

IMMERGAS

Instructions and **IE**
warning book

EOLO STAR 24 4E

1.040470ENG



Dear Customer,

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. By respecting these suggestions, you will no doubt be satisfied with your Immergas product.

For any assistance and scheduled maintenance please contact Authorised After-Sales centres: they have original spare parts and are specifically trained by the manufacturer.

General recommendations

All Immergas products are protected with suitable transport packaging.

The material must be stored in a dry place protected from the weather.

The instruction book is an integral and essential part of the product and must also be given to the new user 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 instructions manual provides technical information for installing Immergas boilers. 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 regulations in force and principles of good practice.

In compliance with the 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, intended as staff with specific technical skills in the system sector, as envisioned by the Law.

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

Maintenance must be carried out by authorised technical personnel. 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 prior notice.

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1 INSTALLATION BOILER

1.1 INSTALLATION RECOMMENDATIONS.

The Eolo Star 24 4 E boiler has been designed for wall mounted installation only, for heating and production of domestic hot water for domestic use and similar purposes.

The place of installation of the appliance and relative Immergas accessories must have suitable features (technical and structural), such as to allow for (always in safe, efficient and comfortable conditions):

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

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

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

- **Type B boiler**, if installed using the relevant terminal for air intake directly from the room in which the boiler has been installed.
- **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 enabled companies are authorised to install Immergas gas appliances. Installation must be carried out according to regulation standards, current legislation and in compliance with local technical regulations and the required technical procedures.

Important: Immergas 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; it is therefore recommended to leave at least 45 cm between the upper part of the boiler and the ceiling and a gap of 3 cm between the boiler casing and the vertical sides of the cabinet. 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 draining funnel), or if there are leaks from the hydraulic connections; otherwise, the manufacturer cannot be held responsible for any damage caused to the household appliances.

For the aforementioned reasons, we recommend not placing furnishings, furniture, etc. under the boiler.

In the event of malfunctions, faults or incorrect operation, turn the appliance off and contact an authorised company (e.g. the Technical Assistance centre, which has specifically trained staff and original spare parts). Do not attempt to modify or repair the appliance alone.

Failure to comply with the above implies personal responsibility and invalidates the warranty.

• Installation Standards:

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

NOTE: *this type of installation is only possible when permitted by the laws in force in the appliance's country of destination.*

- Installation of gas appliances, flue exhaust pipes and combustion air intake pipes is forbidden in places with a fire risk (for example: garages, closed parking stalls), and in potentially dangerous places.
- Installation is prohibited on the vertical projection of the cooking surface.
- Installation is forbidden in places/rooms that constitute public areas of apartment buildings, internal stairways or other escape routes (e.g. floor landings, entrance halls, etc.).
- Installation is also forbidden in places/rooms that constitute public areas of apartment buildings such as cellars, entrance halls, attics, lofts, etc., unless otherwise provided for by local regulations in force.

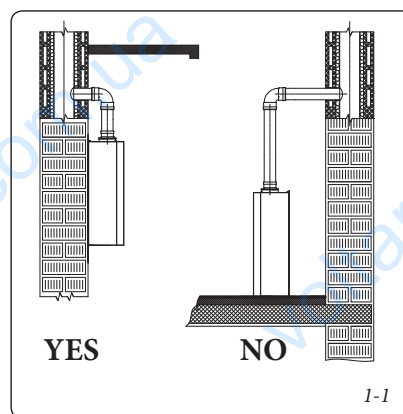
Attention: wall mounting of the boiler must guarantee stable and efficient support for the generator.

The plugs (standard supply) are to be used only in conjunction with the fixing template to fix the boiler 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 mount.

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 connected to a central heating system and domestic hot water circuit suited to their performance and capacity.

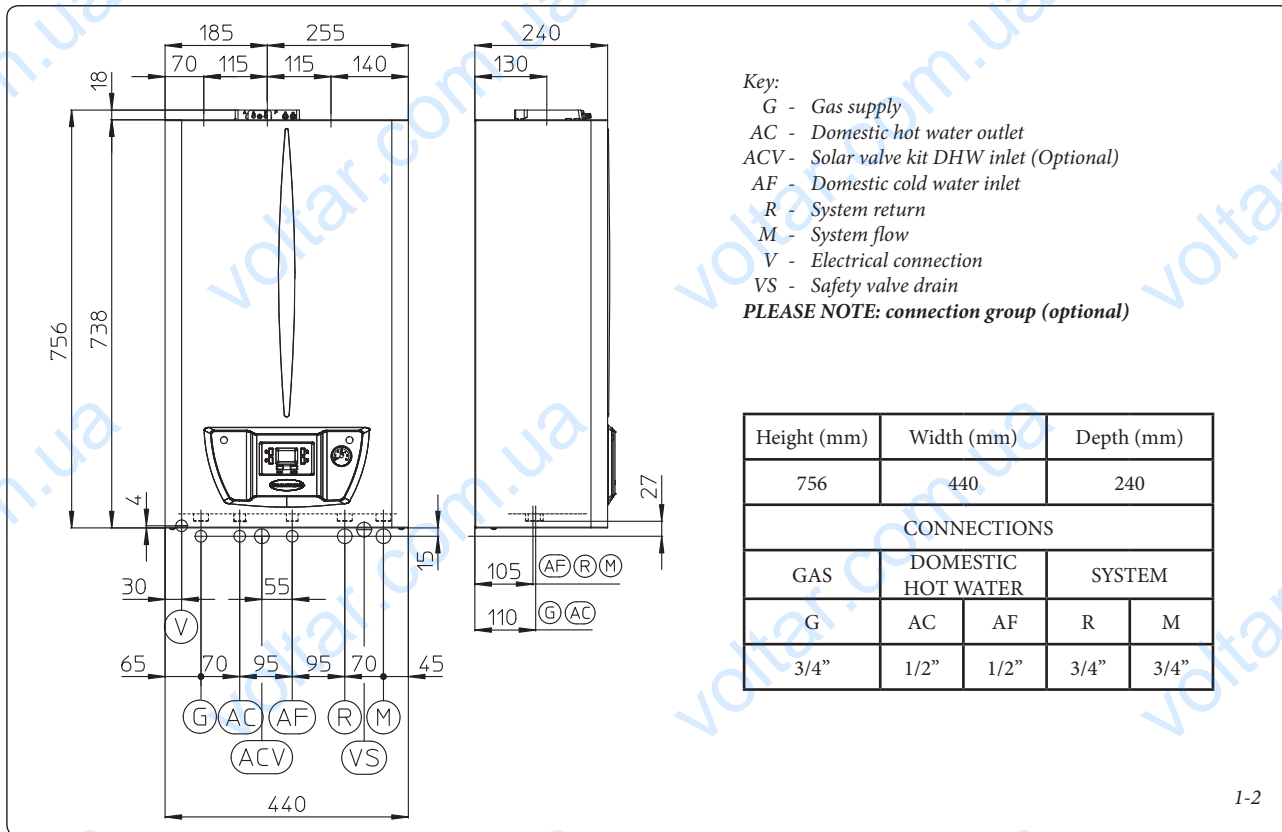


INSTALLER

USER

MAINTENANCE TECHNICIAN

1.2 MAIN DIMENSIONS.



1-2

1.3 ANTIFREEZE PROTECTION.

Minimum temperature -5°C. The boiler comes standard with an antifreeze function that activates the pump and burner when the system water temperature in the boiler falls below 4°C. *In these conditions the boiler is protected against freezing to an ambient temperature of -5°C.*

Minimum temperature -15°C. If the boiler is installed in a place where the temperature drops below -5°C, the appliance can freeze.

To prevent the risk of freezing follow the instructions below:

- protect the central heating circuit from freezing by inserting a good-quality antifreeze liquid into this circuit, which is specially suited for central heating systems and which is manufacturer guaranteed not to cause damage to the heat exchanger or other components of the boiler. The antifreeze liquid must not be harmful to one's health. The instructions of the manufacturer of this liquid must be followed scrupulously regarding the percentage necessary with respect to the minimum temperature at which the system must be kept. An aqueous solution must be made with potential pollution class of water 2 (EN 1717:2002 or local standards in force).

Warning: the excessive use of glycol could jeopardise the proper functioning of the appliance.

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

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

- Protect the domestic hot water circuit against freezing by using an accessory that is supplied on request (antifreeze kit) comprising two electric heating elements, the relevant wiring and a control thermostat (carefully read the installation instructions contained in the accessory kit pack).

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

Boiler antifreeze protection (both -5°C and -15°C) is thus ensured only if:

- the boiler is correctly connected to gas and electricity power supply circuits;
- the boiler is powered constantly;
- the boiler is not in stand-by (⏻);
- the boiler is not in anomaly conditions (Parag. 2.4);
- the essential components of the boiler and/or antifreeze kit are not faulty.

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 domestic hot water and central heating attachment pipes must be insulated.

1.4 BOILER CONNECTION UNIT.

The connection unit consisting of all the necessary parts to perform the hydraulic and gas system connections of the appliance comes as optional.

1.5 GAS CONNECTION.

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

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

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

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.

1.6 HYDRAULIC CONNECTION.

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

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

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


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

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

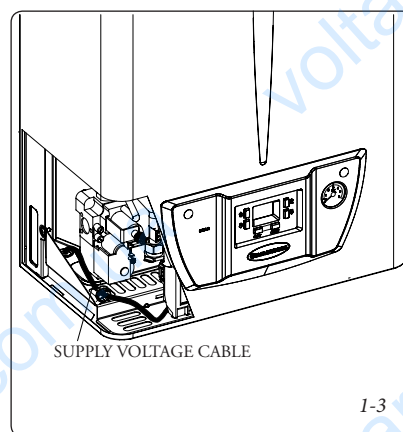
1.7 ELECTRICAL CONNECTION.

The "Eolo Star 24 4 E" boiler has an IPX5D protection rating for the entire appliance. Electrical safety of the appliance is reached only when it is correctly connected to an efficient earthing system as specified by current safety standards.

Attention: 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 nameplate. Boilers are supplied complete with a "Y" type power cable. The power supply cable must be connected to a 230V \pm 10% / 50Hz mains supply respecting L-N polarity and earth connection;  this network must also have a multi-pole circuit breaker with class III overvoltage category. When replacing the power supply cable, contact a qualified firm (e.g. the Authorised After-Sales Technical Assistance Service).

The power cable must be laid as shown (Fig. 1-3). In the event of mains fuse replacement on the P.C.B., use a 3.15A quick-blow fuse. For the main power supply to the appliance, never use adapters, multiple sockets or extension leads.



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

The boiler is prepared for the application of room chrono-thermostats or remote controls, which are available as optional kits (Fig. 1-4; 1-5). All devices are connected with 2 wires only. Carefully read the user and assembly instructions contained in the accessory kit.

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

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

- Digital Remote Mini-Control Device with climate chrono-thermostat and CAR^{V2} function. In addition to the functions described in the previous point, the Mini-DRC and CAR^{V2} panels enable the user to control all the important information regarding operation of the appliance and the central 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 Mini CRD and CAR^{V2} panels are equipped with self-diagnosis to display any boiler functioning anomalies. The climate regulator incorporated into the remote panels 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 Mini CRD and CAR^{V2} are fed directly by the boiler by means of the same 2 wires used for the transmission of data between the boiler and devices.

Digital Remote Mini-Control or CAR^{V2} or On/Off chrono-thermostat electrical connections (Optional). *The operations described below must be performed after having removed the voltage from the appliance.* Any room chrono-thermostat or remote controls must be connected to the 40 and 41 terminal blocks, eliminating the X40 jumper (Fig. 3-2). Make sure that the On/Off thermostat contact is of the "clean" type, i.e. independent of the mains voltage, otherwise the P.C.B. would be damaged. The boiler can only be connected to one device at a time.

Important: if the Mini CRD or CAR^{V2} remote control 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.

1.9 FLUE SYSTEMS.

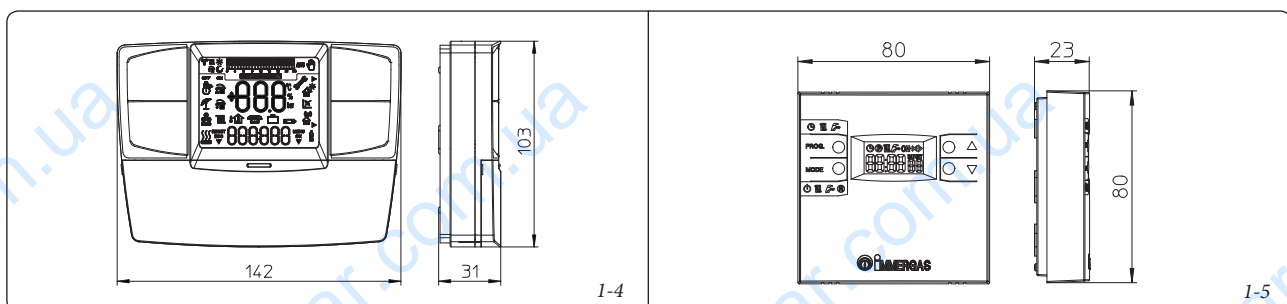
The manufacturer suggests the use of your own flue installation by supplying various solutions separately from the boilers regarding the installation of air intake terminals and flue exhaust, which are fundamental for boiler operation.

Attention: the boiler must only be installed together with an original Immergas air intake and flue gas exhaust system, except for the C6 configuration, in compliance with the standards in force. This system can be identified by an identification mark and special distinctive marking bearing the note "not for condensing boilers".

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

- Resistance factors and equivalent lengths. Each flue component has a *Resistance Factor* based on experimental tests and specified in the table below. The Resistance Factor for individual components is independent from the type of boiler on which it is installed and has a dimensionless size. It is however, conditioned by the temperature of the fluids that pass through the pipe and therefore, varies according to applications for air intake or flue exhaust. Each single component has a resistance corresponding to a certain length in metres of pipe of the same diameter; the so-called *equivalent length*, can be obtained from the ratio between the relative Resistance Factors. *All boilers have an experimentally obtainable maximum Resistance Factor equal to 100.* The maximum Resistance Factor allowed corresponds to the resistance encountered with the maximum allowed pipe length for each type of Terminal Kit. This information allows calculations to be made to verify the possibility of setting up various flue configurations.

