


BLUEHELIX PRIMA 24 C





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

	This symbol indicates "CAUTION" and is placed next to all safety warnings. Strictly follow these instructions in order to avoid danger and damage to persons, animals and things
	This symbol calls attention to a note or important notice.
	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.

CE 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 PRIMA 24 C is a high-efficiency, low emissions **premix condensing** heat generator with **heat exchanger in s/steel** and incorporated DHW production, using **Natural Gas (G20)**, **Liquefied Gas (G30-G31)** or **Propane-Air (G230)** and equipped with a microprocessor control system.

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

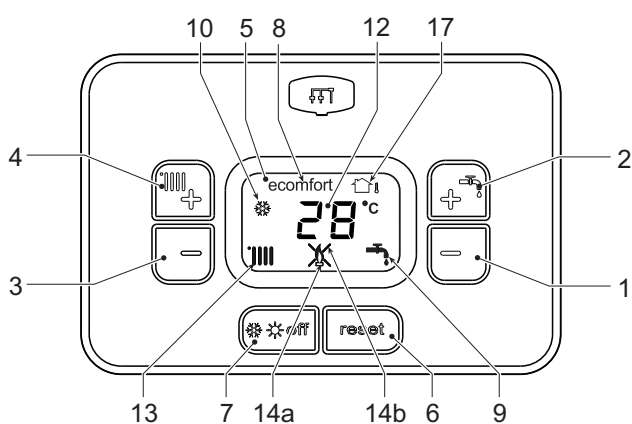


fig. 1- Control panel

- 2 DHW temperature setting increase button
- 3 Heating system temperature setting decrease button
- 4 Heating system temperature setting increase button
- 5 Display
- 6 "Sliding Temperature" Menu - Reset button
- 7 Mode selection button: "Winter", "Summer", "Unit OFF", "ECO", "COMFORT"
- 8 Eco (Economy) or Comfort mode
- 9 DHW mode
- 10 Winter mode
- 12 Multifunction
- 13 Heating
- 14a Burner lit (flashing during calibration function and self-diagnosis phases)
- 14b Appears when a fault has occurred causing the unit to shut down. To restore unit operation, press the RESET button (detail 6)
- 17 External sensor detected (with optional external probe)

Panel legend fig. 1

- 1 DHW temperature setting decrease button

Indication during operation

Heating

A heating demand (generated by the Room Thermostat or Remote Timer Control) is indicated by activation of the radiator.

The display (detail 12 - fig. 1) shows the actual heating delivery temperature and, during heating standby time, the message "d2".

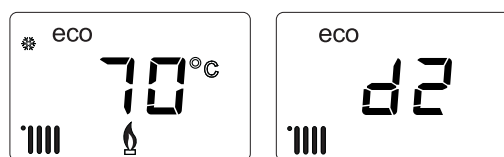


fig. 2

DHW (domestic hot water)

A DHW demand (generated by drawing hot water) is indicated by activation of the tap.

The display (detail 12 - fig. 1) shows the actual DHW outlet temperature and, during DHW standby time, the message "d1".

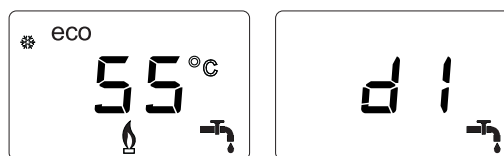


fig. 3

Comfort

A Comfort demand (reinstatement of temperature inside the boiler) is indicated by flashing of the **Comfort** symbol. The display (detail 12 - fig. 1) shows the actual temperature of the water in the boiler.

Fault

In case of a fault (see cap. 3.4 "Troubleshooting") the display shows the fault code (detail 12 - fig. 1) and during safety pause times the messages "d3" and "d4".

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.



fig. 4- Boiler not electrically powered

Boiler electrically powered

Switch on the power to the boiler.

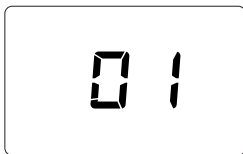


fig. 5- Switching on / Software version

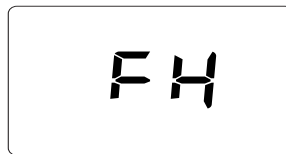


fig. 6- Vent with fan on

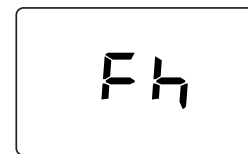


fig. 7- Vent with fan off

- During the first 5 seconds the display shows the card software version (fig. 5).
- For the following 20 seconds the display will show **FH** which identifies the heating system air venting cycle with the fan running (fig. 6).
- In the next 280 seconds, the venting cycle continues with the fan off (fig. 7).
- Open the gas valve ahead of the boiler
- When the message **Fh** disappears, the boiler is ready to operate automatically whenever domestic hot water is drawn or in case of a room thermostat demand

Turning the boiler off and on

It is possible to switch from one mode to another by pressing the **winter/summer/off** button for about one second, following the sequence given in fig. 8.

A =Winter mode

B =Summer mode

C =Off mode

To turn the boiler off, press the **summer/winter/off** button (detail 7 - fig. 1) repeatedly until the display shows dashes.

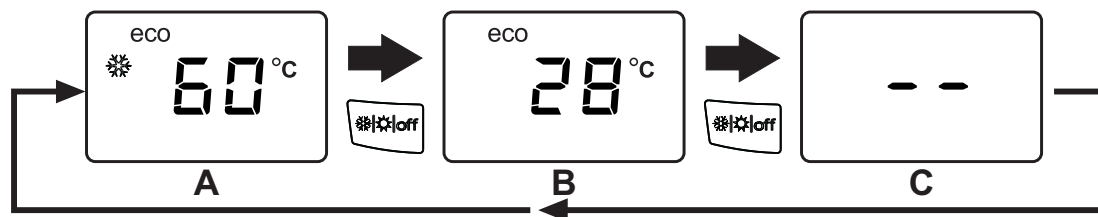


fig. 8- Turning the boiler off

When the boiler is turned off, the electronic board is still powered. Domestic hot water and heating are disabled. The frost protection system remains activated. To switch the boiler back on, press the **summer/winter/off** button again (detail 7 - fig. 1).

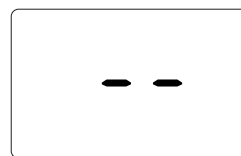


fig. 9

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.

NOTE - If the display does not show the **sun** symbol but there are the multi-function numbers, the boiler is in "Winter" mode.

1.4 Adjustments

Winter/summer switchover

Press the **winter/Summer/off** button (detail 7 - fig. 1) until the icon **winter** (detail 10 - fig. 1): disappears, the boiler will only deliver domestic hot water. The frost protection system remains activated.

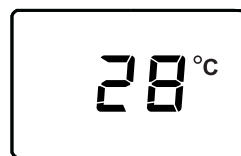


fig. 10

To switch the Winter mode back on, press the **winter/Summer/off** button 2 times (detail 7 - fig. 1).



fig. 11

Heating temperature adjustment

Use the heating buttons (details 3 and 4 - fig. 1) to adjust the temperature from a min. of 20°C to a max. of 80°C.

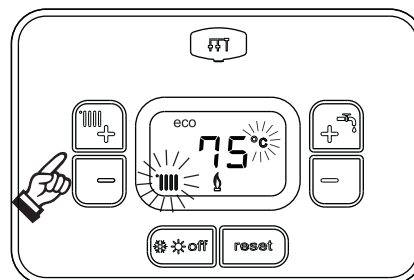


fig. 12

DHW temperature adjustment

Use the DHW buttons (details 1 and 2 - fig. 1) to adjust the temperature from a min. of 40°C to a max. of 55°C.



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

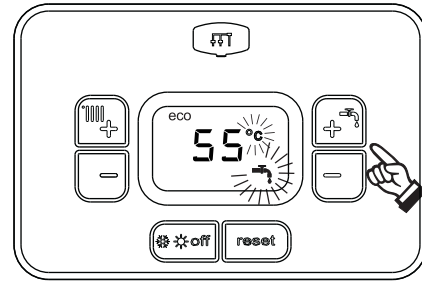


fig. 13

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 a high domestic hot water delivery speed and maximum comfort for the user. When the device is activated (**COMFORT** mode), the water contained in the boiler is kept hot, therefore ensuring immediate availability of hot water on opening the faucet, without waiting times.

