clamp with pin must be installed every 3 metres.

Insulated separator kit Ø 80/80. Kit assembly (Fig. 1-25): install flange (4) on the central hole of the boiler, fitting 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.

- Coupling extension pipes and elbows. To snap-fit extensions with other elements of the fume extraction elements, operate as follows: engage the concentric pipe or elbow with the male side (smooth) on the female section (with lip seal) up to the stop on the previously installed element. This will ensure sealing and joining of the elements correctly.
- 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. 1-26 and 1-27) illustrate different applications of insulated pipes.

Insulated pipes are formed of 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 fume condensate in the exhaust pipe Ø 80, due to fume cooling through the wall, *the length of the pipe must be limited to 12 m*. The figure (Fig. 1-27) 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 flue gas condensate.

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

• Configuration type B, open chamber and fan assisted.

When using type B installation configuration indoors, it is compulsory to install the relative upper cover kit along with the fumes discharge kit. The air intake comes directly from the area where the boiler is installed and from the flue exhaust in each single flue or directly from outdoors. The boiler in this configuration, following the assembly instructions stated in the par. 1.8 is classified as type B.

With this configuration:

- air intake takes place directly from the environment in which the boiler is installed and only functions in permanently ventilated rooms;
- the flue exhaust must be connected to its own individual flue or channelled directly into the external atmosphere.
- 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.

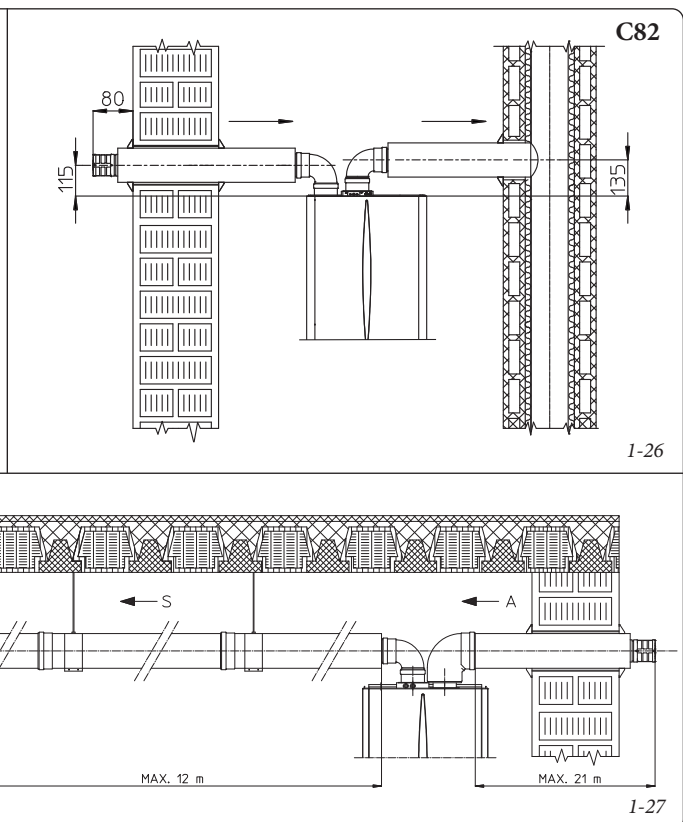
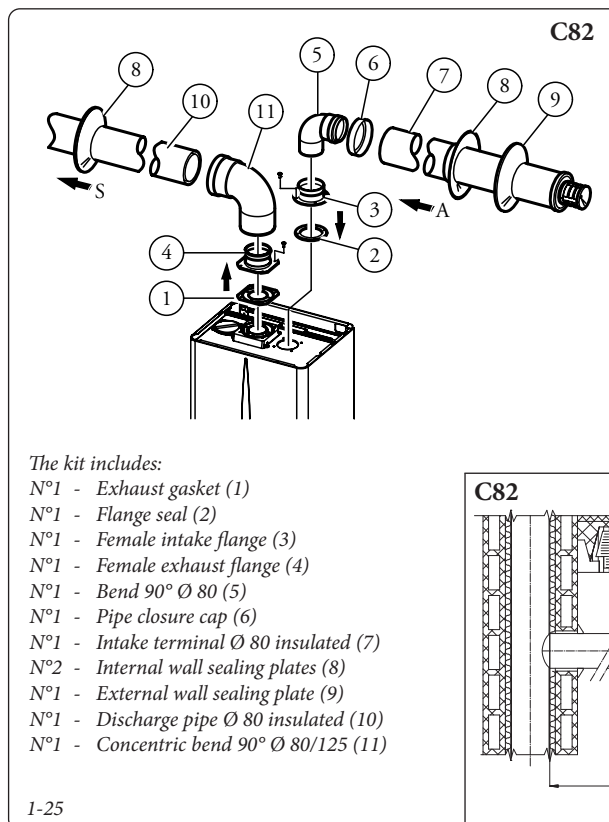
On installation indoors in type B configuration it is mandatory to install the relevant top cover kit along with the flue gas exhaust kit.

The technical regulations in force must be respected.

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1.10 FLUE EXHAUST TO FLUE/CHIMNEY.

Flue gas 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.

1.11 DUCTING OF EXISTING FLUES.

With a specific "ducting system" it is possible to reuse existing flues, chimneys and technical openings to discharge the boiler flue gases. 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 of standards.

1.12 FLUES, CHIMNEYS AND CHIMNEY CAPS.

The flues, chimneys and chimney caps for the evacuation of combustion products must be in compliance with applicable standards.

Positioning the draught terminals. The draught 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 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.

1.13 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 pump. *Check if the cap is loose.*

Open the radiator air vent valves. Close radiator vent valves only when 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 switch 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.

1.14 GAS SYSTEM START-UP.

To start up the system proceed as follows:

- 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.