N.B.: to dimension the flue ducting using commercial components, refer to the table of combustion parameters (Paragr. 3.16).



- **Positioning of double lip seals.** For correct positioning of lip seals on elbows and extensions, follow the assembly direction shown in the figure (Fig. 1-6).

- Coupling extension pipes and concentric elbows. To install push-fitting extensions with other elements of the flue, proceed as follows: Install the concentric pipe or elbow with the male side (smooth) on the female side (with lip seal) to the end stop on the previously installed element in order to ensure sealing efficiency of the coupling.

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

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

- **N.B.:** during the installation of the horizontal pipes one must maintain a minimum inclination of the pipes of 3% towards the boiler and a section clamp with gusset must be installed every 3 metres for non-insulated pipes and one every 2 metres for insulated pipes.

Diaphragm installation. For proper boiler operation a diaphragm must be installed on the outlet of the sealed chamber and before the intake and exhaust pipe (Fig. 1-7).

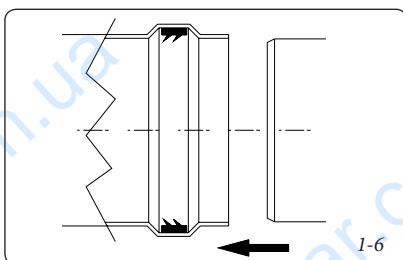
The appropriate diaphragm is chosen based on type of pipe and its maximum extension: this calculation can be made using the tables below:

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

Diaphragm	Duct length in metres Ø 60/100 horizontal
Ø 38	From 0 to 1
Ø 42.5	Exceeding 1 up to 3

Diaphragm	Duct length in metres Ø 60/100 vertical
Ø 38	From 0 to 3.2
Ø 42.5	Exceeding 3.2 up to 4.7

Diaphragm	Duct length in metres Ø 80/125 horizontal
Ø 38	From 0 to 3.3
Ø 42.5	Exceeding 3.3 up to 7.4



Diaphragm	Duct length in metres Ø 80/125 vertical
Ø 38	From 0 to 8.1
Ø 42.5	Exceeding 8.1 up to 12.2

Diaphragm		(*) Extension in metres Ø 80 horizontal pipe with two bends
exhaust	intake	
Ø 40	Ø 55	From 0 to 8

Diaphragm		(*) Extension in metres vertical pipe Ø 80 without bends
exhaust	intake	
Ø 40	Ø 55	From 0 to 12

Diaphragm		(*) Extension in metres Ø 80 horizontal pipe with two bends
exhaust	intake	
-	Ø 55	Exceeding 8 up to 14
Ø 40	-	Exceeding 14 up to 35

Diaphragm		(*) Extension in metres vertical pipe Ø 80 without bends
exhaust	intake	
-	Ø 55	Exceeding 12 up to 18
Ø 40	-	Exceeding 18 up to 40

Diaphragm		(**) Extension in metres Ø 80 horizontal pipe with two bends
exhaust	intake	
Ø 40	Ø 55	From 0 to 8

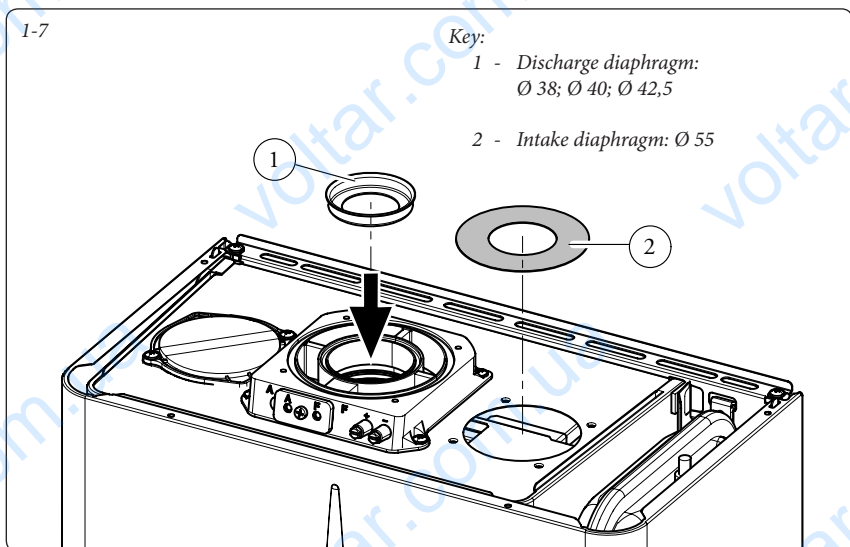
Diaphragm		(**) Extension in metres vertical pipe Ø 80 without bends
exhaust	intake	
Ø 40	Ø 55	From 0 to 12

Diaphragm intake	(**) Extension in metres Ø 80 horizontal pipe with two bends
Ø 55	Exceeding 8 up to 27

Diaphragm intake	(**) Extension in metres vertical pipe Ø 80 without bends
Ø 55	Exceeding 12 up to 27

(*) These maximum extension values are considered intake with 1 metre exhaust pipe.

(**) These maximum extension values are considered exhaust with 1 metre intake pipe.

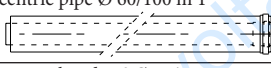


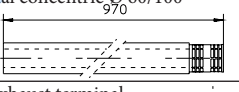

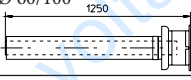
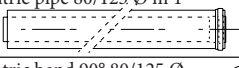


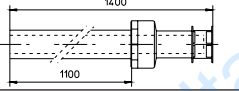
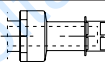
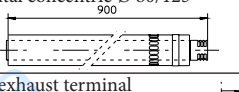



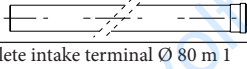
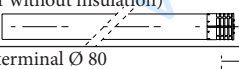



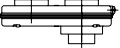


1.10 TABLES OF RESISTANCE FACTORS AND EQUIVALENT LENGTHS.

INSTALLER

USER

MAINTENANCE TECHNICIAN

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

1.11 OUTDOOR INSTALLATION IN PARTIALLY PROTECTED AREA.

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

This type of installation is only possible when permitted by the laws in force in the appliance's country of destination.

- **Configuration type B, open chamber and fan assisted.**

Using the special coverage kit one can achieve direct air intake (Fig. 1-8) and flue gas exhaust in a single chimney or directly outside. In this configuration it is possible to install the boiler in a partially protected place. In this configuration the boiler is classified as type B₂₂.

With this configuration:

- air intake takes place directly from the environment in which the appliance is installed (external);
- the flue gas exhaust must be connected to its own single flue (B₂₃) or ducted directly outside via a vertical terminal for direct exhaust (B₃₃) or via an Immergas ducting system (B₃₃).

The technical regulations in force must be respected.

- **Coverage kit assembly (Fig. 1-9).** Remove the two plugs and the gaskets present from the two lateral holes with respect to the central one. Install the Ø 80 outlet flange on the central hole of the boiler, taking care to insert the gasket supplied with the kit and tighten by means of the screws provided. Install the plug on the left hole and the diaphragm on the right hole and tighten by means of the screws provided. Install the upper cover, fixing it using the 4 screws present in the kit, positioning the relevant gaskets. Engage the 90° Ø 80 bend with the male end (smooth) in the female end (with lip seal) of the Ø 80 flange unit until it stops. Introduce the gasket, making it run along the bend. Fix it using the metal sheet plate and tighten by

means of the clips present in the kit, making sure to block the 4 gasket flaps. Fit the male end (smooth) of the exhaust terminal into the female end of the bend 90° Ø 80, making sure that the relevant wall sealing plate is already fitted; this will ensure hold and joining of the elements making up the kit.

Max. length of exhaust duct. The flue pipe (vertical or horizontal) can be extended to a max. length of 12 linear metres, using insulated pipes (Fig. 1-25). To prevent problems of flue gas condensate in the exhaust pipe Ø 80, due to flue gas cooling through the wall, the length of the pipe (not insulated) must be limited to just 5 m (Fig. 1-22).

- **Configuration without cover kit in a partially protected location (type C boiler)**

By leaving the side plugs fitted it is possible to install the appliance externally without the cover kit. Installation takes place using the Ø 60/100, Ø 80/125 and separator Ø 80/80 concentric intake/exhaust kits. Refer to the paragraph relative to indoor installation. In this configuration the upper cover kit assures additional protection for the boiler. It is recommended but not compulsory.

Diaphragm installation. (Fig. 1-9 and Fig. 1-7). For a proper functioning of the boiler, install a plug to close the intake hole on the left and a diameter 55 diaphragm on the right while on the outlet of the sealed chamber insert a discharge diaphragm, according to the type of pipe and its maximum extension, making reference to the following tables:

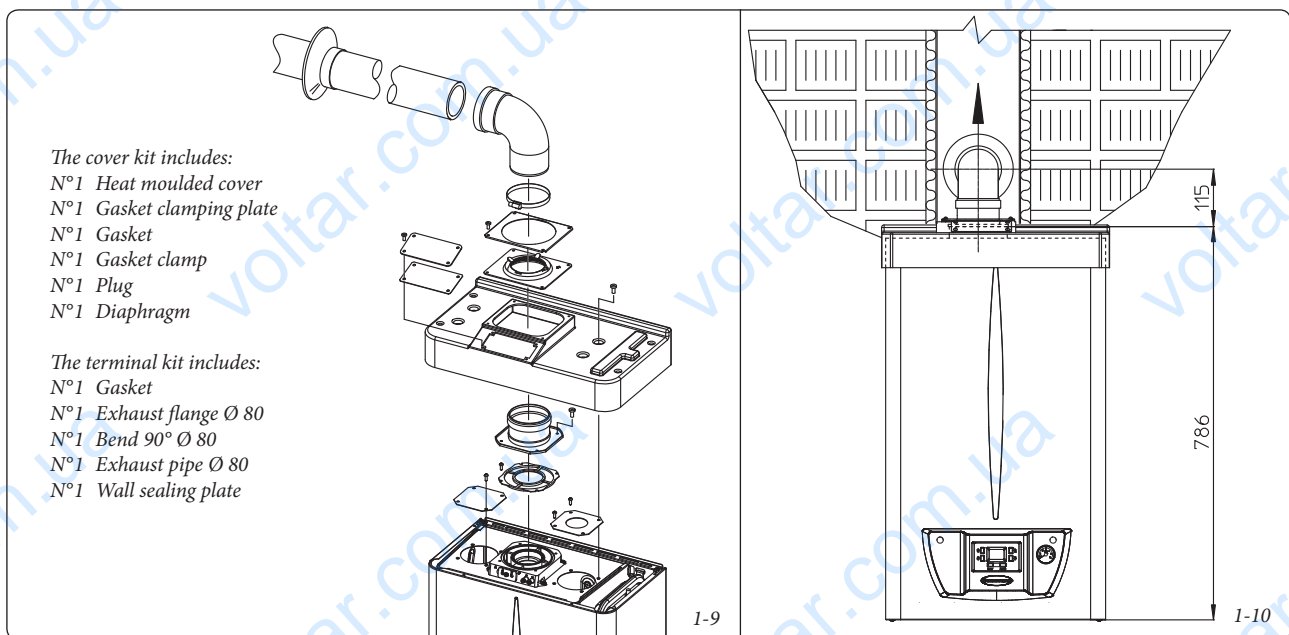
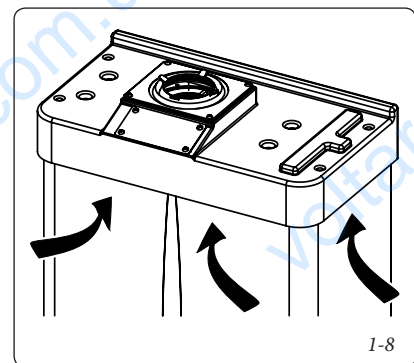
NOTE: the intake diaphragm and the plug are supplied with the covering kit.

Diaphragm		Extension in meters Ø 80 horizontal pipe with one bend
exhaust	intake	
Ø 42.5	Ø 55	From 0 to 6.5

Diaphragm		Extension in meters vertical pipe Ø 80 without bend
exhaust	intake	
Ø 42.5	Ø 55	From 0 to 8.5

Diaphragm		Extension in meters Ø 80 horizontal pipe with one bend
exhaust	intake	
---	Ø 55	Exceeding 6.5 up to 12

Diaphragm		Extension in meters vertical pipe Ø 80 without bend
exhaust	intake	
---	Ø 55	Exceeding 8.5 up to 12



The cover kit includes:
 N°1 Heat moulded cover
 N°1 Gasket clamping plate
 N°1 Gasket
 N°1 Gasket clamp
 N°1 Plug
 N°1 Diaphragm

The terminal kit includes:
 N°1 Gasket
 N°1 Exhaust flange Ø 80
 N°1 Bend 90° Ø 80
 N°1 Exhaust pipe Ø 80
 N°1 Wall sealing plate

1.12 CONCENTRIC HORIZONTAL KIT INSTALLATION.

Type C configuration, sealed chamber and fan assisted.

The position of the terminal (in terms of distances from openings, overlooking buildings, floor, etc.) must be in compliance with the regulations in force.

This terminal is connected directly to the outside of the building for air intake and flue gas exhaust. The horizontal kit can be installed with the rear, right side, left side or front outlet. For installation with frontal outlet, one must use the fixing plate and a concentric bend coupling in order to ensure sufficient space to carry out the tests required by law upon commissioning.

- External grid. Both the Ø 60/100 and Ø 80/125 intake/exhaust terminal, if properly installed, is pleasant to look at on the outside of the building. Make sure that the external silicone wall sealing plate is properly inserted in the wall.