The device can be deactivated by the user (**ECO** mode) by pressing the **winter/summer/off** button (detail 7 - fig. 1) for 5 seconds. In **ECO** mode the display activates the **ECO** symbol (detail 12 - fig. 1). To activate the **COMFORT** mode, press the **winter/summer/off** button again (detail 7 - fig. 1) for 5 seconds.

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 delivery temperature decreases according to a specific "compensation curve".

With the Sliding Temperature adjustment, the temperature set with the heating buttons (details 3 and 4 - fig. 1) becomes the maximum system delivery 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

Press the **reset** button (detail 6 - fig. 1) for 5 seconds to access the "Sliding temperature" menu; the display shows "CU" flashing.

Use the DHW buttons (detail 1 - fig. 1) to adjust the desired curve from 1 to 10 according to the characteristic (fig. 14). By setting the curve to 0, the sliding temperature adjustment is disabled.

Press the heating buttons (detail 3 - fig. 1) to access parallel curve offset; the display shows "OF" flashing. Use the DHW buttons (detail 1 - fig. 1) to adjust parallel curve offset according to the characteristic (fig. 15).

Press the heating buttons (detail 3 - fig. 1) to access the menu "shutdown for external temperature"; the display shows "SH" flashing. Use the DHW buttons (detail 1 - fig. 1) to adjust the shutdown external temperature. If set to 0 the function is disabled; the range varies from 1 to 40°C. Lighting occurs when the external probe temperature is 2°C lower than the set temperature.



Press the reset **button** (detail 6 - fig. 1) again for 5 seconds to exit the "Sliding Temperature" menu.

If the room temperature is lower than the required 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.

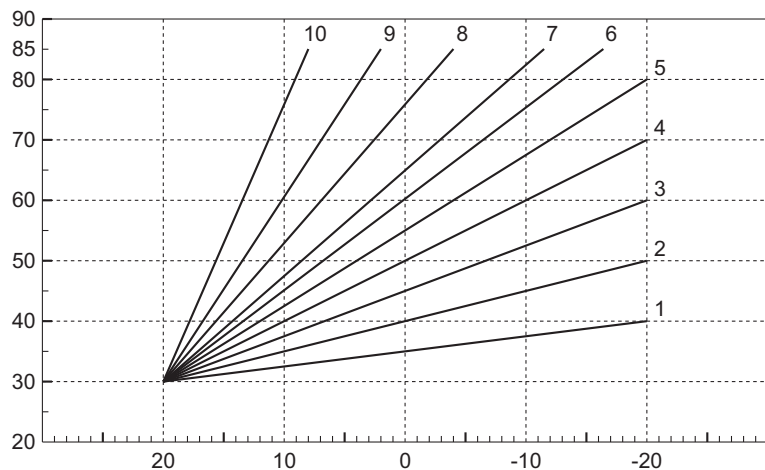


fig. 14- Compensation curves

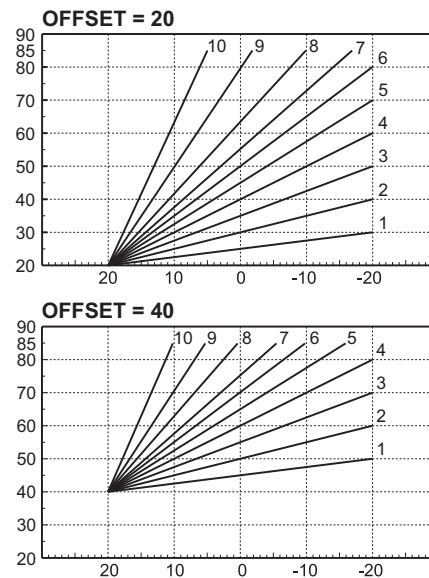


fig. 15- Example of compensation parallel curve offset

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 1.

Table 1

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 Comfort mode. 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 read on the boiler water gauge (detail 2 - fig. 16) with system cold must be approx 1.0 bar. If the system pressure falls below minimum values, the boiler stops and fault **F37** is displayed. Pull out the filling knob (detail 1 - fig. 16) and turn it anti-clockwise to return it to the initial value. Always close it afterwards.

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

To prevent boiler shutdown, it is advisable to periodically check the pressure on the gauge with system cold. In case of a pressure below 0.8 bar, it is advisable to restore it.

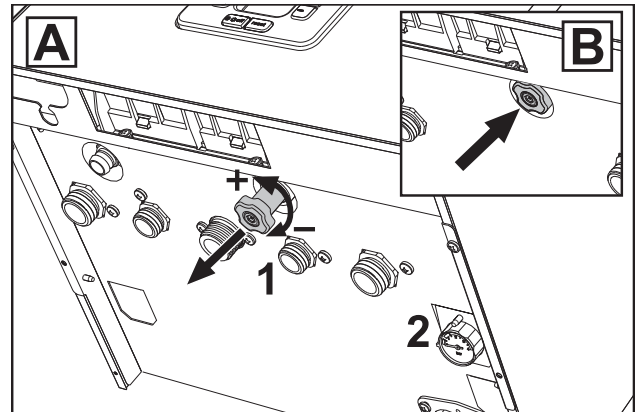


fig. 16- Filling knob

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. 17) 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.

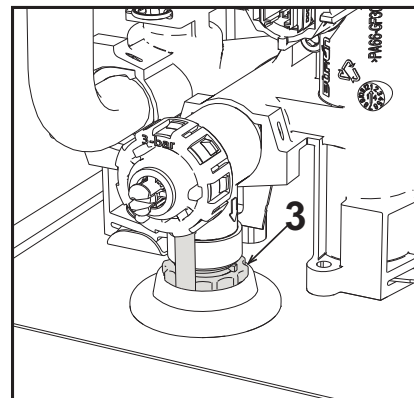


fig. 17



2. Installation

2.1 General Instructions

BOILER INSTALLATION MUST ONLY BE PERFORMED BY QUALIFIED PERSONNEL, IN ACCORDANCE WITH ALL THE INSTRUCTIONS GIVEN IN THIS TECHNICAL MANUAL, THE PROVISIONS OF CURRENT LAW, THE PRESCRIPTIONS OF NATIONAL AND LOCAL STANDARDS AND THE RULES OF PROPER WORKMANSHIP.

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 a risk of suffocation and intoxication or explosion and fire. This safety precaution is required by EEC Directive No. 2009/142 for all gas units, including so-called sealed chamber units.

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

The place of installation must be free of flammable materials, objects and dusts 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, there must be sufficient space for removing the casing and for normal maintenance activities

2.3 Plumbing connections

Important



The safety valve outlet must be connected to a funnel or collection pipe to prevent water spurting onto the floor in case of overpressure in the heating circuit. Otherwise, if the discharge valve cuts in and floods the room, the boiler manufacturer cannot be held liable.



Before installation, flush all the pipes of the system thoroughly to remove any residuals or impurities that could affect proper operation of the unit.

In case of replacement of generators in existing installations, the system must be completely emptied and cleaned of any sludge and pollutants. For that purpose only use suitable guaranteed products for heating systems (see next section), that do not harm metals, plastics or rubber. **The manufacturer declines any liability for damage caused to the generator by failure to properly clean the system.**

Make the connections to the respective points (see fig. 51, and) and to the symbols given on the unit.

Antifreeze system, antifreeze fluids, additives and inhibitors

When necessary, antifreeze fluids, additives and inhibitors can be used only if the manufacturer of such fluids or additives guarantees that they are suitable and do not cause damage to the exchanger or other components and/or materials of the boiler and system. Do not use generic antifreeze fluids, additives or inhibitors that are not specific for use in heating systems and compatible with the materials of the boiler and system.

System water characteristics



BLUEHELIX PRIMA 24 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 within a heating system must have the characteristics required by UNI 8065, and comply with laws and regulations in force and the provisions of EN14868 (protection of metallic materials against corrosion).

