

BlueHelix HiTech RRT C



CE

INSTRUCTIONS FOR USE, INSTALLATION AND MAINTENANCE

"BLUEHELIX HITECH RRT 24C" GC N° **47-267-74**

"BLUEHELIX HITECH RRT 28C" GC N° **47-267-75**

"BLUEHELIX HITECH RRT 34C" GC N° **47-267-76**



- Read the warnings in this instruction booklet carefully since they provide important information on safe installation, use and maintenance.
- This instruction booklet is an integral and essential part of the product and must be kept with care by the user for future reference.
- If the unit is sold or transferred to another owner or if it is to be moved, always make sure the booklet stays with the boiler so that it can be consulted by the new owner and/or installer.
- Installation and maintenance must be carried out by professionally qualified personnel, according to current regulations and the manufacturer's instructions.
- Incorrect installation or inadequate maintenance can result in damage or injury. The manufacturer declines any liability for damage caused by errors in installation and use or by failure to follow the instructions provided.
- Before carrying out any cleaning or maintenance operation, disconnect the unit from the power supply using the system switch and/or the special cut-off devices.
- In case of a fault and/or poor operation, deactivate the unit and do not try to repair it or directly intervene. Contact professionally qualified personnel. Any repair/replacement of the products must only be carried out by qualified personnel using genuine parts. Failure to comply with the above can compromise the safety of the unit.
- Periodic maintenance performed by qualified personnel is essential in order to ensure proper operation of the unit.
- This unit must only be used for its intended purpose. Any other use is deemed improper and therefore hazardous.
- After unpacking, check the good condition of the contents. The packing materials are potentially hazardous and must not be left within the reach of children.
- The unit can be used by children aged at least 8 years and by persons with reduced physical, sensory or mental capabilities, or lacking experience or the necessary knowledge, only if under supervision or they have received instructions on its safe use and the related risks. Children must not play with the unit. Cleaning and maintenance intended to be done by the user can be carried out by children aged at least 8 years only if under supervision.
- In case of doubt, do not use the unit. Contact the supplier.
- The unit and its accessories must be appropriately disposed of in compliance with current regulations.
- The images given in this manual are a simplified representation of the product. In this representation there may be slight and insignificant differences with respect to the product supplied.

	This symbol indicates "CAUTION" and is placed next to all safety warnings. Strictly follow these instructions in order to avoid danger and damage to persons, animals and things
	This symbol calls attention to a note or important notice.
	<p>This symbol, which is used on the product, packaging or documents, means that at the end of its useful life, this product must not be collected, recycled or disposed of together with domestic waste. Improper management of electric or electronic waste can lead to the leakage of hazardous substances contained in the product. For the purpose of preventing damage to health or the environment, users are kindly asked to separate this equipment from other types of waste and to ask for it to be dealt with by the municipal waste service or dealer under the conditions and according to the methods set down in national and international laws transposing the Directive 2012/19/EU.</p> <p>Separate waste collection and recycling of unused equipment helps to save natural resources and to guarantee that this waste is processed in a manner that is safe for health and the environment. For more information about how to collect electric and electronic equipment and appliances, please contact your local Council or Public Authority competent to issue the relevant permits.</p>



The CE marking certifies that the products meet the essential requirements of the relevant directives in force.

The declaration of conformity may be requested from the manufacturer.

COUNTRIES OF DESTINATION: GB

1 Operating instructions	4
1.1 Introduction.....	4
1.2 Control panel.....	4
1.3 Connection to the power supply, switching on and off	7
1.4 Adjustments.....	10
2 Installation	18
2.1 General Instructions	18
2.2 Place of installation	19
2.3 Plumbing connections	19
2.4 Gas connection	22
2.5 Electrical connections.....	23
2.6 Fume ducts.....	25
2.7 Condensate drain connection.....	30
3 Service and maintenance.....	32
3.1 Adjustments.....	32
3.2 Commissioning.....	38
3.3 Maintenance.....	38
3.4 Troubleshooting.....	46
4 Technical data and characteristics	51
4.1 Dimensions and connections	51
4.2 General view	52
4.3 Hydraulic circuit	52
4.4 Technical data table	53
4.5 Diagrams	57
4.6 Wiring diagram	58



1. Operating instructions

1.1 Introduction

Dear Customer,

BlueHelix HiTech RRT C is a high-efficiency, low emissions **premix condensing heat generator with heat exchanger in s/steel** and incorporated DHW production, equipped with a microprocessor control system.

It can use **Natural Gas (G20), Liquefied Gas (G30-G31), Propane Air (G230)** and, thanks to the **“Hydrogen plug-in”** system, it self adjusts to also work with mixtures of **natural gas and hydrogen** (Natural Gas/Hydrogen mixtures 80%/20%), that will soon arrive in Europe to fight global warming.

The sealed chamber unit is suitable for indoor installation or outdoors in a **partially protected place** (according to **EN 15502**) with temperatures to -5°C.

1.2 Control panel

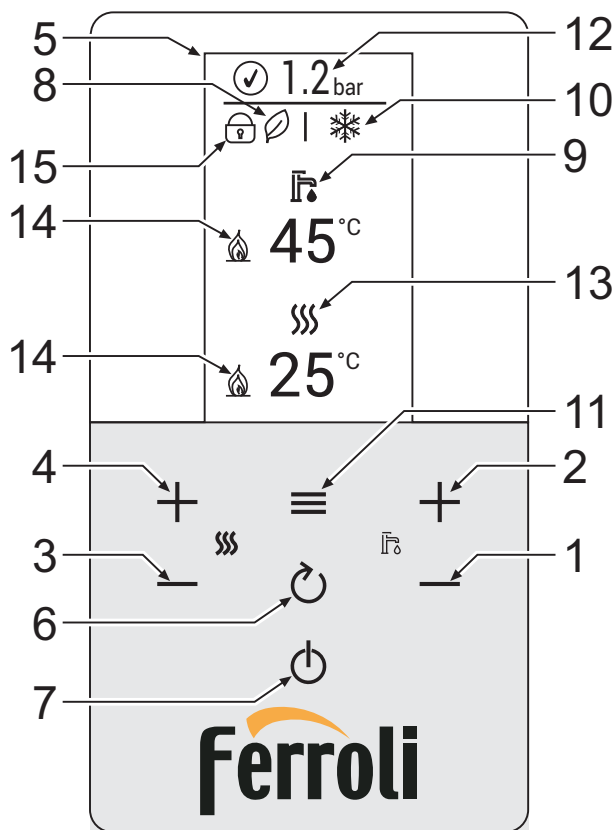


fig. 1- Control panel

Panel legend fig. 1

- | | | | |
|---|--|----|-----------------------|
| 1 | DHW temperature setting decrease button | 8 | Eco mode (🍃) |
| 2 | DHW temperature setting increase button | 9 | DHW mode |
| 3 | Heating system temperature setting decrease button | 10 | Summer/Winter mode |
| 4 | Heating system temperature setting increase button | 11 | Menu / confirm button |
| 5 | Display | 12 | System pressure |
| 6 | Return button | 13 | Heating mode |
| 7 | “Winter”, “Summer”, “Unit OFF”, “ECO”, “COMFORT” mode selection button | 14 | Burner lit |
| | | 15 | “Key lock” on |

Indication during operation

Heating

A heating request (generated by the Room Thermostat or Remote Timer Control) is indicated by the flashing radiator symbol.

When the burner is lit, the flame symbol appears and the 3 levels indicate the actual intensity.

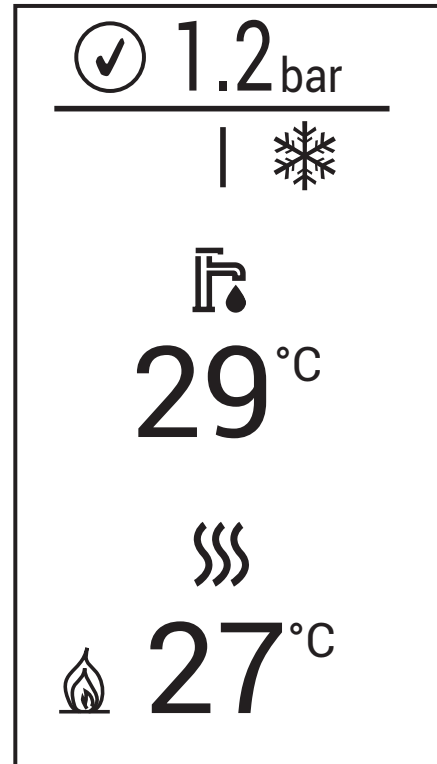


fig. 2

DHW (domestic hot water)

A DHW request (generated by hot water draw-off) is indicated by the flashing faucet icon.

When the burner is lit, the flame symbol appears and the 3 levels indicate the actual intensity.

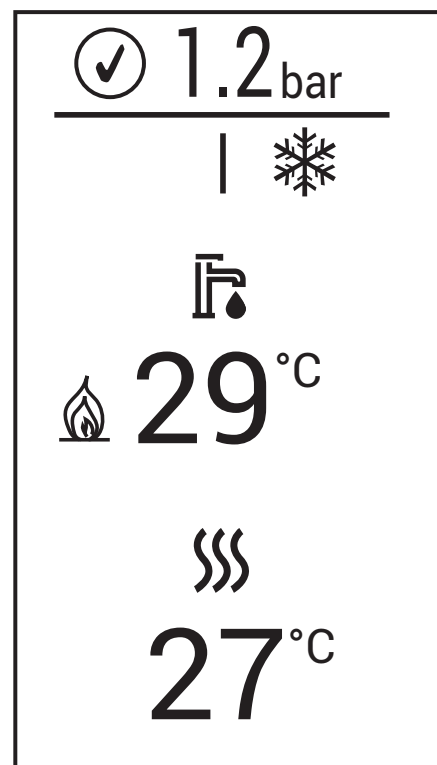


fig. 3



Comfort



In Comfort mode (restoration of boiler internal temperature) the flame symbol appears while the faucet flashes.

Frost protection

In frost protection mode (flow temperature below 5°C) the flame symbol appears.

Fault

In case of a fault, the display shows the fault code with different graphics depending on the type.

A-type fault (fig. 5): To unlock the boiler in the presence of this type of fault, press the button  until the message "Confirm?" appears. Then confirm with the button .

F-type fault (fig. 4): A fault which will be automatically reset after the problem has been eliminated.

Message-type fault (fig. 6): The fault is such as not to compromise boiler operation. The message disappears when the problem is eliminated.

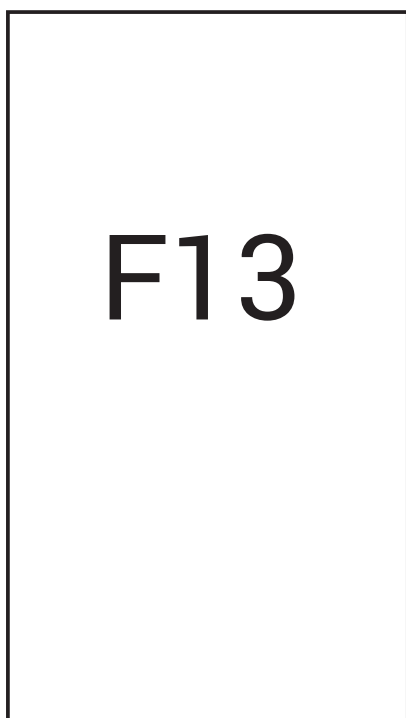


fig. 4

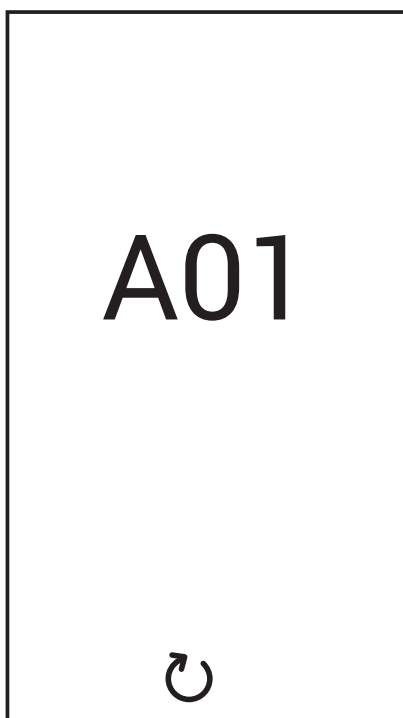


fig. 5

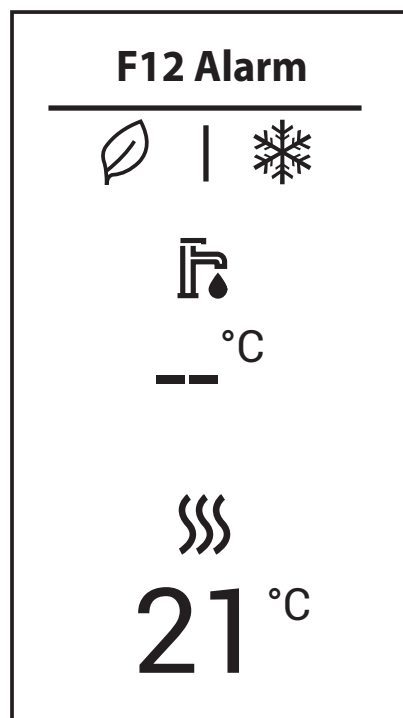


fig. 6

1.3 Connection to the power supply, switching on and off

Boiler not electrically powered



To avoid damage caused by freezing during long idle periods in winter, it is advisable to drain all the water from the boiler.

Boiler electrically powered

Electrically power to the boiler.

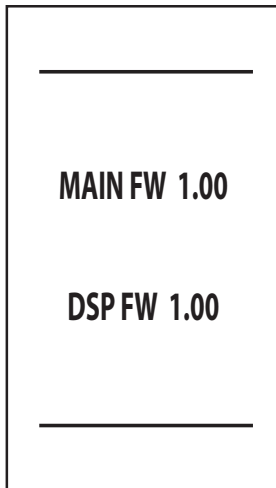


fig. 7- Switching on / Software version

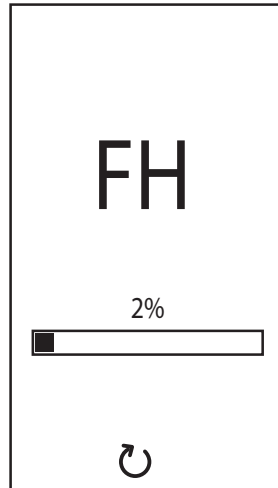


fig. 8- Vent with fan on

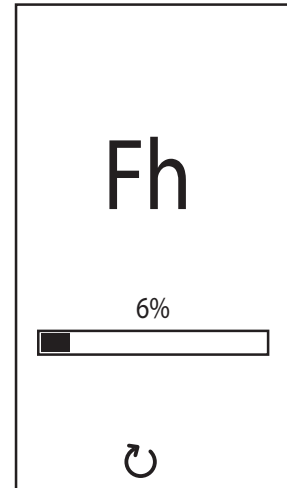


fig. 9- Vent with fan off

- During the first 5 seconds the display shows the software version of the board and display (fig. 7).
- For the following 20 seconds the display will show **FH** which identifies the heating system air venting cycle with the fan running (fig. 8).
- In the next 280 seconds, the venting cycle continues with the fan off (fig. 9).
- Open the gas valve ahead of the boiler
- When the message **Fh** disappears, the boiler is ready to operate automatically whenever hot water is drawn or in case of a room thermostat request

To interrupt the venting phase (FH or Fh), keep the button pressed until the message "Stop?" appears. Then confirm with the button .

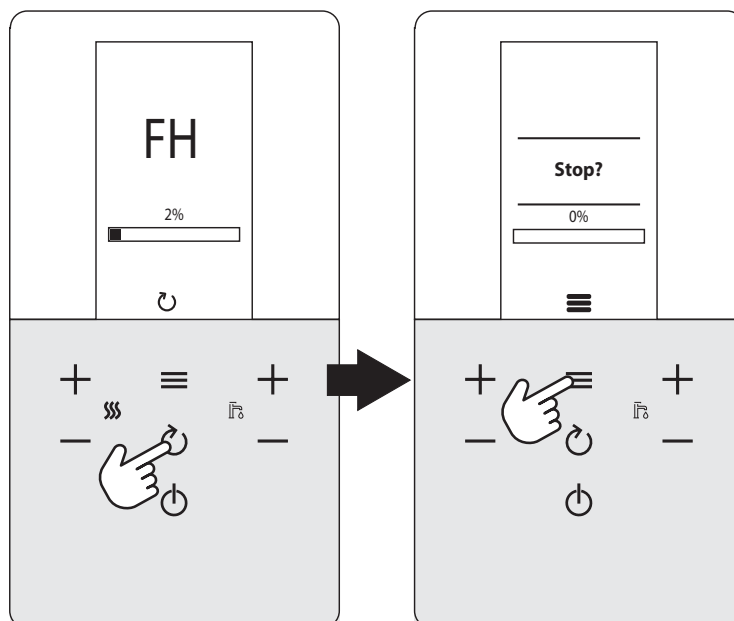




fig. 10



Turning the boiler off and on

Changing from one mode to another is possible by repeatedly pressing the button , following the sequence shown in fig. 11.

A = "Summer" mode - **B** = "Winter" mode - **C** = "Off" mode

To turn the boiler off, repeatedly press the button  until detail **C** of fig. 11 is displayed.

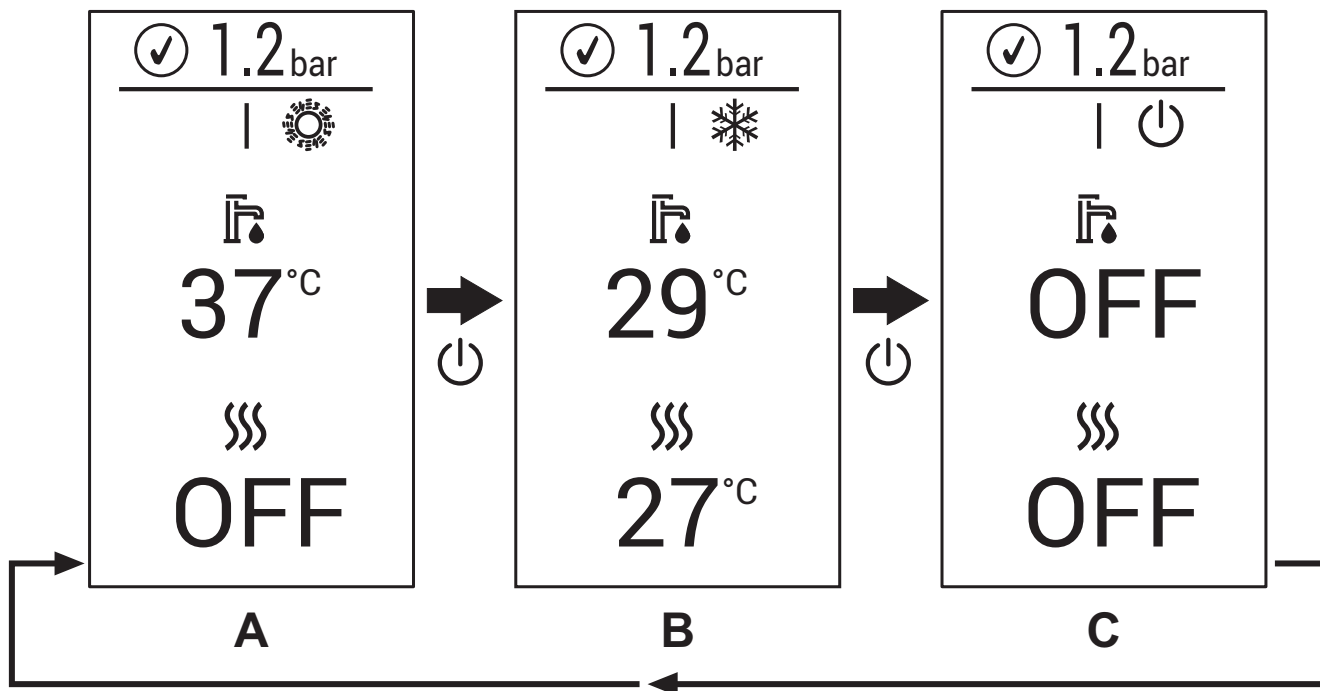



fig. 11- Turning the boiler off

When the boiler is turned off, the PCB is still powered. DHW and heating are disabled. The frost protection system remains on. To relight the boiler, press the button .

The boiler will be immediately ready in Winter and DHW mode.



The frost protection system does not work when the power and/or gas to the unit are turned off. To avoid damage caused by freezing during long shutdowns in winter, it is advisable to drain all water from the boiler, the DHW circuit and the heating system water; or drain just the DHW circuit and add a suitable antifreeze to the heating system, as prescribed in sec. 2.3.

1.4 Adjustments

Winter/summer switchover

Repeatedly press the button until the summer symbol (sun) appears, with the word "OFF" for heating (detail 10 - fig. 1): the boiler will only deliver hot water. The frost protection system remains on.

To reactivate the winter mode, repeatedly press the button until the snowflake appears.

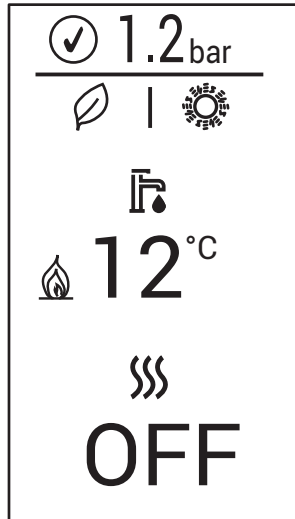


fig. 12- Summer

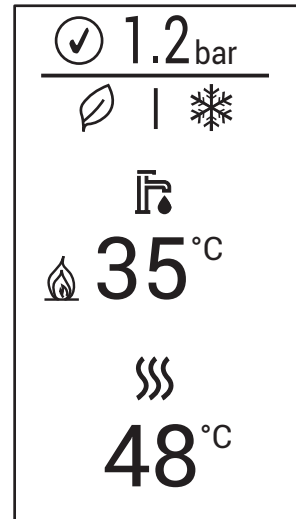


fig. 13- Winter

Heating temperature adjustment

Use the heating buttons (details 3 and 4 - fig. 1) to adjust the temperature from a minimum of 20°C to a maximum of 80°C. The maximum value can be changed inside the **parameters menu** [TSP] via parameter P40.

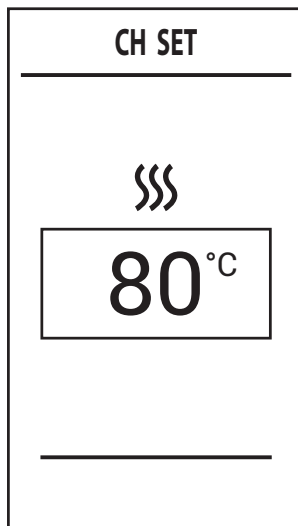


fig. 14

DHW temperature adjustment

Use the DHW buttons (details 1 and 2 - fig. 1) to adjust the temperature from a minimum of 40°C to a maximum of 55°C. The maximum value can be changed inside the **parameters menu** [TSP] via parameter P46.

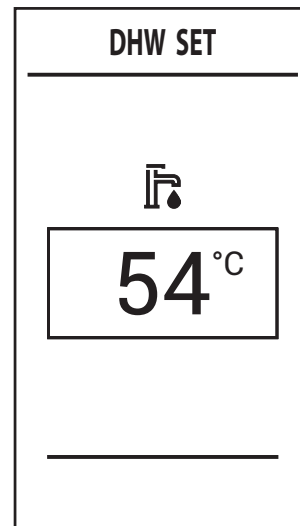


fig. 15



If little water is drawn and/or with a high water inlet temperature, the DHW outlet temperature may differ from the set temperature.

