

BlueHelix HiTech RRT C



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.
- Do not alter components protected by tamper seals.
- 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.
	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. 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.



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.

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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

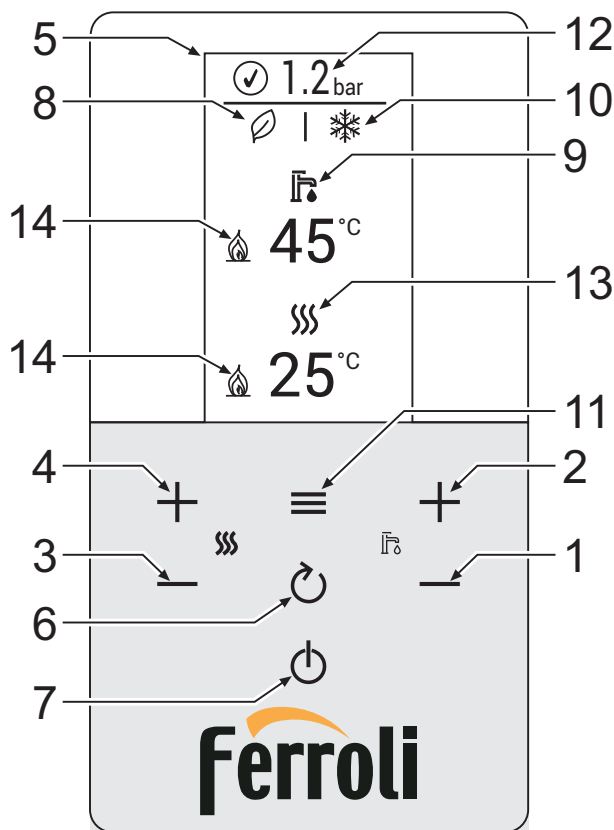


fig. 1- Control panel

Panel legend fig. 1

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

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.

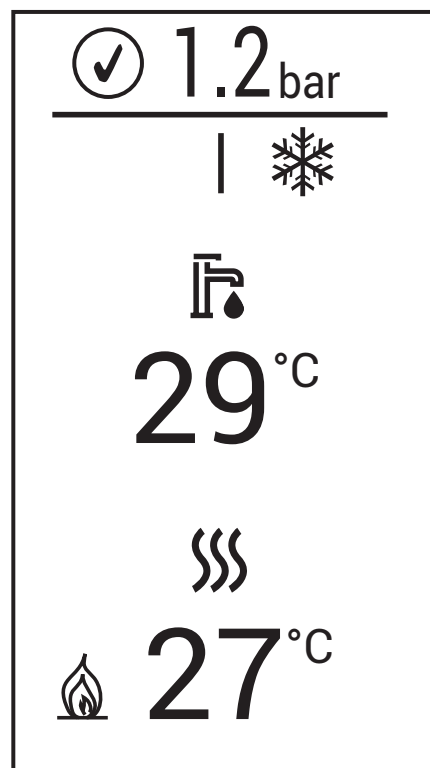


fig. 2

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.

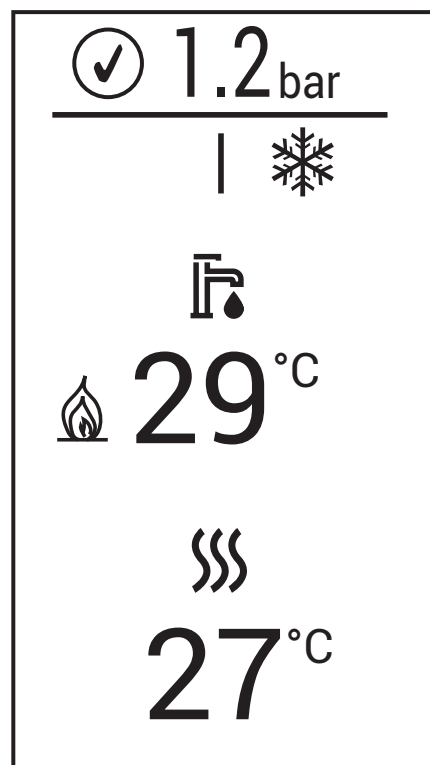


fig. 3

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.

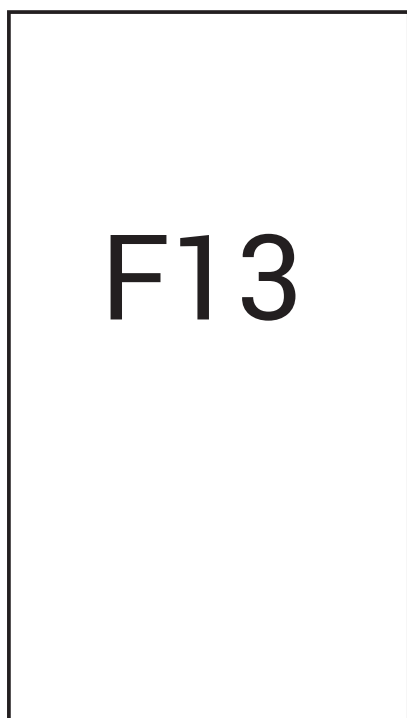


fig. 4

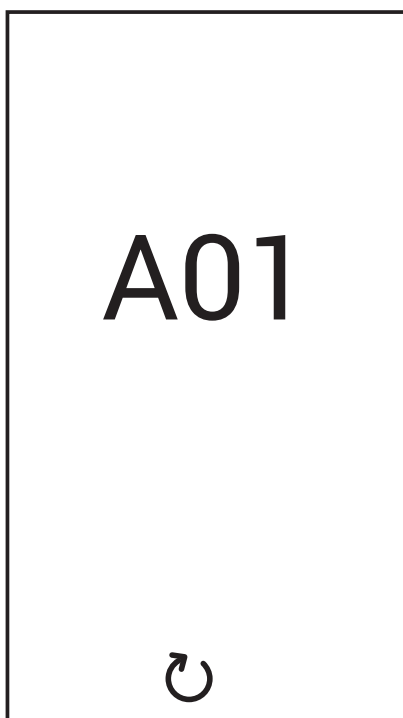


fig. 5

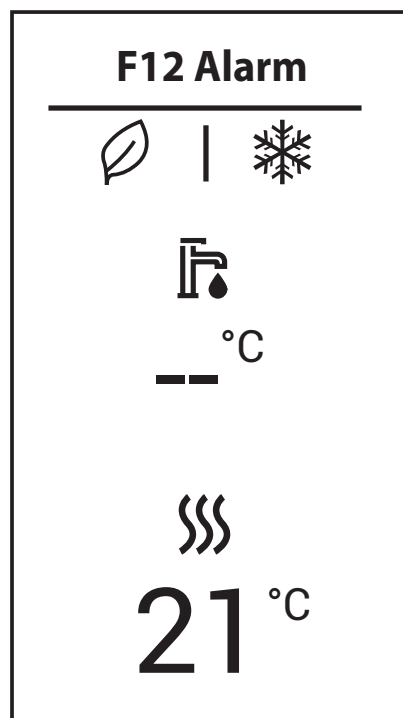


fig. 6

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.

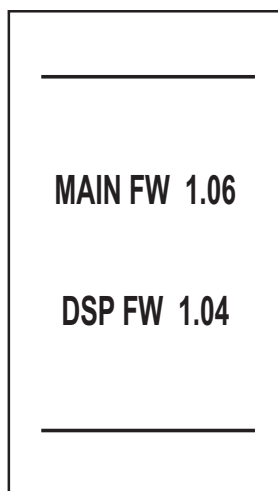


fig. 7- Switching on / Software version

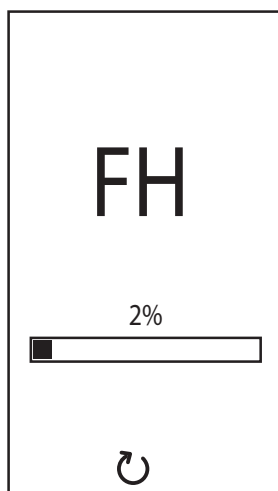


fig. 8- Vent with fan on

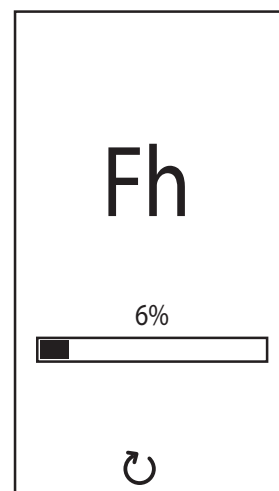


fig. 9- Vent with fan off

- 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 .

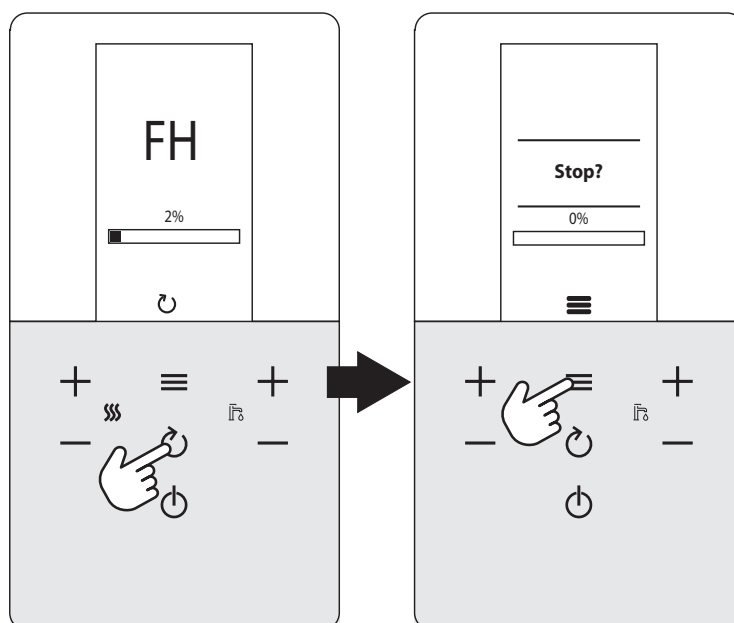


fig. 10

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.

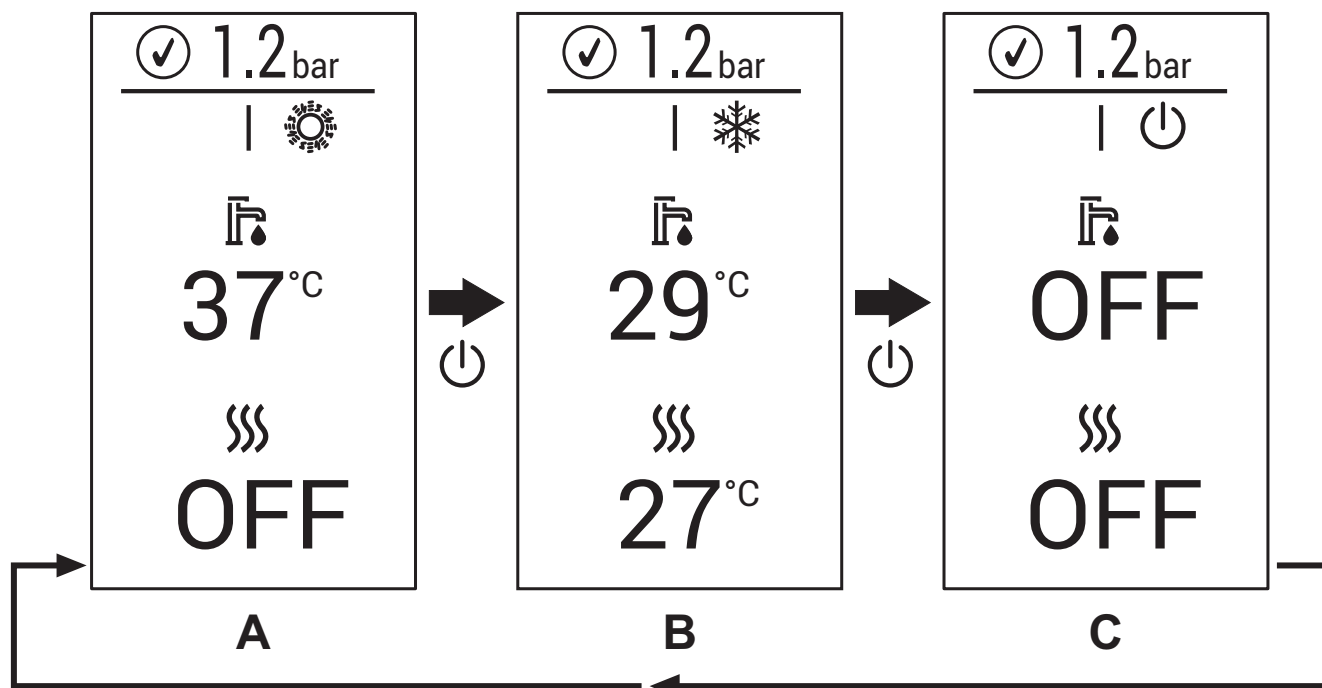


fig. 11- Turning the boiler off

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.

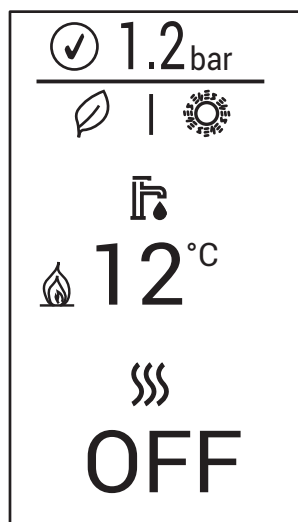


fig. 12- Summer

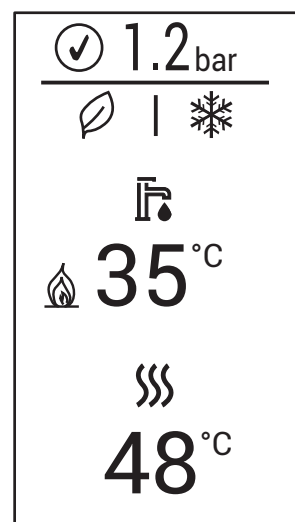


fig. 13- Winter

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.

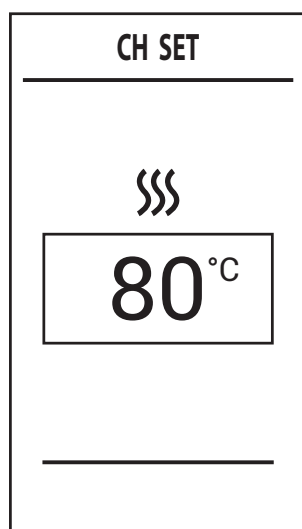


fig. 14

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.

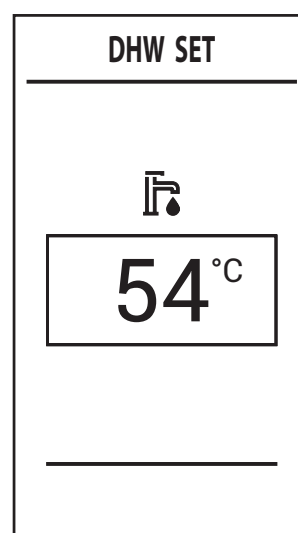


fig. 15



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 10.
- **[Diagnostic]** - Provides information on boiler status, in real time.
See "Boiler information menu [Diagnostic]" on page 11.
- **[Counters]** - Boiler counters.
See "Boiler counters menu [Counters]" on page 13.
- **[Alarm]** - Storage of last faults that occurred in the boiler.
See "Boiler faults menu [Alarm]" on page 13.
- **[Display]** - For doing the display settings.
See "Display adjustment menu [Display]" on page 13.

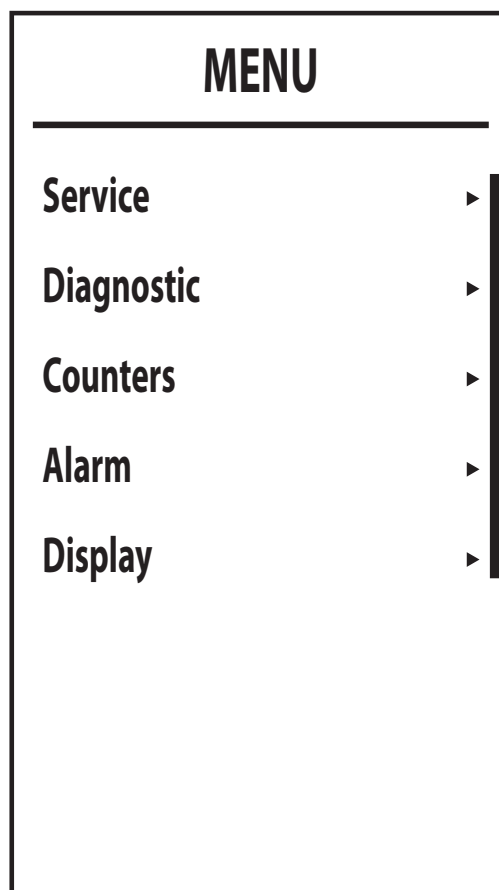


fig. 16- Main menu

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).

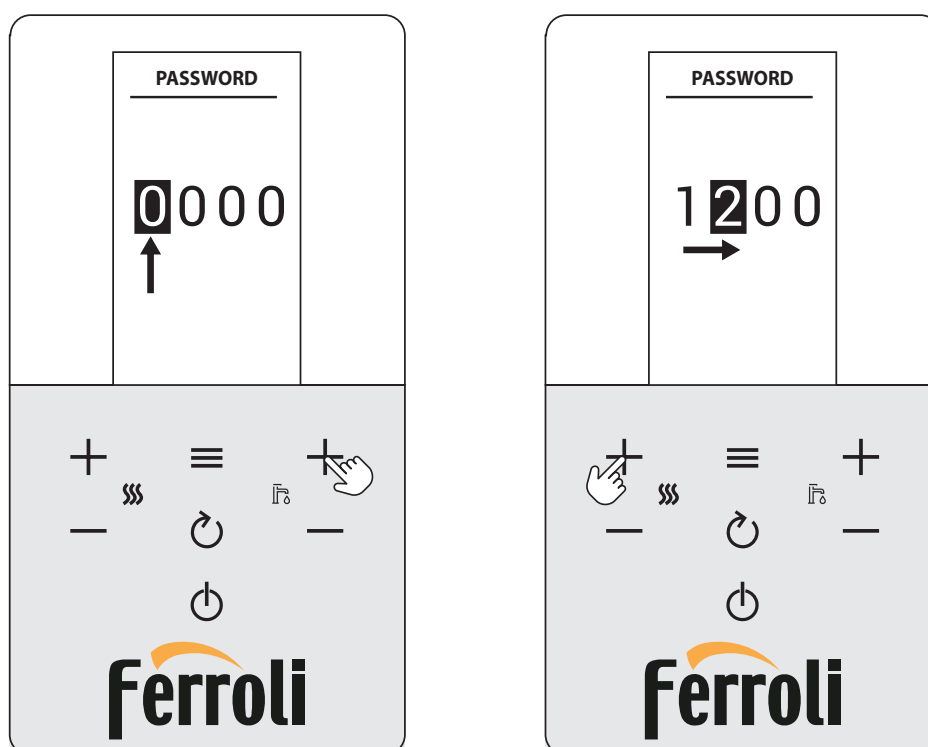


fig. 17- Password entry

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**.