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 in the system must be periodically checked (at least twice a year during the season when the systems are used, as required by UNI8065) and have: possibly a clear appearance, hardness below 15°F for new systems or 20°F for existing systems, pH above 7 and below 8.5, iron content (Fe) below 0.5 mg/l, copper content (Cu) below 0.1 mg/l, chloride content below 50mg/l, electrical conductivity below 200 µs/cm, and must contain chemical conditioners in a concentration sufficient to protect the system for at least 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 protection for yellow metals (copper and its alloys), anti-fouling agents for scale, 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 delivery 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, for system protection use a suitable antifreeze liquid that meets the same requirements as set out above and provided for by Standard 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 must be connected to the corresponding union (see) in conformity with current regulations, with a rigid metal pipe or with a continuous flexible s/steel tube, installing a gas cock between the system and boiler. Make sure that all the gas connections are tight. Otherwise there may be a risk of fire, explosion or suffocation.

2.5 Electrical connections

IMPORTANT



BEFORE CARRYING OUT ANY OPERATION THAT REQUIRES REMOVING 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 earth the system.

The boiler is prewired and provided with a three-pole cable, without a plug, for connection to the electric line. The connections to the grid must be made with a permanent connection and equipped with a bipolar switch whose contacts have a minimum opening of at least 3 mm, interposing fuses of max. 3A between the boiler and the 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 supply 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, only use cable "HAR H05 VV-F" 3x0.75 mm² with max. external 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 29 ***) to access the terminal block (M) and fuse (F) by proceeding as follows (fig. 18 and fig. 19). **The terminals indicated in fig. 18 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. 55.

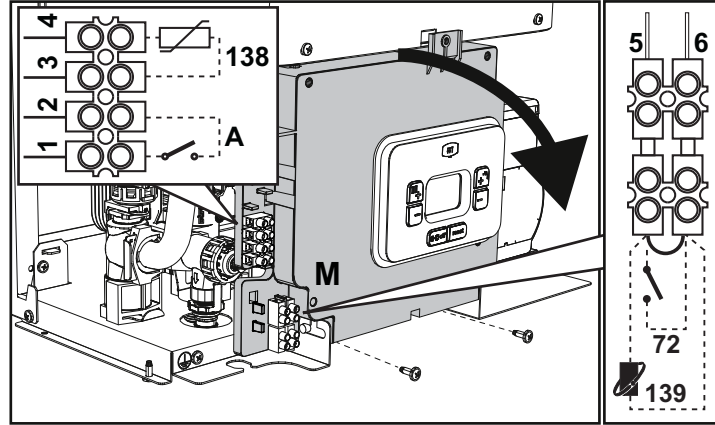


fig. 18

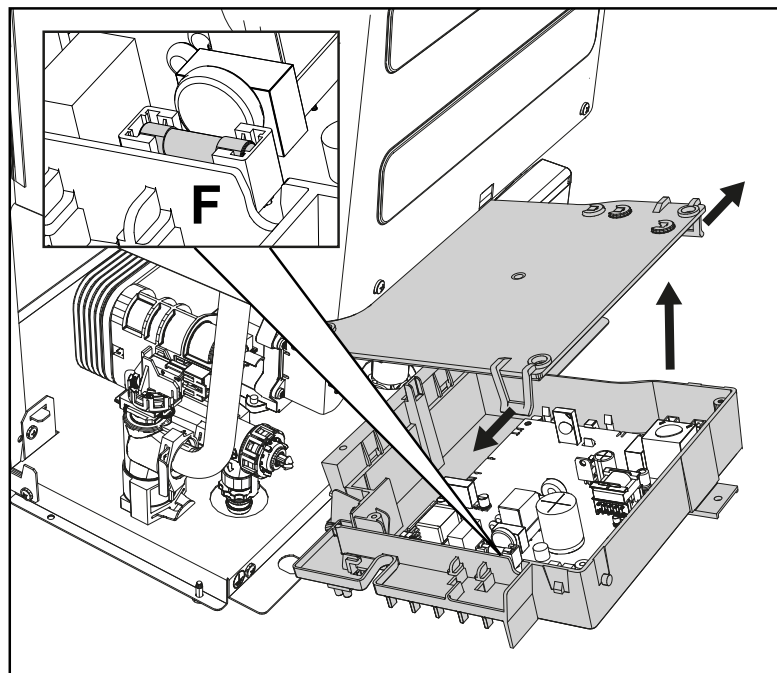


fig. 19



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. 55.

To use the desired function, refer to the table 2.

Table 2- Settings LC32

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

ON/OFF (A fig. 19) configuration

Table 3- Switch A setting

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

2.6 Fume ducts



THE BOILER MUST BE INSTALLED IN PLACES THAT MEET THE FUNDAMENTAL REQUIREMENTS FOR VENTILATION. OTHERWISE THERE IS A DANGER OF SUFFOCATION OR INTOXICATION.

READ THE INSTALLATION AND MAINTENANCE INSTRUCTIONS BEFORE INSTALLING THE UNIT.

ALSO FOLLOW THE DESIGN INSTRUCTIONS.

IN CASE OF PRESSURES ABOVE 200 Pa INSIDE THE FUME EXHAUST PIPES, CLASS "H1" FLUES MUST BE USED.

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

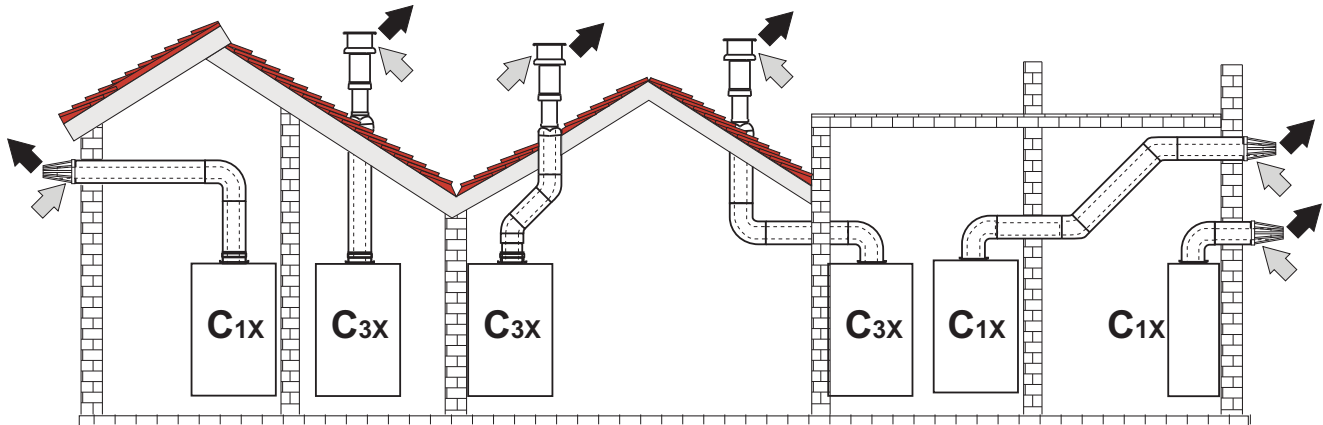


fig. 20 - Examples of connection with coaxial pipes (⇨ = Air / ⇨ = Fumes)