1.15 BOILER START-UP (IGNITION).

For issue of the envisioned Declaration of Conformity, the following must be performed for boiler start-up:

- check that the internal system is properly sealed according to specifications;
- make sure that the type of gas used corresponds to boiler settings;
- switch the boiler on and check correct ignition;
- make sure that the gas flow rate and relevant pressure values comply with those given in the manual (par. 3.18);
- 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 intake/exhaust concentric 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 boiler preliminary check must be carried out by a qualified technician. The conventional boiler warranty is valid as of the date of testing. The test certificate and warranty is issued to the user.

1.16 CIRCULATION PUMP.

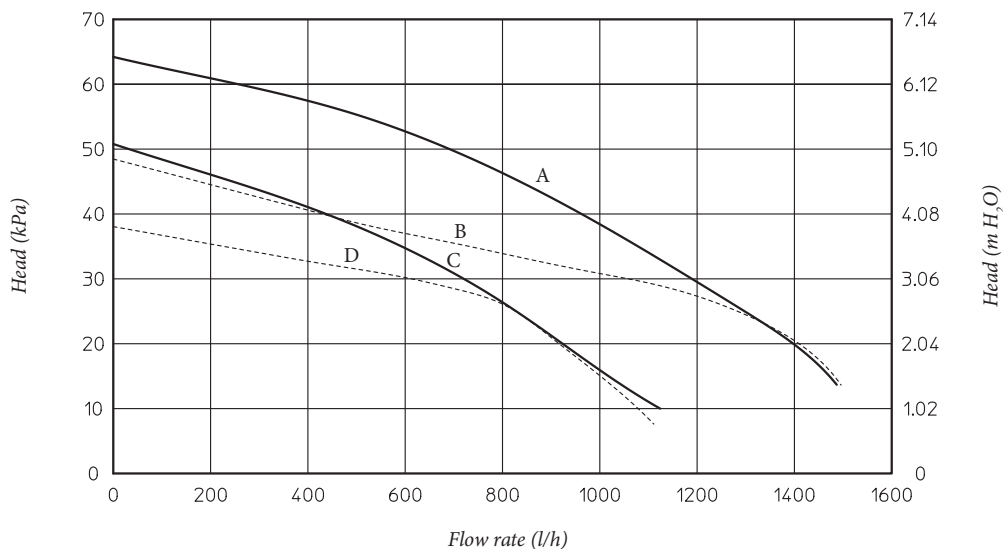
The boilers are supplied with a built-in circulation pump with 3-position electric speed control. The boiler does not operate correctly with the circulation pump on first speed. To ensure optimal boiler operation, in the case of new systems (single pipe and module) it is recommended to use the pump at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

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. 1-29). If necessary, the by-pass can be regulated according to plant requirements from a minimum (by-pass

excluded) to a maximum (by-pass inserted) represented by the following graphics (Fig. 1-28). Make the regulation using a flat head screwdriver, turn clockwise and insert the by-pass, anti-clockwise it is excluded.

Total head available to the system.



- A = Head available to the system at maximum speed with by-pass excluded.
 B = Head available to the system at maximum speed with by-pass inserted.
 C = Head available to the system at second speed with by-pass excluded.
 D = Head available to the system at second speed with by-pass inserted.

1-28

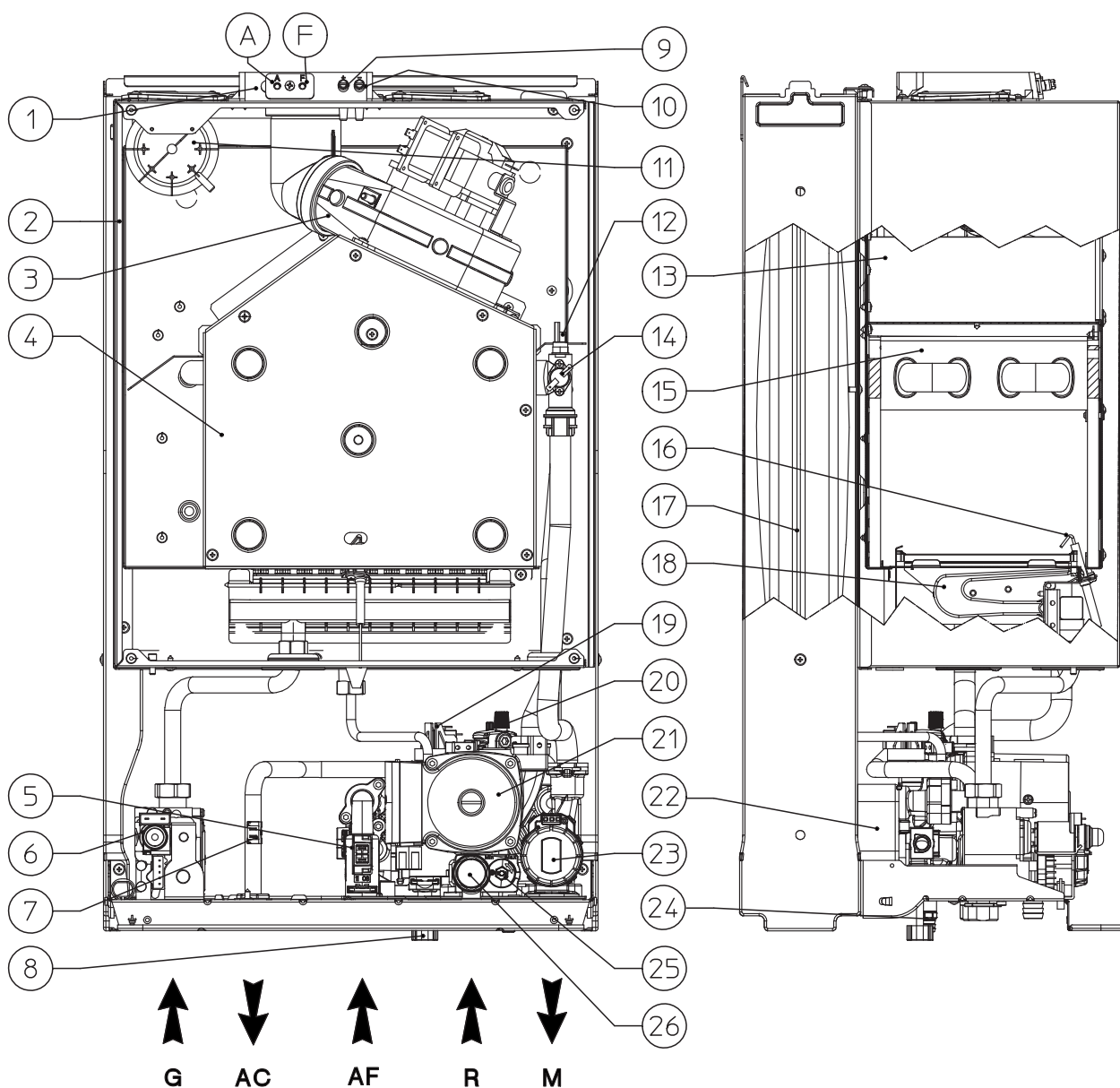
1.17 KITS AVAILABLE ON REQUEST.