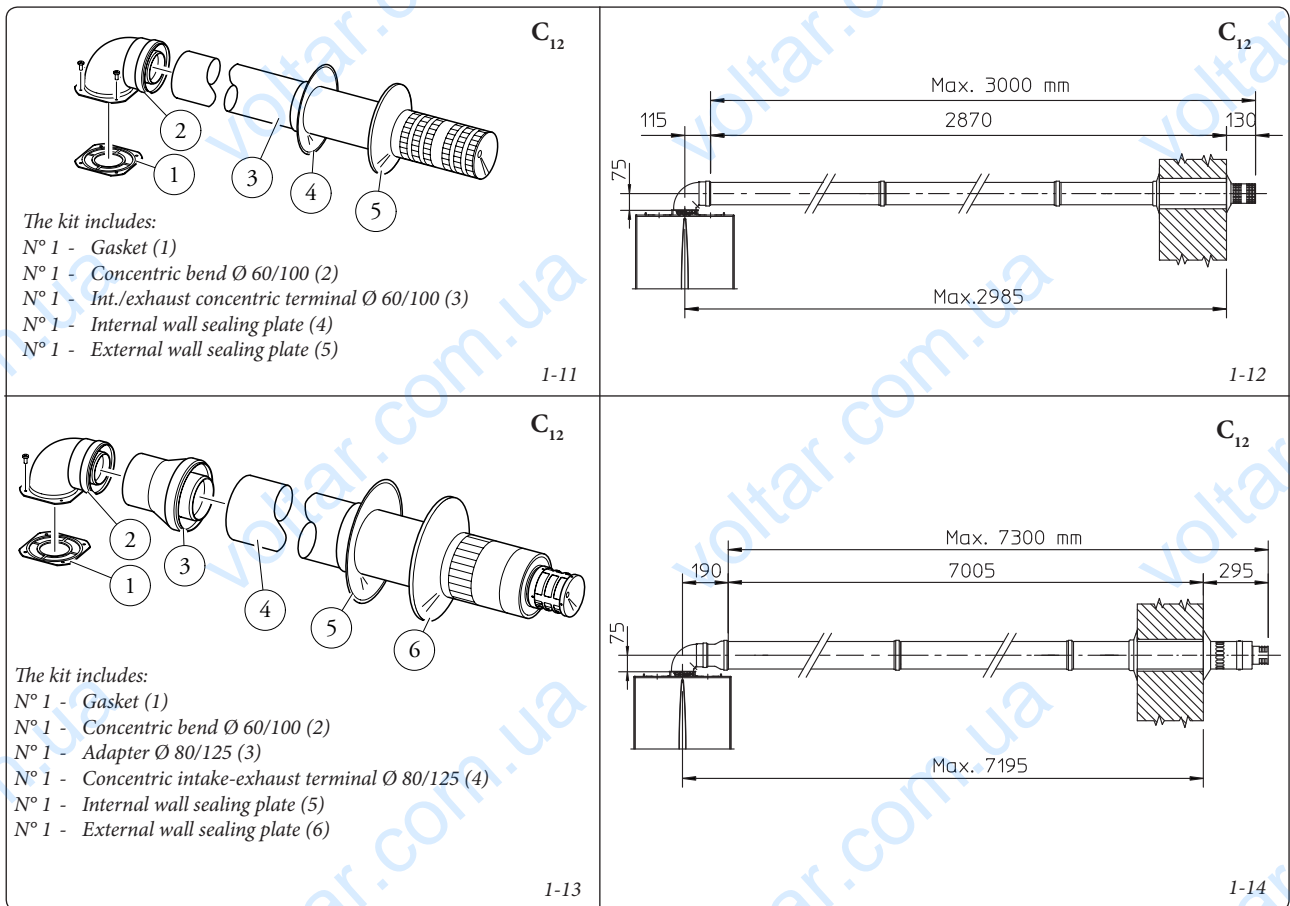
Horizontal intake - exhaust kit Ø 60/100. Kit assembly (Fig. 1-11): install the bend with flange (2) onto the central hole of the boiler inserting the gasket (1) and tighten using the screws included in the kit. Couple the concentric terminal pipe Ø 60/100 (3) with the male end (smooth) into the female end (with lip seals) of the bend (2) up to the stop, making sure that the internal and external wall sealing plate have been fitted, this will ensure sealing and joining of the kit elements.

- Extensions for Ø 60/100 horizontal kit (Fig. 1-12). The kit with this configuration can be extended up to a *max. horizontal length of 3 m* including the terminal with grid and excluding the concentric bend leaving the boiler. This configuration corresponds to a resistance factor of 100. In this case the special extensions must be requested.

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

Horizontal intake - exhaust kits Ø 80/125. Kit assembly (Fig. 1-13): install the bend with flange (2) onto the central hole of the boiler inserting the gasket (1) and tighten using the screws included in the kit. Fit the male end (smooth) of the adapter (3) up to the end stop on the female side of the bend (2) (with lip seal). Fit the Ø 80/125 (4) concentric terminal pipe with the male end (smooth) to the female end of the adapter (3) (with lip gasket) up to the end stop; making sure that the internal and external wall sealing plates have been fitted; this will ensure sealing and joining of the elements making up the kit.

- Extensions for Ø 80/125 horizontal kit (Fig. 1-14). The kit with this configuration can be extended up to a *maximum length of 7.3 m*, including the terminal with grid and excluding the concentric bend leaving the boiler and the adapter Ø 60/100 in Ø 80/125. This configuration corresponds to a resistance factor of 100. In this case the special extensions must be requested.



1.13 CONCENTRIC VERTICAL KIT INSTALLATION.

Type C configuration, sealed chamber and fan assisted.

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

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

Vertical kit with aluminium tile Ø 60/100.

To use this kit one must use the fixing plate kit 60/100 (sold separately).

Kit assembly (Fig. 1-15): install the concentric flange (2) on the central hole of the boiler inserting the gasket (1) and tighten using the screws in the kit. Fit the male end (smooth) of the adapter (3) into the female end of the concentric flange (2). Imitation aluminium tile installation. Replace the tile with the aluminium sheet (5), shaping it to ensure that rainwater runs off. Position the

fixed half-shell (7) and insert the intake-exhaust pipe (6). Fit the Ø 80/125 concentric terminal pipe with the male end (6) (smooth) to the female end of the adapter (3) (with lip gasket) up to the end stop; making sure that the wall sealing plate (4) has been fitted, this will ensure sealing and joining of the elements making up the kit.

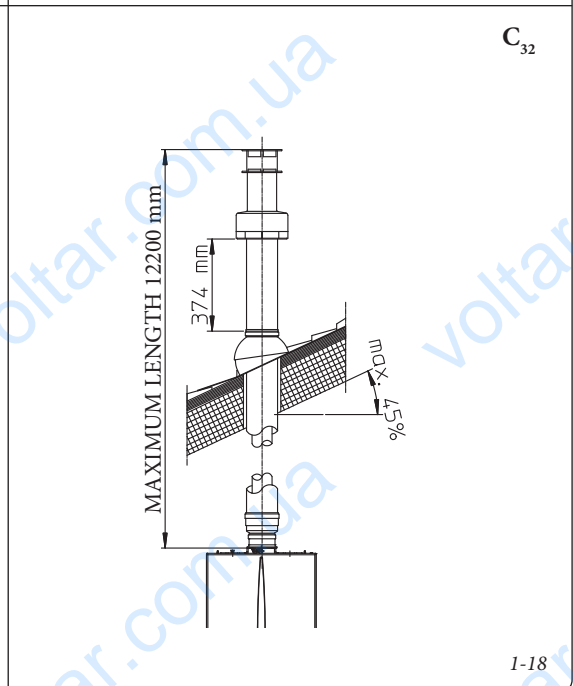
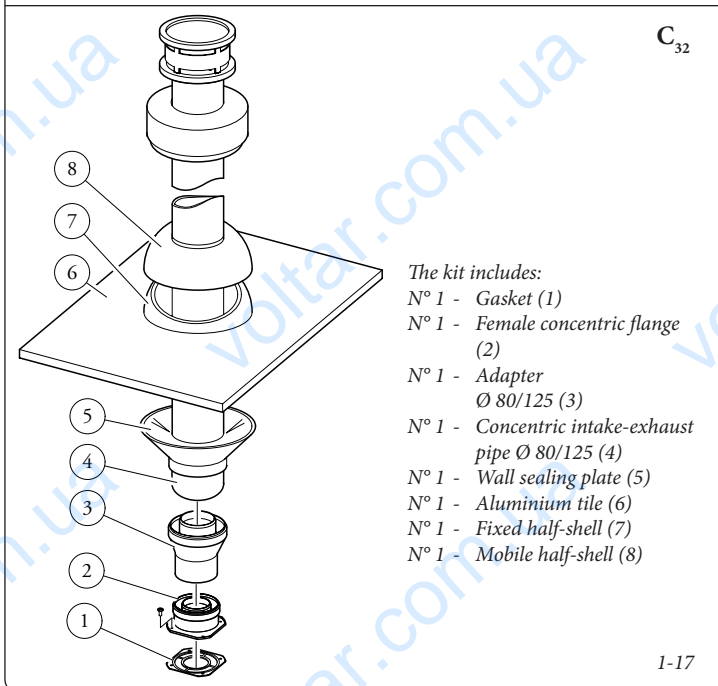
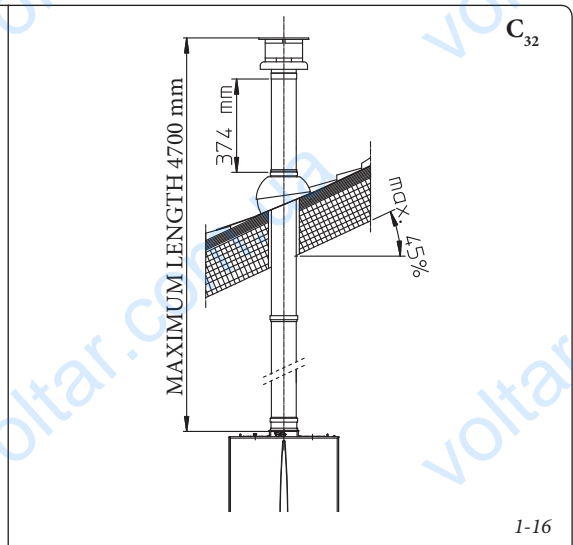
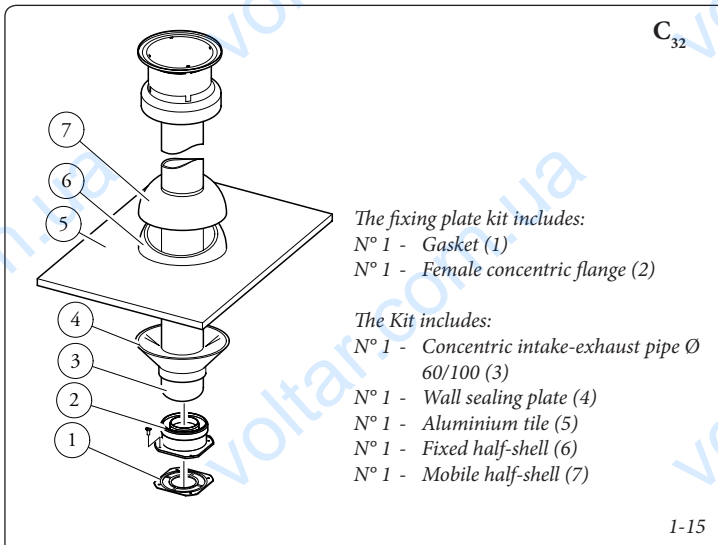
- Extensions for vertical kit Ø 60/100 (Fig. 1-16). The kit with this configuration can be extended to a *max. straight vertical length of 4.7 m*, including the terminal. This configuration corresponds to a resistance factor of 100. In this case specific extensions must be requested.

Vertical kit with aluminium tile Ø 80/125.

Kit assembly (Fig. 1-17): to install the kit Ø 80/125 one must use the flanged adapter kit in order to install the flue system Ø 80/125. Install the flanged adaptor (2) on the central hole of the boiler, positioning gasket (1) with the circular projections downwards in contact with the boiler flange, and tighten using the screws contained in the kit. Installation of the fake aluminium tile: replace the tiles with the aluminium sheet (4), shaping it to ensure that rainwater runs off. Position the fixed half-shell (5) on the aluminium

tile and insert the intake-exhaust pipe (7). Fit the Ø 80/125 concentric terminal pipe with the male side (smooth) to the female side of the adapter (1) (with lip gaskets) up to the end stop; making sure that the wall sealing plate (3) has been fitted, this will ensure sealing and joining of the elements making up the kit.

- Extensions for vertical kit Ø 80/125 (Fig. 1-18). The kit with this configuration can be extended up to a *max. length of 12.2 m* including the terminal. If additional components are assembled, the length equivalent to the maximum allowed must be subtracted. In this case specific extensions must be requested.