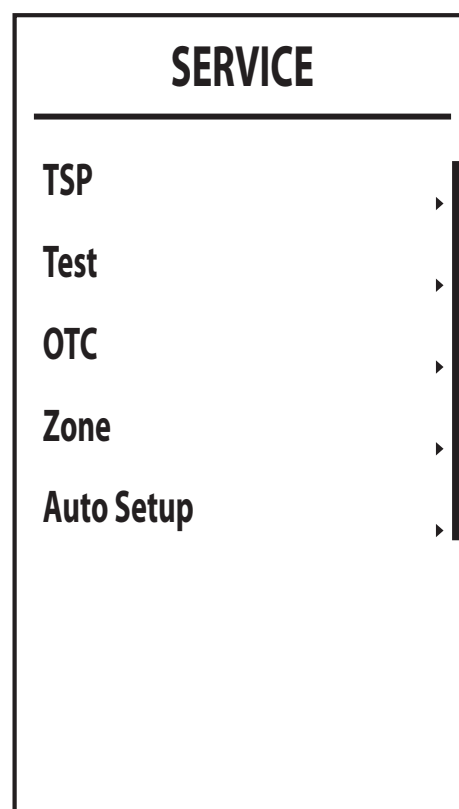


fig. 18

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 .

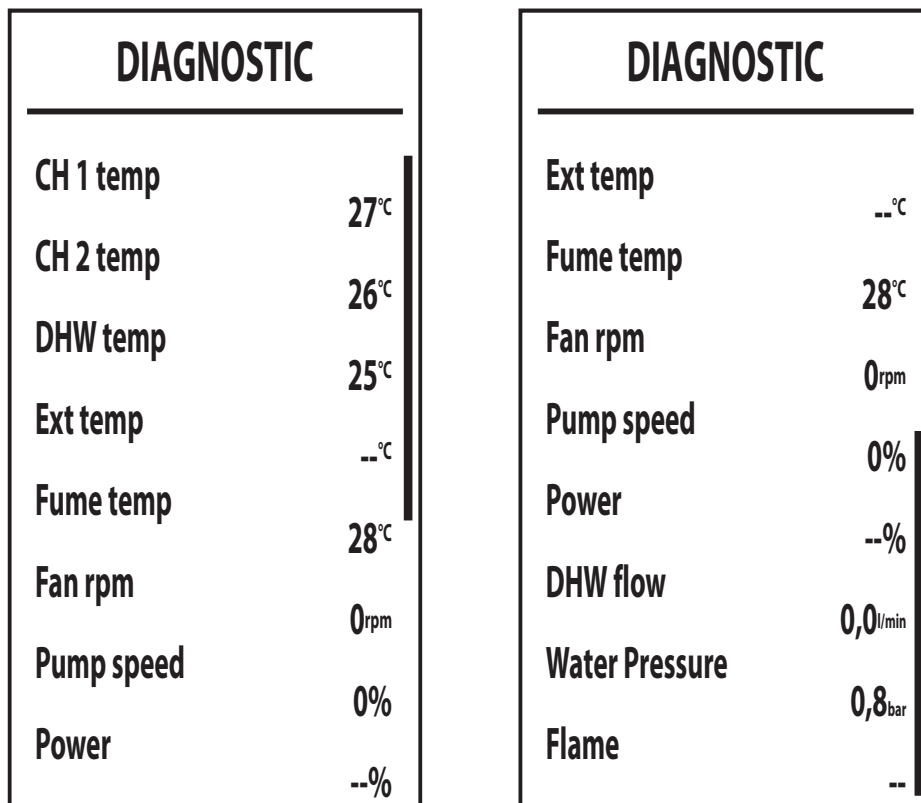


fig. 19

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

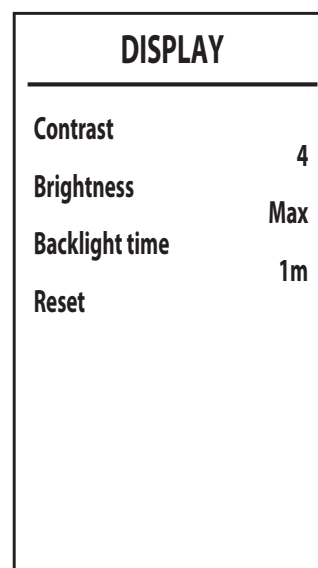


fig. 22

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 10) and press the button . Using the buttons  and  **heating** select the menu **Climatic 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.

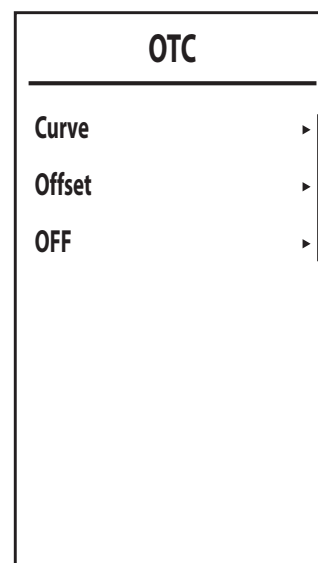


fig. 23

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.

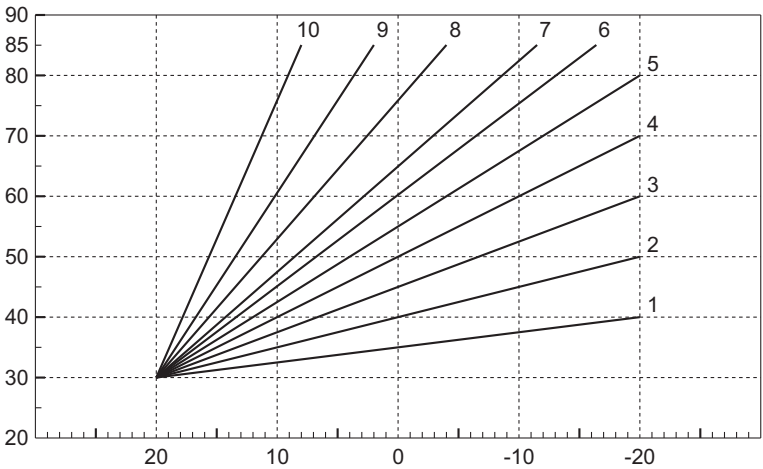


fig. 24- Compensation curves

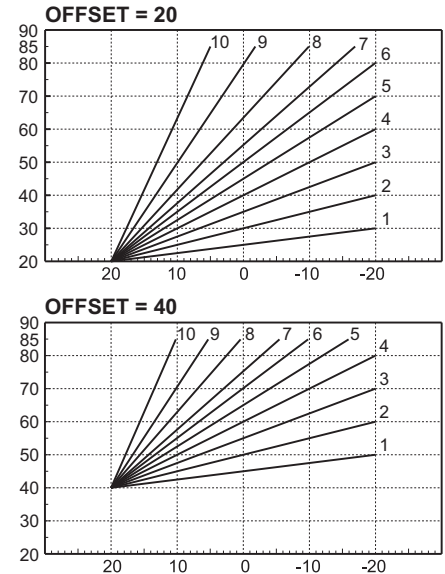


fig. 25- Example of compensation parallel curve offset

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
 2.3 bar	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).

Respect the direction of insertion.

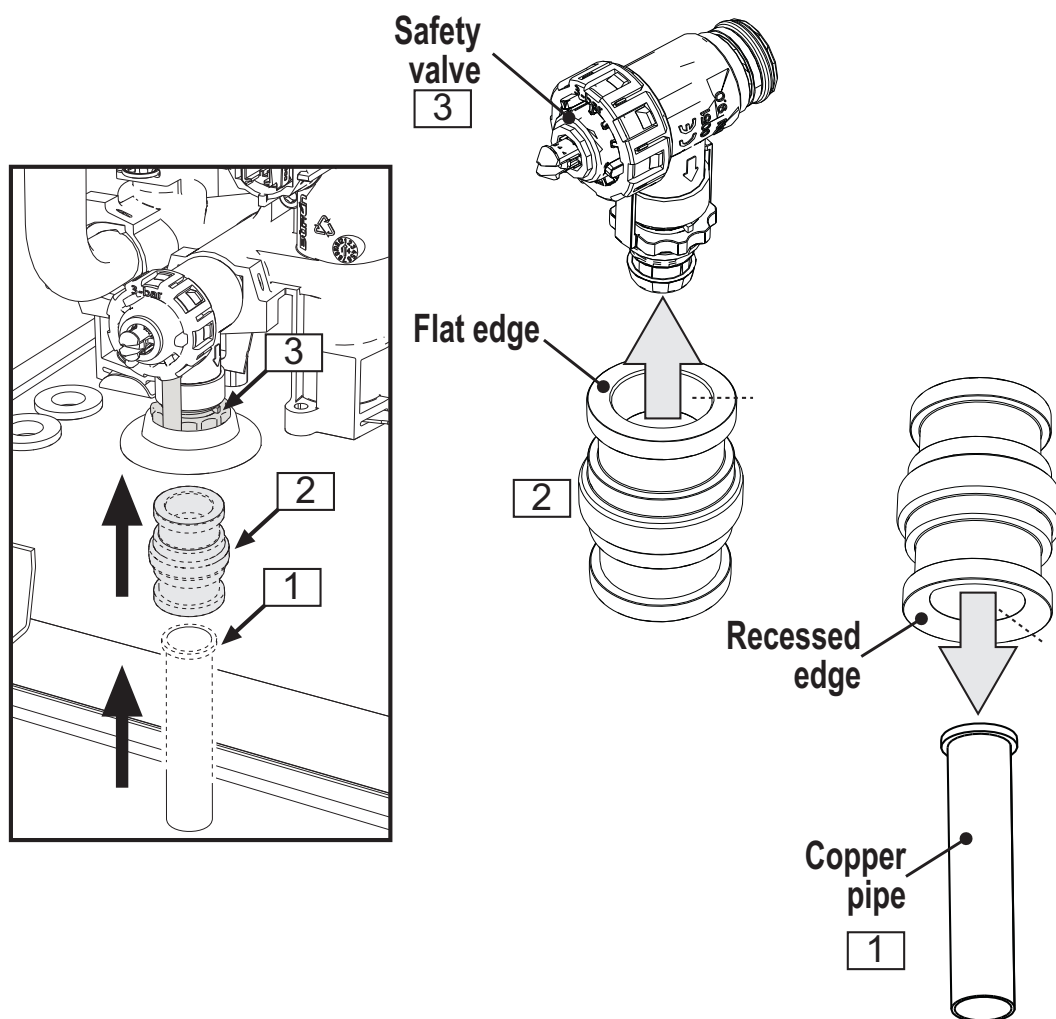


fig. 26

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.

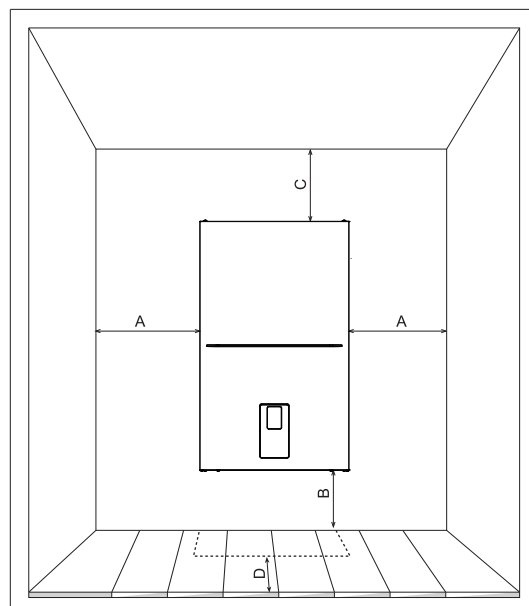


fig. 27

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 fig. 28.

! 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

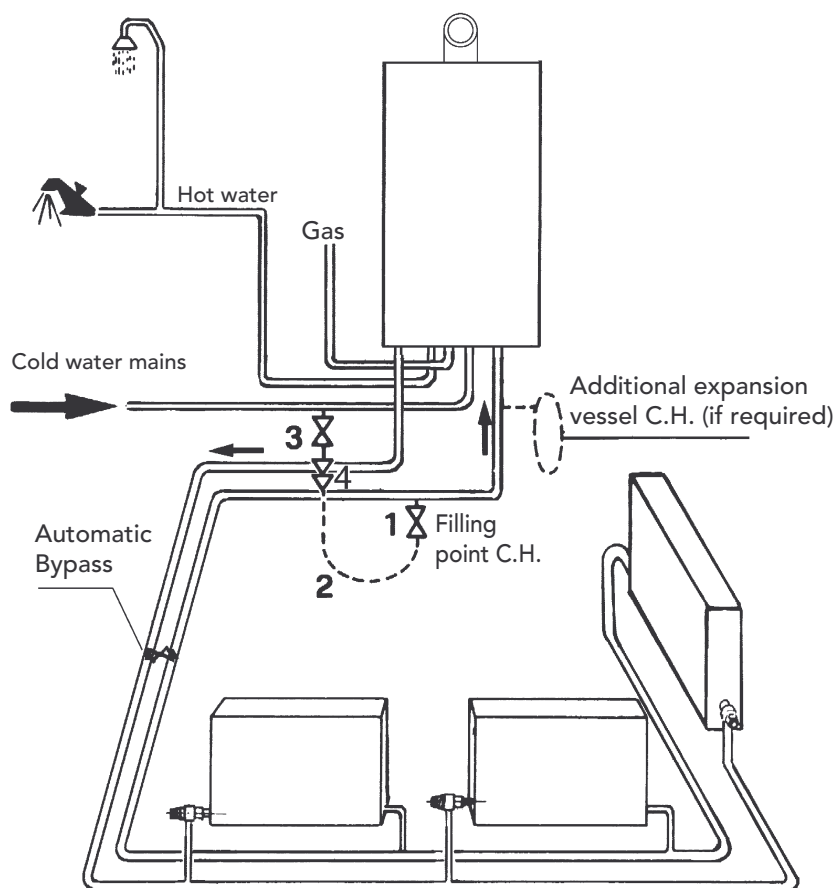


fig. 28

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

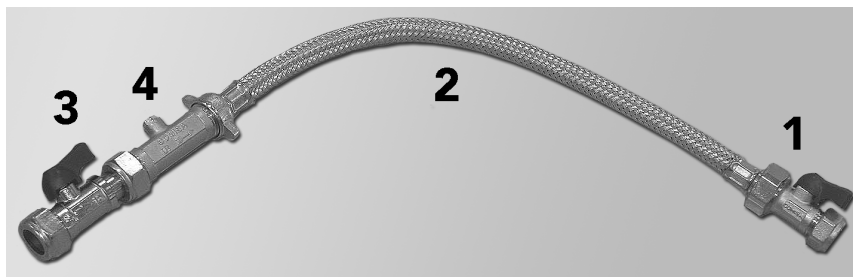
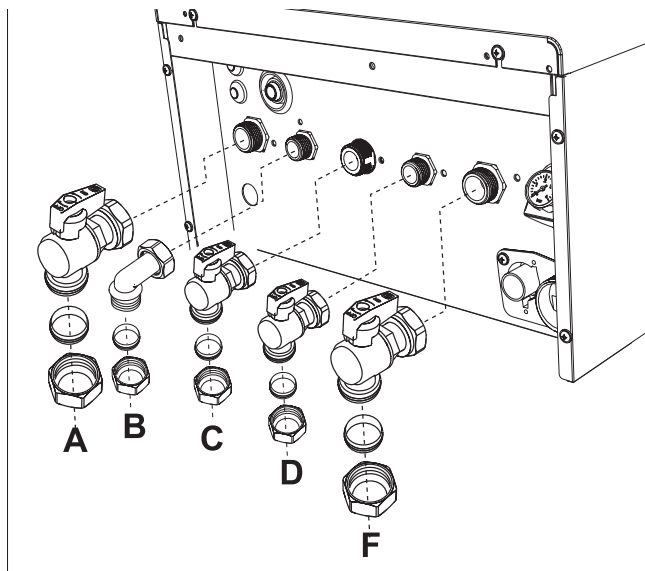


fig. 29 - Filling Loop (supplied with boiler)

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 cyclicity 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. 80) 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 47) 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. 85.

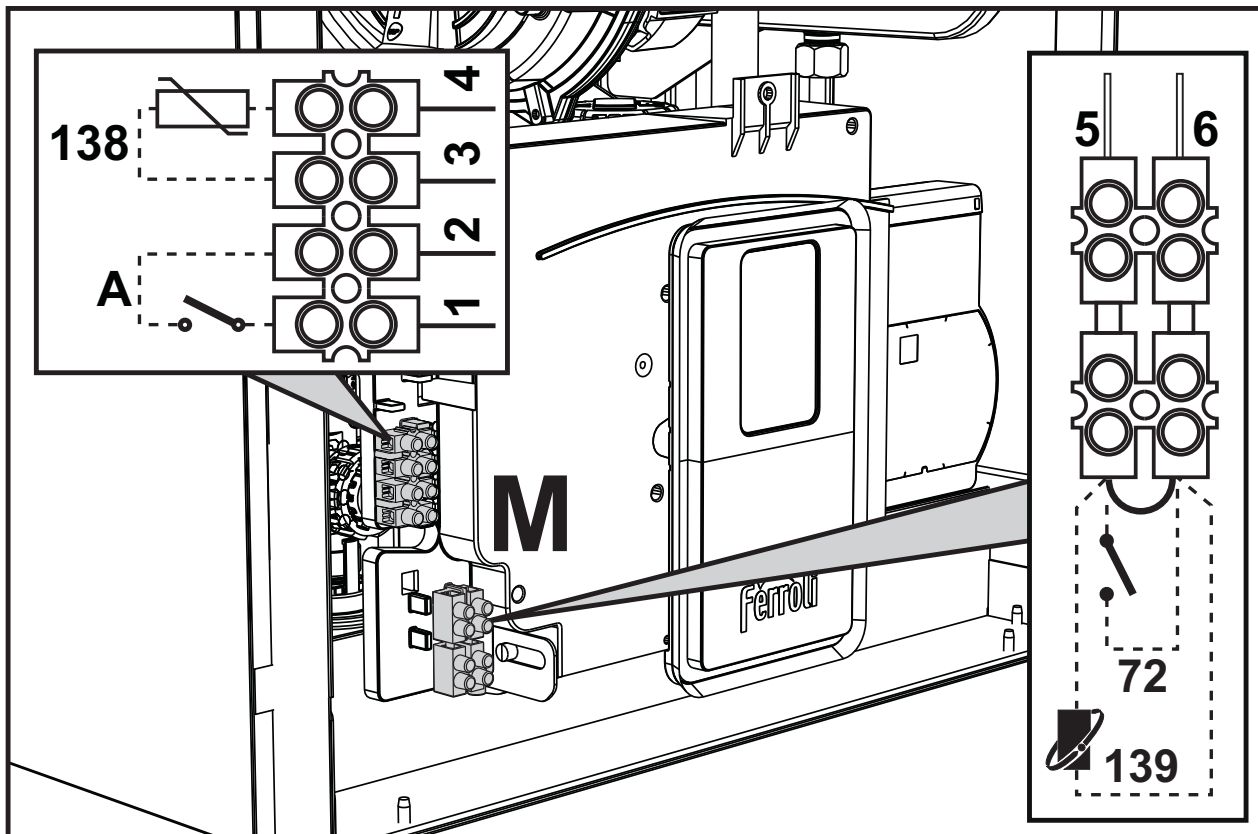


fig. 31

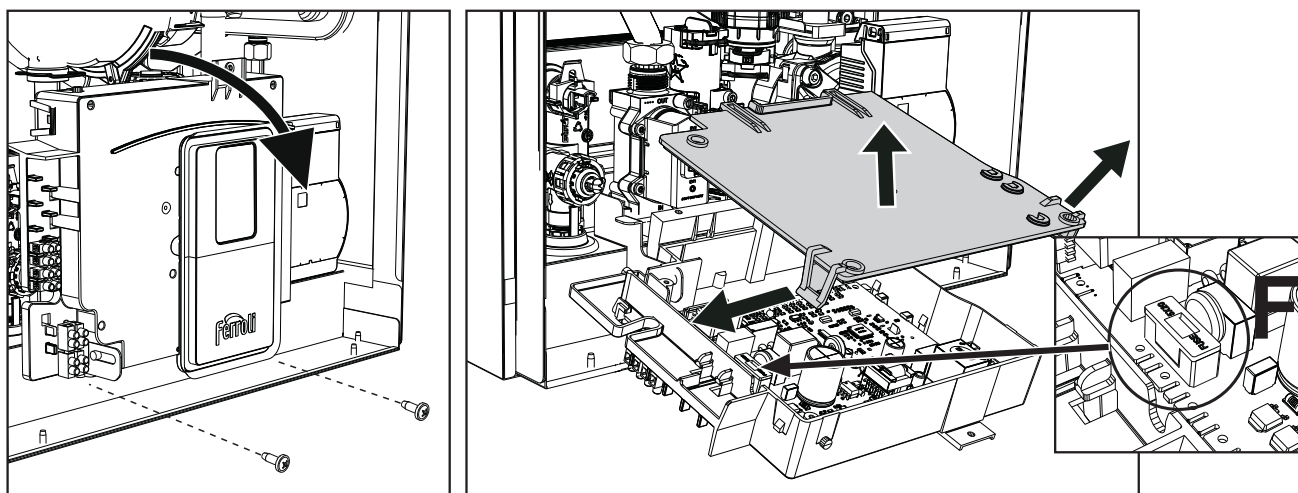


fig. 32

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. 85.

