USER'S MANUAL

IMMERGAS

Instruction booklet and warning

ZEUS
24 - 28 kW

1.038761ENG

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, the respect of which, will confirm your satisfaction for the Immergas product.
For any interventions or routine maintenance contact Immergas Authorised Centres: these have original spare parts and boast of specific preparation directly from the manufacturer.

General recommendations

All Immergas products are protected with packaging suitable for transport. The material must be stored in dry environments and protected from bad weather.
The instruction book is an integral and important part of the product and must be consigned to the user also in the case of transfer of ownership.
It must be kept well and consulted carefully, as all of the warnings supply important indications for safety in the installation, use and maintenance stages.
This instruction booklet contains technical information on how installing Immergas boilers. For other issues related to installation of boilers (i.e.: safety in work sites, environment protection, injury prevention), comply with the laws in force and technical standards.
Installation and maintenance must be performed in compliance with the regulations in force, according to the manufacturer and professionally qualified staff, intending staff with specific technical skills in the plant sector.
Improper installation or assembly of Immergas appliance and/or components, accessories, kit and devices can cause unexpected problems to persons, animals and objects. Read the provided product instructions carefully in order to install the product correctly. Maintenance must be carried out by skilled technical staff. The Immergas Authorised After-sales Service represents a guarantee of qualifications and professionalism.
The appliance must only be destined for the use for which it has been expressly declared. Any other use must be considered improper and therefore dangerous.
In the case of errors during installation, running and maintenance due tot he failure to comply with the technical laws in force, standards or the 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

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1 INSTALLATION OF THE BOILER

1.1 INSTALLATION RECOMMENDATION.

The Zeus kW boiler has been designed for wall mounted installation only; they must be used to heat environments, to produce domestic hot water and similar purposes.
The installation site and relative Immergas accessories must have suitable characteristics (both technical and structural), in order to allow (always in safe, efficiency and easiness conditions):

- installation (according to the legislation and technical standards in force);
- maintenance operations (including those scheduled, periodical, ordinary and special);
- removal (to the outdoors in a place suitable for loading and transporting appliances and components) as well as any replacement with equivalent appliances and/or 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:

- **B_{22} type boiler** if installed using the relevant terminal for air intake directly from the room in which the boiler has been installed.
- **C type boiler** if installed using concentric pipes or other types of pipes envisioned for the sealed chamber boiler for intake of air and expulsion of fumes.

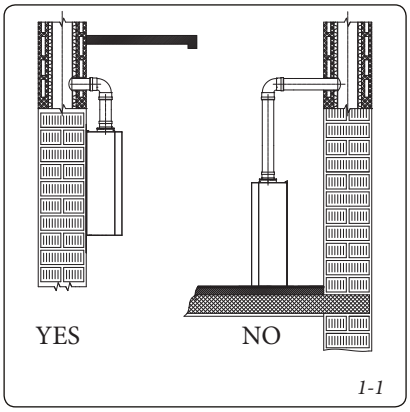
Only professionally qualified heating/plumbing technicians are authorised to install Immergas gas appliances.
Installation must be carried out according to the standards, current legislation and in compliance with local technical regulations and the required technical procedures.
Attention: the manufacturer declines all liability for damages caused by boilers removed from other systems or for any non-conformities of such equipment.

Installation of the Zeus kW boiler when powered by LPG must comply with the rules regarding gases with a greater density than air (remember, as an example, that it is prohibited to install plants powered with the above-mentioned gas in rooms where the floor is at a lower quota that the average external country one).
Before installing the appliance, ensure that it is delivered in perfect condition; if in doubt, contact the supplier immediately. Packing materials (staples, nails, plastic bags, polystyrene foam, etc.) constitute a hazard and must be kept out of the reach of children. If the appliance is installed inside or between cabinets, ensure sufficient space for normal servicing; therefore it is advisable to leave a clearance of at least 3 cm between the boiler casing and the vertical sides of the cabinet.
Leave adequate space above the boiler for possible water and fume removal connections.
At least 60 cm must be left below the boiler in order to guarantee replacement of the magnesium anode. Keep all flammable objects away from the appliance (paper, rags, plastic, polystyrene, etc.).

Do not place household appliances underneath the boiler as they could be damaged if the safety valve intervenes (if not conveyed away by a discharge funnel), or if there are leaks from the connections; on the contrary, the manufacturer cannot be held responsible for any damage caused to the household appliances.
In the event of malfunctions, faults or incorrect operation, turn the appliance
off immediately and contact a qualified technician (e.g. the Immergas Technical Assistance centre, which has specifically trained personnel and original spare parts). Do not attempt to modify or repair the appliance alone. Failure to comply with the above implies personal responsibility and invalidates the warranty.

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

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

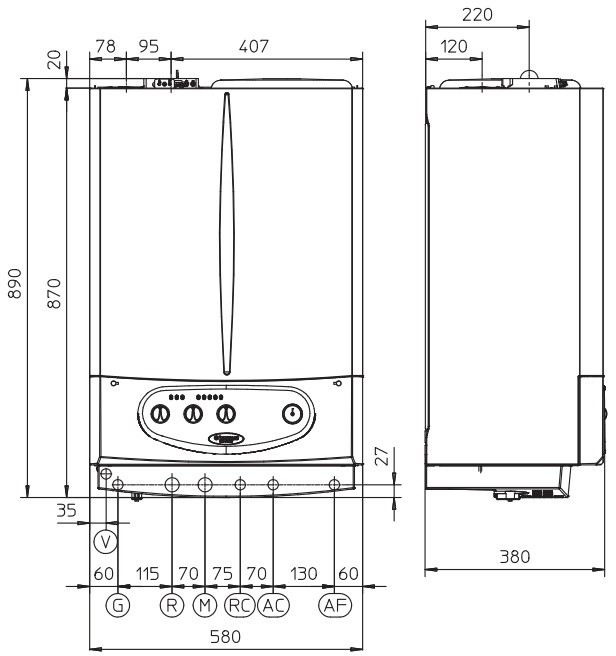


1-1

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 heating system and hot water circuit suited to their performance and capacity.
Anti-Legionella thermal treatment of the Immergas storage tank (which can be activated through the specific function present on the set thermoregulation systems): during this phase, the water temperature inside the storage tank exceeds 60 °C resulting in burns hazards. Keep this DHW treatment under control (and inform the users), to prevent unexpected damage to persons, animals and objects. If required, a thermostatic valve must be installed at the DHW outlet to prevent burns.

1.2 MAIN DIMENSIONS.



1-2

Height (mm)	Width (mm)		Depth (mm)	
890	**580**		**380**	
ATTACHMENTS				
GAS	PLANT		DOMESTIC HOT WATER	
G	R	M	AC	AF
1/2"	3/4"	3/4"	1/2"	1/2"

Key:
G - Gas supply
R - System return
M - System delivery
RC - Domestic hot water re-circ.
AC - Domestic hot water outlet
AF - Domestic hot water inlet
V - Electric attachment

1.3 ATTACHMENTS.

Gas attachment (II_{2H3+} category appliance).
Our boilers are designed to operate with methane gas (G20) and LPG. Supply pipes must be the same as or larger than the 1/2"G boiler fitting. Before connecting the gas line, carefully clean inside all the fuel feed system pipes to remove any residue that could impair boiler efficiency. Also make sure the gas corresponds to that for which the boiler is prepared (see boiler data-plate). If different, the appliance must be converted for operation with the other type of gas (see converting appliance for other gas types). The dynamic gas supply (methane or LPG) pressure must also be checked according to the type used in the boiler, as insufficient levels can reduce generator output and cause malfunctions.

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

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

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

Hydraulic attachment.

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

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 discharge funnel. Otherwise, the manufacturer declines any responsibility in case of flooding if the drain valve cuts in.

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

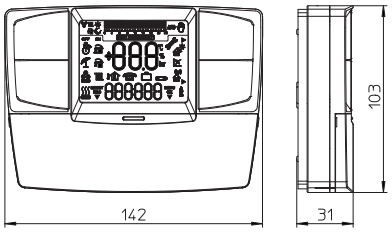
Important: *to preserve the life and efficiency of the domestic hot water exchanger, it is recommended to install the "polyphosphate proportioner" kit in the presence of water whose characteristics can give rise to scale deposits.*

Electrical connection. The "Zeus kW" boiler has an IPX4D protection rating for the entire appliance. Electrical safety of the unit is reached when it is correctly connected to an efficient earthing system as specified by current safety standards.

Important: the manufacturer declines any responsibility for damage or physical injury caused by failure to connect the boiler to an efficient earth system or failure to comply with the reference standards.

Also ensure that the electrical installation corresponds to maximum absorbed power specifications as shown on the boiler data-plate. Boilers are supplied complete with an "X" type power cable without plug. The power supply cable must be connected to a 230V ±10% / 50Hz mains supply respecting L-N polarity and earth connection; ⏚, this network must also have a multi-pole circuit breaker with class III over-voltage category. When replacing the power supply cable, contact a qualified technician (e.g. the Immergas After-Sales Technical Assistance Service).
The power cable must be laid as shown. In the event of mains fuse replacement on the control card, use a 3.15A quick-blow fuse.
For the main power supply to the appliance, never use adapters, multiple sockets or extension leads.

Remote Friend control[V2] (CAR[V2])
On/Off digital timer thermostat.



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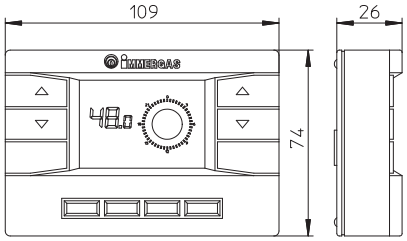
Digital Remote Control
(CRD)



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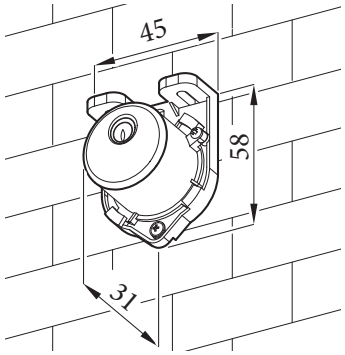

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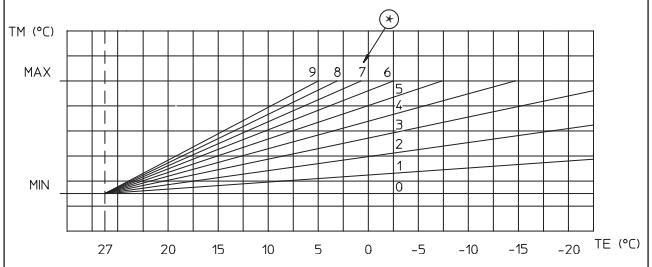

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1.4 REMOTE CONTROLS AND ROOM CHRONOTHERMOSTATS (OPTIONAL).

The boiler is prepared for application of room chronothermostats and external probe. These Immergas components are available as separate kits to the boiler and are supplied on request.
All Immergas chronothermostats are connected with 2 wires only. Carefully read the user and assembly instructions contained in the accessory kit.

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

  The chronothermostat is powered by two 1.5V LR 6 type alkaline batteries;
- There are two types of Remote Friend Control[V2] (CAR[V2]) (Fig. 1-3) and Digital Remote Control (CRD) (Fig. 1-4) both with room chronothermostat functioning. In addition to the functions described in the previous point, the Remote Friend Control[V2] enables the user to control all the important information regarding operation of the appliance and the heating system with the opportunity of easily intervening on the previously set parameters without having to go to the place where the appliance is installed. The Remote Friend Control[V2] panel is provided with self-diagnosis to display any boiler functioning anomalies. The climate chronothermostat incorporated in the remote panel enables the system delivery 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 chronothermostat is fed directly by the boiler by means of the same 2 wires used for the transmission of data between boiler and chronothermostat.

Important: If the system is subdivided into zones using the relevant kit. the CAR[V2] must be used with its climate thermostat function disabled, i.e. it must be set to On/Off mode. The CRD cannot be used for plants divided into zones.

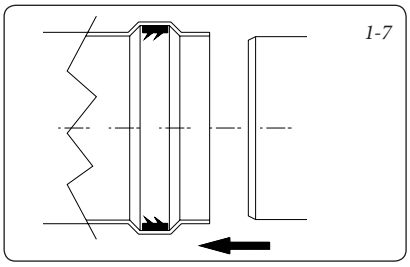
Electrical connection of the Remote Friend Control[V2] or chronothermostat On/Off (Optional). *The operations described below must be performed after having removed the voltage from the appliance.* The eventual thermostat or On/Off room chronothermostat must be connected to terminals 40 and 41 eliminating jumper X40 (Fig. 3-2). Make sure that the On/Off thermostat contact is of the "clean" type, i.e. independent of the mains supply, otherwise the electronic adjustment card would be damaged. The eventual Remote Friend Control[V2] must be connected by means of terminals IN+ and IN- to terminals 42 and 43, eliminating jumper X40 on the terminal board (in the boiler) respecting polarity (Fig. 3-2). Connection with the wrong polarity prevents functioning, but without damaging the Remote Friend Control[V2]. The boiler works with the parameters set on the Remote Friend Control[V2] only if the boiler main selector is turned to Domestic/Remote Friend Control[V2] ( ). The boiler can only be connected to one remote control.

Important: If the Remote Friend Control[V2], Digital Remote Control or any other On/Off chronothermostat is used arrange two separate lines in compliance with current regulations regarding electrical systems. Boiler pipes must never be used to earth the electric or telephone lines. Ensure elimination of this risk before making the boiler electrical connections.

1.5 EXTERNAL PROBE (OPTIONAL).

- External temperature probe (Fig. 1-5). This sensor can be connected directly to the boiler electrical system and allows the max. system delivery temperature to be automatically decreased when the outside temperature increases, in order to adjust the heat supplied to the system according to the change in external temperature. The external probe always operates when connected, regardless of the presence or type of room chronothermostat used and can work in combination with the On/Off chronothermostat and the CAR[V2], (it cannot be connected to the CRD). The correlation between system delivery temperature and outside temperature is determined by the position of the knob on the boiler control panel according to the curves shown in the diagram (Fig. 1-6). The external probe electrical connection must be made on clamps 38 and 39 on the boiler circuit board (Fig. 3-2).