- System shut 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.
- Cover kit. For outdoor installations, in partially protected areas and with direct air intake, the top protection cover must be fitted for a correct functioning of the boiler and to protect it from storms (Fig. 1-7). For indoor installations, type B configuration, a suitable top protection cover coupled with the flue exhaust kit must be fitted.

- Anti freeze kit with resistance (on request). If the boiler is installed in a place where the temperature falls below -5°C and in the event there is no gas, the appliance can 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.

1.18 BOILER COMPONENTS.



Key:

- 1 - Sample points (air A) - (flue gas 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 - Delivery probe
- 13 - Fumes hood
- 14 - Safety thermostat

- 15 - Primary heat exchanger
- 16 - Ignition and detection electrodes
- 17 - System expansion vessel
- 18 - Burner
- 19 - System pressure switch
- 20 - Vent valve
- 21 - Boiler pump
- 22 - Plate heat exchanger
- 23 - Three-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.

Important: the heating plants 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. We recommend stipulating a yearly cleaning and maintenance contract with your zone technician.

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:

- drain the water system if anti-freeze is not used;
- 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.

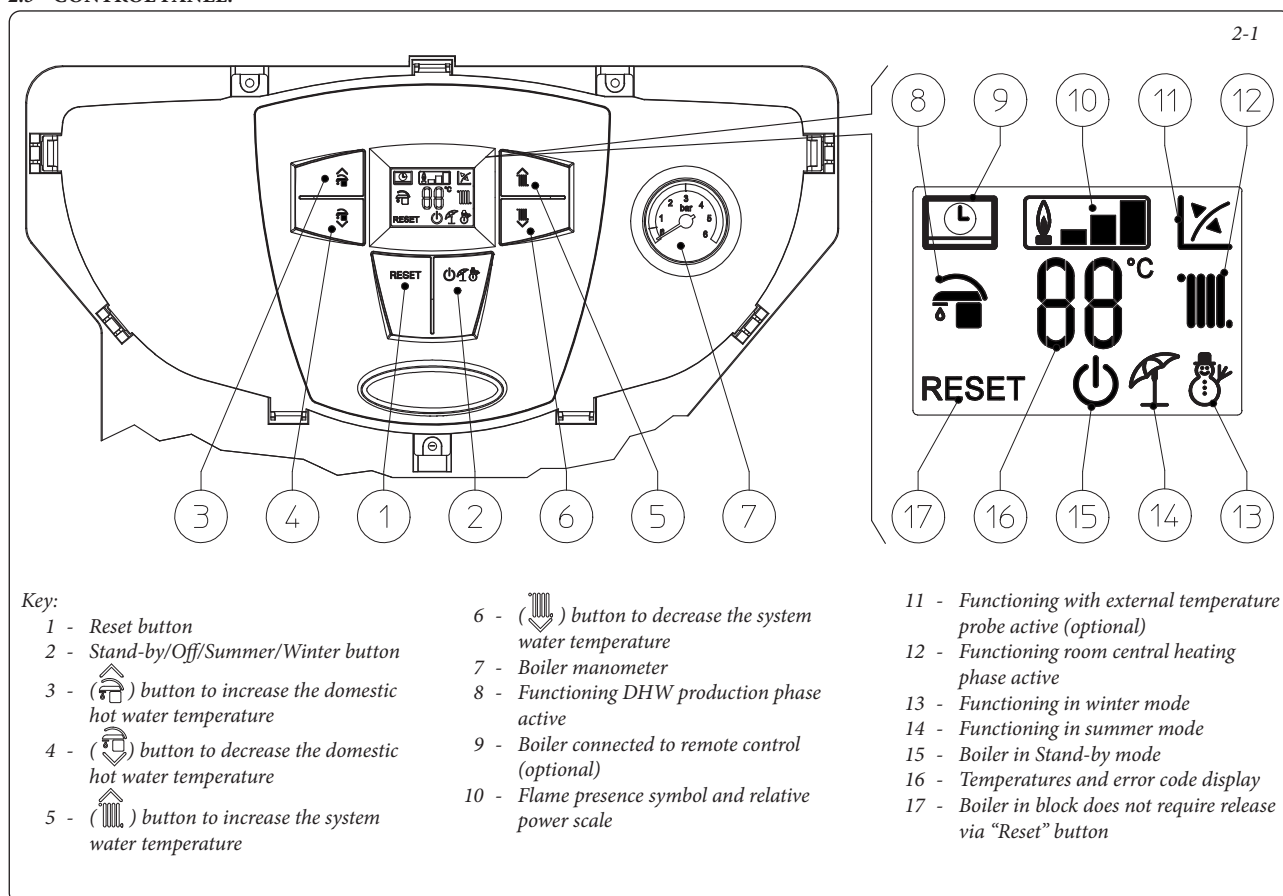
Never clean the appliance or connected parts with easily flammable substances.

Never leave containers or flammable substances in the same environment as the appliance.

• **Attention:** the use of components that employ 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.

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 heat 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 heating 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 power scale.

• **Operation with Comando Amico Remoto^{v2} remote control (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.