Room temperature adjustment (with optional room thermostat)





Using the room thermostat, set the temperature required in the rooms. If the room thermostat is not installed, the boiler will keep the system at the set system delivery setpoint temperature.

Room temperature adjustment (with optional remote timer control)

Using the remote timer control, set the required temperature in the rooms. The boiler will adjust the system water according to the required room temperature. For operation with remote timer control, please refer to the relevant instruction manual.



ECO/COMFORT selection

The unit has a function that ensures fast hot water delivery and maximum comfort for the user. When this function is active (**COMFORT** mode), the water in the boiler is kept at temperature, thus giving the immediate availability of hot water from the boiler when the faucet is turned on, avoiding waiting times.

The **COMFORT** function can be disabled by the user (**ECO** mode) by pressing the button  for 2 seconds. In **ECO** mode the display activates the symbol  (detail 12 - fig. 1). To activate **COMFORT** mode press the button  again for 2 seconds; the symbol  disappears.

Main menu [MENU]

Pressing the button  displays the **main menu** of the boiler **[MENU]** shown in fig. 16.

The desired items can be selected with the buttons  and  **heating**.

To access the menus contained in the **navigation menu [MENU]**, press the button  after selecting the desired item.

- **[Service]** - Menu reserved for the installer
See "Installer menu [SERVICE]" on page 12.
- **[Diagnostic]** - Provides information on boiler status, in real time.
See "Boiler information menu [Diagnostic]" on page 13.
- **[Counters]** - Boiler counters.
See "Boiler counters menu [Counters]" on page 14.
- **[Alarm]** - Storage of last faults that occurred in the boiler.
See "Boiler faults menu [Alarm]" on page 14.
- **[Display]** - For doing the display settings.
See "Display adjustment menu [Display]" on page 15.

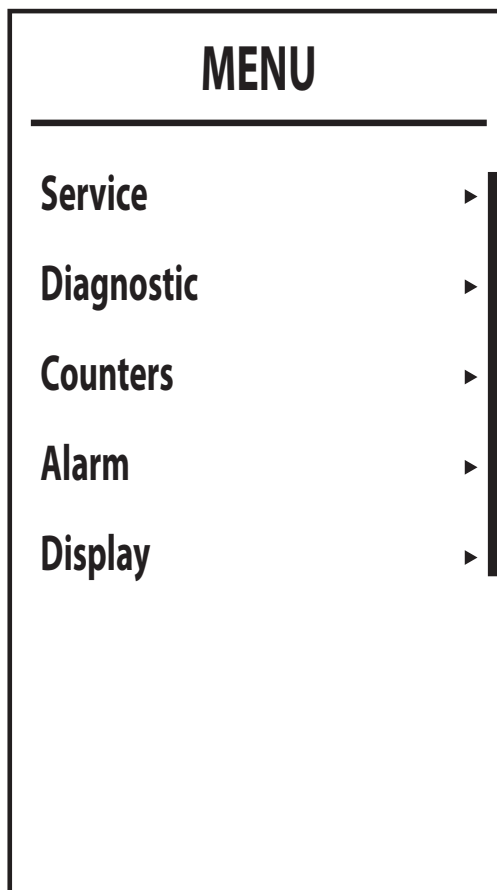


fig. 16- Main menu

Installer menu [SERVICE]

After selecting the **installer menu [Service]**, press the button . To continue, enter the password "1234". Use the buttons and **DHW** to set the cell value, and the buttons and **heating** to shift position (fig. 17).

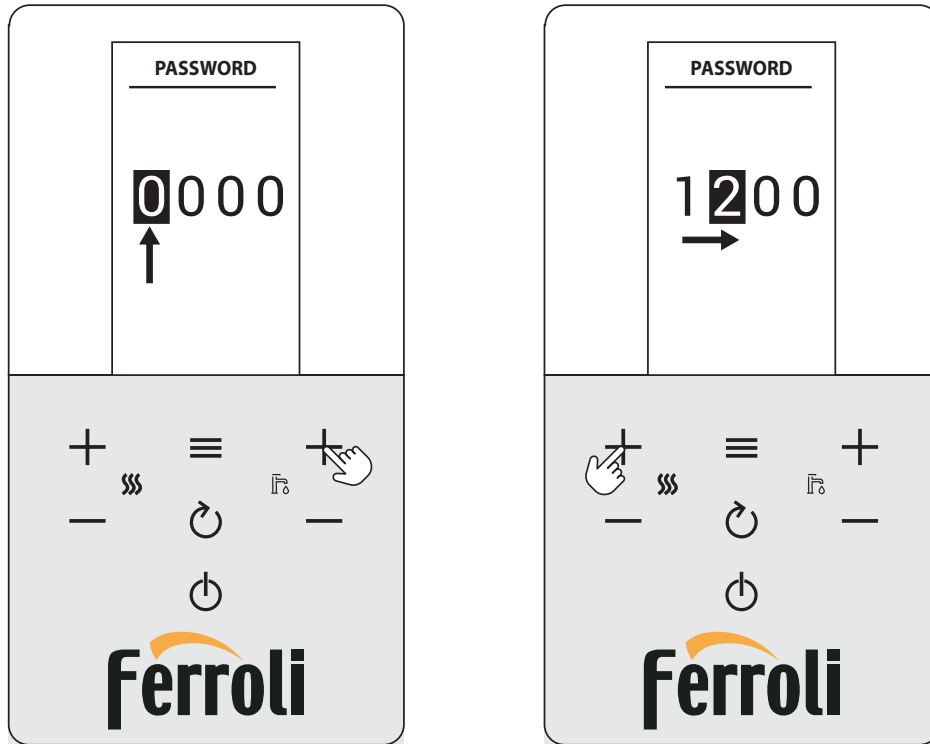


fig. 17- Password entry

Confirm with the button to access the **installer menu[SERVICE]** screen where the following menus are available:

- **[TSP]** - Menu for modifying transparent parameters
- **[Test]** - Activation of boiler Test mode.
- **[OTC]** - Setting of climatic curves for adjustment with external probe.
- **[Zone]** - Settings of climatic curves of additional zones.
- **[Auto Setup]** - This menu is used to activate calibration. Visible only with parameter **b27** set to **5**.

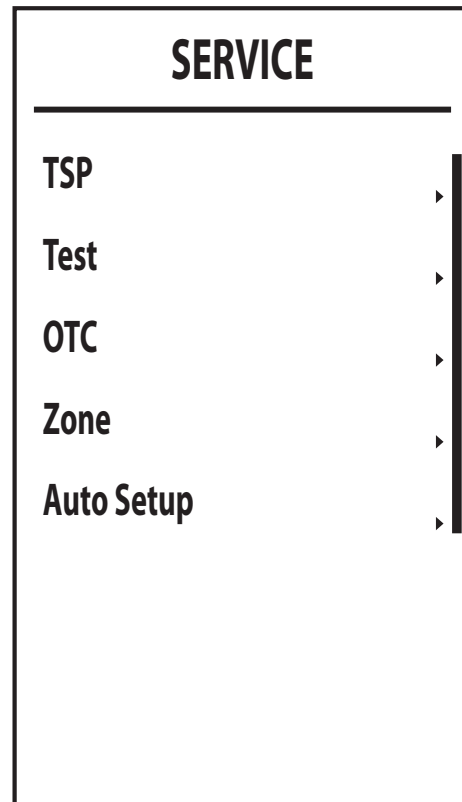


fig. 18



Boiler information menu [Diagnostic]

This menu provides the information, in real time, of the various sensors present in the boiler.

To access it, press the button  from the main screen, select the item **[Diagnostic]** and confirm with the button .

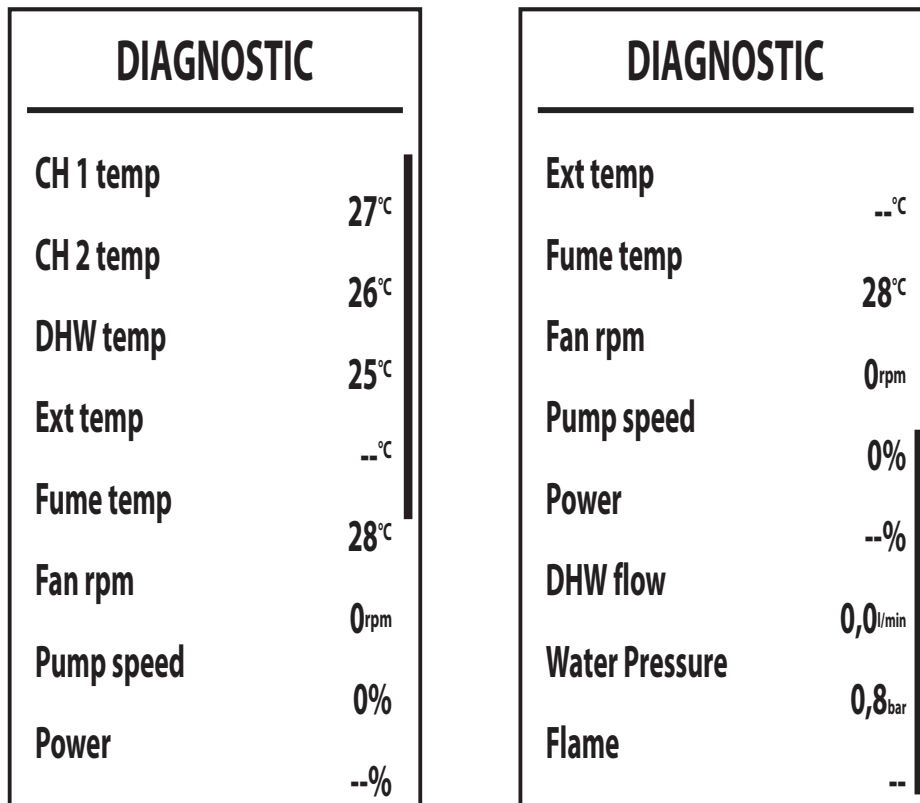


fig. 19

Table 1 - Description - Boiler information menu [Diagnostic]

Parameter displayed	Description	Range
[CH 1 temp]	NTC Flow sensor (°C)	0 ÷ 125 °C
[CH 2 temp]	NTC Return sensor (°C)	0 ÷ 125 °C
[DHW temp]	NTC DHW sensor (storage tank probe) (°C)	0 ÷ 125 °C
[Ext temp]	NTC External sensor (°C)	+70 ÷ -30°C
[Fume temp]	NTC Fume sensor (°C)	0 ÷ 125 °C
[Fan rpm]	Actual fan rpm	0 ÷ 9999 RPM
[Pump speed]	Actual modulating circulating pump speed (%)	00% = Min., 100% = Max.
[Power]	Actual burner power (%)	0 ÷ 100 %
[DHW flow]	Actual DHW draw (l/min)	00 ÷ 99 l/min
[Water Pressure]	Actual system water pressure (bar)	0.0 ÷ 9.9 bar
[Flame]	Flame status	-- ÷ 255

If the sensor is damaged or disconnected, the display will show dashes (--).

To return to the main screen, repeatedly press the button  or wait for automatic switching after 15 minutes.

Boiler counters menu [Counters]

The system counters are displayed in this menu:

[Burner]

Burner operation total hours.

[Ignition ok]

Number of successful ignitions

[Ignition error]

Number of failed ignitions.

[CH pump time]

Pump operation hours in heating.

[DHW pump time]

pump operation hours in DHW.

COUNTERS	
Burner	0h
Ignition ok	3
Ignition error	0
CH pump time	--h
DHW pump time	--h

fig. 20

Boiler faults menu [Alarm]

The card can store the last 10 faults. **Alarm 1** represents the most recent fault that occurred.

The codes of the faults saved are also displayed in the relevant menu of the Remote Timer Control.

Press the buttons **+** and **- Heating** to scroll the list of faults. **Cancel** is the last item in the list and which, once selected and confirmed with the button **≡**, allows all the faults history to be reset.

To exit the **Boiler faults menu [ALARM]**, press the button **↺** repeatedly until reaching the main screen or wait for automatic exit after 15 minutes.

ALARM		ALARM	
Alarm 1	37	Alarm 4	--
Alarm 2	37	Alarm 5	--
Alarm 3	13	Alarm 6	--
Alarm 4	--	Alarm 7	--
Alarm 5	--	Alarm 8	--
Alarm 6	--	Alarm 9	--
Alarm 7	--	Alarm 10	--
Alarm 8	--	Cancel	--

fig. 21

Display adjustment menu [Display]


In this menu it is possible to set some display parameters.




[Contrast] - Contrast adjustment

[Brightness] - Brightness adjustment

[Backlight time] - Display lighting duration

[Lock time]* - Key lock

After keypad inactivity for a time equal to the set value (minutes), the symbol  appears and the buttons are inhibited.

To reactivate the keypad, press the buttons  and  simultaneously until the symbol  disappears (about 2 sec.).

* This function is available from version DSP FW 1.03.

[Reset] - Restore factory values

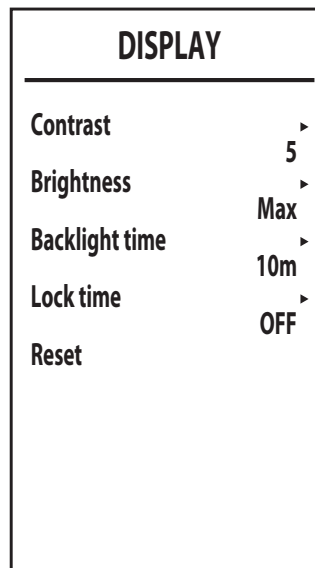


fig. 22









Sliding Temperature



When the external probe (optional) is installed, the boiler adjustment system works with "Sliding Temperature". In this mode, the heating system temperature is regulated according to weather conditions, to ensure high comfort and energy efficiency throughout the year. In particular, as the outside temperature increases the system flow temperature decreases according to a specific "compensation curve".

With "**Sliding Temperature**", the temperature set using the heating buttons (details 3 and 4 - fig. 1) becomes the maximum system flow temperature. It is advisable to set a maximum value to allow system adjustment throughout its useful operating range.



The boiler must be adjusted at the time of installation by qualified personnel. However, the user can make any further adjustments necessary to optimize comfort levels.



Compensation curve and curve offset

From the main screen, press the button  to access the **navigation menu [MENU]**. Using the buttons  and  **heating** select the **installer menu [SERVICE]** and confirm with the button . Enter the password (see "Installer menu [SERVICE]" on page 12) and press the button . Using the buttons  and  **heating** select the menu **Climate curves setting [OTC]** and confirm by pressing the button .

Curve: select this item and use the buttons  and  **DHW** to adjust the desired curve from 1 to 10.

By adjusting the curve to 0, the sliding temperature adjustment is disabled (see fig. 24).

Offset: Access this sub-menu to access parallel offset of the curves using the buttons  and  **DHW**. Refer to fig. 25 for the characteristics.

OFF: This item gives access to the "external temperature shutdown" value. Use the buttons  and  **DHW** to modify the value (from 0 to 40°C), if set to 0 the function is disabled. Ignition occurs when the temperature of the external probe is more than 2°C lower than the set temperature.

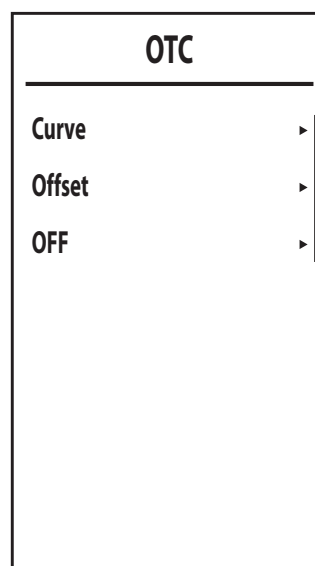


fig. 23

To exit the **Climatic curves setting [OTC]** menu, press the button repeatedly until reaching the main screen.

If the room temperature is lower than the desired value, it is advisable to set a higher order curve and vice versa. Proceed by increasing or decreasing in steps of one and check the result in the room.

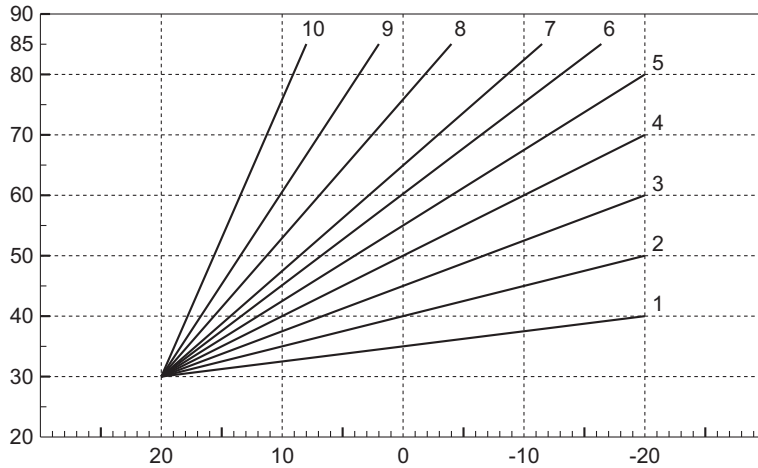


fig. 24- Compensation curves

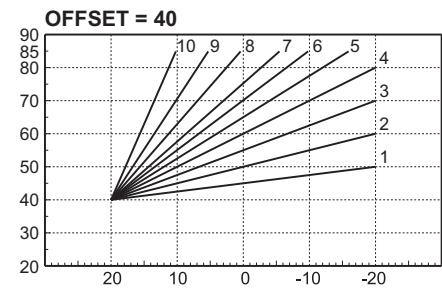
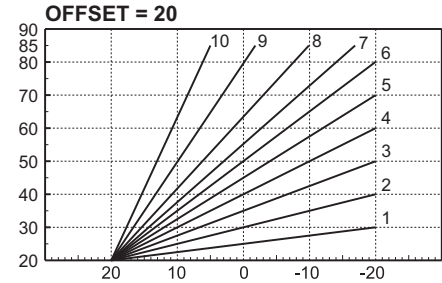


fig. 25- Example of compensation parallel curve offset

Adjustments from Remote Timer Control

If the boiler is connected to the Remote Timer Control (optional), the previously described adjustments are managed as described in table 2.

Table 2

Heating temperature adjustment	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
DHW temperature adjustment	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
Summer/Winter Switchover	Summer mode has priority over a possible Remote Timer Control heating demand.
Eco/Comfort selection	On disabling DHW from the Remote Timer Control menu, the boiler selects Economy mode. In this condition, the eco/comfort button on the boiler panel is disabled.
	By enabling DHW from the Remote Timer Control menu, the boiler selects the Comfort mode (if previously enabled from the boiler panel). In this condition it is possible select one of the two modes on the boiler panel.
Sliding Temperature	You can make all the adjustments by using the remote timer control.




System water pressure adjustment

The filling pressure, with system cold, read on the boiler water gauge (detail 2 - fig. 26) must be approx 1.0 bar. If the system pressure falls below minimum values, the boiler stops and fault **F37** is displayed.

Once the system pressure is restored, the boiler will activate the 300-second air venting cycle, indicated on the display by **Fh**.

To avoid boiler shutdown, it is advisable to periodically check (with system cold) the pressure on the pressure gauge or on the display (detail 12 - fig. 1). In case of a pressure below 0.8 bar, it is advisable to restore it.

Display	Description	Operation
F40	High pressure	The boiler stops
	Pressure slightly high	The boiler works at reduced power

Display	Description	Operation
	Optimum pressure	Normal operation
	Pressure slightly low (The indication with the symbol  is visible only if parameter b09 is set to 1).	The boiler continues to work. It is advisable to refill the system as soon as possible.
F37	Low pressure	The boiler stops

System draining

The drain cock ring nut is located under the safety valve inside the boiler.

To drain the system, turn the ring nut (ref. 3 - fig. 26) counter-clockwise to open the cock. Do not use any tools; use hands only.

To drain only the water in the boiler, first close the shut-off valves between the system and boiler before turning the ring nut.

To connect the safety valve to a disposal system, install the kit supplied (details 1 and 2 - fig. 26).

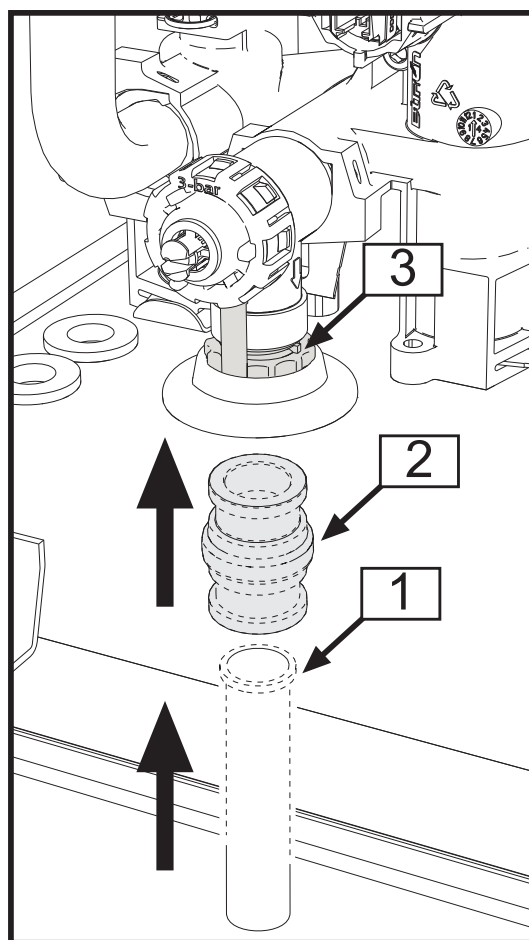


fig. 26

2. Installation

2.1 General Instructions



This unit must only be used for its intended purpose. This unit is designed to heat water to a temperature below boiling point and must be connected to a heating system and/or a water supply system for domestic use, compatible with its performance, characteristics and its heating capacity. Any other use is deemed improper.

BOILER INSTALLATION MUST ONLY BE CARRIED OUT BY QUALIFIED PERSONNEL, IN ACCORDANCE WITH ALL THE INSTRUCTIONS GIVEN IN THIS TECHNICAL MANUAL, THE PROVISIONS OF CURRENT LAW, THE PRESCRIPTIONS OF THE TECHNICAL STANDARDS (BS), ANY LOCAL REGULATIONS AND THE RULES OF PROPER WORKMANSHIP.

Incorrect installation can cause damage or injury for which the manufacturer declines any responsibility.

Installation of this unit must be carried out in strict compliance with the present instructions and the following regulations applicable in Great Britain.

Gas Safety Regulations (Installations & Use).

Local Building Regulations..

The Building Regulations (Part L).

The Buildings Standards (Scotland - Consolidated) Regulations. British Standards Codes of Practice (BSI):

B.S.	5440	Detail 1	Flues
B.S.	5440	Detail 2	Air supply and ventilation
B.S.	5449	.....	Systems for hot water production with forced circulation
B.S.	6798	.....	Installation of gas-fired boilers for hot water
B.S.	6891	.....	Gas systems
B.S.	7671	.....	IEE wiring system regulations
B.S.	4814	.....	Specifications for expansion tanks
B.S.	5482	.....	LPG systems
B.S.	7593	.....	Water treatment in central heating systems for domestic hot water production
B.S.	5546	Installation of systems for domestic hot water production

Model Water By-Laws

B.S.	5955-8	Installation of plastic pipes
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For Northern Ireland, observe the current applicable regulations.

Safe handling of materials

Pay attention when handling the boiler insulation panels because the material they are made of could irritate the skin. No part of the boiler contains asbestos, mercury or CFC's.