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

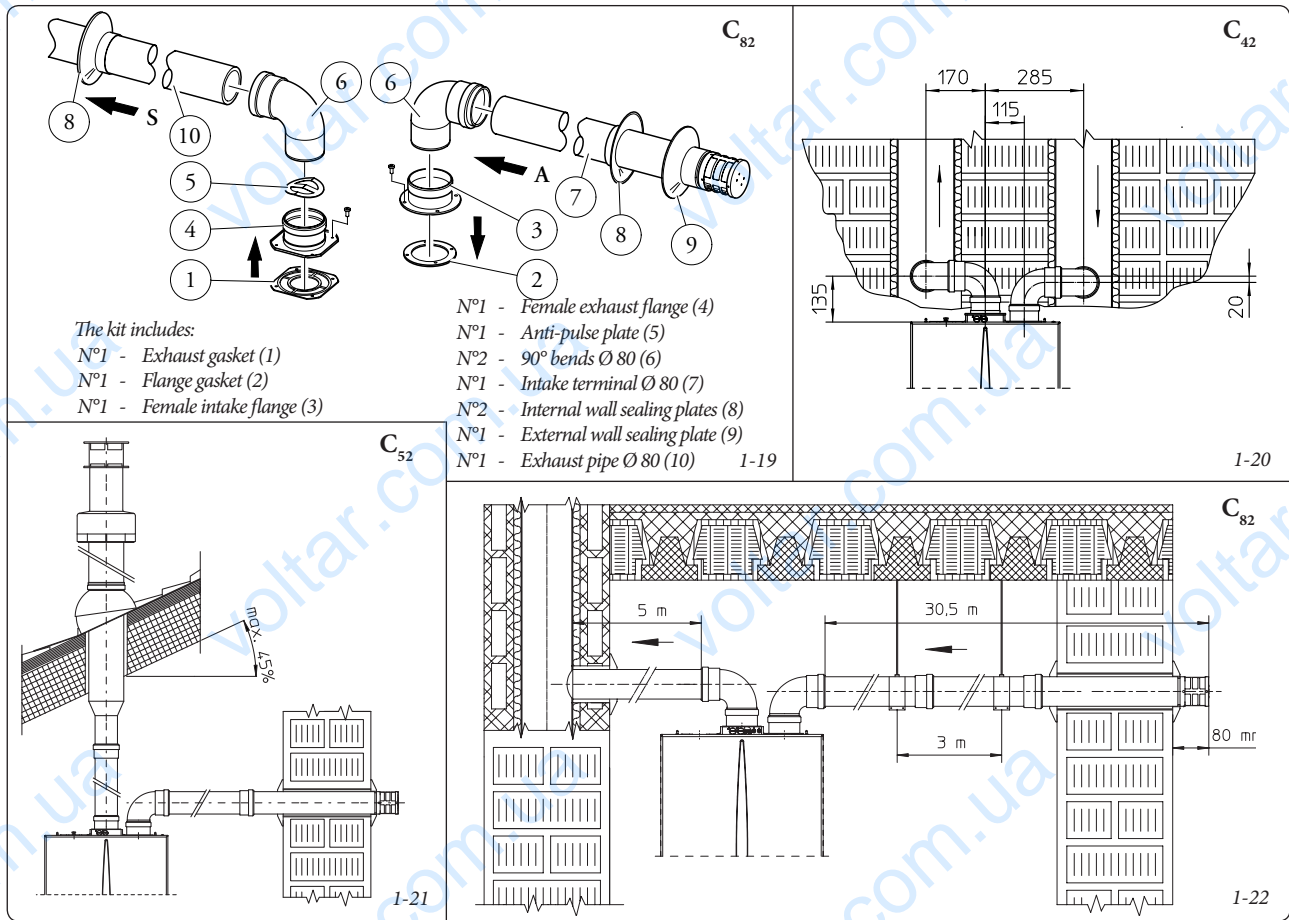
This kit allows air to come in from outside the building and the exhaust to exit from the chimney, flue or intubated duct through divided flue exhaust and air intake pipes. Combustion products are expelled from pipe (S). Air is taken in through pipe (A) for combustion. Both ducts can be routed in any direction.

Separator kit Ø 80/80. Kit assembly (Fig. 1-19): install the flange (4) on the central hole of the boiler inserting the gasket (1) and tighten using the hex head and flat tip screws contained in the kit, insert the anti-pulse plate up to the stop (5). 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 (6) in the female end of the flanges (3 and 4). Fit the intake terminal (7) with the male section (smooth) in the female section of the bend (6) up to the stop, ensuring that the internal and external wall sealing plates are fitted. Fit the exhaust pipe (10) with the male end (smooth) in the female end of the bend (6) up to the stop, making sure that the internal wall sealing plate has been fitted, this will ensure sealing and joining of the kit elements.

- Installation clearances (Fig. 1-20). The minimum installation clearance measurements of the Ø 80/80 separator terminal kit have been stated in some limit conditions.

- The figure (Fig. 1-21) shows the configuration with vertical exhaust and horizontal intake.
- Extensions for separator kit Ø 80/80. The max. vertical straight length (without bends) usable for Ø 80 intake and exhaust pipes is 41 metres of which 40 intake and 1 exhaust. This total length corresponds to a resistance factor of 100. The total usable length obtained by summing the Ø 80 intake and exhaust pipe lengths can reach, as a maximum, the values provided in the following table. If *mixed accessories or components are used*, the maximum extension can be calculated by using a resistance factor for each component or its *equivalent length*. The sum of these resistance factors must not exceed 100.



Maximum usable lengths (including intake terminal with grill and two 90° bends)			
NON-INSULATED PIPE		INSULATED PIPE	
Drain (metres)	Intake (metres)	Drain (metres)	Intake (metres)
1	36.0*	6	29.5*
2	34.5*	7	28.0*
3	33.0*	8	26.5*
4	32.0*	9	25.5*
5	30.5*	10	24.0*
* The air intake pipe can be increased to 2.5 metres if the exhaust bend is eliminated, 2 metres if the air intake bend is eliminated, 4.5 metres eliminating both bends.		11	22.5*
		12	21.5*

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

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

pipe and Immergas insulated "Blue Series" flue kits must be used.

- Temperature loss in flue pipes (Fig. 1-22). To prevent problems of flue gas condensate in the exhaust pipe $\varnothing 80$, due to fume cooling through the wall, *the length of the exhaust pipe must be limited to just 5 m*. If longer distances must be covered, use $\varnothing 80$ pipes with insulation (see insulated separator kit $\varnothing 80/80$ chapter).

Insulated separator kit $\varnothing 80/80$. Kit assembly (Fig. 1-23): install the flange (4) on the central hole of the boiler inserting the gasket (1) and tighten using the hex head and flat tip screws contained in the kit, insert the anti-pulse plate up to the stop (5). Remove the flat flange contained in the side hole with respect to the central one (as needed) and replace it with the flange (3), positioning the gasket (2) already present in the boiler and tighten using the supplied self-threading screws with tip. Insert and slide cap (7) onto bend (6) from the male side (smooth), and join bends (6) with the male side (smooth) in the female side of flange (3). Fit bend (12) with the male side (smooth) into the female side of flange (4). Fit the male end (smooth) of the intake terminal (8) up to the stop on the female end of the bend (6), making sure you have already inserted the wall sealing plates (9 and 10) that ensure correct installation between pipe and wall, then fix the closing cap (7) on the terminal (8). Join the exhaust pipe (11) with the male side (smooth) in the female side of the bend (12) to the end stop, ensuring that the wall sealing plate (9) is already inserted for correct installation between the pipe and flue.

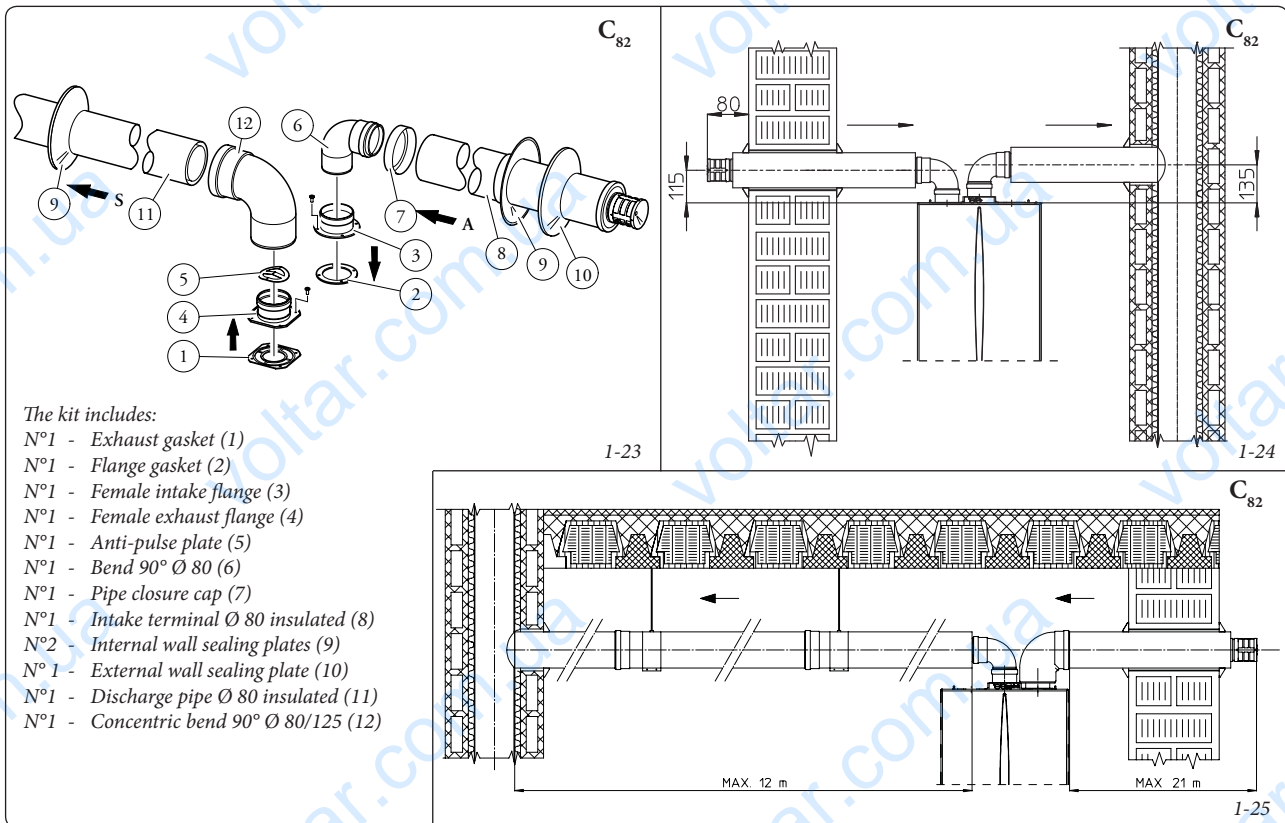
- Insulation of separator terminal kit. Whenever there are flue gas condensate problems in the exhaust pipes or on the external surface of the intake pipes, on request Immergas supplies insulated intake-exhaust pipes. Insulation may be necessary on the exhaust pipe, due to excessive loss of temperature of the flue gas on their route. Insulation may be necessary on the intake pipe as the air entering (if very cold) may cause the outside of the pipe to fall below the dew point of the environmental air. The figures (Fig. 1-24 ÷ 1-25) illustrate different applications of insulated pipes.

Insulated pipes are formed of a $\varnothing 80$ internal concentric pipe and a $\varnothing 125$ external pipe with static air space. It is not technically possible to start with both $\varnothing 80$ 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 end stop on the flue gas exhaust flange, a situation that takes the two intake flue gas exhaust outlets to the same height.

- Temperature loss in insulated flue ducting. To prevent problems of flue gas condensate in the insulated exhaust pipe $\varnothing 80$, due to flue gas cooling through the wall, *the length of the pipe must be limited to 12 metres*. The figure (Fig. 1-25) illustrates a typical insulation application in which the intake pipe is short and the exhaust pipe is very long (over 5 m). The entire intake pipe is insulated to prevent moist air in

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

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



1.15 DUCTING OF FLUES OR TECHNICAL SLOTS.

Ducting is an operation through which by inserting one or more relevant pipes, one achieves a system for the evacuation of the combustion products of a gas appliance, consisting in the combination of an existing or new ducting pipe with a chimney, flue or technical slot (also in new buildings). Ducting requires ducts declared to be suitable for the purpose by the manufacturer, following the installation and user instructions, provided by the manufacturer and the requirements of the standards in force.

1.16 CONFIGURATION TYPE B₂₂, OPEN CHAMBER AND FORCED DRAUGHT FOR INDOORS.

The appliance can be installed inside buildings in B₂₂ mode; in this eventuality, all technical rules and national and local regulations in force, must be complied with.

- Type B open chamber boilers must not be installed in places where commercial, artisan or industrial activities take place, which use products that may develop volatile vapours or substances (e.g. acid vapours, glues, paints, solvents, combustibles, etc.), as well as dusts (e.g. dust deriving from the working of wood, coal fines, cement, etc.), which may be damaging for the components of the appliance and jeopardise functioning.

- in B₂₂ configuration, unless otherwise provided for by local regulations in force: the boilers must not be installed in bedrooms, bathrooms or bedsits. They must neither be installed in rooms containing solid fuel heat generators nor in rooms communicating with said rooms.

- The installation of appliances in B₂₂ configuration is only recommended in places that are not lived in and which are permanently ventilated.

To install them one must use the coverage kit whose installation is referred to in paragraph 1.11.

1.17 FLUE EXHAUST TO FLUE/CHIMNEY.

Flue exhaust does not necessarily have to be connected to a branched type traditional flue. The flue exhaust, for boiler units installed in C configuration, can be connected to a special LAS type multiple flue. For B₂₂ configurations, exhaust is only allowed into individual chimney or directly into the external atmosphere via a relevant terminal, unless otherwise provided by local regulations. Multiple and combined flues must be specially designed according to the calculation method and requirements of the standards in force, by professionally qualified technical staff. Chimney or flue sections for connection of the flue exhaust pipe must comply with requisites of technical standards in force.

1.18 FLUES, CHIMNEYS AND CHIMNEY CAPS.

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

Positioning the wall flue exhaust terminals. The wall flue exhaust terminals must:

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

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

1.19 SYSTEM FILLING.

Once the boiler is connected, proceed with system filling via the filling cock (Fig. 2-2).

Filling is performed at low speed to ensure release of air bubbles in the water via the boiler and central heating system vents.

The boiler has a built-in automatic venting valve on the circulator. *Check if the cap is loose.* Open the radiator vent valves.

Close radiator vent valves when only water escapes from them.

Close the filling valve when the boiler pressure gauge indicates approx. 1.2 bar.

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

Screw the cap back on after the operation.

1.20 GAS SYSTEM START-UP.

To start up the system, make reference to the Standard:

In particular, for new gas systems:

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

1.21 BOILER START UP (IGNITION).

To commission the boiler (the operations listed below must only be performed by qualified personnel and in the presence of staff only):

- check that the internal system is properly sealed according to the regulations in force;
- ensure that the type of gas used corresponds to boiler settings;
- Check that there are external factors that may cause the formation of fuel pockets;
- switch the boiler on and ensure correct ignition;
- make sure that the gas flow rate and relevant pressure values comply with those given in the manual (Par. 3.16);
- 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 and/or exhaust terminals (if fitted) are not blocked.

