INSTRUCTION
Handbook
ENG

use
installation
adjustment
maintenance

CITY PLUS

24 HE
30 HE

Green Heating Technology
ITALTHERM

Caldaie • Scaldabagni • Sistemi Solari • Climatizzatori

IMPORTANT! Install the gasket included in the documents bag, on the intake/outlet flange, *as shown on page 20.*

Table of Content

Safety warnings

This instructions manual is an essential and complementary part of the product and it is supplied together with the boiler.

Carefully read the manual, achieving all important information for a safe installation, use and servicing.

- **Carefully keep the manual**, together with the documentation of all the accessories of the boiler and of the system, for any further consultation you may need.
- **The installation** must be carried out by a qualified technician, in accordance with manufacturer instructions and with the relevant requirements of the current issue.
- **Carbon monoxide (CO) danger:** the CO is a no-smelling and no-colour gas. When a forced draught boiler with air inlet from the room (appliance type B_2) is installed, permanent ventilation of the installation room is mandatory and extremely important. Ventilation must be made and sized in compliance with Laws and Rules in force. Whatever manumission, closing or neutralization of the permanent ventilation could lead to very serious consequences to people in the rooms, as intoxication by CO, permanent damage and death. Besides, the CO and O_2 mix can be explosive.
- A **qualified technician** is a person with a specific technical competence in the field of the heating appliances for domestic use and domestic hot water production, in compliance with Laws and Rules in force.
- The **operations that the user can do** are only and exclusively the ones contained in the "USER GUIDE" section.
- The manufacturer has no contractual and extra-contractual responsibility for any damage arising from wrong installation, wrong use and non-observance of current laws and instructions given by the manufacturer himself.
- **Important:** this gas boiler is used to heat the water at a temperature lower than the boiling one, at atmospheric pressure; it must be connected to an heating system and/or to a domestic hot water system, in accordance with its features and power.
- Packing items (cartons, nails, plastic bags and so on) **must not be left within children easy reach**, as they are potentially dangerous.
- **Before any cleaning or servicing operation**, disconnect the boiler from the mains electrical supply by means of the main electrical switch and stop the gas supply by means of the suitable cock.
- **In case of fault** and/or bad operation of the appliance, disconnect it immediately and do not try to repair it by yourselves.
- **Boiler servicing and repair** must be carried out exclusively by qualified technicians, which will use original spare parts. Strictly observe the above requirement, avoiding any risk of compromising the appliance safety.
- **If the appliance should be definitively dismissed**, remove or cut off any potential dangerous item.
- **When transferring the appliance** (e.g. leaving it installed after a removal or a sale of the building), make always sure that the instructions manual is close to the boiler for the future use of new owners and/or installers.
- This appliance **must be used for its clearly recommended utilization only**. Any other utilization must be considered dangerous and incorrect.
- It is strictly forbidden to use the appliance **for different purposes** than the specified ones.
- This appliance must be **installed exclusively to wall**.

Safety warnings symbols legend

 Generic safety warning	 Electrical danger (fulguration)	 Physical danger (personal damage)
 Thermal danger (burns)	 General warning or advice to avoid material damage or to achieve improvements	

References to Laws and Norms

All references to laws and laws contained in this handbook, as well as all installation, maintenance and use prescriptions and the relevant pictures, are relevant to European and/or Italian regulation.

All laws and norms in force in the territory where the installation takes place prevail on the indications contained in this handbook, that are inconsistent with them.

All the **references to norms and national laws** mentioned in this handbook are indicative as laws and norms are subject to issues and integrations by the authorities in charge. **Also comply to eventual local norms and laws** (not mentioned in this handbook) in force in the territory where the installation takes place.

Personnel in charge of installation

Always comply with national and/or local regulation about WORK SAFETY of Personnel in charge of installation.

Always proceed with caution when handling the boiler and carrying out installation/maintenance work as metal parts may cause injuries such as cuts and abrasions. **Wear personal protection devices** (especially gloves) while doing the above mentioned operations

Installation, use and maintenance

Always comply with national and/or local regulation about BOILER INSTALLATION.

User warnings

Important

In case of gas smell:

1 - **do not press electrical switches, use the telephone or other objects that can provoke sparks;**

2 - **open immediately the windows and the doors in order to cleanse the room air;**

3 - **close the gas supply taps;**

4 - **call a qualified technician.**

Do not obstruct the ventilation openings of the gas boiler room, in order to avoid possible dangerous situations as the creation of poisonous or explosive mixtures.

First starting up and Use

The first starting up and the maintenance of the boiler must be performed by a professionally qualified staff (for example the installer or the Service Centres authorized by ITALTHERM)

The latter will check that:

- the label technical data of the gas boiler correspond to those of the gas available;
- the main burner regulation is compatible with the gas boiler output;
- the chimney works correctly, expelling the combustion products;
- the air supply and the combustion products evacuation work correctly, in accordance with the requirements in force;
- the conditions for a correct ventilation are guaranteed, also when the gas boiler is located inside a closed space (with suitable caracteristics).

The User must not touch sealed items nor break the seals. Only specialized technicians and the official technical service can break the seals of sealed items.

The boiler is fitted with safety devices that block operation the case of problems with the boiler or related systems. These devices must never be disabled: if a device intervenes frequently, have a qualified technician located the cause, even in systems to which the boiler is connected, and in the flue inlet/outlet system that must be efficient and made according to the laws in force (see examples in paragraph "Flue systems" on page 20). If a boiler component has failed, you must only use original replacement parts

When the boiler is off for a long period see the Paragraph "Boiler inactivity" on page 11 for the necessary precautions about the electrical supply, the gas supply and the protection against freezing.

Do not touch the heated surfaces of the boiler, as the doors, the flue, the chimney pipe, etc., also after the boiler operation because, for a certain time, these surfaces are overheated. **Any contact with them can cause dangerous scalds.** It is then forbidden to let children or inexperienced people be close to the boiler, during its operation.

- Do not expose the wall hung gas boiler to water or other liquids sprinklings, or to vapours directly coming from gas cookers/hobs.
- Do not obstruct the air inlet or flue outlet terminals, even momentarily or partially.
- Do not put any object on the gas boiler and don't leave any flammable liquid or solid materials, (e.g. paper, clothes, plastic, polystirene) in its proximity.

- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- If the gas boiler is going to be definitively unused, call a qualified technician to carry out all required operations, checking in particular disconnection of gas, water and electrical supplies.
- **Only for those models that draw directly from the installation room** (type B appliances installed indoor): the installation of aspirators, fireplaces or similar appliances in the room where the type B appliance is installed (and in adjacent rooms in case of indirect ventilation) is prohibited except in cases foreseen by rules in force and anyway the installation must be made in compliance with all specific safety measures mentioned in the rules and laws in force, even in case of modifications or additions.

Installation, first starting up, maintenance and servicing

All operations for installation, first starting up, maintenance, servicing and gas conversion **must be carried out by qualified technicians**, in accordance with the Norms and Laws in force.

Maintenance operations must be carried out in compliance with the manufacturer prescriptions, and in compliance with the laws and rules presently in force for what is not mentioned in this handbook; we advice to perform them at least once a year to maintain the boiler's performance.

Appliance booklet or central plant booklet

All appliances must have an appliance booklet (for outputs less or equal 35 kW) or a central plant booklet (for outputs more than 35 kW). All maintenance and servicing operations and combustion checks must be written on the booklet, together with the name of the person responsible for servicing.

Combustion checking

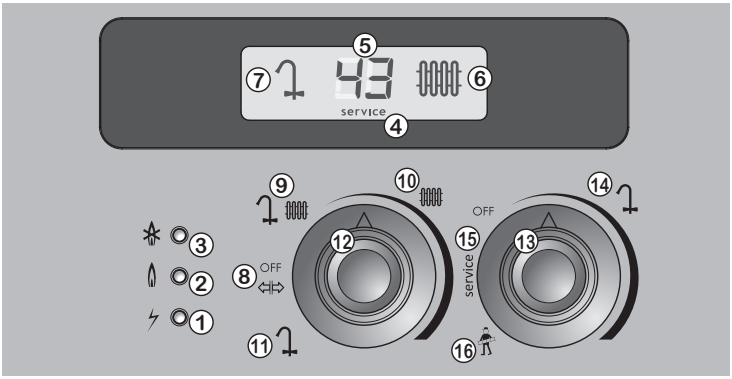
Combustion checking consists of a control of the boiler efficiency. Boilers that, after the checking, will have efficiency rates lower than the ones required and not changeable with suitable adjustments (that must be performed by qualified technicians), must be replaced.

Boiler operation and servicing

The user (owner or tenant of the flat where the boiler is installed) or the administrator of the block of flats (in case of a central heating system) are responsible for the appliance operation and servicing; they can both transfer the responsibility of the servicing and eventually of the operation to another person, which must be a qualified technician as indicated by the Laws. Even if the user or the administrator decide to assume personally this responsibility, ordinary servicing of the warm air heater and combustion checks must be anyway carried out by a qualified technician

The front control panel

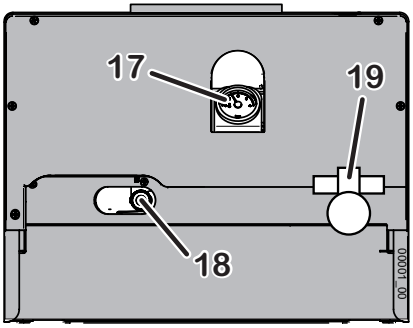
1	green	**Electrical Supply Indicator Light** **Off** - boiler not electrically supplied. **Blinking** - boiler electrically supplied, but not active because the knob **12** is on OFF. **On** - boler active. Knob **12 on** , or **on** along the **scale** . **Flashing with short pulses -** actuated for mistake, by the user, a ***function reserved to the technician***. Rotate immediately the knob **13** back on the scale .
2	yellow	**Burner Indicator Light** **Off** - the flame in the burner is off. **On** - the flame in the burner is on.
3	red	**Alarm Indicator Light** **Off** - no problems detected. **Blinking or Flashing** - see "Alarms - boiler block" on page 35. **Flashing with short flashes -** the user has activated, by mistake, a *function reserved to the technician*. Turn the **knob 13** on the **scale** immediately.
4	**service**	Indication, on the display, for the Technician, usually not displayed.
5	2-digit number on the display	Normally it indicates, in °C, the temperature of the water going out of the boiler (heating or domestic). During the adjustment of the heating system temperature (rotating the knob **12** along the scale **)** or domestic hot water (rotating the knob **13** along the scale **)** it shows the set value, in °C.
6 7	- on the display	Usually, they are shown **in fixed mode** and they indicate that the boiler is ready to supply heat to the relevant heating or DHW . When the boiler is in Summer mode **, the symbol is not shown.** They **blink** during the actual heat delivery, by the boiler, to the relevant system.



8	OFF	Position on which the knob **12** should be positioned to turn the boiler off or to reset a boiler block.
9		Position on which the knob **12** should be positioned to activate the boiler in Winter mode (both Heating and Domestic Hot Water functions available).
10		Scale on which the knob **12** should be positioned to adjust the Heating system temperature *(**attention:** only if the Remote Control Kit is **not installed**).*
11		Position on which the knob **12** should be positioned to activate the boiler in Summer mode (only Domestic Hot Water function available and exclusion of Heating) *(only if the Remote Control Kit is **not installed**).*
12	**boiler mode**	Knob that allows to switch the boiler in OFF mode OFF **8,** Summer **11** or Winter **9** and to adjust the Heating system temperature **10**. If the Outdoor Sensor Kit is installed, see "Outdoor Sensor Kit" on page 47. If the Remote Control Kit is installed, see "Remote Control Kit" on page 48.
13	**DHW**	Knob that allows to adjust the Domestic Hot Water temperature (along the scale **14**). The use of the positions **15 and 16 is reserved to the technician.**
14		Scale on which the knob **13** should be positioned to adjust the Domestic Hot Water temperature.
15	**service**	Positions of the knob **13** which use is reserved to the technician.
16		Do not turn the knob **13** on these positions.

Commands on the lower side

17	System pressure gauge
18	System filling and pressure restoring cock
19	GAS cock



Commands outside the boiler

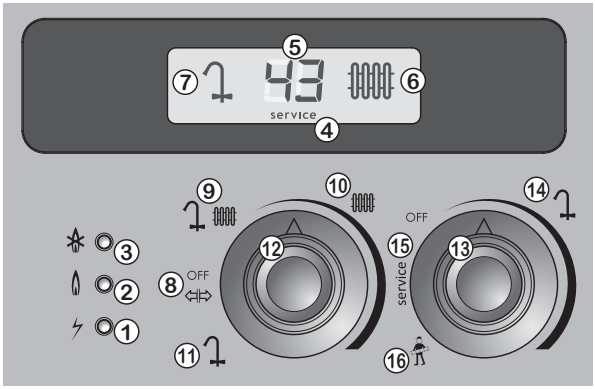
Externally the boiler, suitably positioned in the building (generally by the installer or by the electrician), two devices that the user should access to, are present. The presence and the characteristics of these devices are prescribed by the regulation in force.

Two-pole switch: it is located usually close to the boiler and it's for electrically insulating the boiler itself from the domestic mains power supply network.

Room thermostat: it commands electrically the boiler to activate or deactivate the heating system, in order to keep the room temperature (detected by a sensor) within a value set by the user, Regulation in force prescribe its positioning, the temperature limits within the user can adjust it and the periods of heating. On trade are available programmable room thermostats: most of them allow to make a weekly programming of various temperature levels, besides special programs for various purposes. We suggest to choose original ITALTHERM accessories

Typical use

Preliminary operations



- Firstly, the knob **12** should be on the position OFF **8 .**
- Make sure, by the gauge **17** that the **cold-system temperature is always within 0.5 and 1.5 Bar (optimal: 1÷1.5 Bar)**. When the pressure **drops below 0.5 Bar**, the boiler **stops working**. In this case, open the system filling cock **18** up to obtain, on the gauge, **a value between 1.0 and 1.5 Bar**.

The system pressure raises with the temperature: a too high initial cold-system pressure could lead to **water drain from the 3 Bar safety valve** after the system heating-up.

- Make sure that the gas cock **19** is open.
- Make sure that the boiler is electrically supplied: green light **1** blinks.