Important: if the boiler is put into “off” mode on the CAR^{v2} the “CON” connection error symbol will appear on the CAR^{v2}. The CAR^{v2} is however powered constantly so as not to lose memorised programs.

• **Functioning 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. 1-7).

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

• **“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 TROUBLESHOOTING.

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 (over-temperature), flame control anomaly	02
Fan anomaly	03
General boiler board 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

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 inactivity it may be necessary to eliminate the “ignition block”. If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Authorized After-Sales Technical Assistance Service).

Overtemperature thermostat block. During normal functioning, if a fault causes excessive overheating internally, the boiler goes into over-temperature 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. Authorized 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. Authorized After-Sales Technical Assistance Service).

General boiler board anomaly. This takes place if the boiler board microprocessor erroneously recognises a signal (code 04). To eliminate the “generic boiler board anomaly block”, it is necessary to press the Reset button (1). If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Authorized 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. Authorized 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 anti-freeze function is prevented and an authorised technician must be called (e.g. Authorized After-Sales Service).

Maximum N° of reset. To eliminate any “anomaly” the Reset button (1) must be pressed. 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.

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.

Fumes 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. Authorized After-Sales Technical Assistance 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. Authorized After-Sales Technical Assistance 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. Authorized After-Sales Technical Assistance Service).

Push button control panel anomaly. This occurs when the circuit board 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. Authorized After-Sales Technical Assistance 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 circulation; check that no interception devices are closed on the central heating circuit and that the system is free of air (deaerated);
- pump blocked; free the pump.

If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Authorized 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, remove and re-apply voltage to the boiler. If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Authorized 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. Authorized 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. Authorized 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. Authorized 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 CENTRAL HEATING SYSTEM PRESSURE.

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

If the pressure 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 SYSTEM DRAINING.

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 central 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:

- disconnect the electric power supply;
- the central heating circuit and boiler domestic hot 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.

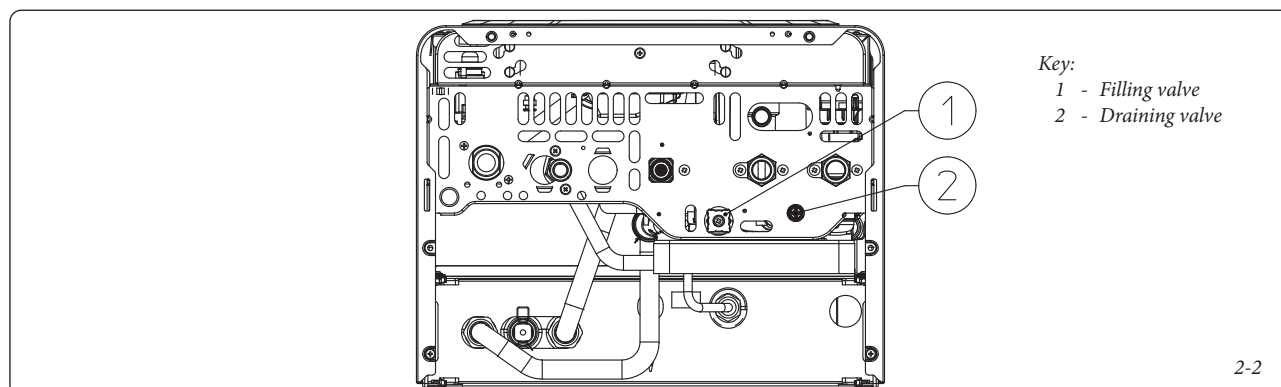
2.10 CASE CLEANING.

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.



2-2

3 BOILER START-UP (INITIAL CHECK)

To commission the boiler:

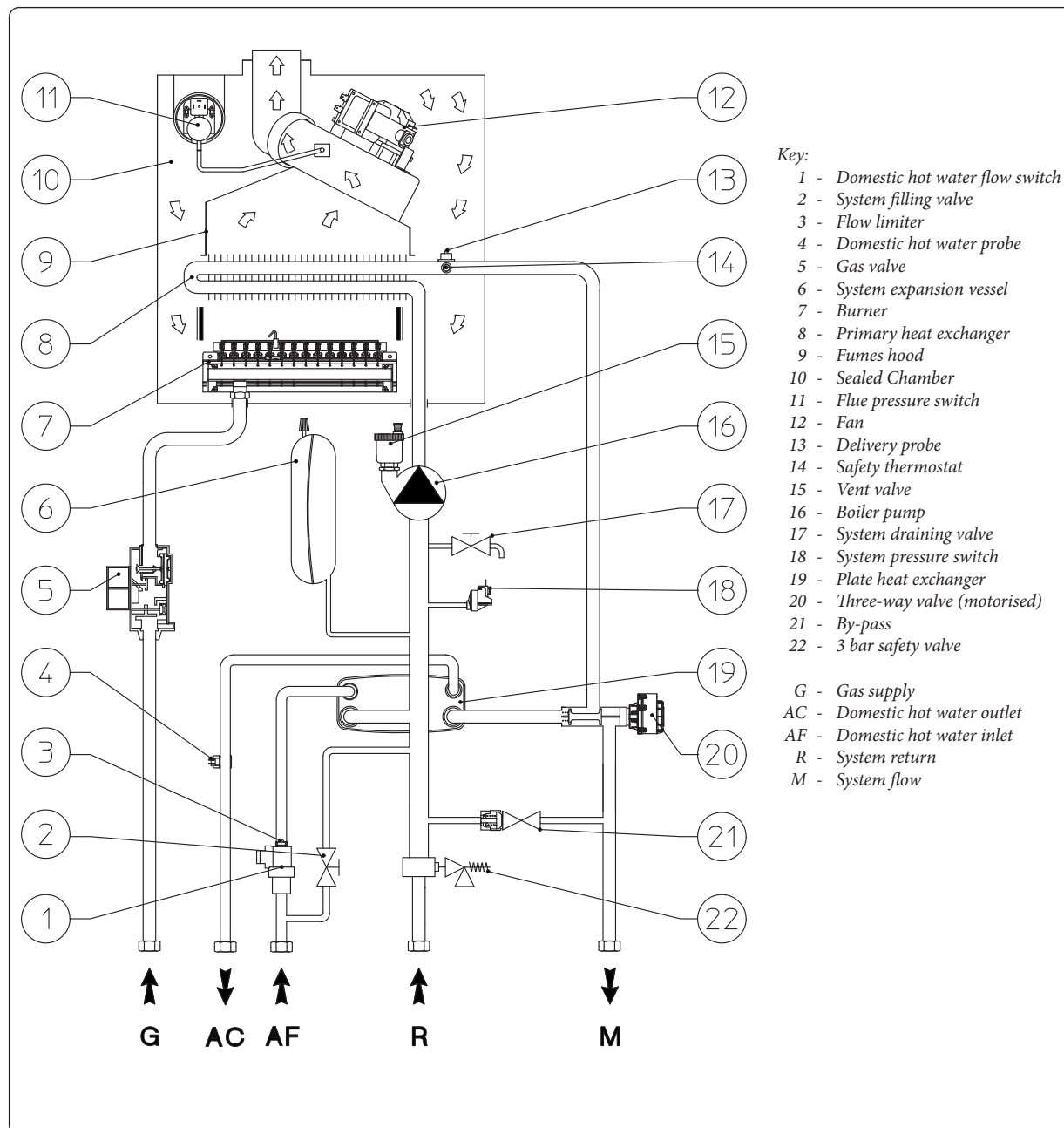
- ensure that the declaration of conformity of installation is supplied with the appliance;
- make sure that the type of gas used corresponds to boiler settings;
- check connection to a 230V-50Hz power mains, correct L-N polarity and the earthing connection;
- make sure the central heating system is filled with water and that the manometer indicates a pressure of 1 ± 1.2 bar.
- make sure the air valve cap is open and that the system is well deaerated;