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

1.22 CIRCULATION PUMP.

The Eolo Star 24 4 E series boilers are supplied with a built-in circulation pump with three-position electric speed control. The boiler does not operate correctly with the circulation pump on first speed. To ensure optimal boiler operation, in the case of new systems (single pipe and module) it is recommended to use the pump at maximum speed. The circulation pump is already fitted with a 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 adjustment (part.24 Fig. 1-27). If necessary, the by-pass can be adjusted according to system requirements from a minimum (by-pass excluded) to a maximum (by-pass inserted) represented by the graph (Fig. 1-26). Make the adjustment using a flat head screwdriver, turn clockwise and insert the by-pass; by turning it anti-clockwise it is excluded.

1.23 KITS AVAILABLE ON REQUEST.

- Connection unit kit (on request). The kit includes pipes, fittings and cocks (including gas cock), to carry out all connections to the boiler system
- System cut-off valve kits with or without inspectionable filter (on request) 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 very useful for maintenance because it allows to empty just the boiler without having to empty the entire system. Moreover, the version with filter preserves the functioning characteristics of the boiler thanks to its inspectionable filter.
- Polyphosphate dispenser kit (on request). The polyphosphate dispenser reduces the formation of lime-scale and preserves the original heat exchange and domestic hot water production conditions. The boiler is prepared for application of the polyphosphate dispenser kit.
- Covering kit. In the case of installation with direct intake and open sky installation it is mandatory to mount the relevant top cover protection for correct functioning of the boiler and to protect it from weather.

- 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.

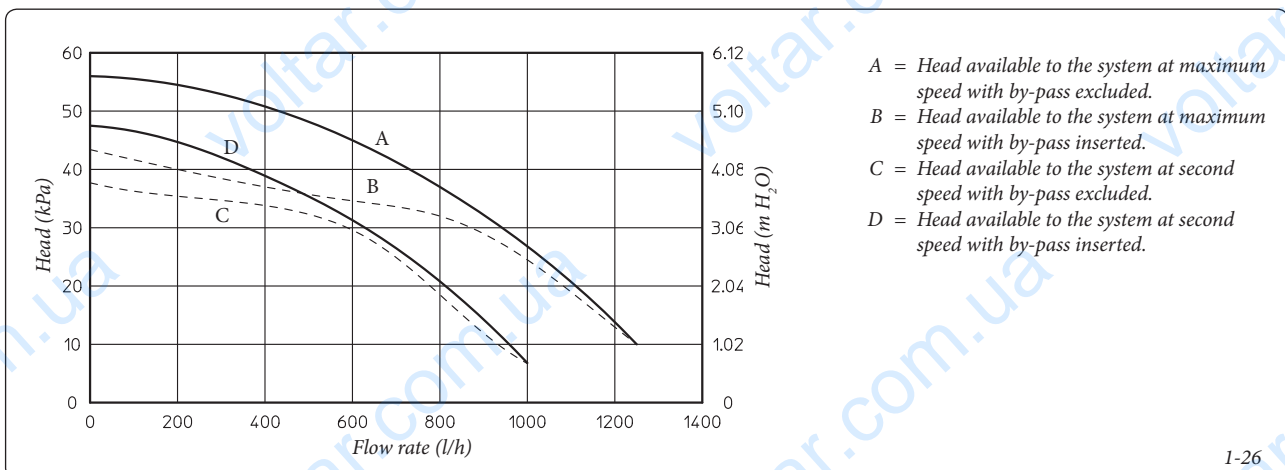
The above-mentioned kits are supplied complete with instructions for assembly and use.

INSTALLER

USER

MAINTENANCE TECHNICIAN

Head available to the system.



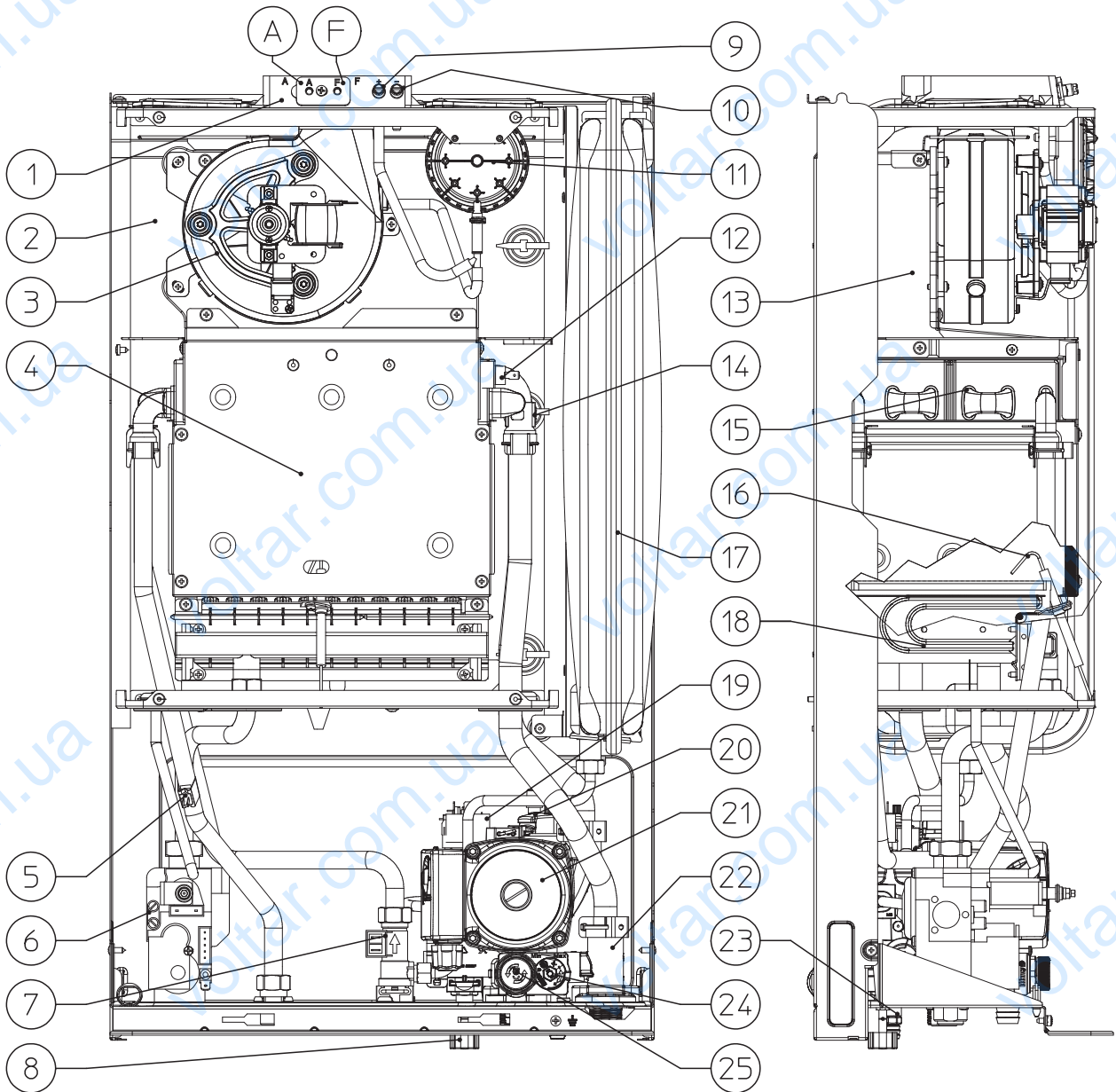
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1.24 BOILER COMPONENTS.

INSTALLER

USER

MAINTENANCE TECHNICIAN



Key:

- 1 - Sample points (air A) - (flue gases F)
- 2 - Sealed chamber
- 3 - Fan
- 4 - Combustion chamber
- 5 - D.H.W. probe
- 6 - Gas valve
- 7 - D.H.W. flow switch
- 8 - System filling valve
- 9 - Positive signal pressure point
- 10 - Negative signal pressure point
- 11 - Flue pressure switch

- 12 - Safety thermostat
- 13 - Flue hood
- 14 - Flow probe
- 15 - Rapid heat exchanger
- 16 - Ignition and detection electrodes
- 17 - System expansion vessel
- 18 - Burner
- 19 - System pressure switch
- 20 - Air vent valve
- 21 - Boiler pump
- 22 - Manifold
- 23 - System draining valve
- 24 - By-pass
- 25 - 3 bar safety valve

PLEASE NOTE: connection group (optional)

2 INSTRUCTIONS FOR USE AND MAINTENANCE

2.1 CLEANING AND MAINTENANCE.

Attention: to preserve the boiler's integrity and keep the safety features, performance and reliability which distinguish it unchanged over time, maintenance operations must be carried out on a yearly basis in compliance with that stated in the "annual check and maintenance of the appliance" section, in compliance with national, regional, or local standards in force.

2.2 GENERAL WARNINGS.

Never expose the wall-mounted boiler to direct vapours from cooking hobs.

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 air intake/flue exhaust terminals (if fitted) are not blocked. If temporary shutdown of the boiler is required, proceed as follows:

- drain the heating 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.

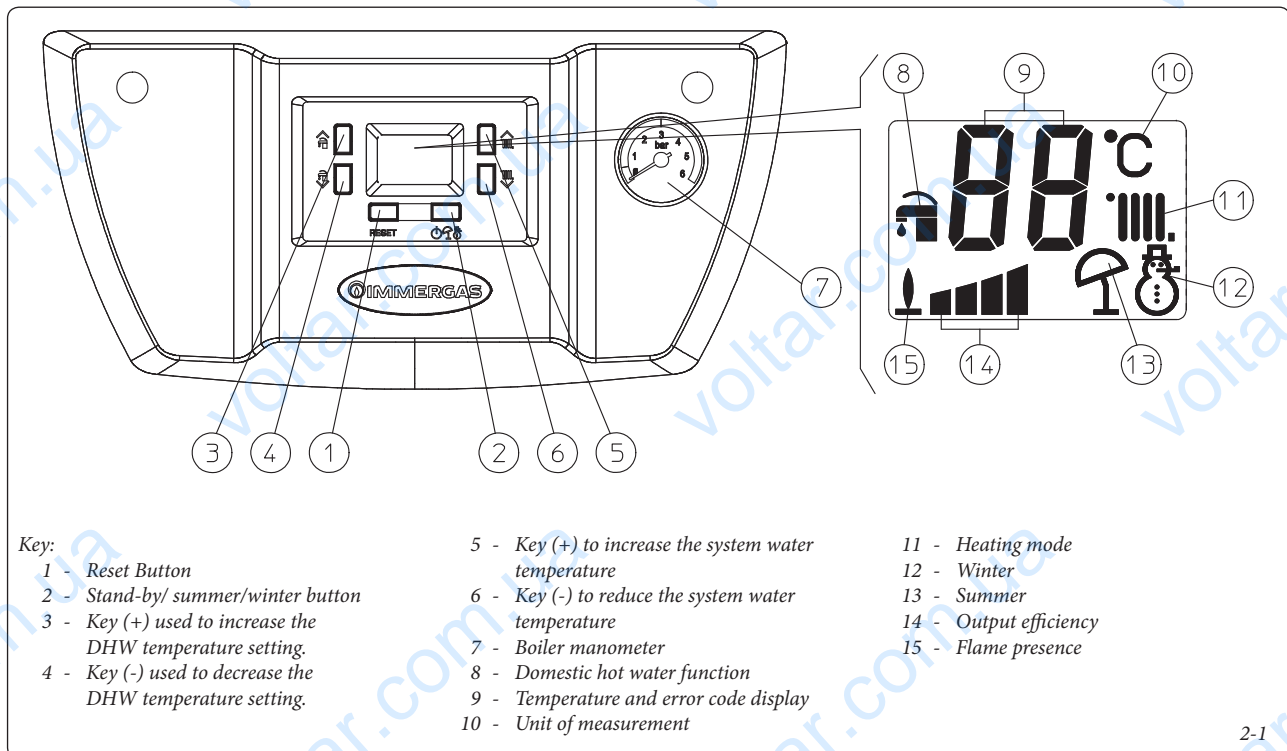
Never clean the appliance or connected parts with easily flammable substances.

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

• **Attention:** using any components that use 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 it when bare-foot.
- 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 upstream of the appliance.

2.3 CONTROL PANEL.



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Ignition of 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 key (2) and set the boiler on Summer (☀) or Winter (❄).

N.B.: the button (2) must be pressed and held for the time required to switch from the Standby (↔), Summer (☀) or Winter (❄) function.

Attention: after each switch the button must in any case be released to switch to the next function.

When in summer position (☀) the domestic hot water temperature is adjusted with the buttons (3-4).

When the winter position is selected (❄) the system water temperature is adjusted with the buttons (5-6), whilst the domestic hot water temperature is adjusted using the buttons (3-4), by pressing (+) to increase and (-) to reduce the temperature.

From this moment the boiler functions automatically. With no demand for heat (central 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 boiler ignites, the relative flame present symbol is displayed (15).

2.4 FAULT AND ANOMALY SIGNALS.

In case of an anomaly, the letter "E" appears on the display alternately with the relevant error code occurred. The error codes are listed in the following table.

Error Code	Anomaly signalled	Cause	Boiler status / Solution
01	No ignition block	In the event of request of room central heating or domestic hot water production, the boiler does not switch on within the preset time. Upon appliance commissioning or after extended downtime, it may be necessary to eliminate the block.	Press the Reset button (1).
02	Safety thermostat block (over-temperature)	During normal operation, if a fault causes excessive overheating internally, the boiler goes into overheating block.	Press the Reset button (1).
03	Flue safety thermostat anomaly	Failure to recognise the flue pressure switch.	The boiler will automatically restart after 30 minutes without having to be reset. After three interventions in less than two hours, the boiler has to be manually rearmed. Restore the normal conditions and press the button Reset (1).
05	Flow probe anomaly	The board detects an anomaly on the flow NTC probe.	The boiler does not start (1).
06	Domestic hot water probe anomaly	The board detects an anomaly on the domestic hot water NTC probe. In this case the antifreeze function is also inhibited	The boiler does not produce domestic hot water (1).
08	Maximum N° of resets	Number of allowed resets already performed.	Attention: the anomaly can be reset 5 times consecutively, after which the function is inhibited for at least one hour. One attempt is gained every hour for a maximum of 5 attempts. By switching the appliance on and off the 5 attempts are re-acquired.
10	Insufficient system pressure	Water pressure inside the central heating circuit that is sufficient to guarantee the correct operation of the boiler is not detected.	Check on the boiler pressure gauge (1) that the system pressure is between $1 \div 1.2$ bar and restore the correct pressure if necessary.
11	Flue pressure switch anomaly	This occurs in case of a fault in the flue pressure switch or the fan.	If normal conditions are restored the boiler restarts without having to be reset (1).
20	Parasite flame block	- This occurs in the event of a leak on the detection circuit or anomaly in the flame control unit.	Press the Reset button (1).