Boiler activation

- Rotate the knob **12** on Summer **11** if you want to have only hot water production, or on Winter **9** if you need both room heating and hot water production.
- Opening a hot water cock, the burner ignites and, after a short time (that also depends on the characteristics of the plant externally the boiler) hot water flows from the cock.
- In Winter mode, consequently a request by the Room thermostat, the burner ignites and the produced heat is sent, by means of the system vector liquid, to the heating elements of the building. If, in the mean time, a Domestic Hot Water request takes place, this latter has the priority for the whole request time. Since the DHW requests are usually limited in time, they generally don't affect the room heating.

Temperature adjustment

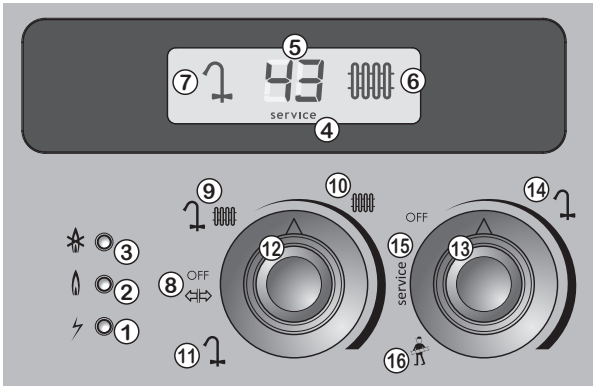
Note: *correct adjustment leads to creating the conditions for energy saving.*

- **Heating system adjustment:** by rotating the knob **12** along the scale **10**, the setting of the heating system temperature is made (the value, during the adjustment, is shown on the display **5**). Generally, in the deep cold season and/or with poor building thermal insulation (or if you notice that the burner stays on for a long time, but the room temperature rises too slowly) prefer higher settings. On the contrary, if you notice that the room temperature exceeds too much, for thermal inertia, the value set on the room temperature, it's appropriate to decrease the system temperature.

  Note: *if the **Outdoor Sensor Kit** is installed, see also "Outdoor Sensor Kit" on page 47; if the **Remote Control Kit** is installed, see also "Remote Control Kit" on page 48 and the relevant instruction booklet.*

  Note: *don't make confusion between the heating system temperature here described, with the temperature of the room set on the Room Thermostat.*

- **Domestic hot water adjustment:** by rotating the knob **13** along the scale **14**, the setting of the hot water produced by the boiler, is made (the value, during the adjustment, is shown on the display **5**). On this type of boiler, we suggest to set the knob in such a way to have a comfortable hot water temperature by drawing only hot water or eventually by mixing it with a little cold water. Avoid maximum values if not strictly needed, that will force to mix the hot water with bigger quantities of cold water. Consider that, because of the dispersions along the pipings, a certain time is needed to have a stable water temperature on the cock outlet, therefore the best temperature evaluation is achieved during a bath or a shower.



Incidental malfunctioning

Avoid performing personally any intervention that are job of the technician, for example the ones on the electrical circuits, on hydraulic system or on the gas system, and whatever other operation that's not mentioned in this "User Guide" section and expressly allowed to the User. Always address yourselves to qualified personnel.

Boilers must be always equipped with original accessories only.

ITALTHERM Srl is not responsible for damages caused by the incorrect, wrong or unreasonable use of not original materials.

The burner doesn't turn on

- if the room thermostat (or programmable room thermostat, or similar) is installed, check that it is really requiring the room heating;
- check that the electrical power supply is present and that the Summer/Winter knob isn't positioned on OFF (stand-by) but on Summer or Winter . The **GREEN** light should be **steadily ON** (see details in the paragraph "The front control panel" on page 7);
- if the **RED** locking light was on or blinking, or if you notice an anomalous behaviour of the light indicators, see the paragraph "Alarms - boiler block" on page 35;
- check on the gauge that the boiler pressure is correct (1÷1.5 Bar **in a cold state**) or at least **not below 0.5 Bar**;
- let the technician to look up the notes in the paragraph "Electrical diagram" on page 45.

Shortage of domestic hot water production

- check that knob is not set on a too low value or to the **"service"**position
- call a qualified technician to check gas valve regulation;
- call a qualified technician to check, and eventually clean, the DHW exchanger.

Remark: where the water hardness value is too high, it is suggested the installation of a softening device, in order to prevent the limestone precipitation; this operation avoids a frequent cleaning of the coil.

Boiler inactivity

The effects of the periods of inactivity can be relevant in particular situations such as in flats used only for some months per year, most of all in cold places.

The user will have to decide to put the boiler in the **SAFETY SHUT OFF state** disconnecting all the supplies, or to **leave it in stand-by and use the Anti Frost Function**. When there is the possibility of freezing it is convenient to chose between the advantages and the disadvantages of the SAFETY SHUT OFF and of the Stand By/Anti Freezing Way.

Safety shut off

- Turn off the general switch on the Electrical Supply Line of the Boiler;
- Close the Gas Tap;

When it is expected that the temperature is going to decrease under 0°C, call a technician to do the following:

- Fill the system with an anti-freezing solution (unless the system was already filled with said solution) otherwise it must be completely emptied. Notice that if it had been necessary to restore the pressure (because of possible loss) in an heating system already filled with an Anti freezing solution, the concentration of the solution could have decreased and it could not guarantee the Anti freezing Protection.
- Let the condense collector syphon be emptied unscrewing its inferior cap.
- completely empty the hot and cold sanitary water system, including the sanitary circuit and the boiler's sanitary exchanger.

Remark: *the boiler is equipped with a system which protects the main components from the exceptional cases of mechanical lock, due to the inactivity in presence of water and scale. The anti-locking function can't work in Safety shut off mode, because of the lack of electrical supply.*

Before re-igniting the boiler, have a technician check that the pump is not blocked due to inactivity (for the technician: unscrew the plug in the centre of the cap to access the rotor shaft and turn it with a screwdriver or other suitable tool).

Stand-by mode with anti-frost & anti-locking function

When the boiler is left in stand-by during a period of inactivity, it will be protected against freezing by several functions provided in the electronic controller, which heat the parts involved when the temperature falls below factory set values.

The anti-frost heating is accomplished by turning on the burner and pump.

In addition, when the boiler is in stand-by, it periodically activates the main internal components to avoid rare cases of blockage due to inactivity in the presence of water and lime. This can also occur when the boiler is locked (red lamp on) provided that the system pressure is correct.

In order for these systems to be active:

- the boiler must be receiving gas and electricity;
- boiler must be left in stand-by mode (Summer/Winter knob on OFF , **green** lamp flashing);
- system pressure must be correct (1÷1.5 bar in a cold state, minimum 0.5 bar)

In case of lack of gas, the burner won't turn on and the boiler will go in LOCK OUT state (red lamp on or flashing). Nevertheless the pump will work, making the water circulate in the system and reducing in this way the possibility of freezing. *It is available, on demand, an Anti Frost Electrical resistance kit which must be installed on the secondary exchanger to protect the boiler also in case of lack of gas.*

ATTENTION: the anti-frost protections cannot intervene in the absence of electricity. If you anticipate this possibility, we recommend you add a good brand of anti-freeze to the heating system, following the producer's instructions.

We recommend to ask directly the installer/technician about the type of antifreeze product put in the heating system during installation.

When the power comes back on, the boiler will check the temperature measured by the two probes and, if it suspects freezing verified by a particular automatic control cycle, alarm 39 will be triggered. For more details, see the relative description in the paragraph "Alarms - boiler block" on page 35.

We recommend that you completely empty the hot and cold sanitary water system, including the sanitary circuit and the boiler's sanitary exchanger. The anti-frost function does not protect the sanitary circuit outside the boiler.

"Ambient Anti-Frost" Function

Note: *if you want to use the "Ambient Anti-Frost" function that is often available in common room thermostats or chronothermostats, it is necessary to leave the boiler in Winter mode and NOT in stand-by.*

The "Ambient Anti-Frost" function does not protect the sanitary circuit outside the boiler and, especially, in areas where the heating system doesn't reach. For this reason, we recommend that you empty the cold and hot sanitary water from the parts of the system that are at risk of freezing.

Installation

Law and regulation prescriptions for the installer

Always comply with national and/or local regulation about BOILER INSTALLATION.

Always comply with national and/or local regulation about WORK SAFETY of Personnel in charge of installation.

Characteristics of the room: as this boiler has an heat output lower than 35 kW (about 30000 Kcal/h), it is not required to install the appliance in a dedicated room, provided that the room complies with the regulation in force and that all installation rules assuring a safe and regular gas boiler operation, are strictly respected.

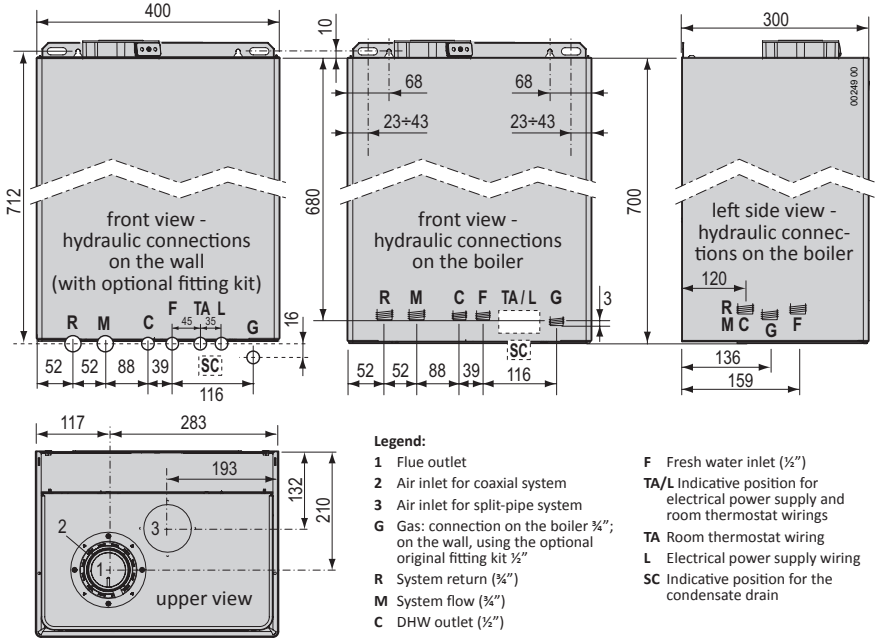
Permanent ventilation of the installation room is mandatory and extremely important when a boiler with air draught from the installation room (B... appliance type) is installed. Ventilation must be made and sized in compliance with Laws and Rules in force.

Presence of other appliances: the presence of other appliances (especially if they interfere with the boiler draught) can be forbidden by the regulation in force or can require modifications (e.g. the enlargement of the ventilation opening or the making of new ones).

Instructing the user: at the end of the installation, the installer must:

- explain the operation of the boiler and its safety devices to the user;
- give this user this booklet and the documentation within his/her competence, duly filled in where required.

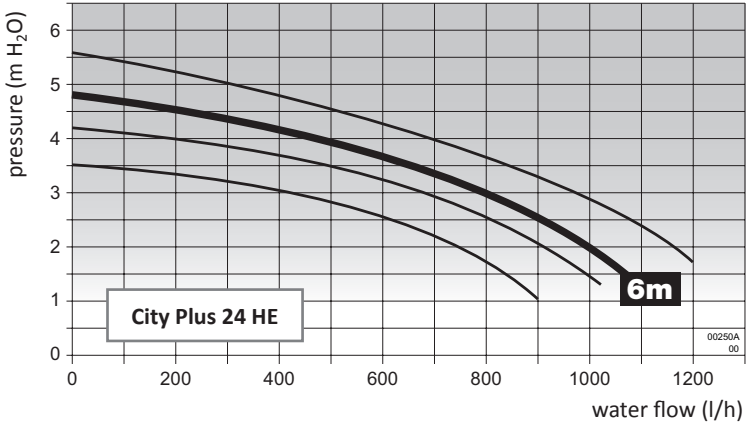
Dimensions and connections



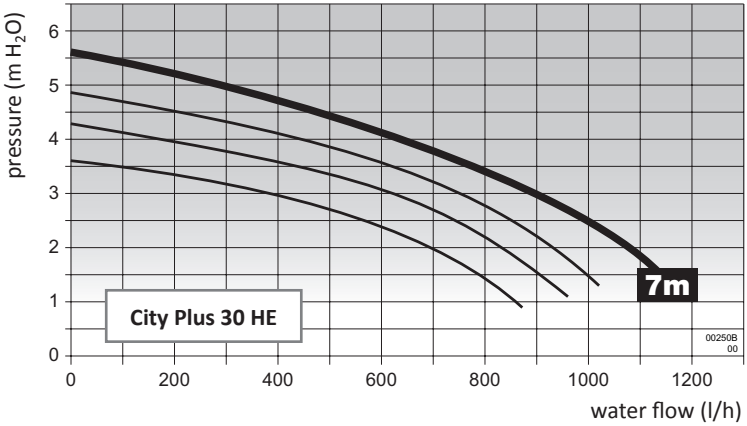
Legend:

1 Flue outlet
2 Air inlet for coaxial system
3 Air inlet for split-pipe system
G Gas: connection on the boiler ¾"; on the wall, using the optional original fitting kit ½"
R System return (¾")
M System flow (¾")
C DHW outlet (½")
F Fresh water inlet (½")
TA/L Indicative position for electrical power supply and room thermostat wirings
TA Room thermostat wiring
L Electrical power supply wiring
SC Indicative position for the condensate drain

Pump capacity diagram



See also "Pump settings" on page 34. The curves shown in these graphs refer to the head available to system for each curve that can be set on the circulation pump and are net of the load loss of the circuits inside the boiler. The factory setting is highlighted.



Warnings for the installation of optional kits or special systems

Floor heating system

The safety thermostat(s) that protects the floor against overheating (that could damage the cladding, the structure or the system itself) must be installed on the flow starting end of the serpentine embedded in the floor itself. It should not installed on the system flow pipe in proximity of the boiler, otherwise frequent and unjustified boiler locks, caused by its triggering, are possible.

Specifications for inlet air

Air must be withdrawn from places free of pollutant (like fluorine, chlorine, sulfur, ammonia, alkaline or similar agents). In the event of installation of the boiler in atmospheres with not negligible presence of aggressive chemical substances (e.g. hairdressing salons, laundries) we recommend to foresee the air inlet from outdoor, choosing the type C installation.

Domestic water supply characteristics

The cold water inlet pressure must be lower than 6 Bar. Besides, for an optimal boiler functioning, water pressure **should be more than 1 Bar**. A lower pressure could make difficult to restore correctly the pressure the heating system, and reduce the flow of hot water available from the boiler.