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

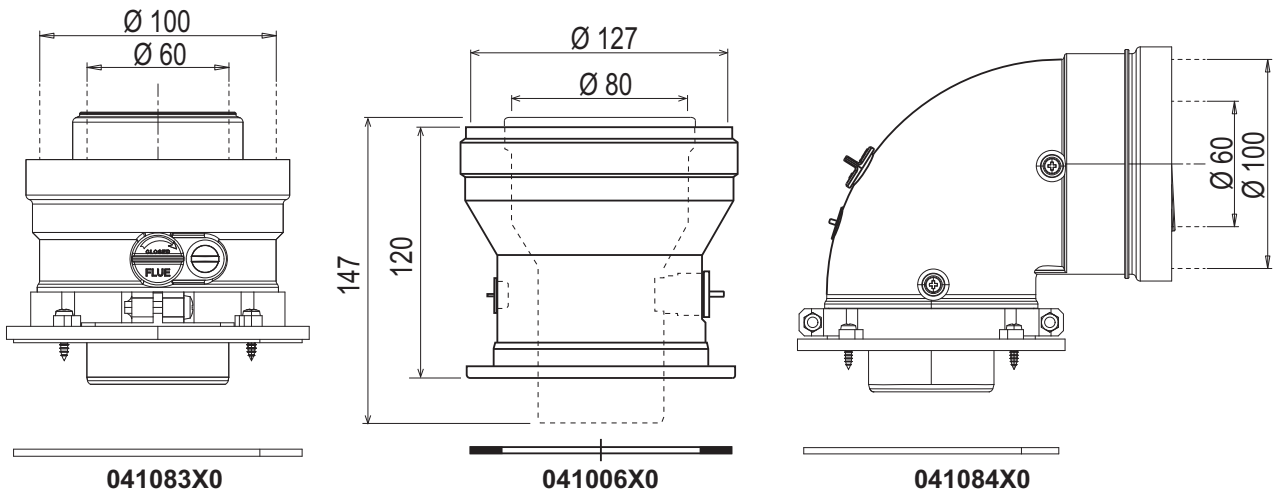


fig. 21- Starting accessories for coaxial ducts

Table 4- Max. length coaxial ducts

	Coaxial 60/100	Coaxial 80/125
Max. permissible length (horizontal)	7 m	28 m
Max. permissible length (vertical)	8 m	
Reduction factor 90° bend	1 m	0.5 m
Reduction factor 45° bend	0.5 m	0.25 m

Connection with separate pipes

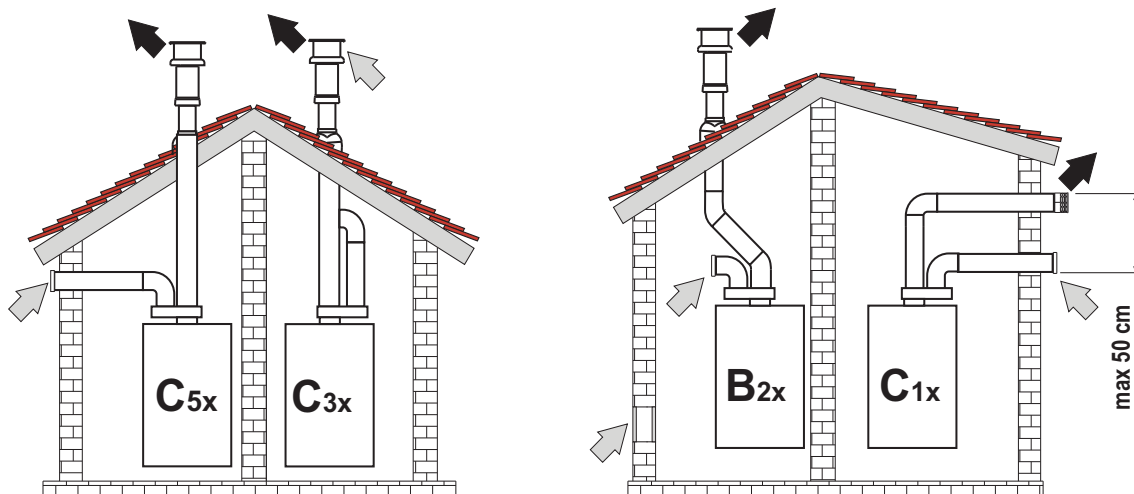


fig. 22- Examples of connection with separate pipes (↔ = Air / ➔ = Fumes)

Table 5 - Typology

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

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

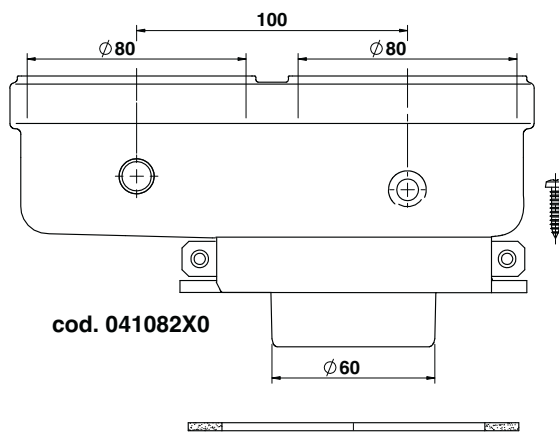


fig. 23- Starting accessory for separate ducts

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

1. Establish the layout of the system of split flues, including accessories and outlet terminals.
2. Consult table 7 and identify the losses in m_{eq} (equivalent meters) of every component, according to the installation position.
3. Check that the sum total of losses is less than or equal to the maximum permissible length in table 6.

Table 6- Max. length separate ducts

Max. permissible length	80 m_{eq}
-------------------------	-------------

Table 7- Accessories

				Losses in m_{eq}		
				Air intake	Fume exhaust	
					Vertical	Horizontal
Ø 80	PIPE	1 m M/F	1KWMA83W	1.0	1.6	2.0
	BEND	45° M/F	1KWMA65W	1.2	1.8	
		90° M/F	1KWMA01W	1.5	2.0	
	PIPE SECTION	with test point	1KWMA70W	0.3	0.3	
	TERMINAL	air, wall	1KWMA85A	2.0	-	
		fumes, wall with antiwind	1KWMA86A	-	5.0	
	FLUE	Split air/fumes 80/80	010027X0	-	12.0	
		Fume outlet only Ø80	010026X0 + 1KWMA86U	-	4.0	
Ø 60	PIPE	1 m M/F	1KWMA89W		6.0	
	BEND	90° M/F	1KWMA88W		4.5	
	REDUCTION	80/60	041050X0		5.0	
	TERMINAL	fumes, wall with antiwind	1KWMA90A		7.0	
Ø 50	PIPE	1 m M/F	041086X0		12	
	BEND	90° M/F	041085X0		9	
	REDUCTION	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.				



Use of Ø50 and Ø60 flexible and rigid pipes

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

Flexible pipe

A maximum of 4 metres of Ø80 mm flue can be used between the boiler and the section to the reduced diameter (Ø50 or Ø60), and no more than 4 metres of Ø80 mm flue on the intake (with the maximum length of Ø50 and Ø60 flues) See .

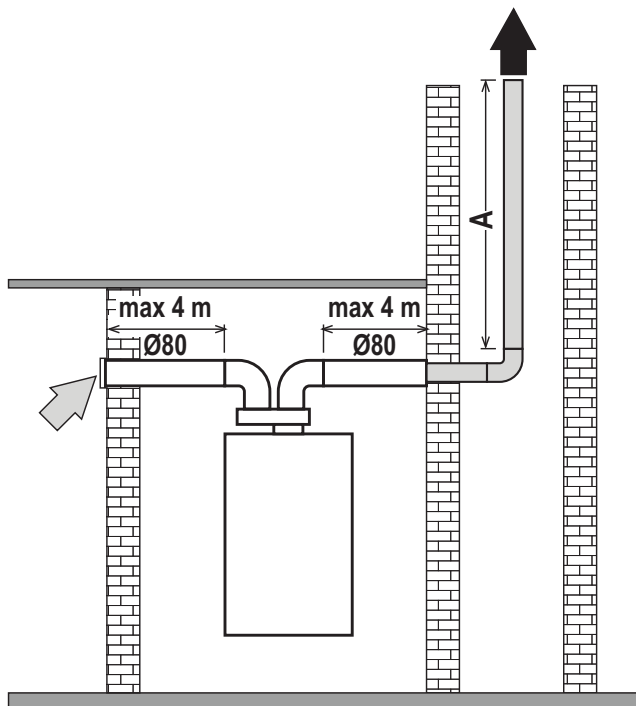


fig. 24- Layout for ducting only with flexible pipe

A = Ø50 - 15 m MAX / Ø60 - 30 m MAX

Flexible and rigid pipes

To use these diameters follow the instructions below.

Enter the menu **TS** (follow the instructions given in par.) and set the parameters **P62, P63 and P64** to the corresponding value in table 8 and table 9.