(1) If the shutdown or fault persists, contact an authorised company (e.g. Technical After-Sales Service).

Error Code	Anomaly signalled	Cause	Boiler status / Solution
24	Push button control panel anomaly	The board detects an anomaly on the pushbutton panel.	If normal conditions are restored the boiler restarts without having to be reset (1).
27	Insufficient circulation	This occurs if there is overheating in the boiler due to insufficient water circulating in the primary circuit; the causes can be: - low system circulation; check that no shut-off devices are closed on the heating circuit and that the system is free of air (deaerated); - circulating pump blocked; free the circulating pump.	If normal conditions are restored the boiler restarts without having to be reset (1).
28	Domestic hot water leakage	If during the heating phase, a rise in domestic hot water temperature occurs, an anomaly is signalled and heating temperature is reduced to limit the formation of limescale in the heat exchanger.	Check that all domestic hot water system cocks are closed and are not drawing and check also that there are no leaks in the system. Once good conditions are restored in the domestic hot water system, the boiler returns to normal functioning (1)
31	Loss of remote control communication.	This occurs if an incompatible remote control is connected, or if communication between the boiler and the remote control is lost.	Disconnect and reconnect the power to the boiler. If the Remote Control is not detected on re-starting the boiler will switch to "Summer" local operating mode. In this case, the controls on the control panel of the boiler are enabled again (1).
36	IMG BUS communication loss	Communication loss on the IMG BUS protocol	The boiler does not satisfy the room heating requests (1).
37	Low power supply voltage	This occurs when the power supply voltage is lower than the allowed limits for the correct boiler operation.	If normal conditions are restored the boiler restarts without having to be reset (1).
38	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.	(1).
43	Block due to loss of flame signal	This occurs if the "Flame signal loss (38)" error occurs many times in a row within a preset period.	Press the Reset button (1).
44	Block for exceeding the maximum openings close to the gas valve	This occurs if the gas valve remains open for longer than required for normal operation, without the boiler switching on.	Press the Reset button (1).
59	Supply voltage frequency anomaly	The board detects a main supply voltage frequency anomaly.	The boiler does not start (1).
80	Failure signalled of the gas valve modulator pilot circuit	Possible failure to the gas valve modulator or electronic board, cut-off wiring. The boiler operates to the minimum DHW output.	Check the wiring connection and modulator coil continuity (1).
98	Block - maximum no. of software errors	The maximum number of software errors possible has been reached.	Press the Reset button (1).
(1) If the shutdown or fault persists, contact an authorised company (e.g. Technical After-Sales Service).			

2.5 INFORMATION MENU.

Pressing the buttons (3) and (4) simultaneously for 3 seconds, the "Information menu" is activated, which displays some boiler functioning parameters.

Press buttons (3) and (4) to scroll through the various parameters. To exit the menu, press buttons (3) and (4) simultaneously again for 3 seconds or wait for 5 minutes.

List of parameters

Id Parameter	Description
d1	Displays the flame signal
d2	Displays the primary exchanger output instant flow temperature (flow probe)
d3	Displays the instant output temperature from the DHW exchanger (DHW probe)
d4	Not used
d5	Displays the operating instantaneous power (value in %).
d6	Displays the actual temperature for the central heating set (if remote control is present)
d7	Displays the temperature set for the DHW set (if remote control is present)
E1 - E7	Display the anomaly history, of which E1 is the most recent

Resetting the anomaly history.

Press the Reset button on the information menu for > 2 seconds and < 4.5 seconds. "E-" will appear on the display.

Only during this time, if you release the button, it resets the anomaly history.

2.6 BOILER SHUTDOWN

Press the button (2 Fig. 2-1) (⏻) until the symbol appears on the display (→→).

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

Disconnect the omnipolar switch outside the boiler and close the gas cock upstream of 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 value of between 1 and 1.2 bar.

If the pressure is below 1 bar (with the circuit cool) restore normal pressure via the filling 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, remove water from an air vent valve of a radiator until reaching pressure of 1 bar, or ask for assistance from professionally qualified personnel.

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

2.8 DRAINING THE SYSTEM.

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

Before draining, ensure that the filling cock is closed.

2.9 ANTIFREEZE PROTECTION.

The boiler comes standard with an antifreeze function that activates the pump and burner when the system water temperature in the boiler falls below 4°C (standard protection up to the min. temperature of -5°C) and stops once it exceeds 42°C. The antifreeze function is guaranteed if the boiler is fully operative and not in "block" status, and is electrically powered. To avoid keeping the system switched on in case of a prolonged absence, the system must be drained completely or antifreeze substances must be added to the heating system water. In both cases the 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. All information relative to the antifreeze protection is stated in par. 1.3 In order to guarantee the integrity of the appliance and the domestic hot water heating system in areas 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. In the case of prolonged inactivity (second case), we also recommend that:

- the electric power supply is disconnected;
- empty the boiler domestic hot water circuit via the drain valves (Fig. 1-27) and the internal domestic hot water distribution network.

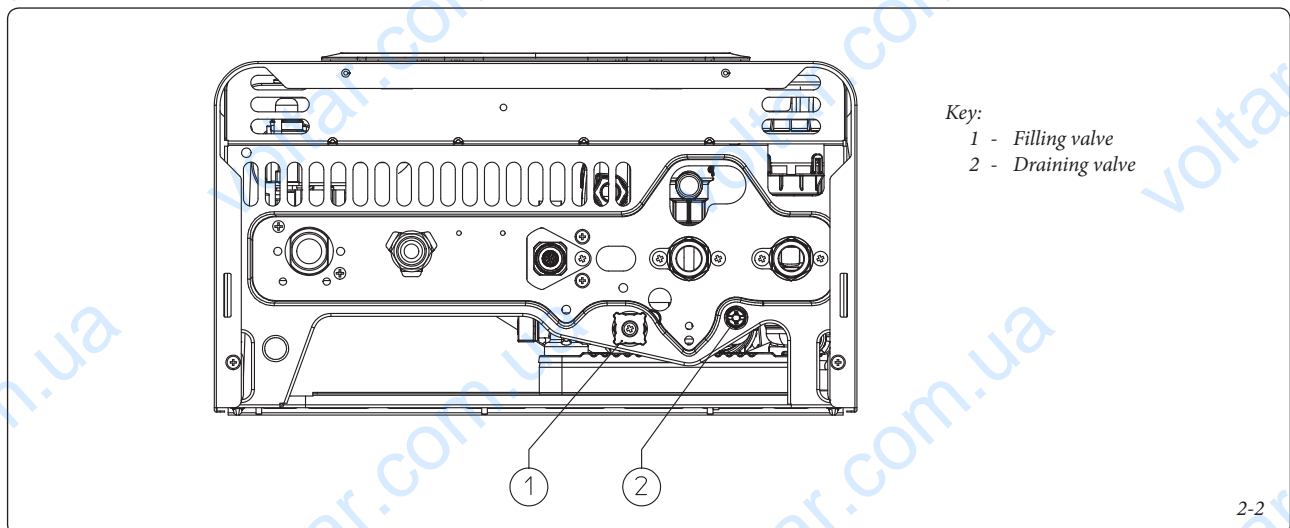
2.10 CASE CLEANING.

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.



Key:
1 - Filling valve
2 - Draining valve

2-2

3 COMMISSIONING THE BOILER (INITIAL CHECK)

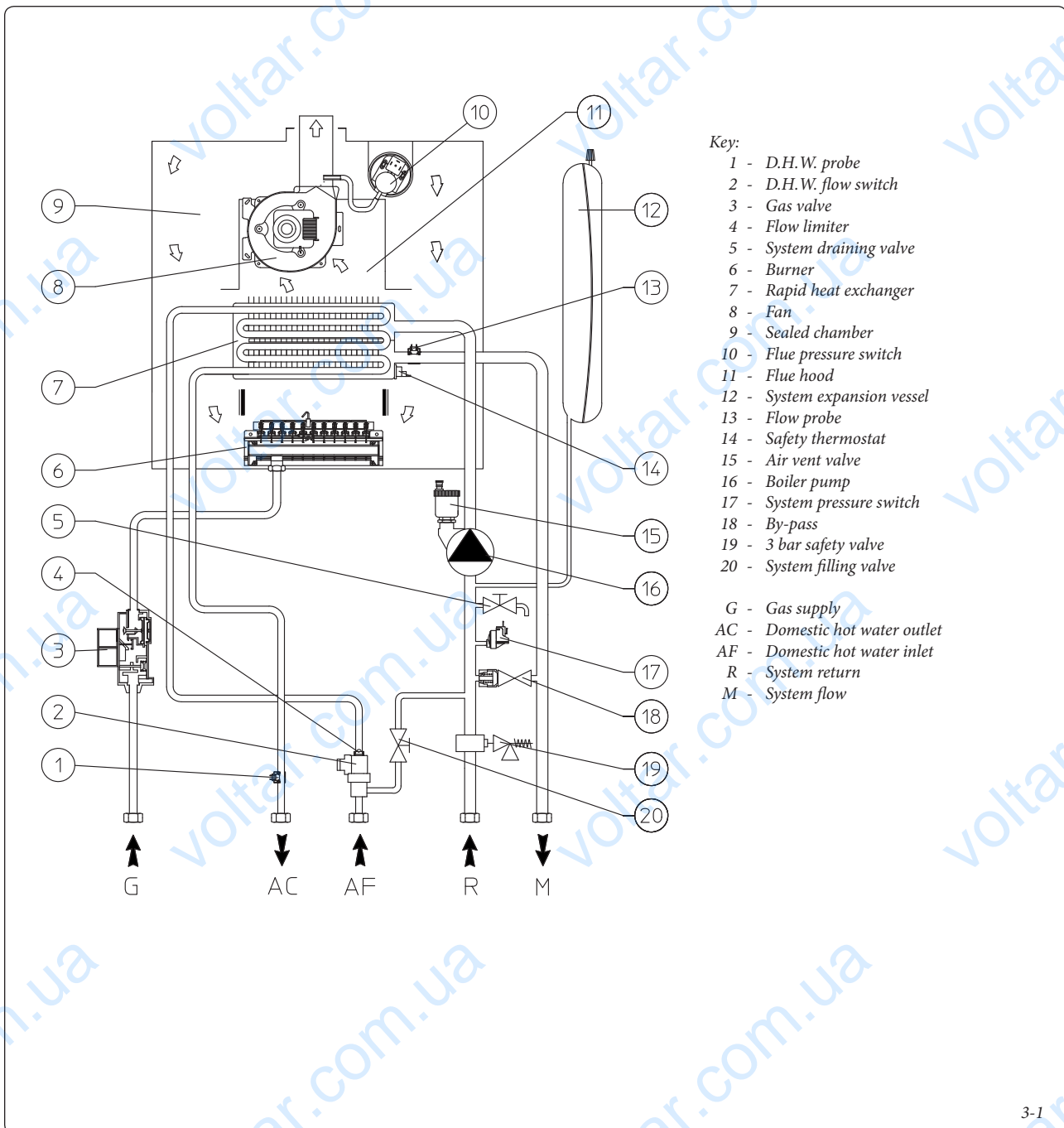
To commission the boiler:

- ensure that the type of gas used corresponds to boiler settings;
- check connection to a 230V-50Hz power mains, correct L-N polarity and the earthing connection;
- make sure the central heating system is filled with water and that the boiler 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 ensure correct ignition;

- make sure the gas maximum, medium and minimum flow rate and pressure values correspond to those given in the handbook (Paragraph 3.16);
- check activation of the safety device in the event of no gas, as well as the relative activation time;
- check activation of the main switch located upstream from the boiler;
- check that the intake and/or exhaust terminals are not blocked;
- check activation of the "no air" safety pressure switch;
- ensure activation of all adjustment devices;
- seal the gas flow rate regulation devices (if settings are modified);
- ensure production of domestic hot water;
- ensure sealing efficiency of water circuits;

- check ventilation and/or aeration of the installation room where provided.
- Even if just one single safety check provides a negative result, do not commission the system.