In case of higher pressure **it is indispensable to install a PRESSURE REDUCER** upstream the boiler.

The cleaning frequency of the DHW heat exchanger depends on the water supply hardness. If the water hardness is more than 25° fr it's required to install a softener to bring the hardness below that value.

Besides, the presence of solid residuals or impurities in the water (for example in case of new systems) could compromise the correct functioning of the boiler. For DHW production systems, the regulation in force prescribes a safety filter to protect the systems.

Protection against freezing

Thanks to its antifreeze system, inner components could never reach a temperature lower than 5°C. This system is activated when the boiler is supplied by the electrical and gas lines, provided that the pressure in the heating system is correct. *On request, it is possible to install an antifreeze electrical resistance device on the domestic exchanger, so as to protect boiler even in case of gas lack.*

In case of boiler installation in rooms where temperature can drop down to 0°, it is advisable to fill the heating circuit with an antifreeze liquid specific for heating systems, propylenic glycol based, following the instructions of its manufacturer. Pay attention to the correct product concentration: adding those substances to the heating water in incorrect dose could lead to the deformation of the seals and cause unusual noises during operation.

ITALTHERM S.r.l. will not be held responsible for consequent damages.

Instruct the User about the antifreeze function of the boiler and about the antifreeze product added in the heating system.

Condensate drain trap

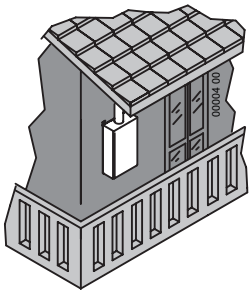
Check the siphon sealing by checking that caps **1**, **2**, **3 and 5** are correctly and fully screwed/inserted.

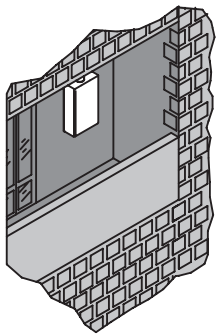
The siphon is provided with a **condensate level sensor**, installed in hole **4**, that controls the burner shut down (thus stopping the condensate production) before it is full.

Outdoor installation in a partially protected place

"HE" forced draught models can be installed outdoor, but only in partially protected places.

The boiler minimum and maximum working temperatures are mentioned in the paragraph "Technical data" on page 42 and on the boiler data plate.





The materials used for the boiler installation, including the devices and/or the materials used for thermal insulation, should be so to **maintain their functionality** within the temperature range indicated on the data plate.

If the place where the boiler is located is converted **from outdoor to indoor** (e.g. veranda) it will be necessary to **verify the compliance** of the new configuration with the laws and rules in force, and to make the modifications required.

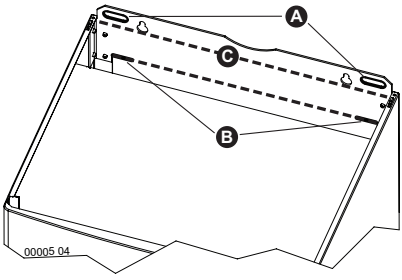
GAS	Gas (1/2")
	Hot Water Outlet (1/2")
	Cold Water Inlet (1/2")
	Heating Flow (3/4")
	Heating Return (3/4")
	Electrical Power Supply
TA	Room Thermostat

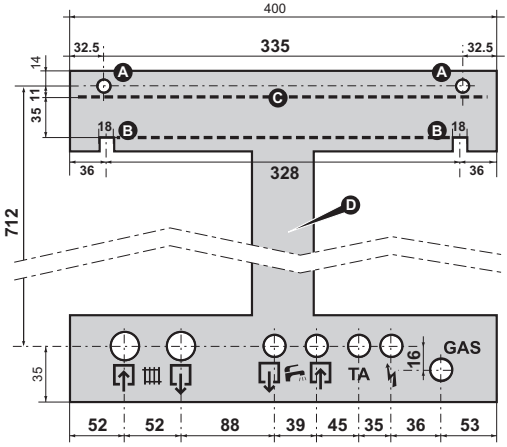
Positioning and fastening

Remark: *A re-usable metal jig (* **D** *in the figure) can be ordered separately, so as to facilitate connections and fixing points positioning (when the original connection kit is used).* ***If the metal jig and/or the original connection kit are not used, refer to the paragraph "Dimensions and connections" on page 13 for the position of the connections directly on the boiler.***

- Locate the exact position of the boiler considering the sufficient clearances for maintenance and servicing: at least 50mm laterally and 300 mm on the lower side
- To fix the boiler with wallplugs ("stud" type with nut), centre the relevant wall holes as regards to **A** points. To hang it with open hooks, place hooks in correspondence with **B** points.
- If the metal jig is used, hang it on the wall using the same wallplugs or hooks and the holes or slots indicated in the figure (**A** for the plugs and **B** for the open hooks).

If necessary, the open hooks can be positioned at any point along the edge **B** of the boiler's frame bracket, provided that they are 2 and that they support the device in a correct and safe way.





- Fix up the connections and all ducts for heating flow and return, cold water, hot water, gas and electrical cables, predisposing them in the holes of the metal jig or respecting the measures in the paragraph "Dimensions and connections" on page 13. The upper edge of boiler's body, used as a reference in the paragraph "Flue system types" on page 24, is represented by the dotted line **C** in the figure.
- Remove the jig (if used) and hang the boiler to the wallplugs or hooks, using the holes or slots indicated in the figure (**A** for the plugs and **B** for the open hooks).
- **Remove the plastic caps** placed to close the hydraulic connections on the boiler.
- Proceed with the hydraulic, gas, electrical and flue connections following the instructions and warnings reported in the following paragraphs.

The connections of the boiler are engineered to fit plain couplings with screw ring, interposing a plain gasket of suitable size and material, that ensure a reliable seal even without excessive tightening force. They are NOT suitable for hemp, teflon tape or similar materials

Remark: *the lower grid is spare inside packing, not assembled. We suggest to fix the grid only at the end of the boiler installation operations.*

Hydraulic system (DHW and heating)

Make sure that the hydraulic and heating systems ducts **are not used as earth connections of the electrical system**. They are absolutely NOT SUITABLE for such a use. Besides: they don't guarantee the earth dispersion; in case of electrical fault they could generate a fulguration risk; there could take place galvanic currents in the pipings and consequent corrosion and hydraulic leaks.

Advices and suggestions to avoid vibrations and noises in the system

- Do not use pipes with reduced diameters;
- Do not use bends with small radius and reductions of important sections.

Cleaning and preservation of the systems

The efficiency, the reliability and the safety of the boilers, as all generic thermal systems and components, depend strictly on the features of the water that supply them and on their treatment.

A proper treatment of the water improves the protection of the systems against corrosions (and therefore perforations, noise, leaks, etc.) and limestone incrustations that drastically reduce the efficiency of the thermal exchange (consider that 1 mm of limestone incrustations reduces of 18% the thermal exchange of the heating element on which it has been formed).

ITALTHERM guarantees its products only if the characteristics of the water comply with UNI 8065, reported also in laws on energy saving.

Thoroughly wash the heating system with water, before connecting the boiler. This will eliminate residual like welding drops, slag, hemp, mastic, mud, rust and other dirt from pipes and radiators. Otherwise, these substances could enter the boiler and damage the internal components (pump etc.).

- **In case of old or very dirty systems, to wash them use specific, proven efficiency products**, in the suitable quantity and following the instructions of its manufacturer.
- If the water on boiler inlet is harder than 25° fr, it's required to install a softener to bring the hardness below that value, as required by the reference regulation.
- For floor system and generally all low temperature systems, the water treatment product must have filming action (protection against corrosion and incrustation) and action against bacteria and algae.

Heating system

- Connect the safety evacuation ducts of the boiler to an evacuation funnel. If safety valves are not connected to an evacuation device, their intervention could flood the room. The manufacturer cannot be held responsible for any damage arising from that situation.

Condense drain

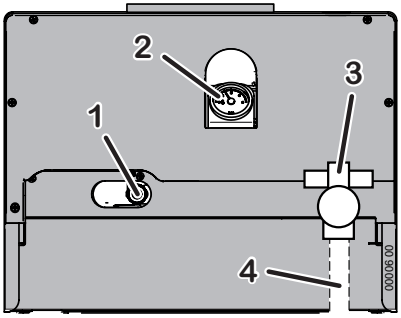
Insert the flexible pipe of condense outlet inside the outlet funnel (or other inspectable connection device) properly installed for this purpose, or in the outlet funnel of the safety valve, in case of the above mentioned outlet is able to receive the acid liquids of the condense as foreseen by the norms in force in matter of condensing boilers.

The system must be made in order to avoid the condense freezing. Before the activation of the appliance be sure that the condense can be evacuated correctly.

Heating system filling and pressuring

Once all system connections have been carried out, proceed with system filling. This operation should be made with care, respecting the following steps:

- Open the radiators venting devices;
- Check that the plug of the automatic air vent, incorporated in the boiler circulator, is unscrewed: if not, unscrew it and leave it unscrewed, even afterwards, for normal operation;
- If it's required to fill the system with anti-freeze solution, do this operation, then hermetically close the connection or the valve used to put the solution in, to allow the pressurization.
- Gradually open the filling cock **1** ;
- Check the correct functioning of automatic venting devices, eventually installed;
- Close the radiators venting devices as soon as water flows out of them;
- Make sure, by reading the pressure gauge **2**, that the pressure reaches the optimal value of **1.0 bar (max 1.5 bar)**;
- Close the water supply valve **1** and bleed each radiator again;
- Repeat the venting and pressurization operations until the air is completely purged from the system.



Gas connection

Due to various installation possibilities, the gas cock **3** supplied with the original Connections Kit has a simple male Ø ½" connection, facing the rear of the boiler. *The gas pipe **4**, upstream the gas cock **3**, should be supplied by the installer.*

While connecting the gas inlet of the boiler to the gas supply piping, it is MANDATORY to insert a PLAIN GASKET, whose dimensions and material must be adequate. Connection is NOT suitable for hemp, teflon strip or similar materials. Because of the type of fitting, the use of those materials does not make the suitable seal with consequent gas leaks!

Using LPG, it is absolutely necessary to install a pressure reducer upstream the boiler. Failure to do this, the gas valve of the boiler will get damaged.

The gas connection, as generally the boiler installation, must be done by qualified personnel as prescribed by the regulation in force, because a faulty gas connection could lead to fire, explosion and other very serious damages to persons, animals and objects. The manufacturer cannot be held responsible for any damage arising from that situation.

▶ **Verify what follows:**

- cleaning of all system gas pipes in order to avoid the presence of work residuals that could compromise the correct boiler functioning;
- gas line and ramp conformity with laws and rules currently in force;
- internal and external tightness of the gas system and connections;
- supply pipe must have a section greater than or equal to the boiler one;
- supply gas must correspond to the one for which the boiler has been set: otherwise, it's mandatory to ask to qualified personnel to set the boiler for the correct gas type;
- an interception valve must be installed upstream the appliance.

▶ Open the meter valve and purge the air that is inside the system pipes (including all the appliances).

Electrical connections

The link of the room thermostat works with a safety extra low voltage (SELV); connect it to the voltage free contacts of the room thermostat/chronothermostat. **On NO account must any electrical voltage be applied** to these terminals.

All low-voltage wirings (e.g. Room Thermostat or Chronothermostat for trade) must be kept separate from power supply cables, as to avoid boiler malfunctioning due to electrical noise. It is advisable to use separate tubes for them.

The boiler must be connected to a 220÷240V - 50Hz electrical power supply. In any case, the power supply voltage must be within the range –15% ... +10% from the nominal value (230V); otherwise it may cause malfunctions or failures. It is necessary to respect the polarities L-N (Live L=brown; - Neutral N=blue) - otherwise the boiler may not work - and the earth connection (yellow-green cable).

Place upstream the boiler a bipolar switch in compliance with the regulation currently in force. The installation must be made complying the regulation currently in force and generally with the standard craft rules.

For the general electrical supply of the appliance the bipolar switch should be used. The use of adaptors, multiple taps and extensions is not allowed.

If the supply cable must be replaced, use one of the following cable types: H05VVF or H05-VVH2-F. **It is mandatory the earth connection in accordance with the rules actually in force.** To replace the cable,

open the control panel cover, unlock its fastening device and disconnect it from the terminals. Install the new cable proceeding in the reverse way. When connecting the cable to the boiler, it's mandatory:

- to leave the Earth wire about 2 cm longer than the other (Live and Neutral) wires;
- to lock the cable upstream the terminals by means of the suitable fastening device.

Electrical safety of the appliance is only achieved when it is well connected to an efficient earthing system, executed as indicated by the safety rules actually in force.

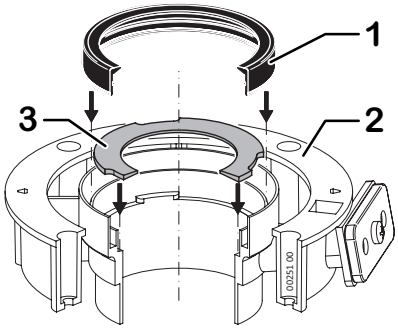
A qualified technician must check that the electrical system is in line with the maximum power allowed by the boiler, indicated on the data plate, with particular attention to the cables section.

ITALTHERM S.r.l. declines any responsibility for damages to persons, animals or things caused by the faulty or missing connection of the boiler earthing and by failure to comply with the rules.

Flue systems

Fume outlet/air intake diaphragm and seal installation

IMPORTANT: for a correct and safe boiler operation it is necessary to fit seal **1**, supplied with the boiler, on the intake/outlet flange **2**, positioning it correctly as shown in the figure ***before inserting the fume outlet pipe.***



Then, **refer to the tables** in "Flue system types" on page 24, calculate the equivalent linear length considering any supplementary installed curve (excluding those already shown in the drawings) and, **if requested, install the diaphragm 3** as shown in the figure.

General indications

To grant the functionality and efficiency of the appliance it is indispensable to realize inlet and outlet ducts using flue accessories specific for condensing boilers.