Table 8

	Ø50 flexible and rigid pipe		
Maximum permitted length	15 m		
Parameter	P62	P63	P64
Up to 5.9 m (Factory setting)	76	200	204
6 m to 15 m	88	220	224

Table 9

	Ø60 flexible and rigid pipe		
Maximum permitted length	30 m		
Parameter	P62	P63	P64
Up to 14.9 m (Factory setting)	76	200	204
15 m to 30 m	88	220	224

Connection to collective flues

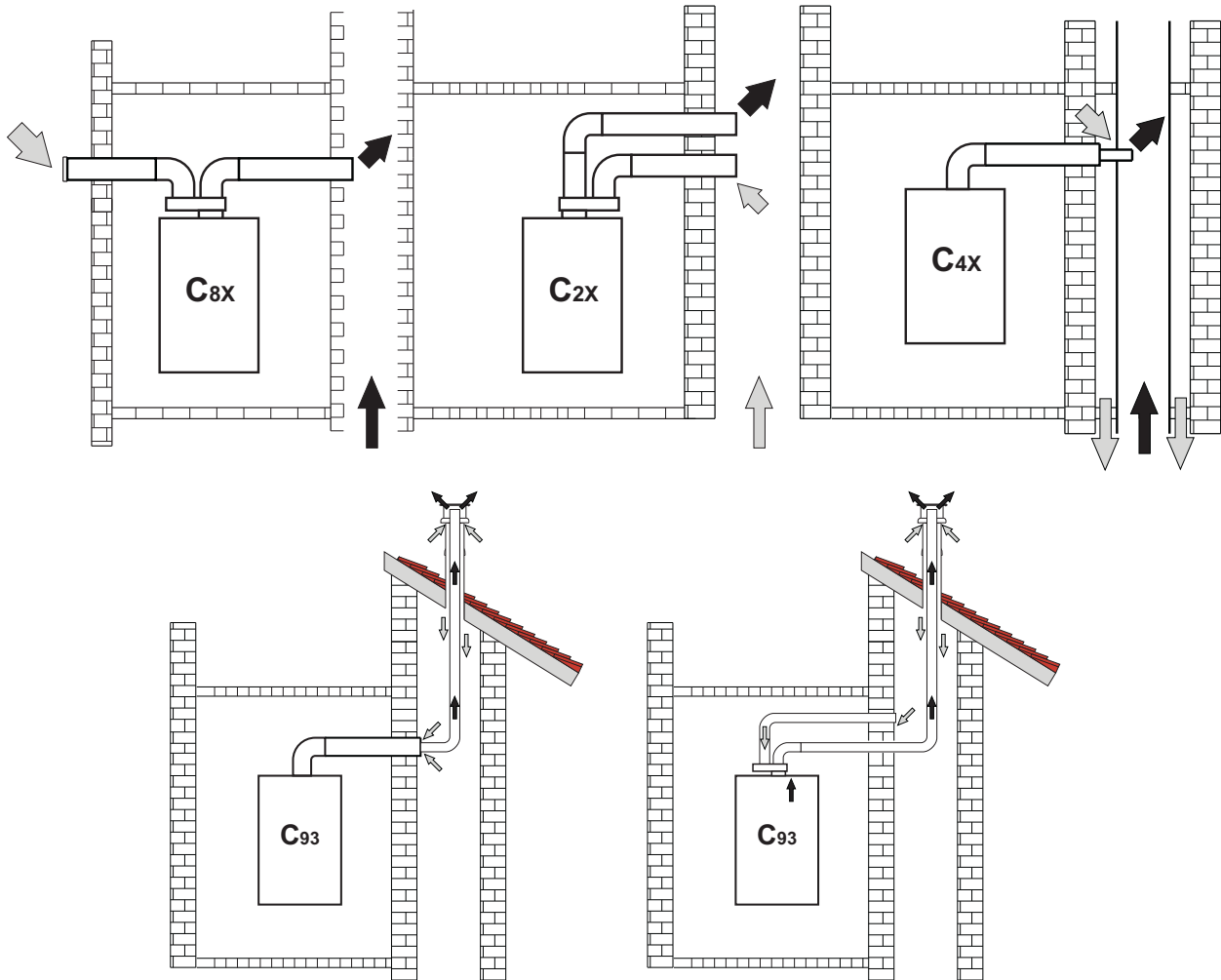


fig. 25- Examples of connection to collective flues (⇨ = Air / ⇨ = Fumes)

Table 10- Typology

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

If the **BLUEHELIX PRIMA 24 C** boiler is to be connected to a flue or a single chimney with natural draught, the flue or chimney must be expressly designed by professionally qualified technical personnel in conformity with the current regulations and be suitable for sealed chamber units equipped with fan.

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.

Drains connected to the drainage system must be resistant to acidic condensate.

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.

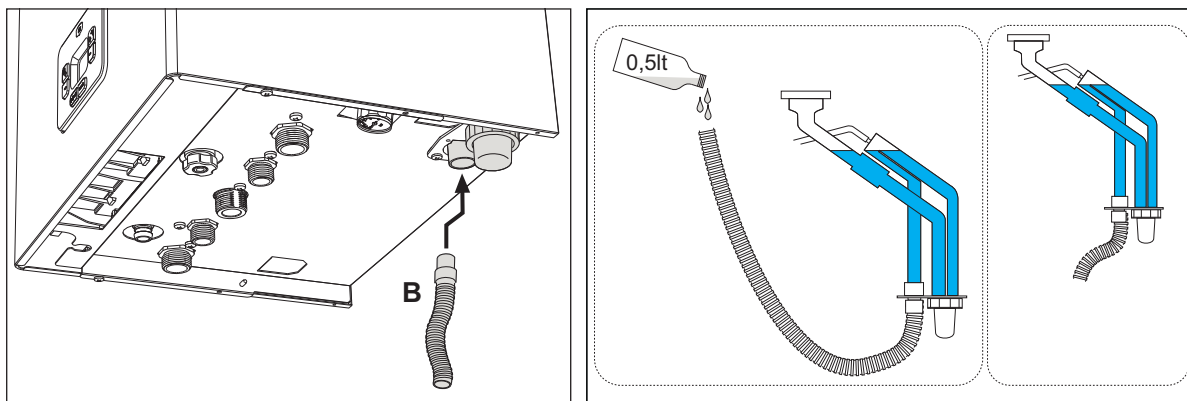


fig. 26- Condensate drain connection

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 use gas of the 2nd or 3rd family as clearly indicated on the packaging and on the unit's technical data plate. 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 29 ***).
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:**
 - Put the boiler in standby mode and press the **Reset button** (detail 6 - fig. 1) for 10 seconds.
 - The display shows **100** and the message "**co**" flashing; press the "**Heating +**" button (detail 4 - fig. 1) until setting and displaying **120**.
Then press the "**DHW +**" button (detail 2 - fig. 1) until setting **123**.
 - Press the **Reset button** (detail 6 - fig. 1) once.
 - The display shows **tS** flashing; press the "**Heating +**" button (detail 4 - fig. 1) once.
 - Press the **Reset button** (detail 6 - fig. 1) once.
 - Using the "**Heating +**" button (detail 4 - fig. 1) scroll to the parameter **b03**.
 - Using the "**DHW +**" button (detail 4 - fig. 1) set:
 - 0 =G20** - Natural Gas (Default setting)
 - 1 =G30/G31** Liquefied Gas
 - 2 =G230** Propane Air
 - Press the "**Heating +**" button (detail 4 - fig. 1) to confirm (Changing the value of the parameter **b03**, automatically changes the value of the parameter **b27** to 5).
 - Press the **Reset button** (detail 6 - fig. 1) for 10 seconds.
 - Turn the power off for 10 seconds and then back on.
 - Wait until the mode **Fh** finishes.
 - Put the boiler in standby mode and activate the complete manual calibration mode by simultaneously pressing the "**OFF/Summer/Winter**" and "**Heating +**" buttons for 5 seconds. The display will show the flashing symbols "**Au**" and "**to**". After burner ignition (flashing symbols "Hi+flame+tap+radiator") the boiler will do the calibration in the three power levels "**Hi**", "**ME**" and "**Lo**". At the end a numerical value will be displayed (the boiler is now at minimum power "**Lo**").
 - If the **CO₂** values were not within the range table 11 proceed as follows: using the "DHW + and -" buttons. Adjust the **CO₂** at minimum power (Lo), Each time the "**DHW + or -**" buttons are pressed the display will show the modified value and then the icon "Lo" (to indicate the minimum power level).
 - Increasing the value will decrease the **CO₂** level and vice versa.
 - Press the "**Heating +**" button for ignition/intermediate power "**ME**", the display will show the icon "**ME**", when ignition/intermediate power is reached, a numerical value will appear.
 - Using the "DHW + and -" buttons adjust the **CO₂**. Each time the "DHW + or -" buttons are pressed the display will show the modified value and then the icon "**ME**" (to indicate the ignition/intermediate power level).
 - Press the "**Heating +**" button for maximum power "**Hi**", the display will show the icon "**Hi**" and when the maximum power is reached a numerical value will appear.
 - Using the "**DHW + and -**" buttons adjust the **CO₂** at maximum power (**Hi**), each time the "**DHW + or -**" buttons are pressed the display will show the modified value and then the icon "**Hi**" (to indicate the maximum power level). After adjustment of the **CO₂** at maximum power it will still be possible to scroll the three power levels "**Hi**" "**ME**" and "**Lo**" pressing the "**Heating + or -**" buttons to recheck or correct the **CO₂** value.
 - Press the "**OFF/Summer/Winter**" and "**Heating +**" buttons for 5 seconds to exit the complete manual calibration mode and save the settings. The modification of parameters to adjust the **CO₂** in complete manual calibration mode will have a maximum duration of about 8 minutes