3.1 HYDRAULIC DIAGRAM.

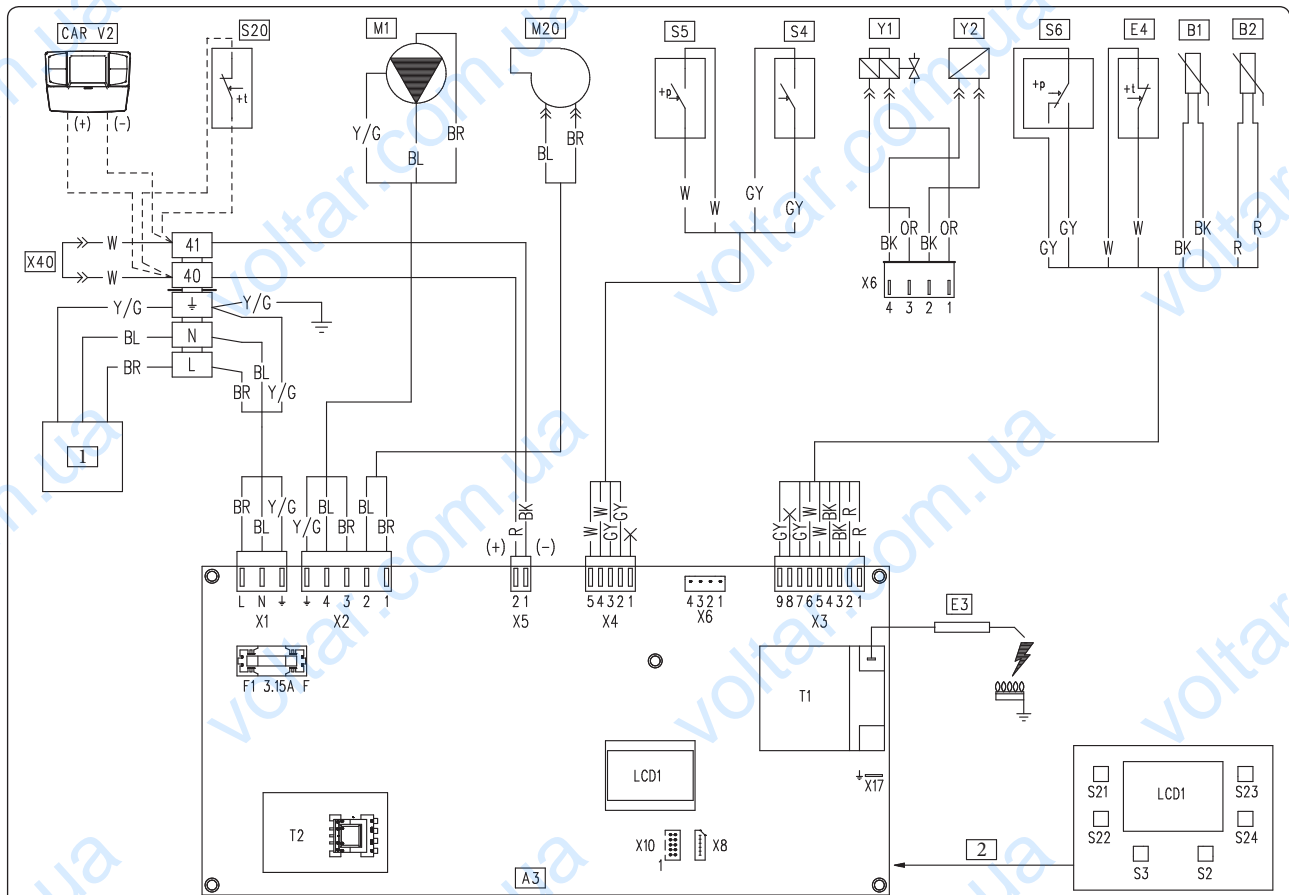


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3.2 WIRING DIAGRAM.



Key:

A3 - Integrated P.C.B.

B1 - Flow probe

B2 - D.H.W. probe

CAR^{V2} - Comando Amico Remoto ^{V2} remote control (optional)

E3 - Ignition and detection electrode

E4 - Safety thermostat

F1 - Phase fuse

LCD1 - Display

M1 - Boiler pump

M20 - Fan

S2 - Selector switch functioning

S3 - Reset block key

S4 - D.H.W. flow switch

S5 - System pressure switch

S6 - Flue pressure switch

S20 - Room thermostat (optional)

S21 - Key to increase DHW temperature

S22 - Key to decrease DHW temperature

S23 - Key to increase central heating temperature

S24 - Key to decrease central heating temperature

T1 - Ignition transformer

T2 - Boiler P.C.B. transformer

X40 - Room thermostat jumper

Y1 - Gas valve

Y2 - Gas valve modulator

1 - User interface

2 - 230 Vac 50 Hz supply voltage

Colour code key:

BK - Black

BL - Blue

BR - Brown

G - Green

DY - Grey

OR - Orange

P - Purple

PK - Pink

R - Red

W - White

W/BK - White/Black

Y - Yellow

Y/G - Yellow/Green

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Comando Amico Remoto^{V2}: the boiler is set-up for the application of the Comando Amico Remoto remote control ^{V2} (CAR^{V2}) or of the Mini CRD, which must be connected to clamps 40 and 41, by observing polarity and eliminating jumper X40.

Room thermostat: the boiler is set-up for the application of the Room Thermostat (S20) which must be connected to clamps 40 and 41 and by eliminating jumper X40.

The X5 connector is used for automatic inspection.

NOTE: the user interface is on the welding side of the boiler board.

3.3 TROUBLESHOOTING

NOTE: maintenance operations must be carried out by an authorised company (e.g. After-Sales Technical Assistance Service).

- Smell of gas. Caused by leakage from gas circuit pipelines. Check sealing efficiency of gas intake circuit.

- The fan works but ignition discharge does not occur on the burner ramp. The fan may start but the safety air pressure switch does not switch the contact over. Make sure:

- 1) the intake-exhaust duct is not too long (over allowed length).
- 2) the intake-exhaust pipe is not partially blocked (on the exhaust or intake side).
- 3) the diaphragm of the fume exhaust is adequate for the length of the intake-exhaust duct.
- 4) the sealed chamber is kept in good conditions.
- 5) the fan power supply voltage is not less than 196 V.

- Irregular combustion (red or yellow flame). Can be caused by: dirty burner, clogged lamel-

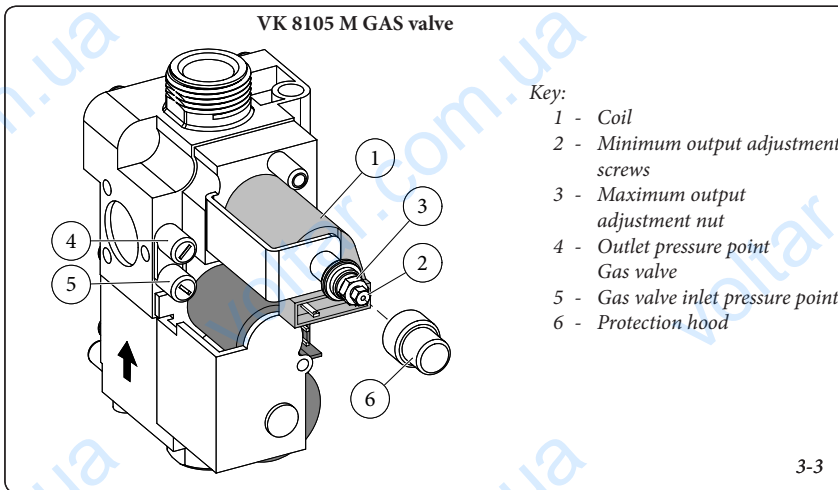
lar pack, intake - exhaust terminal not installed properly. Clean the above components and ensure correct installation of the terminal.

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

- Presence of air in the system. Check opening of the special air vent valve cap (Fig. 1-27). Make sure the system pressure and expansion vessel factory-set pressure-set values are within the set limits; the factory-set value for the expansion vessel must be 1.0 bar, and system pressure between 1 and 1.2 bar.

- Ignition block. (Par. 2.4).

- Low water flow: if, as a result of limescale



- Key:
- 1 - Coil
 - 2 - Minimum output adjustment screws
 - 3 - Maximum output adjustment nut
 - 4 - Outlet pressure point Gas valve
 - 5 - Gas valve inlet pressure point
 - 6 - Protection hood

(calcium and magnesium), the domestic hot water system does not work properly, contact a qualified technician for descaling e.g. After-Sales Technical Service. Descaling must be carried out on the domestic hot water side of the bithermal heat exchanger in accordance with good practice. To preserve integrity and efficiency of the heat exchanger, a non corrosive descaler must be used. Cleaning must be carried out without the use of tools which can damage the heat exchanger.

3.4 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 nameplate, request the relative conversion kit for quick and easy conversion.

The gas conversion operation must be carried out by an authorised company (e.g. After-Sales Technical Assistance).

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;
- select, using the boiler key, the gas parameter type (P01) and select (nG) in the case of methane supply or (LG) in the case of LPG supply and save it;
- adjust the boiler nominal heat output;
- adjust the boiler nominal heat output in domestic hot water phase;
- adjust the boiler nominal heat output in heating phase (para. 3.7);
- adjust (eventually) the maximum heating power (para. 3.7);
- seal the gas flow rate devices (if adjusted);
- after completing conversion, apply the sticker, present in the conversion kit, near the data-plate. Using an indelible marker pen, delete 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. 3.16).

3.5 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.

NOTE: all boiler adjustment operations must be carried out by an authorised company (e.g. After-Sales Technical Assistance). Burner adjustment must be carried out using a differential "U" or digital type pressure gauge connected to the pressure socket located above the sealed chamber (part. 9 Fig. 1-27) and the gas valve pressure outlet (part. 4 Fig. 3-3), keeping to the pressure value given in the table (Par. 3.16) according to the type of gas for which the boiler is prepared.

3.6 POSSIBLE ADJUSTMENTS

- Adjustment of boiler nominal thermal heat output.
 - Activate the chimney sweep function. (Ref. Par. 3.9) in DHW, making sure that the maximum boiler output is reached (on the display "99" is to be displayed).
 - From the brass nut (3 Fig. 3-3) adjust the boiler nominal output, observing the maximum pressure values stated in the tables (Par. 3.16) depending on the type of gas.
 - By turning in a clockwise direction the heating potential increases and in an anti-clockwise direction it decreases.
- Adjust the boiler minimum heat output in the domestic hot water phase (Fig. 3-3).

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

Adjustment of the minimum thermal input is obtained by operating on the cross plastic screws (2) on the gas valve maintaining the brass nut blocked (3);

- press the button 4 (Fig. 2-1) up to reach the minimum boiler output (on the display "00" is to be displayed). The pressure to which the boiler minimum power must be adjusted, must

not be lower than that stated in the tables (par. 3.16) depending on the type of gas.

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

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

NOTE: only proceed after having calibrated the minimum domestic hot water pressure.

To adjust the minimum 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 minimum heat output must be adjusted, must not be lower than that stated in the tables (Par. 3.16).

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3.7 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 (references Fig. 2-1):

- press buttons (1) and (2) for 5 about seconds until the programming mode is accessed on the display;
- Using keys (3) and (4), select the parameter to be changed indicated in the following table:
- adjust the corresponding value consulting the table using keys (5) and (6): first pressure of buttons displays the current value;
- confirm the value set by pressing the Reset but-

ton (1) for about 5 seconds. Only the displayed value is saved.

Note: 2 minutes after no button is touched will automatically cancel the operation or by pressing buttons (1) and (2) simultaneously for about 5 seconds. Modified but not confirmed values are to be restored to the value preceding the modification.

Id Parameter	Parameter	Description	Range (ref. 9 Fig. 2-1)	Default
P00	Solar panels selection	The setting of this function is used to set the boiler in order to function with the use of solar panels. By setting the parameter P0 in "solar" on mode, the switching off of the burner is correlated to the adjustment of the domestic hot water temperature. In OFF mode, the burner is switched off at maximum value.	on - oF	oF
P01	Gas type selection	The setting of this function is used to adjust the boiler so that it can operate with the correct type of gas	nG - Methane LG - LPG	Set according to the gas being used
P02	Heating switch-on delay request from room thermostat and remote control.	The boiler is set to switch-on 3 seconds after the request. In the event of particular systems (e.g. area systems with motorised thermostatic valves etc.) it may be necessary to delay ignition	00 - 20 (00 = 3 seconds 01 = 30 seconds 02 = 60 seconds 20 = 600 seconds)	00
P03	Function anti-leakage	This function reduces the heating temperature to 57°C in the case that domestic hot water circulation is detected in the heating mode.	on - oF	oF
P04	Domestic hot water post circulation function	With the post-circulation function active after domestic hot water withdrawal, the pump remains on for 2.5 seconds in winter time and 1.5 seconds in summer time to reduce the formation of limestone.	on - oF	on
P05	Minimum CH output	The boiler also has electronic modulation that adapts the boiler potentiality to the effective heating demand of the house. Then the boiler works normally in a variable gas pressure field between the minimum heating output and the maximum heating output depending on the system's heating load.	00 - 70 %	Set according to factory inspection
P06	Maximum CH output	NOTE: 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 (P08). NOTE: the selection of the "Minimum heating output" and "Maximum heating output" parameters, in presence of a heating request, allows boiler ignition and power supply of the modulator with current equal to the value of the respective set value.	00 - 99 (99 = 100%)	99
P07	Central heating ignitions timer	The boiler has electronic timing, which prevents the burner from igniting too often in central heating mode	01 - 20 01 = 30 seconds 02 = 60 seconds 20 = 600 seconds	06
P08	Central heating ramp timer	In the ignition phase, the boiler performs an ignition ramp in order to arrive at the maximum nominal power set (P06).	01 - 20 01 = 30 seconds 02 = 60 seconds 20 = 600 seconds	20
P09	Boiler type	Not used on this model.	01	01
P10	Power ignition	Not used on this model.	---	---
P11	Minimum heating setting	Defines the minimum flow temperature	35 - 80 °C	35 °C
P12	Maximum heating setting	Defines the maximum flow temperature	35 - 80 °C	80°C

P13	Temperature gradient	Change the insufficient circulation intervention value (E27)	00 - 15 (0 = Function deactivated)	11
P14	Pump functioning	The pump can function in two ways: oF intermittent: in "winter" mode, the circulator is managed by the room thermostat or by the remote control. on continuous: in "winter" mode the circulator is always powered and is therefore always in operation.	oF - on	oF
P15	Gas valve calibration	Not used on this model.	---	---
P16	Valve check	Not used on this model.	---	---
P17	Solar delay	The boiler is set to switch-on immediately after a request for DHW. In the case of coupling with a solar storage tank positioned upstream from the boiler, it is possible to compensate the distance between the storage tank and the boiler in order to allow the water to reach the boiler. Set the time necessary to verify that the water is hot enough not to start the boiler.	00 - 60 (00 = Function deactivated) 01 - 60 seconds	00
P18	Display lighting	Establishes the display lighting mode: 00 = (Off) the display lights on if buttons are pressed (time out = 15 seconds). 01 = (Auto) equal to 00, it also lights on to indicate the flame presence. 02 = (On) always on.	00 - 02	01

3.8 AUTOMATIC SLOW IGNITION FUNCTION WITH TIMED RAMP DELIVERY.

In the ignition phase the P.C.B. carries out an increasing gas delivery ramp (with pressure values that depend on the type of gas selected) with preset duration. This prevents every calibration or precision adjustment of the boiler ignition phase in any conditions of use.

3.9 "CHIMNEY SWEEP" FUNCTION.

When activated, this function forces the boiler at max. output (P06) for 15 minutes.