WARNING: the specific flue accessories components for condensing boilers, especially the parts which are in touch with the flues inlet, are so projected because they are made with **plastic materials acids resistant**, but because of their nature, **they are not suitable to resist to the higher temperature** of the flues of the traditional boilers. So **it is not possible to use traditional flue components for the outlet ducts of the condensing boilers, neither vice versa.**

When installing the pipes, we recommend lubricating the inside of their gaskets exclusively with **silicone** lubricants since their material (EPDM peroxide) is not compatible with other types of oils or greases

If it is possible, we recommend to foresee (referring to the direction of the air/flue, see examples on page 22) an upwards slope for all the inlet and outlet ducts, in order to:

- PREVENT the water or dust or other objects entrance inside the INLET duct. In case of coaxial ducts, use the special horizontal terminal, which is especially built to respect these slopes only for the first tract of the inlet duct;
- FACILITATE, in the OUTLET duct, the flowing back of the condense towards the combustion chamber, which is built to work in these conditions and to discharge the condense. If so it is not possible, or if there are some points where the condense stagnates inside the outlet duct and if it is not possible to avoid this through a modification of the slope of the ducts, these points must be drained using the specific kit of condense collector (consult the commercial catalogues of the original accessories), and ducting the condense formed towards the outlet duct as foreseen by the norms in force in matter of condensing boilers.

Air inlet and flue outlet terminals should be protected by suitable approved flue accessories, to avoid environmental elements penetration.

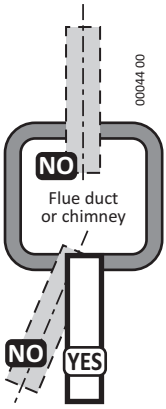
Carefully follow the indications foreseen by the specific laws in force.

Respect the minimum and maximum flue length prescribed (see "Flue system types" on page 24).

In case of flue outlet on wall, the positions and the distances prescribed by the regulation mist be respected.

The **outlet duct is the assembly of components that connect the boiler to the point where the flues are discharged. The** outlet can be directly outdoor only in the case foreseen by the law in force and using at the end of the outlet duct a specific terminal.

In case you foreseen to discharge the combustion products through **a chimney** (for single user) or **a common flue** (for multiple users) the part of the evacuation system (the chimney or the flue) to which the outlet duct of the condensing boilers is connected, **must be declared suitable for this purpose by its producer**. In case of common chimney, keep in mind the laws in force regarding the typologies and rates of users.



Don't lean the flue pipe into the chimney, but stop it before the inner surface of the chimney. The axis of the flue pipe must intersect the axis of the chimney or of the flue duct.

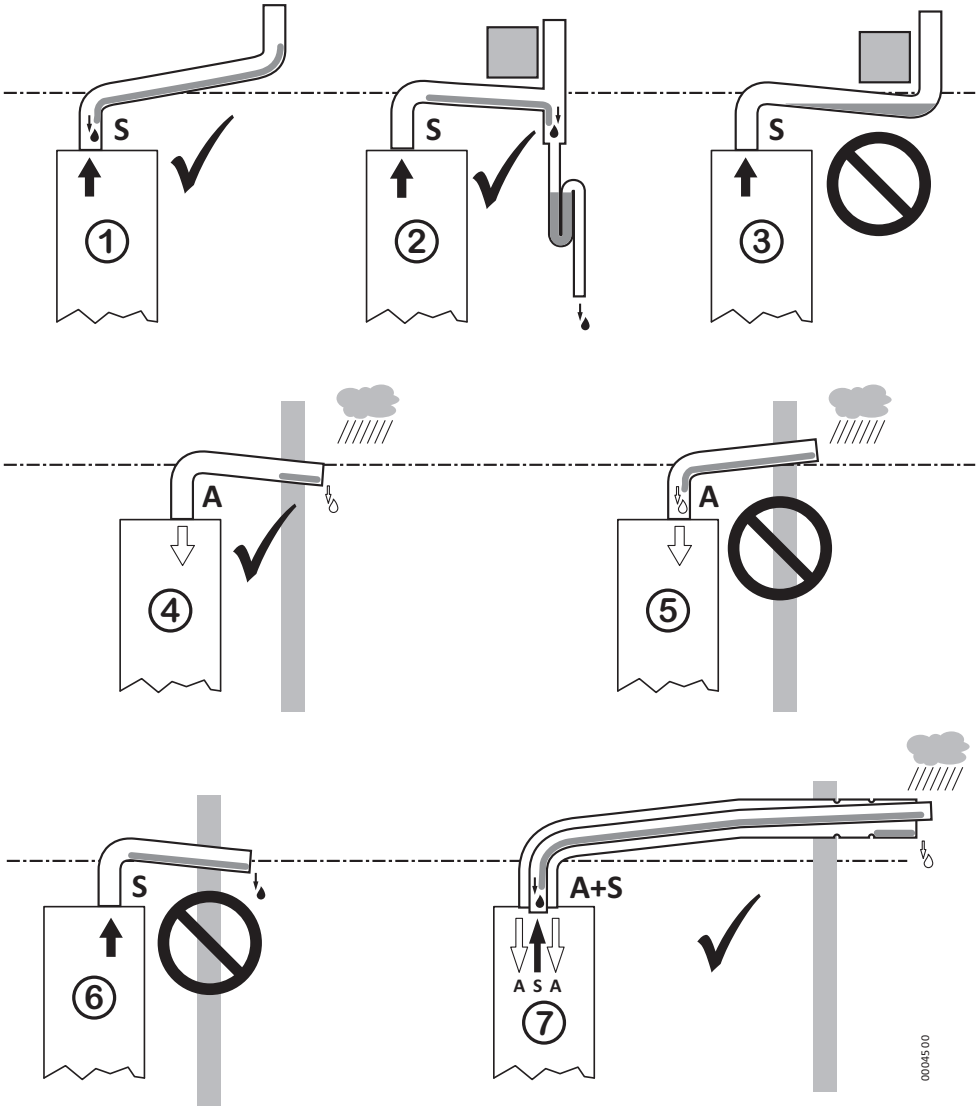
In general situations the **evacuation systems** of the combustion products **must be properly declared suitable from the producer of the same system** for wet functioning, **or must be supplied by the appliance's producer** (gas boiler).

If the chimney (or the flue) were not suitable, it would be indispensable, to use it, to canalise it through specific ducts, so for example through the original flue accessories.

Examples of installation of inlet and outlet ducts

We give you some correct and wrong examples of installation of inlet and outlet ducts for condensing boilers (the slope are voluntarily represented in an exaggerated way).

A = Inlet; **S =** Outlet. **1:** the most functional and economic solution is to let the condense come back towards the boiler. **2-3:** if an obstacle prevents to install the ducts upwards, it is necessary to install condense collectors, so as to avoid stagnations. **4:** the slope upwards of the inlet ducts, for their all length or at least only for the external tract, is sufficient to prevent that the rain water reaches the combustion chamber. **5:** so the inlet must not be downwards. **6:** do not let the condense go out from the flue outlet terminal. **7:** the coaxial inlet/outlet duct must be installed so as the flues are upwards, and so the condense discharge itself towards the boiler. The terminal tract with inlet head and outside with an outlet out axis must be horizontal placed and it is equipped with ribs which prevents the water entrance in the external inlet duct. The internal outlet duct is upwards and canalises the condense in the correct direction.



Dimensioning the inlet and outlet ducts

In the list that follows, you will the characteristic losses of load of the original fume venting accessories, expressed as equivalence in meters (m).

Se fossero previsti accessori di fumisteria originali aggiuntivi rispetto a quelli raffigurati, nel calcolo della lunghezza totale devono essere considerate le relative perdite di carico equivalenti, espresse come equivalenza in metri (m) nell'elenco seguente.

In the case where pipes are installed with non-original accessories (this is allowed by the boiler's C6 type-approval), ***but, in any case, absolutely certified for condensation,*** the installer must consider the losses of load specified by the manufacturer of these accessories, dimensioning the suction and discharge system so that the total loss of load (expressed in Pa) is between the head loss values of the boiler fan specified in the paragraph "Technical data" on page 42.

Original accessories for separated systems (advises even for type C6):

Connector between boiler and Ø80mm inlet pipe ..... 0.3 m - 2 Pa
Connector between boiler and Ø80mm outlet pipe ..... 0.7 m - 5 Pa

Separate system Ø 60 mm (original accessories):

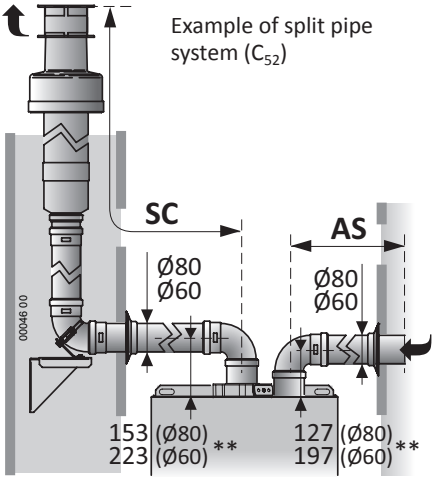
Reduction from Ø80mm to Ø60mm on inlet ..... 0.4 m
Reduction from Ø80mm to Ø60mm on outlet ..... 1.7 m
Linear section or extension Ø60mm length 0.5m on inlet ..... 0.5 m
Linear section or extension Ø60mm length 0.5m on outlet ..... 0.5 m
Linear section or extension Ø60mm length 1m on inlet ..... 0.9 m
Linear section or extension Ø60mm length 1m on outlet ..... 1 m
Linear section or extension Ø60mm length 2m on inlet ..... 1.8 m
Linear section or extension Ø60mm length 2m on outlet ..... 2 m
90° bend Ø60mm on inlet ..... 1 m
90° bend Ø60mm on outlet ..... 1.6 m
45° bend Ø60mm on inlet ..... 0.5 m
45° bend Ø60mm on outlet ..... 0.8 m
T-shaped condense collector Ø60mm on discharge ..... 3 m
Inlet terminal Ø60mm (length 1 m) ..... 1.4 m
Horizontal outlet terminal Ø60mm (length 1 m) ..... 1.4 m
Vertical outlet terminal Ø60mm (length 1 m) ..... 1.3 m

Coaxial system Ø100/60mm (original accessories):

Flanged coaxial connector Ø100/60mm (starting vertically) ..... 0 m
Flanged coaxial 90° bend Ø100/60mm (starting horizontally) ..... 2 m
Coaxial linear section or extension Ø100/60mm (length 1 m) ..... 1 m
90° coaxial bend Ø100/60mm ..... 2 m
45° coaxial bend Ø100/60mm ..... 1.5 m
Horizontal condense collector Ø100/60mm ..... 0 m
Horizontal inlet + outlet coaxial terminal Ø100/60mm ..... 1.5 m
Vertical inlet + outlet coaxial terminal Ø125/80mm (connector Ø100/60mm) ..... 1 m

Flue system types

Split pipe system (C_{42} , C_{52} , C_{82} , C_{92} *)



Mod.	Original*** split pipe system Ø80mm		
	AS+SC min÷max (m)	SC max (m)	Diaphragm (a)
24 HE	2 ÷ 30	20	Ø42; 8m
30 HE	2 ÷ 30	20	Ø42; 8m
	Original*** split pipe system Ø60mm		
24 HE	2 ÷ 10	7	Ø42; 3m
30 HE	2 ÷ 10	7	Ø42; 3m

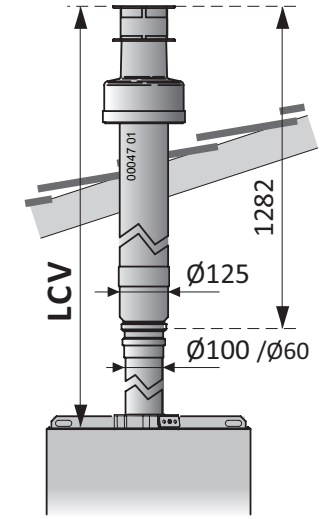
**** Remark:** Split pipes allow to make also C_{12} and C_{32} flue systems.*

*** The dimensions on the duct axis are referred to the upper edge of the boiler's body, close to the mouth of the first 90° bend. The difference of level due to the slopes are not considered.*

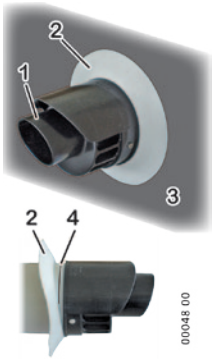
**** **IMPORTANT:** this table is referred to the original flue accessories. Using **non-original** flue accessories (certified for condensation, whose use is allowed by the boiler's C6-type certification) refer to paragraph "Dimensioning the inlet and outlet ducts" on page 23.*

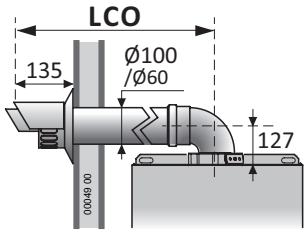
(a) Diaphragm diameter (supplied as standard) and AS+SC total length UP TO WHICH the diaphragm must be installed.

Coaxial system (C_{12} , C_{32})



Example of vertical coaxial system (C_{32})





Example of horizontal coaxial system (C_{12})

*Put the outlet coaxial horizontal terminal with the outlet head **1** UPWARDS, as indicated in the picture, respecting the measures in the drawing. Check that the elastic sealing collar **2** is housed in the groove **4** and against the outside wall face **3**.*

Mod.	Original*** coaxial system Ø60/100 mm		
	LCO min÷max (m)	LCV min÷max (m)	Diaphragm (b)
24 HE	0.8 ÷ 4	0.8 ÷ 5	Ø42; 1m
30 HE	0.8 ÷ 4	0.8 ÷ 5	Ø42; 1m

(b) Diaphragm diameter (supplied as standard) and LCO or LCV duct length UNTIL which is it necessary to install the diaphragm.

WARNING: Hereby described operation can be performed by qualified technicians only.

When regulation/measuring is over, remember to tighten pressure tapping point screws and ALWAYS check for gas leaks!

The siphon is an integral part of the combustion system and it's necessary to check its seal during every technical intervention on the boiler. Verify that both caps (upper and lower) are properly and completely screwed.

Verify that the combustion products do not go out from the outlet of the condense.

The condense syphon trap of the boiler is equipped with a special device which closes when dry. Anyway, the seal is guaranteed only when the syphon trap is filled with liquid. So, at the end of the first firing / commissioning operation, it is recommended to check that the syphon trap contains liquid, e.g. checking that liquid exits the condense drain of the boiler.

Before switching on the boiler, **make sure that the circulating pump is not blocked** due to inactivity: in the middle of the cap there is a hole (should there be a cap, remove it) that gives access to the rotor shaft; **push and turn it using a suitable tool**, usually a "Phillips" screwdriver. In case of faults, the circulating pump can trigger diagnosis alarms (see page 34).