Advice for transport and handling

For lifting and transport always take suitable safety precautions: keep your back straight, bend knees, do not turn your body, move feet, avoid bending forward or sideways and keep the load as close as possible to your body.

If possible, use a trolley or other suitable means to carry the boiler.

Grip the boiler firmly and, before lifting it, try and find the point where the load is concentrated in order to establish the centre of gravity and suitably reposition yourself.



2.2 Place of installation



The combustion circuit is sealed with respect to the place of installation and therefore the unit can be installed in any room except in a garage. The place of installation must be sufficiently ventilated to prevent the creation of dangerous conditions in case of even small gas leaks. Otherwise there may be risk of suffocation and intoxication or explosion and fire. This safety standard is set by the EEC Directive no. 2009/142 for all units that use gas (including sealed chamber units).

The unit is designed to operate in a partially protected place, with minimum temperature of -5°C. If provided with the special frost protection kit it can be used with minimum temperature to -15°C. The boiler must be installed in a sheltered place, e.g. under the slope of a roof, inside a balcony or in a protected recess.

The place of installation must be free of dusts, flammable materials or objects, or corrosive gases.

The boiler is arranged for wall mounting and comes as standard with a hooking bracket. Wall fixing must ensure stable and effective support for the generator.



If the unit is enclosed in a cabinet or mounted alongside, a space must be provided for removing the casing and for normal maintenance operations. fig. 27 gives the minimum distances to be respected.

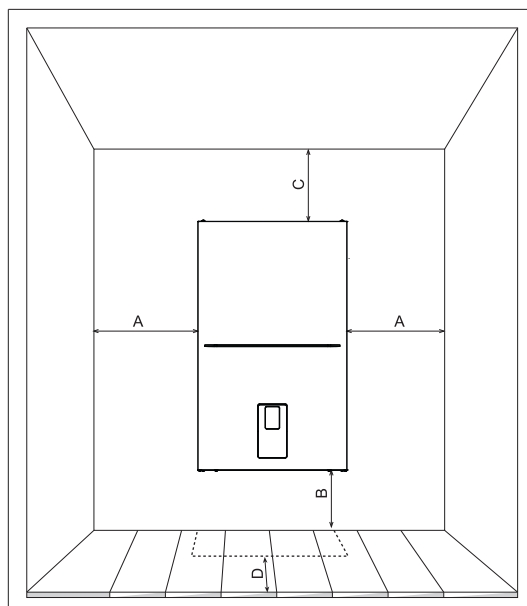


fig. 27

A	Min. 2.5 cm
B	Min. 20 cm
C	Min. 30cm
D	Min. 60 cm (via an openable panel)

2.3 Plumbing connections

Important

The heating capacity of the boiler must be previously established by calculating the building's heat requirement according to the current regulations. To ensure proper operation and long boiler life, the plumbing system must be adequately sized and complete with all the necessary accessories, including a room thermostat, a thermostatic radiator valve (TRV), etc. The system flow and return pipes must have a diameter of at least 22 mm for the first 3 m of length from the unit.

If the system delivery and return pipes follow a path where air pockets could form in certain places, it is advisable to install vent valves at these points. Also, install type "A" drain cocks at the lowest points in the system to allow complete emptying.

The temperature drop between the delivery manifold and the return to the boiler should not exceed 20 °C.

A flow rate of at least 6 litres/min through the heat exchanger is required.



Do not use the water system pipes to earth electrical appliances.

Before installation, carefully flush all the heating system pipes to remove any residuals or impurities that could affect proper operation of the unit (as required by BS 7593 Building regs Doc L).

Carry out the connections to the unit as indicated in .



The safety valve discharge must be connected to a 15 mm diameter copper pipe descending from the boiler to run off system water in case of overpressure in the heating circuit. Otherwise, the boiler manufacturer cannot be held liable if the discharge valve operates and floods the room. The discharge must be run to the outside of the building to prevent the risk of damage or injury caused by discharged hot water in case of overpressure in the system.

Connections to the boiler are to be made in such a way as to ensure that its internal pipes and fittings are free of stress. If a non-return valve is installed also on the DHW circuit (if provided for), it is necessary to install a safety valve between the boiler and circuit (with non-return valve at least 3 metres from the boiler) or an expansion tank for domestic use.

Typical System By-pass layout

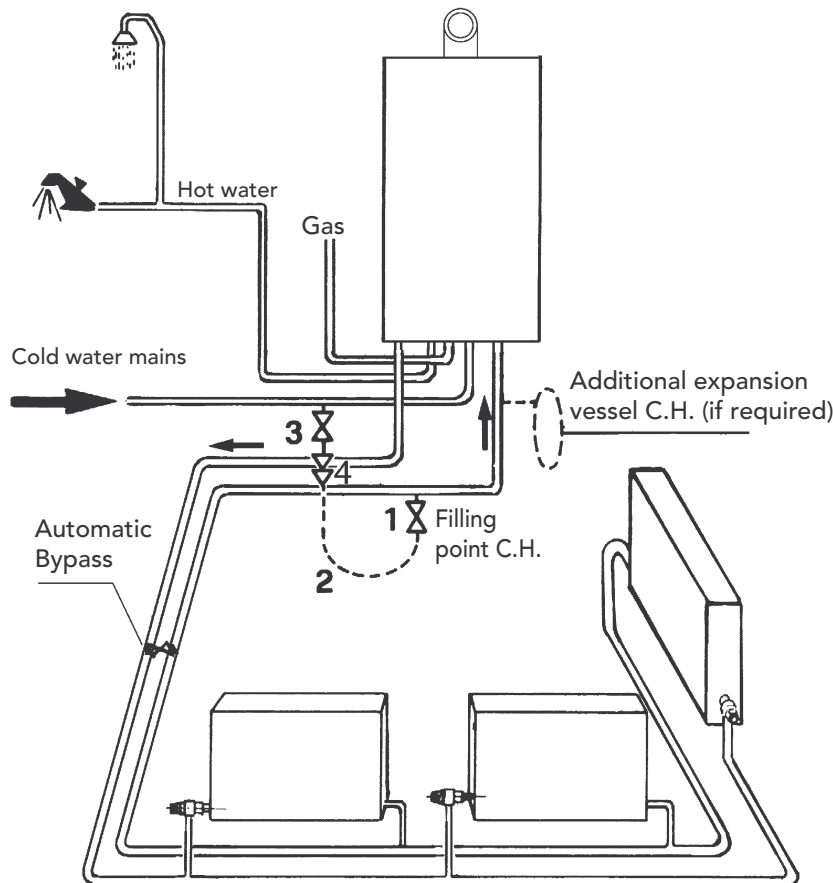


fig. 28

The automatic by-pass must be installed a least 3 metres from the boiler & set to allow a minimum of 6 ltr/min through the valve when all TRV's are closed.

Make up water

Provision must be made for replacing water lost from the sealed system. Reference should be made to BS6798, for methods of filling and making up sealed systems. There must be no direct connection between the boiler's central heating system and the mains water supply. The use of mains water to charge and pressurise the system directly, is conditional upon the Local Water Byelaws. Again any such connection must be disconnected after use. Ensure the filling point is on the return pipe to the boiler.

Attention - is drawn to the Model Water Byelaws.

Filling Loop in fig. 29 is supplied with boiler.

Key

- 1. C.H. filling valve
- 2. Temporary connection
- 3. Cold water supply valve
- 4. Double check valve

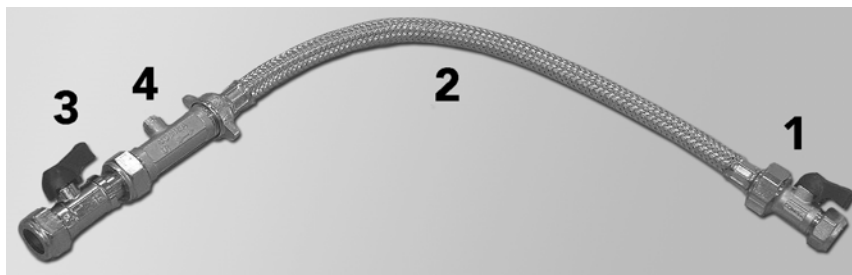
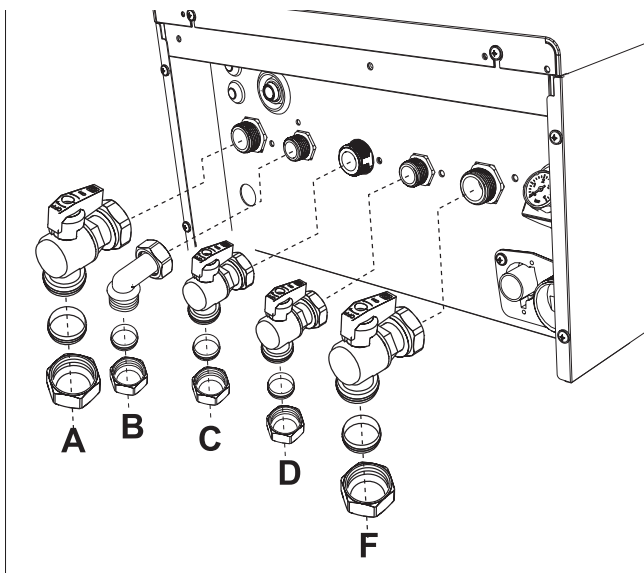


fig. 29 - Filling Loop (supplied with boiler)

The maximum domestic water pressure for the inlet supply is 9 bar (130 P.S.I.). If the cold mains supply exceeds 5 bar (72 P.S.I.), a water governor or pressure reducing valve must be fitted by the installer into the mains supply in an inconspicuous but accessible position preferably between 3 and 5 metres (10-16ft) before the appliance. Such a valve must be approved by WRAS. The fitting of a DHW expansion vessel is also recommended.

Isolation valve kit

The isolation valves supplied (see fig. 30) must be installed between the boiler and heating system to allow the boiler to be isolated from the system if necessary.



- A Heating Flow 3/4" (22mm with isolation valve fitted)
- B DHW outlet elbow 1/2" (15mm with outlet union fitted)
- C Gas 3/4" (22mm with yellow isolation valve fitted)
- D Cold water inlet 1/2" (15mm with isolation valve fitted)
- F Heating Return 3/4" (22mm with isolation valve c/w filter fitted)

fig. 30 - Isolation valve kit

Frost protection system, antifreeze liquids, additives and inhibitors

If necessary, the use of antifreeze liquids, additives and inhibitors is allowed, only and exclusively if their manufacturer guarantees that the products are suitable for use and do not cause damage to the boiler's heat exchanger or other components and/or materials of the boiler and system. It is prohibited to use generic antifreeze liquids, additives or inhibitors that are not expressly suitable for use in heating systems and compatible with the materials of the boiler and system

System water characteristics



BlueHelix HiTech RRT C boilers are suitable for installation in heating systems with non-significant entry of oxygen (ref. systems "case I" EN14868). A physical separator (e.g. plate heat exchanger) must be provided in systems with continuous entry of oxygen (e.g. underfloor systems without antidiffusion pipes or open vessel), or intermittent (less than 20% of system water content).

The water inside a heating system must comply with the applicable laws and regulations, the characteristics required by UNI 8065, and the indications of EN14868 (protection of metal materials against corrosion) must be observed.

The filling water (first filling and subsequent replenishment) must be clear, with hardness below 15°F and treated with suitable chemical conditioners against the initiation of corrosion, that are not aggressive on metals and plastics, do not develop gases and, in low-temperature systems, do not cause proliferation of bacterial or microbial masses.

The water contained in the system must be checked regularly (at least twice a year during the season of use, as required by UNI8065) and have: a possibly clear appearance, a hardness lower than 15°F for new systems or 20°F for existing systems, a PH higher than 7 and less than 8.5, an iron content (Fe) less than 0.5 mg/l, a copper content (Cu) less than 0.1 mg/l, a chloride content lower than 50mg/l, an electrical conductivity lower than 200 µS/cm, and must contain chemical conditioning agents in a concentration sufficient to protect the system at least for one year. Bacterial or microbial loads must not be present in low temperature systems.

Only use conditioners, additives, inhibitors and antifreeze liquids declared by the producer suitable for use in heating systems and that do not cause damage to the heat exchanger or other components and/or materials of the boiler and system.

Chemical conditioners must ensure complete deoxygenation of the water, contain specific protective agents for yellow metals (copper and its alloys), anti-scaling agents for limestone, neutral PH stabilizers and, in low-temperature systems, specific biocides for use in heating systems.

Recommended chemical conditioners:

SENTINEL X100 and SENTINEL X200

FERNOX F1 and FERNOX F3

The unit is equipped with a frost protection system that activates the boiler in heating mode when the system flow water temperature falls below 6°C. The device is not active if the power and/or gas supply to the unit is turned off. If necessary, to protect the system use a suitable antifreeze liquid that meets the above requirements and provided for by UNI 8065.

In the presence of adequate chemical/physical system and feed water treatments and related high cyclicality controls able to ensure the required parameters, for industrial process applications the product can be installed in open-vessel systems with vessel hydrostatic height able to ensure compliance with the minimum operating pressure indicated in the product technical specifications.

The presence of deposits on the boiler exchange surfaces due to non-compliance with the above requirements will involve non-recognition of the warranty.

2.4 Gas connection



Before making the connection, ensure that the unit is arranged for operation with the type of fuel available.

The gas connection must be made to the relevant connection (see fig. 64) in compliance with current legislation, using a rigid metal pipe or a continuous wall flexible hose in stainless steel, placing a gas valve between the system and boiler. Make sure all the gas connections are tight. Otherwise there may be a risk of fire, explosion or suffocation.



2.5 Electrical connections

ATTENTION



BEFORE CARRYING OUT ANY OPERATION REQUIRING REMOVAL OF THE CASING, DISCONNECT THE BOILER FROM THE ELECTRIC MAINS WITH THE MAIN SWITCH.

NEVER TOUCH THE ELECTRICAL COMPONENTS OR CONTACTS WITH THE MAIN SWITCH TURNED ON! DANGER OF ELECTRIC SHOCK WITH RISK OF INJURY OR DEATH!



The unit must be connected to an efficient grounding system in accordance with applicable safety regulations. Have the efficiency and suitability of the grounding system checked by professionally qualified personnel; the Manufacturer declines any liability for damage caused by failure to ground the system.

The boiler is pre-wired and equipped with a three-core connection cable to the electric line without plug. The connections to the grid must be made with a permanent connection and equipped with a bipolar switch with contact opening of at least 3 mm, interposing fuses of max. 3A between the boiler and line. Make sure to respect the polarities (LINE: brown wire / NEUTRAL: blue wire / GROUND: yellow-green wire) in the connections to the electric line.



The unit's power cable **MUST NOT BE REPLACED BY THE USER. If the cable gets damaged, turn the unit off and have the cable replaced only by professionally qualified personnel.** In case of replacement, use exclusively "HAR H05 VV-F" 3x0.75 mm² cable with maximum ext. diameter of 8 mm.

Room thermostat (optional)



ATTENTION: THE ROOM THERMOSTAT MUST HAVE VOLTAGE-FREE CONTACTS. CONNECTING 230V TO THE ROOM THERMOSTAT TERMINALS WILL PERMANENTLY DAMAGE THE PCB.

When connecting a time control or timer, do not take the power supply for such devices from their cutoff contacts. Their power supply must be via a direct connection from the grid or with batteries, depending on the kind of device.

Accessing the electrical terminal block and fuse

Remove the front panel ("Opening the front panel" on page 38) to access the terminal block (M) and fuse (F) by proceeding as follows (fig. 31 and fig. 32). **The terminals indicated in fig. 31 must be with voltage-free contacts (not 230V).** The arrangement of the terminals for the various connections is also given in the wiring diagram in fig. 70.

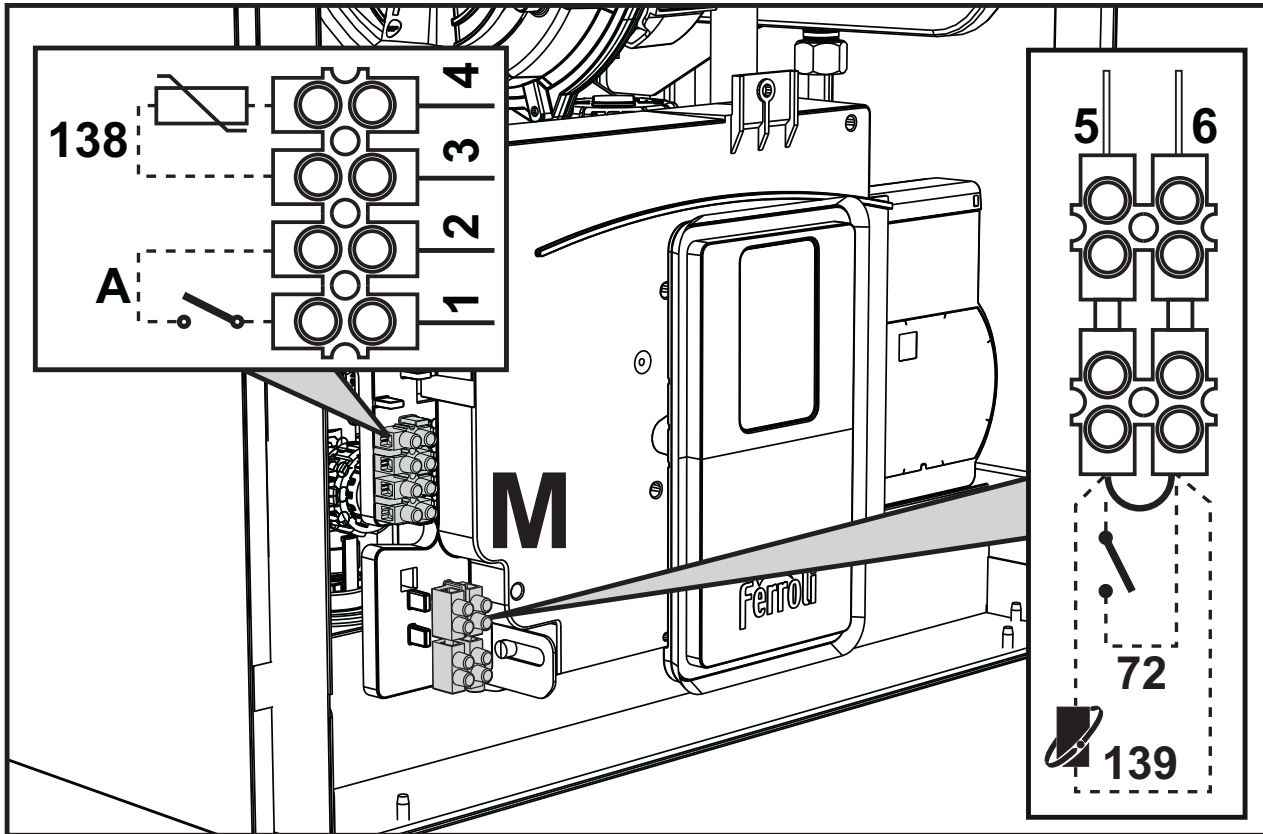


fig. 31

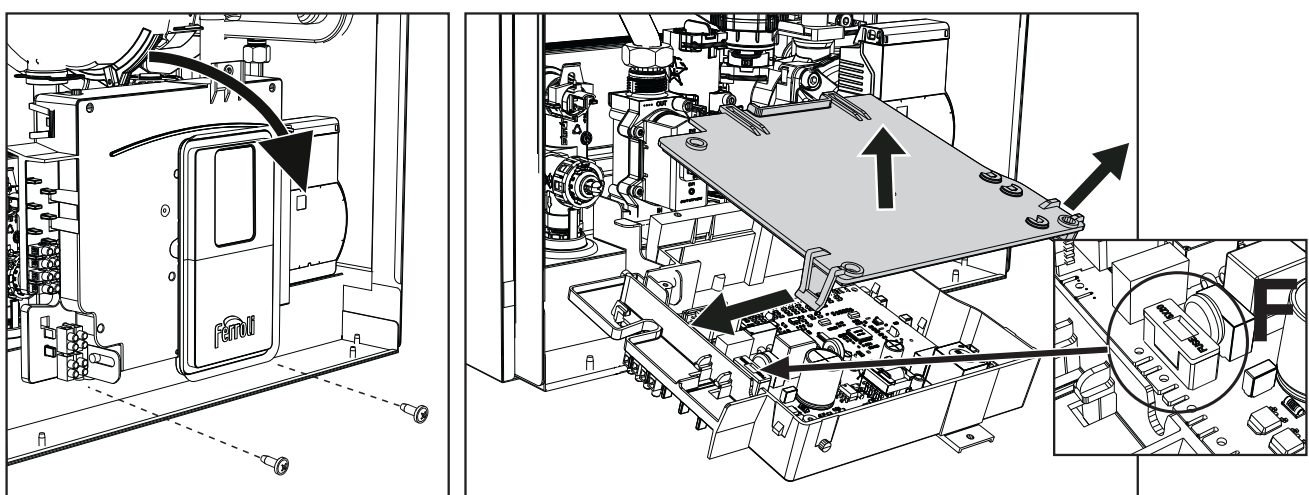


fig. 32

Variable output relay card LC32 (optional - 043011X0)

The variable output relay **LC32** consists of a small card with a switchover of free contacts (closed means contact between C and NO). Operation is managed by the software.

For installation, carefully follow the instructions provided in the kit package and on the wiring diagram of fig. 70.

To use the desired function, refer to the table 3.

Table 3- Settings LC32

Parameter b07	Function LC32	Action LC32
0	Manages a secondary gas valve (default)	The contacts are closed when the gas valve (in the boiler) is powered
1	Use as an alarm output (warning light comes on)	The contacts are closed when there is an error condition (generic)
2	Manages a water loading valve	The contacts are closed until the water pressure in the heating circuit is restored to the normal level (after manual or automatic topping up)
3	Manages a solar 3-way valve	The contacts are closed when the DHW mode is active
4	Manages a second heating pump	The contacts are closed when the heating mode is active
5	Use as an alarm output (warning light goes off)	The contacts are opened when there is an error condition (generic)
6	Indicates ignition of the burner	The contacts are closed when the flame is present
7	Manages the trap heater	The contacts are closed when the frost protection mode is active

ON/OFF (A fig. 31) configuration

Table 4- Switch A setting

DHW configuration	Parameter b06	
b01 = 3	b06=0	Contact open disables DHW and re-enables it if closed.
	b06=1	Contact open disables heating and displays F50 . Contact closed enables heating.
	b06=2	The contact acts as a room thermostat.
	b06=3	Contact open displays F51 and the boiler continues to operate. It is used as an alarm.
	b06=4	The contact acts as a limit thermostat, if open it displays F53 and turns off the request.

2.6 Fume ducts



THE BOILERS MUST BE INSTALLED IN ROOMS THAT MEET THE FUNDAMENTAL VENTILATION REQUIREMENTS. OTHERWISE THERE IS A DANGER OF ASPHYXIA OR POISONING.

READ THE INSTALLATION AND MAINTENANCE INSTRUCTIONS BEFORE INSTALLING THE UNIT.

ALSO RESPECT THE DESIGN INSTRUCTIONS.

IN CASE OF PRESSURES EXCEEDING 200 Pa INSIDE THE FUME EXHAUST PIPES, THE USE OF CLASS "H1" FLUES IS MANDATORY.

Important

The unit is a "C-type" with sealed chamber and forced draft; the air inlet and fume outlet must be connected to one of the extraction/suction systems indicated below. Before proceeding with installation, check and carefully observe the above instructions. Also, comply with the provisions on the positioning of wall and/or roof terminals and the minimum distances from windows, walls, ventilation openings, etc.