Checking the combustion values

MAKE SURE THE SEALED CHAMBER 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 node** (see *** 'TEST mode activation' on page 23 ***).
3. Using a combustion analyser connected to the devices located on the starting accessories above the boiler, check that the CO₂ content in the fumes, with the boiler operating at maximum and minimum power, matches that indicated in table 11.

Table 11- CO₂ values to respect

G20	G30/G31	G230
9% ±0,8	10% ±1	10% ±1

4. If the combustion values do not match, do the **manual calibration** as described in the following paragraph.
5. Activate a manual calibration and at the end change the values of **Hi**, **ME** and **Lo** to bring the **CO₂ values** as per table 11.

Calibration

IMPORTANT: DURING THE COMPLETE MANUAL OR MANUAL CALIBRATION PROCEDURE, FOR CHECKING THE CO₂ VALUE THE BOILER SEALED CHAMBER MUST BE CLOSED AND THE INTAKE/FUME EXHAUST DUCTS COMPLETELY ASSEMBLED.

Manual calibration

Calibration procedure.

- Put the boiler in **standby mode**.
- To activate manual calibration, simultaneously press the **OFF/Summer/Winter buttons** (detail 7 - fig. 1) and "**Heating +**" **button** (detail 4 - fig. 1) for 5 seconds. Calibration will start in heating request. If there is insufficient heat dissipation, a DHW request can be made (the three-way valve will automatically switch in the DHW circuit).
- Manual calibration will start. In the ignition stage the flashing symbols **MA** alternating "**nu**" + **radiator + tap will appear**. With flame present (flashing icons "Hi + flame + tap + radiator") the boiler will do the check first in **Hi** (maximum power) then **ME** (intermediate power) then **Lo** (minimum power). The calibration can be stopped at any time by pressing the "**OFF/Summer/Winter**" and "**Heating +**" **buttons** for 5 seconds.
- At the end a numerical value between 0 and 6 will appear on the display (**the boiler is now at minimum power "Lo"**). At this point the **CO₂ can be adjusted**.

Using the "**DHW + and -**" buttons adjust the **CO₂** at minimum power (**Lo**), each time the "**DHW + or -**" buttons are pressed the display will show the modified value and then the icon "**Lo**" (to indicate the minimum power level). The adjustment range is from 0 to 6 (for all power levels **Hi**, **ME**, **Lo**), increasing the value will increase the **CO₂ level** and vice versa.

Press the "**Heating +**" **button**, the display will show the icon "**ME**", when ignition/intermediate power is reached, a numerical value will appear. Using the "**DHW + and -**" buttons adjust the **CO₂** at ignition/intermediate power **ME**, each time the "**DHW + or -**" buttons are pressed the display will show the modified value and then the icon "**ME**" (to indicate the ignition/intermediate power level). Press the "**Heating +**" **button**, the display will show the icon "**Hi**" and when the maximum power is reached a numerical value will appear.

Using the "**DHW + and -**" buttons adjust the **CO₂** at maximum power (**Hi**).

Each time the "**DHW + or -**" buttons are pressed the display will show the modified value and then the icon "**Hi**" (to indicate the maximum power level). After adjustment of the **CO₂** at maximum power it will still be possible to scroll the three power levels "**Hi**", "**ME**" and "**Lo**" pressing the "**Heating + or -**" buttons to recheck or correct the **CO₂ value**. To exit and save the settings, simultaneously press the **OFF/Summer/Winter buttons** (detail 7 - fig. 1) and "**Heating +**" **button** (detail 4 - fig. 1) for 5 seconds.

- The calibration mode will be deactivated in any case after about 5 minutes if no buttons are pressed.

Complete manual calibration

Complete manual calibration is selected by setting the parameter **b27** to **5**. It must be activated manually by simultaneously pressing the **OFF/Summer/Winter buttons** (detail 7 - fig. 1) and "**Heating +**" **button** (detail 4 - fig. 1) for 5 seconds, in standby conditions. Modifying the parameter "**gas type**" **b03** or "**Restoring Factory Values**" with the parameter **b29**, the parameter **b27** is set to **5** automatically. Complete manual calibration is foreseen in case of: board replacement, gas change (**b03**), or after setting the parameter **b27** to **5**, replacement of parts such as the electrode, burner, gas valve, fan or for installations with maximum flue resistance. Complete manual calibration can be done in case of faults **A01**, **A06** or other faults where it is required (see table 12. Respect the sequence of fault solutions). Complete **manual calibration** resets the combustion parameters recorded previously and must be done only in the cases described above.

Procedure:

- Put the boiler in standby mode and activate the complete manual calibration mode by simultaneously pressing the "OFF/Summer/Winter" and "Heating +" buttons for 5 seconds. The display will show the symbols "Au" and "to" flashing. After burner ignition (flashing icons "Hi+flame+tap+radiator") the boiler will do the calibration in the three power levels "Hi", "ME" and "Lo". At the end a numerical value will be displayed (the boiler is now at minimum power "Lo").
- If the CO₂ values are not within the range table 11, proceed as follows: use the "DHW + and -" buttons to adjust the CO₂ at minimum power (Lo). Each time the "DHW + and -" buttons are pressed, the display will show the modified value and then the icon "Lo" (to indicate the minimum power level).
- Increasing the value will decrease the CO₂ level and vice versa.
- Press the "Heating +" button to go to ignition/medium power "ME", the icon "ME" will appear on the display, a numerical value will appear when the ignition/intermediate power is reached. Adjust the CO₂ using the "DHW + and -" buttons. Each time the "DHW + or -" buttons are pressed, the display will show the modified value and then the icon "ME" (to indicate the ignition/intermediate power level). Press the "Heating +" button to go to maximum power "Hi". The icon "Hi" will appear on the display and a numerical value will appear when it reaches maximum power.
- Use the "DHW + and -" buttons to adjust the CO₂ at maximum power (Hi), each time the "DHW + or -" buttons are pressed, the display will show the modified value and then the icon "Hi" (to indicate the maximum power level). After adjusting the CO₂ at maximum power, the three power levels "Hi", "ME" and "Lo" can be scrolled by pressing the "Heating + or -" buttons to recheck or correct the CO₂ level.
- Press the "OFF/Summer/Winter" and "Heating +" buttons for 5 seconds to exit the complete manual calibration mode and save the settings. Modification of parameters to adjust the CO₂ in complete manual calibration mode will have a maximum duration of about 8 minutes

TEST mode activation

Perform a heating or DHW demand.

Press the heating buttons (details 3 and 4 - fig. 1) together for 5 seconds to activate the **TEST** mode. After switching on, the boiler adjusts to 80% of maximum power.

The Heating and DHW symbols (fig. 27) flash on the display and the set power will appear.