During the commissioning of the **new boiler**, it is necessary to **run the burner for 30 minutes before checking the combustion** because, in that period of time, any residual fabrication vapours could cause false results in the combustion products analysis.

Remark: *during the first 10 minutes of electrical power supply, the re-ignition delay in heating mode might be nil (see "Electronic settings" on page 30, SW3).*

- *The knob on control panel has the position* "**service**" *that is used only during the regulation of the MAX heating power.*
- *The ignition electronics does several ignition attempts, to avoid blocking the boiler when the ignition fails sporadically.*
- *When the gas supply pipe is filled with air (e.g. in case of new installation) it may be necessary to repeat the ignition cycle several times.*
- *The boiler is factory regulated and tested. Anyway it's advisable, during the commissioning, to check that the regulation is correct.*

First starting up

All boilers are tested and factory set during manufacture; however it is advisable, during the first starting up, to perform the following checks and, only if necessary, the adjustments that could be necessary.

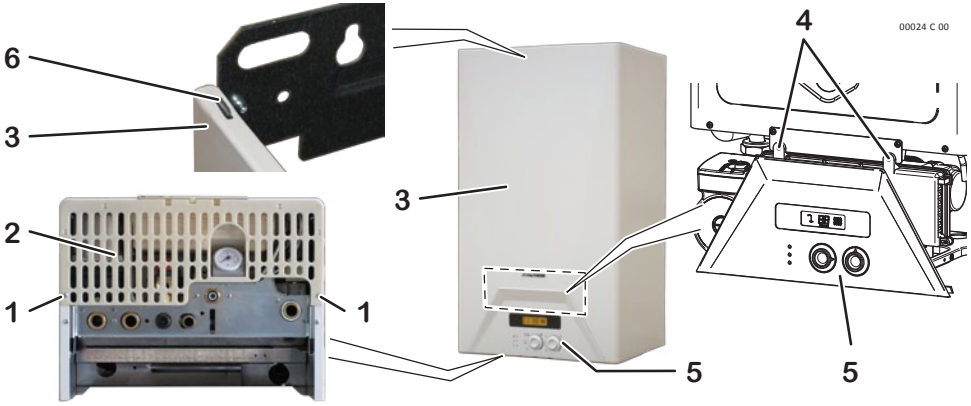
1. check the inlet gas pressure and flow (see "Inlet gas check" on page 26);
2. check the burner pressure at maximum and minimum power input and gas valve adjustment (see "Max and Min pressure adjustment" on page 26);
3. adjust the max power output in heating mode (see "Max heating power adjustment" on page 27);
4. eventual customization of the electronic settings to adapt the boiler work to particular system requirements (see "Electronic settings" on page 30).

Access to the inside of the boiler

1. Unscrew the screws **1** and remove the lower grid **2**, if any;

   Remark: *Lower grid is spare inside packing, not assembled.*

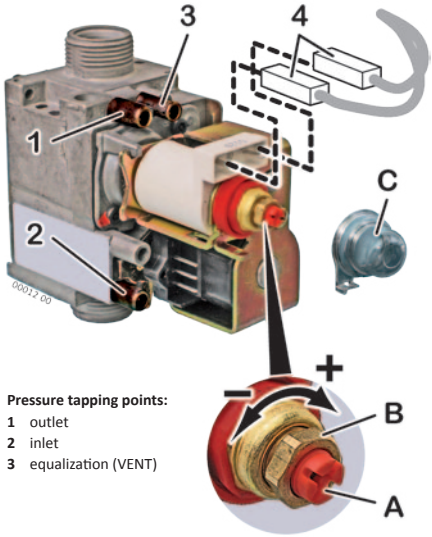
2. Push the casing **3** upwards and remove it;
3. unscrew the two screws **4** and overturn downwards the control panel **5**;
4. after the regulations, close the boiler repeating everything in the other sense, carefully hooking the casing **3** to the tongues **6**.



Inlet gas check

Remark: *The pressure should be measured at nominal input, so this test must be performed with the burner ignited.*

1. Loosen (2-3 turns) the screw of pressure tapping point for gas inlet **2** of the gas valve and insert the manometer sensor;
2. check that the measured pressure complies with the inlet gas nominal pressure (see "Technical data" on page 42).
3. close the pressure tapping point **2** and **check the absence of gas leaks**.



Pressure tapping points:
1 outlet
2 inlet
3 equalization (VENT)

Max and Min pressure adjustment

1. Loosen (2-3 turns) the screw of pressure tapping point for gas outlet **1** of the gas valve and insert the manometer sensor. In the forced draught models unthread from the “Vent” **3** the silicon tube coming from the sealed chamber;
2. Activate the boiler to its maximum output not modulated, using the “Chimney-sweeper” function. Proceed as follows:
   - supply the boiler and turn the Summer/Winter knob to Summer position ;

- provide that Room Thermostat contact is closed (activated) or open an hot water tap (the heat produced by the boiler will be drained consequently);
- turn the Hot Water knob to the position Chimney-sweeper and wait (about 5 seconds) that the display shows **"SE"** (SErvice) flashing (moreover, **GREEN** lamp flashes with short lightnings).
- when the display shows **"SE"** flashing, turn the Hot Water knob on the scale . On the display, the indication **service** appears and the burner ignites at the maximum output not modulated (the **YELLOW** indicator turns on);

3. **wait at least 10 seconds** and verify that the measured pressure corresponds to the MAX value indicated in the Burner Pressure table (see page 29), with regard to the boiler model and gas type;
4. extract one of the connectors **4** that supply the modulation coil; verify that the measured pressure corresponds to the MIN value indicated in the Burner Pressure table (see page 29), with regard to the boiler model and gas type;
5. reinsert the connector **4** ;
6. if it is necessary to adjust the regulation, proceed as it follows, referring to the figure:
   - take off the protection cap **C** ;
   - adjust MAX pressure acting on the nut **B** (10 mm). Turn clockwise to increase pressure, counterclockwise to decrease pressure;
   - extract again one of the connectors **4** ;
   - adjust MIN pressure acting on the screw **A** (with a 4 mm screwdriver), paying attention not to contemporarily move the nut **B** . Turn clockwise to increase pressure, counterclockwise to decrease pressure;
   - reinsert the connector **4** and check that MAX pressure is not changed;

Important: LOCK THE ADJUSTMENT DEVICE AFTER ANY SETTING OPERATION.

   - mount the cap **C** ;
7. for the forced draught models reinsert the tube in the "Vent" **3** of the gas valve. **ATTENTION: after this operation, the value measured by the manometer could decrease** due to pressure compensation. This fact **is normal** and does not require any change of the regulation;
8. screw the pressure tapping point screw for gas outlet **1** and **verify that there is no gas leak**.
9. To switch the burner off, turn the Summer/Winter knob to the OFF position.

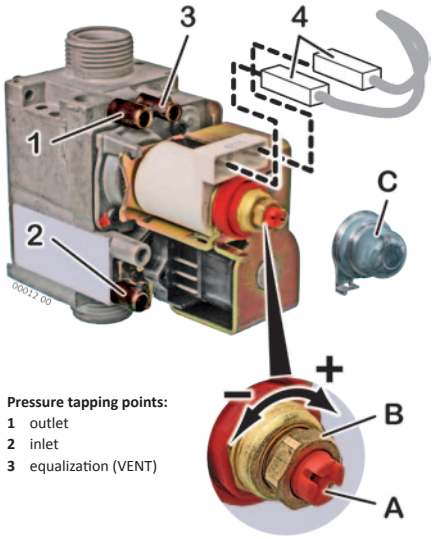
Max heating power adjustment

The maximum heating power output must be set in accordance with the system requirements (stated in the project). Once you know the power suitable for the heating system, refer to the "Burner pressure tables" on page 29 and find the burner pressure for the boiler model and for the type of gas used.

The adjustment will be performed through the boiler's controls, following a special procedure that avoids accidental activations by the User:

1. Loosen (2-3 turns) the screw of pressure tapping point for gas outlet **1** of the gas valve and insert the manometer sensor. In the forced draught models unthread from the "Vent" **3** the silicon tube coming from the sealed chamber;
2. supply the boiler and turn the Summer/Winter knob to Summer position ;
3. ensure that there are NOT domestic hot water requests (no open taps); if the room thermostat is installed, make so that it requires the heating (e.g. raise the requested room temperature manually);

- turn the Hot Water knob on **service** position: on the display will appear a flashing number from 00 to 99 that indicates the current set point of the value of heating power, where the value **00** corresponds to the minimum setting of the gas valve and the value **99** corresponds to the maximum;
- wait (approximately five seconds) that the display shows **"PO"** (POwer) flashing (moreover, both the **GREEN** and **RED** indicators flash to short "pulses").
- when the display shows **"PO"** flashing, within 15 seconds turn the Summer/Winter knob on the MAXIMUM value of the scale of the heating (fully clockwise). The **service** indication appears on the display and the burner ignites to the maximum output not modulated (the **YELLOW** indicator turns on);
- read on the micromanometer the value of the gas pressure to the burner and turn the Summer/Winter knob along the heating system temperature scale , until you read, on the micromanometer, the burner pressure corresponding to the power needed; the display will show a flashing number from **00** to **99** indicating the new set point;



Pressure tapping points:
1 outlet
2 inlet
3 equalization (VENT)

Remark: *the value from 00 to 99 that appears on the display during the setting, is foreseen to be read at the end of the adjustment and to be eventually re-used as a quick reference to set the boiler again to the same heating power. To set the power the first time, make exclusively reference to the burner pressure measured by the micromanometer.*

- **do NOT move the Summer/Winter** knob for about **30 seconds**, until the number on the display stops flashing (also the **GREEN** indicator stops flashing and stays on). During this time, **check that the pressure displayed on the manometer remains stabilized** on the correct value. If further pressure adjustment should be needed, turn the knob and wait again 30 seconds and the end of flashing;
- to confirm and save the setting, turn the Hot Water knob on the scale ; the burner will turn off for a moment. Wait (about 5 seconds) that both the **GREEN** and **RED** indicators stay on for about 5 seconds (this is the confirmation that the burner pressure for heating is stored), then the **RED** indicator turns off;

4. for the forced draught models reinsert the tube in the "Vent" **3** of the gas valve. **ATTENTION: after this operation, the value measured by the micromanometer could decrease** due to pressure compensation. This fact **is normal** and does not require any change of the regulation;

5. screw the pressure tapping point screw for gas outlet **1**; **verify that there is no gas leak**.

6. To switch off the burner, turn the Summer/Winter knob to the OFF position.

The MAX power for the heating system is adjusted now.

The whole procedure should be completed within 15 minutes from the start. If you exceed this time, or in case of mistakes, the new pressure will not be stored and it will be necessary to repeat the procedure from the beginning, by turning the Summer/Winter knob on OFF and the Hot Water knob on the scale .

Burner pressure tables

City Plus 24 HE

HEAT OUTPUT		Display value	NATURAL GAS G20		BUTANE G30		PROPANE G31	
kW	kcal/h		mbar	mm H_2O	mbar	mm H_2O	mbar	mm H_2O
MIN. 9.5	8172	00	2.2	22	4.2	43	5.0	51
11	9460		2.9	29	5.6	57	6.7	69
12	10320		3.4	34	6.7	68	8.1	82
13	11180	↓	3.9	40	7.9	80	9.5	97
14	12040		4.4	45	9.1	93	11.1	113
15	12900		5.0	51	10.5	107	12.8	131
16	13760	↓	5.5	56	11.9	121	14.7	149
17	14620		6.1	62	13.4	137	16.6	170
18	15480	↓	6.7	69	15.0	153	18.8	191
MIN. central heating 19.1	16426	↓	7.4	76	16.9	173	21.2	217
20	17200		8.0	81	18.6	189	23.4	239
21	18060	↓	8.6	88	20.5	209	26.0	265
22	18920		9.3	95	22.5	229	28.7	292
23	19780		9.9	101	24.6	250	31.5	321
MAX. 24.4	21009	99	10.9	111	27.5	281	35.5	362

City Plus 30 HE

HEAT OUTPUT		Display value	NATURAL GAS G20		BUTANE G30		PROPANE G31	
kW	kcal/h		mbar	mm H_2O	mbar	mm H_2O	mbar	mm H_2O
MIN. 11.5	9876	00	1.9	19	5.0	51	5.0	51
12	10320		2.1	21	5.4	55	5.5	56
13	11180		2.5	25	6.3	64	6.5	67
14	12040	↓	2.9	29	7.3	74	7.6	78
15	12900		3.3	34	8.3	85	8.8	90
MIN. central heating 16.4	14104	↓	4.0	41	9.9	101	10.7	109
18	15480	↓	4.9	49	11.8	120	12.9	132
19	16340		5.4	55	13.1	133	14.5	148
20	17200	↓	6.1	62	14.4	147	16.3	166
21	18060		6.7	69	15.7	160	18.1	184
22	18920	↓	7.4	76	17.1	175	20.0	204
23	19780		8.2	83	18.6	190	22.1	225
24	20640		9.0	91	20.1	205	24.2	247
25	21500	↓	9.8	100	21.7	221	26.5	271
26	22360		10.7	109	23.3	238	29.0	295
27	23220		11.6	118	25.0	255	31.5	321
MAX. 28.6	24558	99	13.0	133	27.7	283	35.5	362

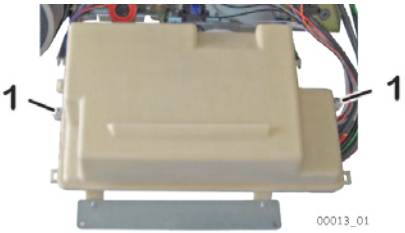
Electronic settings

Accessing the main board

To access the main board:

Cut off the electrical supply to the boiler. Restore the supply after having closed the contol panel rear cover.

- unscrew the screws **1** and remove the back cover of the control panel.