In case of installation with maximum resistance (coaxial or separate flue) it is advisable to carry out a calibration procedure [AUTO SETUP] to optimize boiler combustion.

Connection with coaxial pipes

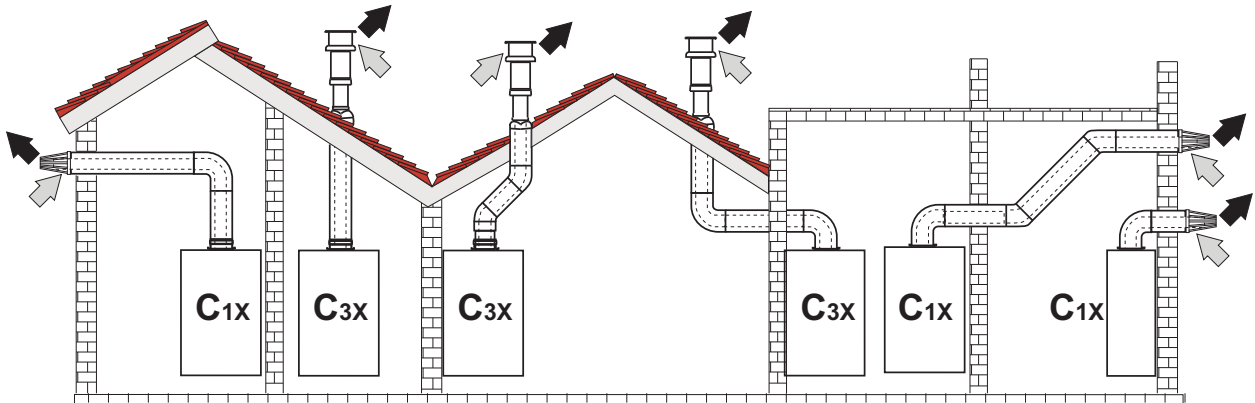


fig. 33- Examples of connection with coaxial pipes (⇨ = Air / ⇨ = Fumes)

For coaxial connection, fit the unit with one of the following starting accessories. For the wall hole dimensions, refer to the figure on the cover. Any horizontal sections of the fume exhaust must be kept sloping slightly towards the boiler, to prevent possible condensate from flowing back towards the outside and causing dripping.

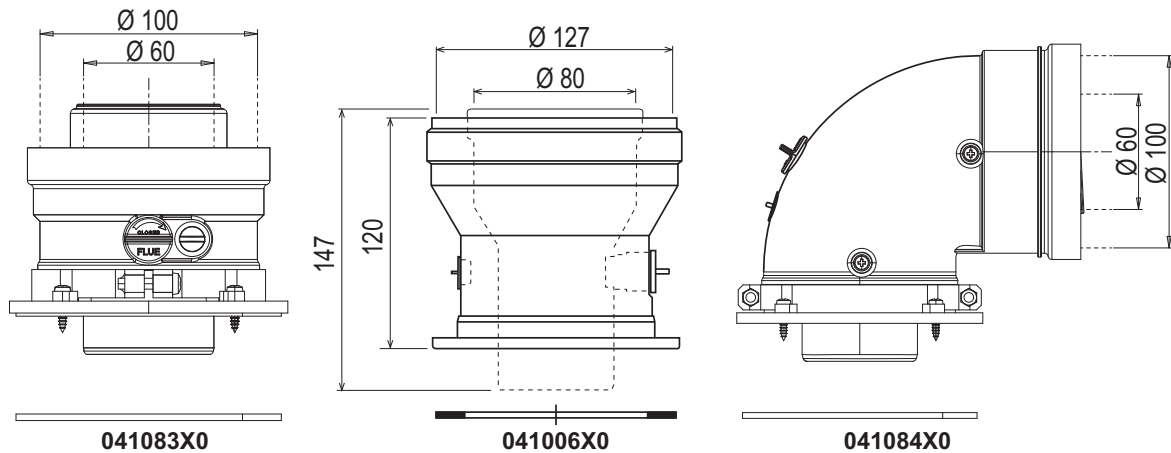


fig. 34- Starting accessories for coaxial ducts

Table 5- Max. length coaxial ducts

	Coaxial 60/100	Coaxial 80/125
Max. permissible length (horizontal)	All models 7 m	BlueHelix HiTech RRT 24 C = 28 m BlueHelix HiTech RRT 28 C = 20 m BlueHelix HiTech RRT 34 C = 20 m
Max. permissible length (vertical)	All models 8 m	
Reduction factor 90° bend	1 m	0.5 m
Reduction factor 45° bend	0.5 m	0.25 m

Connection with separate pipes

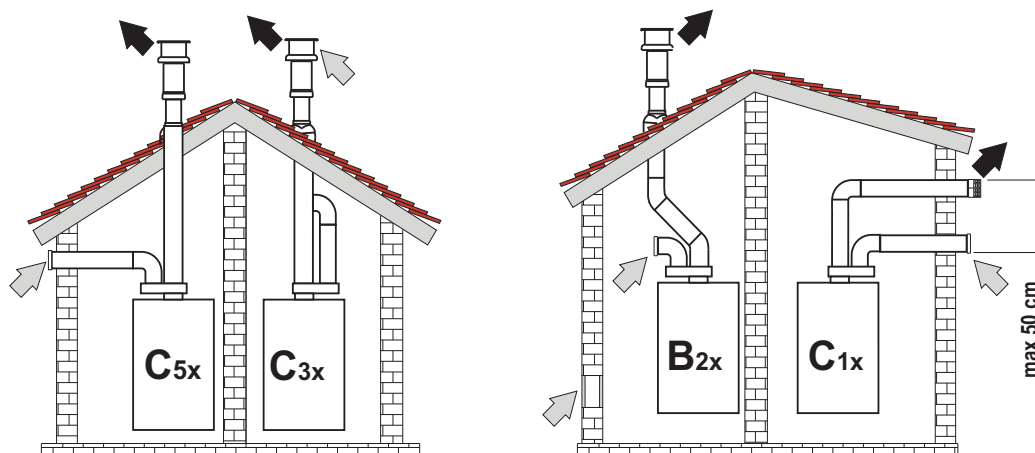


fig. 35- Examples of connection with separate pipes (⇐ = Air / ⇨ = Fumes)

Table 6- Typology

Type	Description
C1X	Wall horizontal exhaust and intake. The inlet/outlet terminals must be concentric or close enough to be subjected to similar wind conditions (within 50cm)
C3X	Roof vertical exhaust and intake. Inlet/outlet terminals like for C12
C5X	Separate wall or roof intake and exhaust and in any case in areas with different pressures. The exhaust and intake must not be located on opposite walls
C6X	Intake and exhaust with separately certified pipes (EN 1856/1)
B2X	Intake from installation room and wall or roof exhaust ⚠ IMPORTANT- THE ROOM MUST BE PROVIDED WITH APPROPRIATE VENTILATION

For the connection of separate ducts, fit the unit with the following starting accessory:

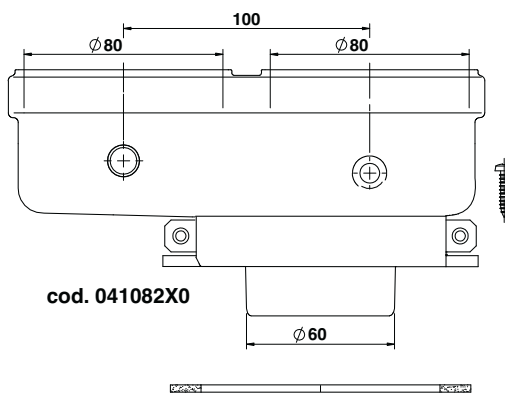


fig. 36- Starting accessory for separate ducts

Before installation, make sure the maximum permissible length has not been exceeded by means of a simple calculation:

1. Establish the layout of the system of split flues, including accessories and outlet terminals.
2. Consult table 8 and identify the losses in m_{eq} (equivalent m) of every component, according to the installation position.
3. Check that the sum total of losses is less than or equal to the maximum permissible length in table 7.

Table 7- Max. length separate ducts

Max. permissible length	BlueHelix HiTech RRT 24 C = 80 m_{eq} BlueHelix HiTech RRT 28 C = 70 m_{eq} BlueHelix HiTech RRT 34 C = 70 m_{eq}
--------------------------------	--

Table 8- Accessories

				Losses in m_{eq}		
				Air intake	Fume exhaust	
					Vertical	Horizontal
Ø 80	PIPE	1 m M/F	1KWMA83W	1.0	1.6	2.0
	BEND	45° M/F	1KWMA65W	1.2	1.8	
		90° M/F	1KWMA01W	1.5	2.0	
	PIPE SECTION	with test point	1KWMA70W	0.3	0.3	
	TERMINAL	air, wall	1KWMA85A	2.0	-	
		fumes, wall with antiwind	1KWMA86A	-	5.0	
	FLUE	Split air/fumes 80/80	010027X0	-	12.0	
Fume outlet only Ø80		010026X0 + 1KWMA86U	-	4.0		

Connection to collective flues

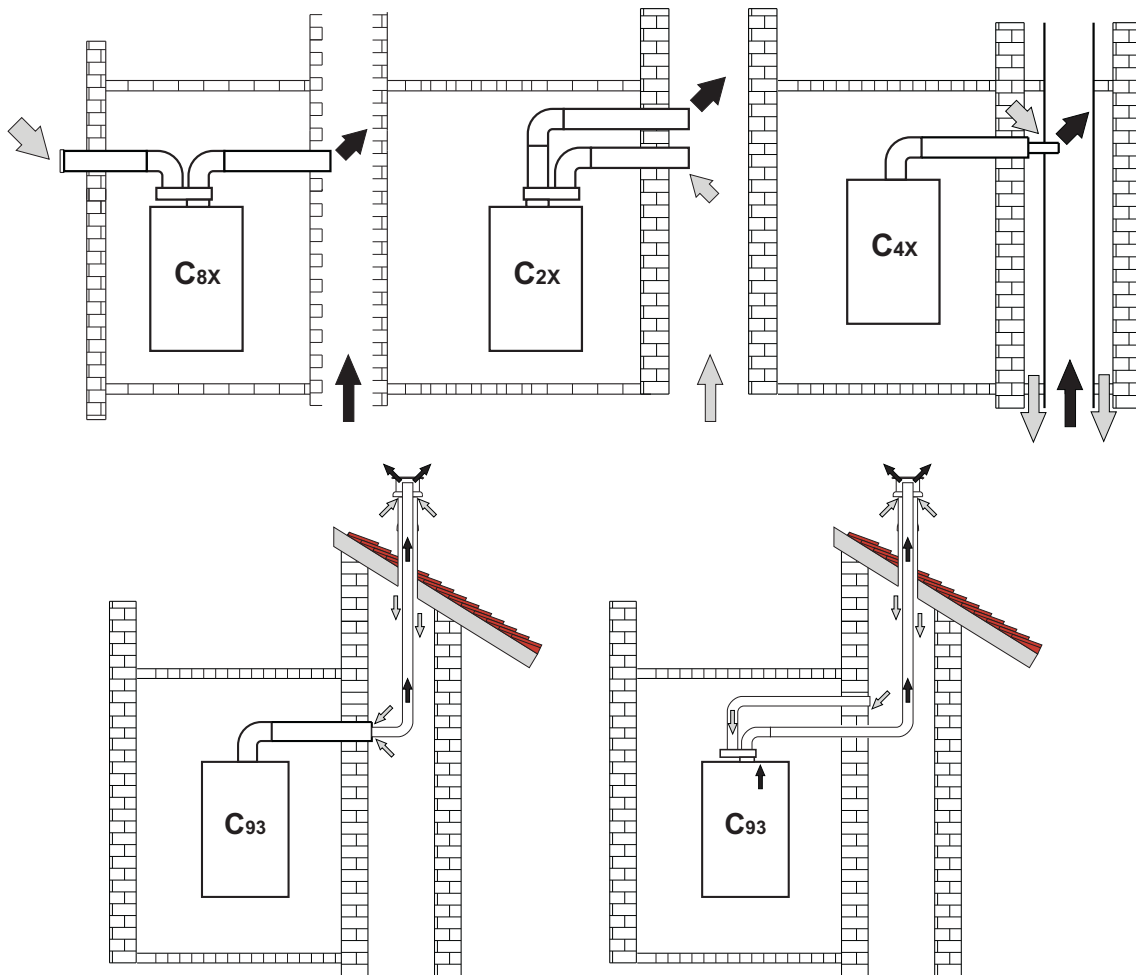


fig. 37- Examples of connection to collective flues (⇨ = Air / ⇨ = Fumes)

Table 9- Typology

Type	Description
C8X	Exhaust in single or common flue and wall intake
B3X	Intake from installation room by means of concentric duct (that encloses the exhaust) and exhaust in common flue with natural draft ⚠ IMPORTANT- THE ROOM MUST BE PROVIDED WITH APPROPRIATE VENTILATION
C93	Exhaust to a vertical terminal and intake from existing flue.

If the **BlueHelix HiTech RRT C** boiler is to be connected to a flue or a single chimney with natural draft, the flue or chimney must be expressly designed by professionally qualified technical personnel in conformity with the current regulations and be suitable for sealed chamber units equipped with fan.

Backflow preventer valve

The **BlueHelix HiTech RRT C** boiler is fitted as standard with a clapet non-return valve (backflow preventer) therefore it can be connected, **only if running on G20 gas**, to collective flues in positive pressure.

Using this type of installation, **parameter P67** must be set to 1.

In case of a type C(10)3 or C(11)3 boiler installation apply, IN A CLEARLY VISIBLE PLACE on the FRONT PANEL, the relevant white sticker included in the document envelope supplied with the unit.



After installation, check the tightness of the fumes and gas circuit.

OTHERWISE THERE IS DANGER OF SUFFOCATION DUE TO THE EMISSION OF COMBUSTION FUMES.

Position of terminals

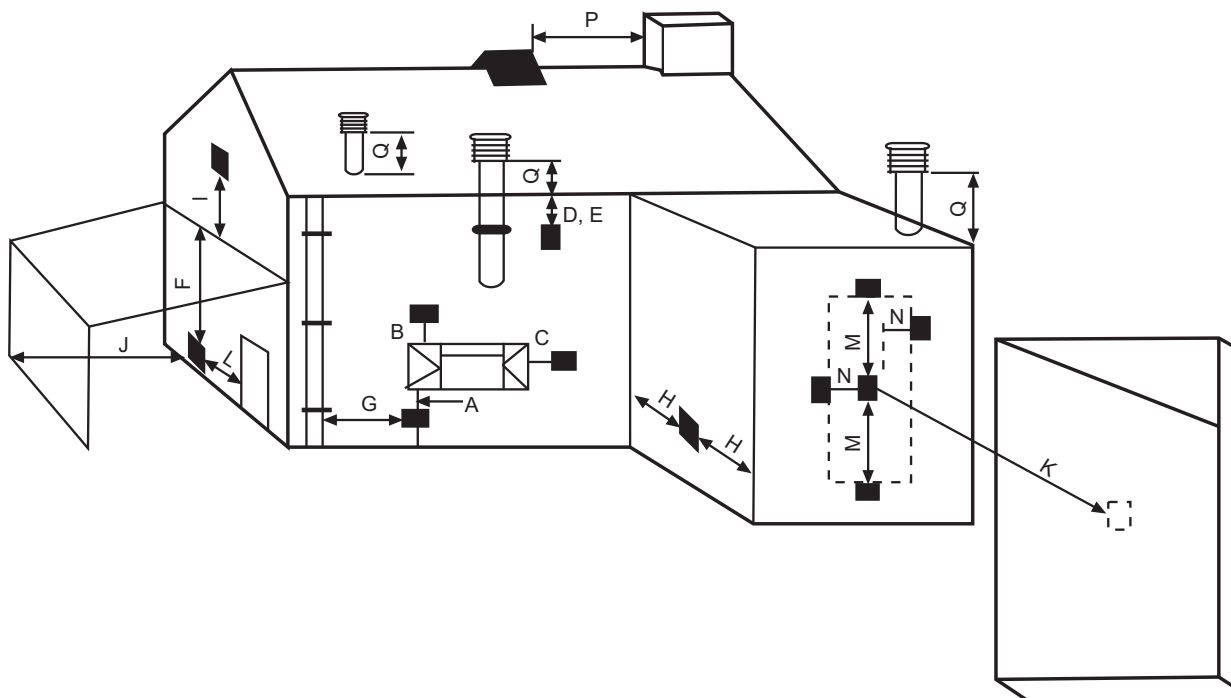


fig. 38

Minimum dimensions of fume exhaust terminals		
A	Directly under an opening, air inlet, openable window, etc.	300 mm
B	Above an opening, air inlet, openable window, etc.	300 mm
C	Horizontally to an opening, air inlet, openable window, etc.	300 mm
D	Under gutters, drain pipes	75 mm
E	Under cornices or under eaves	200 mm
F	Under balconies or garages	200 mm
G	From a drain pipe or a vertical drain pipe	150 mm
H	From an internal or external corner	100 mm
I	Above ground level, a roof or balcony	300 mm
J	From a surface facing the terminal	600 mm
K	From a terminal facing the terminal	1200 mm
L	From a garage opening (e.g. door, window) with access to the home	1200 mm
M	Vertically from a terminal on the same wall	1500 mm

Minimum dimensions of fume exhaust terminals		
N	Horizontally from a terminal on the same wall	300 mm
O	From the wall on which the terminal is fitted	N/A
P	From a vertical structure on the roof	150 mm
Q	Above the intersection with the roof	300 mm
NOTES	<ul style="list-style-type: none"> • N/A = Not applicable • Also, the terminal must be at least 150 mm (fanned draught) from an opening made in the structure of the building to house a fitted element such as a window frame. • Positions of flue terminals: if the flue is installed at a low level the potential effect of the plume must be considered. Special plume management kits are available by request. • The plume must not be directed towards: <ul style="list-style-type: none"> - A frequented approach - A window or door - An adjacent property 	

2.7 Condensate drain connection

IMPORTANT

The boiler has an internal trap for draining condensate. Install the hose “B” by pressing it into place. Before commissioning, fill the trap with approx. 0.5 L of water and connect the hose to the disposal system.

The connections to the drainage system must be resistant to acid condensation and always allow the condensate produced by the boiler to drain.

If the condensate drain is not connected to the waste water drainage system, a neutralizer must be installed.



ATTENTION: THE UNIT MUST NEVER BE OPERATED WITH THE TRAP EMPTY!

OTHERWISE THERE IS A DANGER OF SUFFOCATION DUE TO THE EMISSION OF COMBUSTION FUMES.

THE CONDENSATE DRAIN MUST BE CONNECTED TO THE DRAINAGE SYSTEM IN SUCH A WAY THAT THE LIQUID CONTAINED CANNOT FREEZE.

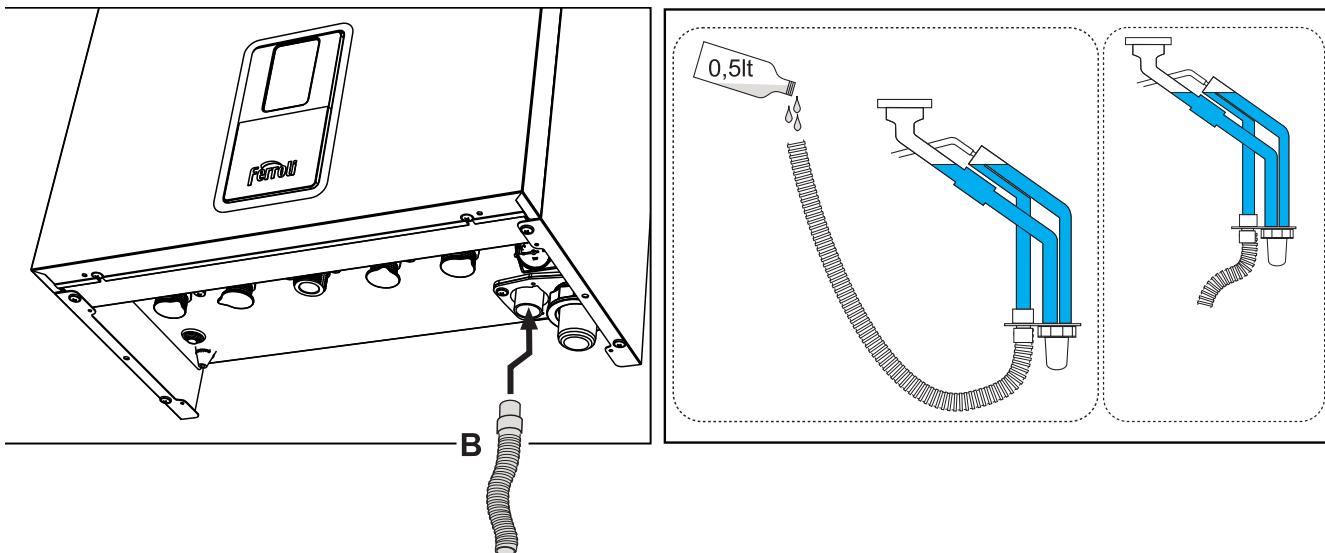


fig. 39- Condensate drain connection

Condensate drain

If possible, the condensate should be conveyed inside an underground drainage system or pipe. For that purpose, use a pipe of at least 22 mm diameter and a trap with flexible connection preinstalled in the unit to facilitate connection of the condensate drain pipe.

The pipe must be in glue-joined plastic and not in copper, since the condensate has a pH of 4 (slightly acid).

If the condensate drain pipe cannot be ended on the inside, it is advisable to run it outside as shown in the following figure.

The pipe sections going to the outside are exposed to the risk of freezing in particularly rigid weather conditions. To prevent this from occurring, it is advisable to reduce the length of the condensate drain pipes and run them on the inside, as much as possible, before going to the outside.

The pipes outside the building must be in glue-joined plastic with increased diameter of up to 32 or 40 mm and at least 3 m long for connection to a condensate collection pit or external drain.

If using a condensate collection pit, it must be as indicated in the figure below, or use a specific system (such as Mc Alpine SOAK1GR) available from the majority of suppliers of products and accessories for plumbing or heating systems.