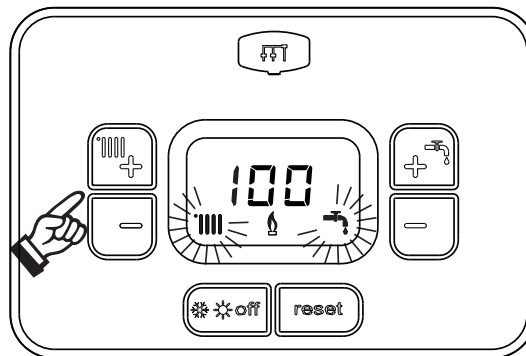


fig. 27- TEST mode (heating power = 100%)

Press the heating buttons (details 3 and 4 - fig. 1) to increase or decrease the power (Minimum=0%, Maximum=100%).

By pressing the DHW "-" button (detail 1 - fig. 1), boiler output is immediately adjusted to minimum (0%).

Wait about 1 minute for stabilisation.

By pressing the DHW "+" button (detail 2 - fig. 1), boiler output is immediately adjusted to maximum (100%).

If the TEST mode is activated and enough hot water is drawn to activate the DHW mode, the boiler remains in TEST mode but the 3-way valve goes to DHW.

To deactivate the TEST mode, press the heating buttons simultaneously (details 3 and 4 - fig. 1) for 5 seconds.

The TEST mode is automatically disabled in any case after 15 minutes or on stopping of hot water drawing (if enough hot water is drawn to activate DHW mode).

Heating power adjustment in TEST mode

To adjust the heating power (in addition to parameter **P41** modification) set the boiler to TEST mode. Press the "heating + or -" buttons to increase or decrease the power. By pressing the **reset** button for 1 second within 20 seconds of the modification, the maximum power will remain that just set (settable range 0-85). Exit **TEST** mode.



Service menu

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

The card Service Menu is accessed by pressing the Reset button for 10 seconds.

The display will show: "100" and the message "co" flashing.

Then set "103" with the DHW buttons, with the heating buttons set "123" and confirm by pressing the Reset button.

4 submenus are available: press the Heating buttons to select, in increasing or decreasing order, "tS", "In", "Hi" or "rE".

To enter the selected menu, press the **reset button once**.

"tS" - Transparent Parameters Menu

Press the Heating buttons to scroll the list of parameters in increasing or decreasing order. To view or modify the value of a parameter, just press the DHW buttons: the change will be saved by pressing the "heating + or -" buttons (after modifying the parameter value, scroll to the next or previous parameter to save the change).

Contents	Description	Range	Default
b01	Boiler type selection	3 = COMBI HEATING ONLY (NOT MODIFIABLE)	3
b02	Boiler type	2 = BLUEHELIX PRIMA 24 C (NOT MODIFIABLE)	2
b03	Gas type	0 = Natural gas 1 = Liquefied gas 2 = Propane air	0
b04	System water pressure protection selection	0 = Pressure switch 1 = Pressure transducer	0
b05	Summer/Winter mode	0 = WINTER - SUMMER - OFF 1 = WINTER - OFF	0 = Enabled
b06	Variable input contact operation selection	0 =Flowmeter exclusion 1 =System thermostat 2 =Second room therm. 3 =Warning/Alert 4 =Safety thermostat	2
b07	Relay card LC32 selection	0 =External gas valve 1 =Alarm 2 =System loading solenoid valve 3 =3-way solar valve 4 =Second heating pump 5 =Alarm2 6 =Burner On 7 =Frost protection activated.	0
b08	Hours without DHW drawn	0-24 hours (time for temporary deactivation of comfort mode without drawing)	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	Not implemented	--	--
b13	Not implemented	--	--
b14	Not implemented	--	--

Contents	Description	Range	Default
b15	Flowmeter type selection	1=Flow. (450 imp/l) 2=Flow. (700 imp/l) 3= Flow (190 imp/l)	3
b16	Not implemented	--	--
b17	Not implemented	--	--
b18	DHW mode activation flow rate	0-100L/min/10	25
b19	DHW mode deactivation flow rate	0-100L/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 type	0 = Manual 5 = Complete manual	0
b28	Not implemented	--	--
b29	Restoring Factory Values	Change the value from 0 to 10 by pressing the "DHW +" button. Confirm by pressing the "heating +" button. (When restoring the Factory Values, the parameter b27 will be automatically set to 5).	0
P30	Heating ramp	10÷80 (ex. 10=20°C/min, 20=12°C/min, 40=6°C/min, 80=3°C/min)	40
P31	Heating standby time	0-10 minutes	4
P32	Heating Post-Circulation	0-255 minutes	15
P33	Pump operation	0 = Continuous pump (active only in winter mode) 1 = Modulating pump	1
P34	Pump modulation DeltaT	0 ÷ 40°C	20
P35	Modulating pump min. speed	30 ÷ 100%	30
P36	Modulating pump start speed	90 ÷ 100%	90
P37	Modulating pump max. speed	90 ÷ 100%	100
P38	Pump deactivation temperature during Post-Circulation	0 ÷ 100°C	55
P39	Pump activation hysteresis temperature during Post-Circulation	0 ÷ 100°C	25
P40	Heating user max. setpoint	20 ÷ 90°C	80



Contents	Description	Range	Default
P41	Max. output in heating	0 ÷ 85%	80
P42	Burner shutdown in DHW	0=Fixed 1=Linked to setpoint 2=Solar	0
P43	Comfort activation temperature	0 ÷ 80°C	40
P44	Comfort 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	Solar off temperature	0 ÷ 100°C	10
P52	Solar on temperature	0 ÷ 100°C	10
P53	Solar standby time	0 ÷ 255 seconds	10
P54	System pre-circulation time	0 ÷ 60 seconds	30
P55	System filling mode	0= Disabled 1=Automatic	0
P56	Minimum system pressure limit value	0-8 bar/10 (Only for boilers with water pressure sensor)	4
P57	System nominal pressure value	5-20 bar/10 (Only for boilers with water pressure sensor)	7
P58	Maximum system pressure limit value	25-35 bar/10 (Only for boilers with water pressure sensor)	28
P59	Not implemented	--	--
P60	Frost protection power	0 ÷ 50% (0 = minimum)	0
P61	Minimum power	0 ÷ 50% (0 = minimum)	0
P62	Fan minimum speed	Modify only when using Ø50 and Ø60 flues (see table 8 and)	76
P63	Fan on speed		200
P64	Fan maximum speed		204

Notes:

1. The Maximum Power parameter can also be modified in Test Mode.

Press the Reset button to return to the Service Menu. Press the Reset button for 10 seconds to exit the card Service Menu, or exiting occurs automatically after 15 minutes.

“In” - Information Menu

12 pieces of information are available.

Press the Heating buttons to scroll the list of information in increasing or decreasing order. Press the DHW buttons to display the value.

Contents	Description	Range
t01	NTC Heating sensor (°C)	0 ÷ 125 °C
t02	NTC Return sensor (°C)	0 ÷ 125 °C
t03	NTC DHW sensor (°C)	0 ÷ 125 °C
t04	NTC External sensor (°C)	+70 ÷ -30°C (negative values flash)
t05	NTC Fume sensor (°C)	0 ÷ 125 °C
F06	Actual fan rpm	00 ÷ 120 x100RPM
L07	Actual burner power (%)	00%=Min., 100%=Max.
F08	Actual DHW drawing (l/min/10)	00 ÷ 99 Lt/min/10
P09	Actual system water pressure (bar/10)	00 = With Pressure switch open, 12 = With Pressure switch closed, 00-99 bar/10 with Pressure transducer
P10	Actual modulating pump speed (%)	00 ÷ 100%
P11	Burner operating hours	00 ÷ 99 x 100 hours
F12	Flame status	-- ÷ 255

Notes:

1. In case of damaged sensor, the card displays hyphens.

Press the Reset button to return to the Service Menu. Press the Reset button for 10 seconds to exit the card Service Menu, or exiting occurs automatically after 15 minutes.

"Hi" - History Menu

The card can store the last 8 faults: the History datum item H1 represents the most recent fault that occurred, whereas the History datum item H08 represents the least recent.

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

Press the Heating buttons to scroll the list of faults in increasing or decreasing order. Press the DHW buttons to display the value.