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
8	Pump management ON-OFF	The contacts are closed when the circulating pump is running

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.
	b06 = 5	If the contact is open it disables the heating. If the contact is closed it enables heating.

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 PRESSURE INSIDE THE FUME EXHAUST DUCT, THE USE OF FLUES COMPLYING WITH REGULATION EN 14471 WITH THE FOLLOWING DESIGNATIONS IS MANDATORY.

“T120 - H1 - L - 2 - O - 20 - LI - E - U”

“T120 - H1 - W - 2 - O - 00 - LI - E - U1”

“T120 - H1 - W - 2 - O - 00 - LI - E - U0”

Important

The unit is a “C type” with sealed chamber and forced draught; 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 chimney) it is advisable to perform a complete manual calibration to optimize boiler combustion.

Connection with coaxial pipes

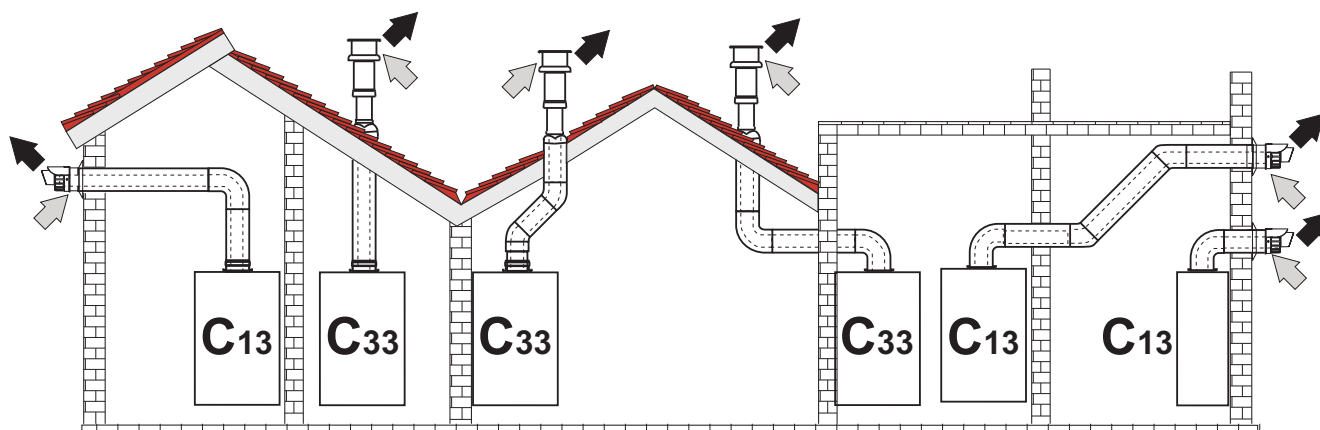


fig. 33- Examples of connection with coaxial pipes

= Air inlet
 = Fume outlet

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.

To facilitate the removal of condensate, the horizontal pipes must be inclined towards the unit with a minimum slope of 5% (3°).

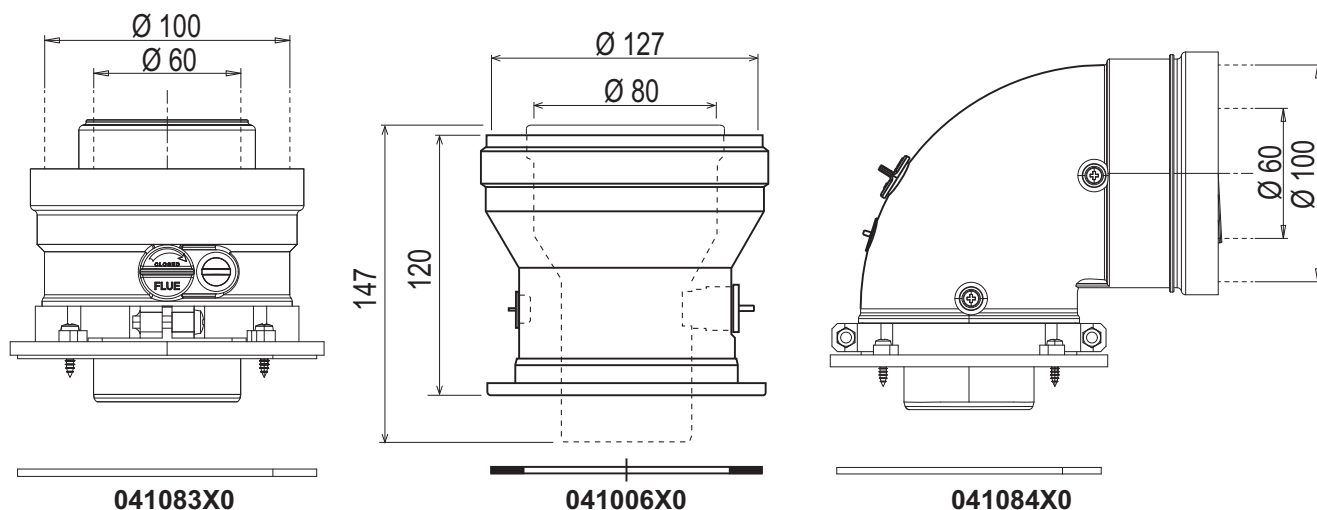


fig. 34- Starting accessories for coaxial ducts

Terminal distance (Type C13)

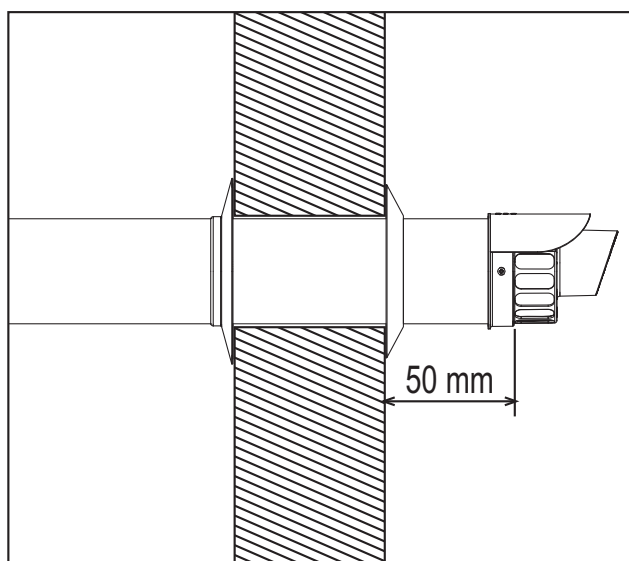


fig. 35

Terminal distance (Type C33)

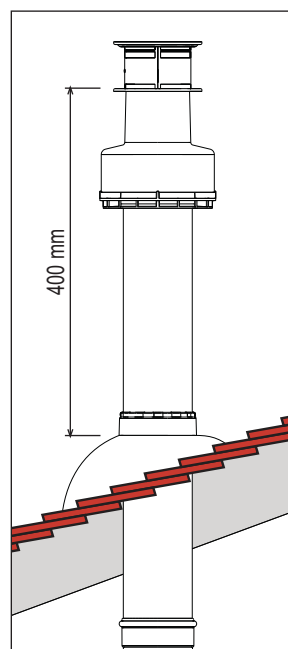


fig. 36

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

From the minimum length to the maximum length of the flues described in the table, the power and combustion values declared in the technical data table will be respected within the tolerances established by EN15502.

Connection with separate pipes

- For temperatures and fume flow rates, refer to “- Technical data table” on page 62

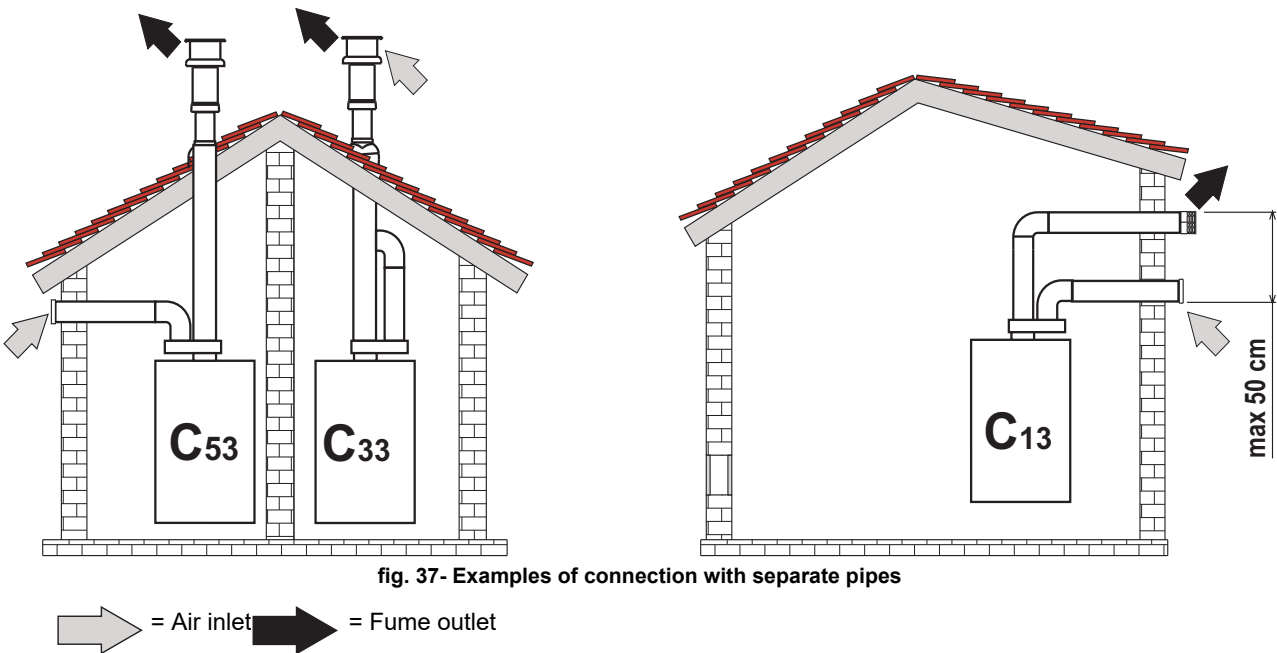


fig. 37- Examples of connection with separate pipes

Table 6- Typology

Type	Description
C13	Wall horizontal exhaust and intake. The inlet/outlet terminals must be concentric or close enough to be subjected to similar wind conditions (within 50 cm)
C33	Roof vertical exhaust and intake. Inlet/outlet terminals like for C12
C53	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
C63	Intake and exhaust with separately certified pipes (EN 1856/1)

For connection of separate ducts, fit the unit with the following starting accessory fig. 38.

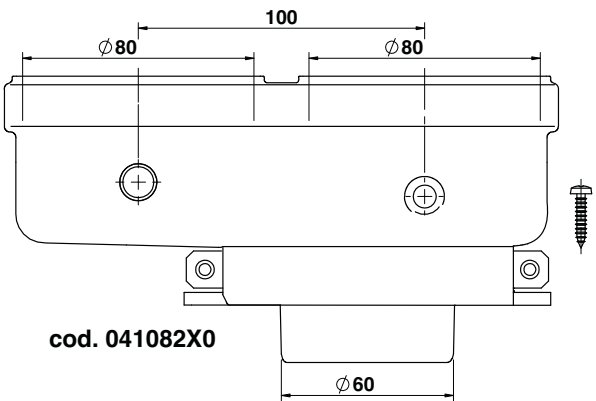


fig. 38- Starting accessory for separate ducts

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

- Establish the layout of the system of split flues, including accessories and outlet terminals.
- See table 8 and identify the losses in eq_m (equivalent meters) of every component, according to the installation position.
- Check that the sum total of losses is less than or equal to the maximum permissible length in table 7.

Terminal distance (Type C13)

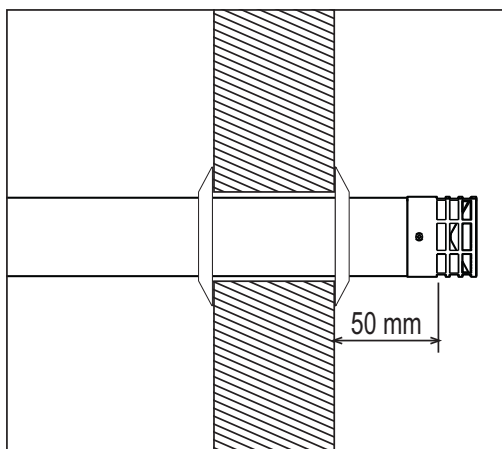


fig. 39

Terminal distance (Type C33)

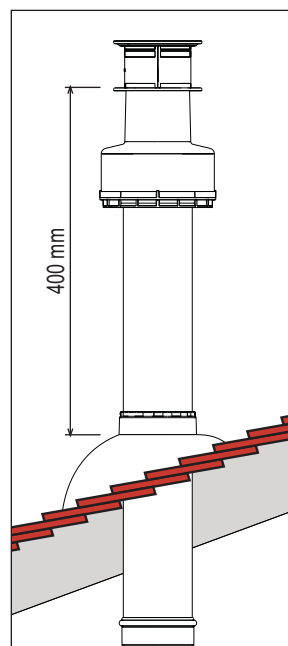


fig. 40

Table 7- Max. length separate ducts

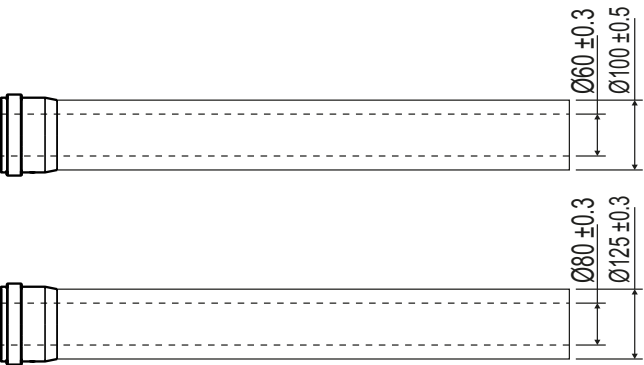
Max. permissible length	BlueHelix HiTech RRT 24 C = 80 eq _m	BlueHelix HiTech RRT 28 C = 70 eq _m	BlueHelix HiTech RRT 34 C = 70 eq _m
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Table 8- Accessories

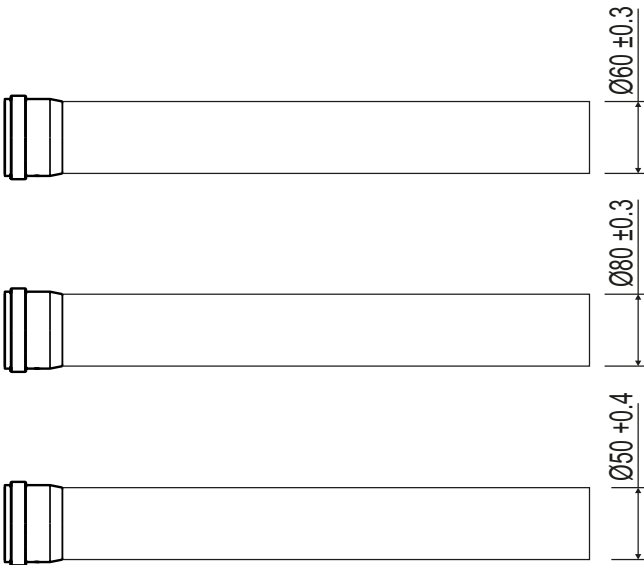
				Losses in eq _m		
				Air intake	Fume exhaust	
					Vertical	Horizontal
Ø80	PIPE	1 m M/F	1KWMA83W	1.0	1.6	2.0
	BEND	45° M/F	1KWMA65W	1.2	1.8	
		90° M/F	1KWMA01W	1.5	2.0	
	PIPE SECTION	with test point	1KWMA70W	0.3	0.3	
	TERMINAL	air, wall	1KWMA85A	2.0	-	
		fumes, wall with antiwind	1KWMA86A	-	5.0	
	FLUE	Split air/fumes 80/80	010027X0	-	12.0	
Fume outlet only Ø80		010026X0 + 1KWMA86U	-	4.0		
Ø60	PIPE	1 m M/F	1KWMA89W		6.0	
	BEND	90° M/F	1KWMA88W		4.5	
	REDUCER	80/60	041050X0		5.0	
	TERMINAL	fumes, wall with antiwind	1KWMA90A		7.0	
Ø50	PIPE	1 m M/F	041086X0		12	
	BEND	90° M/F	041085X0		9	
	REDUCER	80/50	041087X0		10	
		ATTENTION: CONSIDER THE HIGH PRESSURE LOSSES OF Ø50 and Ø60 ACCESSORIES, USE THEM ONLY IF NECESSARY AND AT THE LAST FUME EXHAUST SECTION.				

Duct diameters and tolerances

Coaxial ducts



Separate ducts



Use of flexible and rigid pipes Ø50 and Ø60

The calculation shown in the tables below includes the starting accessories code 041087X0 for Ø50 and code 041050X0 for Ø60.

Flexible pipe

It is possible to use up to 4 m of Ø80 mm flue between the boiler and the change to smaller diameter (Ø50 or Ø60), and up to 4 m of Ø80 mm flue on the intake (with maximum length for flues of Ø50 and Ø60).

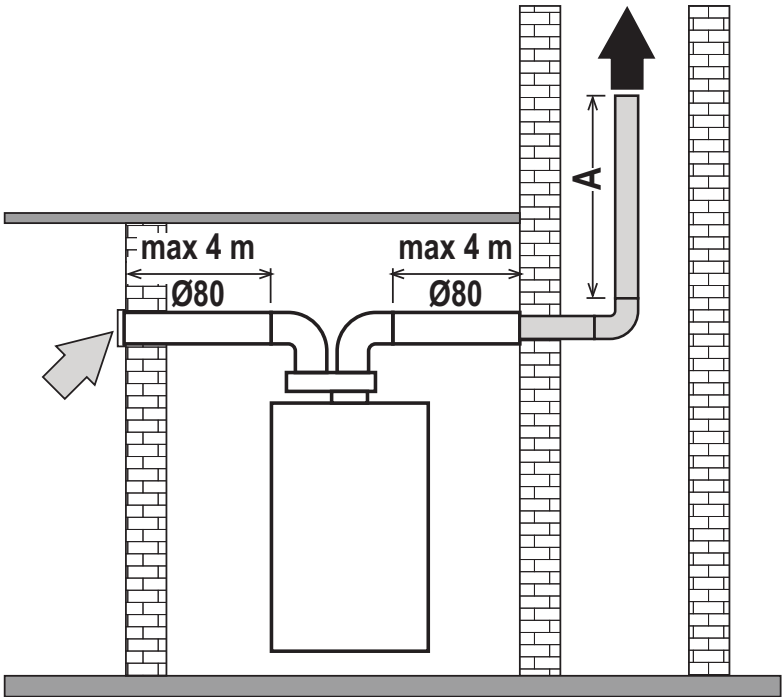


fig. 41- Layout for ducting only with flexible pipe

		BlueHelix HiTech RRT 24 C	BlueHelix HiTech RRT 28 C	BlueHelix HiTech RRT 34 C
A	Ø50	28 m MAX	22 m MAX	17 m MAX
	Ø60	78 m MAX	60 m MAX	45 m MAX

Flexible and rigid pipes

To use these diameters follow the instructions below.