** (Fig. 1-6) Position of the heating temperature user adjustment.*



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1.6 INSTALLATION OUTSIDE IN A PARTIALLY PROTECTED PLACE.

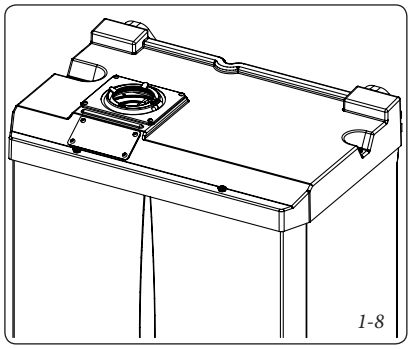
N.B.: *a partially protected location is one in which the appliance is not exposed to the direct action of the weather (rain, snow, hail, etc.).*

- **Configuration type B, open chamber and forced draught.**

The relevant terminal must be used for this configuration (present in the intake kit for the installation in question), which must be placed on the central hole of the boiler (see following figure). Air intake takes place directly from the environment in which the boiler is installed and fumes are expelled in an individual flue or directly to the outside.
The boiler in this configuration is classified as type B22 according to the standards.
With this configuration:
- air intake takes place directly from the environment in which the boiler is installed and only functions in permanently ventilated rooms
- the fumes pipe must be connected to its own individual flue or channelled directly into the external atmosphere.

The technical regulations in force must be respected.

- **Fitting the cover kit.** (Fig. 1-10) Remove the two plugs and the seals present from the two holes to the laterally to the central one.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Install the Ø 80 outlet flange on the central hole of the boiler, taking care to insert the seal supplied with the kit and tighten by means of the screws provided. Install the top cover, fixing it with the screws previously removed from the lateral plugs. Engage the 90°, Ø 80 bend with the male end (smooth) in the female end (with lip seal) of the Ø 80 flange until it stops. Cut the seal in the relative groove at the desired diameter (Ø 80), run it along the bend and fix it using the sheet steel plate. Insert the exhaust pipe with the male end (smooth) into the female side of the 90° bend, Ø 80, making sure that the relative washer has already been introduced. This will ensure tightness and coupling of the elements making up the kit.

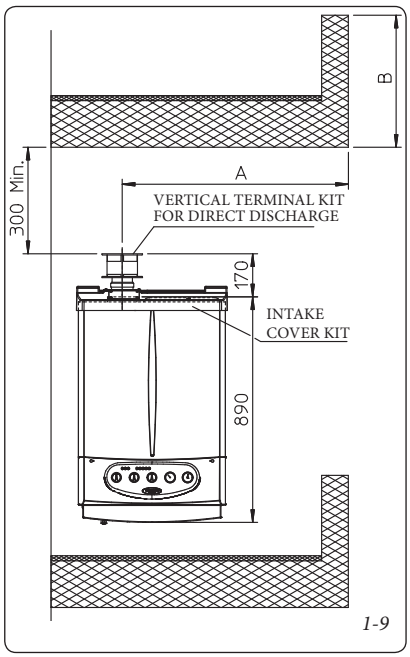
Max. length of exhaust flue. The flue pipe (vertical or horizontal) can be *extended to a max. length of 12 m straight route, using insulated pipes* (Fig. 1-28). To prevent problems of fume condensate in the exhaust pipe Ø 80, due to fume cooling through the wall, *the length of the pipe must be limited to just 5 m (Fig. 1-25).*

- Coupling of extension pipes and elbows. To install possible coupling extensions on other fume extraction elements, proceed as follows:: Fit the male end (smooth) of the pipe or elbow up to the stop on the female end (with lip seals) of the previously installed element; this will ensure correct seal and joining of the elements.

Example of installation with direct vertical terminal in partially protected locatio. When the vertical terminal for direct discharge of combustion fumes is used, a minimum gap of 300 mm must be left between the terminal and the balcony above. The distance A + B (always with respect to the balcony above), must be equal to or less than 2000 mm (Fig. 1-9).

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

By leaving the side plugs fitted it is possible to install the appliance externally without the cover kit. Installation is carried out using the horizontal concentric Ø60/100, Ø80/125 and Ø80/80 separator kits.



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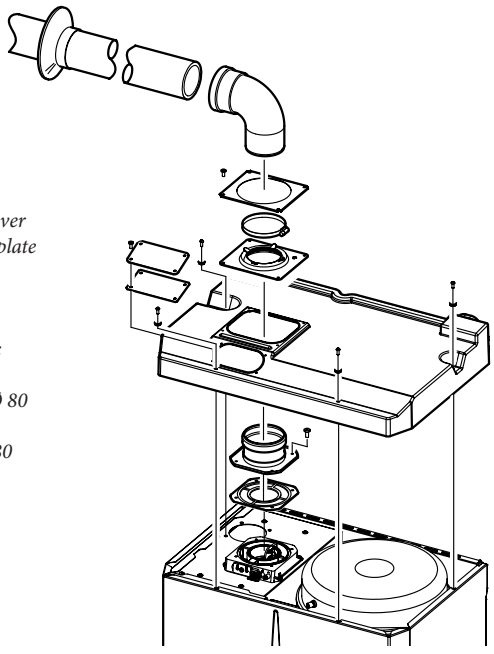
The cover kit include:
N° 1 - Heat moulded cover
N° 1 - Gasket camping plate
N° 1 - Gasket
N° 1 - Gasket clamp

The terminal kit includes:
N° 1 - Seal
N° 1 - Exhaust flange Ø 80
N° 1 - 90° bend Ø 80
N° 1 - Exhaust pipe Ø 80
N° 1 - Ring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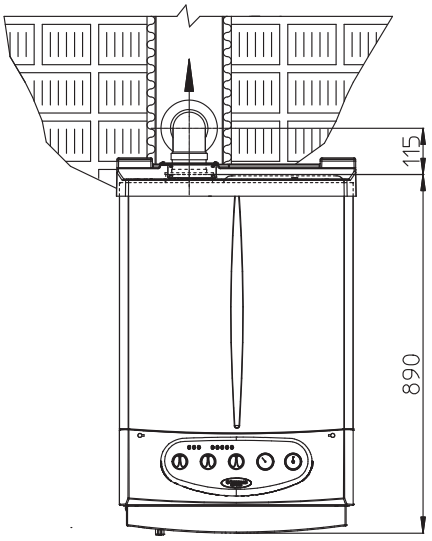

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1.7 INSTALLATION INDOORS.

- **Type C configuration, sealed chamber and forced draught.**

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

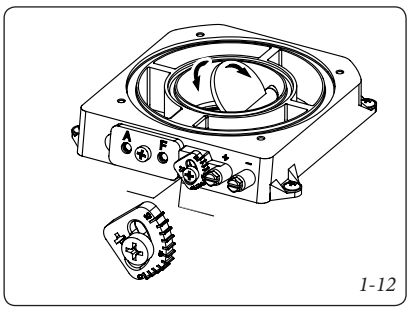
Important: the boiler must only be installed together with an origin Immergas air intake and fume extraction system. This system can be identified by a special distinctive marking bearing the note: "not for condensing boilers".

The fume exhaust pipes must not be in contact with or near flammable materials and must not cross building structures or walls made of flammable materials.

- Resistance factors and equivalent lengths. Each flue extraction system component is designed with a *Resistance Factor* based on preliminary tests and specified in the table below The resistance factor for individual components does not depend either on the type of boiler on which it is installed or the actual dimensions. It is based on the temperature of fluids conveyed through the ducts and therefore varies according to applications for air intake or flue exhaust Each single component has a resistance corresponding to a certain length in metres of pipe of the same diameter; the so-called *equivalent length*, obtained from the ration between he relative Resistance Factors. *All boilers have an experimentally obtainable maximum Resistance Factor equal to 100.* The maximum Resistance Factor allowed corresponds to the resistance encountered with the maximum allowed pipe length for each type of Terminal Kit. This information enables calculations to verify the possibility of various configurations of flue extraction systems.

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

Fumes separator adjustment. For correct functioning of the boiler the fumes separator positioned on the air/fumes extraction well must be adjusted (Fig. 1-12).
Adjustment is carried out by loosening the front retainer screw and moving the indicator to the correct position, aligning its value to the horizontal reference (Fig. 1-12). Once adjustment has been performed, tighten the screw to fix the separator. Appropriate adjustment takes place on the basis of the type of pipe and its extension: this calculation can be carried out using the fumes separator adjustment tables.



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Fumes separator adjustments Zeus 24 kW.

Fumes separator	Duct length in metres **Ø 60/100 horizontal**
3	From 0 to 0,5
5	From 0,5 to 2
10	From 2 to 3

Fumes separator	Duct length in metres **Ø 60/100 vertical**
3	From 0 to 2,2
5	From 2,2 to 3,7
10	From 3,7 to 4,7

Fumes separator	*Duct length in metres **Ø 80 horizontal With two bends**
3	From 0 to 4
5	From 4 to 26
6	From 26 to 35

Fumes separator	*Duct length in metres **Ø 80 vertical without bends**
3	Da 0 to 8
5	Da 8 to 30
6	Da 30 to 40

Fumes separator	Duct length in metres **Ø 80/125 horizontal**
3	From 0 to 0,5
5	From 0,5 to 4,6
10	From 4,6 to 7,4

Fumes separator	Duct length in metres **Ø 80/125 vertical**
3	From 0 to 5,4
5	From 5,4 to 9,5
10	From 9,5 to 12,2

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

Fumes separator adjustments Zeus 28 kW.

Fumes separator	Duct length in metres **Ø 60/100 horizontal**
3	From 0 to 0,5
5	From 0,5 to 2
10	From 2 to 3

Fumes separator	Duct length in metres **Ø 60/100 vertical**
3	From 0 to 2,2
5	From 2,2 to 3,7
10	From 3,7 to 5,7

Fumes separator	*Duct length in metres **Ø 80 horizontal with two bends**
3	From 0 to 2
5	From 2 to 21
7	From 21 to 35

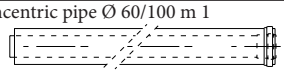
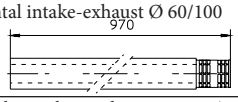
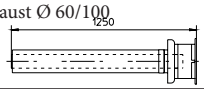
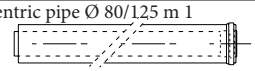
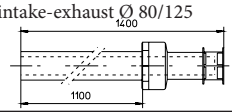
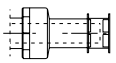
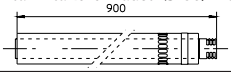
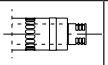
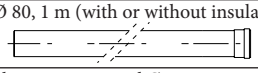
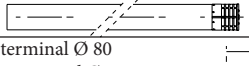
Fumes separator	*Duct length in metres **Ø 80 vertical without bends**
3	From 0 to 6
5	From 6 to 25
7	From 25 to 40

Fumes separator	Duct length in metres **Ø 80/125 horizontal**
3	From 0 to 0,5
5	From 0,5 to 4,6
10	From 4,6 to 10,1

Fumes separator	Duct length in metres **Ø 80/125 vertical**
3	From 0 to 5,4
5	From 5,4 to 9,5
10	From 9,5 to 15,0

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

Resistance Factors and Equivalent Lengths Table

DUCT TYPE	Resistance Factor (R)	Equivalent length in meter of concentric pipe Ø 60/100	Equivalent length in meter of concentric pipe Ø 80/125	Equivalent length in metres of pipe Ø 80
Concentric pipe Ø 60/100 m 1 	Intake and Exhaust 16,5	**m 1**	m 2,8	Intake m 7,1
				Exhaust m 5,5
90° bend concentric Ø 60/100 	Intake and Exhaust 21	**m 1,3**	m 3,5	Intake m 9,1
				Exhaust m 7,0
45° bend concentric Ø 60/100 	Intake and Exhaust 16,5	**m 1**	m 2,8	Intake m 7,1
				Exhaust m 5,5
Terminal complete with concentric horizontal intake-exhaust Ø 60/100 	Intake and Exhaust 46	**m 2,8**	m 7,6	Intake m 20
				Exhaust m 15
Terminal complete with concentric horizontal intake-exhaust Ø 60/100 	Intake and Exhaust 32	**m 1,9**	m 5,3	Intake m 14
				Exhaust m 10,6
Terminal complete with concentric vertical intake-exhaust Ø 60/100 	Intake and Exhaust 41,7	**m 2,5**	m 7	Intake m 18
				Exhaust m 14
Concentric pipe Ø 80/125 m 1 	Intake and Exhaust 6	m 0,4	**m 1,0**	Intake m 2,6
				Exhaust m 2,0
90° bend concentric Ø 80/125 	Intake and Exhaust 7,5	m 0,5	**m 1,3**	Intake m 3,3
				Exhaust m 2,5
45 bend concentric Ø 80/125 	Intake and Exhaust 6	m 0,4	**m 1,0**	Intake m 2,6
				Exhaust m 2,0
Terminal complete with concentric horizontal intake-exhaust Ø 80/125 	Intake and Exhaust 33	m 2,0	**m 5,5**	Intake m 14,3
				Exhaust m 11,0
Terminal complete with concentric horizontal intake-exhaust Ø 80/125 	Intake and Exhaust 26,5	m 1,6	**m 4,4**	Intake m 11,5
				Exhaust m 8,8
Terminal complete with concentric horizontal intake-exhaust Ø 80/125 	Intake and Exhaust 39	m 2,3	**m 6,5**	Intake m 16,9
				Exhaust m 13
Terminal complete with concentric horizontal intake-exhaust 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 collector 	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, 1 m (with or without insulation) 	Intake 2,3	m 0,1	m 0,4	**Intake m 1,0**
	Exhaust 3	m 0,2	m 0,5	**Exhaust m 1,0**
Complete pipe terminal Ø 80, 1 m (with or without insulation) 	Intake 5	m 0,3	m 0,8	**Intake m 2,2**
Intake terminal Ø 80 Exhaust terminal Ø 80 	Intake 3	m 0,2	m 0,5	**Intake m 1,3**
	Exhaust 2,5	m 0,1	m 0,4	**Exhaust m 0,8**
Bend 90° Ø 80 	Intake 5	m 0,3	m 0,8	**Intake m 2,2**
	Exhaust 6,5	m 0,4	m 1,1	**Exhaust m 2,1**
Bend 45° Ø 80 	Intake 3	m 0,2	m 0,5	**Intake m 1,3**
	Exhaust 4	m 0,2	m 0,6	**Exhaust m 1,3**
Split parallel Ø 80 from Ø 60/100 to Ø 80/80 	Intake and Exhaust 8,8	m 0,5	m 1,5	**Intake m 3,8**
				Exhaust m 2,9

Horizontal intake kits - exhaust Ø60/100. Kit assembly (Fig. 1-13): install the bend with flange (2) on the central hole of the boiler inserting the seal (1) and tighten using the screws present in the kit. Engage the terminal pipe (3) with the male side (smooth), into the female side (with lip seal) of the curve (2) until it stops, making sure the relevant internal and external rings are fitted, this will ensure hold and joining of the elements making up the kit.