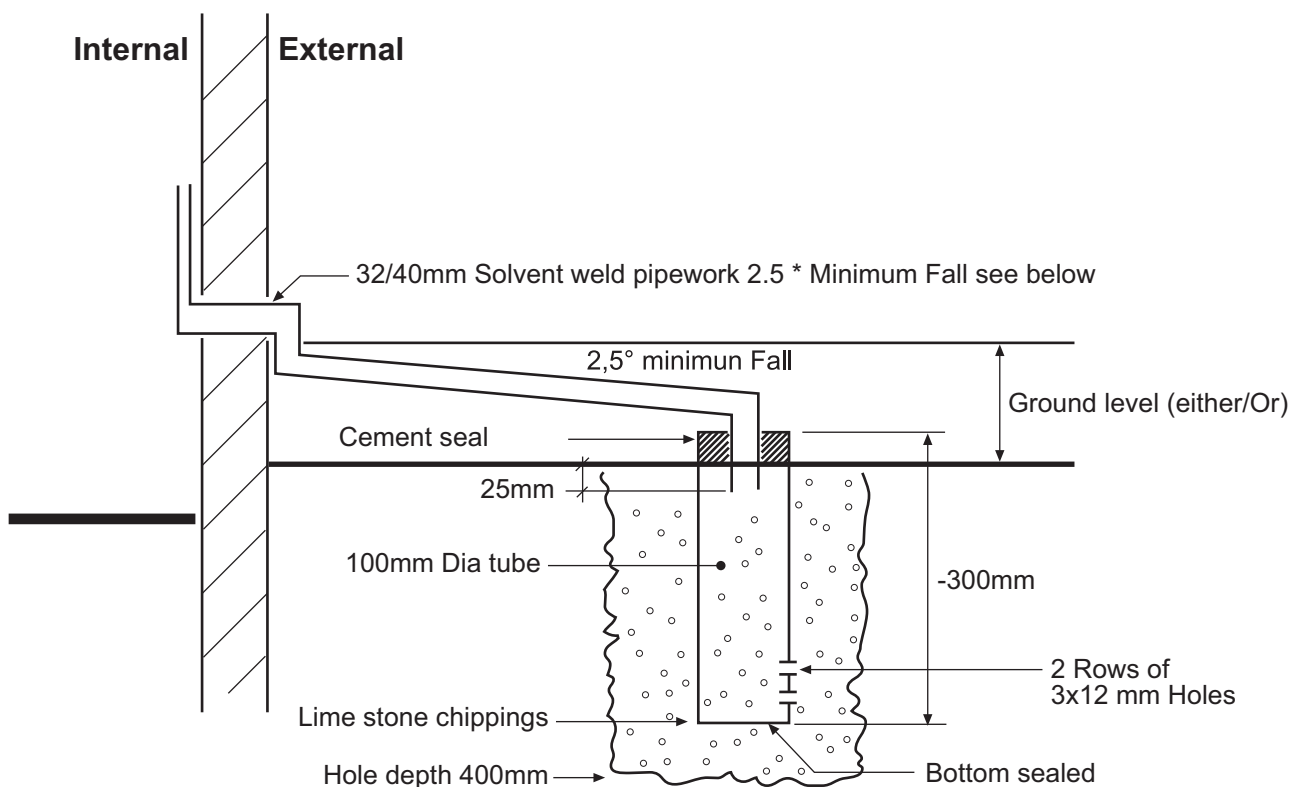


fig. 40 - Condensate drain

3. Service and maintenance



All adjustments described in this chapter can only be carried out by qualified personnel.

3.1 Adjustments

Gas conversion

The unit can work with 2nd or 3rd family gases, which is clearly indicated on the packaging and on the data plate of the unit. If the unit has to be used with a gas other than the factory-set one, proceed as follows:

1. Disconnect the power supply and turn off the gas.
2. Remove the front panel (see "Opening the front panel" on page 38).
3. Apply the plate for LPG (contained in the document bag) near the technical data plate.
4. Refit the front panel and turn on the power to the boiler.
5. **Modify the parameter for the type of gas:**
 - Access the **Main menu [MENU]** using the button .
 - Follow the path **installer menu [Service] > enter the Password 1234 (see fig. 17) > parameters menu [TSP]**.
 - Using the buttons and **Heating**, select parameter **b03** and set the corresponding value with the buttons and **DHW**:
 - 0 =G20**
 - 1 =G30/G31**
 - 2 =G230**
 - To confirm, press the button .
 - Turn the power off for 10 seconds and then back on.
 - Wait until the **Fh** mode has finished.
 - Put the boiler in standby mode and activate the **calibration mode[AUTO SETUP]** (see "IMPORTANT" on page 32).

Checking the combustion values

MAKE SURE THE FRONT PANEL IS CLOSED AND THE INTAKE/FUME EXHAUST DUCTS ARE COMPLETELY ASSEMBLED.

1. Put the boiler in heating or DHW mode for at least 2 minutes.
2. Activate the **Test [Test]** mode (see "Test mode [Test]" on page 34).
3. Using a combustion analyzer connected to the arrangements located on the starting accessories above the boiler, with boiler operating at maximum and minimum power check that the CO₂ content in the fumes matches that indicated in the following table.

Case studies		G20	G30/G31	G230
A	New boiler (first ignition/conversion or electrode replacement)	7.5%-9.9%	9%-11.5%	9%-11.5%
B	Boiler with at least 500 hours of operation	9%+/-0.8	10%+/-0.8	10%+/-0.8

4. If the combustion values do not match, adjust the Offset values in the **Test mode** as described in the following paragraph.

IMPORTANT



During the **CALIBRATION PROCEDURE [AUTO SETUP]**, the **TEST PROCEDURE [Test]** or during the **CO₂ VALUE CHECK**, the **FRONT PANEL** must be **CLOSED** and the **INTAKE/FUME EXHAUST DUCTS** completely assembled. Also, the boiler must not be in **OFF** mode or in vent cycle mode "FH-Fh" (see detail C of fig. 11) and there must not be a DHW or heating circuit request.



Calibration procedure [AUTO SETUP]

1. Access the **parameters menu**[TSP].
2. Select parameter **b27** with the **+** and **-** **heating** buttons and set it to **5** with the **+** and **-****DHW** buttons.
Confirm with the button **≡**.
Return to the **main menu**[MENU].
3. Return to the **installer menu** [**Service**] >enter the **Password 1234** (see fig. 17).
Now the **menu for calibration**[Auto Setup] is also displayed.
4. Select it and confirm with the button **≡**.
5. The procedure starts automatically finding the optimal ignition point (a few ignition attempts are required to determine the exact point).
6. After ignition, the burner goes to heating at the various powers (max, med, min) indicated by point **a** (fig. 41).
If the system heat dissipation is not sufficient to end the procedure, a DHW request can be activated **only after the burner has ignited**.
7. At the end of the calibration sequence [**Completed**] will be displayed for a few seconds and then return to the Service menu.
8. If the ignition sequence described in point "6" is not successful, the message **max_err** at point **a** and an error code at point **c** will appear (fig. 41).
9. Exit with the button **↺** and unlock the boiler.
Repeat the sequence from point "1".

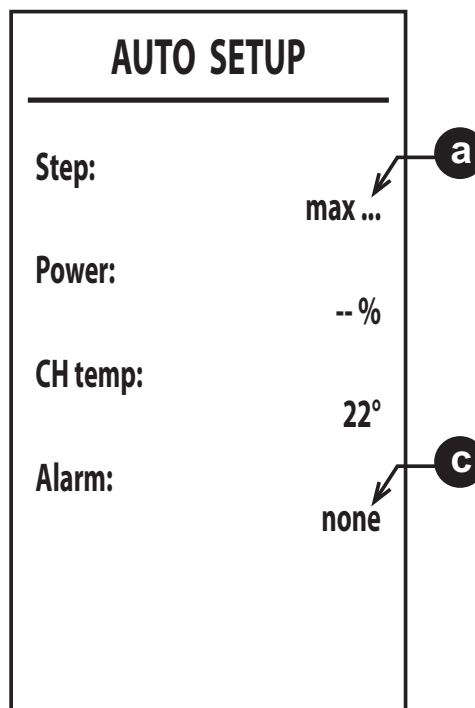


fig. 41

The **calibration procedure [Auto Setup]** can only be performed if parameter **b27** is set to **5**.

Parameter **b27** can be set manually to the value **5**, or by:

- changing the parameter "gas type" **b03**.
- setting parameter **P67** to **1**.
- changing the value of parameter **P68**.
- doing "**Restore Factory Values**" with the parameter **b29=10** (after carrying out this operation, disconnect and reconnect the power supply for about ten seconds).

In each of the above cases, **b27** automatically changes to **5**.

It is necessary to perform the **calibration procedure [Auto Setup]** in the following cases:

- after replacing the PCB
- after changing the gas (**b03**)
- setting parameter **P67** to **1**
- after changing the value of parameter **P68**
- after setting parameter **b27** to **5** for replacement of components such as the electrode, burner, gas valve, fan or for installations with maximum flue resistance
- in case of fault conditions **A01**, **A06** or **other faults when required** (see table 11. Respect the sequence of fault cures).

The **calibration procedure [Auto Setup]** resets the combustion parameters previously recorded and must be done only in the cases described above.

Test mode [Test]

Do a heating or DHW request.

1. Access the **Main menu [MENU]** using the button . Follow the path **installer menu [Service]** > enter the **Password 1234** (see fig. 17) > **test mode menu [Test]**. Confirm with the button .
2. After ignition, the power adjusts to Medium "med". When the combustion value is stable, "med ok" is displayed (point **a**).
3. The heating buttons are used for the 4 power levels: min (minimum power), med (medium power), max CH (maximum power CH) and max (maximum power DHW) (point **a**).
4. Only when the **step** value at the set power is followed by "ok" (med ok, min ok...) can the CO₂ be adjusted with the DHW buttons. Pressing the button **DHW** increases the "Offset" value by one unit (point **b**). By pressing buttons and **DHW** for more than 2 sec., the Offset value will change by 3 units. When the Power value is followed by "ok" the combustion value will be saved.
5. The "Offset" adjustment range is from -8 to +8. Increasing the value decreases the CO₂, decreasing it increases the CO₂.

The CO₂ adjustment must not be done with less than 500 burner operation hours, because the system adjusts itself.

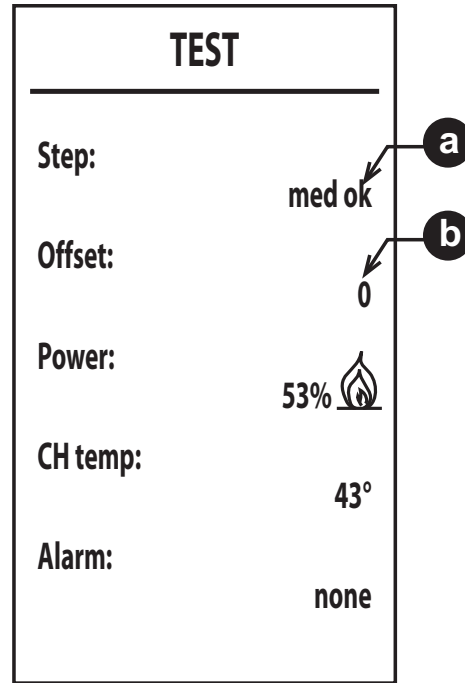


fig. 42

To exit the **test mode [Test]** hold down the button .

If the **Test mode [Test]** is active and enough hot water is drawn to activate the **DHW mode**, the boiler remains in **Test mode [Test]** but the 3-way valve switches to DHW.

The **Test mode [Test]** is automatically disabled in any case after 15 minutes or by stopping hot water draw-off (if enough hot water was drawn to activate the DHW mode).

Installer menu [SERVICE]

ONLY QUALIFIED PERSONNEL CAN ACCESS THE SERVICE MENU AND MODIFY PARAMETERS.

Access the **Main menu [MENU]** with the button .

Follow the path **installer menu [Service]** > enter the **Password 1234** (see fig. 17). Confirm with the button .

Menu for modifying parameters [TSP]

Press the **Heating buttons** to scroll the list, and display with value with the button . To modify press the **DHW buttons**, confirm with the button or cancel with the button .

Table 10- Transparent Parameters Table

Index	Description	Range	Default
b01	Boiler type selection	3 = HEATING ONLY COMBI (DO NOT MODIFY)	3
b02	Boiler type	1 = 24 kW 2 = 28 kW 3 = 34 kW 4 = Do not use 5 = Hybrid 24 C 6 = Hybrid 28 C 7 = Hybrid 34 C	1 = 24 kW 2 = 28 kW 3 = 34 kW 4 = / 5 = Hybrid 24 C 6 = Hybrid 28 C 7 = Hybrid 34 C

Index	Description	Range	Default
b03	Gas type	0 = Natural gas 1 = Liquefied gas 2 = Propane-air	0
b04	System water pressure protection selection	0 = Pressure switch 1 = Pressure transducer	1
b05	Summer/Winter mode	0 = WINTER - SUMMER - OFF 1 = WINTER - OFF	0 = Enabled
b06	Variable input contact operation selection	0 = Flowmeter exclusion 1 = System thermostat 2 = Second room therm. 3 = Warning/Alert 4 = Safety thermostat	2
b07	Relay card LC32 operation selection	0 = External gas valve 1 = Alarm 2 = System filling solenoid valve 3 = Solar 3-way valve 4 = Second heating pump 5 = Alarm2 6 = Burner lit 7 = Frost protection On	0
b08	Hours without DHW draw-off	0 ÷ 24 hours (time for temporary deactivation of comfort mode without draw-off with b012 = 0)	24
b09	Fault 20 status selection	0 = Deactivated 1 = Enabled (only for versions with pressure transducer)	0
b10	Not implemented	--	--
b11	Flowmeter timing	0 = Deactivated 1-10 = seconds	0
b12	Comfort mode	0 = Activation with draw-off 1 = Always active	0
b13	Not implemented	--	--
b14	DHW factor	0 - 1	0
b15	Flowmeter type selection	1 = Flow. (450 imp/l) 2 = Flow. (700 imp/l) 3 = Flow. (190 imp/l)	3
b16	Not implemented	--	--
b17	Not implemented	--	--
b18	DHW mode activation flow rate	0 ÷ 100l/min/10 (do not set this value below 16)	25
b19	DHW mode deactivation flow rate	0-100 l/min/10	20
b20	Flue material selection	0 = Standard 1 = PVC 2 = CPVC	0
b21	Not implemented	--	--
b22	Not implemented	--	--
b23	Standard flue shutdown maximum temperature	60-110°C	105
b24	PVC flue shutdown maximum temperature	60-110°C	93
b25	CPVC flue shutdown maximum temperature	60-110°C	98
b26	Not implemented	--	--
b27	Calibration procedure [AUTO SETUP]	5 = Calibration procedure [AUTO SETUP] enabled All other values = Calibration procedure [AUTO SETUP] disabled (See "Calibration procedure [AUTO SETUP]" on page 32)	0
b28	Not implemented	--	--

Index	Description	Range	Default
b29	Restore Factory Values	See "** Restore Factory Values" on page 37 .	0
P30	Heating ramp	10÷80 (ex. 10=20°C/min, 20=12°C/min, 40=6°C/min, 80=3°C/min)	40
P31	Heating standby time	0 ÷ 10 minutes	4
P32	Heating Post-Circulation	0 ÷ 255 (Multiply the value by 10. Example 15 x 10 = 150 seconds)	15
P33	Pump operation	0 = Continuous pump (active only in winter mode) 1 = Modulating pump	1
P34	Pump modulation DeltaT	0 ÷ 40°C	20
P35	Modulating pump min. speed	30 ÷ 100%	30
P36	Modulating pump start speed	90 ÷ 100%	90
P37	Modulating pump max. speed	90 ÷ 100%	100
P38	Pump deactivation temperature during Post-Circulation	0 ÷ 100°C	55
P39	Pump activation hysteresis temperature during Post-Circulation	0 ÷ 100°C	25
P40	Heating user max. setpoint	20 ÷ 90°C	80
P41	Max. output in heating	0 ÷ 100%	24 kW = 80 28 kW = 85 34 kW = 90
P42	Burner shutdown in DHW	0 = Fixed 1 = Linked to setpoint 2 = Solar	0
P43	Comfort mode activation temperature	0 ÷ 80°C	40
P44	Comfort mode deactivation hysteresis	0 ÷ 20°C	20
P45	DHW standby time	30 ÷ 255 seconds	120
P46	DHW user max. setpoint	40 ÷ 65°C	55
P47	DHW pump Post-Circulation	0 ÷ 255 seconds	30
P48	Max. output in DHW	0 ÷ 100%	100
P49	Not implemented (b01=2)	--	--
P50	Not implemented (b01=2)	--	--
P51	Burner shutdown in DHW (P42=2)	0 ÷ 100 OFF = DHW user setpoint + P51	10
P52	Burner ignition in DHW (P42=2)	0 ÷ 100 ON = DHW user setpoint - P52	10
P53	Solar standby time	0 ÷ 255 seconds	10
P54	System pre-circulation time in heating	0 ÷ 60 seconds	30
P55	System filling mode	0 = Disabled 1 = Automatic	0
P56	Minimum system pressure limit value	0-8 bar/10 (Only for boilers with water pressure sensor)	4
P57	System nominal pressure value	5-20 bar/10 (Only for boilers with water pressure sensor)	7
P58	Maximum system pressure limit value	25-35 bar/10 (Only for boilers with water pressure sensor)	28
P59	Circulating pump deactivation with OpenTherm	0 = Circulating pump activated in heating 1 = Circulating pump deactivated in heating with request from OpenTherm only	0
P60	Frost protection power	0 ÷ 50% (0 = minimum)	0
P61	Minimum power	0 ÷ 50% (0 = minimum)	0



Index	Description	Range	Default
P62	Fan minimum speed	DO NOT MODIFY (The parameters are automatically updated)	G20/G230: 24 kW = 47 28 kW = 47 34 kW = 49 G30/G31: 24 kW = 49 28 kW = 49 34 kW = 48
P63	Fan on speed	DO NOT MODIFY (The parameters are automatically updated)	G20/G230: 24 kW = 160 28 kW = 160 34 kW = 140 G30/G31: 24 kW = 152 28 kW = 152 34 kW = 132
P64	Fan maximum speed	DO NOT MODIFY (The parameters are automatically updated)	G20/G230: 24 kW = 140 28 kW = 172 34 kW = 194 G30/G31: 24 kW = 134 28 kW = 156 34 kW = 186
P65	Not implemented	--	1
P66	Valve frequency	0 ÷ 2	1
P67	Installation C(10)3/C(11)3	0 - 1 (1 = installation C(10)3 / C(11)3)	0
P68	Flue parameter	0 ÷ 10 (modify according to flue table)	0
P69	Heating hysteresis after ignition. (available from MAIN and DSP FW 1.03)	6 ÷ 30 °C	10

* Restore Factory Values

To restore all the parameters to the factory values, set parameter **b29** to **10** and confirm. Turn the power off for 10 seconds and then back on.

At this point it is necessary to restore parameter **b02** and the modified parameters to the correct value according to the type of boiler. Parameter **b27** will be automatically set to **5**.

Display Adjustment Menu [DISPLAY]

Here it is possible to set some display parameters.

[Contrast]

Contrast adjustment.

[Brightness]

Brightness adjustment

[Backlight time]

Display backlight duration.

[Reset]

Restore factory values.

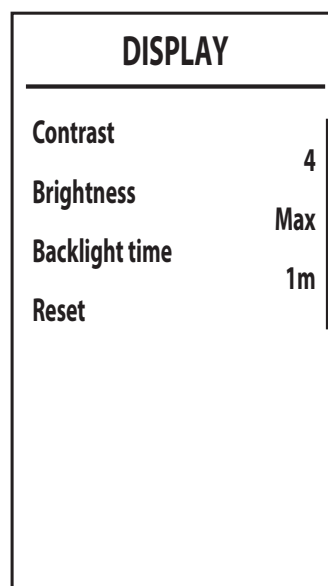


fig. 43

3.2 Commissioning

Before lighting the boiler

- Check the tightness of the gas system.
- Check correct expansion vessel precharge.
- Fill the hydraulic system and make sure that all air contained in the boiler and the system has been vented.
- Make sure there are no water leaks in the system, DHW circuits, connections or boiler.
- Make sure there are no flammable liquids or materials near the boiler.
- Check correct connection of the electrical system and efficiency of the grounding system.
- Fill the trap (see cap. 2.7 "Condensate drain connection").



IF THE ABOVE INSTRUCTIONS ARE NOT OBSERVED THERE MAY BE RISK OF SUFFOCATION OR POISONING DUE TO GAS OR FUMES ESCAPING; DANGER OF FIRE OR EXPLOSION. ALSO, THERE MAY BE A RISK OF ELECTRIC SHOCK OR FLOODING THE ROOM.

First boiler ignition

- Make sure there is no draw-off of hot water and room thermostat requests.
- Turn on the gas and check that the gas supply pressure ahead of the unit complies with the technical data table or in any case the tolerance provided for by the regulations.
- Power the boiler electrically, the display shows the software version number of the control unit and display and then **Fh** and **Fh** air venting cycle (see cap. 1.3 "Connection to the power supply, switching on and off" on page 7).
- After the **Fh** cycle, the display will show the winter mode screen (fig. 11); do the temperature adjustments: heating flow and DHW outlet (fig. 14 and fig. 15). Check if the value of the flue parameter, **P68** - *** '- Transparent Parameters Table' on page 34 ***, is suitable for the length of flue installed.
- In case of gas change (G20 - G30 - G31 - G230), check if the relevant parameter is suitable for the type of gas present in the supply system (and cap. 3.1 "Adjustments" on page 32).
- Put the boiler in DHW or heating mode (see cap. 1.3 "Connection to the power supply, switching on and off" on page 7).
- In Heating mode, do a request: the radiator symbol flashes on the display and the flame appears when the burner ignites.
- DHW mode with hot water draw-off present: the faucet symbol flashes on the display and the flame appears when the burner ignites.
- Do the combustion check as described in par. "Checking the combustion values" on page 32.

3.3 Maintenance

IMPORTANT



ALL MAINTENANCE WORK AND REPLACEMENTS MUST BE CARRIED OUT BY SKILLED QUALIFIED PERSONNEL.

Before carrying out any operation inside the boiler, disconnect the power and close the gas cock upstream. Otherwise there may be a danger of explosion, electric shock, suffocation or poisoning.

Opening the front panel



Some internal components of the boiler can reach temperatures high enough to cause severe burns. Before carrying out any operation, wait for these components to cool or else wear suitable gloves.



To open the boiler casing:

1. Undo the screws "1" (see fig. 44).
2. Pull the panel outwards and lift it.

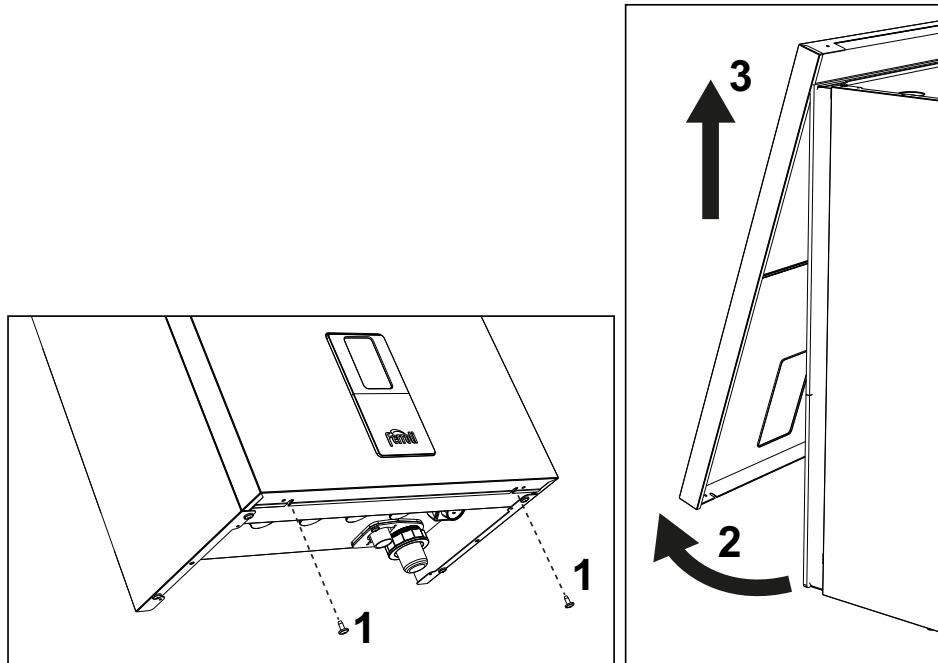


fig. 44- Front panel opening



On this unit, the casing also acts as a sealed chamber. After any operation involving opening the boiler, carefully check the correct refitting of the front panel and its seal.

Proceed in reverse order to refit the front panel. Make sure it is correctly hooked to the upper fastenings and is correctly positioned at the sides. Once the screw "1" is tightened, the head must not be below the lower reference fold (see fig. 45).