Access the **TS** menu and bring the value of parameter **P68** to the value corresponding to the length of flue used. After changing the value, proceed with the **complete manual calibration** (see "Calibration procedure [AUTO SETUP]" on page 42).

— · — · — For model **BlueHelix HiTech RRT 24 C** / — — — For model **BlueHelix HiTech RRT 28 C** /
 ————— For model **BlueHelix HiTech RRT 34 C**

P68

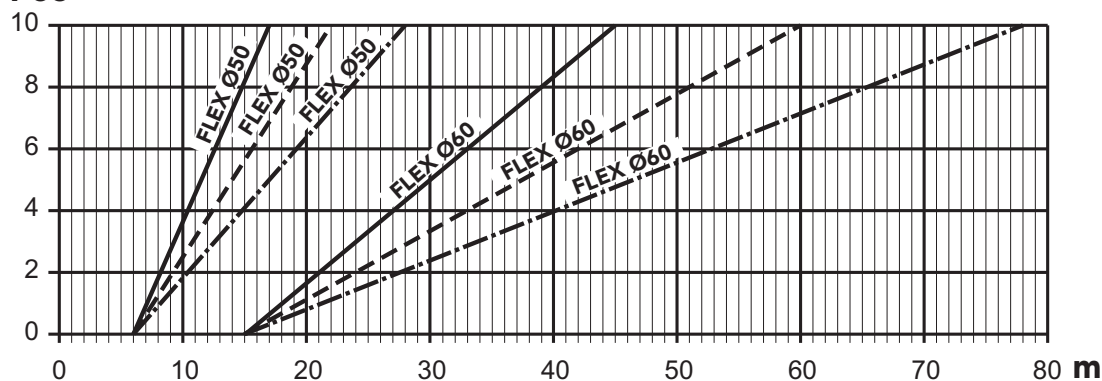


fig. 42- Chart for flue parameter choice

Connection to collective flues

For C83 type installations

The unit's fume evacuation pipe is connected to a single or collective natural draft flue. The combustion air enters via a second duct, with its own terminal, directly from the outside.

The fan is located upstream of the combustion circuit.

- For temperatures and fume flow rates, refer to "Technical data table" on page 62

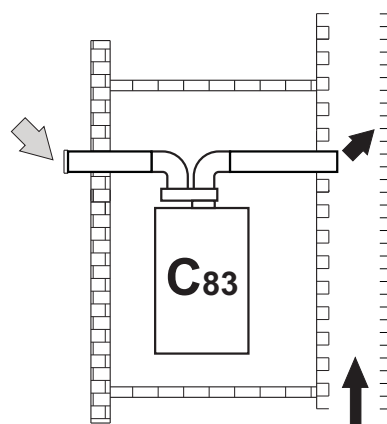


fig. 43

For C43 type installations

Device intended to be connected via two separate ducts to a collective natural draft flue. The flue consists of two ducts (concentric or separate), whose terminals are in similar wind conditions; in one the air is sucked in and in the other the fumes are evacuated.

The fan is located upstream of the combustion circuit.

- For temperatures and fume flow rates, refer to "Technical data table" on page 62

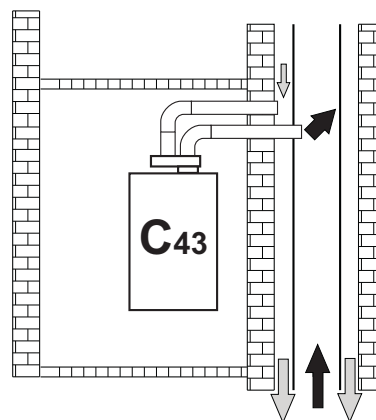


fig. 44

For C93 type installations

Device connected to a vertical terminal via its own channelled evacuation duct. The technical compartment in which the exhaust is housed also acts, through the cavity, as a combustion air intake duct.

The fan is located upstream of the combustion circuit.

- For temperatures and fume flow rates, refer to “- Technical data table” on page 62

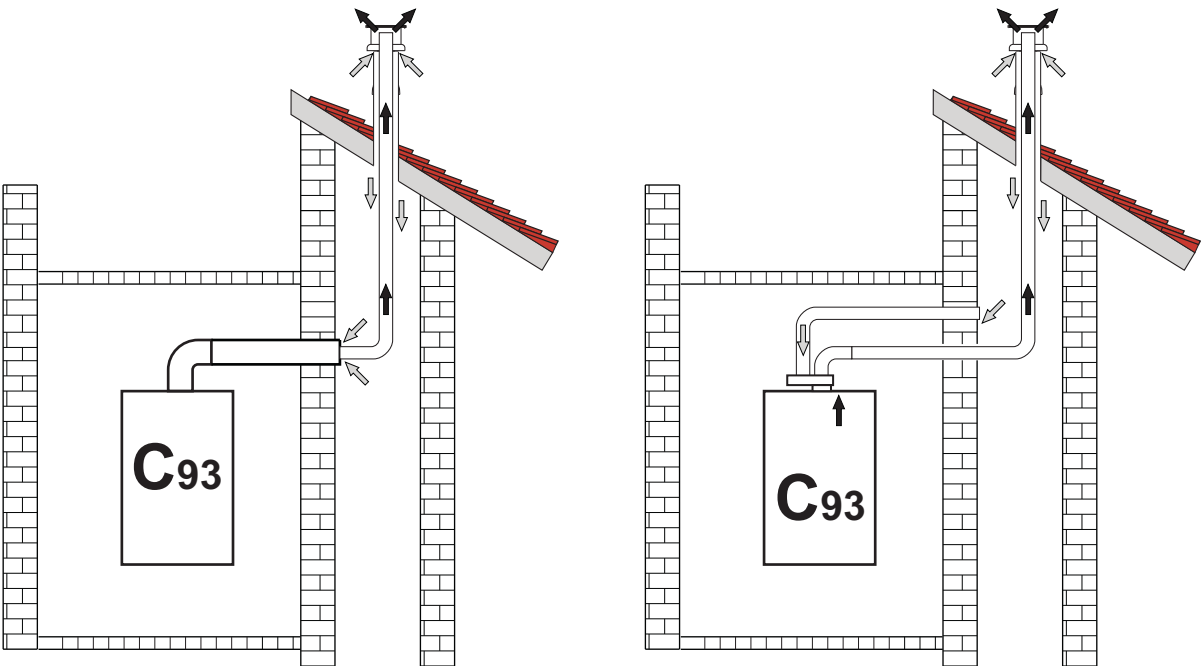


fig. 45- Examples of connection to collective flues (⇨ = Air / ⇨ = Fumes)

Duct size

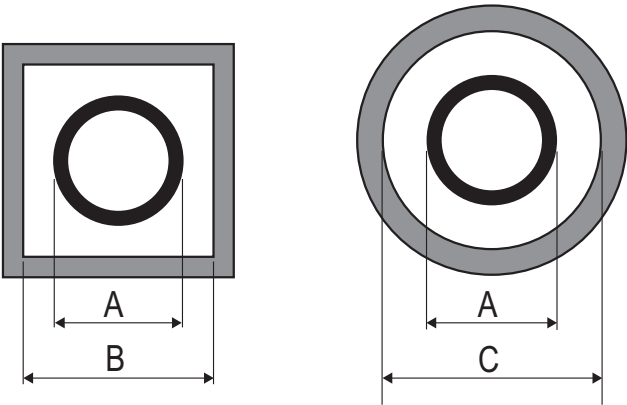


fig. 46

Table 9- Fume duct minimum dimensions

A (mm)	B (mm)	C (mm)
Ø 60	110 x 110	110
Ø 80	130 x 130	130
Ø 60/100	120 x 120	120
Ø 80/125	160 x 160	145

For B33 type installations

Intake from boiler room via concentric duct (that encloses the exhaust) and evacuation via a common natural draft flue.



IMPORTANT - THE ROOM MUST BE HAVE A SPECIAL VENTILATION DEVICE

The fan is located upstream of the combustion circuit.

- For temperatures and fume flow rates, refer to “- Technical data table” on page 62

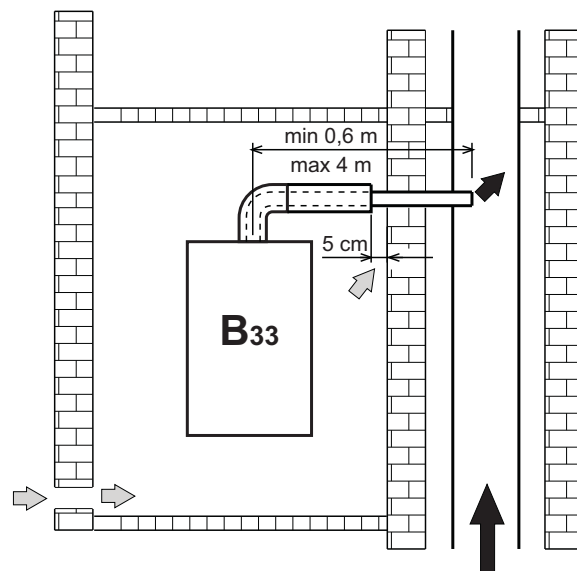


fig. 47

For B23 type installations

Intake directly from the place of boiler installation and fume evacuation through approved and marked ducts.

The fan is located upstream of the combustion circuit.

- For temperatures and fume flow rates, refer to “- Technical data table” on page 62

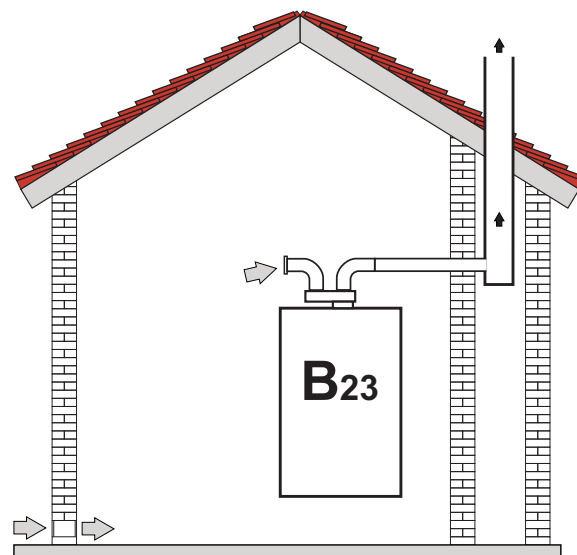


fig. 48

Installation in a partially protected place

Intake directly from the place of boiler installation and fume evacuation through approved and marked ducts.

The fan is located upstream of the combustion circuit.

The unit is suitable for operation in a partially protected place, with minimum temperature of -5°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.

If equipped with the special frost protection kit it can be used with minimum temperatures to -15°C .

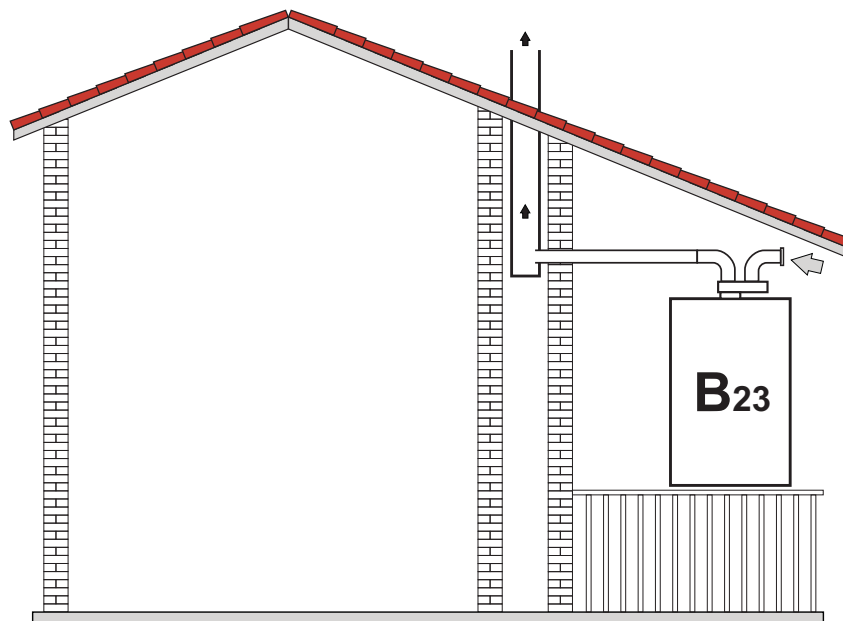


fig. 49

Install the starting accessory (ref. 1 fig. 50 - code **COD_ACC**). The protection grille must be mounted in the intake duct (ref. 2 - fig. 50 - code **COD_GRI**). If necessary, insert a short piece (3) between the grille and the accessory.

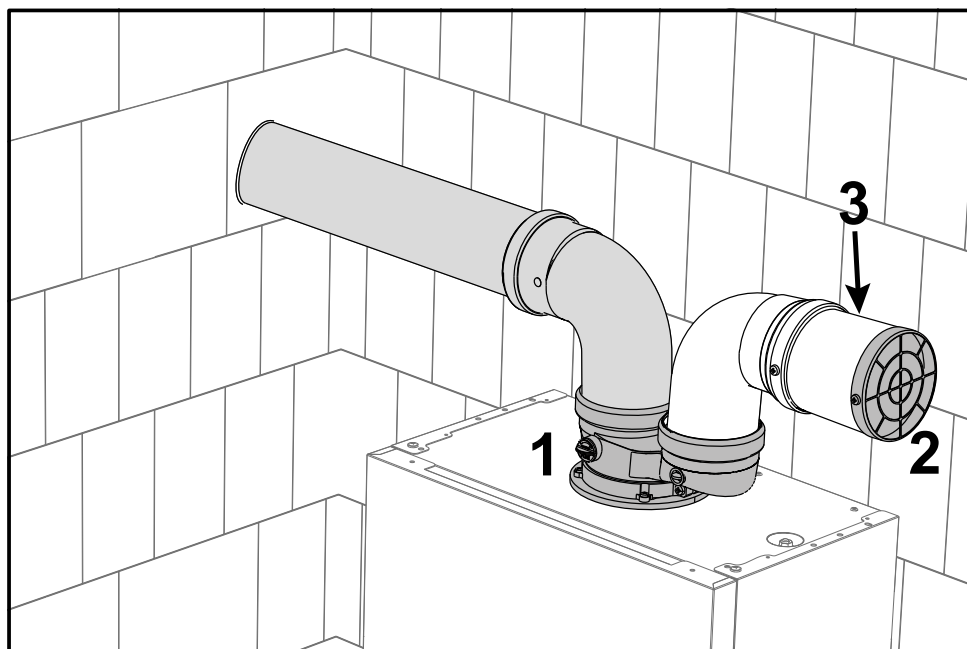


fig. 50- Protection grille

Frost protection kit for outdoor installation (optional).

In case of installation outside in a place partially protected for temperatures below -5°C and to -15°C , the boiler must be fitted with the special frost protection kit for protecting the circuit. Connect the kit to the PCB as indicated in the wiring diagram in fig. 85 (ref. 288) and position the thermostat and heaters on the pipes as indicated in fig. 51 and in the instructions provided with the kit.

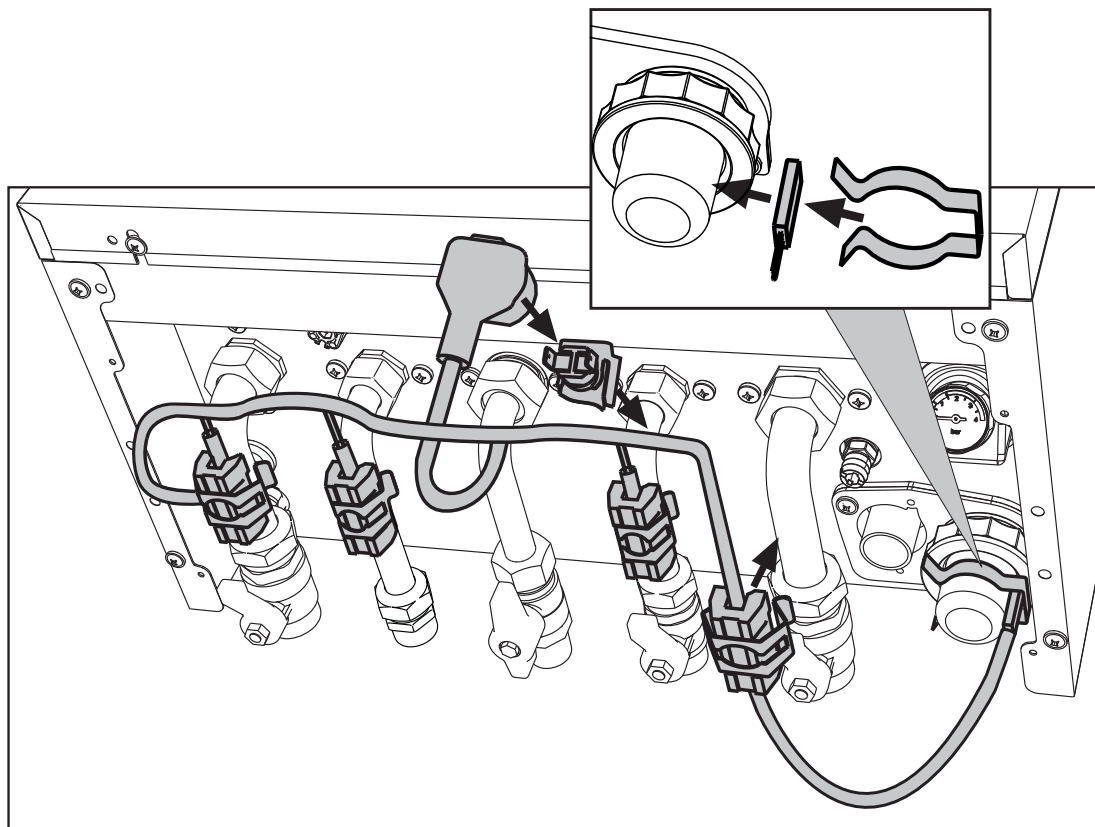


fig. 51- Frost protection kit

For Installations type C(10)3 / C(11)3

Combined air intake and fume evacuation system (collective air/fume system) in overpressure.

Equipment intended to be connected via its ducts to a terminal which simultaneously allows the entry of combustion air and the evacuation of fumes through concentric orifices or sufficiently close to be in similar wind conditions.

The fan is located upstream of the combustion circuit.

- For temperatures and fume flow rates, refer to “- Technical data table” on page 62.

The boiler can be connected to positive pressure collective flues **ONLY IF NATURAL GAS (G20) FIRED**. The boiler **BlueHelix HiTech RRT C** is equipped with a **Swing check valve** (backflow prevention system)

After completing installation of the flues, to adapt the fan speed to the system, it is necessary to set parameter **P67** to **1** and do **complete manual calibration** (see “Calibration procedure [AUTO SETUP]” on page 42).