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

- Coupling extension pipes and concentric elbows Ø 60/100 snap-fit extensions with other elements of the fume extraction elements assembly, follows: fit the concentric pipe or elbow with the male on the female section (with lip seal) to the end stop on the previously installed element. to ensure sealing efficiency of the coupling.

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

- Application with rear outlet (Fig. 1-14). The 970 mm pipe length enables routingthrough a max. thickness 685 mm. Normally the terminal must be shortened. Calculate the distance by adding the following: part thickness+ internal projection + external projection. The minimum projectionvalues are given in the figure.
- Application with side outlet (Fig. 1-15); Using the horizontal intake/exhaust kit, without the special extensions, the maximum distance between the vertical exhaust axis and the outside wall is 905 mm.
- Extensions for horizontal kit. The horizontal intake/exhaust kit Ø 60/100 can be extended up to a max. horizontal distance of 3000 mm includingthe terminal with grille and excluding the concentric bend leaving theboiler. This configuration corresponds to a resistance factor of 100. Inthese cases the special extensions must be requested.

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

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

Horizontal intake/exhaust kits Ø 80/125. Kit assembly (Fig. 1-18): install the bend with flange (2) on the central hole of theboiler inserting the seal (1) and tighten using the screws in the kit. Fit the male end (smooth) of the adapter (3) up to the stop on the female end of the bend (2) (with lip seal). Fit the male end (smooth) of the Ø 80/125 concentric terminal pipe (4) up to the stop on the female end of the adapter (3) (with lip seals),, making sure the relevant internal and external rings are fitted, this will ensure hold and joining of the elements making up the kit.

- Coupling extension pipes and concentric elbows Ø 80/125 snap-fit extensions with other elements of the fume extraction elements assembly, follows: fit the concentric pipe or elbow with the male on the female section (with lip seal) to the end stop on the previously installed element; this will ensure correct hold and joining of the elements.

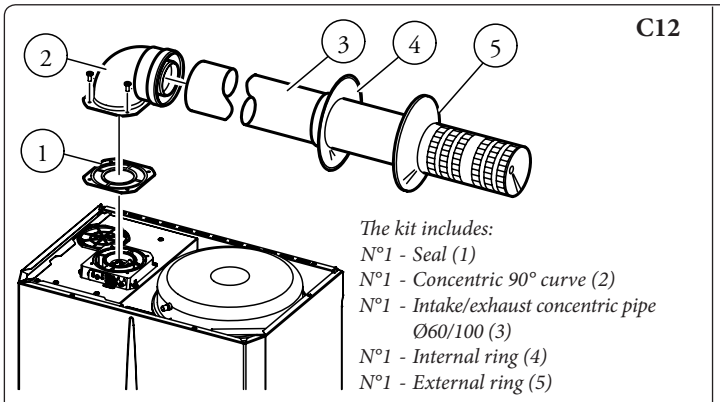
Important: if the exhaust terminal and/or extension concentric pipe needs shortening, consider that the internal duct must always project by 5 mm with respect to the external duct.

Normally the horizontal intake/exhaust kit Ø 80/125 is used if particularly long extensions are required; the kit Ø 80/125 can be installed with the rear, right side, left side or front outlet.

- Extensions for horizontal kit. The horizontal intake/exhaust kit Ø 80/125 can be extended up to a *a maximum horizontal length of 7300*, including the terminal with grille and excluding the concentric bend leaving the boiler and the adapter Ø 60/100 in Ø 80/125 (Fig. 1-19). This configuration corresponds to a resistance factor of 100. In this case the special extensions must be requested.

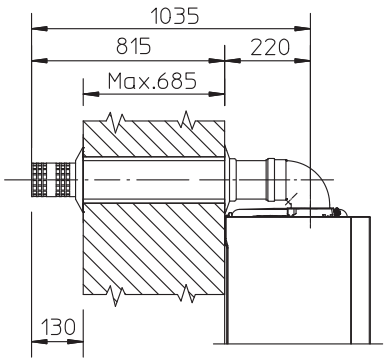
  N.B.: When installing the ducts, a section clamp with pin must be installed every 3 metres.
- External grill. **N.B.:** for safety purposes, do not even temporarily obstruct the boiler intake/exhaust terminal.

Vertical kit with aluminium tile Ø 80/125. Kit assembly (Fig. 1-20): install the concentric flange (2) on the central hole of the boiler inserting the seal (1) and tighten using the screws in the kit. Fit the male end (smooth) of the adapter (3) in the female end of the concentric flange (2). Imitation aluminium tile installation. replace the tile with the aluminium sheet (5), shaping it to ensure that rainwater runs off. Position the fixed half-shell (7) on the aluminium tile and insert the intake/exhaust pipe (6). Fit the male end (smooth) of the Ø 80/125 concentric terminal pipe (6) up to the stop on the female end of the adapter (3) (with lip seals), making sure that the ring is already fitted (4), this will ensure sealing and joining of the elements making up the kit.

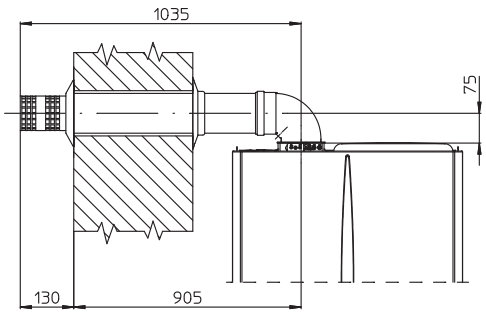


The kit includes:
N°1 - Seal (1)
N°1 - Concentric 90° curve (2)
N°1 - Intake/exhaust concentric pipe Ø60/100 (3)
N°1 - Internal ring (4)
N°1 - External ring (5)

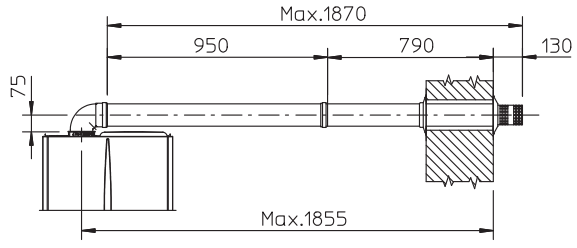
1-13



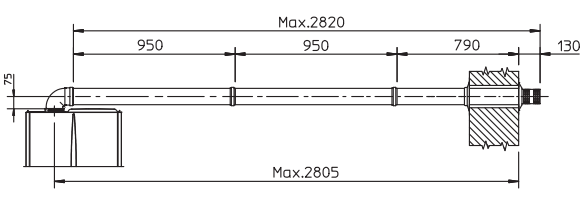
1-14



1-15

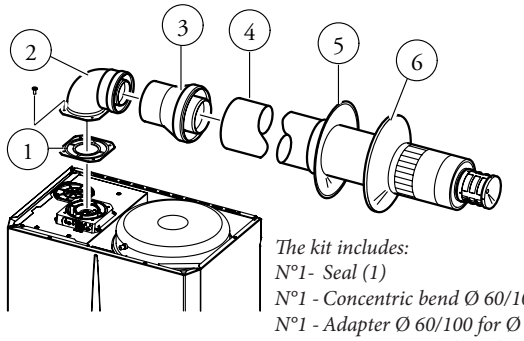


1-16



1-17

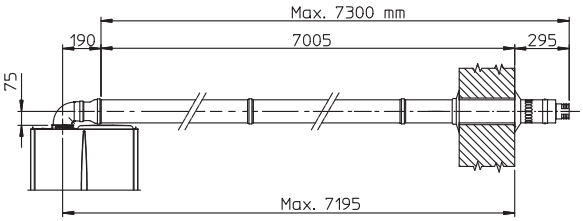
C12



The kit includes:
N°1- Seal (1)
N°1 - Concentric bend Ø 60/100 (2)
N°1 - Adapter Ø 60/100 for Ø 80/125 (3)
N°1- Concentric intake/exhaust terminal Ø 80/125
N°1- Internal ring (5)
N°1- External ring (6)

1-18

C12



1-19

- Coupling extension pipes and concentric elbows. To install possible coupling extensions on other fume extraction elements, proceed as follows: fit the male end (smooth) of the concentric pipe or concentric elbow up to the stop on the female end (with lip seals) of the previously installed element; this will ensure correct hold and joining of the elements.

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

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

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

The vertical kit with this configuration can be extended up to a *maximum of 12200 mm* vertical rectilinear, including the terminal (Fig. 1-21). This configuration correspondsto a resistance factor of 100. In this case specific extensions must be requested.

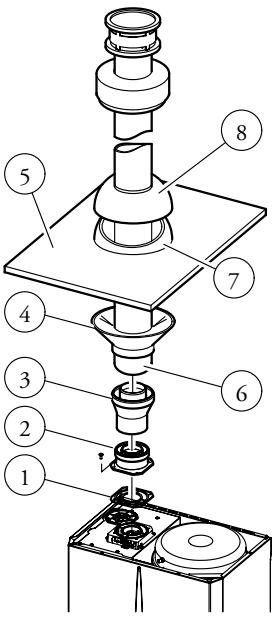
The terminal Ø 60/100 can also be used for vertical exhaust, in conjunction with concentric flange code no. 3.011141 (sold separately). The height between the terminal cap and half-shell (374 mm) must always be respected (Fig. 1-21).

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

Separator kit Ø 80/80. The separator kit Ø 80/80, enables separation of the exhaust flues and air intake pipes according to the diagram shown in the figure. (Fig. 1-22). Fumes are expelled from duct (S). Air is taken in through duct (A) for combustion. Intake duct (A) can be installed either on the right or left hand side of the central exhaust duct (S). Both ducts can be routed in any direction.

- Assembly of separator kit Ø 80/80. Install the flange (4) on the central hole of the boiler inserting the seal (1) and tighten using the hex and flathead screws supplied with the kit. Remove the flat flange in the lateral hole with respect to the central one (depending on installation requirements) and replace with flange (3) inserting the seal (2) already fitted on the boiler and tighten using the self-tapping screws supplied. Fit the male end (smooth) of the bends (5) in the female end of the flanges (3 and 4). Fit the male end (smooth) of the intake terminal (6) up to the stop on the female end of the bend (5), making sure that the relevant internal and external rings are fitted. Join the exhaust pipe (9) with the male section (smooth) in the female section of the bend (5) to the end stop, ensuring that the internal washer is fitted; this will ensure the sealing efficiency of the kit components.
- Snap fit extension pipe fittings and elbows. To install snap-fit extensions with other elements of the fume extraction elements assembly, proceed as follows: fit the pipe or elbow with the male section (smooth) in the female section (with lip seal) to the end stop on the previously installed element; in this way sealing efficiency of the couplings is assured.
- The figure (Fig. 1-24) shows the configuration with vertical exhaust and horizontal intake.
- Installation clearances. The figure (Fig. 1-23) gives the min. installation space dimensions of the Ø 80/80 separator terminal kit al limit condition.
- 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 adding the length of the intake and exhaust pipes Ø 80, must not exceed the maximum values given in the following table. If *mixed accessories or components* (are used (e.g. changing from a

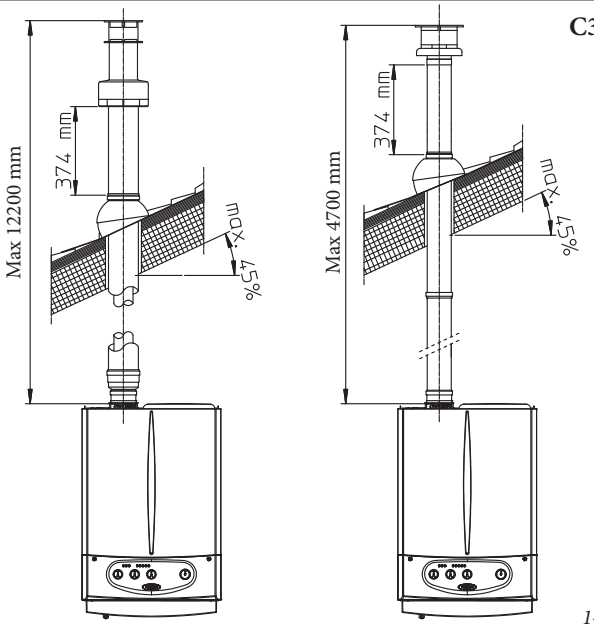
C32



The kit includes:
N°1 - Seal (1)
N°1 - Female concentric flange (2)
N°1 - Adapter Ø 60/100 for Ø 80/125 (3)
N°1 - Ring (4)
N°1 - Aluminium tile (5)
N°1 - Intake/Exhaust concentric pipe Ø 80/125 (6)
N°1 - Fixed semi-shell (7)
N°1 - Mobile half-shell (8)