- switch the boiler on and check correct ignition;
- make sure the gas maximum, intermediate and minimum flow rate and pressure values correspond to those given in the handbook, (Par. 3.18);
- 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);
- check the production of domestic hot water;
- check sealing efficiency of water circuits;
- check ventilation and/or aeration of the installation room where provided.

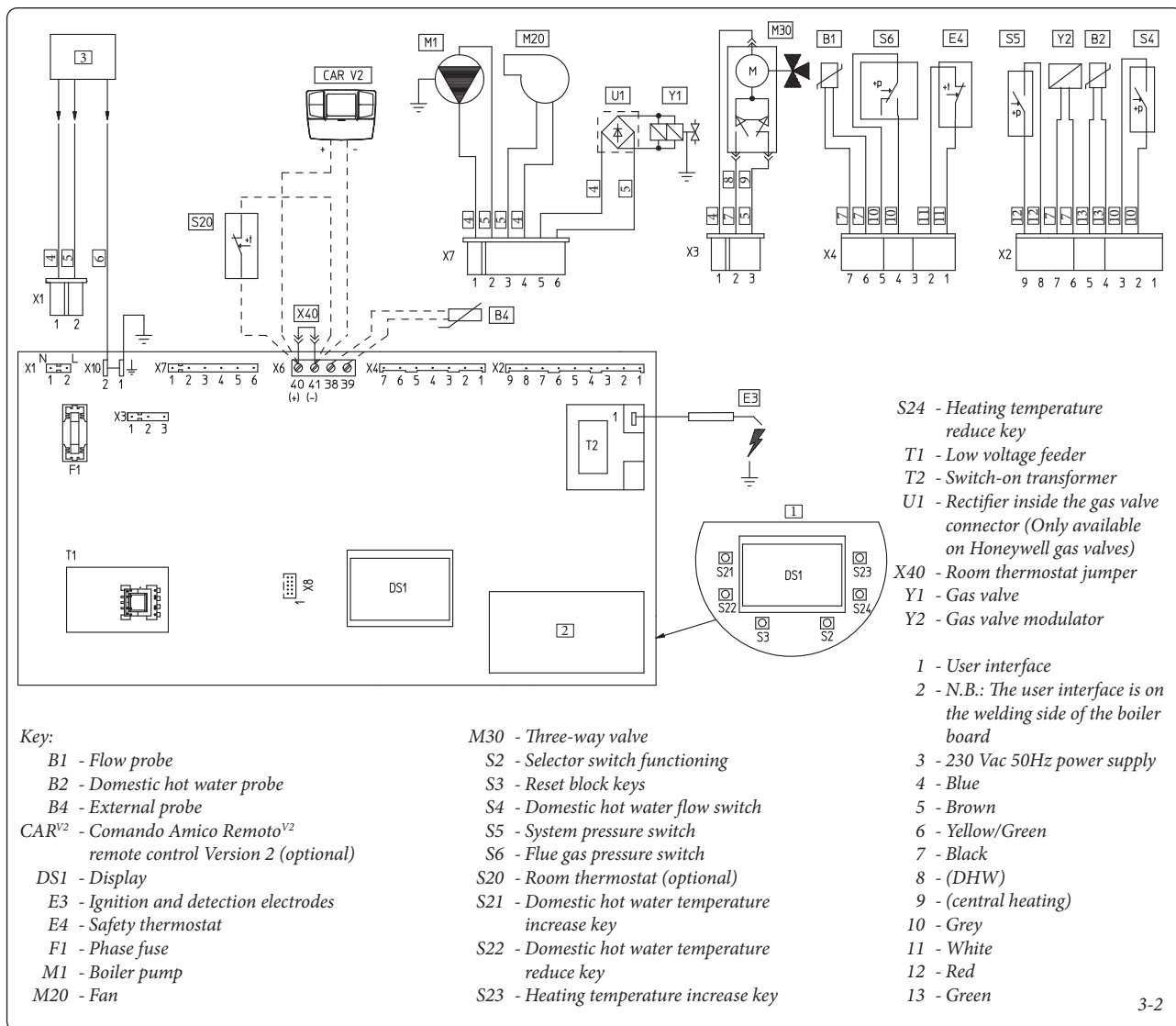
If any checks/inspection give negative results, do not start the boiler.