Fill in the label, inside the document bag, giving the heat flow values at Q_{min} (Δp_{max} , saf (min) and Q_{min} (0Pa) according to the image opposite. Complete the date and signature field.

It is mandatory to VISIBLY attach the white sticker (included in the document bag), supplied with the unit, to the front panel of the boiler.

	C(10)3	cod. 3541R050
P67 = 1		
$Q_{min} (\Delta p_{max}, saf(min))$		4.1 kW
$Q_{min} (0Pa)$		4.7 kW
		date ____/____/____
Signature _____		



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

FAILURE TO COMPLY WITH THIS INSTRUCTION MAY RESULT IN THE RISK OF ASPHYXIA DUE TO THE EMISSION OF COMBUSTION FUMES IN THE PLACE WHERE THE BOILER IS INSTALLED.

Removing the casing could cause combustion products to escape even when the unit is off.

The unit must be connected to a fume exhaust system designed by a heating engineer according to EN 13384-2.

The collective fume evacuation system must be suitably sized to allow the device to function according to the following design specifications:

- The maximum pressure, when n-1 units operate at maximum heat output (with n = total number of units connected or that can be connected to the same collective duct), and one boiler operates at minimum heat output, is 25 Pa.
- The authorized minimum pressure difference between the combustion products outlet and the combustion air inlet is -200 Pa including the -100 Pa pressure generated by the wind.
- The duct must have been sized with a nominal combustion products temperature of 25°C.
- The maximum recirculation percentage allowed due to wind action is 10%.
- The common duct must be certified to allow an overpressure of at least 200 Pa (min. pressure class P1).
- There must not be any draft diverter in the duct system.

In particular, at the point of connection to the collective pressure hose, a plate giving at least the following technical information must be visible:

- The name and brand of the common flue pipe manufacturer.
- Possibility of operating with C10 or C11 certified boilers.
- The maximum authorized fume mass value in kg/h.
- The dimensions of the common duct (collective duct) for each connection point.



When the boiler module is disconnected, the air outlet and combustion products inlet openings must be closed and checked for tightness.



Connection to the air intake well is possible with a cut Ø80 male or Ø80 female duct.

Connection to the collective fume evacuation duct is possible via a Ø80 female duct with gasket.



The openings for the combustion air and the entry of combustion products of the collective pressurized duct must be closed and their tightness checked with the unit disconnected from the power socket.

Connection of the unit to the collective pressure piping must be carried out in the foreseen manner without exceeding the specific maximum extensions declared.

The flue must be inclined (5% slope) towards the unit, to facilitate the removal of condensate.



Example of installation type C(10)3

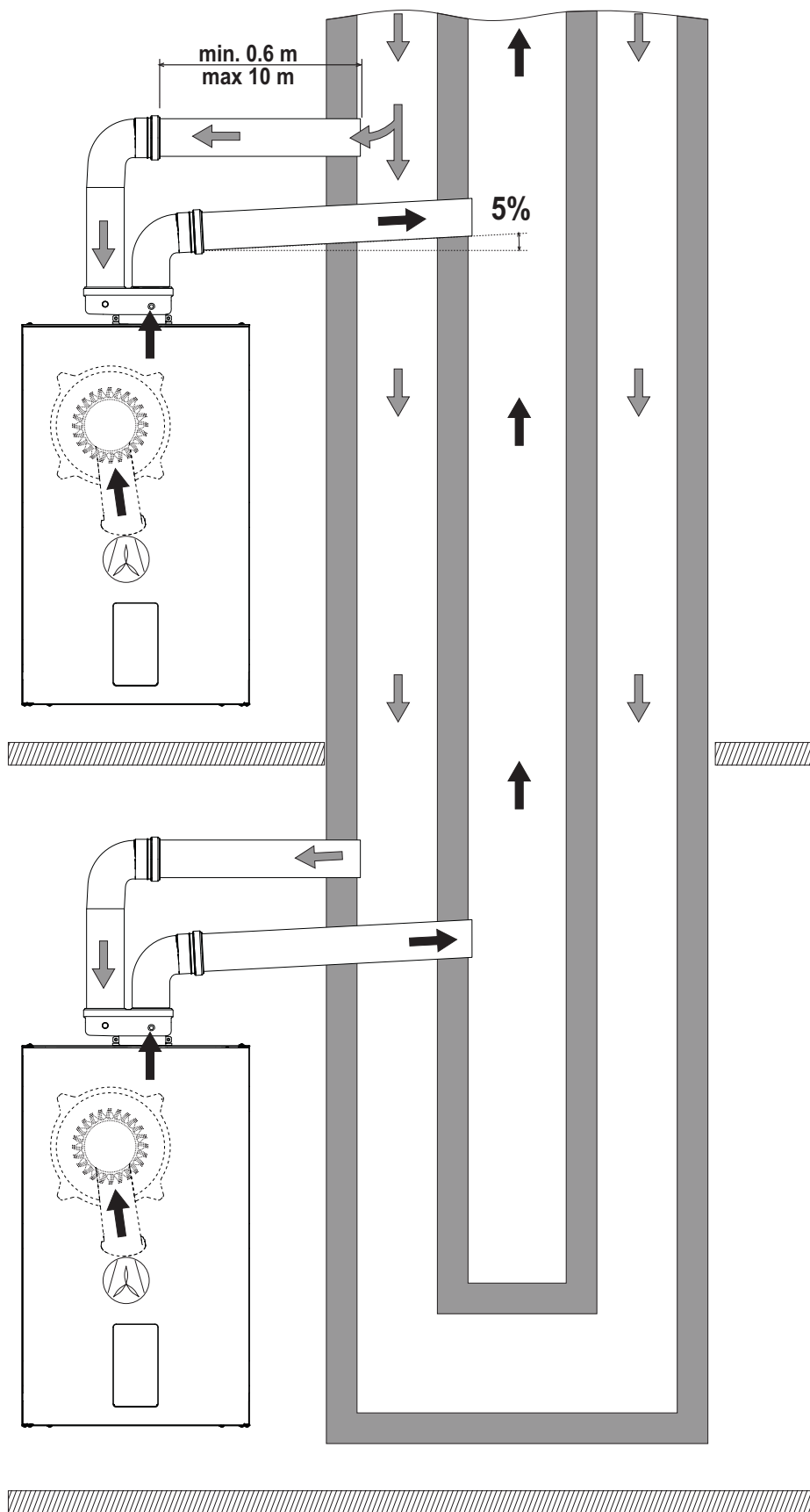


fig. 52

Example of installation type C(11)3

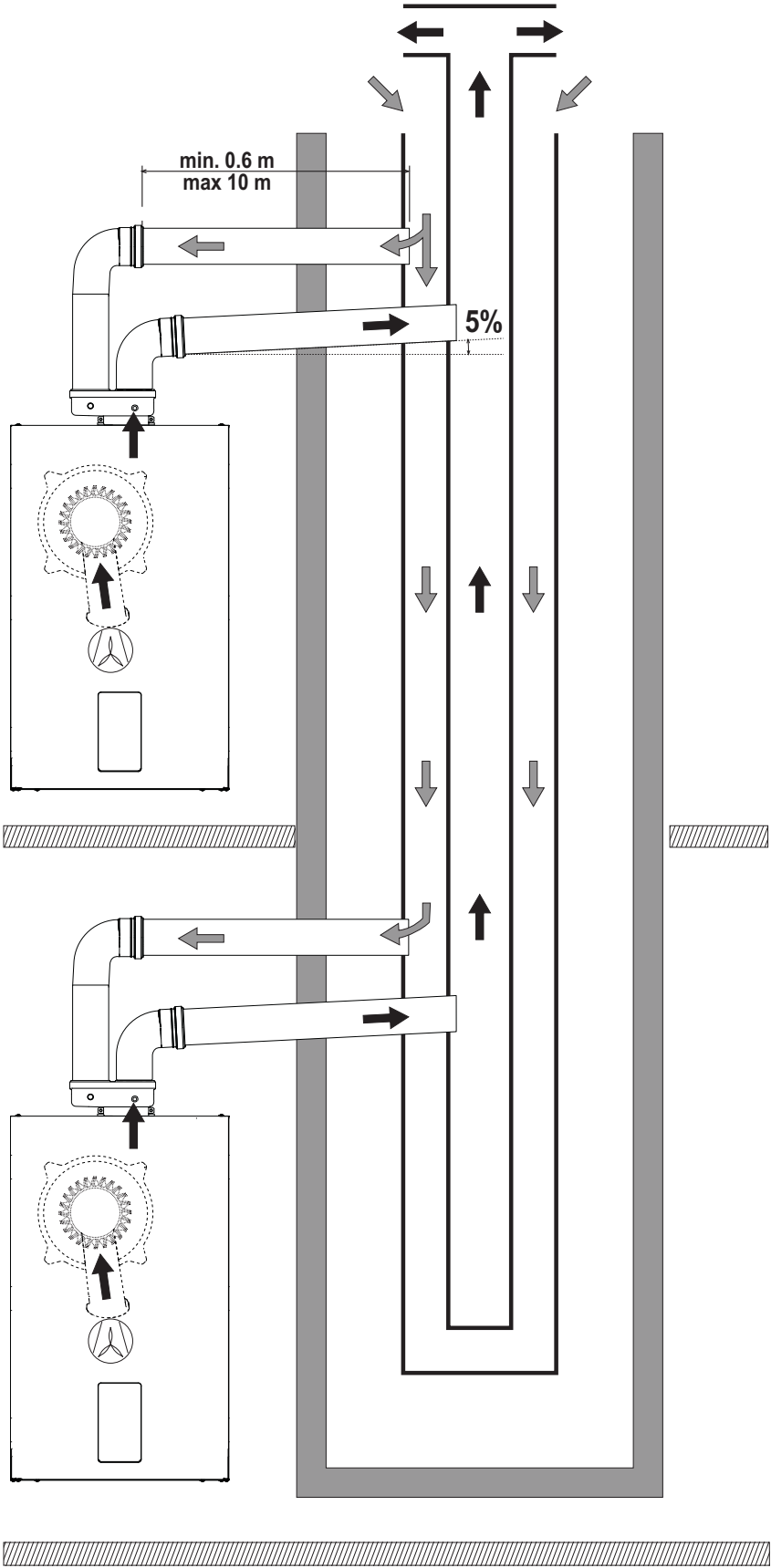


fig. 53

Position of terminals

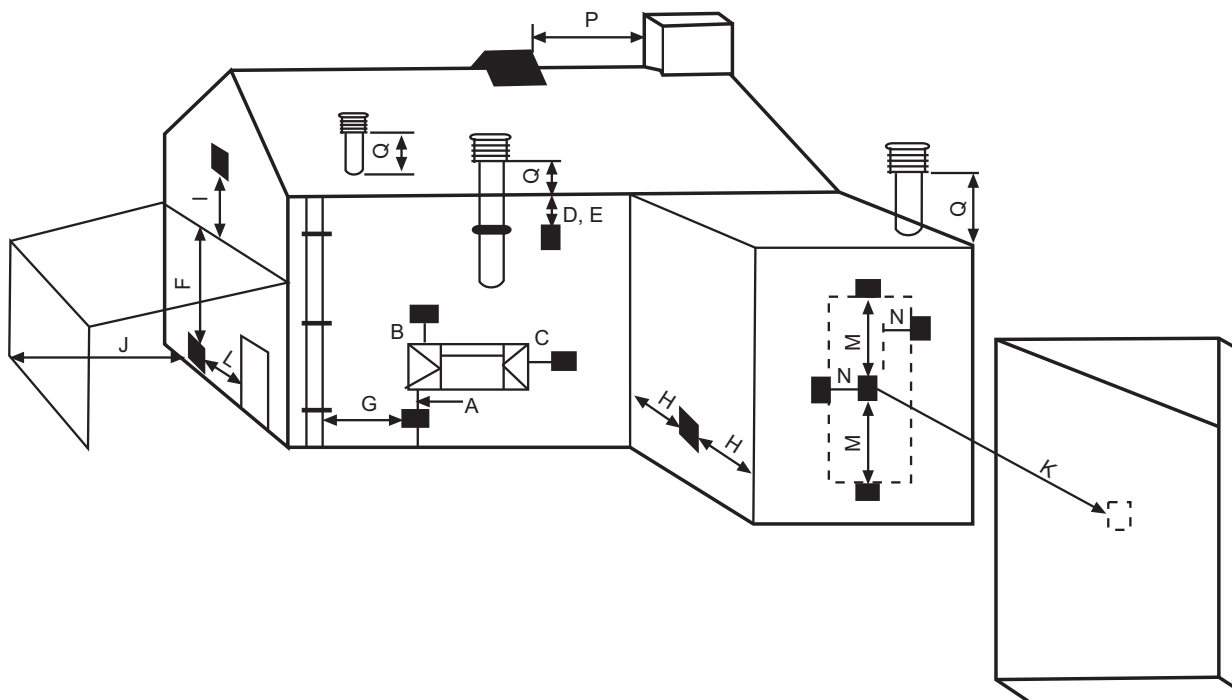


fig. 54

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
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	• 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: - 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.

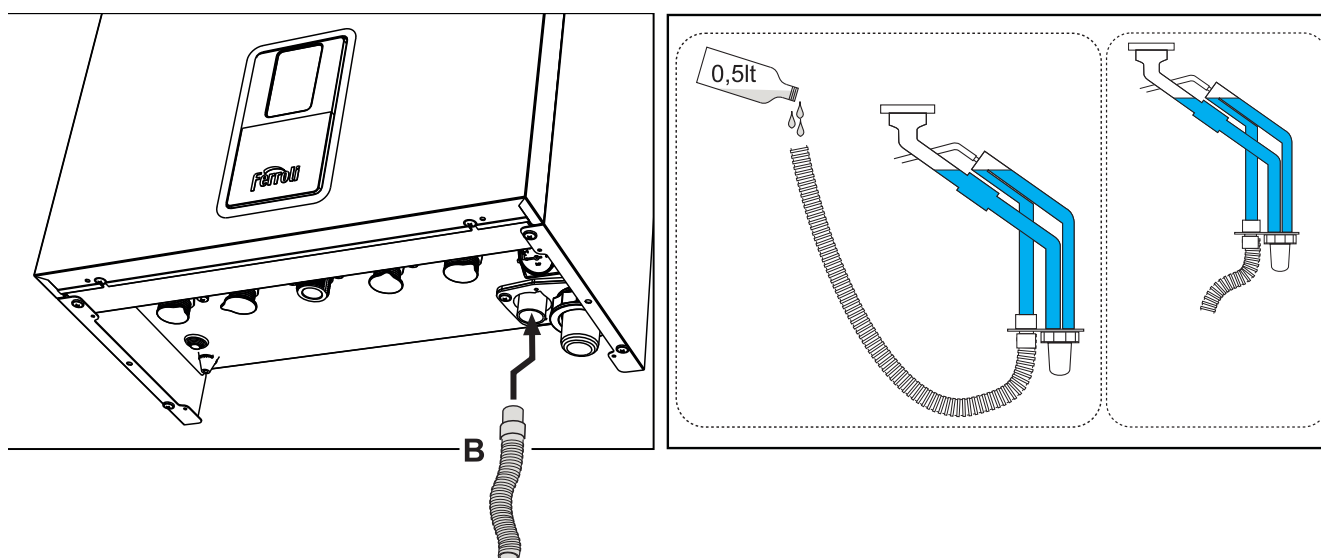


fig. 55- Condensate drain connection

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.

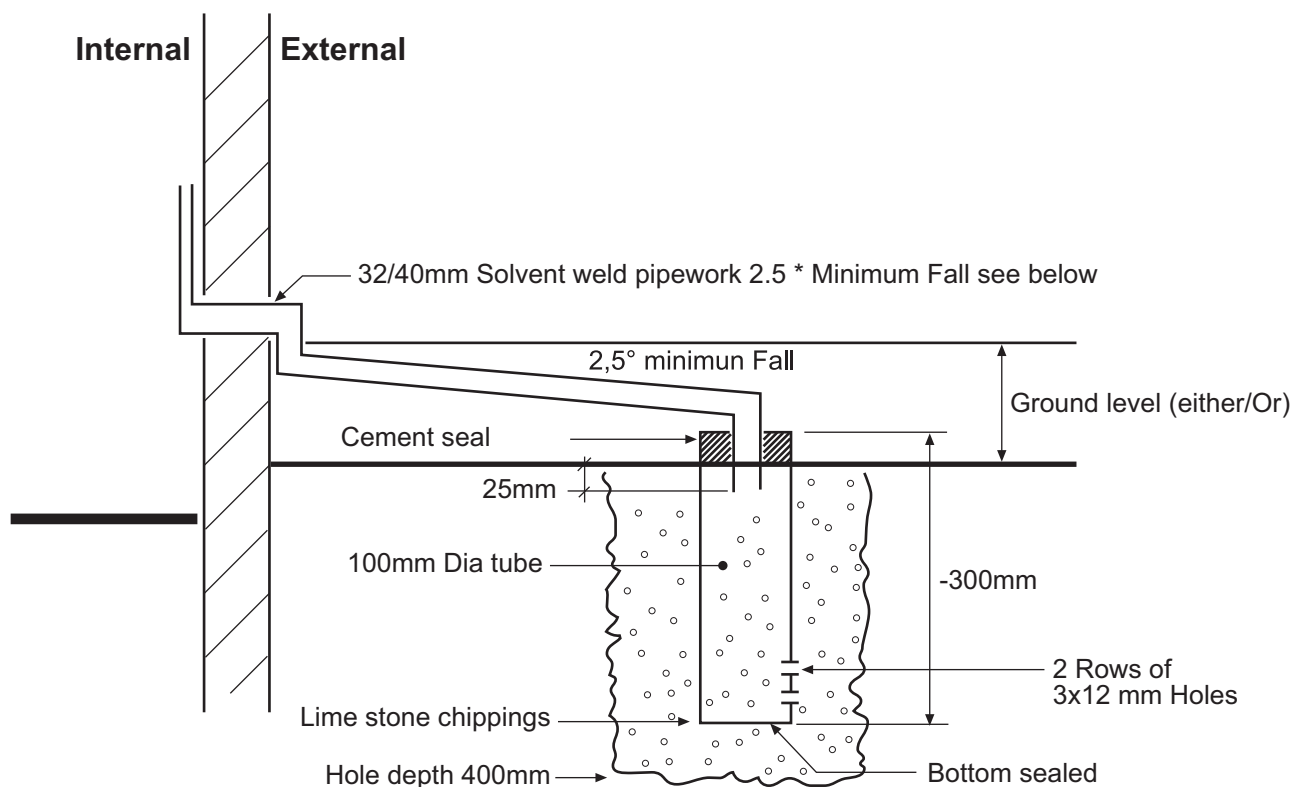


fig. 56 - Condensate drain

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 47).
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 41).

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 43).
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.

"THE "CO" VALUES PRODUCED BY THE DEVICE COMPLY WITH LOCAL REGULATIONS"

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. 57).
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. 57).
9. Exit with the button **↺** and unlock the boiler.
Repeat the sequence from point "1".

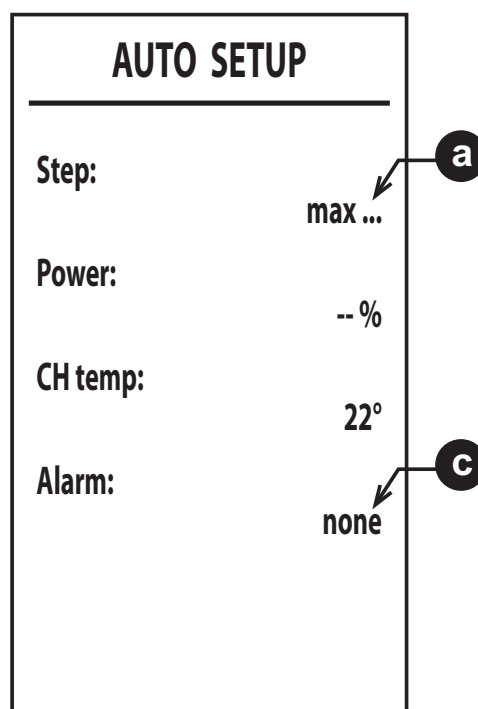


fig. 57

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.