1-20

C32



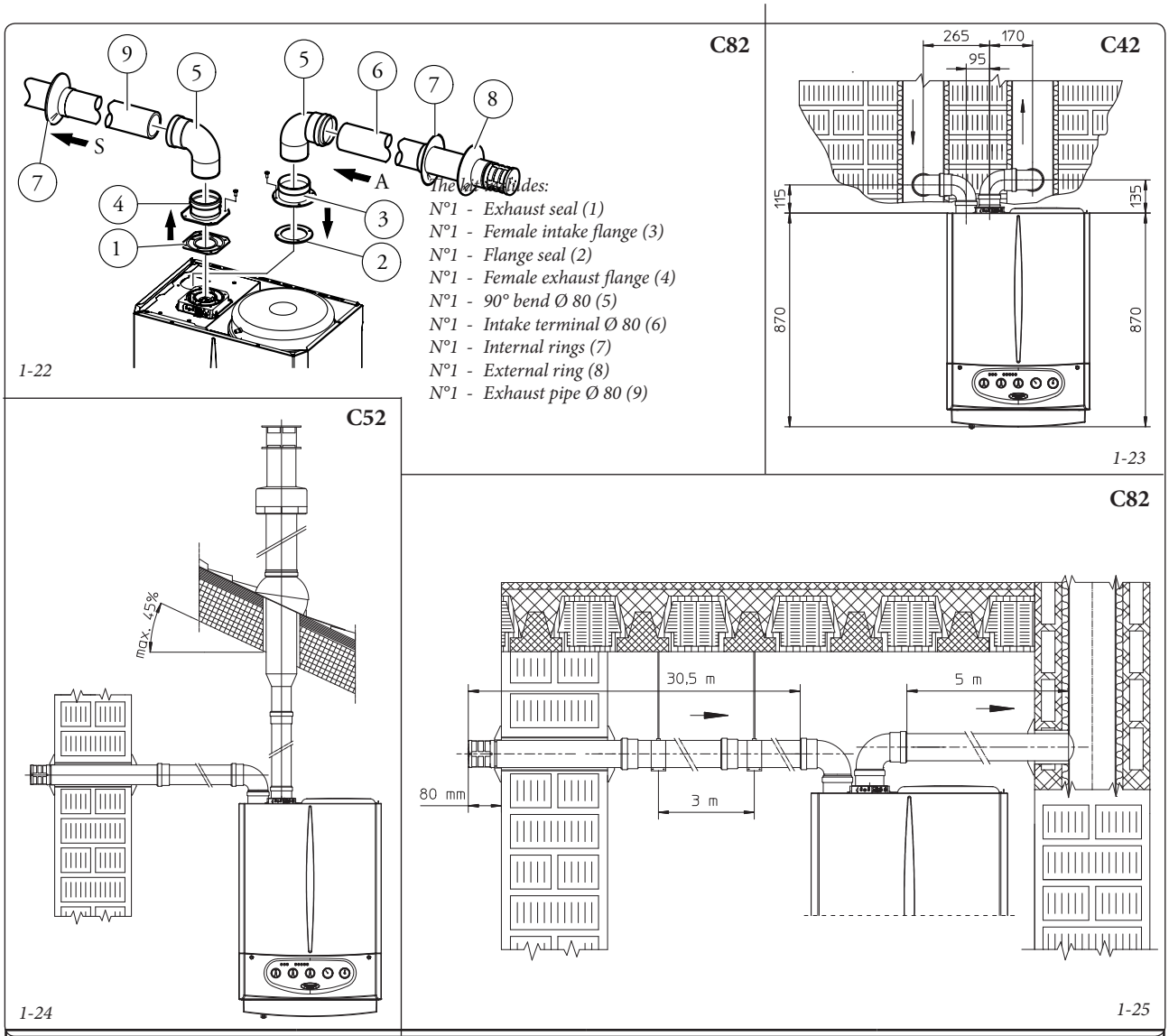
1-21

separator Ø 80/80 to a concentric pipe), the maximum extension can be calculated by using a resistance factor for each component or the *the equivalent length*. The sumof these resistance factors must not exceed 100.

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

Insulated separator kit Ø 80/80. Kit assembly (Fig. 1-26): install flange (4) on the central hole of the boiler, fitting seal (1), and tighten with the flat-tipped hex screws included in the kit. Remove the flat flange on the lateral hole (depending on installation requirements) and replace with flange (3) inserting seal (2) already fitted on the boiler and tighten using the self-tapping screws supplied. Insert and slide cap (6) onto bend (5) from the male side (smooth), and join bends (5) with the male side (smooth) in the female side of flange (3). Fit bend (11) with the male side (smooth) in the female side of flange (4). Fit the male end (smooth) of the intake terminal (7) up to the stop on the female end of the bend (5), making sure you have already inserted the rings (8 and 9) that ensure correct installation between pipe and wall, then fix the closing cap (6) on the terminal (7). Join the exhaust pipe (10) with the male side (smooth) in the female side of the bend (11) to the end stop, ensuring that the washer (8) is already inserted for correct installation between the pipe and flue.

- Coupling of extension pipes and elbows. To install snap-fit extensions with other elements of the fume exhaust system, proceed as follows: fit the male end (smooth) of the concentric pipe or concentric elbow up to the stop on the



Max. usable lengths (including intake terminal with grill and two 90° bends)

NON-INSULATED PIPE		INSULATED PIPE	
Exhaust (m)	Intake (m)	Exhaust (m)	Intake (m)
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, and 4.5 metres eliminating both bends.		11	22,5*
		12	21,5*

female end (with lip seals) of the previously installed element; this will ensure correct hold and joining of the elements.

- Insulation of separator terminal kit. In case of problems of fume condensate in the exhaust pipes or on the outside of intake pipes, Immergas supplies insulated intake and exhaust pipes on request. Insulation may be necessary on the exhaust pipe due to excessive temperature loss of fumes during conveyance. Insulation may be necessary on the intake pipe as the air entering (if very cold) may cause the outside of the pipe to fall below the dew point of the environmental air. The figures (Fig. 1-27÷1-28) illustrate different applications of insulated pipes.

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

- Temperature loss in insulated fume ducting. To prevent problems of fume condensate in the insulated exhaust pipe Ø 80, due to cooling through the wall, *the exhaust pipe length must be limited to 12 metres.* The figure (Fig. 1-28) illustrates a typical insulation application in which the intake pipe is short and the exhaust pipe very long (over 5 m). The entire intake pipe is insulated to prevent moist air in the place where the boiler is installed, condensing in contact with the pipe cooled by air entering from the outside. The entire exhaust pipe, except the elbow leaving the splitter, is insulated to reduce heat loss from the pipe, thus preventing the formation of fume condensate.

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

- **Configuration type B, open chamber and forced draught.**

By removing the lateral caps on the sealed chamber and using the cover kit (optional) air intake takes place directly from the environment in which the boiler is installed and the fumes are expelled in an individual flue or directly to the outside.
The boiler in this configuration, following the assembly instructions (Fig. 1-10÷1-11), is classified as type B.
With this configuration:
- air intake takes place directly from the environment in which the boiler is installed and only functions in permanently ventilated rooms;
- the fumes pipe must be connected to its own individual flue or channelled directly into the external atmosphere;
- type B open chamber boilers must not be installed in places where commercial, artisan or industrial activities take place, which use products that may develop volatile vapours or substances (e.g. acid vapours, glues, paints, solvents, combustibles, etc.), as well as dusts (e.g. dust deriving from the working of wood, coal fines, cement, etc.), which may be damaging for the components of the appliance and jeopardise functioning.

When using type B installation configuration indoors, it is compulsory to install the relative upper cover kit along with the fumes discharge kit.
The technical regulations in force must be respected.

1.8 FUME EXHAUST TO FLUE/CHIMNEY.

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

1.9 DUCTING OF EXISTING FLUES.

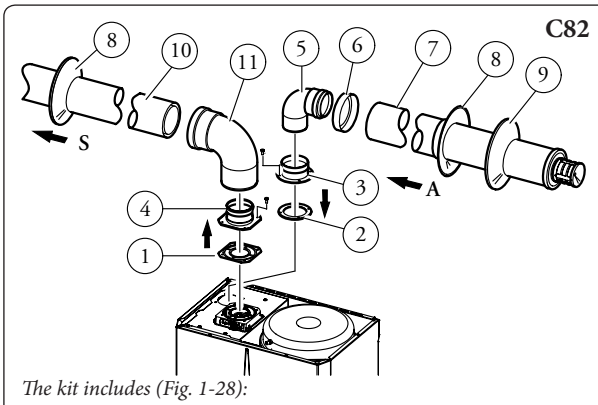
With a specific "ducting system" it is possible to reuse existing flues, chimneys and technical openings to discharge the boiler fumes.. Ducting requires the use of ducts declared to be suitable for the purpose by the manufacturer, following the installation and user instructions, provided by the manufacturer, and the requirements of the standards.

1.10 FLUES, CHIMNEYS AND CHIMNEY CAPS.

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

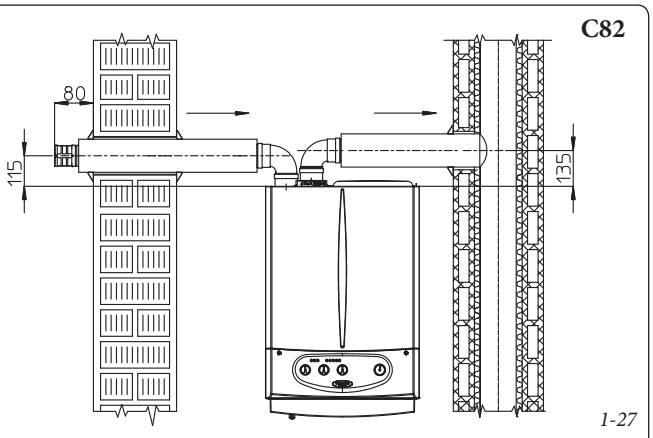
Positioning the draft terminals. Draft terminals must:
- be installed on external perimeter walls of the building;
- be positioned according to the minimum distances specified in current technical standards.

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

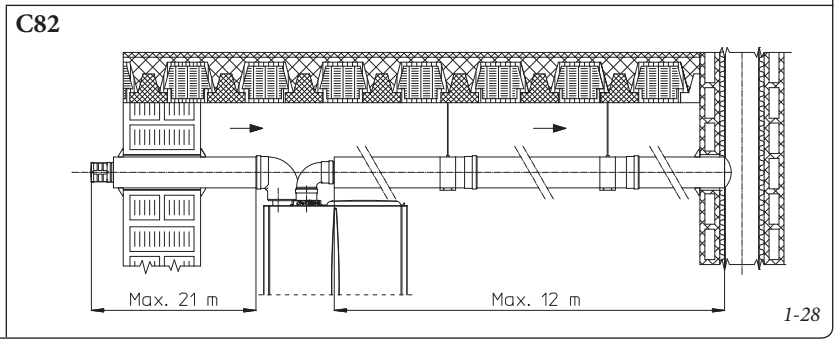


The kit includes (Fig. 1-28):
N°1 - Exhaust seal (1)
N°1 - Flange seal (2)
N°1 - Female intake flange (3)
N°1 - Female exhaust flange (4)
N°1 - 90° bend Ø 80 (5)
N°1 - Pipe closure cap (6)
N°1 - Intake terminal Ø 80 insulated (7)
N°2 - Internal rings (8)
N°1 - External ring (9)
N°1 - Exhaust pipe Ø 80 insulated (10)
N°1 - Concentric 90° curve Ø 80/125 (11)

1-26



1-27



1-28

1.11 SYSTEM FILLING.
Once the boiler is connected, proceed with system filling via the filling valve (Fig. 2-2).
Filling is performed at low speed to ensure release of air bubbles in the water via the boiler and heating system vents.
The boiler has a built-in automatic venting valve on the circulator. *Check if the cap is loose*. Open the radiator air vent valves.
Close vent valves only when water is delivered.
Close the filling valve when the boiler pressure gauge indicates approx. 1.2 bar.

N.B.: During these operations, turn on the circulating pump at intervals by means of the main selector switch on the control pane. *Vent the circulation pump by loosening the front cap and keeping the motor running.*
Re-tighten the cap afterwards.

1.12 GAS SYSTEM START-UP.
To start up the system proceed as follows:
- open windows and doors;
- avoid presence of sparks or naked flames;
- bleed all air from pipelines;
- check that the internal system is properly sealed according to specifications.

1.13 BOILER START-UP (LIGHTING).
For issue of the Declaration of Conformity provided for by Italian Law, the following must be performed for boiler start-up:
- check that the internal system is properly sealed according to specifications;
- ensure that the type of gas used corresponds to boiler settings;
- switch on the boiler and ensure correct ignition;
- make sure that the gas flow rate and relevant pressure values comply withthose given in the manual (Para. 3.16);
- ensure that the safety device is engaged in the event of gas supply failureand check activation time;
- check activation of the main circuit-breaker selector upstream from theboiler and on the unit;
- check that the concentric intake/exhaust terminal (if fitted) is not blocked.

The boiler must not be started up in the event of failure to comply with any of the above.

N.B.: *The boiler preliminary check must be carried out by a qualified technician. The boiler warranty is valid as of the date of testing. The test certificate and warranty is issued to the user.*

1.14 DOMESTIC HOT WATER BOILER DEVICE.
The Zeus kW boiler is the accumulation type with a capacity of 45 litres. It contains a large coiled stainless steel heat exchanger pipe, which allows to notably reduce hot water production times. These boilers built with stainless steel casing and bottoms, guarantee long duration. The assembly concepts and welding (T.I.G.) are implemented to the minimum detail to ensure maximum reliability.
The lower inspection flange ensures practical control of the boiler and the coiled heat exchanger and easy internal cleaning. The domestic water attachments are found on the flange cover (cold inlet and hot outlet) and also the magnesium anode holder cap, including the latter, supplied as standard for internal protection of the boiler from possible corrosion.
N.B.: every year a skilled technician (e.g. Immergas Authorised After-sales Service), must check the efficiency of the boiler's Magnesium Anode. The boiler is prepared for introduction of the domestic water re-circulation connection.

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

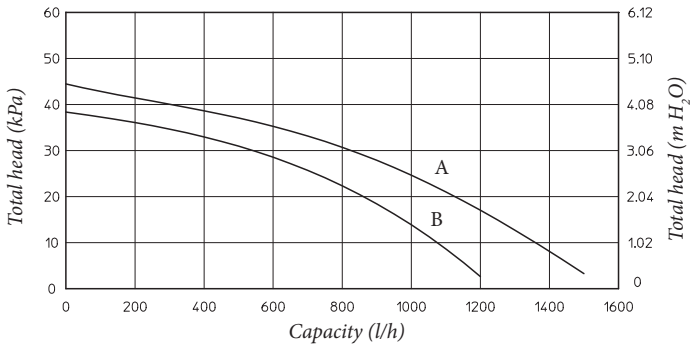
Pump release. If, after a prolonged period of inactivity, the circulation pump is blocked, unscrew the front cap and turn the motor shaft using a screwdriver. Take great care during this operation to avoid damage to the motor.