3.1 HYDRAULIC DIAGRAM.



3-1

3.2 WIRING DIAGRAM.



The boiler is designed for application of a room thermostat (S20), an On/Off room chronothermostat, a program timer or a Comando Amico Remoto^{V2} remote control (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 must be carried out by a qualified technician (e.g. Authorized Technical After-Sales 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 duct is not partially blocked (on the exhaust or intake side).

3) the diaphragm of the flue 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). This may 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 interventions of the over heating safety 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.

- The boiler produces condensate. It can be determined by functioning at boiler temperatures that are excessively low. In this case, make the boiler run at higher temperatures.

- Presence of air in the system. Check opening of the hood of the special air vent valve (Fig. 1-29). Make sure the system pressure and expansion vessel pre-charge values are within the set limits; the pre-charge 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).

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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.

Parameter N°	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 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 buttons (1) and (2) at the same time for approximately 8 seconds;
- Using buttons (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 5 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 power and the maximum heating power 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 power" and "Maximum heating power" 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

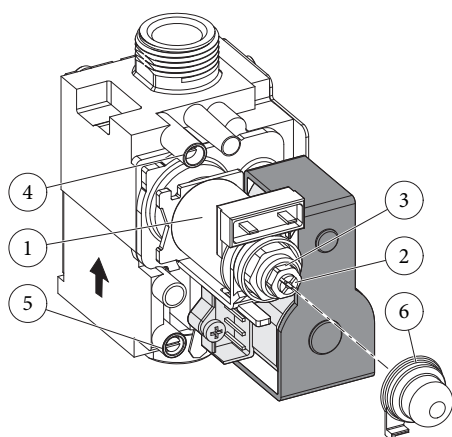
Central heating ignitions timer. The boiler has electronic timing, which prevents the burner from igniting too often in central heating mode.

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')

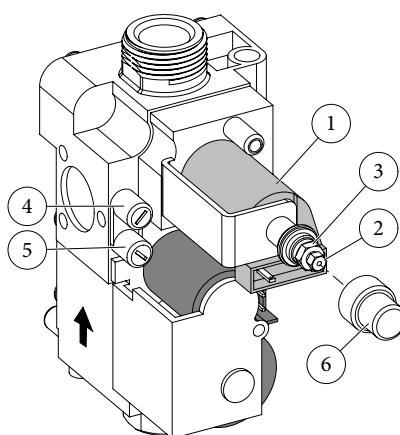
Central heating ramp timing. In the ignition phase, the boiler performs an ignition ramp in order to arrive at the maximum power set.

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

SIT 845 GAS valve



VK 4105 M GAS valve



Key:

- 1 - Coil
- 2 - Minimum power adjustment nut
- 3 - Maximum power adjustment nut
- 4 - Gas valve outlet pressure point
- 5 - Gas valve inlet pressure point
- 6 - Protection hood

3-3

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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 could be necessary to delay switch-on.

Heating switch-on delay request from room thermostat and remote control (P8)	
Range of values which can be set	Parametro
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 in order to function 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 power (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. Authorized 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;
- use the boiler push button control panel to select the gas parameter type (G1) and select (Ng) in case of Methane supply or (Lg) in the case of LPG;
- adjust the boiler nominal heat output;
- adjust the boiler minimum heat power;
- adjust the boiler nominal heat output in heating phase;
- adjust (eventually) the maximum heating power;
- seal the gas flow rate regulation devices (if settings are modified);
- after completing conversion, apply the sticker, present in the conversion kit, near to 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).

3.7 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. Authorized After-Sales Technical Assistance). Burner adjustment must be carried out using a differential "U" or digital type pressure gauge located above the sealed chamber (part. 9 Fig. 1-29) and the gas valve pressure outlet (part. 4 Fig. 3-3), keeping to the pressure value given in the table (Par. 3.18) 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).
 - Adjust the boiler nominal power on the brass nut (3 Fig. 3.3), keeping to the maximum pressure values stated in the tables (Par. 3.18) 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%) always 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).
- Adjustment (any) of the boiler maximum heat output in heating phase.
 - To adjust the maximum heat output during the heating phase, change parameter (5), 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).

3.9 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  or  symbols.

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 FUNCTION.

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 central heating mode or with boiler in stand-by, 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.

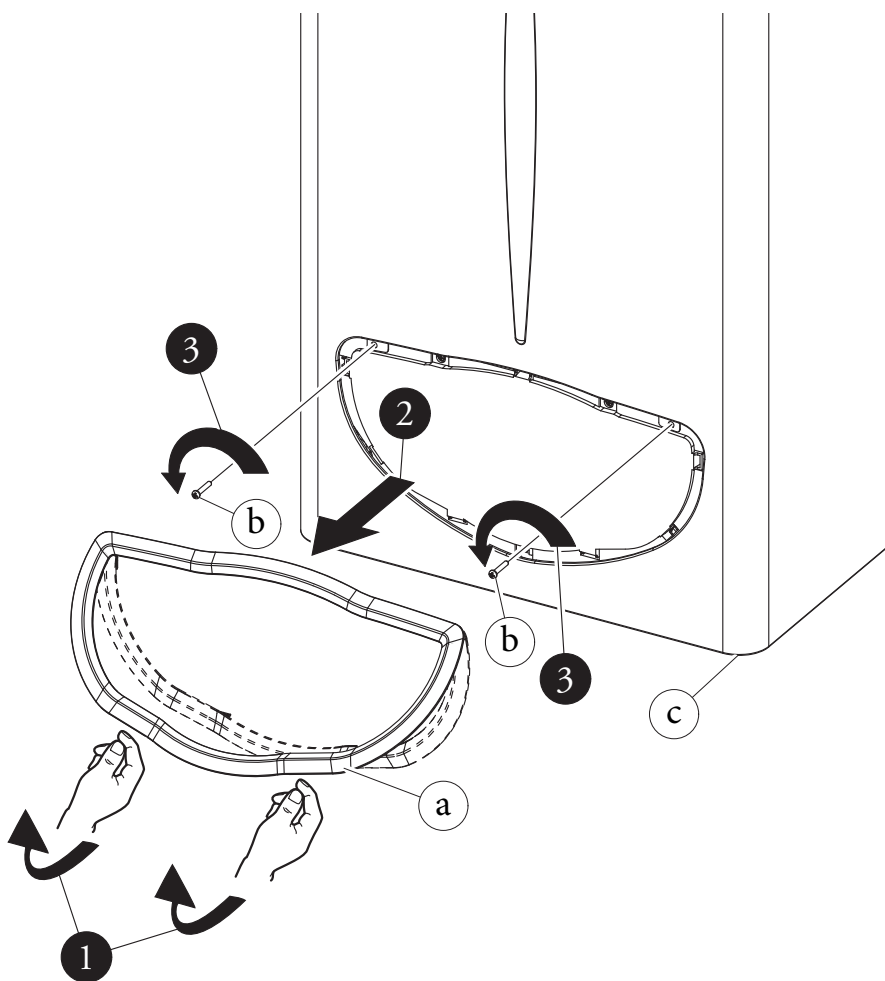
3.16 CASING REMOVAL.