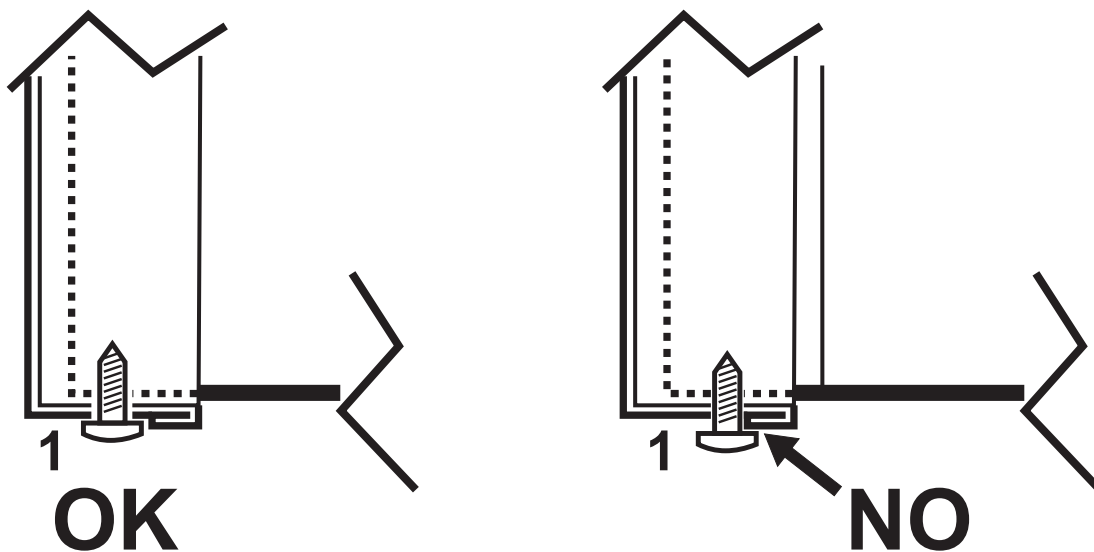


fig. 45- Correct position of front panel

Periodical check

To ensure proper operation of the unit over time, have qualified personnel carry out a yearly inspection, providing for the following checks:

- The control and safety devices (gas valve, flow meter, thermostats, etc.) must function correctly.
- The fume exhaust circuit must be perfectly efficient.
- The sealed chamber must be tight.
- The air-fume end piece and ducts must be free of obstructions and leaks
- The burner and exchanger must be clean and free of deposits. Use suitable brushes for cleaning. Never use chemical products.
- The electrode must be properly positioned and free of scale.
The electrode can be cleaned of incrustations only with a non-metallic brush, and must NOT be sanded.
- The gas and water systems must be tight.
- The water pressure in the system when cold must be approx. 1 bar; otherwise bring it to that value.
- The circulating pump must not be blocked.
- The expansion tank must be filled.
- The gas flow and pressure must match that given in the respective tables.
- The condensate evacuation system must be efficient with no leakage or obstructions.
- The trap must be full of water.
- Check the quality of the water in the system.
- Check the condition of the insulation of the exchanger.
- Check the gas connection between the valve and Venturi.
- Replace the burner gasket if damaged.
- At the end of the check, always check the combustion parameters (see "checking the combustion values").



Extraordinary maintenance and replacement of components

After replacing the gas valve, burner, electrode and PCB, it is necessary to do the **calibration procedure [AUTO SETUP]** (see "Calibration procedure [AUTO SETUP]" on page 32). Then follow the instructions in par. "Checking the combustion values" on page 32.

Gas valve replacement

- **Disconnect the power supply and close the gas cock ahead of the valve.**
- Disconnect the electrical connectors "1" (fig. 46).
- Disconnect the gas supply pipe "2" (fig. 46)
- Undo the screws "3" (fig. 47)
- Remove the gas valve "4" and the gas diaphragm "5" (fig. 48).
- Fit the new valve, carrying out the above steps in reverse order.
- **Refer to the instruction sheet included in the kit when replacing the gas diaphragm.**

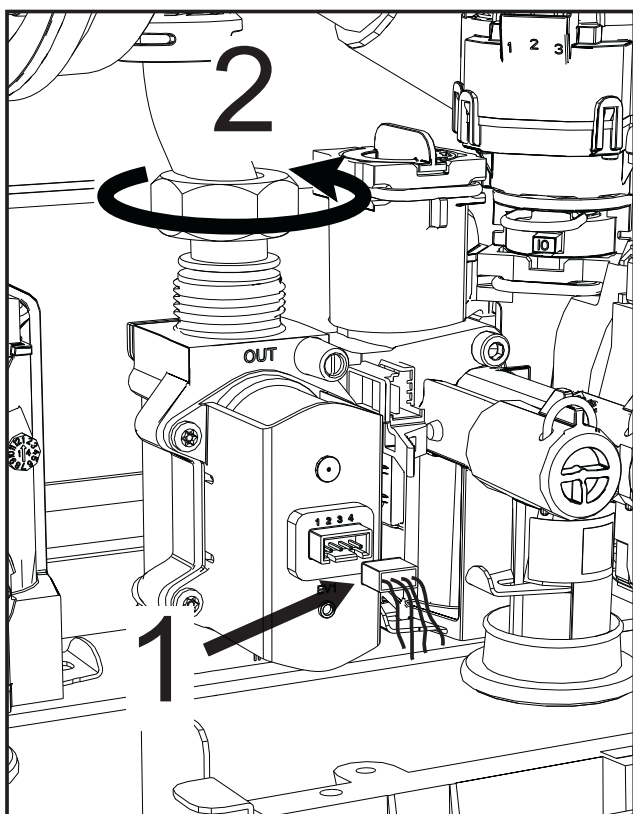


fig. 46

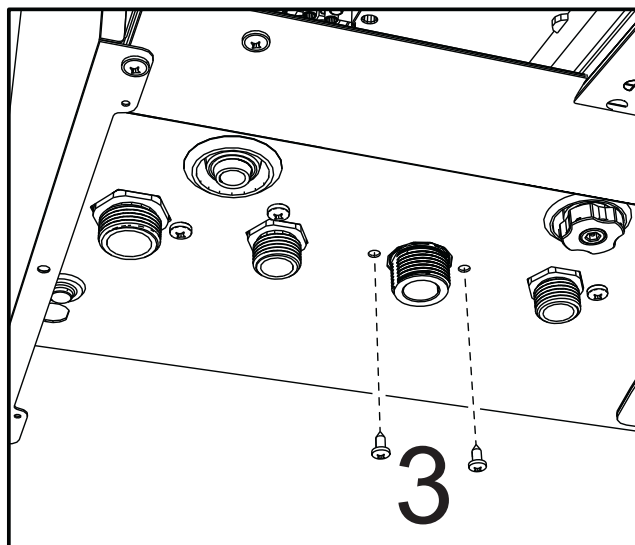


fig. 47

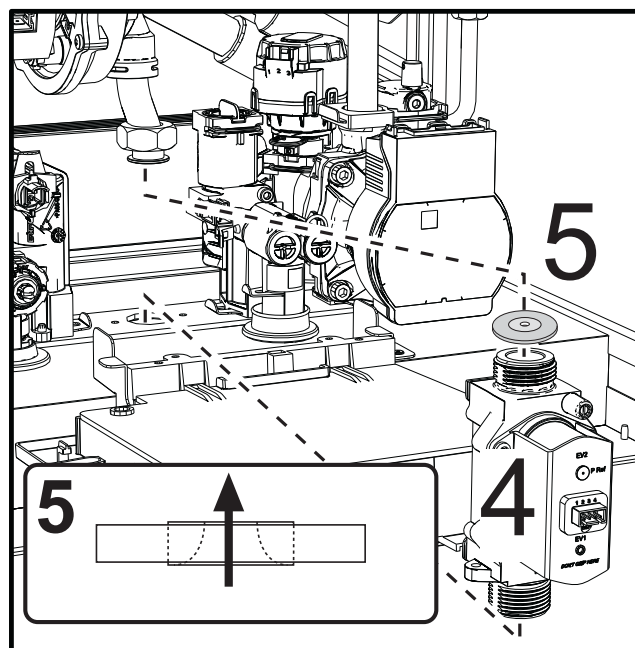


fig. 48

Main exchanger replacement

Before carrying out the following instructions it is advisable to protect the room and the boiler's electrical box against accidental water spillage.

Disconnect the power supply and close the gas cock ahead of the valve

Disconnect the fume sensor connector 1.

• For assembly, proceed in reverse order

- Disconnect the fan connector
- Disconnect the connector of the ignition electrode connected to the board.
- Drain the water from the boiler heating circuit.
- Remove the flue connection (concentric or accessory for separate ducts)
- Remove the fan
- Remove the clips of the two pipes on the exchanger, pump and hydraulic unit
- Loosen the 2 **bottom screws "5"** securing the exchanger to the frame (fig. 52)
- Remove the 2 **top screws "6"** securing the exchanger to the frame (fig. 53)
- Remove the exchanger
- Insert the new exchanger, resting it on the **bottom screws "5"**

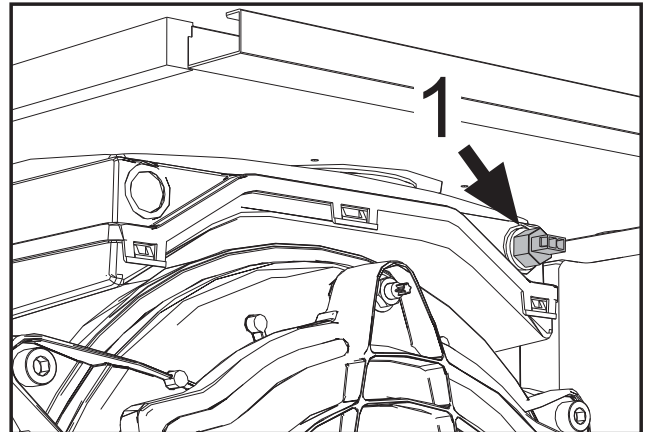


fig. 49

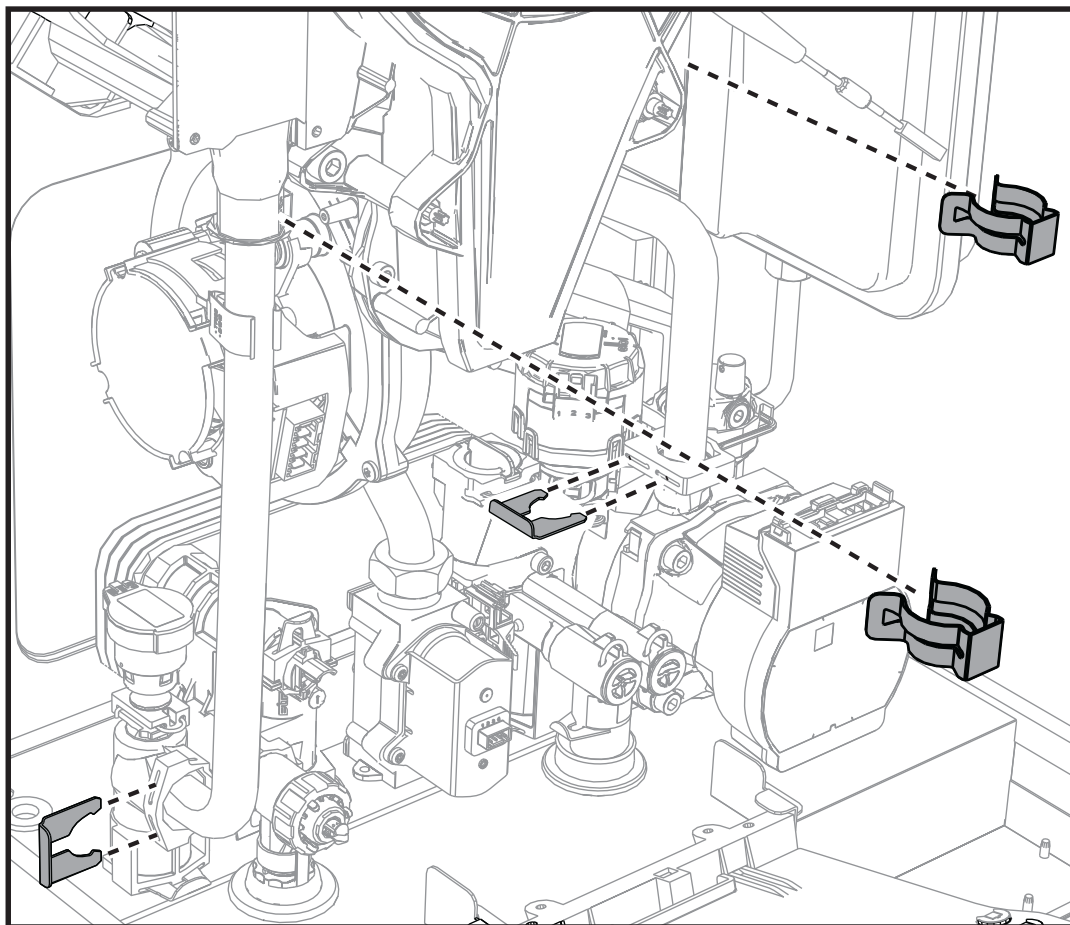


fig. 50



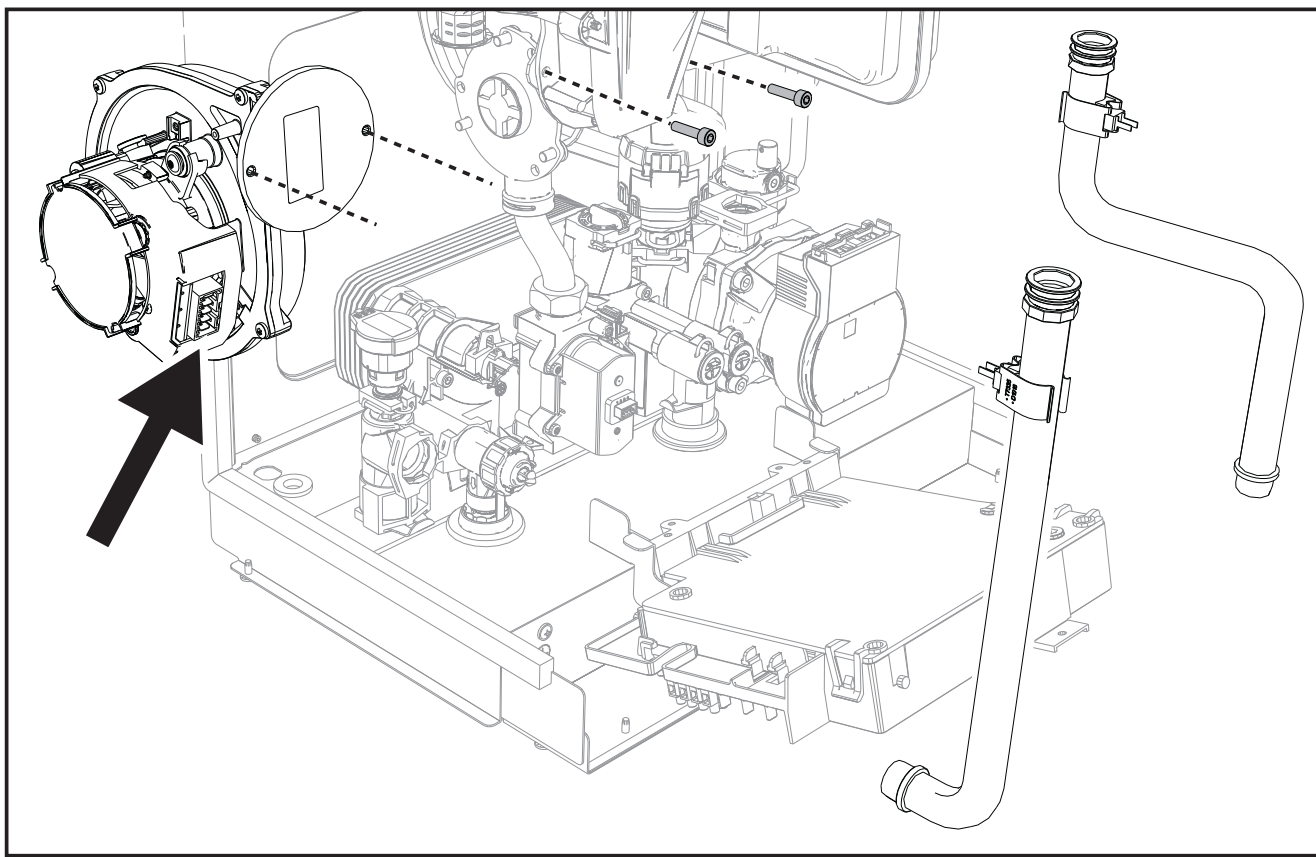


fig. 51

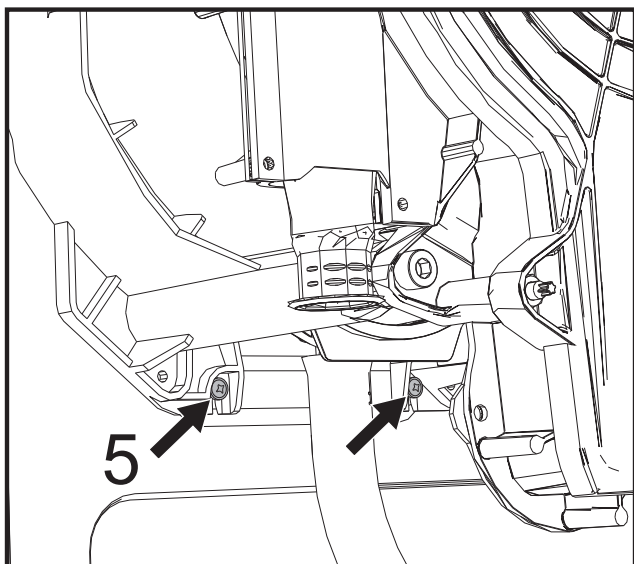


fig. 52

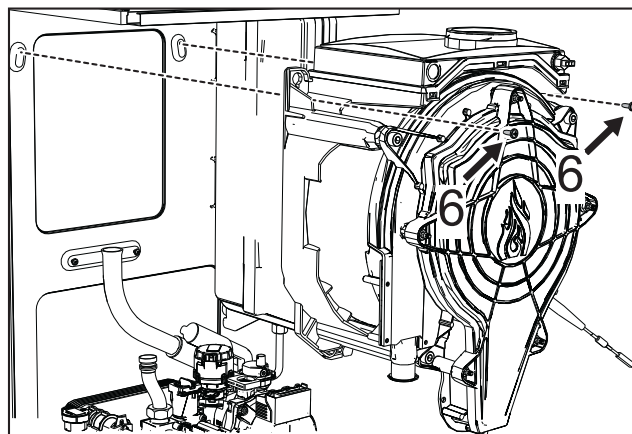


fig. 53

PCB replacement

- Disconnect the power supply and close the gas cock ahead of the valve.
- Undo the two screws “1” and rotate the control panel.
- Raise the electrical box cover by operating on the tabs “2”
- Undo the screws “3”. Raise the board by operating on the side tabs “4”.
- Remove all the electrical connectors.
- Insert the new board and reconnect the electrical connections.

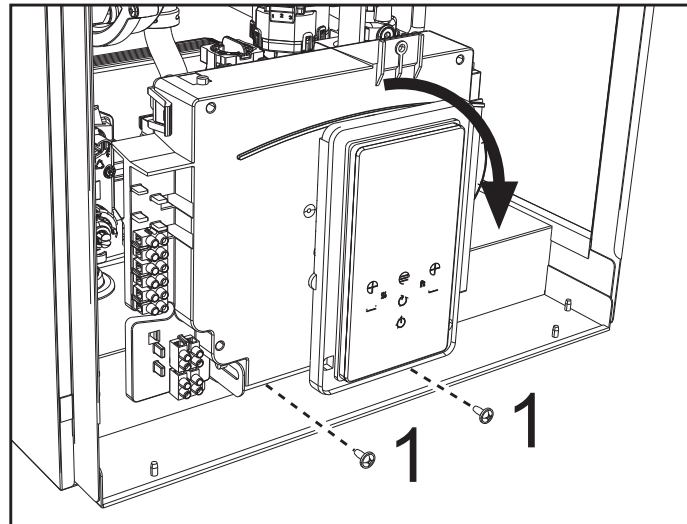


fig. 54

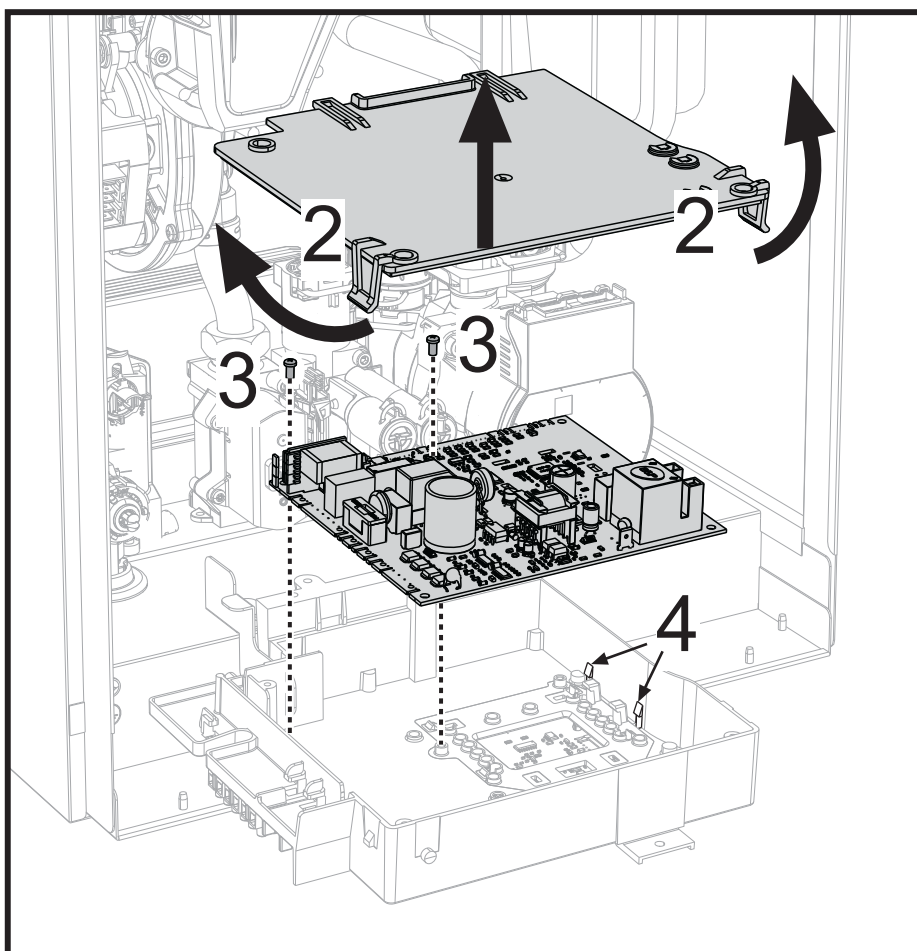


fig. 55



Fan replacement

- Disconnect the power supply and close the gas cock ahead of the valve.
- Remove the fan electrical connections.
- Undo the screws "1" and gas pipe connection "2".
- Remove the venturi "3".