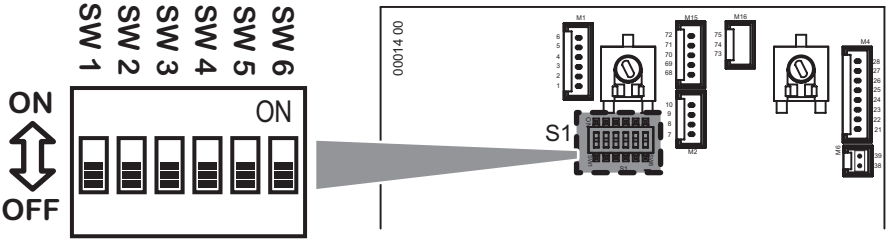


Main board settings

The boiler is equipped with a Microprocessor modulation board, featuring a 6-microswitch array (SW1÷SW6) which allow to make personalizing actions for the boiler's functioning as described in the following table.

Disconnect the power supply before approaching the microswitches. Restore the power supply only after you have closed the back cover of the control panel.

Changes to microswitches status have no effect until the boiler is electrically supplied (they are red during the board startup, when the supply is connected).



SW1	**OFF**	**Natural gas (G20)** Functioning.
	ON	**Butane (G30)** or **Propane (G31)** Functioning.
	The factory setting depends on the gas type arranged in factory for the boiler. To change the type of gas supply, it is necessary to follow the complete instructions described in the paragraph "Gas conversion" on page 31.	
SW2	Adjustment range for heating system flow temperature.	
	OFF	**Normal** setting, suitable for traditional radiators systems. It allows to select a heating system temperature within the standard range from 35°C to 78°C. **Factory setting**.
	ON	**Reduced** setting, suitable for low temperature systems. It allows to select a heating system temperature within the reduced range from 20°C to 45°C. ***Remark:*** *If the boiler supplies a mixed type system (high and low temperature) through the suitable optional kit, use the reduced range* **(ON)** *(refer also to the documentation supplied with the kit).*

SW3	It determines the delay of 3 minutes, before the new ignition of the burner after the overcoming of the heating set temperature.	
	OFF	**delay ON** (for normal radiators systems). **Factory setting**.
	ON	**delay OFF** (for fan coil systems).
SW4	**OFF**	In these models it must be **OFF**. **Factory setting**.
SW5	Pump functioning mode during heating working.	
	OFF	**intermittent** for normal applications (with or without delay, see SW3). **Factory setting**.
	ON	**always off** (external pumps are present). *Remark: The pump will be anyway activated in all other circumstances, e.g. during the DHW functioning, for post-circulation (if foreseen) or for anti-freezing or anti-lockout functions.*
SW6	**OFF**	In these models it must be **OFF**. **Factory setting**.

Combustion check

The boiler has the "chimney-sweeper" function, forcing burner ignition at the maximum output not modulated. This function allows more reliable measurements of those obtained when the gas boiler is activated through the room thermostat or hot water demands.

- Prepare the instruments for combustion checking;
- To activate the "Chimney-sweeper" function, a simple procedure has been designed to avoid involuntary activation on the part of the user. Proceed as follows:
  - supply the boiler and turn the Summer/Winter knob to Summer position ;
  - provide that Room Thermostat contact is closed (activated) or open an hot water tap (the heat produced by the boiler will be drained consequently);
  - turn the Hot Water knob to the position Chimney-sweeper and wait (about 5 seconds) that the display shows **"SE"** (SErvice) flashing (moreover, **GREEN** lamp flashes with short lightnings).
  - when the display shows **"SE"** flashing, turn the Hot Water knob on the scale . On the display, the indication **service** appears and the burner ignites at the maximum output not modulated (the **YELLOW** indicator turns on);
- make the checks and measurements;
- To switch off the burner, turn the Summer/Winter knob to the OFF position. The **GREEN** indicator blinks.

Remark: *the burner will switch off automatically when reaching the maximum temperature, and in any case after 15 minutes.*

Gas conversion

ATTENTION: the operations described below must be carried out only by qualified personnel.

For gas conversion, use the components supplied by boiler manufacturer only.

Using LPG, it is absolutely necessary to install a suitable pressure reducer upstream the boiler.

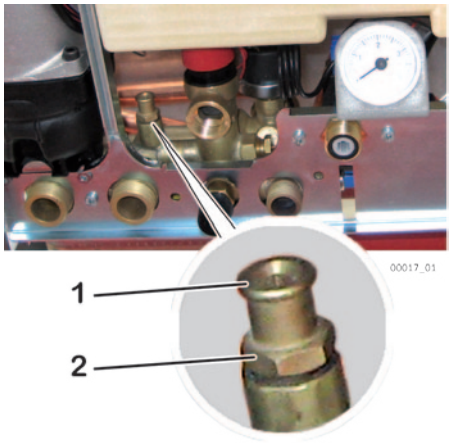
1. Disconnect the boiler from the electrical supply. Remove the boiler cover as described in the paragraph "Access to the inside of the boiler" on page 26;

00253.00

2. access the main board and switch **SW1** (see also "Main board settings" on page 30) accordingly with the available gas type:
   - **OFF** for **Natural gas (G20),**
   - for **Butane (G30)** or **Propane (G31)**
3. ensure that the inlet gas pressure complies with the required nominal pressure (see "Technical data" on page 42) and that the gas flow is sufficient to guarantee the appliance correct work;
4. open the sealed combustion chamber;
5. Remove the pipe between the gas valve and the injectors bar.
6. Remove injectors bar and replace the nozzles* with the ones suitable for the available gas type, using a 7 mm. spanner (see figure). The nozzles number and diameter is stated in the table "Technical data" on page 42.
7. Reassemble injectors bar and pipe, replacing gaskets. Check, with burner ON, that there are no gas leaks. On the forced draught models, close the sealed combustion chamber;

(i) * Install the nozzles kit with the supplied washers, although the existing nozzles, factory fitted in the boiler, are originally without washer.

8. Verify, with burner ignited, the inlet gas pressure (see page 26).
9. Check and if necessary adjust the gas valve maximum and minimum pressure (see page 26) and the heating maximum power (see page 27).
10. **Check that there are no gas leaks.**
11. Apply the sticker indicating the type of gas (supplied with the kit) on the suitable area on “WARNING” label inside the boiler.



Draining the heating system

When it is necessary to drain the heating system, proceed as described here below:

- Connect a rubber pipe to the draining tap terminal **1** ;
- put the other end of the pipe in a suitable drain or sink;
- open the draining tap by turning the nut **2** counterclockwise, using a suitable spanner;
- when the pressure is COMPLETELY drained, it's possible to open the radiators venting valves, to allow the air inlet. The complete system drain is possible only draining the liquid from the lowest point of the system itself.
- when everything is over, close taps (turning the nut **2** clockwise) and air vents.

(i) In the primary exchanger a certain quantity of water of the heating system remains. If you want to remove the boiler from the wall, we advice you to close with plugs the hydraulic inlet/outlet heating system connections.

Pump settings

The circulating pump is already set by the factory for all normal boiler applications. Should it be necessary to change the head curve (see page 13) to optimise the system operation or reduce any noise caused by a too fast circulation, proceed as follows.

Visualizzazioni

1. Switch on the boiler in Winter mode and activate the heating request (to activate the circulating pump).
2. Usually, a **G**reen LED is displayed, followed by one or more **Y**ellow LEDs (steady on). This does not indicate the selected curve but the **operating status**, i.e. the current performance level of the circulating pump to obtain the selected curve:

- no. of yellow LEDs on: **1 = 0…25%; 2 = 25…50%; 3 = 50…75%; 4 = 75…100%**;

3. Briefly press the button , to display the circulating pump operating curve for a few seconds without changing it, by means of an LED code (steady on), the first **R**ed and the following **Y**ellow:

4 metres

5 metres

6 metres

7 metres

Circulating pump alarms

In case of circulating pump operation fault, instead of the operating status the display shows an alarm code visually indicated by the first red LED instead of green:

Electric fault

Low supply voltage

Blocked rotor

Setting

4. To modify the curve, **keep** button pressed for 2-3 seconds until the LEDs start **flashing**; then release the button and **press it briefly once or more times** until seeing the yellow LED sequence corresponding to the selected curve.

In case of circulating pump replacement, **the spare part is set by the factory at 6 meters**, suitable to the **24 HE model**. Select the correct curve suitable to the boiler model on which is it installed, for instance model 30 HE requires the setting at 7 meters (except special cases).

***Note: if** this does not happen and the display shows the operating status, the programming may have been blocked. To enable it, keep button pressed for at least 10 seconds (the LEDs indicate the release by flashing twice fast) and try again.*

5. Wait approximately 10 seconds without pressing the button and the circulating pump will return to its normal condition (operating status display) **by memorising the new setting**. If necessary, block the programming by keeping the button pressed for at least 10 seconds (the LEDs indicate the block by flashing fast twice).

Alarms - boiler block

Following a malfunction, the boiler can lock-up and show a particular signalling, consisting of an alarm code on the display and of the status of the **RED** light indicator (and eventually of the **GREEN** and the **YELLOW** ones). In the following table, all the alarm signals are listed, their most probable causes and the suggested solutions.

Each alarm code is complete of the status of the **RED** light indicator: **= on**; **= blinking**; **= flashing with pulses**; **= off**. Some alarms are signalled with a combination of two or more lights, in this case the light colours are explicitly reported close to the relevant status.

Operations accompanied by the symbol are always reserved to the Technician. Operations with grey background are reserved to the Technician.

Signal	Probable causes	Suggested solutions
01	Boiler just installed (air mixed to gas).	Retry the ignition several times: turn the knob on the unlock position OFF, wait the red light to turn off, then bring the knob in the previous position.
	The flame has extinguished or it did not ignite	Restore the boiler function by turning the knob on the unlock position OFF, wait the red light to turn off, then bring the knob in the previous position.
		In case of frequent blocks, verify the correct combustion, the good state and the cleaning of the burner.
	Incorrect combustion / flame detachment from the burner	Check that the Inlet/Outlet Ducts and the respective terminals are clean and in good condition, and that there are no leaks in them. During the installation, respect the regulation prescriptions, the slopes and the lengths (see "Flue systems" on page 20). ***Note for the TECHNICIAN:*** *The burner flame is not detected by the control electronics because it has not turned on or it has suddenly turned off, or it has detached from the burner, because of an incorrect combustion. This can be due, in example, to combustion product reflow into inlet duct, leaks in inlet/outlet ducts or errors in sizing of ducts (ducts length out of the allowed range, and/or wrong use of the reducer on boiler's outlet).*
	Incorrect electrical supply	Check that the electrical connections Live, Neutral and Earth are correct and efficient, and especially that the Live and the Neutral are not swapped (see "Electrical diagram" on page 45). ***Remark:*** *The problem may also be caused by an incorrect electricity supply by the Electrical Agency (unbalanced Neutral).*
	Condensate discharge problems (condensate touches the siphon maximum level sensor)	**User:** Try once to reset the boiler operation by moving the knob on the unlock position OFF, wait for the red light to turn off and then move the knob in the previous position.
		The condensate level in the siphon is above the safe level, probably due to problems with downstream discharge problems, therefore the burner is switched off to stop the condensate production. Verify and restore the correct condensation discharge.

Signal	Probable causes	Suggested solutions
02	the boiler has overheated and the Safety Thermostat has triggered	Turn the knob on the unlock position OFF until the red lamp turns off (or eventually for a longer period to make the boiler cool), then bring the knob in the previous position. If necessary, wait and try again for few times. If the lockout persists or reappears, call the Service Centre.
		Verify the safety thermostat functionality. Detect the causes of the overheating, e.g. an insufficient circulation in the primary circuit; max gas pressure out of the limits or maximum heating power excessive for the heating system size.
	Triggering of the Flue safety thermal switch (too hot fumes exiting the boiler)	Solve the problem that caused fume overheating, then manually reset the Flue safety thermal switch. ***Note for the TECHNICIAN:*** *The Flue safety thermal switch protects exhaust ducts (made of polypropylene, material suitable for condensation acidity) from high temperatures and from the subsequent fusion or deformation. The Flue safety thermal switch manual reset control is located on the boiler upper surface, on the right side. Loosen the cap to access it.*
03	Incorrect flue flow (even momentary)	Restore the boiler function by turning the knob on the unlock position OFF , wait the red light to turn off, then bring the knob in the previous position. If the lockout persists or reappears, call the Service Centre.
		check the efficiency of the flue; of the air inlet / flue outlet ducts; of the flue flow detection device.
– 5	Communication between display and main PCB is not correct	At every Power On, this alarm is showed for max 2-3 seconds; then it will disappear. If not, call the Service.
		Check display, main PCB and connection wire. Replace what it is needed.
05	Failure to the system flow temperature probe.	Check the cabling of the system flow temperature probe. Replacement of the system flow temperature probe.
06	Failure to the DHW temperature probe.	Check the cabling of the DHW temperature probe. Replacement of the DHW temperature probe.
10	Insufficient system pressure *(loss of water pressure switch triggered)*	Restore the correct pressure as described in "Preliminary operations" on page 9 or (preferibly bu the Technician) in "Heating system filling and pressuring" on page 18.

Remark: Consider that the pressure, in normal conditions, should not decrease with the progress of the time. If this happens, there is probably a loss in the heating system. Sometimes the loss is so small that it doesn't leave evident signs, but with the progress of the time it can cause the decreasing of the pressure. Also the opening of the manual venting taps of radiators (intentional or unintentional) makes the pressure decrease. Check that this doesn't happen.

Signal	Probable causes	Suggested solutions
22	Memory-stored data not coherent.	**User:** Disconnect the electrical supply to the boiler by operating the suitable external bipolar switch, then connect it again after a few minutes. If the lockout persists or reappears, call the Service Centre.
		Redo all the boiler settings ("Max heating power adjustment" on page 27 and "Electronic settings" on page 30) to update the data in the main board memory. Replace the main board (consequently, redo the "Max heating power adjustment" on page 27 and "Electronic settings" on page 30).
24	Floor heating system safety thermostat triggering: system flow temperature too high; floor heating system defective, faulty or malfunctioning.	The floor heating system and the floor cladding can be damaged by temperature shocks, so a good quality system includes one or more safety thermostats that, if necessary, trigger and lock the boiler. Turn the knob on the unlock position OFF until the red lamp turns off (or eventually for a longer period to cool the system and restore the thermostat), then bring the knob in the previous position. If the lockout persists or reappears, call the Service Centre ***Remark:*** *when this alarm is active, the hot water production is locked too.*
		If any floor heating system was installed, check the integrity of the jumper connecting terminals 57 and 58 of M12 see "Electrical diagram" on page 45). **If the floor heating system is installed**, check the system flow temperatures on the boiler and on the low temperature system kits (if installed). Replace the faulty or out-of-tolerance thermostats. Check the correct positioning of the thermostats on the system (see "Floor heating system" on page 14).
31	Remote control* not working *Data exchanged between the boiler and the Remote Control don't comply with the expected protocol.* ** This applies to Remote Control optional kit only, and not to third parties chrono-thermostats*	**User:** see also paragraph "Remote Control Kit" on page 48. *Under these conditions, the boiler functions only in Sanitary. If the heating was necessary, and no spare Remote Control nor standard room thermostat were immediately available, ask* ***the technician*** *to* ***temporarily*** *make heating work manually from the boiler's control panel (excluding the operation from the remote control).*
		Note for the TECHNICIAN: *to activate the heating in manual mode, jumper the boiler's room thermostat input (see "Electrical diagram" on page 45); make the boiler operate in Winter mode by regulating the heating temperature manually from the boiler's control panel. Show the User how to adjust the heating from the boiler's in-built control panel, by rotating the* ***Summer/Winter*** *knob within the scale .*
33-34	Cabling configuration error.	Refer to the electric diagram (page 45) and check the integrity of the wirings, especially the eventual short cable jumpers between two contacts of the same connector (on the cabling connections to the electronic board).