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

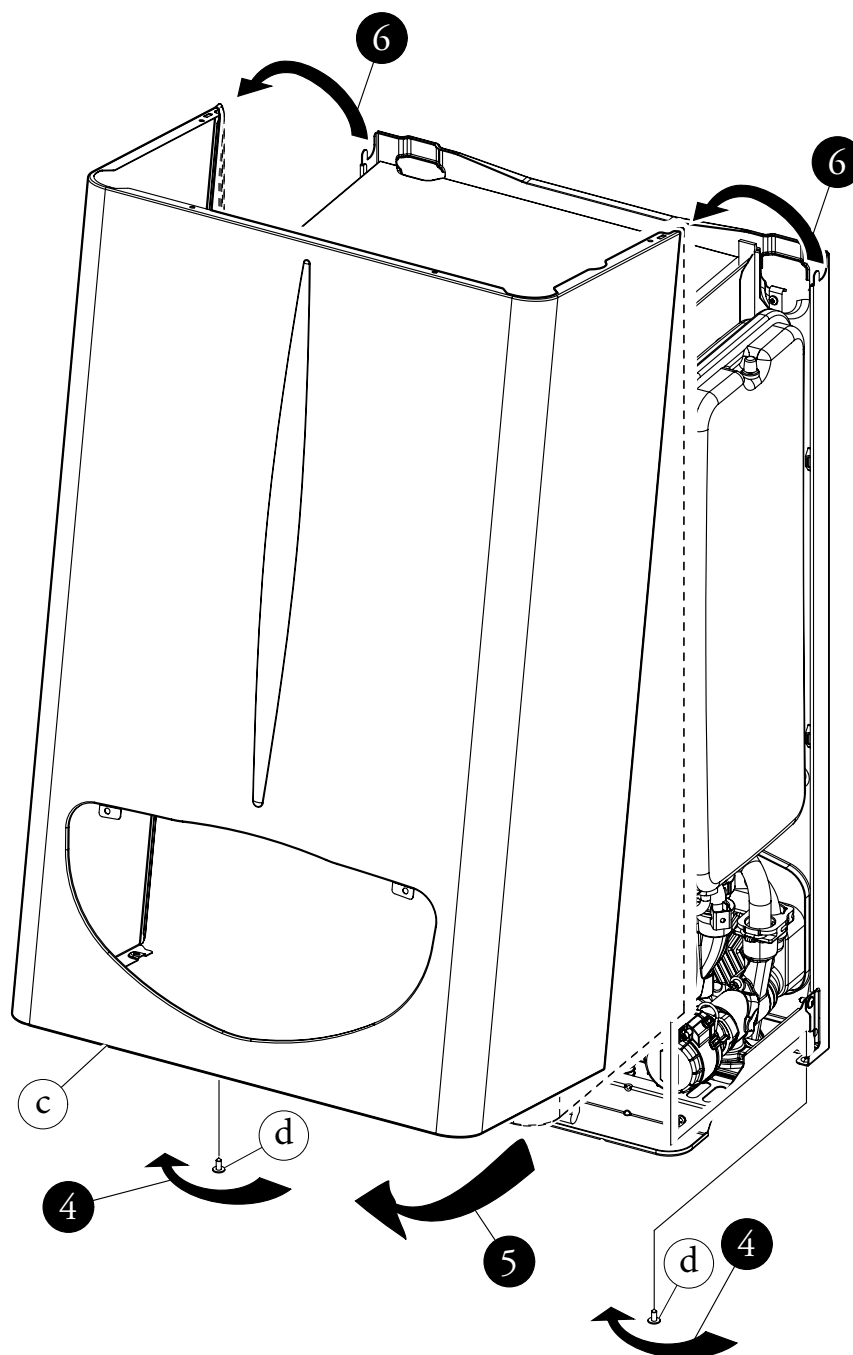
- 1 Unhook the decorative frame (a) from the relative lower retainers.
- 2 Remove the decorative frame (a) from the casing (c).
- 3 Loosen the 2 front screws (b) for fixing the casing.
- 4 Loosen the 2 lower screws (b) for fixing the casing.
- 5 Pull the case towards yourself (c).
- 6 Push the case (c) 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 functioning.
- Check correct calibration of the burner in domestic hot water and central heating phases.
- Check correct functioning of control and adjustment devices and in particular:
 - the intervention of main electrical switch positioned outside of the boiler;
 - system control thermostat intervention;
 - domestic hot water control thermostat intervention.
- Check sealing efficiency of the 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 valve drain is not blocked.
- Check that, after discharging system pressure and bringing it to zero (read on boiler manometer), the expansion vessel factory-set pressure 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.
- Visually check 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 whipping;
 - there must be no traces of blackening or burning.

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

3.18 VARIABLE HEAT OUTPUT.

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.