1.16 KITS AVAILABLE ON REQUEST.
- Kit of system shutoff valves (on request). The boiler is designed for installation of system shutoff valves to be placed on delivery and return pipes of the connection assembly. This kit is particularly useful for maintenance as it allows the boiler to be drained separately without having to empty the entire system.
- System zone Kit (on request). If the heating system is to be divided into several zones (max. three), in order to interlock them with separate adjustments and to keep water flow rate high for each zone, Immergas supplies zone system kits by request.
- Polyphosphate batching kit (on request). The polyphosphate dispenser Reduces the formation of lime-scale and preserves the original heat exchange and domestic hot production water conditions. The boiler is prepared for application of the polyphosphate dispenser kit.

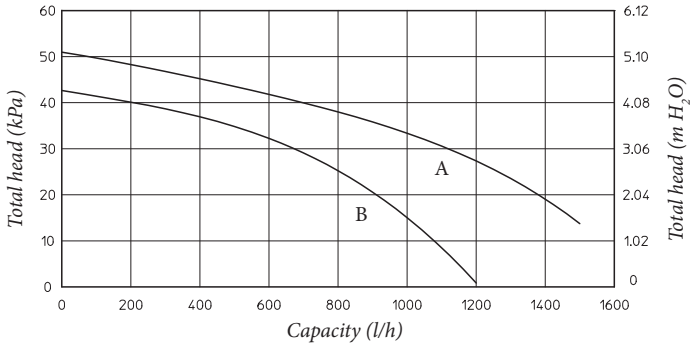
The above kits are supplied complete with instructions for assembly and use.

Total head available to the plant.

Zeus 24 kW



Zeus 28 kW

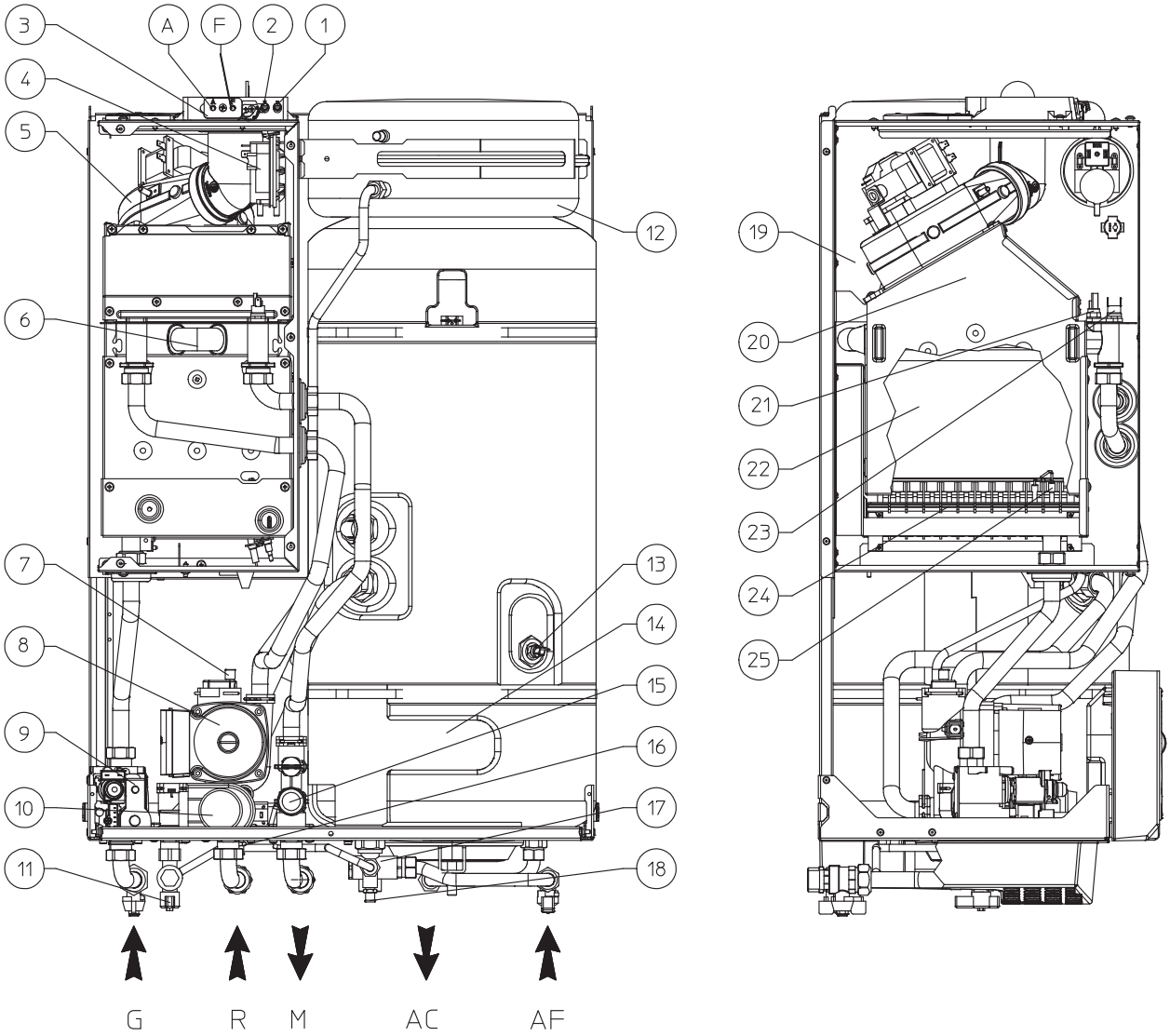


A = Total head available to the plant on the third speed (screws tightened by 1.5 revs with respect to the completely loose adjustment screws)

B = Total head available to the plant on the second speed (screws tightened by 1.5 revs with respect to the completely loose adjustment screws).

1-29

1.17 ZEUS 24-28 KW BOILER COMPONENTS.



Key:

1 - *Negative signal pressure point*
2 - *Positive signal pressure point*
3 - *Intake points (air A) - (fumes F)*
4 - *Fumes pressure switch*
5 - *Fan*
6 - *Primary heat exchanger*
7 - *Air bleeding valve*
8 - *Boiler circulation pump*
9 - *Gas valve*
10 - *3-way valve (motorised)*
11 - *System filler tap*
12 - *System expansion tank*
13 - *Domestic hot water probe*
14 - *Stainless Steel Boiler*
15 - *3 bar safety valve*
16 - *System emptying tap*
17 - *8 bar safety valve*
18 - *Boiler emptying tap*
19 - *Sealed chamber*
20 - *Flue extractor hood*
21 - *Delivery probe*
22 - *Combustion chamber*
23 - *Safety thermostat*
24 - *Burner*
25 - *Ignition and detection plugs*

2 USER AND MAINTENANCE INSTRUCTIONS

2.1 CLEANING AND MAINTENANCE.

Important: the heating plants must undergo periodical maintenance (regarding this, see in the section dedicated to the technician, the point relative to "yearly control and maintenance of the appliance") and regular checks of energy efficiency in compliance with national, regional or local provisions in force.
This ensures that the optimal safety, performance and operation characteristics of the boiler remain unchanged over time. We recommend stipulating a yearly cleaning and maintenance contract with your zone technician.

2.2 GENERAL WARNINGS.

Never expose the wall-mounted boiler to direct vapours from a cooking surface.
Use of the boiler by unskilled persons or children is strictly prohibited.
Do not touch the fumes exhaust terminal (if present) due to the high temperature it reaches;
For safety purposes, check that the concentric air intake/flue exhaust terminal (if fitted), is not blocked.
If temporary shutdown of the boiler is required, proceed as follows:

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

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

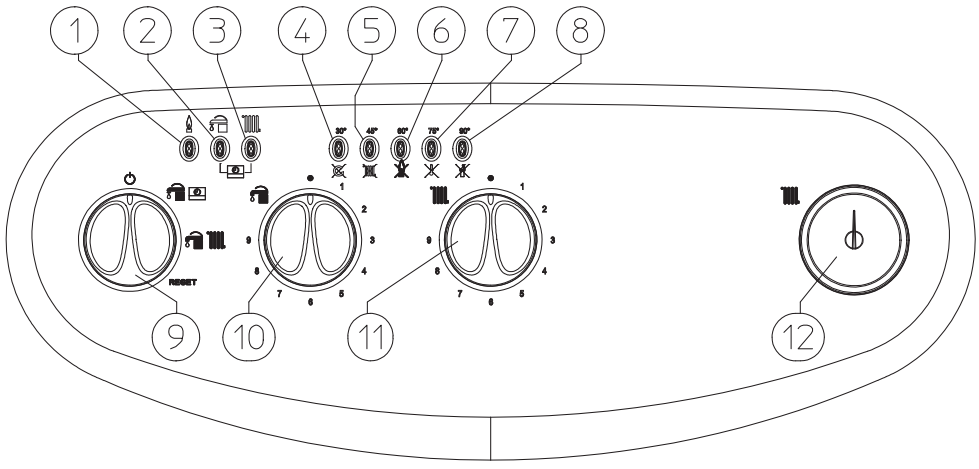
In the case of work or maintenance to structures located in the vicinity of ducting or devices for flue extraction and relative accessories, switch off the appliance and on completion of operations ensure that a qualified technician checks efficiency of the ducting or other devices. Never clean the appliance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

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

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

2.3 CONTROL PANEL.

2-1



Key:

1 - *Flame presence LED*
2 - *Domestic hot water LED*
3 - *Heating function LED*
4 - *Temperature LED – Insufficient circulation anomaly*
5 - *Temperature LED – Delivery probe anomaly*
6 - *Temperature LED – ignition block*
7 - *Temperature LED – Over-temperature block*
8 - *Temperature LED – Fumes pressure switch anomaly*
9 - *Stand-by-Domestic water / Remote Control - Domestic water and Heating-Reset Selector switch*
10 - *Domestic hot water temperature selector switch*
11 - *Heating water temperature selector switch*
12 - *Boiler manometer*

2.4 IGNITION OF THE BOILER.

Before ignition make sure the heating system is filled with water and that the manometer (12) indicates a pressure of 1 - 1.2 bar.

- Open the gas cock upstream from the boiler.
- Turn the master switch (9) taking it to the Domestic/Remote Friend Control^{V2} (CAR^{V2}) ( ) or Domestic Hot Water ( ) position.

N.B.: once the main selector switch has been placed (9) on one of these positions, the presence of voltage is indicated by the switch-on with a fixed light of one of the LEDS from 4 to 8, which indicate the temperature of the output water from the main heat exchanger.

Important: lflashing of one of the LEDs from 4 to 8 indicates that there is an anomaly present, refer to the successive paragraph.

Functioning of the boiler in domestic water mode and in heating mode is indicated respectively by the switch-on of LED 2 or LED 3 with a fixed light (in absence of remote controls).

- Operation with Remote Friend Control^{V2} (Optional). With selector switch (9) in position ( ) Remote Control connected to the boiler selector switches (10) and (11) excluded. The boiler adjustment parameters are set from the control panel of the Remote Friend Control^{V2}. Connection tot he Remote Control is indicated by the contemporary fixed switch-on of LEDs 2 and 3 ( ). Also in the presence of Remote Control the indications of the temperature and any faults are maintained on the control panel.
- Operation without Remote Control. With the selector switch (9) in position ( ) the heating adjustment selector switch(4) is cut out, the domestic hot water temperature is regulated by selector switch (10). With the selector switch in position ( ) the heating adjustment selector switch (11) is used to regulate the temperature of radiators, while selector (10) continues to be used for domestic hot water. Turn the selector switches in a clockwise direction to increase the temperature and in an anti-clockwise direction to decrease it.

From this moment the boiler functions automatically. With no demand for heat (heating or domestic hot water production) the boiler goes to "standby" function, equivalent to the boiler being powered without presence of flame (LED corresponding to the ignited boiler temperature). Each time the boiler lights up, the relative flame present symbol is displayed by the green LED 1 ( ).

N.B.: the boiler may start-up automatically if the anti-freeze function is activated.

2.5 FAULT AND ANOMALY SIGNALS.

The Zeus kW boiler signals ant anomaly by flashing of one of the LEDs from 4 to 8 or LEDs 1 and 2 coupled to LED 7. On any remote controls, the error code will be displayed using a numerical code preceeded or folowed by the letter E (e.g. CAR^{V2} = Exx, CRD = xxE)

Anomaly signalled	Flashing LED	Remote display
Boiling device probe anomaly	LED 2 ( )	12
Insufficent circulation	LED 4 ( )	27
Delivery probe anomaly	LED 5 ( )	05
Ignition block	LED 6 ( )	01
Safety thermostat block (over-temperature)	LED 7 ( )	02
Fumes pressure switch anomaly	LED 8 ( )	11
Contacts resistance block	LEDs 2 ( ) and 7 ( ) contempora-ry flashing	04
Parasite flame block	LEDs 1 ( ) and 7 ( ) contempo-rary flashing	20
Loss of remote control communication	LEDs 2 and 3 alterna-ting flashing ( )	31

Boiling device probe anomaly. If the card detects an anomaly on the boiler NTC probe, the boiler does not start-up in domestic water mode however, functioning in heating mode; a skilled technician must be called (e.g. Immergas After-sales Service).

Insufficient water circulation. This occurs if there is overheating in the boiler due to insufficient water circulating in the primary circuit; thecauses can be:

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

If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas Technical Services Centre).

Delivery probe anomaly. If the board detects an anomaly on the system NTC delivery probe (code 05) the boiler will not start; contact a qualified technician for assistance (e.g. Immergas Technical Services Centre).

Ignition block. The boiler lights up with each demand for room heating or hot water production. If this does not occur within 10 seconds, the boiler remains in stand-by for 30 seconds, try again and if the second attempt fails it goes into "ignition block" (flashing LED 6). To eliminate "ignition block" the main selector switch (9) must be turned to the Rest position. The Anomaly can be reset 5 times consecutively, after which the function in 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. On commissioning or after extended inactivity it may be necessary to eliminate the "ignition block". If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas After-sales Service).