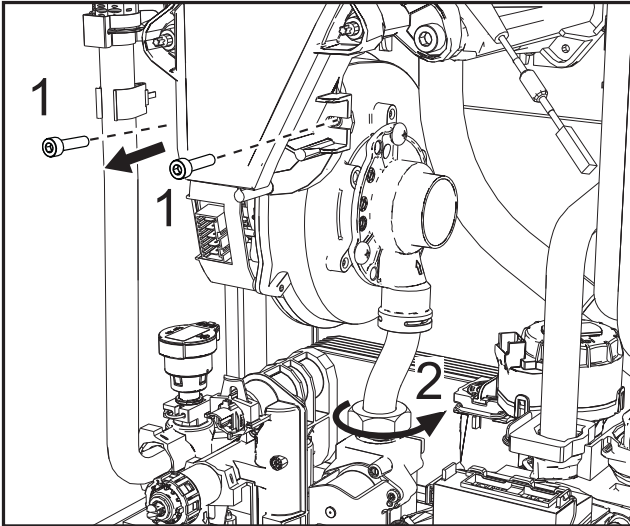


fig. 56

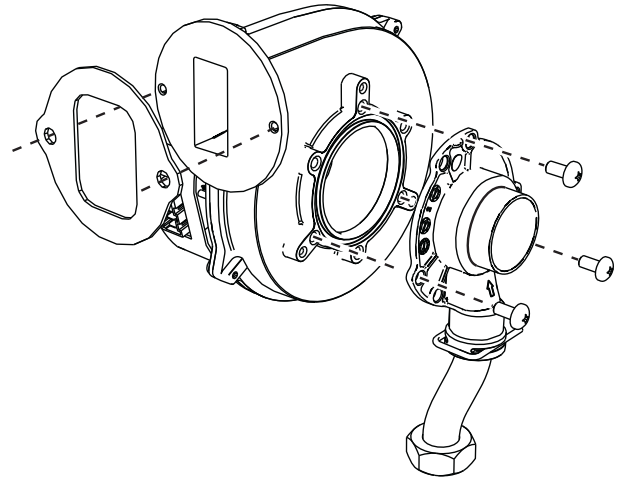



fig. 57

Water pressure switch replacement

 Before carrying out the following instructions it is advisable to protect the room and the boiler's electrical box against accidental water spillage.

- Disconnect the power supply and close the gas cock ahead of the valve.
- Drain the water from the heating circuit.
- Remove the pressure transducer connector and retaining clip "1".
- Remove the pressure transducer "2".

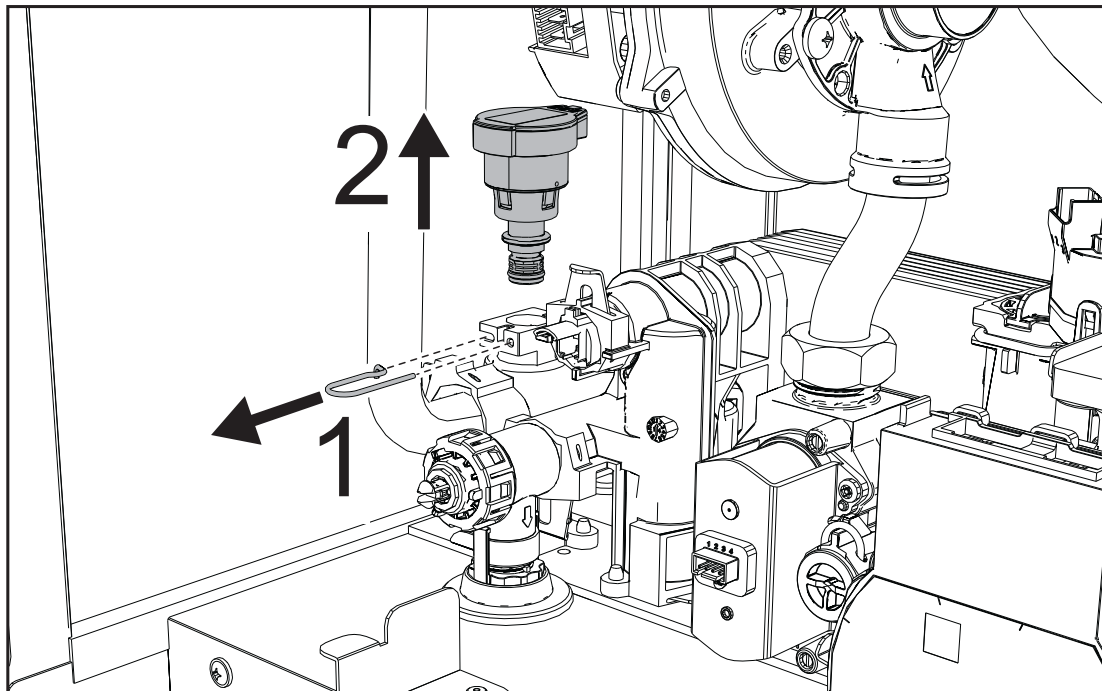


fig. 58

Water inlet filter cleaning

- Disconnect the power supply and close the gas cock ahead of the valve.
- Isolate the boiler by operating the DHW inlet and system shut-off valves.
- Clean the water inlet filter.

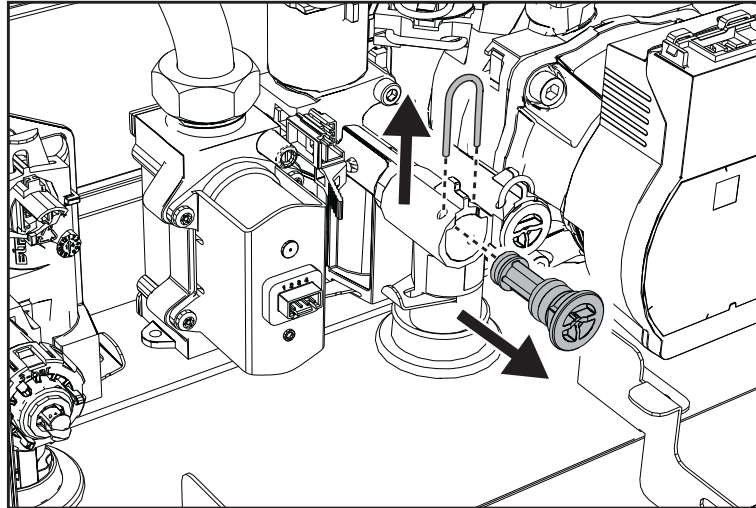


fig. 59

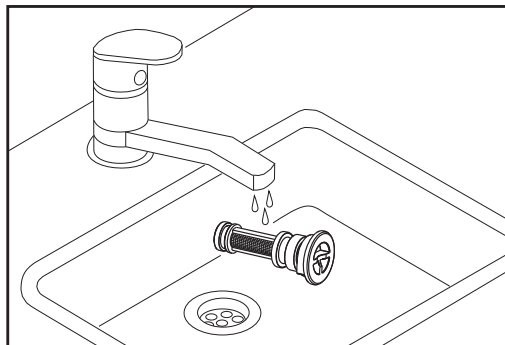


fig. 60

3.4 Troubleshooting

Diagnostics

LCD display Off



If, even after touching the buttons, the display does not come on, check that the card is electrically powered. Using a digital multimeter, check for presence of power.

In case of no voltage, check the wiring.

If the voltage is sufficient (Range 195 – 253 Vac), check the fuse (**3.15AL@230VAC**). The fuse is on the card. To access it, see fig. 31.

LCD display On

In case of operation problems or faults, the display shows the fault identification code.

There are faults that cause permanent shutdowns (indicated with the letter “A”): to restore operation, just hold down the button  until the message “Confirm?” appears and confirm with the button , or use the RESET of the remote timer control (optional) if installed. If the boiler does not restart, the fault must be eliminated.

Other faults cause temporary shutdowns (indicated with the letter “F”) which are automatically reset as soon as the value returns within the boiler's normal working range.



Table of faults

Table 11- List of faults

Fault code	Fault	Possible cause	Cure
A01	No burner ignition	No gas	Check the regular gas flow to the boiler and that the air has been eliminated from the pipes
		Ignition/detection electrode fault	Check the wiring of the electrode and that it is correctly positioned and free of any deposits; replace the electrode if necessary.
		Insufficient gas supply pressure	Check the gas supply pressure
		Trap blocked	Check the trap and clean it if necessary
		Air/fume ducts obstructed	Remove the obstruction from the flue, fume extraction ducts, air inlet and terminals.
		Wrong calibration	Do the Calibration procedure [AUTO SETUP].
		Faulty gas valve	Check the gas valve and replace it if necessary
A02	Flame present signal with burner off	Electrode fault	Check the ionization electrode wiring
			Check the condition of the electrode
			Electrode to ground
			Cable to ground
		Card fault	Check the card
F05	Fan fault	No 230V power supply	Check the 5-pin connector wiring
		Tachometric signal interrupted	
		Fan damaged	Check the fan and replace it if necessary
A06	No flame after the ignition phase	Ionization electrode fault	Check the position of the ionization electrode, free it from any encrustations and do the Calibration procedure [AUTO SETUP]. Replace the electrode if necessary.
		Flame unstable	Check the burner
		air/fume ducts obstructed	Remove the obstruction from the flue, fume extraction ducts, air inlet and terminals
		Trap blocked	Check the trap and clean it if necessary
		Wrong calibration	Do the Calibration procedure [AUTO SETUP].
		Insufficient gas supply pressure	Check the gas supply pressure
A08	Overtemperature protection intervention	Flow or return sensors incorrectly positioned or damaged	Check the correct positioning and operation of the sensors and replace them if necessary.
		No water circulation in the system	Check the circulating pump
		Air in the system	Vent the system

Fault code	Fault	Possible cause	Cure
A09	Exchanger protection intervention	No water circulation in the system	Check the circulating pump and heating system
		Poor circulation and anomalous flow probe temperature increase	Vent the system
		blocked exchanger	check the exchanger and system
F09	Overtemperature protection intervention	Flow sensor damaged	Check correct positioning and operation of the flow sensor and replace it if necessary
		No water circulation in the system	Check the circulating pump and heating system
		Air in the system	Vent the system
F10	Flow sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
A11	Gas valve connection	Gas valve connector not inserted.	Insert the connector
		Electrical connection between control unit and gas valve interrupted.	Check the wiring
		Gas valve damaged.	Replace the gas valve
F11	Return sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F12	DHW sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F13	Fume probe fault	Probe damaged	Check the wiring or replace the fume probe
		Wiring shorted	
		Wiring disconnected	
A14	Fume extraction duct safety device intervention	Fault A07 generated 3 times in the last 24 hours	See fault A07
F15 - A07	High fume temperature	The fume probe detects an excessive temperature	Check the exchanger
			Check the fume probe
			Check the flue material parameter
F19	Card parameter fault	Wrong card parameter setting	Check and if necessary modify parameter b15 to 3
F21	System pressure slightly high (visible only in the Alarm menu)	System water pressure too high	Partially drain the system to a pressure (shown on the display) of 1÷1.5 bar. Check the expansion tank
A23-A24-F51	Pressure sensor fault	Wrongly configured parameter	Check if the parameter b04 is correctly configured
		System pressure problems (transducer)	System pressure value outside set limits (transducer)
		b06 set to 3	
A26	Intervention of fault F40 more than 3 times in 24 hours	System water pressure too high	Partially drain the system to a pressure (shown on the display) of 1÷1.5 bar
		Expansion vessel discharged or damaged	Charge or replace the expansion vessel



Fault code	Fault	Possible cause	Cure
F34	Supply voltage under 180V	Electric mains trouble	Check the electrical system
F35	Wrong supply frequency	Electric mains trouble	Check the electrical system
F37	Incorrect system water pressure	Pressure too low	Fill the system
		Pressure transducer not connected or damaged	Check the pressure transducer
F39	External probe fault	Probe damaged or wiring shorted	Check the wiring or replace the sensor
		Probe disconnected after activating the sliding temperature	Reconnect the external probe or disable the sliding temperature
F40	Pressure sensor fault	System water pressure too high and parameter P58 not set to default	Partially drain the system to a pressure (shown on the display) of 1÷1.5 bar
		Expansion vessel discharged or damaged	Charge or replace the expansion vessel
A44	Multiple requests error	Repeated short-term requests	Check if there are pressure peaks in the DHW circuit. If necessary, modify parameter b11.
F47	Pressure transducer no communication	Pressure transducer not electrically connected	Check the electrical connection, transducer connector and wiring.
		Pressure transducer not working	Replace the pressure transducer
F50 - F53	Limit thermostat fault with parameter b06 = 1 or 4	No/poor water circulation in the system	Check the circulating pump and heating system
		Air in the system	Vent the system
		Incorrect parameter	Check the correct parameter setting
F62	Calibration required	New card or boiler not yet calibrated	Do the Calibration procedure [AUTO SETUP].
F64	Maximum number of consecutive Resets exceeded	Maximum number of consecutive Resets exceeded	Disconnect the power supply to the boiler for 60 seconds and then reinstate the boiler
A65 ÷ A97	Specific combustion control errors	Fume ducts obstructed. Low gas pressure (A78 - A84). Condensate trap blocked. Fumes recirculation or combustion problem	Check that the fume ducts and the condensate trap are not blocked. Check the correct gas supply pressure. Do the CO ₂ adjustment in TEST mode. If necessary, do the Calibration procedure [AUTO SETUP].
F65 ÷ F98	Specific combustion control errors	Fume ducts obstructed. Low gas pressure. Condensate trap blocked. Fumes recirculation or combustion problem	Check that the fume ducts and the condensate trap are not blocked. Check the correct gas supply pressure. Do the CO ₂ adjustment in TEST mode. If necessary, do the Calibration procedure [AUTO SETUP].
A80	Parasite flame signal after valve closing	Electrode problem. Gas valve problem. PCB problem.	Check the correct position and condition of the electrode. Check the PCB. Check the gas valve and replace it if necessary.
A88	Specific combustion control errors or gas valve	Calibration activation with burner lit. Combustion problem, faulty gas valve or PCB	Reset the fault and do the Calibration procedure [AUTO SETUP]. If necessary, replace the gas valve or PCB.

Fault code	Fault	Possible cause	Cure
F96	Specific flame combustion error	Unstable flame or unstable flame signal after ignition.	Check the gas supply, fume ducts and condensate drain. Check the correct position and state of the electrode After about 3 minutes the error is reset.
A98	Too many SW errors or error occurred during board replacement	Board replacement	Reset the fault and do the Calibration procedure [AUTO SETUP].
		Fume ducts obstructed. Low gas pressure. Condensate trap blocked. Fumes recirculation or combustion problem.	Initially solve the problem, reset the fault and check correct ignition. Do the Calibration procedure [AUTO SETUP]. Replace the board if necessary.
A99	Generic error	PCB hardware or software error	Reset the fault and check for correct ignition. Do the Calibration procedure [AUTO SETUP]. If the problem persists, replace the board.
F99	Communication fault between display and control unit	Connection cable interrupted or not inserted	Check the connection
		Misalignment of parameters between control unit and display	Turn the power off and on
		Factory values reset	Turn the power off and on



4. Technical data and characteristics

4.1 Dimensions and connections

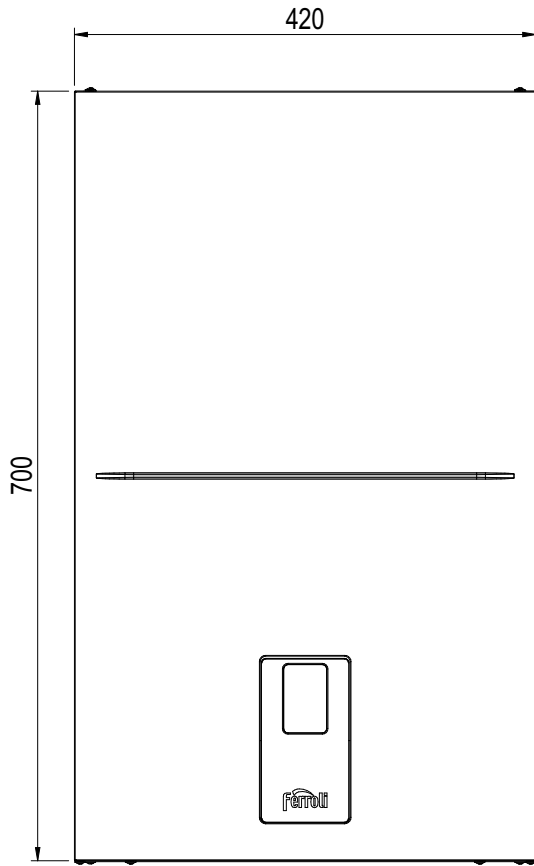


fig. 61- Front view

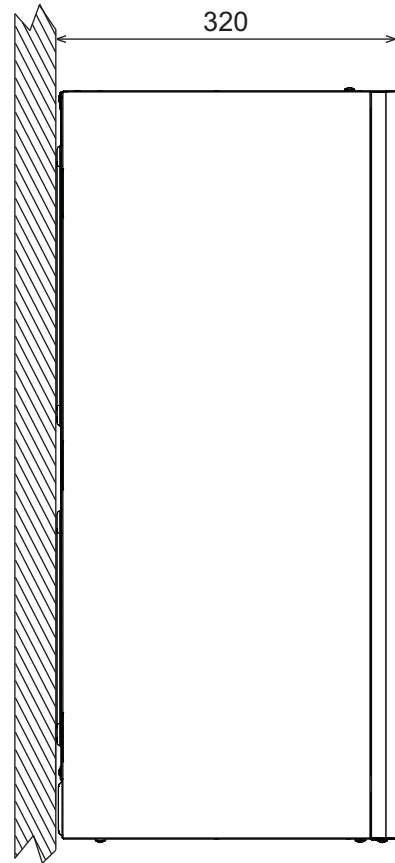


fig. 62- Side view

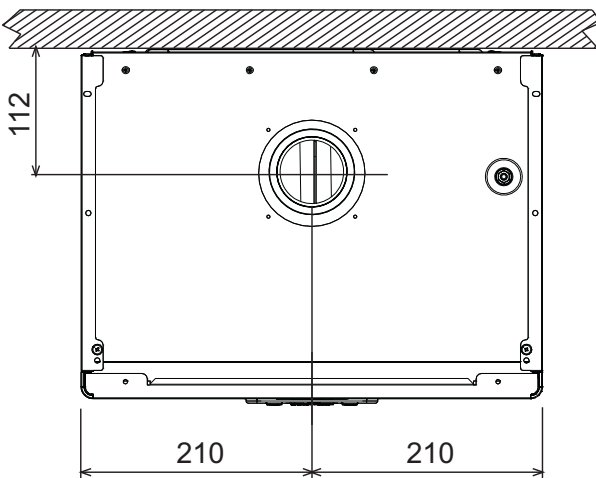


fig. 63- Top view

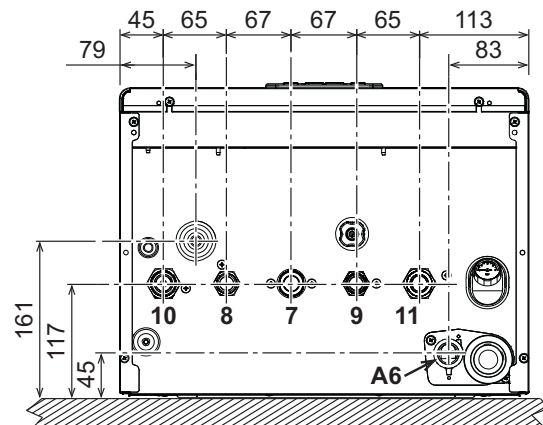
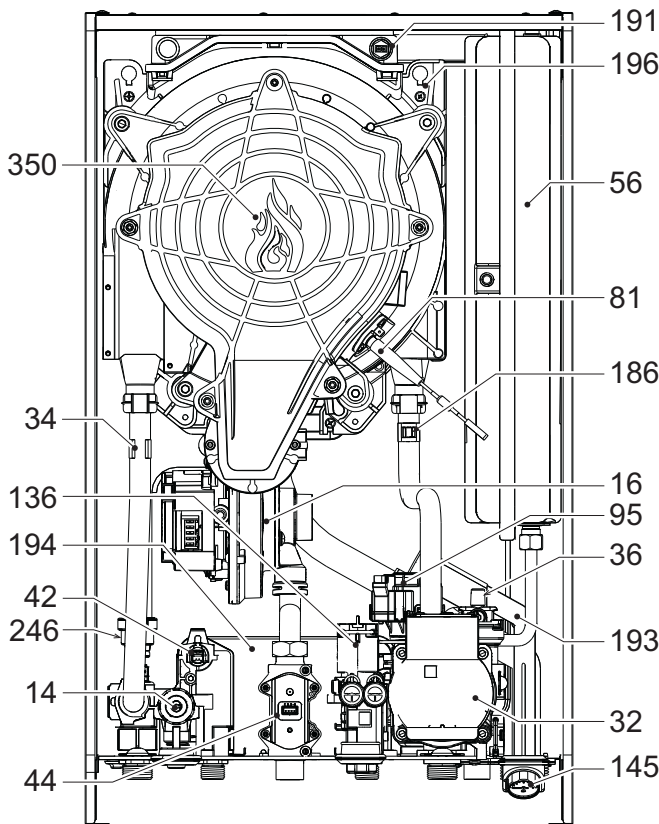


fig. 64- Bottom view

- 7 Gas inlet - Ø 3/4"
- 8 DHW outlet - Ø 1/2"
- 9 Cold water inlet - Ø 1/2"
- 10 System flow - Ø 3/4"