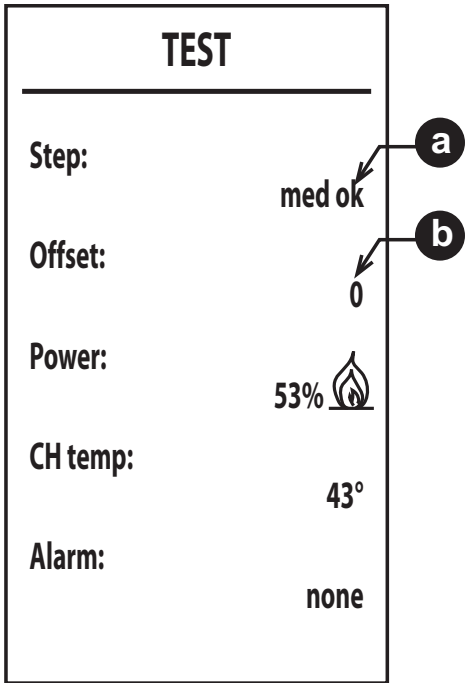


fig. 58

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
b03	Gas type	0 = Natural gas 1 = Liquefied gas 2 = Propane-air	0

Index	Description	Range	Default
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
b06	Variable input contact operation selection	0 = Flowmeter exclusion 1 = System thermostat (F50 If open) 2 = Second room therm. 3 = Warning/Alert 4 = Safety thermostat 5 = System 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 8 = Pump ON-OFF	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 modulation	0 = Standard 1 = Fast	1
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	15 - 100l/min/10 (do not set this value below 16)	25
b19	DHW mode deactivation flow rate	15 - 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 42)	0
b28	Not implemented	--	--
b29	Restore Factory Values	See "** Restore Factory Values" on page 46 .	0

Index	Description	Range	Default
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 %	40
P36	Modulating pump start speed	30 - 100 %	90
P37	Modulating pump max. speed	50 - 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 - 255 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)	32
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 - 3	3
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 the first minute following ignition	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.

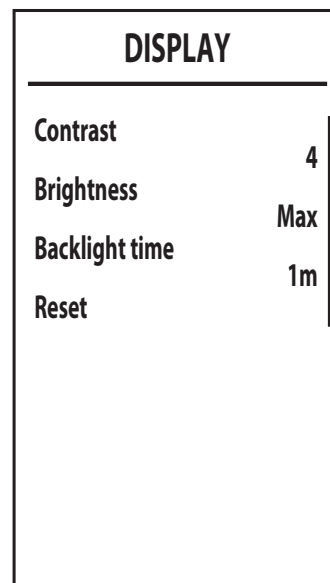


fig. 59

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 43 ***, 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 (Table 10, "- Transparent Parameters Table," on page 43 and cap. 3.1 "Adjustments" on page 41).
- 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 41.

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. 60).
2. Pull the panel outwards and lift it.

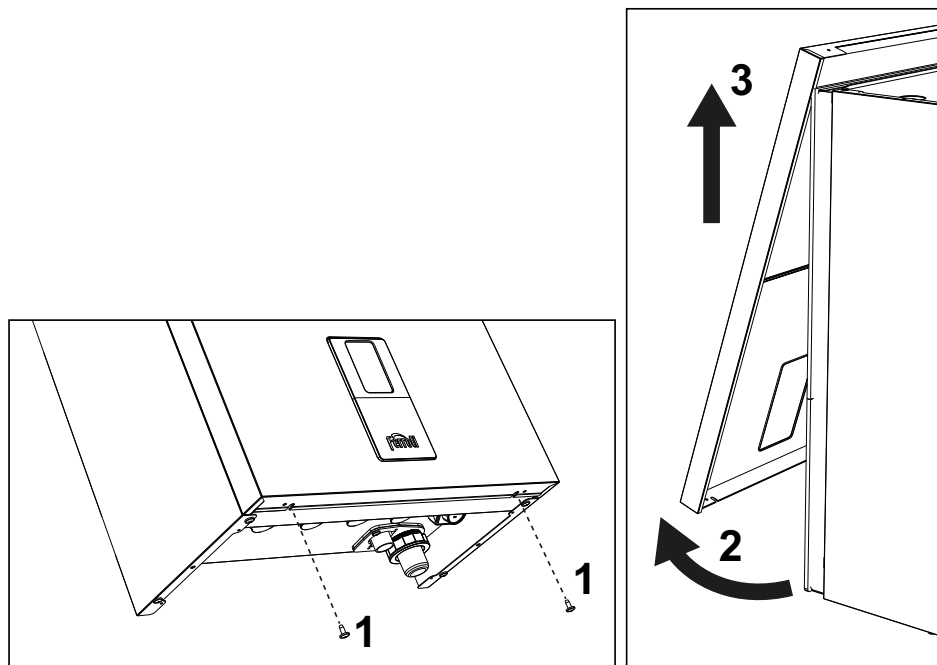


fig. 60- Front panel opening



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. 61).

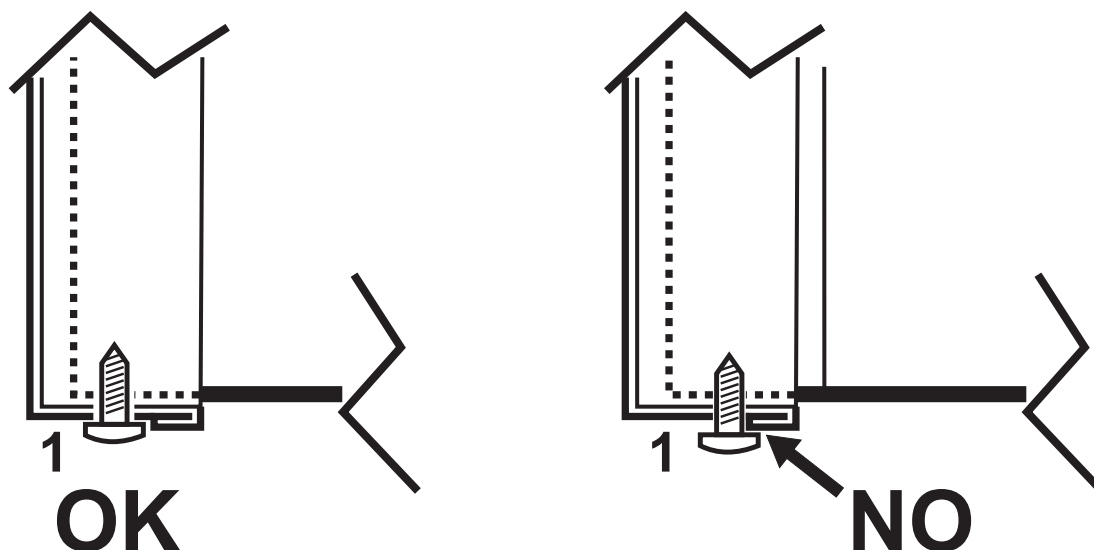


fig. 61- Correct position of front panel

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 42). Then follow the instructions in par. "Checking the combustion values" on page 41.

Gas valve replacement

- **Disconnect the power supply and close the gas cock ahead of the valve.**
- Disconnect the electrical connectors "1" (fig. 62).
- Disconnect the gas supply pipe "2" (fig. 62)
- Undo the screws "3" (fig. 63)
- Remove the gas valve "4" and the gas diaphragm "5" (fig. 64).
- 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.**

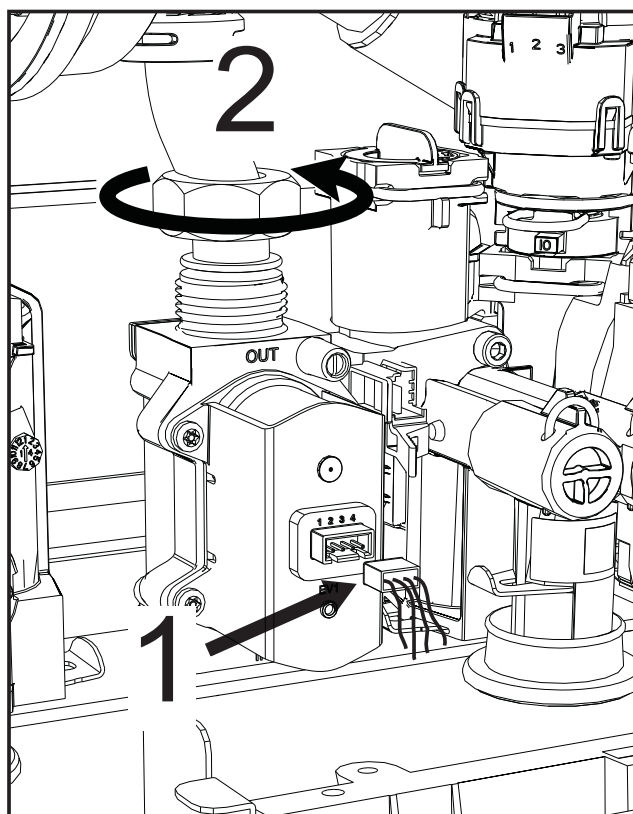


fig. 62

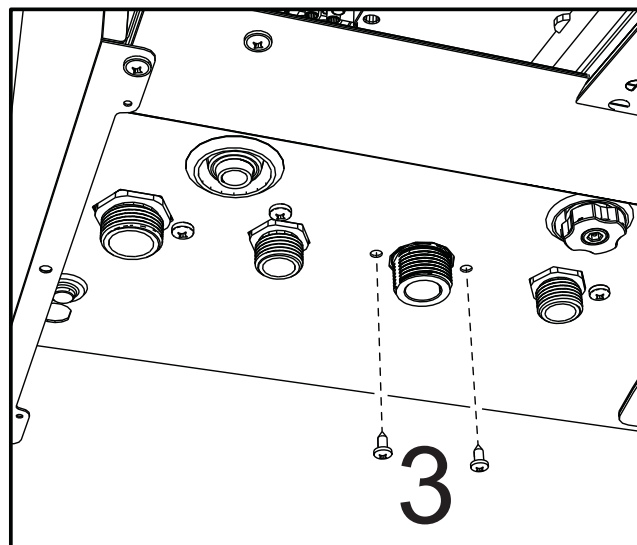


fig. 63

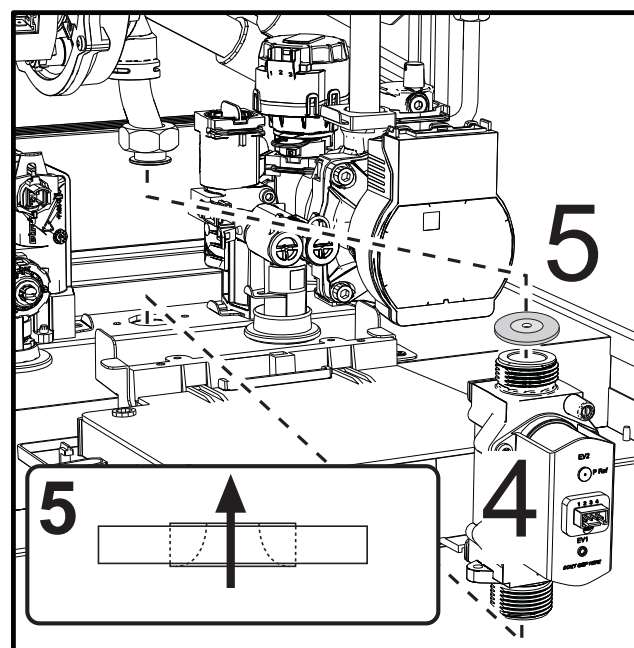


fig. 64

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. 68)
- Remove the 2 **top screws "6"** securing the exchanger to the frame (fig. 69)
- Remove the exchanger
- Insert the new exchanger, resting it on the **bottom screws "5"**

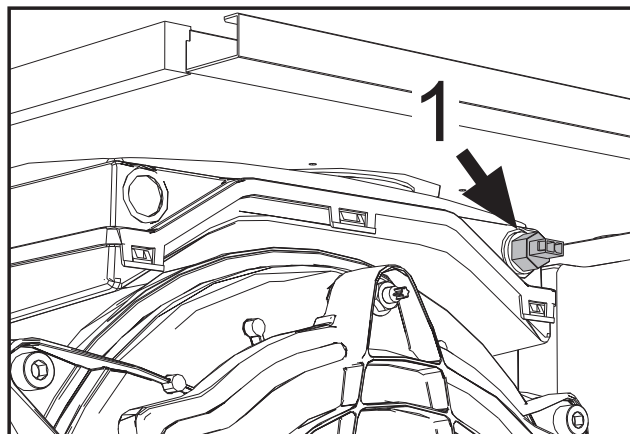


fig. 65

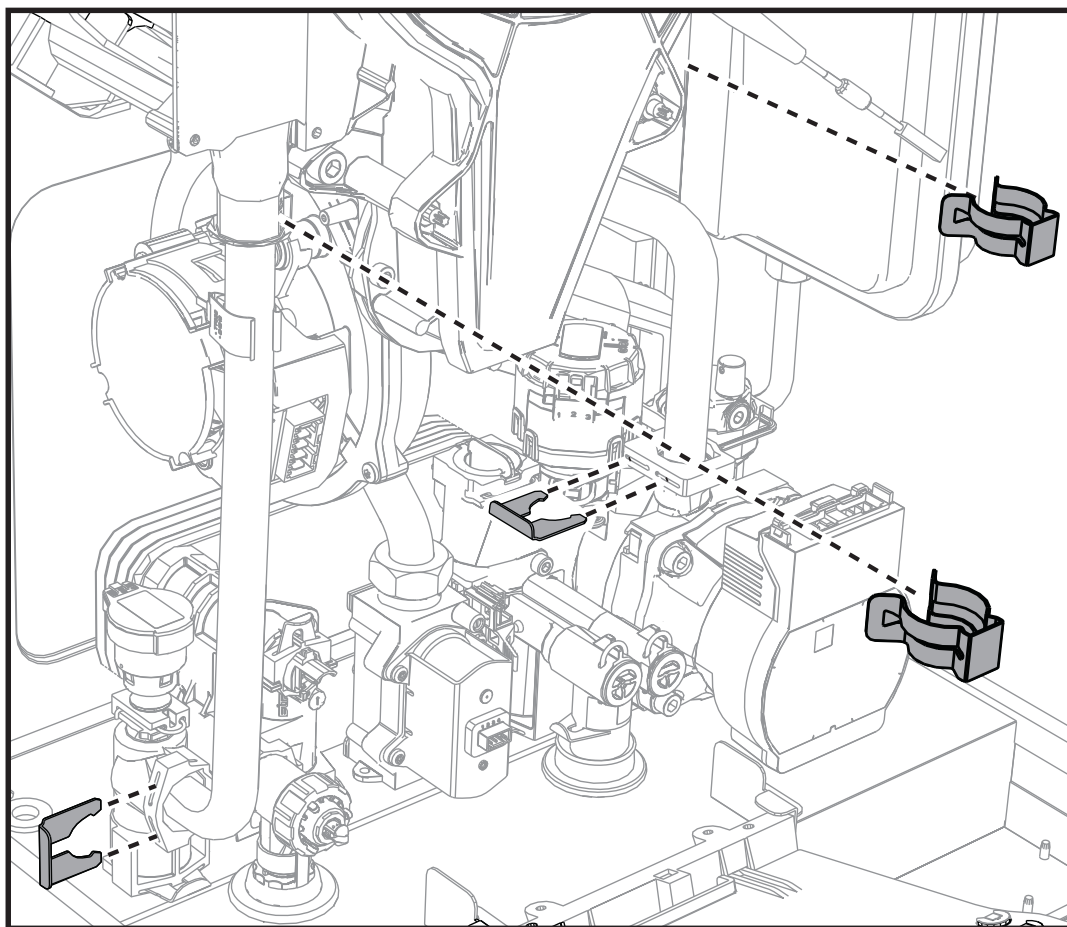


fig. 66

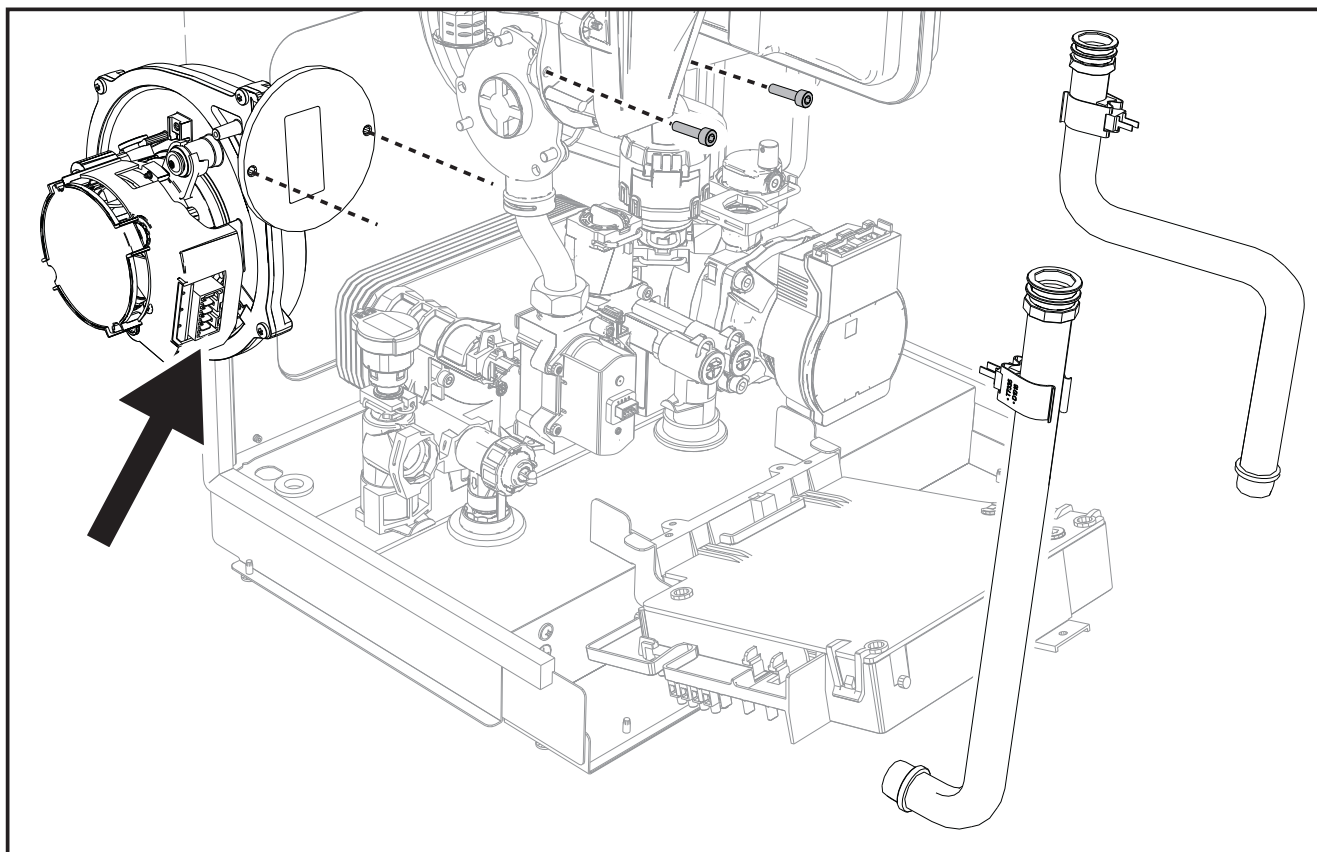


fig. 67

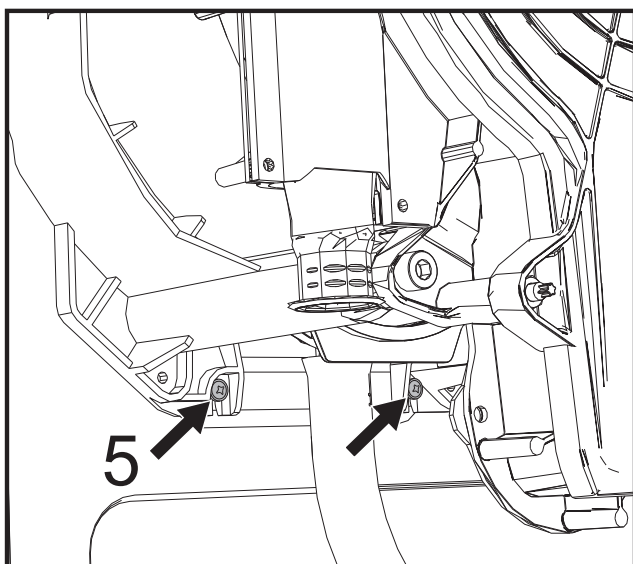


fig. 68

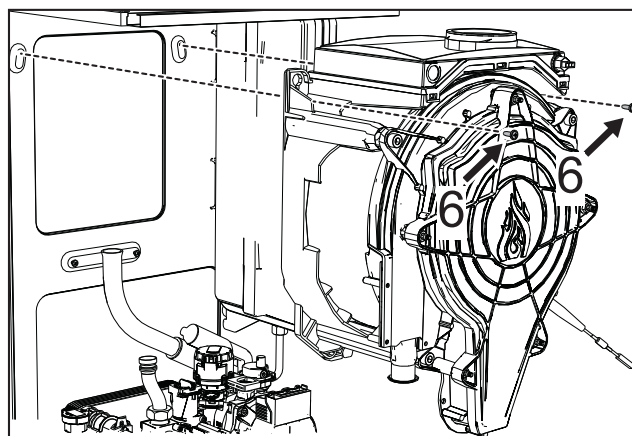


fig. 69

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.