In this state all adjustments are excluded and only the temperature safety thermostat and the limit thermostat remain active (temperature is limited by the parameter "P12"). To activate the chimney sweep function, press the Reset key for at least 5 seconds. Its activation is indicated by the flashing symbols (8 and 11 Fig. 2-1). This function allows the technician to check the combustion parameters. After the checks disable the function, switching the boiler off and then on again or simply by pressing the reset button for about 5 seconds (1 Fig. 2-1).

The heating power can be set to P06 and P05 by pressing buttons (3 or 4). The power can be changed by one percentage point by pressing buttons (5 or 6).

If you wish to run the "chimney sweep" function in D.H.W., open a D.H.W. tap after switching the burner on.

Attention: ensure a sufficient DHW flow, in order to avoid high temperatures of the water.

The boiler power can be set to 0% and 100% by pressing buttons (3 or 4). The power can be changed by one percentage point by pressing buttons (5 or 6).

Note: the display of the boiler power percentage alternates with the display of the temperature read by the flow probe.

3.10 PUMP ANTI-BLOCK FUNCTION.

In the "summer" functioning mode (☀) the boiler has a function that starts the pump at least once every 24 hours for 30 seconds in order to reduce the risk of the pump becoming blocked due to prolonged inactivity.

In the "winter" functioning mode (❄) the boiler has a function that makes the pump start at least once every 3 hours for 30 seconds.

3.11 DOMESTIC HOT WATER CIRCUIT ANTI-EXTRUDER FUNCTION.

This function reduces the heating temperature to 57°C if the domestic hot water circulation is detected in the heating mode. The function can be enabled using parameter (P3).

3.12 RADIATORS ANTIFREEZE FUNCTION.

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

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

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

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

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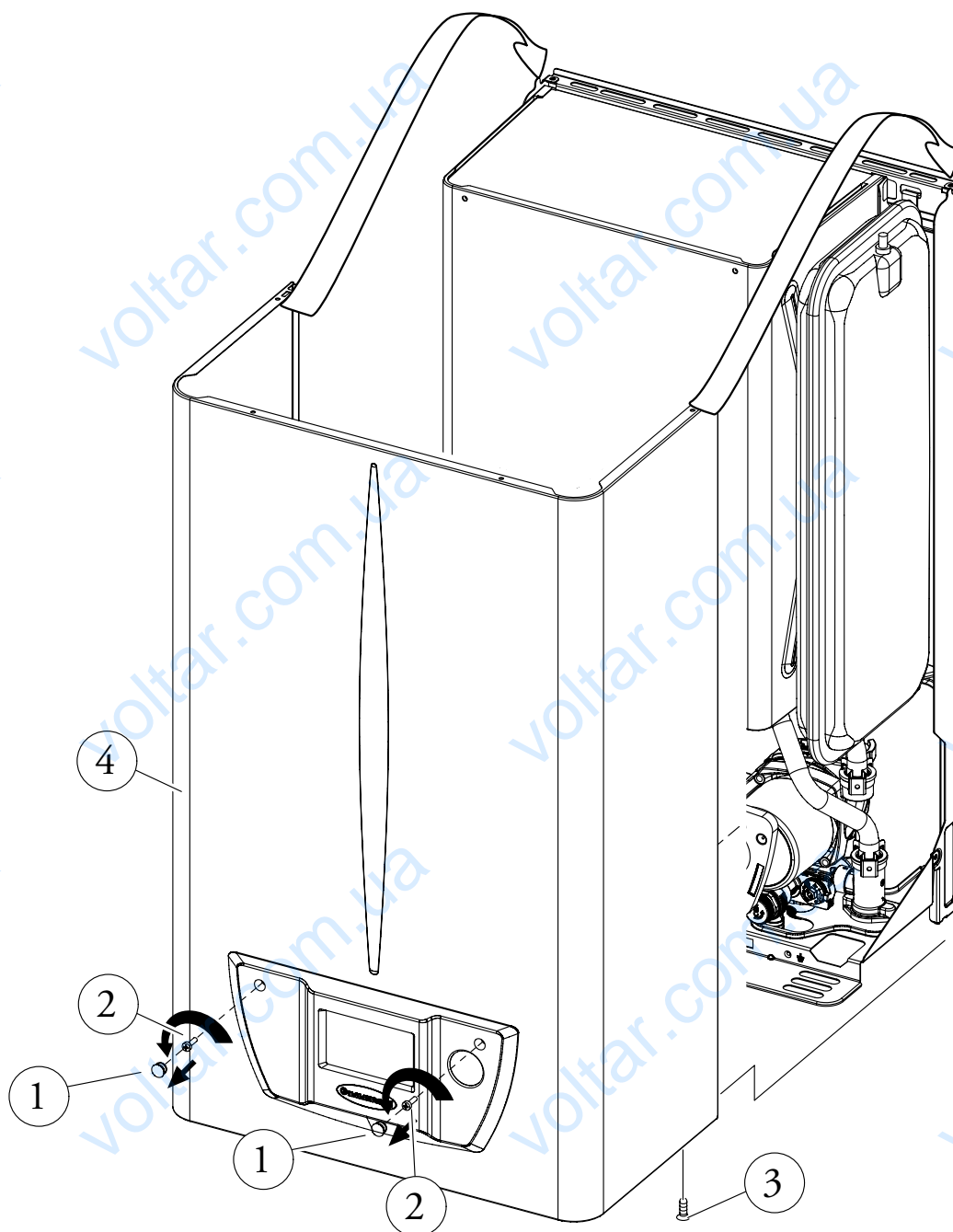
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3.14 CASING REMOVAL.

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

- Remove the plugs from the cover (1) by pulling them to you as shown by the arrows.
- Undo the 2 front screws (2) and the 2 lower screws (3) which fasten the casing (4).

- Pull the casing (4) towards yourself and up at the same time to detach it from the upper hooks.



3-4

3.15 YEARLY APPLIANCE CHECK AND MAINTENANCE.

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

- Clean the flue side of the heat exchanger.
- Clean the main burner.
- Visually check the flue hood for deterioration or corrosion.
- Check correct lighting and operation.
- Ensure correct calibration of the burner in domestic water and heating phases.
- Check correct operation of control and adjustment devices and in particular:
 - intervention of main electrical switch positioned outside of the boiler;
 - system control thermostat intervention;
 - domestic hot water control thermostat intervention.
- Check sealing efficiency of gas circuit and the internal system.
- Check the intervention of the device against no gas ionisation flame control. Intervention time must be less than 10 seconds.

- Visually check for water leaks or oxidation from/on connections.
- Visually check that the water safety drain valve is not blocked.
- Check that, after discharging system pressure and bringing it to zero (read on boiler pressure gauge), the expansion vessel load is at 1.0 bar.
- Check that the system static pressure (with system cold and after refilling the system by means of the filling valve) is between 1 and 1.2 bar.
- Check visually that the safety and control devices have not been tampered with and/or shorted, in particular:
 - temperature safety thermostat;
 - water pressure switch;
 - air pressure switch.
- Check the condition and integrity of the electrical system and in particular:
 - electrical power cables must be inside the fairleads;
 - there must be no traces of blackening or burning.

NOTE: in addition to yearly maintenance, one must also check the thermal system, with frequency and procedures that comply with the indications of the technical regulations in force.

3.16 VARIABLE HEAT OUTPUT.

		METHANE (G20)			BUTANE (G30)			PROPANE (G31)		
HEAT THERMAL	HEAT THERMAL	GAS FLOW RATE BURNER	PRESS. NOZZLE BURNER		GAS FLOW RATE BURNER	PRESS. NOZZLE BURNER		GAS FLOW RATE BURNER	PRESS. NOZZLE BURNER	
(kW)	(kcal/h)		(m³/h)	(mbar)		(mm H ₂ O)	(kg/h)		(mbar)	(mm H ₂ O)
23.8.	20468	2.70	11.40	116.3	2.01	28.20	287.6	1.98	36.30	370.2
23.0	19780	2.61	10.65	108.6	1.94	26.30	268.2	1.91	33.97	346.4
21.9	18806	2.48	9.65	98.4	1.85	23.76	242.3	1.82	30.84	314.5
21.0	18060	2.38	8.92	91.0	1.78	21.93	223.6	1.75	28.58	291.5
20.0	17200	2.27	8.13	82.9	1.70	19.94	203.3	1.67	26.11	266.2
19.0	16340	2.16	7.39	75.3	1.61	18.07	184.3	1.59	23.77	242.4
18.0	15480	2.06	6.69	68.2	1.53	16.31	166.3	1.51	21.56	219.8
17.0	14620	1.95	6.02	61.4	1.45	14.65	149.4	1.43	19.46	198.5
16.0	13760	1.84	5.40	55.1	1.37	13.10	133.6	1.35	17.48	178.3
15.0	12900	1.74	4.82	49.1	1.30	11.65	118.8	1.27	15.61	159.2
14.0	12040	1.63	4.27	43.5	1.22	10.28	104.9	1.20	13.85	141.2
13.0	11180	1.52	3.75	38.3	1.14	9.01	91.9	1.12	12.18	124.3
12.0	10320	1.42	3.27	33.4	1.06	7.83	79.9	1.04	10.62	108.3
11.5	9847	1.36	3.03	30.9	1.01	7.24	73.8	1.00	9.82	100.2
10.0	8600	1.19	2.36	24.1	0.89	5.62	57.3	0.87	7.62	77.7
9.0	7740	1.07	1.95	19.9	0.80	4.64	47.3	0.78	6.25	63.7
8.0	6880	0.95	1.59	16.3	0.71	3.79	38.6	0.70	5.02	51.2
7.0	6020	0.83	1.27	13.0	0.62	3.04	31.0	0.61	3.91	39.9
6.8	5848	0.81	1.22	12.4	0.60	2.91	29.7	0.59	3.71	37.8

NOTE: the pressures indicated in the tables 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 given in the table is obtained with 0.5m long intake/exhaust pipe.

Gas flow rates refer to heating power below a temperature of 15°C and pressure of 1013 mbar. Burner pressure values refer to use of gas at 15°C.

3.17 COMBUSTION PARAMETERS.

		G20	G30	G31
Gas nozzle diameter	mm	1.35	0.79	0.79
supply pressure	mbar (mm H ₂ O)	20 (204)	29 (296)	37 (377)
Flue flow rate at nominal heat output	kg/h	52	53	55
Flue flow rate at min heat output	kg/h	52	53	54
CO ₂ at Nom./Min. Q.	%	7.00 / 1.95	8.00 / 2.24	7.66 / 2.20
CO with 0% O ₂ at Nom./Min. Q.	ppm	72 / 200	95 / 147	63 / 137
NO _x with 0% O ₂ at Nom./Min. Q.	ppm	55 / 34	77 / 30	78 / 30
Flue temperature at nominal output	°C	111	112	109
Flue temperature at minimum output	°C	96	93	95
Intake / exhaust available head	Pa	91		

Combustion parameters: measuring conditions of useful efficiency (flow temperature/return temperature= 80 / 60 °C), ambient temperature reference = 15°C.

3.18 TECHNICAL DATA.

Nominal heat input	kW (kcal/h)	25.5 (21914)
Minimum DHW heat input	kW (kcal/h)	7.6 (6578)
CH minimum heat input	kW (kcal/h)	12.8 (11045)
Nominal heat output (useful)	kW (kcal/h)	23.8 (20468)
DHW minimum heat output (useful)	kW (kcal/h)	6.8 (5848)
CH minimum heat output (useful)	kW (kcal/h)	11.5 (9847)
Efficiency at nominal heat output	%	93.4
Efficiency at 30% nominal heat output load	%	90.2
Heat loss at case with burner On/Off	%	0.6 / 0.46
Heat loss at flue with burner On/Off	%	6.0 / 0.03
Central heating circuit max. operating pressure	bar	3
Maximum central heating temperature	°C	90
Adjustable central heating temperature	°C	35-80
System expansion vessel total volume	l	4.2
Heating expansion vessel pre-charge	bar	1.0
Appliance water content	l	0.7
Head available with 1000 l/h flow rate	kPa (m H ₂ O)	30.4 (3.1)
Domestic hot water adjustable temperature	°C	35 - 55
Domestic hot water circuit min. pressure (dynamic)	bar	0.3
Domestic hot water circuit max. operating pressure	bar	10
Minimum D.H.W. flow rate	l/min	1.7
Flow rate capacity in continuous duty (ΔT 30°C)	l/min	11.1
Weight of full boiler	kg	29.7
Weight of empty boiler	kg	29.0
Electrical connection	V/Hz	230/50
Nominal power absorption	A	0.63
Installed electric power	W	130
Pump absorbed power	W	85
Fan power absorbed power	W	34
Equipment electrical system protection	-	IPX5D
NO _x class	-	3
Weighted NO _x	mg/kWh	139
Weighted CO	mg/kWh	61
Type of appliance	C12 /C32 / C42 / C52 / C62 / C82 / B22 / B32	
Category	II 2H3+	

- The data relevant to domestic hot water performance refers to a dynamic inlet pressure of 2 bar and an inlet temperature of 15°C; the values are measured directly at the boiler outlet considering that to obtain the data declared mixing with cold water is necessary.

- The max. sound level emitted during boiler operation is < 55dBA. The sound level value is referred to semianechoic chamber tests with boiler operating at max. heat output, with extension of flue gas exhaust system according to product standards.

3.19 KEY FOR DATA NAMEPLATE.

Md		Code Md	
Sr N°	CHK	Code 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 is provided on the data plate on the boiler

	IE
Md	Model
Code Md	Model code
Sr N°	Serial Number
CHK	Check
Code PIN	PIN code
Type	Type of installation (ref. CEN TR 1749)
Q _{nw} min.	Minimum DHW heat input
Q _n min.	CH minimum heat input
Q _{nw} max.	DHW maximum heat input
Q _n max.	CH maximum heat input
P _n min.	Minimum heat output
P _n max.	Maximum heat output
PMS	Maximum system pressure
PMW	Maximum domestic hot water pressure
D	Specific flow rate
TM	Maximum operating temperature
NO _x Class	NO _x Class

INSTALLER

USER

MAINTENANCE TECHNICIAN

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