- 11 System return - Ø 3/4"
- A6 Condensate discharge connection

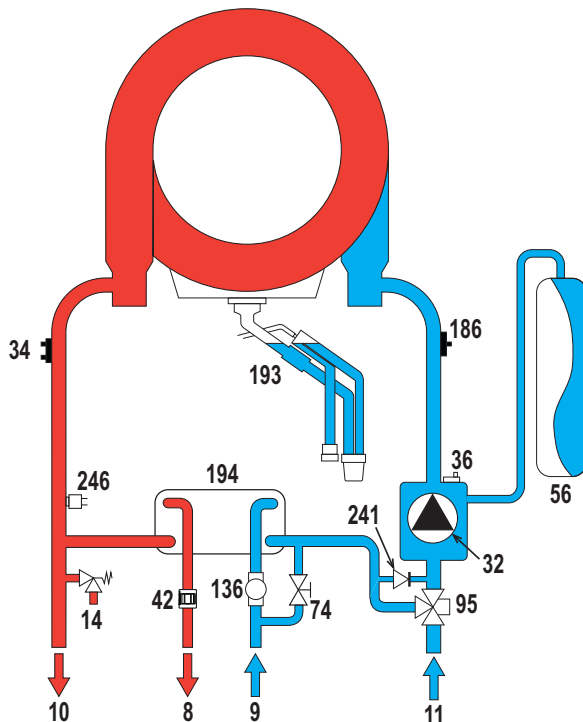
4.2 General view



- 14 Safety valve
- 16 Fan
- 32 Heating circulating pump
- 34 Heating temperature sensor
- 36 Automatic air vent
- 42 DHW temperature probe
- 44 Gas valve
- 56 Expansion vessel
- 81 Ionization/ignition electrode
- 95 Diverter valve
- 136 Flowmeter
- 145 Water gauge
- 186 Return sensor
- 191 Fume temperature sensor
- 193 Trap
- 194 DHW exchanger
- 196 Condensate tray
- 246 Pressure transducer
- 350 Fan/Burner assembly

fig. 65- General view

4.3 Hydraulic circuit



- 8 Domestic hot water outlet
- 9 Cold water inlet
- 10 System flow
- 11 System return
- 14 Safety valve
- 32 Heating circulating pump
- 34 Heating temperature sensor
- 36 Automatic air vent
- 42 DHW temperature probe
- 56 Expansion vessel
- 74 System filling faucet
- 95 Diverter valve
- 136 Flowmeter
- 186 Return sensor
- 193 Trap
- 194 DHW exchanger
- 241 Automatic bypass (inside pump unit)
- 246 Pressure transducer

fig. 66- Hydraulic circuit

4.4 Technical data table

Table 12- Technical data table

0T4B2AGA BLUEHELIX HITECH RRT 24 C		0T4B4AGA BLUEHELIX HITECH RRT 28 C		0T4B7AGA BLUEHELIX HITECH RRT 34 C	
COUNTRIES OF DESTINATION		GB			
GAS CATEGORY		I12H3+ (GB)			
PRODUCT IDENTIFICATION CODES		0T4B2AGA	0T4B4AGA	0T4B7AGA	
Max. heating capacity	kW	20,4	24,5	30,6	
Min. heating capacity	kW	3,5	3,5	3,5	
Max. heat output in heating (80/60°C)	kW	20	24	30	
Min. heat output in heating (80/60°C)	kW	3,4	3,4	3,4	
Max. heat output in heating (50/30°C)	kW	21,6	26	32,5	
Min. heat output in heating (50/30°C)	kW	3,8	3,8	3,8	
Max. heating capacity in DHW	kW	25	28,5	34,7	
Min. heating capacity in DHW	kW	3,5	3,5	3,5	
Max. heat output in DHW	kW	24,5	28	34	
Min. heat output in DHW	kW	3,4	3,4	3,4	
Efficiency Pmax (80-60°C)	%	98,1	98,1	97,9	
Efficiency Pmin (80-60°C)	%	98	98	98	
Efficiency Pmax (50-30°C)	%	106,1	106,1	106,1	
Efficiency Pmin (50-30°C)	%	107,5	107,5	107,5	
Efficiency 30%	%	109,7	109,7	109,5	
Flue losses with burner ON - Pmax (80/60)	%	2	1,9	2	
Flue losses with burner ON - Pmin (80/60)	%	1,5	1,7	1,5	
Shell losses with burner ON - Pmax (80/60)	%	0,5	0,4	0,3	
Shell losses with burner ON - Pmin (80/60)	%	2,4	2,4	1,4	
Flue losses with burner ON - Pmax (50/30)	%	1,1	1,1	0,9	
Flue losses with burner ON - Pmin (50/30)	%	0,7	0,7	0,6	
Shell losses with burner ON - Pmax (50/30)	%	0,6	0,3	0,6	
Shell losses with burner ON - Pmin (50/30)	%	1,1	1,1	1,1	
Flue losses with burner OFF (50K)	%	0	0	0	
Shell losses with burner OFF (50K)	%	0,2	0,2	0,1	
Flue losses with burner OFF (20K)	%	0	0	0	
Shell losses with burner OFF (20K)	%	0,1	0,1	0,1	
Gas supply pressure G20	mbar	20	20	20	
Max. gas flow G20	m3/h	2,6	3	3,7	
Min. gas flow G20	m3/h	0,4	0,4	0,4	
CO ₂ - G20	%	90,8	90,8	90,8	
Gas supply pressure G31	mbar	37	37	37	
Max. gas flow G31	kg/h	1,9	2,2	2,7	
Min. gas flow G31	kg/h	0,3	0,3	0,3	
CO ₂ - G31	%	100,8	100,8	100,8	
NOx emissions class	-	6 (< 56 mg/kWh)			
Max. working pressure in heating	bar	2,5	2,5	2,5	
Min. working pressure in heating	bar	0,8	0,8	0,8	
Heating adjustment max. temperature	°C	95	95	95	
Heating water content	liters	2,9	2,9	4,3	
Heating expansion vessel capacity	liters	8	8	10	
Heating expansion vessel precharge pressure	bar	0,8	0,8	0,8	
Max. working pressure in DHW	bar	9	9	9	
Min. working pressure in DHW	bar	0,3	0,3	0,3	
DHW flow rate Δt 25°C	l/min	14	16,1	19,5	
DHW flow rate Δt 30°C	l/min	11,7	13,4	16,2	
DHW water content	liters	0,3	0,3	0,4	
Protection rating	IP	4	4	4	
Power supply voltage	V/Hz	230V~50HZ			
Electrical power input	W	73	82	105	
Empty weight	kg	28,4	28,4	30,7	
Type of unit		C10-C11-C13-C23-C33-C43-C53-C63-C83-C93-B23-B33			
C10-C11 flues installation pressure	Pa	86	89	94	

ErP product fiche

MODEL: BLUEHELIX HITECH RRT 24 C - (0T4B2AGA)

Trademark: FERROLI			
Condensing boiler: YES			
Low-temperature boiler (**): YES			
B1 Boiler: NO			
Combination heater: YES			
Cogeneration space heater: NO			
Item	Symbol	Unit	Value
Seasonal space heating energy efficiency class (from A+++ to D)			
Seasonal space heating energy efficiency class (from A+++ to D)			A
Rated heat output	Pn	kW	20
Seasonal space heating energy efficiency	η_s	%	94
Useful heat output			
Useful heat output at rated heat output and high-temperature regime (*)	P4	kW	20,0
Useful heat output at 30% of rated heat output and low-temperature regime (**)	P1	kW	6,7
Useful efficiency			
Useful efficiency at rated heat output and high-temperature regime (*)	η_4	%	88,3
Useful efficiency at 30% of rated heat output and low-temperature regime (**)	η_1	%	98,8
Auxiliary electricity consumption			
At full load	elmax	kW	0,024
At part load	elmin	kW	0,010
In standby mode	PSB	kW	0,004
Other items			
Standby heat loss	Pstby	kW	0,042
Ignition burner power consumption	Pign	kW	0,000
Annual energy consumption	QHE	GJ	38
Sound power level	LWA	dB	47
Emissions of nitrogen oxides	NOx	mg/kWh	34
For combination heaters			
Declared load profile			XL
Water heating energy efficiency class (from A+ to F)			A
Daily electricity consumption	Qelec	kWh	0,148
Annual electricity consumption	AEC	kWh	34
Water heating energy efficiency	η_{wh}	%	87
Daily fuel consumption	Qfuel	kWh	20,220
Annual fuel consumption	AFC	GJ	17

(*) 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).

ErP product fiche

MODEL: BLUEHELIX HITECH RRT 28 C - (0T4B4AGA)

Trademark: FERROLI			
Condensing boiler: YES			
Low-temperature boiler (**): YES			
B1 Boiler: NO			
Combination heater: YES			
Cogeneration space heater: NO			
Item	Symbol	Unit	Value
Seasonal space heating energy efficiency class (from A+++ to D)			
Seasonal space heating energy efficiency class (from A+++ to D)			A
Rated heat output	P _n	kW	24
Seasonal space heating energy efficiency	η_s	%	94
Useful heat output			
Useful heat output at rated heat output and high-temperature regime (*)	P ₄	kW	24,0
Useful heat output at 30% of rated heat output and low-temperature regime (**)	P ₁	kW	8,1
Useful efficiency			
Useful efficiency at rated heat output and high-temperature regime (*)	η_4	%	88,3
Useful efficiency at 30% of rated heat output and low-temperature regime (**)	η_1	%	98,8
Auxiliary electricity consumption			
At full load	el _{max}	kW	0,028
At part load	el _{min}	kW	0,011
In standby mode	PSB	kW	0,004
Other items			
Standby heat loss	P _{stby}	kW	0,042
Ignition burner power consumption	P _{ign}	kW	0,000
Annual energy consumption	Q _{HE}	GJ	44
Sound power level	L _{WA}	dB	48
Emissions of nitrogen oxides	NO _x	mg/kWh	31
For combination heaters			
Declared load profile			XL
Water heating energy efficiency class (from A+ to F)			A
Daily electricity consumption	Q _{elec}	kWh	0,148
Annual electricity consumption	AEC	kWh	32
Water heating energy efficiency	η_{wh}	%	87
Daily fuel consumption	Q _{fuel}	kWh	20,220
Annual fuel consumption	AFC	GJ	17

(*) 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).

ErP product fiche

MODEL: BLUEHELIX HITECH RRT 34 C - (0T4B7AGA)

Trademark: FERROLI			
Condensing boiler: YES			
Low-temperature boiler (**): YES			
B1 Boiler: NO			
Combination heater: YES			
Cogeneration space heater: NO			
Item	Symbol	Unit	Value
Seasonal space heating energy efficiency class (from A+++ to D)			
Seasonal space heating energy efficiency class (from A+++ to D)			A
Rated heat output	Pn	kW	30
Seasonal space heating energy efficiency	η_s	%	94
Useful heat output			
Useful heat output at rated heat output and high-temperature regime (*)	P4	kW	30,0
Useful heat output at 30% of rated heat output and low-temperature regime (**)	P1	kW	10,1
Useful efficiency			
Useful efficiency at rated heat output and high-temperature regime (*)	η_4	%	88,2
Useful efficiency at 30% of rated heat output and low-temperature regime (**)	η_1	%	98,6
Auxiliary electricity consumption			
At full load	elmax	kW	0,045
At part load	elmin	kW	0,009
In standby mode	PSB	kW	0,004
Other items			
Standby heat loss	Pstby	kW	0,046
Ignition burner power consumption	Pign	kW	0,000
Annual energy consumption	QHE	GJ	55
Sound power level	LWA	dB	49
Emissions of nitrogen oxides	NOx	mg/kWh	26
For combination heaters			
Declared load profile			XXL
Water heating energy efficiency class (from A+ to F)			A
Daily electricity consumption	Qelec	kWh	0,186
Annual electricity consumption	AEC	kWh	41
Water heating energy efficiency	η_{wh}	%	85
Daily fuel consumption	Qfuel	kWh	25,530
Annual fuel consumption	AFC	GJ	22

(*) 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).

4.5 Diagrams

Residual head available for system

BlueHelix HiTech RRT 24 C

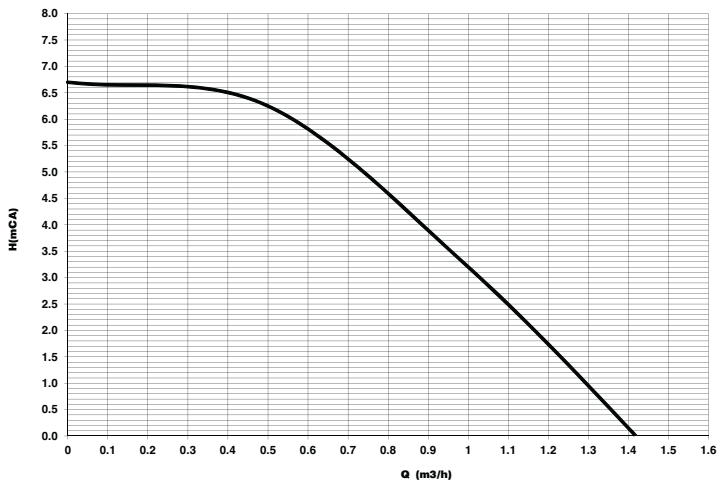


fig. 67- Residual head available for system

BlueHelix HiTech RRT 28 C

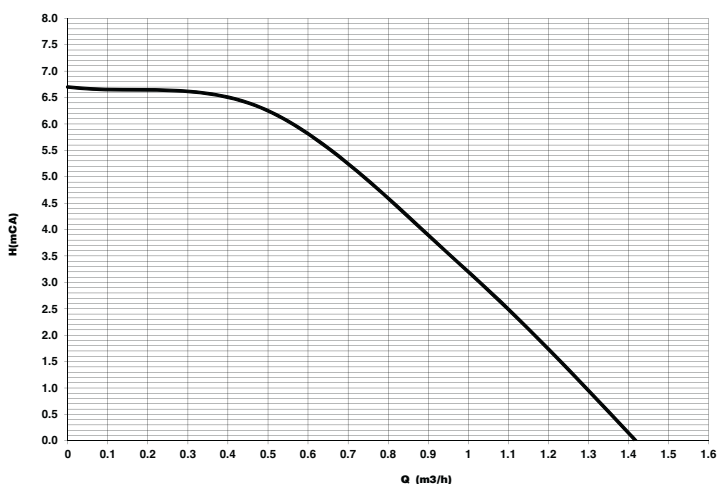


fig. 68- Residual head available for system

BlueHelix HiTech RRT 34 C

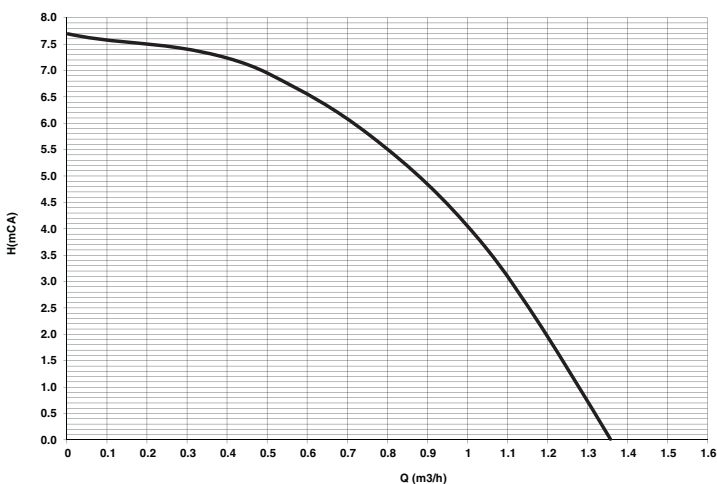


fig. 69- Residual head available for system

4.6 Wiring diagram

- | | | | |
|----|--------------------------------|-----|---------------------------------|
| 16 | Fan | 136 | Flowmeter |
| 32 | Heating circulating pump | 138 | External probe (optional) |
| 34 | Heating temperature sensor | 139 | Remote timer control (optional) |
| 42 | DHW temperature probe | 186 | Return sensor |
| 44 | Gas valve | 191 | Fume temperature sensor |
| 72 | Room thermostat (not supplied) | 288 | Frost protection kit |
| 81 | Ionization/ignition electrode | 246 | Pressure transducer |
| 95 | Diverter valve | A | ON/OFF switch (configurable) |

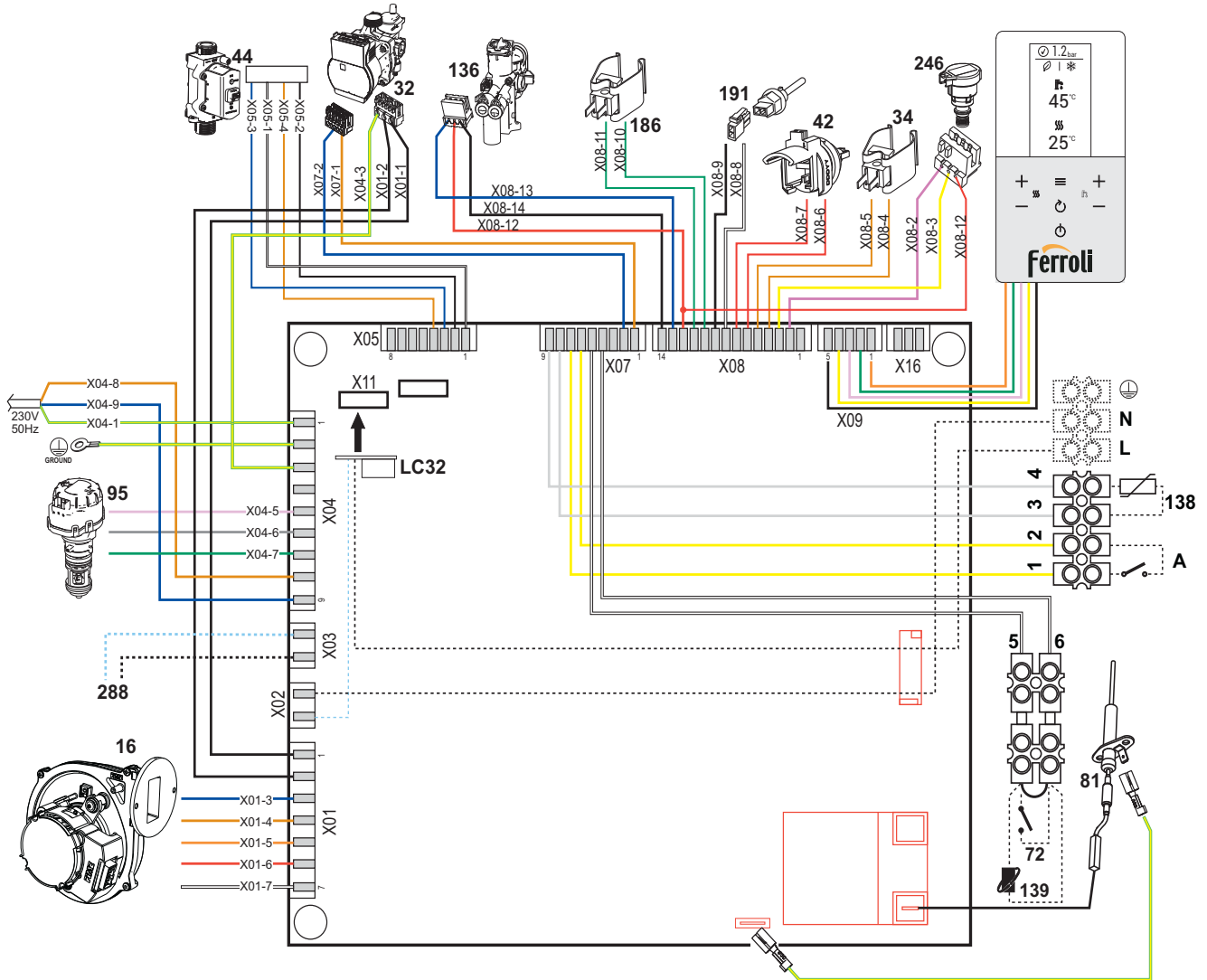


fig. 70- Wiring diagram



Attention: Before connecting the **room thermostat** or **remote timer control**, remove the jumper on the terminal block.

To connect more zones of the hydraulic system controlled by thermostats with voltage-free contact, and the timer control has to be used as a remote control for the boiler, the voltage-free contacts of the zones must be connected to terminals 1-2 and the timer control to terminals 5-6.

ALL CONNECTIONS TO THE TERMINAL BLOCK MUST BE WITH VOLTAGE-FREE CONTACTS (NOT 230V).

Benchmark Commissioning and Servicing Section

It is a requirement that the boiler is installed and commissioned in accordance with manufacturer's instructions and the data fields on the commissioning checklist are completed in full.

To validate the boiler guarantee the boiler needs to be registered with the manufacturer within one month of the installation.

To maintain the boiler guarantee it is essential that the boiler is serviced annually by a Gas Safe registered engineer who has been trained on the boiler installed. The service details should be recorded on the Benchmark Service Interval Record and left with the householder.



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GAS BOILER SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the boiler as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission according to the manufacturer's instructions and complete this Benchmark Commissioning Checklist will invalidate the warranty. This does not affect the customer's statutory rights.

Customer name:				Telephone number:			
Address:							
Boiler make and model:							
Boiler serial number:							
Commissioned by (PRINT NAME):				Gas Safe register number:			
Company name:				Telephone number:			
Company address:							
				Commissioning date:			
To be completed by the customer on receipt of a Building Regulations Compliance Certificate*							
Building Regulations Notification Number (if applicable):							
CONTROLS (tick the appropriate boxes)							
Time and temperature control to heating		Room thermostat and programmer/timer		Programmable room thermostat			
		Load/weather compensation		Optimum start control			
Time and temperature control to hot water		Cylinder thermostat and programmer/timer		Combination Boiler			
Heating zone valves		Fitted		Not required			
Hot water zone valves		Fitted		Not required			
Thermostatic radiator valves		Fitted		Not required			
Automatic bypass to system		Fitted		Not required			
Boiler interlock				Provided			
ALL SYSTEMS							
The system has been flushed and cleaned in accordance with BS7593 and boiler manufacturer's instructions						Yes	
What system cleaner was used?							
What inhibitor was used?						Quantity	
						litres	
Has a primary water system filter been installed?						Yes	
						No	
CENTRAL HEATING MODE measure and record:							
Gas rate		m ³ /hr		OR		ft ³ /hr	
Burner operating pressure (if applicable)		mbar		OR Gas inlet pressure		mbar	
Central heating flow temperature						°C	
Central heating return temperature						°C	
COMBINATION BOILERS ONLY							
Is the installation in a hard water area (above 200ppm)?						Yes	
						No	
If yes, has a water scale reducer been fitted?						Yes	
						No	
What type of scale reducer has been fitted?							
DOMESTIC HOT WATER MODE Measure and Record:							
Gas rate		m ³ /hr		OR		ft ³ /hr	
Burner operating pressure (at maximum rate)		mbar		OR Gas inlet pressure at maximum rate		mbar	
Cold water inlet temperature						°C	
Hot water has been checked at all outlets						Yes	
						Temperature	
						°C	
Water flow rate						l/min	
CONDENSING BOILERS ONLY							
The condensate drain has been installed in accordance with the manufacturer's instructions and/or BS5546/BS6798						Yes	
ALL INSTALLATIONS							
Record the following:		At max. rate: CO ppm		AND		CO/CO ₂ Ratio	
		At min. rate: (where possible) CO ppm		AND		CO/CO ₂ Ratio	
Mandatory Requirement		CO₂ @Max Rate %		CO₂ @Min Rate %			
The heating and hot water system complies with the appropriate Building Regulations						Yes	
The boiler and associated products have been installed and commissioned in accordance with the manufacturer's instructions						Yes	
The operation of the boiler and system controls have been demonstrated to and understood by the customer						Yes	
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer						Yes	
Commissioning Engineer's Signature							
Customer's Signature							
(To confirm satisfactory demonstration and receipt of manufacturer's literature)							

All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a *Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



SERVICE INTERVAL RECORD

It is necessary that your heating system is serviced annually to validate your warranty and that the appropriate Service Interval Record is completed.

Service Provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions. Always use the manufacturer's specified spares when replacing parts.

SERVICE 01				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

SERVICE 02				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

SERVICE 03				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

SERVICE 04				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

SERVICE 05				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

SERVICE 06				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

SERVICE 07				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

SERVICE 08				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

SERVICE 09				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

SERVICE 10				Date:
Engineer name:				
Company name:				
Telephone No:				
Gas safe register No:				
Record:	At max. rate:	CO	ppm	AND CO ₂ %
	At min. rate:	CO	ppm	AND CO ₂ %
CO/CO ₂ Ratio	min. rate		max rate	
Comments:				
Signature				

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



Before contacting Ferroli please have available the completed BENCHMARK document (located in the back of this manual), boiler serial number and model detail.

For Technical assistance during the installation, call our **Technical Helpline on 0330 205 0005**.
You will be required to provide your Gas Safe Register Number.

Should you require a Service Engineer to visit, call our **Service Centre on 0330 205 0005**.

Calls to our 0330 numbers cost the same as a call to an 01 or 02 national number whether from a landline or mobile.
Calls are also inclusive in any bundle you may have with have your phone provider.

Phone numbers:

Installer _____

Service Engineer _____

BECAUSE OF OUR CONSTANT ENDEAVOUR FOR IMPROVEMENT DETAILS MAY VARY SLIGHTLY FROM THOSE QUOTED IN THESE INSTRUCTIONS.

ALL SPECIFICATIONS SUBJECT TO CHANGE

Please note - to avoid incurring unnecessary expense, in the event of a boiler shut down, check this is not caused by lack of electricity supply, gas supply or low water pressure before calling our Customer Service Helpline

The logo for Ferroli, featuring the word "ferroli" in a bold, lowercase, sans-serif font. Above the letters "e" and "r" is a stylized, grey, curved graphic element that resembles a flame or a protective shield.

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