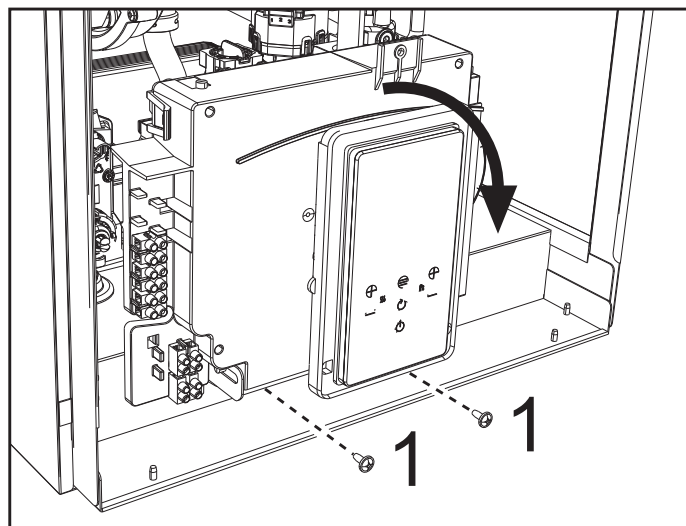


fig. 70

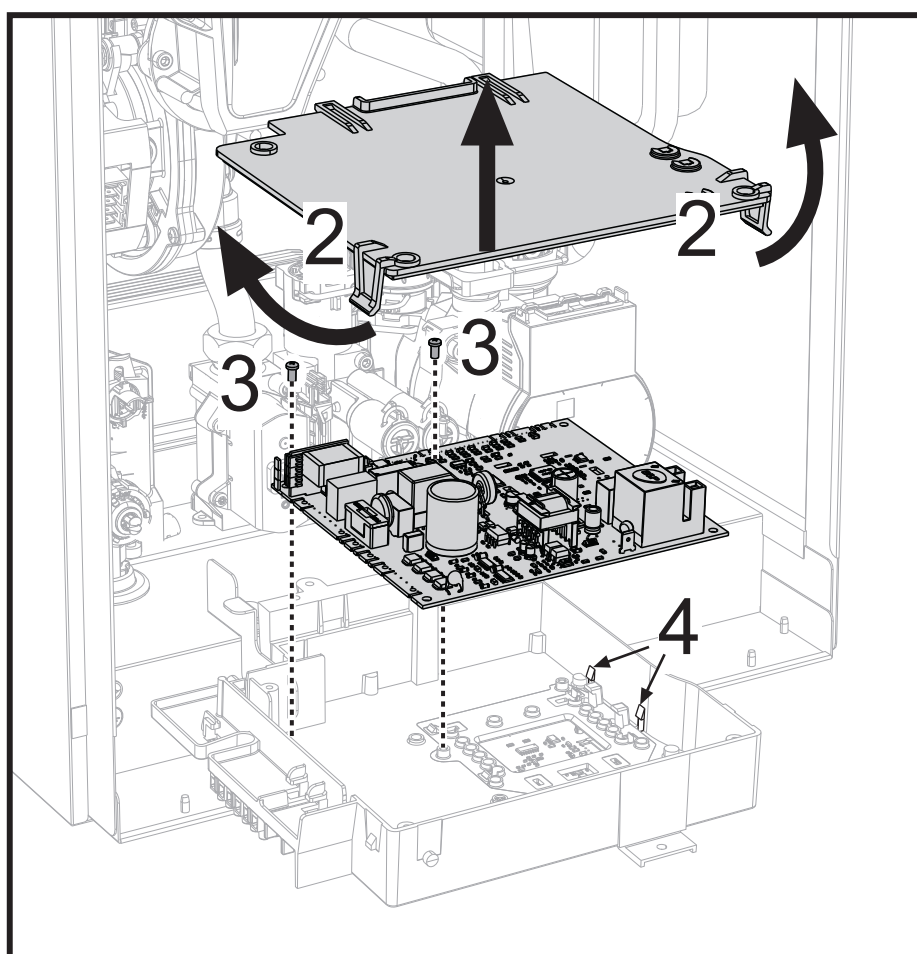


fig. 71



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".

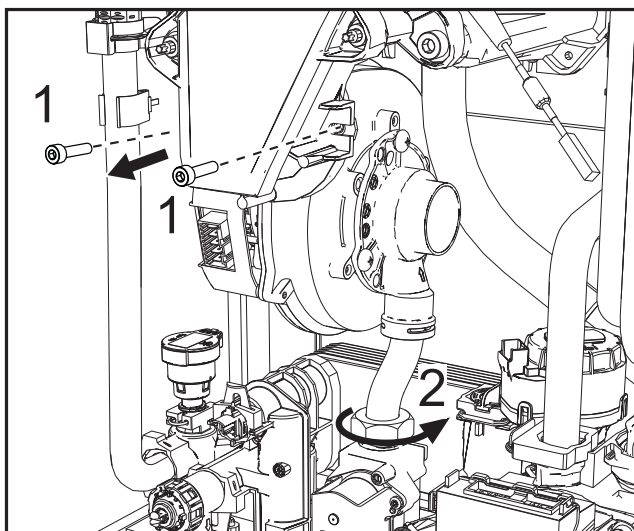


fig. 72

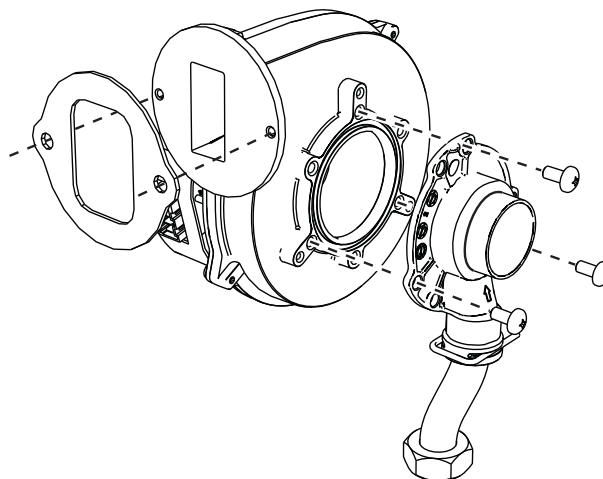


fig. 73

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".

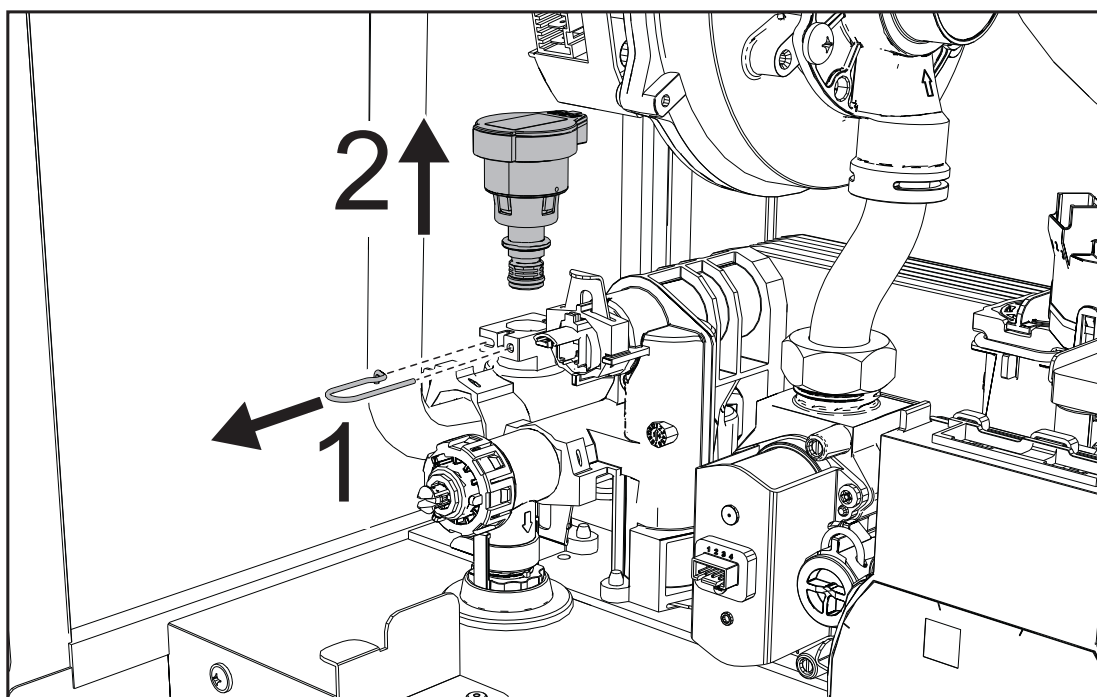


fig. 74

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.

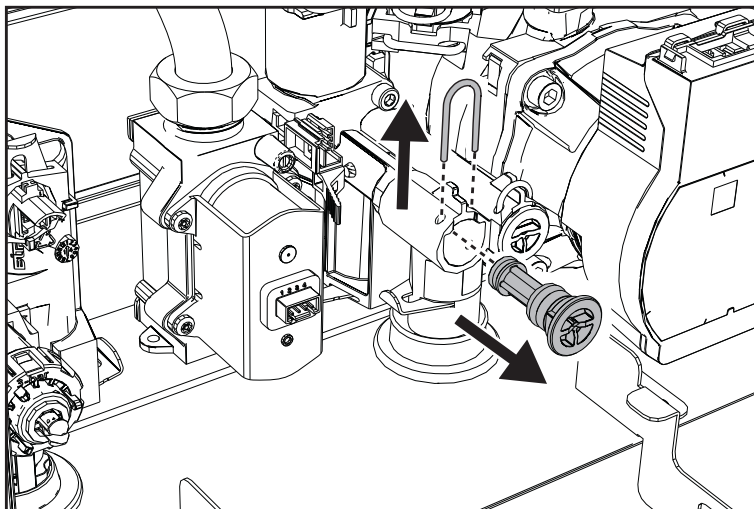


fig. 75

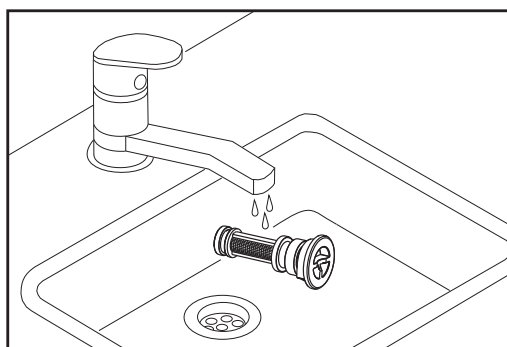


fig. 76

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 trap and clean it if necessary
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