Signal	Probable causes	Suggested solutions
35 **RED** **YELLOW**	Unexpected flame the control electronic has detected the flame on the burner when this one should be off	Wait for the boiler automatic reset (5 minutes) or reset it manually by turning the knob on the unlock position OFF, waiting the red light to turn off, then bringing the knob in the previous position. If the lockout persists or reappears, call the Service Centre Detect eventual malfunctioning of the gas valve (that does not stop fully the gas flow, so the burner remains ignited) or of the electronics, flame detection section (that detects the flame presence even if it's absent).
38	Failure to the outdoor temperature probe (optional). The outdoor temperature probe, that was recognized and working, now results faulty.	**User:** Call the Service Centre. *The boiler now works either in heating and in hot water, like as the external boiler had never been installed, so the heating system temperature is set by the knob , in direct way and not as a function of the outdoor temperature. The alarm is displayed to inform that the accessory is no more efficient (consider that, on a first analysis, the boiler seems to work perfectly).* ***Important: if the boiler is turned off and then on again, it's possible** that the alarm is no more displayed, even though the problem persists.*** Check the cabling of the outdoor temperature probe. Replacement of the outdoor temperature probe. *** The alarm shows again only if the resistance of the probe is out of tolerance or in short-circuit. On the contrary, if the probe or the relevant cabling is interrupted, when the electrical supply is restored the boiler will consider the external probe absent and, in Winter mode, it will work in normal mode (temperature shifting disabled).*
39	Suspected freezing After a power failure, the boiler detected temperatures at the Heating and DHW probes equal to, or less than, 0°C when power was restored	The display shows the alarm code 39 while the boiler inhibits the ignition of the burner and activates the circulator, forcing water to circulate in the hydraulic circuits. If, during this time, the temperatures measured by the probes rise above +1°C, the alarm is reset and the boiler returns to the normal operation. Otherwise, the alarm will persist and you should suspect that water has frozen at one or more points of the hydraulic circuit of the boiler and/or system (with possible damage to the frozen parts). If the alarm persists, call a qualified technician. Find/replace the parts damaged by the freezing.

Signal	Probable causes	Suggested solutions
42 RED YELLOW	System error Anomaly of inner boiler device(s) Mains electrical power supply out of tolerance limits	Detect the fault or anomaly also referring to the technical literature reserved to the service centres.
43	Over-temperature of water on system return	The water that returns to the boiler from the heating system is too hot: this may be an effect of a malfunction of the system, and anyway this can cause a too high temperature of the flue and damage the flue system. Before this happens, a suitable safety protection has triggered. Wait 20-30 minutes to let the boiler and the system cool down, then turn the knob on the unlock position OFF until the red lamp turns off, then bring again the knob in the previous position. It is impossible to restart the boiler before the cooling of the system. If the block happens again, please call a qualified technician.
46	Cabling configuration error.	See alarm **33**.
– – (??)	The "Hot Water" knob is on a position reserved to the technician: or **service** .	Turn the knob back along the scale .
– – (??) RED GREEN	it has been started, by mistake (moreover very improbable), a procedure reserved to the Technician	In order to avoid malfunctions, do the following as soon as possible: ▶ turn the knob on the off/unlock OFF position; ▶ turn the "Hot Water" knob along the scale ; ▶ turn the knob on the normal working position (Summer or Winter along the scale).

Warnings for servicing

All servicing operations and gas conversions MUST BE CARRIED OUT BY QUALIFIED TECHNICIANS, in compliance with the norms and laws in force (see an indicative list on page 4). Moreover, MAINTENANCE operations must be carried out in compliance with the manufacturer prescriptions and with the laws and rules presently in force, for the parts not mentioned in this handbook; we advice to perform them at least once a year to maintain the boiler's performance.

A careful servicing is always a guarantee of safety and energy saving. Normally, it will be necessary to execute the following operations:

- Remove any possible oxidization from burners and electrodes;
- Remove the scale from the exchangers;
- Condensate siphon cleaning and check, check of all parts in contact with condensate;
- Check integrity and stability of the insulating coverings in the combustion chamber and proceed eventually to substitution;
- Check the boiler ignition, switching off and operation;
- Check the water and gas connections tightness;
- Check the gas consumption at the minimum and maximum output;
- Verify that safety devices are correctly working;
- Verify the correct functioning of control and adjusting devices;
- Verify periodically the absence of leaks of combustion products to the inner room, the correct functioning and the integrity of the flue outlet ducts and/or devices and of the relevant terminals and accessories;
- In case of works or servicing of the structures placed near the above mentioned ducts and /or devices and their accessories, switch off the boiler;
- Do not leave any inflammable tanks and/or substances in the installation room;
- If the boiler draws directly from the installation room *(type B appliance installed indoor)*: Do not clean the room where boiler is installed, while it is working
- Clean casing with soapy water only. Do not clean casing, other painted or plastic surfaces with thinner.
- In any case of parts replacement, it is mandatory to use ITALTHERM original spare parts.

ITALTHERM declines any responsibility in case of non-original spare parts utilization.

ErP Data - EU 813/2013

Supplier name: **Italtherm** Contact details: **Italtherm Srl – Via Salvo D'Acquisto, 10 – 29010 Pontenure (PC) – Italy**		Model(s):		**City Plus 24 HE**	**City Plus 30 HE**
ErP Data - EU 813/2013		**Symbol**	**Unit**	**Value**	**Value**
Condensing boiler			Yes/No	Yes	Yes
Combination heater			Yes/No	Yes	Yes
B1 boiler			Yes/No	No	No
Cogeneration space heater:			Yes/No	No	No
Low-temperature (**) boiler			Yes/No	No	No
ErP space heating	Rated heat output	P_{rated}	kW	24	29
	Useful heat output at rated heat output and high-temperature regime (*)	P_4	kW	24.4	28.6
	Useful heat output at 30% at rated heat output and low-temperature regime (**)	P_1	kW	7.7	8.9
	Seasonal space heating energy efficiency (GCV)	η_S	%	86	86
	Useful efficiency at rated heat output and high-temperature regime (*) (GCV)	η_4	%	85.8	86.4
	Useful efficiency at 30% of rated heat output and low-temperature regime (**) (GCV)	η_1	%	89.9	90.1
ErP DHW	Declared load profile			XL	XXL
	Water heating energy efficiency (GCV)	η_{wh}	%	81	81
	Daily electricity consumption	Q_{elec}	kWh	0.150	0.164
	Daily fuel consumption	Q_{fuel}	kWh	24.515	29.843
Auxiliary electricity consumption	At full load	*elmax*	kW	0.054	0.055
	At part load	*elmin*	kW	0.018	0.021
	In standby mode	P_{SB}	kW	0.002	0.002
Other items	Standby heat loss	P_{stby}	kW	0.060	0.055
	Ignition burner power consumption	P_{ign}	kW	0	0
	Sound power level, indoors	L_{WA}	dB	54	54
	Emissions of nitrogen oxides	NO_X	mg/kWh	129	120

(*) High-temperature regime means: 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.

(**) Low temperature means: for condensing boilers 30 °C, for low-temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet).

***GCV** = Gross Calorific Value (=Hs)*

Product fiche - EU 811/2013

Supplier name: **Italtherm** Contact details: **Italtherm Srl – Via Salvo D'Acquisto, 10 – 29010 Pontenure (PC) – Italy**	Model(s):		**City Plus 24 HE**	**City Plus 30 HE**
Product fiche - EU 811/2013	**Symbol**	**Unit**	**Value**	**Value**
Declared load profile DHW			**XL**	**XXL**
Seasonal energy efficiency for space heating			**B**	**B**
Energy efficiency for water heating			**A**	**B**
Rated heat output	P_{rated}	kW	24	29
Annual energy consumption	Q_{HE}	GJ	73	77
Annual electricity consumption	*AEC*	kWh	32	36
Annual fuel consumption	*AFC*	GJ	19	24
Seasonal space heating energy efficiency (GCV)	η_S	%	86	86
Water heating energy efficiency (GCV)	η_{wh}	%	81	81
Sound power level, indoors	L_{WA}	dB	54	54

***GCV** = Gross Calorific Value (=Hs)*

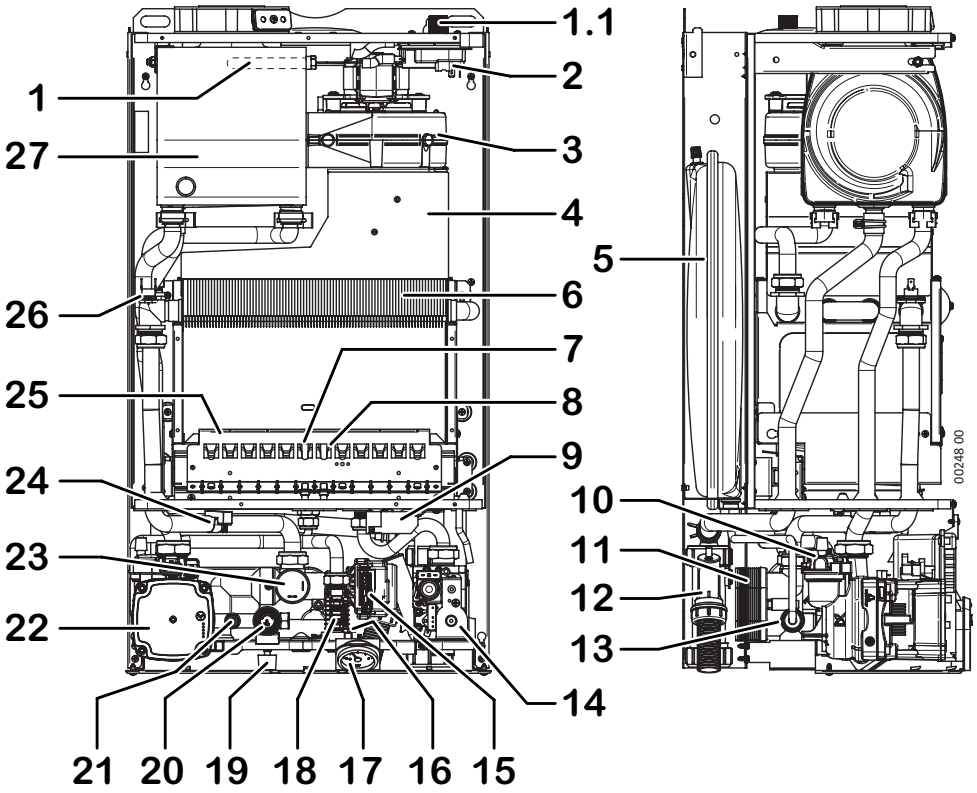
Technical data

TECHNICAL DATA	U.M.	City Plus 24 HE		City Plus 30 HE	
Gas type		*G20*	*G30/G31*	*G20*	*G30/G31*
CE certification		0476 CQ 2073		0476 CQ 2073	
Class		II_{2H3+}		II_{2H3+}	
Type		C12 - C32 - C42 - C52 - C62 - C82 - C92			
Working temperature range (min÷max)	°C	0 ÷ +60		0 ÷ +60	
Max heat input	kW	25.5	25.5	29.5	29.5
Min heat input in Space Heating	kW	20.0	20.0	18.0	18.0
Min heat input in Water (DHW) Heating (Qr)	kW	10.5	10.5	12.0	12.0
Max heat output 60°/80°C *	kW	24.4	24.4	28.6	28.6
Min heat output 60°/80°C *	kW	9.5	9.5	11.5	11.5
Max heat output 30°/50°C *	kW	26.1	26.1	30.2	30.2
Min heat output 30°/50°C *	kW	9.9	9.9	11.4	11.4
NO_X Class		3	1 / 1	3	1 / 1
CO at 0% O_2 (Qn)	ppm	51.6	41.3/44.5	105.5	138.3/70.3
CO_2 at nominal input	%	6.80	7.80/7.70	7.10	8.10/7.80
Condense quantity at Qn (30°/50°C *)	l/h	2.04	2.04	2.20	2.20
Condense quantity at Qr (30°/50°C *)	l/h	1.20	1.20	1.40	1.40
Condense acidity	pH	2.8	2.8	2.8	2.8
Flue temperature (Qn)	°C	82.7	82.7	73.4	73.4
Flue mass flow rate (60/80°C - Qn)	kg/h	55.27	54.98/55.44	61.13	60.34/62.31
EFFICIENCY					
Nominal efficiency (NCV) at 60°/80°C *	%	95.8		96.8	
Nominal efficiency (NCV) at 30°/50°C *	%	102.3		102.5	
Efficiency at 30% load Qa (NCV) at 30°C *	%	99.8		100.1	
* *system return / flow water temperature; NCV = Net Calorific Value (=Hi)* ***Remark:*** *data have been measured with horizontal coaxial flue, length = 1 m*					
HEATING					
Temperature selection range (min÷max) *Main heating circuit, normal range / low temp. range*	°C	35÷78 / 20÷45			
Temperature selection range (min÷max) *Secondary heating circuit*	°C	20÷78			
Expansion vessel	l	8		8	
Expansion vessel pre-loading pressure	bar	1		1	
Loss of water pressure switch off / on pressure	bar	0.4 / 0.9 (±0.2)		0.4 / 0.9 (±0.2)	
		To allow the correct system filling, the pressure of the domestic water should be higher than the ON value of the pressure switch.			
Max working pressure	bar	3		3	