Safety thermostat block (over-temperature). During operation, if a fault causes excessive overheating internally, in the exhaust, or an anomaly occurs in the flamecontrol section, an over-temperature block is triggered in the boiler (LED 7 flashing). To eliminate the "over-temperature block", turn the main selector switch (2)temporarily to the Reset position. If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas Technical Services Centre).

Fume pressure switch fault. This occurs if the intake or exhaust pipes are blocked or in case of a fan fault. If normal conditions are restored the boiler restarts without having to be reset. If this anomaly persists, contact a qualified technician for assistance (e.g. Immergas After-Sales Service).

Contacts resistance block. This occurs in the case of faults to the safety thermostat over-temperature). The boiler does not start and a technician must be called (e.g. Immergas After-Sales Service).

Parasite flame block. This occurs in case of a leak on the detection circuit or anomaly in the flame control unit. The boiler does not start. A qualified technician must be called (e.g. Immergas After-Sales Service).

Loss of remote control communicaton. This occurs if an incompatible remote control is connected, or if communication between the boiler and the CAR^{V2} or CRD is lost. Try the connection procedure again by turning the boiler off and turning the selector switch (9) to position ( ). If the CAR^{V2} is still not detected on re-starting the boiler will switch to local operating mode, i.e. using the controls on the boiler itself. If this phenomenon occurs frequently, contact a qualified technician for assistance (e.g. Immergas Technical Services Centre).

Signalling and diagnostics - Display on Remote Friend Control^{V2} screen (optional). During normal boiler operation the room temperature value is displayed on the Remote Friend Control^{V2} (CAR^{V2} or CRD) screen; in case of malfunction or anomaly, the temperature value is replaced by the relative error code given in the table (Para. 2-5).

Important: if the boiler is set in stand-by " " the "CON" connection error symbol will appear on the CAR^{V2} and error code "31E" on the CRD. The remote controls are powered constantly so as not to loose the memorised programs.

2.6 BOILER SHUT-DOWN.

Disconnect the main selector switch (9) taking it to position " " (LEDs from 1 to 8 off), disconnect the external omni-polar switch to the boiler and close the gas cock upstream from the appliance. Never leave the boiler switched on if left unused for prolonged periods.

2.7 RESTORING HEATING SYSTEM PRESSURE.

Periodically check the system water pressure.
The boiler pressure gauge should read a pressure between 1 and 1.2 bar.
If the pressure falls below 1 bar (with the circuit cool) restore normal pressure via the valve located at the bottom of the boiler (Fig. 2-2).

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

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

2.8 DRAINING THE SYSTEM.

To drain the boiler, use the special drain cock (Fig. 2-2).
Before draining, ensure that the filling cock is closed.

2.9 ANTI-FREEZE 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 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 added to the heating system water. In both cases the boiler domestic water circuit must be drained. In systems that are drained frequently, filling must be carried out with suitably treated water to eliminate hardness that can cause lime-scale.

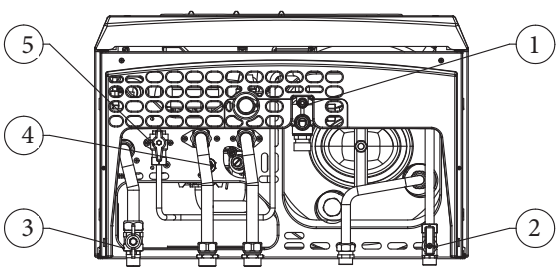
N.B.: if the boiler is installed in places where the temperature falls below 0°C the domestic water and heating attachment pipes must be insulated.

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



BOTTOM VIEW
1 - Boiler drain cock
2 - Domestic water inlet cock
3 - Gas cock
4 - System drain cock
5 - System filling valve

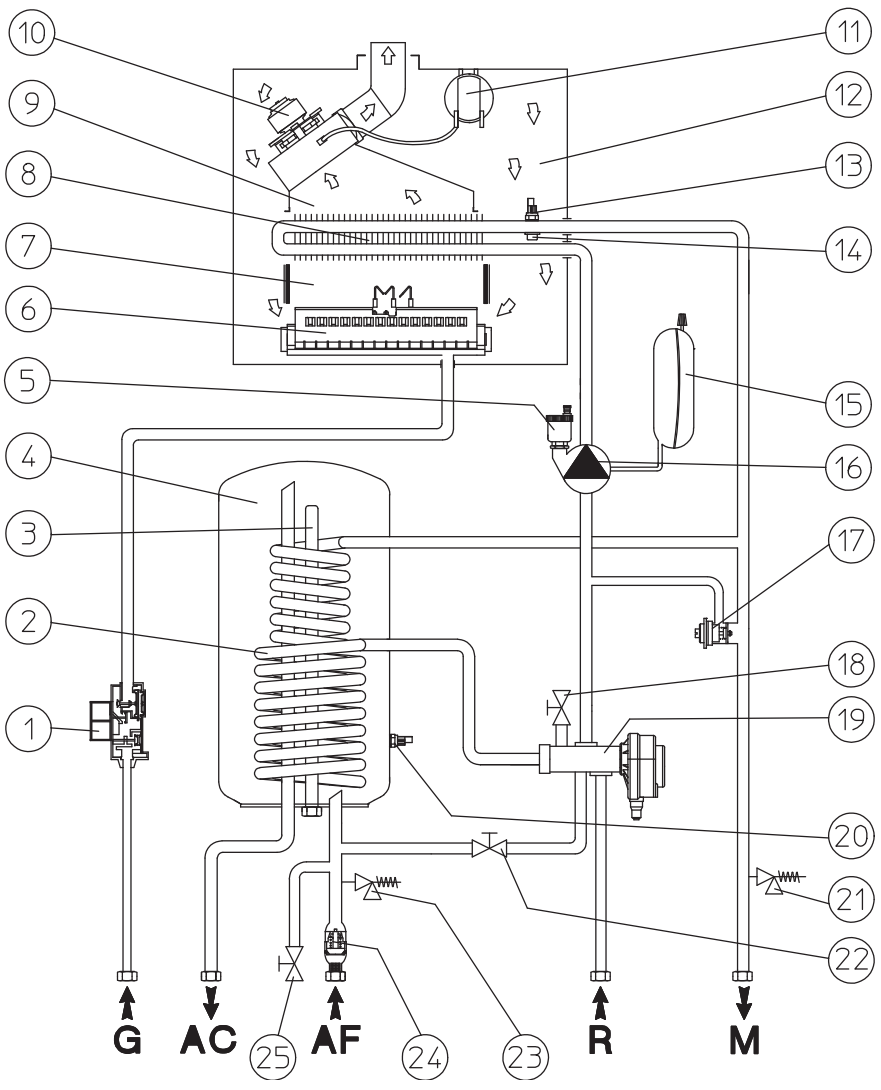
2-2

3 BOILER COMMISSIONING (INITIAL CHECK)

To commission the boiler:
- ensure that the declaration of conformity of installation is supplied with the appliance;
- ensure that the type of gas used corresponds to boiler settings;
- check connection to a 230V-50Hz power mains, correct L-N polarity and the earthing connection;
- make sure the heating system is filled with water and that the manometer indicates a pressure of 1 - 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 (Para. 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 master switch located upstream from the boiler and in 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 hot domestic water;
- ensure sealing efficiency of water circuits;
- check ventilation and/or aeration of the installation room where provided.

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

3.1 PLUMBING LAYOUT.

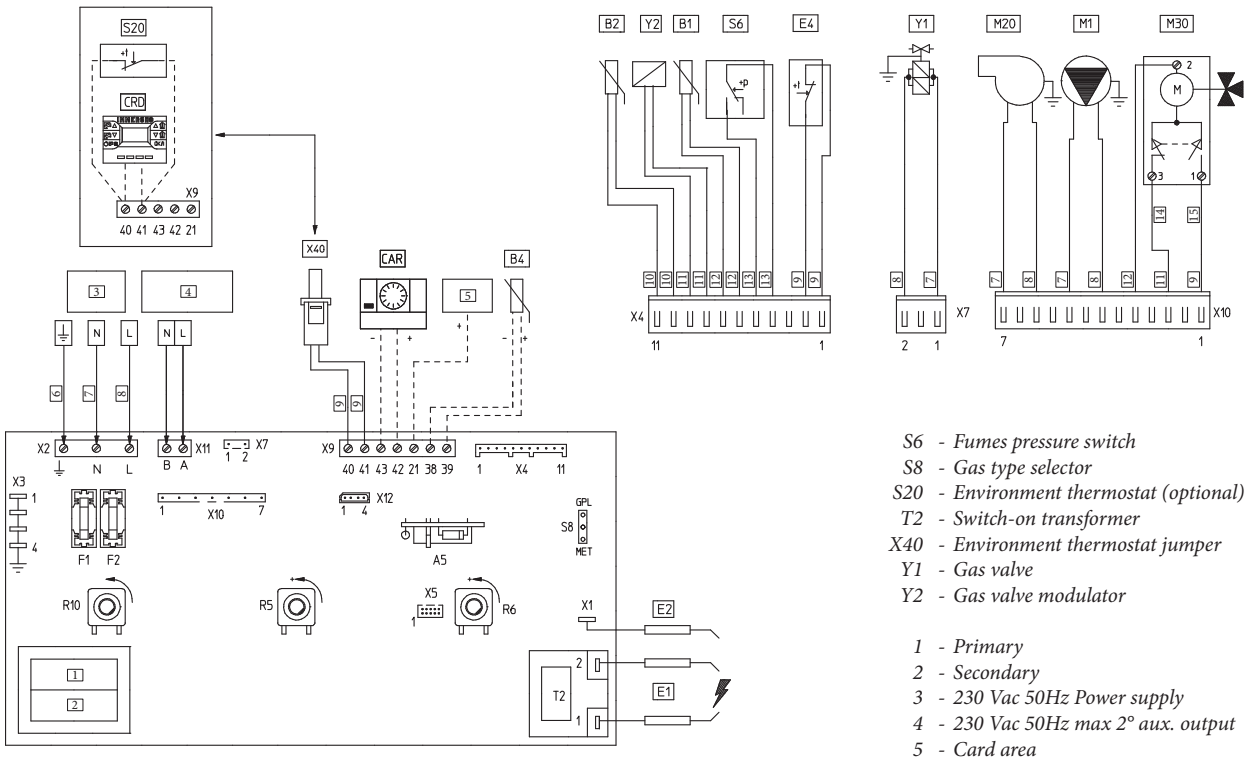


Key:
- *1 - Gas valve*
- *2 - Stainless steel coil for boiler*
- *3 - Magnesium anode*
- *4 - Stainless steel boiler*
- *5 - Air bleeding valve*
- *6 - Burner*
- *7 - Combustion chamber*
- *8 - Primary heat exchanger*
- *9 - Fumes hood*
- *10 - Fan*
- *11 - Fumes pressure switch*
- *12 - Sealed chamber*
- *13 - Delivery probe*
- *14 - Safety thermostat*
- *15 - System expansion tank*
- *16 - Boiler circulating pump*
- *17 - Adjustable by-pass*
- *18 - System drain cock*
- *19 - 3-way valve (motorised)*
- *20 - Domestic water probe*
- *21 - 3 bar safety valve*
- *22 - System filling cock*
- *23 - 8 bar safety valve*
- *24 - Cold water inlet non-return valve*
- *25 - Boiler drain cock*

- *G - Gas supply*
- *AC - Domestic hot water outlet*
- *AF - Domestic cold water inlet*
- *R - System return*
- *M - System delivery*

3-1

3.2 WIRING DIAGRAM.



Key:

A5 - CAR[V2] interface card
B1 - Delivery probe
B2 - Domestic water probe
B4 - External probe (optional)
CAR[V2] - Remote Friend Control[V2] (optional)
CRD - Remote digital control (optional)
E1 - Ignition plugs
E2 - Igniter sensor
E4 - Safety thermostat
F1 - Neutral fuse
F2 - Line fuse
M1 - Boiler circulating pump
M20 - Fan
M30 - 3-way valve (motorised)
R5 - Domestic water temp. trimmer
R6 - Heating temp. trimmer
R10 - Main selector switch
S6 - Fumes pressure switch
S8 - Gas type selector
S20 - Environment thermostat (optional)
T2 - Switch-on transformer
X40 - Environment thermostat jumper
Y1 - Gas valve
Y2 - Gas valve modulator

1 - Primary
2 - Secondary
3 - 230 Vac 50Hz Power supply
4 - 230 Vac 50Hz max 2° aux. output
5 - Card area
6 - Yellow/Green
7 - Blue
8 - Brown
9 - White
10 - Green
11 - Red
12 - Black
13 - Grey
14 - Heating
15 - Domestic water

3-2

Remote controls: the boiler is designed to use the Remote Friend Control[V2] (CAR[V2]), or as an alternative to the Digital Remote Control (CRD) which must be connected to clamps 42 and 43 of connector X9 for the CAR[V2] (respecting polarity) and clamps 40 and41 of connector X9 for the CRD on the circuit board and in both cases eliminating X40.

Environment thermostat (alternative to the CRD): the boiler is designed to use the Room Thermostat (S20). Connect it to clamps 40 – eliminating jumper X40.

Connector X12 (RS 232) is used for automatic inspection for connection to the personal computer.

3.3 TROUBLESHOOTING.

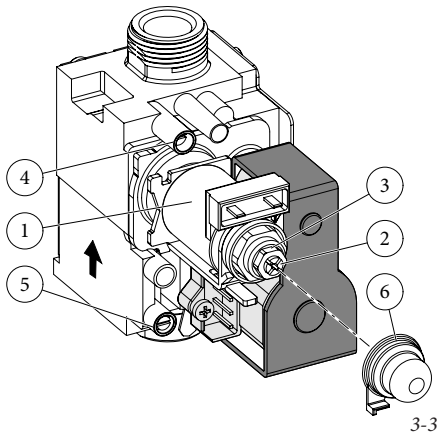
N.B.: Maintenance must be carried out by a qualified technician (e.g. Immergas Technical Assistance Service).

- 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 train. The fan may start but the safety air pressure switch does not change the contact. Make sure:

1) the intake/exhaust duct is not too long (over allowed length).
2) the intake/exhaust duct is not partially blocked (on the exhaust or intake side).
3) the diaphragm on the fume exhaust is adequate for the length of the intake/exhaust ducts.
4) the fan power supply voltage is not less than 196 V.