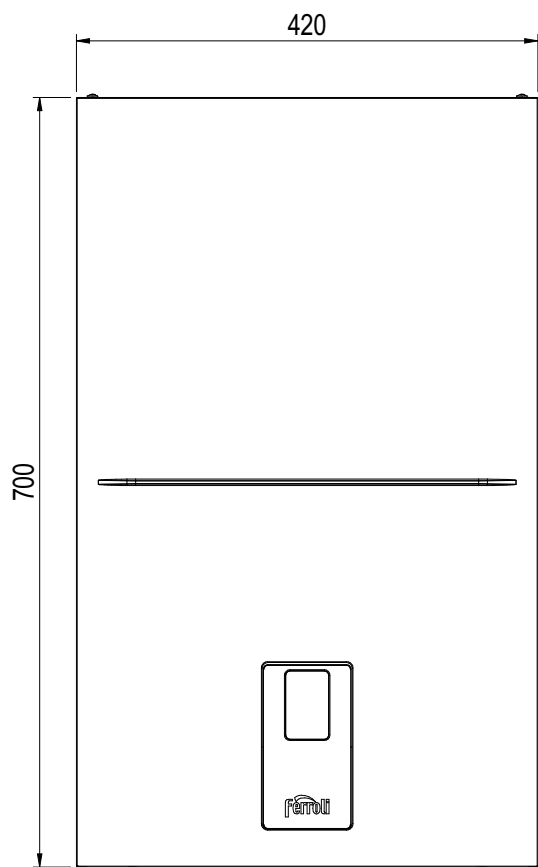


fig. 77- Front view

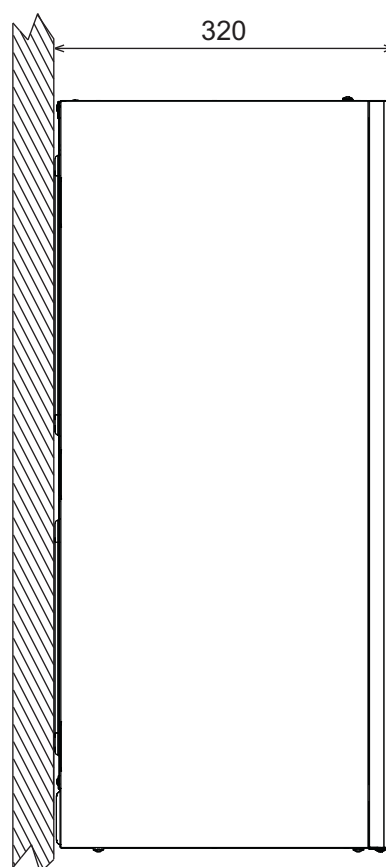


fig. 78- Side view

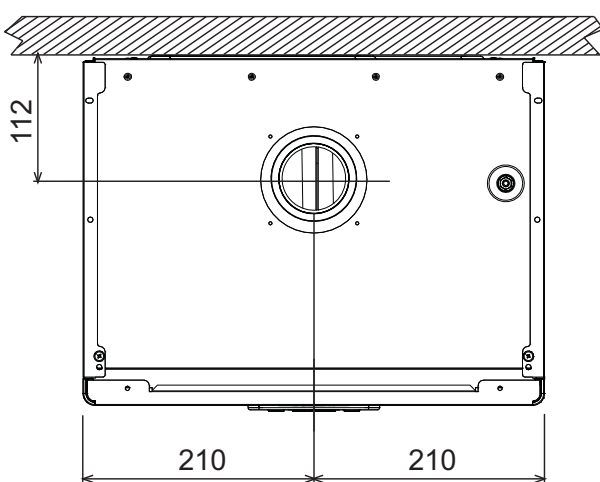


fig. 79- Top view

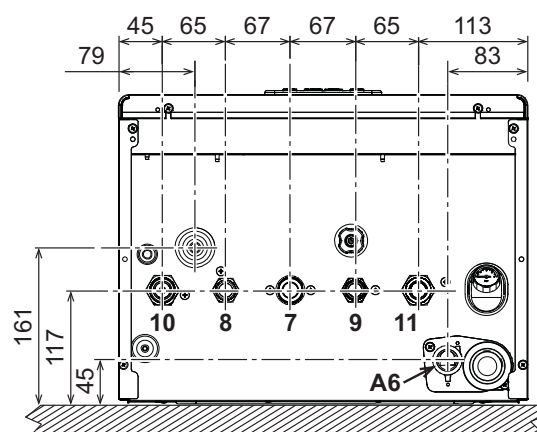


fig. 80- Bottom view

- 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

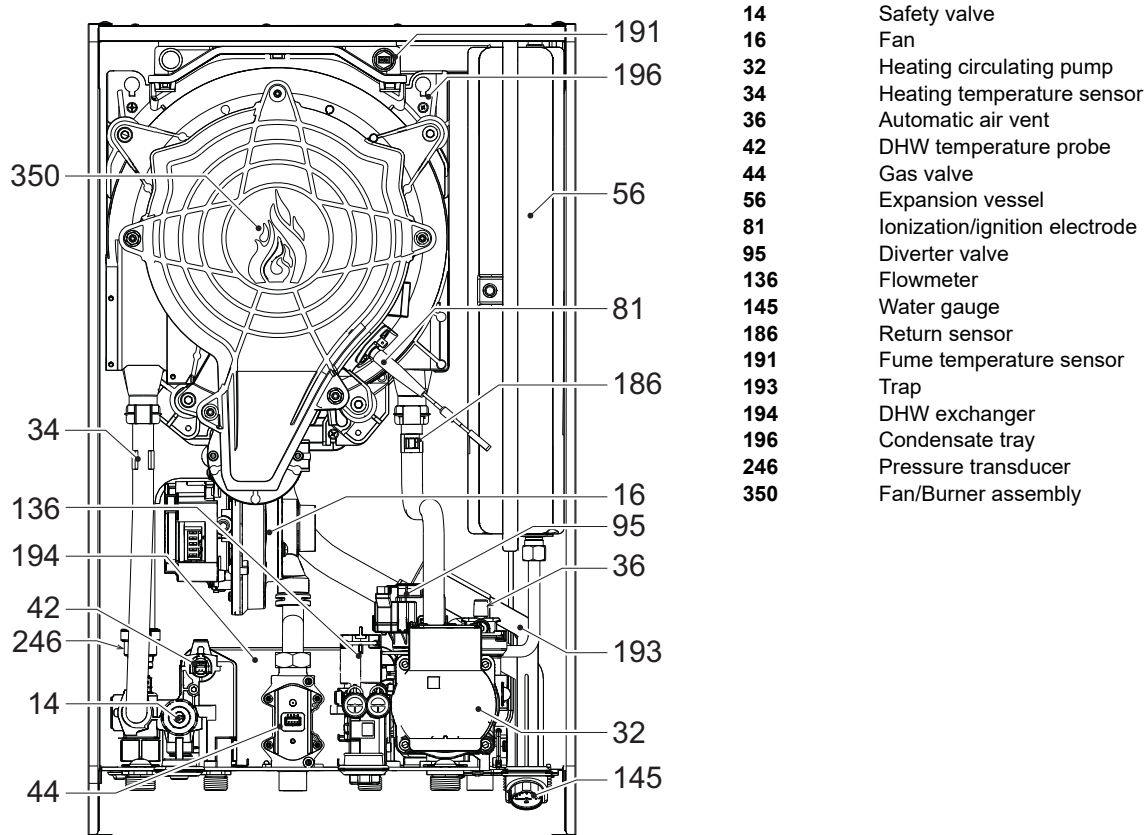


fig. 81- General view

4.3 Hydraulic circuit

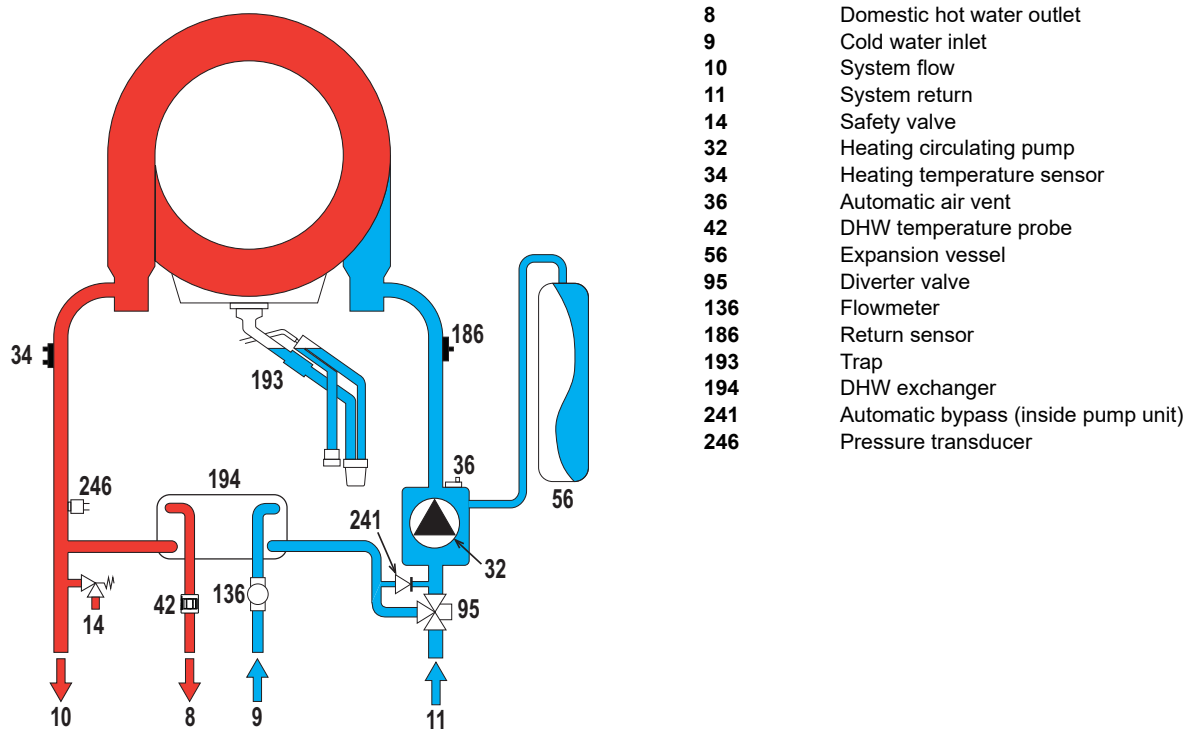


fig. 82- Hydraulic circuit

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		II2H3+ (GB)						
PRODUCT IDENTIFICATION CODES		0T4B2AGA		0T4B4AGA		0T4B7AGA		
PIN CE		CE-0085CT0650						
Max. heating capacity	kW	20,4		24,5		30,6		Qn
Min. heating capacity	kW	3,5		3,5		3,5		Qn
Max. heat output in heating (80/60 °C)	kW	20,0		24,0		30,0		Pn
Min. heat output in heating (80/60 °C)	kW	3,4		3,4		3,4		Pn
Max. heat output in heating (50/30 °C)	kW	21,6		26,0		32,5		Pn
Min. heat output in heating (50/30 °C)	kW	3,8		3,8		3,8		Pn
Max. heating capacity in DHW	kW	25,0		28,5		34,7		Qnw
Min. heating capacity in DHW	kW	3,5		3,5		3,5		Qnw
Max. heat output in DHW	kW	24,5		28,0		34,0		
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)	%	98,0		98,0		98,0		
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 (80/60 °C) - Pmax / Pmin	%	2,03	1,47	1,92	1,71	2,02	1,47	
Shell losses with burner ON (80/60 °C) - Pmax / Pmin	%	0,46	2,36	0,39	2,36	0,26	1,44	
Flue losses with burner ON (50/30 °C) - Pmax / Pmin	%	1,09	0,72	1,11	0,74	0,92	0,61	
Shell losses with burner ON (50/30 °C) - Pmax / Pmin	%	0,55	1,05	0,34	1,05	0,60	1,05	
Flue losses with burner OFF (50K / 20K)	%	0,02	0,01	0,02	0,01	0,02	0,01	
Shell losses with burner OFF (50K / 20K)	%	0,19	0,07	0,15	0,06	0,14	0,05	
Fume temperature (80/60 °C) - Pmax / Pmin	°C	69	58	66	58	66	60	
Fume temperature (50/30 °C) - Pmax / Pmin	°C	51	43	51	43	52	45	
Max combustion products temperature in overheating	°C	110		110		110		
Fume flow rate - Pmax / Pmin	g/s	9,2	1,6	11,1	1,6	14,1	1,7	
Gas supply pressure G20	mbar	20		20		20		
Gas nozzle G20	Ø	5,6		5,6		6		
Gas flow rate G20 - Max / min	m3/h	2,65	0,37	3,02	0,37	3,67	0,37	
CO2 - G20	%	9±0,8		9±0,8		9±0,8		
CO - G20 - Max / min	mg/kWh	109	6	185	6	130	2	
Gas supply pressure G31	mbar	37		37		37		
Gas nozzle G31	Ø	5,6		5,6		6		
Gas flow rate G31 - Max / min	kg/h	1,96	0,27	2,23	0,27	2,72	0,27	
CO2 - G31	%	10 ±0,8		10 ±0,8		10 ±0,8		
CO - G31 - Max / min	mg/kWh	126	8	184	8	153	2	
NOx emissions class	-	6 (< 56 mg/kWh)						NOx
Max. working pressure in heating	bar	2,5		2,5		2,5		PMS
Min. working pressure in heating	bar	0,8		0,8		0,8		
Maximum operating temperature	°C	95		95		95		tmax
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	9,0		9,0		9,0		PMW
Min. working pressure in DHW	bar	0,3		0,3		0,3		
DHW continuous flow rate (Δt 25°C)	l/min	14,0		16,1		19,5		
DHW continuous flow rate (Δt 30°C)	l/min	11,7		13,4		16,2		D
DHW content	liters	0,3		0,3		0,4		H2O
Protection rating	IP	IPX4D		IPX4D		IPX4D		
Power supply voltage	V/Hz	230V~50HZ						
Electrical power input	W	73		82		105		W
Empty weight	kg	28,4		28,4		30,7		
Type of unit	C(10)3-C(11)3-C(12)3-C(13)3-C(14)3-C(15)3-C13-C33-C43-C53-C63-C83-C93-B23-B33							
Flue installation pressure C(10)3-C(11)3	Pa	86,0		89,0		94,0		

ErP product fiche

MODEL: BLUEHELIX HITECH RRT 24 C (0T4B2AGA)

MODEL: BLUEHELIX HITECH RRT 28 C (0T4B4AGA)

MODEL: BLUEHELIX HITECH RRT 34 C (0T4B7AGA)

0T4B2AGA

0T4B4AGA

0T4B7AGA



TRADEMARK: FERROLI					
Condensing boiler			YES	YES	YES
Low-temperature boiler (**)			YES	YES	YES
B1 Boiler			NO	NO	NO
Combination heater			YES	YES	YES
Cogeneration space heater			NO	NO	NO
Item	SYMBOL	UNIT	VALUE		
Seasonal space heating energy efficiency class (from A+++ to D)			A	A	A
Rated heat output	P _n	kW	20	24	30
Seasonal space heating energy efficiency	η _s	%	94	94	93
Useful heat output					
Useful heat output at rated heat output and high-temperature regime (*)	P ₄	kW	20,0	24,0	30,0
Useful heat output at 30% of rated heat output and low-temperature regime (**)	P ₁	kW	6,7	4,6	5,6
Useful efficiency					
Useful heat output at rated heat output and high-temperature regime (*)	η ₄	%	88,3	88,3	88,2
Useful heat output at 30% of rated heat output and low-temperature regime (**)	η ₁	%	98,8	98,8	98,6
Auxiliary electricity consumption					
At full load	el _{max}	kW	0,024	0,028	0,045
At part load	el _{min}	kW	0,010	0,011	0,009
In standby mode	PSB	kW	0,004	0,003	0,004
Other items					
Standby heat loss	P _{stby}	kW	0,042	0,042	0,046
Ignition burner power consumption	P _{ign}	kW	0,000	0,000	0,000
Annual energy consumption	Q _{HE}	GJ	38	44	55
Sound power level	L _{WA}	dB	45	48	54
Emissions of nitrogen oxides	NO _x	mg/kWh	34	31	26
For combination heaters					
Declared load profile			XL	XL	XXL
Water heating energy efficiency class (from A+ to F)			A	A	A
Daily electricity consumption	Q _{elec}	kWh	0,148	0,148	0,186
Annual electricity consumption	AEC	kWh	34	32	41
Water heating energy efficiency	η _{wh}	%	87	87	85
Daily fuel consumption	Q _{fuel}	kWh	20,220	20,220	25,530
Annual fuel consumption	AFC	GJ	17	17	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 - BlueHelix HiTech RRT 28 C

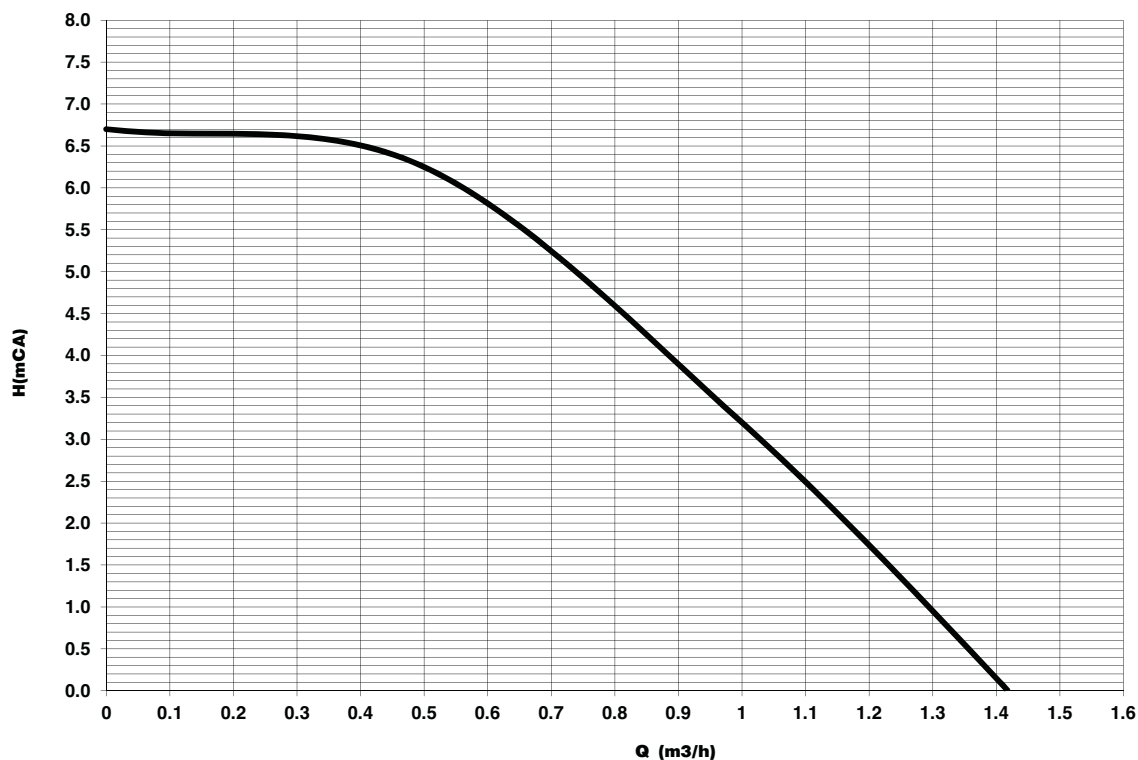


fig. 83- Residual head available for system

BlueHelix HiTech RRT 34 C

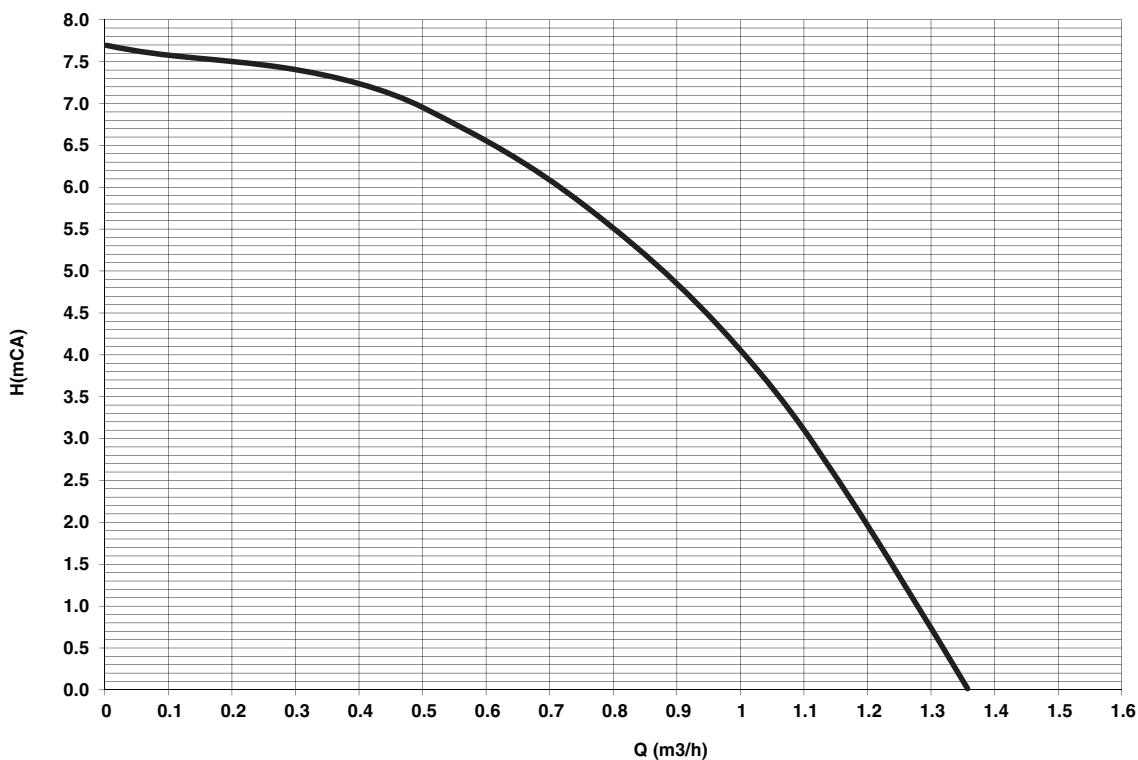


fig. 84- Residual head available for system

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) |

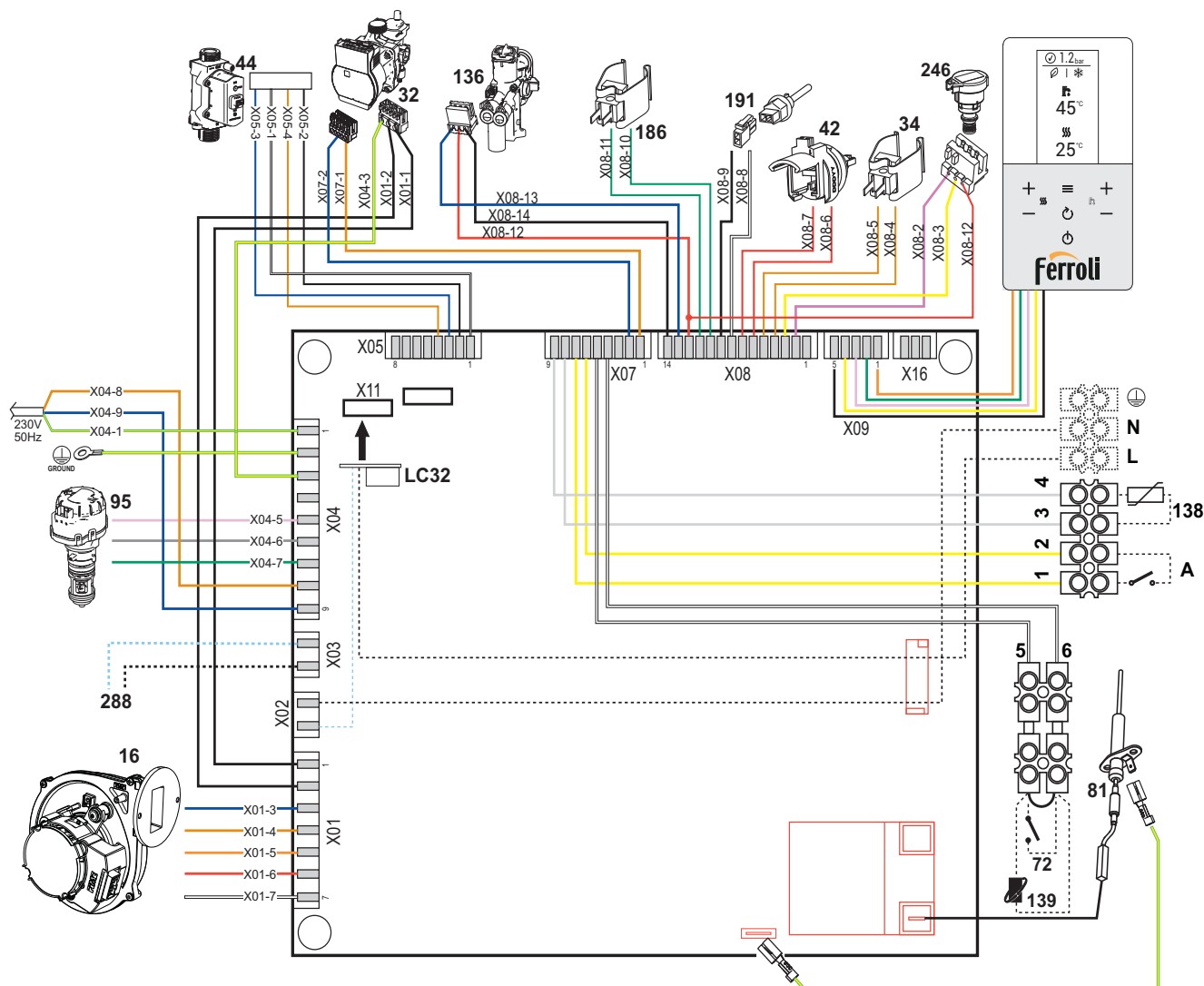


fig. 85- Wiring diagram



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										CO ₂ @Max Rate					%					CO ₂ @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 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 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 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 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 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 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 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 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 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 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



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