(follows)

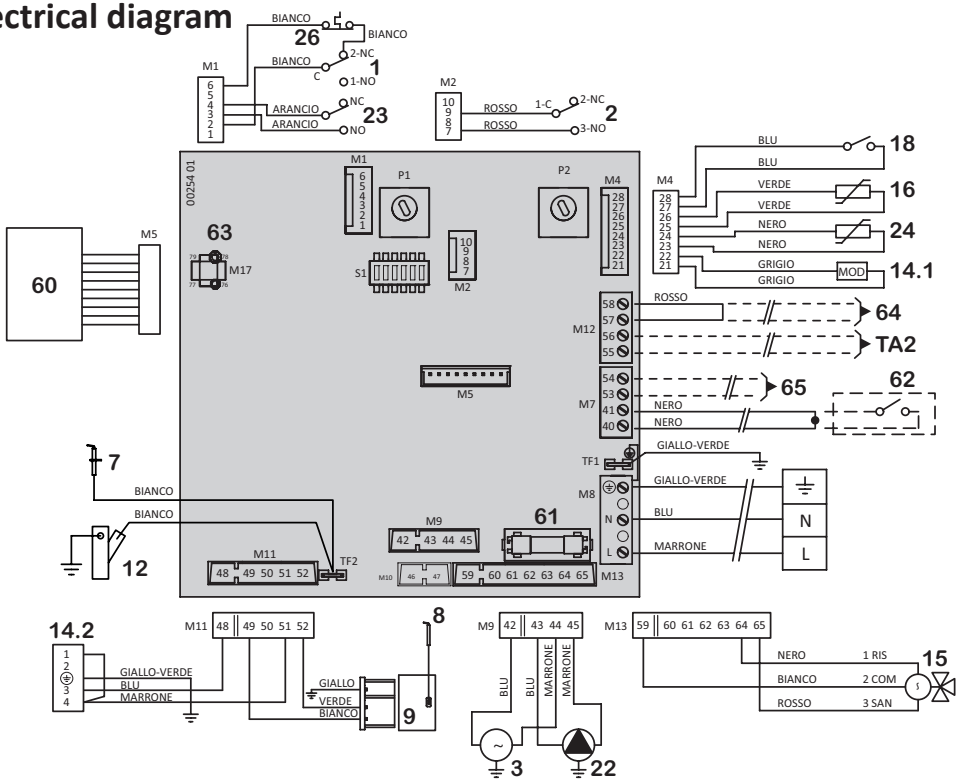
TECHNICAL DATA *(cont'd)*	U.M.	City Plus 24 HE		City Plus 30 HE	
Gas type		***G20***	***G30/G31***	***G20***	***G30/G31***
Max system temperature	°C	85		85	
Anti-freezing function temperature on / off	°C	5 / 30		5 / 30	
HOT WATER					
Flow rate at 25°C temp. rise	l/min	15.0		17.3	
Flow rate at 30°C temp. rise	l/min	11.7		13.6	
Min water flow *(for the DHW function activation)*	l/min	2.2		2.2	
Min supply pressure *(for the DHW function activation)*	bar	0.5		0.5	
Max supply pressure	bar	6		6	
Temperature selection range (min÷max)	°C	30÷55		30÷55	
ELECTRICAL DATA					
Voltage / frequency (nominal voltage)	V / Hz	220÷240 / 50 (230V)		220÷240 / 50 (230V)	
Power consumption	W	95		111	
Level of protection		IP X4D		IP X4D	
DIMENSIONS					
Width - Height - Depth	mm	*see "Dimensions and connections" on page 13*			
Weight	kg	35.5		35.5	
CONNECTIONS					
Hydraulic and gas connections		*see "Dimensions and connections" on page 13*			
Flue: types, lengths and diameters		*see "Flue systems" on page 20*			
GAS SUPPLY PRESSURE					
Nominal pressure	mbar	20	37	20	37
Inlet pressure (min÷max)	mbar	17 ÷ 25	35÷40	17 ÷ 25	35÷40
Injectors number	mm	13		13	
Injectors diameter		125	75/75	130	78/78
GAS CONSUMPTION					
Qmax	m^3/h	2.70		3.12	
	kg/h		2.01/1.98		2.32/2.29
Qmin	m^3/h	1.11		1.27	
	kg/h		0.83/0.81		0.94/0.93

Boiler internal components



1 Flue safety thermal switch
1.1 Flue safety thermal switch - manual reset button with protection screw cap
2 Flue pressure switch
3 Fan
4 Flue hood
5 Expansion Vessel
6 Primary exchanger
7 Flame detection electrode
8 Ignition Electrode
9 Electronic igniter
10 Automatic Venting Device (heating circuit, incorporated in the pump)
11 DHW exchanger
12 Siphon for condense outlet
13 By-pass
14 Gas valve
15 Motorized 3-way valve
16 DHW temperature sensor
17 System pressure gauge
18 Priority flow switch (with filter)
19 Filling valve
20 Safety valve 3 bar
21 Drain valve
22 Pump
23 Loss of water pressure switch
24 Temperature Sensor, system flow
25 Burner
26 Safety thermostat on system flow
27 Flue heat recovery unit

Electrical diagram



1 Flue safety thermal switch (*)
2 Flue pressure switch (*)
3 Fan
7 Flame detection electrode
8 Ignition Electrode
9 Electronic igniter
12 Siphon for condense outlet *(with level sensor)*
14.1 Gas valve - modulation control
14.2 Gas valve - opening control
15 Motorized 3-way valve
16 DHW temperature sensor
18 Priority flow switch (*)
22 Pump
23 Loss of water pressure switch (*)
24 Temperature Sensor, system flow
26 Safety thermostat on system flow (*)
60 Display board
61 Fuse F2A (2A fast)

(*) the contacts of these components are shown in rest conditions (cold condition, no system pressure, no flow)

Colours, abbreviations:

NERO	Black	**BIANCO**	White
MARRONE	Brown	**GIALLO**	Yellow
BLU	Blue		
VERDE	Green	**RIS**	Heating mode
GRIGIO	Grey	**COM**	Common
ARANCIO	Orange	**SAN**	DHW mode
ROSSO	Red	**NC**	Normally Closed
VIOLA	Violet	**NO**	Normally Open

Optional external devices:

62 **Room thermostat:** *Voltage-free Contact for Room Thermostat or Chronothermostat (for trade) working at safety extra low voltage SELV. Closed contact = heating request.*
Remote control: *Terminals of the original remote control device. See also page 48.*
To install, open the junction on the wires and connect them to the device terminals (eventually, extend the cable)

63 *Connector for CH multi zones PCB kit*

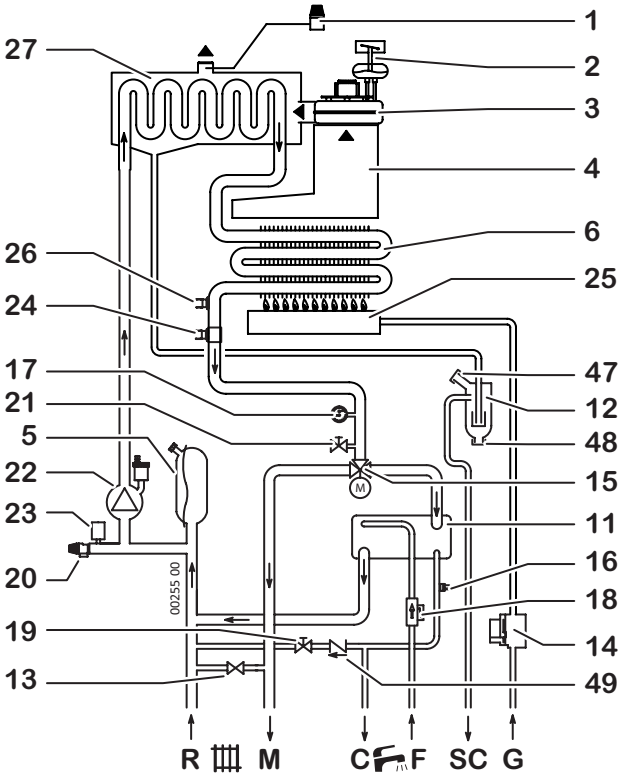
64 *To optional floor heating system safety thermostat*

65 *To optional outdoor temperature sensor*

TA2 *To optional room thermostat for zones with different temperature range*

Hydraulic diagram

This diagram is for information only. To make boiler hydraulic connection either see "Dimensions and connections" on page 13 and eventually "Positioning and fastening" on page 16.



1 Flue safety thermal switch
2 Flue pressure switch
3 Fan
4 Flue hood
5 Expansion Vessel
6 Primary exchanger
11 DHW exchanger
12 Siphon for condense outlet
13 By-pass
14 Gas valve
15 Motorized 3-way valve
16 DHW temperature sensor
17 System pressure gauge
18 Priority flow switch (with filter)
19 Filling valve
20 Safety valve 3 bar
21 Drain valve
22 Pump
23 Loss of water pressure switch
24 Temperature Sensor, system flow
25 Burner
26 Safety thermostat on system flow
27 Flue heat recovery unit
47 Siphon cork with condense level sensor
48 Tap for condensate trap cleaning
49 Check valve

R Heating return
M Heating flow
C Hot water outlet
F Cold water inlet
SC Condense drain
G Gas inlet

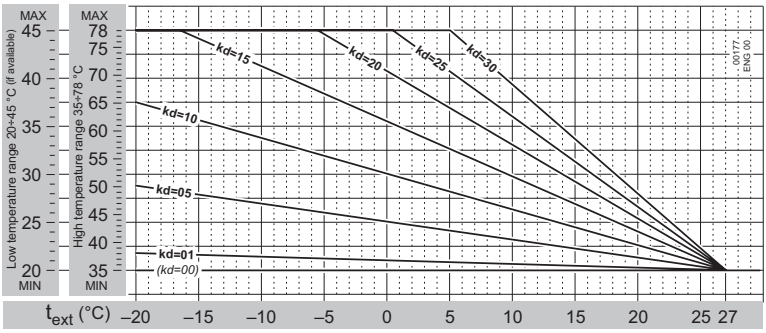
Outdoor Sensor Kit

Installation and setting

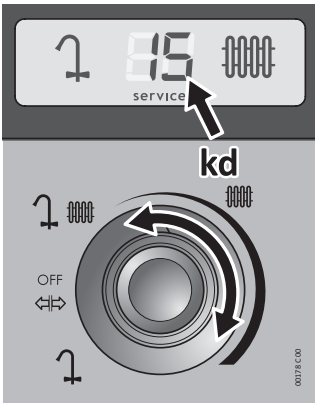
The Outdoor Sensor manages automatically the CH flow temperature** as a function of the outdoor temperature, thus avoiding the user to adjust it manually. This function is also named *"shifting temperature"*.

** *that's the temperature of the heating elements. Don't mistake it with the room temperature (managed by the room thermostat or by the Remote Control, but not by the boiler) that doesn't depend on the first one.*

The installation must be made by a professionally skilled technician following the instructions supplied with the kit. Refer to "Electrical diagram" on page 45 for the links to the Main Board.



After the installation of the Sensor, **the Summer/Winter knob won't adjust directly the CH flow temperature, but the dispersion factor *"kd"*** that's the response of the outdoor temperature, detected by the sensor, on the CH flow temperature (see graph).



Practically, *kd* value should be adjusted depending on the estimated efficiency of the building's thermal insulation. Its range is from 01 to 30: use **higher values** when there is a **high thermal dispersion** and therefore a **less efficient insulation** (and vice versa).

Because of the wide buildings typologies, it's impossible to give precise indications on kd value to set. **The correct setting must be determined case by case and will have, as a result, an optimal comfort in all the climatic conditions** requiring heating, i.e. a prompt reaching of the room temperature with cold weather and no room overheating during mild periods.

Outdoor Sensor kit and Remote Control

If also the Remote Control Kit is installed, its parameter **P04** (modulation mode) should be set on value **2** (modulating on outdoor sensor and on-off on room sensor) or **3** (modulating on both outdoor and room sensors) as described in the **paragraph 5** of the instruction booklet included in the Remote Control Kit. Afterwards, also the ***kd*** should be set on this latter (refer to **paragraph 8.6** of the same booklet). On the Remote Control, just because of different display, the ***kd*** adjustment range is ***0.1…3.0*** instead of 01…30.

Remote Control Kit

This remote control is **more than a simple room thermostat**. Thanks to this, it is possible to **manage the boiler in all its settings** like DHW and CH temperature adjustment, **boiler reset** in case of boiler block, and of course it works as a **room thermostat** both in **manual** and **weekly program** mode. It's powered by the boiler (in safety low voltage), so **it doesn't need batteries**.

Extract the Remote Control from its package. **Keep the relevant user instruction booklet and annex it to this Manual.**

Nor the Remote Control neither the relevant cable coming from the boiler must not, for any reason, be connected to the 230Vac supply mains.

To avoid malfunctions due to electrical noise, the Remote Control connections, as well as all low-voltage connections, should be kept separated from power supply cables, e.g. by enclosing it into separate raceways.

The maximum overall cable length shouldn't exceed 50 m.

1. Cut off electricity from boiler;
2. install the device as described in the **paragraph 4** of the supplied instruction booklet;
3. link the Remote Control wirings to the "Room Thermostat - Remote Control" cable coming out of the boiler, by means of a suitable bipolar terminal. See also "Electrical diagram" on page 45;

Note: *The Remote Control link is not polarized.*

4. power supply the boiler; **turn the boiler's Summer/Winter knob on Summer otherwise the Remote Control doesn't work** and the boiler goes into alarm **31** described below;
5. check the correct work of the device. The electronics should recognize it automatically.

Hereafter, the Summer/Winter knob should be left on Summer ; the boiler work is managed by the Remote Control, including the OFF, Summer and Winter modes, and the technical functions (such as several additional functions).

Signal	Probable causes	Suggested solutions
31	Communication error between the Remote Control (if present) and the boiler	Disconnect the electrical supply to the boiler for 30 seconds by operating the suitable external bipolar switch, turn the boiler's Summer/Winter knob on Summer , then power supply the boiler. If the lockout persists or reappears, call the Service Centre. Under these conditions, **the boiler works only in DHW**.
		For the Technician: Problems on the optional Remote Control connection link (passing close to supply cables or other electromagnetic field sources; connection failure; cable length over 50 meters).

Notes

Notes

Notes

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