- Irregular combustion (red or yellow flame). This may be caused by a dirty burner, incorrect combustion parameters, intake-exhaust terminal not correctly installed. Clean the above components and ensure correct installation of the terminal.
- Frequent activation of the temperature overload thermostat. This may be caused by lack of water in the boiler, insufficient water circulation in the circuit or a blocked circulator. Check via the pressure gauge that values are within admissible limits. Check that radiator valves are not all closed.
- Presence of air in the system. Check opening of the special air bleeding cap (Fig. 1-30). Make sure the system pressure and expansion tank pre-charge values are within the set limits; the pre-charge value for the expansion tank must be 1.0 bar, and system pressure between 1 and 1.2 bar.
- Ignition block: (Para. 2.5).
- Domestic water probe broken. The boiler does not have to be emptied in order to replace the domestic water probe as the probe is not in direct contact with the domestic hot water present in the boiler.

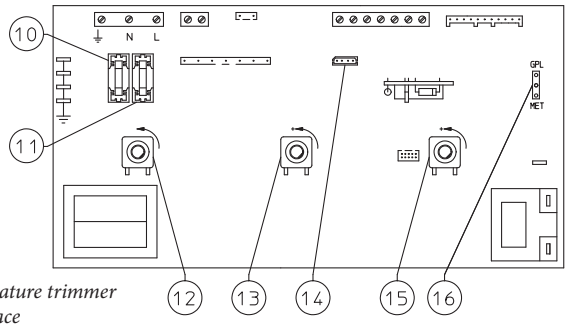
SIT 845 gas valve



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

3-3

Zeus 24-28 kW circuit board



10 - Line fuse 3.15AF
11 - Neutral fuse 3.15AF
12 - Main selector switch
13 - Domestic water temperature trimmer
14 - RS232 computer interface
15 - Heating temperature trimmer
16 - METHANE L.P.G. gas type selector

3-4

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-plate, request the relative conversion kit for quick and easy conversion.
Boiler conversion must be carried out by a qualified technician (e.g. Immergas Technical Assistance Service).
To convert to another type of gas the following operations are required:
- remove the voltage from the appliance;
- replace the main burner injectors, making sure to insert the special seal rings supplied in the kit, between the gas manifold and the injectors;
- move jumper 16 (Fig. 3-4) into the correct position for the type of gas in use (Methane or L.P.G.);
- to access adjustments on the circuit board the cover must be removed from the dashboard by loosening the rear screw fasteners;
- apply voltage to the appliance;
- adjust the boiler maximum heat power;
- adjust the boiler minimum heat power;
- adjust (eventually) the heating power;
- seal the gas flow rate devices (if adjusted);
- after completing conversion, apply the sticker, present in the conversion kit, near the data-plate. Using an indelible marker pen, cancel the data relative to the old type of gas.

These adjustments must be made with reference to the type of gas used, following that given in the table (Para. 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 return in the combustion chamber;
- the burner flame is not too high or low and that it is stable (does not detach from burner);
- the pressure testers used for calibration are perfectly closed and there are no leaks from the gas circuit.

N.B.: All boiler adjustment operations must be carried out by a qualified technician (e.g. Immergas Assistance Service). Burner adjustment must be carried out using a differential "U" or digital type pressure gauge, connected to the pressure point located above the sealed chamber (part. 2 Fig. 1-30) and the gas valve pressure outlet (part. 4 Fig. 3-3), keeping to the pressure value given in the tables (Para. 3.16) according to the type of gas for which the boiler is prepared.

3.6 POSSIBLE ADJUSTMENTS OF THE GAS VALVE.

• Adjustment of boiler nominal heat output (Fig. 3-3).
- Turn the domestic hot water selector knob (10 Fig. 2-1) to the maximum functioning position;
- open the domestic hot water cock in order to prevent modulation intervention;
- adjust the boiler nominal power on the brass nut (3), keeping to the maximum pressure values stated in the tables (Para. 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 thermal input (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);
- disconnect the power supply t the modulating reel (just disconnect a faston); By turning the screw in a clockwise direction, the pressure increases, in an anti-clockwise direction it decreases. On completion of calibration, re-apply the power supply tot he modulating reel. The pressure to which the boiler minimum power must be adjusted, must not be lower than that stated in the tables (Para. 3.16) depending on the type of gas.

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

3.7 PROGRAMMING THE CIRCUIT BOARD.

The Zeus kW 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: position the main selector switch on Reset for a period of time between 15 and 20 seconds (after about 10 sec. LEDs 2 and 3 will start to flash at the same time. Wait for this to end and re-position the main selector switch on domestic water and heating). At his point, re-position the main selector switch on domestic water-heating ( ).

When the programming phase has been activated, enter the first level where it is possible to choose the parameter to be set.
The latter is indicated by the fast flashing of one of the LEDs between 1 and 8 (Fig. 2-1).
Selection is made by turning the domestic hot water temperature selector switch (10). For association of the LED to the parameter, see the following table:

List of parameters	Flashing LED (fast)
Minimum heating power	LED 1
Maximum heating power	LED 2
Heating switch-on timer	LED 3
Heating power output ramp	LED 4
Heating switch-on delay on request from Environmental Thermostat, Digital Remote Control or Remote Friend Control^{V2}	LED 5
Domestic water thermostat/Boiler hysteresis	LED 6
Circulating pump functioning	LED 7
Functioning gas	LED 8
Boiler mode	LEDs1 and 8

Once the parameter to be modified has been selected, confirm by turning the main selector switch to Reset momentarily until the LED relative to the parameter switches-off, then release.

Given the OK for selection, pass to the second level where it is possible to set the value of the parameter selected. The value is indicated by the slow flashing of one of the LEDs between 1 and 8. The value is selected by rotating the heating temperature selector switch (11).

Once the value of the parameter to be modified has been selected, confirm the selection by momentarily turning the main selector switch onto Reset momentarily until the LED relative to the parameter switches-off, then release.

Programming mode is exited if no operation is carried out for 30 seconds or if the main selector switch is positioned at OFF from the "parameter setting" level.
For association of the LED to the relative value, see the following tables:

Heating power. The boiler is produced and calibrated in the heating phase at nominal power. It also has electronic modulation that adapts the boiler potentiality to the effective heating demand of the house. Then the boiler works normally in a variable gas pressure field between the minimum heating power and the maximum heating power depending on the plants heating.

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

Minimum heating power (continuous variation)	**Flashing LED (slow)**
0% Imax. (Standard setting)	LED 1
7% Imax.	LED 2
14% Imax.	LED 3
21% Imax.	LED 4
28% Imax.	LED 5
35% Imax.	LED 6
42% Imax.	LED 7
63% Imax.	LED 8

Maximum heating power (continuous variation)	**Flashing LED (slow)**
0% Imax.	LED 1
11% Imax.	LED 2
22% Imax.	LED 3
33% Imax.	LED 4
44% Imax.	LED 5
55% Imax.	LED 6
88% Imax.	LED 7
100% Imax. (Standard setting)	LED 8

Permanent reduction of the timer. The boiler has an electronic timing device that prevents the burner from igniting too often in the heating phase. The boiler has a standard supply of a timer adjusted at 180 seconds.

Heating switch-on timer (continuous variation)	**Flashing LED (slow)**
30 seconds	LED 1
55 seconds	LED 2
80 seconds	LED 3
105 seconds	LED 4
130 seconds	LED 5
155 seconds	LED 6
180 seconds (Standard setting)	LED 7
255 seconds	LED 8

Heating ramp timing. The boiler distributes he maximum power set in the previous parameter. The boiler performs an ignition ramp of about 650 seconds to arrive from minimum power to nominal heating power.

Heating ramp timer (continuous variation)	**Flashing LED (slow)**
65 seconds	LED 1
130 seconds	LED 2
195 seconds	LED 3
390 seconds	LED 4
455 seconds	LED 5
520 seconds	LED 6
585 seconds	LED 7
650 seconds (Standard setting)	LED 8

Heating switch-on delay request from Room thermostat and Remote Friend Control^{V2}. The boiler is set to switch-on immediately after a request. In the case of particular plants (e.g. area plants with motorised thermostatic valves etc.) it could be necessary to delay switch-on.

Heating switch-on delay request from Room thermostat and Remote Friend Control^{V2} (continuous variation)	**Flashing LED (slow)**
0 seconds (Standard setting)	LED 1
54 seconds	LED 2
131 seconds	LED 3
180 seconds	LED 4
206 seconds	LED 5
355 seconds	LED 6
400 seconds	LED 7
510 seconds	LED 8

Domestic water thermostat/Boiler hysteresis. With the setting of hysteresis 1 the boiler switches on with a boiling device temperature equal to a set point at -3°C. With the setting of hysteresis 2 l the boiler switches on with a boiling device temperature equal to a set point at -10°C.

Domestic water thermostat/ Boiler hysteresis	**Flashing LED (slow)**
Hysteresis 1 (Standard setting)	LED 1
Hysteresis 2	LED 8

Circulating pump function. two circulating pump operational modes can be selected in heating phase.
In "intermittent" mode it is activated from the environmental thermostat or from the remote control, in "continual" mode the circulation pump functions constantly when the main selector switch (12) is on heating mode.

Circulating pump function	**Flashing LED (slow)**
Intermittent (Standard setting)	LED 1
Continuous	LED 8

Town Gas G110 – Industrial gas. The setting of this function is used to ad just the boiler in order to function with gases from the first family.

Town Gas G110 - Industrial gas (first family gas)	**Flashing LED (slow)**
Off (Standard setting)	LED 1
On	LED 8

Boiler mode. Establishes if the boiler functions in instantaneous mode or with boiler (standard supply).

Boiler mode	**Flashing LED (slow)**
Instantaneous (Cannot be used)	LED 1
With boiler (Standard setting)	LED 8

3.8 AUTOMATIC SLOW IGNITION FUNCTION WITH TIMED RAMP DELIVERY.

In the switch-on phase the electronic card carries out an increasing gas delivery ramp (with pressure values that depend on the type of gas selected) of preset duration. This avoids every boiler lighting phase calibration or preparation operation in any conditions of use.

3.9 CHIMNEY SWEEP "FUNCTION".

When activated, this function forces the boiler at max. output for 15 minutes.
In this mode all the adjustments are cut out and only the temperature safety thermostat and the limit thermostat remain active. To activate the "Chimney-Sweep" function, press the Reset key for 8 to 15 seconds in absence of domestic water and heating requests. Its activation is indicated by the simultaneous flashing of LEDS (2) and (3). This function allows the technician to check the combustion parameters. After the checks deactivate the function, switching the boiler off and then on again.

3.10 PUMP ANTI-BLOCK FUNCTION.
If the main selector is set on "domestic water" ( ) the boiler has a function that makes the pump start at least once every 24 hours for 2.5 minutes in order to reduce the risk of the pump blocking due to extended inactivity.
If the main selector is set on "domestic water -heating"( ) the boiler has a function that makes the pump start at least once every 3 hours for 2.5 minutes.

3.11 THREE-WAY ANTI-BLOCK SYSTEM.
Both in "domestic" and in "domestic-heating" phase the boiler is equipped with a function that starts the three-way motorized group 24 hours after it was last in operation, running it for a full cycle so as to reduce the risk of the three-way group becoming blocked due to prolonged inactivity.

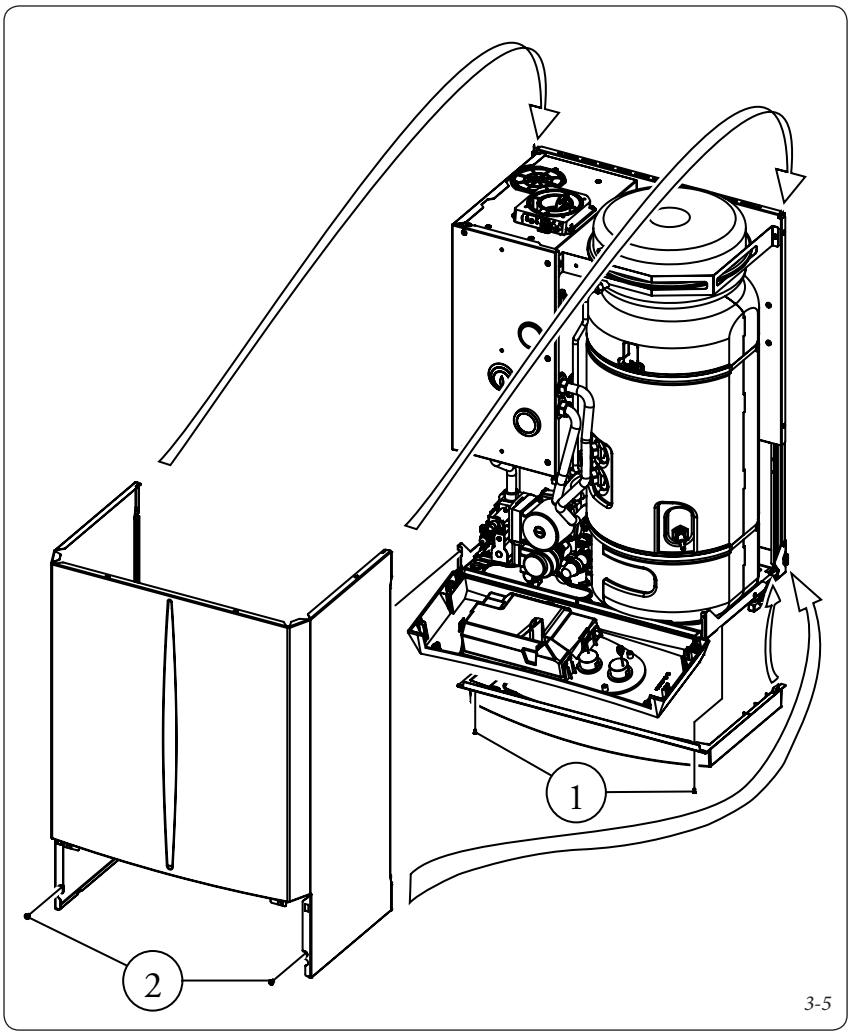
3.12 RADIATOR ANTI-FREEZE FUNCTION.
If the system return water is below 4°C, the boiler starts up until reaching 42°C.