			METHANE (G20)			BUTANE (G30)			PROPANE (G31)		
HEAT OUTPUT	HEAT OUTPUT	CH. + DHW.	BURNER GAS FLOW RATE	PRESS. BURNER NOZZLES		BURNER GAS FLOW RATE	PRESS. BURNER NOZZLES		BURNER GAS FLOW RATE	PRESS. BURNER NOZZLES	
(kW)	(kcal/h)		(m³/h)	(mbar)	(mm H ₂ O)	(kg/h)	(mbar)	(mm H ₂ O)	(kg/h)	(mbar)	(mm H ₂ O)
28.0	24080		3.14	11.50	117.3	2.35	28.00	285.5	2.31	36.00	367.1
27.0	23220		3.03	10.76	109.7	2.26	26.23	267.5	2.22	33.60	342.6
26.2	22516		2.94	10.17	103.7	2.19	24.84	253.3	2.16	31.71	323.4
25.0	21500		2.81	9.36	95.5	2.10	22.91	233.6	2.06	29.12	297.0
24.0	20640		2.70	8.71	88.8	2.02	21.34	217.6	1.98	27.04	275.7
23.0	19780		2.59	8.08	82.4	1.94	19.84	202.3	1.90	25.04	255.4
22.0	18920		2.49	7.48	76.3	1.86	18.39	187.5	1.83	23.14	236.0
21.0	18060		2.38	6.91	70.5	1.78	16.99	173.3	1.75	21.33	217.5
20.0	17200		2.27	6.36	64.8	1.70	15.65	159.6	1.67	19.59	199.8
19.0	16340		2.17	5.83	59.4	1.62	14.35	146.4	1.59	17.94	182.9
18.0	15480		2.06	5.32	54.3	1.54	13.11	133.6	1.52	16.36	166.8
17.0	14620		1.96	4.83	49.3	1.46	11.90	121.4	1.44	14.85	151.4
16.0	13760		1.85	4.37	44.5	1.38	10.74	109.5	1.36	13.41	136.8
15.0	12900		1.75	3.92	40.0	1.30	9.62	98.1	1.28	12.05	122.8
14.0	12040		1.64	3.49	35.6	1.23	8.54	87.1	1.21	10.75	109.6
13.0	11180		1.54	3.08	31.5	1.15	7.50	76.5	1.13	9.52	97.0
12.0	10320		1.43	2.69	27.5	1.07	6.50	66.3	1.05	8.35	85.2
11.2	9632		1.34	2.39	24.4	1.00	5.73	58.4	0.98	7.47	76.1
10.0	8600	D.H.W.	1.21	1.97	20.1	0.90	4.61	47.0	0.89	6.22	63.4
9.0	7740		1.10	1.63	16.6	0.82	3.72	37.9	0.81	5.25	53.6
8.5	7310		1.04	1.47	15.0	0.78	3.29	33.5	0.77	4.80	48.9

3.19 COMBUSTION PARAMETERS.

		G20	G30	G31
Gas nozzle diameter	mm	1.35	0.78	0.78
supply pressure	mbar (mm H ₂ O)	20 (204)	29 (296)	37 (377)
Flue flow rate at nominal heat output	kg/h	60	59	60
Flue flow rate at min heat output	kg/h	64	67	66
CO ₂ at Q. Nom./Min.	%	7.10 / 2.05	8.40 / 2.30	8.15 / 2.30
CO at 0% of O ₂ at Nom. Q./Min.	ppm	70 / 155	109 / 180	71 / 183
NO _x at 0% of O ₂ at Nom.Q./Min.	mg/kWh	157 / 102	269 / 125	220 / 125
Flue temperature at nominal output	°C	109	113	111
Flue temperature at minimum output	°C	77	79	76

3.20 TECHNICAL DATA.

Nominal heat input	kW (kcal/h)	29.7 (25536)
DHW minimum heat input	kW (kcal/h)	9.9 (8480)
CH minimum heat input	kW (kcal/h)	12.7 (10902)
Nominal heat output (useful)	kW (kcal/h)	28.0 (24080)
DHW minimum heat output (useful)	kW (kcal/h)	8.5 (7310)
CH minimum heat output (useful)	kW (kcal/h)	11.2 (9632)
Efficiency at nominal heat output	%	94.3
Efficiency at 30% nominal heat output load	%	91.5
Heat loss at case with burner On/Off	%	0.50 / 0.43
Heat loss at flue with burner On/Off	%	5.10 / 0.04
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	7.4
Expansion vessel factory-set pressure	bar	1
Water content in generator	l	2.8
Total head available with 1000 l/h flow rate	kPa (m H ₂ O)	32.46 (3.3)
Hot water production useful heat output	kW (kcal/h)	28.0 (24080)
Domestic hot water adjustable temperature	°C	30 - 60
Domestic hot water circuit flow limiter at 2 bar	l/min	9.5
Min. pressure (dynamic) domestic hot water circuit	bar	0.3
Domestic hot water circuit max. working pressure	bar	10
Minimum D.H.W. flow rate	l/min	1.5
Specific flow rate (ΔT 30°C)	l/min	13.4
Drawing capacity in continuous duty (ΔT 30°C)	l/min	13.6
Weight of full boiler	kg	40.8
Weight of empty boiler	kg	38.0
Electrical connection	V/Hz	230/50
Power input	A	0.74
Installed electric power	W	130
Pump consumption	W	84.0
Fan consumption	W	41.0
Equipment electrical system protection	-	IPX5D
NO _x class	-	3
Weighted NO _x	mg/kWh	107
Weighted CO	mg/kWh	92
Type of appliance	C12 / C32 / C42 / C52 / C62 / C82 / B22p / B32	
Category	II2H3+	

- Fume temperature values refer to an air inlet temperature of 15°C.
- The data relevant to domestic hot water performance refer 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 maximum 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 fume exhaust system according to product standards.

3.21 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

	ENG
Md	Model
Cod. Md	Model code
Sr N°	Serial Number
CHK	Check
Cod. PIN	PIN code
Type	Type of installation (ref. CEN TR 1749)
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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