3.13 ELECTRONIC CARD PERIODICAL SELF-CHECK.
During operation in heating mode or with boiler in standby, the function activates every 18 hours after the last boiler check/power supply. In case of operation in domestic circuit mode the self-check starts within 10 minutes after the end of the drawing in progress, for a length of approx. 10 seconds.

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

3.14 CASING REMOVAL.
To facilitate boiler maintenance the casing can be completely removed as follows (Fig. 3-5):
- Disassemble the lower cover by removing the two relevant screws (1).
- Unscrew the two screw fasteners on the dashboard and open it making it pivot.
- Unscrew the 2 fixing screws (2) on the casing.
- Unhook the lower part of the casing as described in the figure.
- Pull the casing (4) forwards and up at the same time (see figure) to detachit from the upper hooks.

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 fume 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 electrical main electrical switch on boiler;
  - system control thermostat intervention;
  - domestic water control thermostat intervention.
- Check that the internal system is properly sealed according to specifications.
- Check intervention of the device against no gas ionization flame control: intervention time must be less than10 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 tank charge is at 1.0 bar.
- Check that the system static pressure (with system cold and after refilling the system by means of the filler cock) 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;
  - system pressure switch;
  - fumes pressure switch.
- Check integrity of the boiler Magnesium anode.
- Check the condition and integrity of the electrical system and in particular:
  - electrical power cables must be inside the whipping;
  - there must be no traces of blackening or burning.



3-5

3.16 VARIABLE HEAT POWER

N.B.: The pressures given in the table represent the pressure differences existing between the gas valve outlet and the combustion chamber. Adjustments must therefore carried out with the differential pressure gauge ("U" or digital type) with the sensors inserted in the test pressure outlet of the modulating adjustable gas valve and on the sealed chamber positive pressure test outlet. The power data given in the table is obtained with intake/exhaust pipe of length 0.5 m. Gas flow rates refer to heating power below a temperature of 15°C and at a pressure of 1013 mbar. Burner pressure values refer to use of gas at 15°C.

Zeus 24 kW

		METHANE (G20)			BUTANE (G30)			PROPANE (G31)		
HEAT POWER	HEAT POWER	GAS FLOW RATE BURNER	NOZZLE PRESSURE BURNER		GAS FLOW RATE BURNER	NOZZLE PRESSURE BURNER		GAS FLOW RATE BURNER	NOZZLE PRESSURE BURNER	
(kW)	(kcal/h)	(m3/h)	(mbar)	(mm H_2O)	(kg/h)	(mbar)	(mm H_2O)	(kg/h)	(mbar)	(mm H_2O)
24,0	20640	2,70	12,10	123,4	2,01	28,70	292,7	1,98	36,50	372,2
23,0	19780	2,59	11,42	116,4	1,93	26,40	269,2	1,90	34,50	351,9
22,0	18920	2,48	10,74	109,5	1,85	24,21	246,9	1,82	32,52	331,6
21,0	18060	2,37	10,07	102,7	1,77	22,14	225,8	1,74	30,55	311,5
20,0	17200	2,27	9,40	95,9	1,69	20,18	205,7	1,66	28,59	291,5
19,0	16340	2,16	8,73	89,0	1,61	18,32	186,8	1,59	26,63	271,6
18,0	15480	2,05	8,07	82,3	1,53	16,56	168,8	1,51	24,68	251,7
17,0	14620	1,95	7,40	75,5	1,45	14,90	151,9	1,43	22,73	231,8
16,0	13760	1,84	6,73	68,7	1,37	13,34	136,0	1,35	20,78	211,9
15,0	12900	1,73	6,07	61,9	1,29	11,87	121,0	1,27	18,83	192,0
14,0	12040	1,63	5,40	55,1	1,21	10,50	107,1	1,19	16,87	172,0
13,0	11180	1,52	4,73	48,2	1,13	9,22	94,0	1,11	14,90	152,0
12,0	10320	1,41	4,05	41,3	1,05	8,03	81,9	1,03	12,92	131,8
11,0	9460	1,30	3,37	34,4	0,97	6,94	70,8	0,95	10,93	111,4
10,0	8600	1,19	2,68	27,4	0,89	5,94	60,6	0,87	8,92	90,9
9,3	7998	1,11	2,20	22,4	0,83	5,30	54,0	0,82	7,50	76,5

Zeus 28 kW

		METHANE (G20)			BUTANE (G30)			PROPANE (G31)		
HEAT POWER	HEAT POWER	GAS FLOW RATE BURNER	NOZZLE PRESSURE BURNER		GAS FLOW RATE BURNER	NOZZLE PRESSURE BURNER		GAS FLOW RATE BURNER	NOZZLE PRESSURE BURNER	
(kW)	(kcal/h)	(m3/h)	(mbar)	(mm H_2O)	(kg/h)	(mbar)	(mm H_2O)	(kg/h)	(mbar)	(mm H_2O)
28,0	24080	3,16	11,20	114,2	2,36	28,20	287,6	2,32	36,00	367,1
27,0	23220	3,06	10,68	108,9	2,28	26,94	274,8	2,24	34,42	351,0
26,0	22360	2,96	10,15	103,5	2,21	25,68	261,8	2,17	32,82	334,7
25,0	21500	2,85	9,63	98,2	2,13	24,40	248,8	2,10	31,21	318,3
24,0	20640	2,75	9,10	92,7	2,05	23,10	235,6	2,02	29,58	301,7
23,0	19780	2,65	8,56	87,3	1,98	21,80	222,3	1,94	27,94	284,9
22,0	18920	2,54	8,03	81,9	1,90	20,49	208,9	1,87	26,28	268,0
21,0	18060	2,44	7,49	76,4	1,82	19,16	195,4	1,79	24,61	250,9
20,0	17200	2,33	6,95	70,9	1,74	17,82	181,7	1,71	22,91	233,7
19,0	16340	2,22	6,41	65,3	1,66	16,47	167,9	1,63	21,21	216,3
18,0	15480	2,12	5,86	59,8	1,58	15,11	154,0	1,55	19,49	198,7
17,0	14620	2,01	5,32	54,2	1,50	13,73	140,0	1,47	17,75	181,0
16,0	13760	1,90	4,77	48,6	1,41	12,35	125,9	1,39	16,00	163,1
15,0	12900	1,78	4,22	43,0	1,33	10,95	111,7	1,31	14,23	145,1
14,0	12040	1,67	3,67	37,4	1,25	9,54	97,3	1,23	12,44	126,9
13,0	11180	1,56	3,11	31,7	1,16	8,12	82,8	1,14	10,64	108,5
12,0	10320	1,44	2,56	26,1	1,08	6,69	68,2	1,06	8,83	90,0
11,0	9460	1,33	2,00	20,4	0,99	5,25	53,5	0,98	7,00	71,4

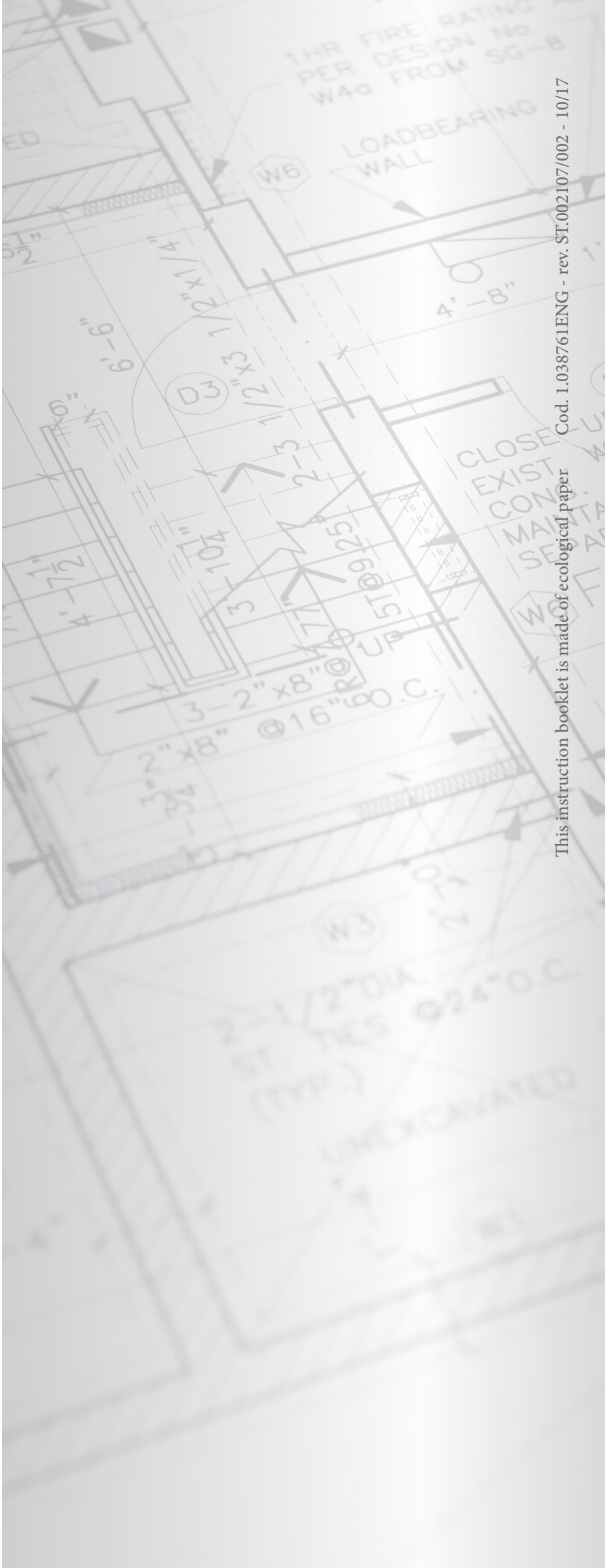
3.17 COMBUSTION PARAMETERS.

		G20	G30	G31
Zeus 24 kW				
Gas nozzle diameter	mm	1.35	0.79	0.79
Supply pressure	mbar (mm H_2O)	20 (204)	29 (296)	37 (377)
Flue flow rate at nominal heat output	kg/h	49	50	51
Flue flow rate at minimum heat output	kg/h	53	50	50
CO_2 at Q. Nom./Min.	%	7.5 / 2.7	8.5 / 3.3	8.2 / 3.3
CO at 0% of O_2 at Q. Nom./Min.	ppm	86 / 66	70 / 84	45 / 80
NO_X at 0% of O_2 at Q. Nom./Min.	ppm	123 / 71	161 / 84	165 / 80
Flue temperature at nominal heat output	°C	108	109	107
Flue temperature at minimum heat output	°C	87	91	91
Zeus 28 kW				
Gas nozzle diameter	mm	1.35	0.79	0.79
Supply pressure	mbar (mm H_2O)	20 (204)	29 (296)	37 (377)
Flue flow rate at nominal heat output	kg/h	56	56	57
Flue flow rate at minimum heat output	kg/h	60	57	58
CO_2 at Q. Nom./Min.	%	7.70 / 2.86	9.00 / 3.47	8.70 / 3.42
CO at 0% of O_2 at Q. Nom./Min.	ppm	158 / 101	184 / 109	105 / 108
NO_X at 0% of O_2 at Q. Nom./Min.	ppm	54 / 28	67 / 37	74 / 35
Flue temperature at nominal heat output	°C	110	114	111
Flue temperature at minimum heat output	°C	87	91	90

3.18 TECHNICAL DATA.

		Zeus 24 kW	Zeus 28 kW
Nominal heating power	kW (kcal/h)	25,5 (21934)	29,8 (25644)
Minimum heating power	kW (kcal/h)	10,5 (9048)	12,6 (10799)
Nominal heating power (useful)	kW (kcal/h)	24,0 (20640)	28,0 (24080)
Minimum heating power (useful)	kW (kcal/h)	9,3 (7998)	11,0 (9460)
Useful thermal efficiency at nominal output	%	94,1	93,9
Useful thermal efficiency at 30% nominal output	%	90,4	90,6
Heat loss at case with burner On/Off	%	0,40 / 0,89	0,60 / 0,62
Heat loss at flue with burner On/Off	%	5,50 / 0,03	5,50 / 0,01
Heating circuit max. working pressure	bar	3	3
Heating circuit max. working temperature	°C	90	90
Adjustable heating temperature	°C	35 - 85	35 - 85
Total volume system heating expansion tank	l	7,7	7,7
Heating expansion tank pre-charge	bar	1	1
Generator water capacity	l	3,6	4,1
Head available with flow rate 1000/h	kPa (m H_2O)	24,7 (2,52)	33,4 (3,41)
Hot water production available heat output	kW (kcal/h)	24,0 (20640)	28,0 (24080)
Domestic hot water adjustable temperature	°C	20 - 60	20 - 60
Domestic circuit flow limiter at 2 bar	l/min	9,2	11,6
Domestic circuit min. pressure (dynamic	bar	0,3	0,3
Domestic circuit max. working pressure	bar	8	8
Specific capacity (ΔT 30°C)	l/min	13,5	14,5
Drawing capacity in continuous duty (ΔT 30°C)	l/min	11,5	13,4
Weight of full boiler	kg	100,1	104,6
Weight of empty boiler	kg	54	58
Electric attachment	V/Hz	230/50	230/50
Nominal absorption	A	0,7	0,73
Installed electric power	W	140	145
Power absorbed by circulation pump	W	81,7	85,6
Power absorbed by fan	W	32,8	37,6
Equipment electrical system protection	-	IPX4D	IPX4D
NO_x class	-	3	3
NO_x weighted	mg/kWh	134	113
CO weighted	mg/kWh	111	104
Type of appliance	C12 /C32 / C42 / C52 / C82 / B22 / B32		
Category	II2H3+		

- Temperature adjustment at domestic water flow of 7l/min. with inlet temperature of 15°C.
- Fume temperature values refer to an air inlet temperature of 15°C.
- The data relevant to domestic hot water performance refer to a dynamic inlet pressure of 2 bar and an inlet temperature of 15°C; the values are measured directly at the boiler outlet considering that to obtain the data declared mixing with cold water is necessary.
- The 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 fume exhaust system according to product standards.



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