Press the Reset button to return to the Service Menu. Press the Reset button for 10 seconds to exit the card Service Menu, or exiting occurs automatically after 15 minutes.

"rE" - History Reset

Press the Winter/Summer/Off-On button for 3 seconds to delete all faults stored in the History Menu: the card automatically exits the Service Menu, in order to confirm the operation.

Press the Reset button for 10 seconds to exit the card Service Menu, or exiting occurs automatically after 15 minutes.



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 drawing 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.
- Electrically power the boiler; the display will show the software version number and then Fh and FH air venting cycle (see cap. 1.3 "Connection to the power supply, switching on and off" on page 5).
- At the end of the FH cycle, the winter mode screen (fig. 8) will appear on the display; make the temperature adjustments: heating delivery and DHW outlet (fig. 12 and fig. 13).
- In case of gas change (G20 - G30 - G31 - G230), check if the relevant parameter is suitable for the type of gas present in the supply system (and cap. 3.1 "Adjustments" on page 21).
- Set the boiler to DHW or heating mode (see cap. 1.3 "Connection to the power supply, switching on and off" on page 5).
- Perform a demand in Heating mode: the radiator symbol appears on the display and the actual heating system temperature is displayed.
- DHW mode with drawing of hot water: the tap symbol appears on the display and the actual DHW temperature is displayed.
- Do the combustion check as described in par. "Checking the combustion values" on page 22.

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 **A** (see fig. 28).
2. Pull the panel **B** towards yourself and release it from the upper fastenings.

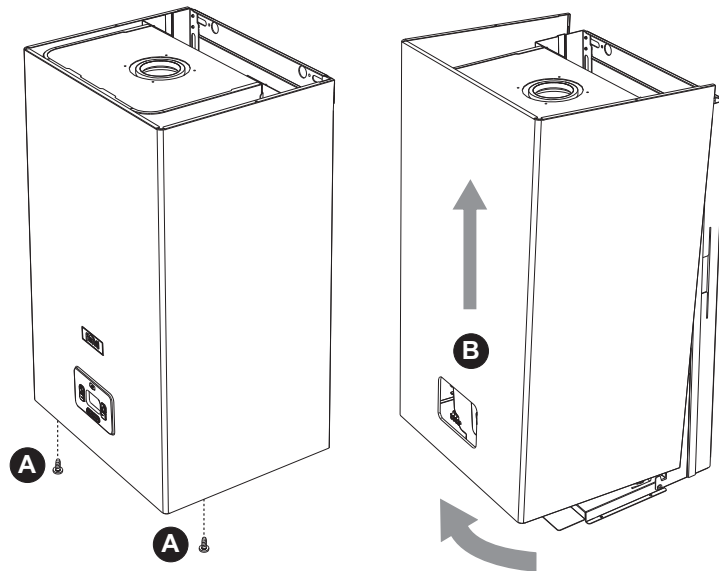


fig. 28- Front panel opening

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 electronic board, it is necessary to carry out **complete manual calibration** (see "Complete manual calibration" on page 22). Then follow the instructions in par. "Checking the combustion values" on page 22.

Gas valve

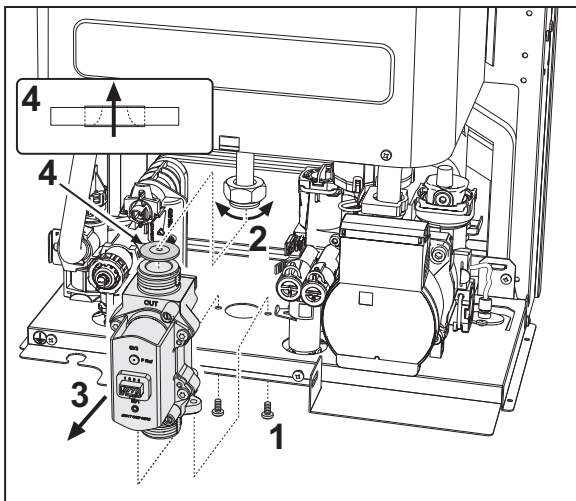


fig. 29- Gas valve replacement

- Disconnect the power supply and turn off the gas cock ahead of the valve.
- Disconnect the electrical connector from the valve.
- Undo the screws "1".
- Disconnect the gas supply pipe "2".
- Remove the gas valve "3" and gas baffle "4".
- Fit the new valve and baffle, carrying out the above steps in reverse order.
- **The gas baffle "4" must comply with the direction indicated in fig. 29.**

Plate heat exchanger



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

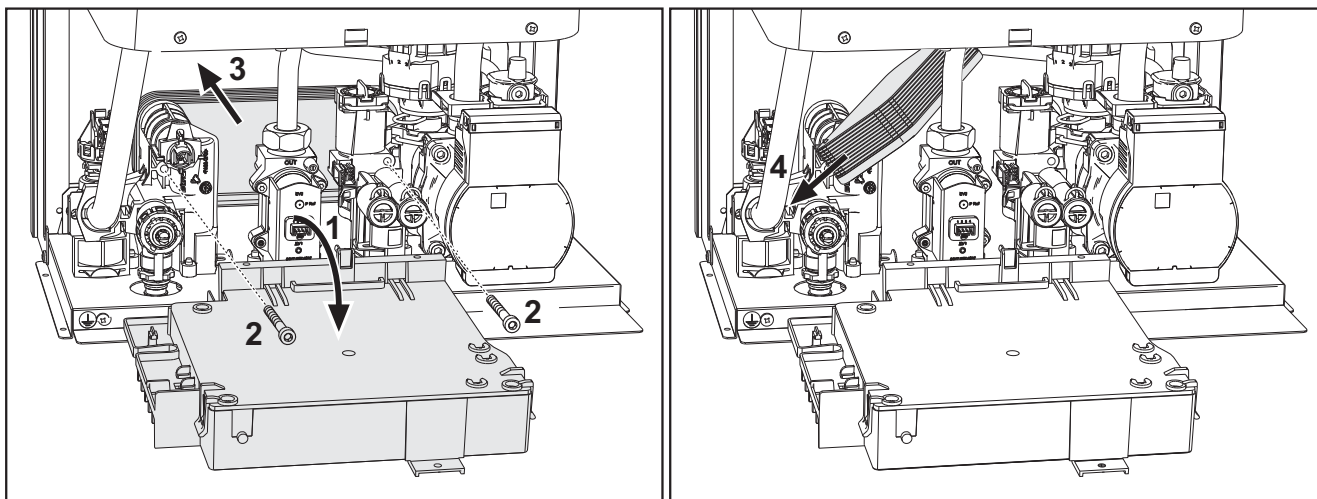


fig. 30- Plate-type exchanger replacement/maintenance

- Isolate the boiler by operating the DHW inlet and system shut-off valves.
- Open a tap to drain the domestic hot water.
- Rotate the box on the panel
- Drain the water in the boiler through the drain cock (see *** 'System draining' on page 9 ***)
- Undo the screws "2"
- Move the plate heat exchanger back and slide it to the left.
- Remove the heat exchanger as shown in the figure
- When refitting the plate heat exchanger, make sure the arrows (indicating: HEATING) are pointing downwards.

Circulating pump



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

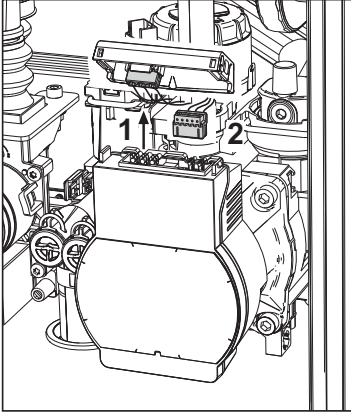


fig. 31

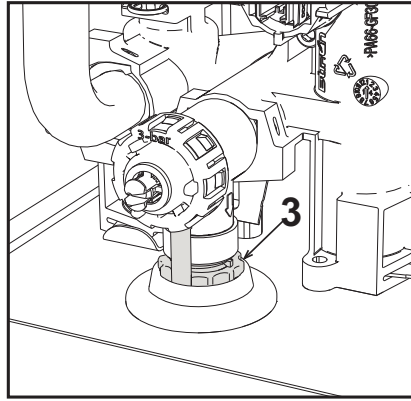


fig. 32

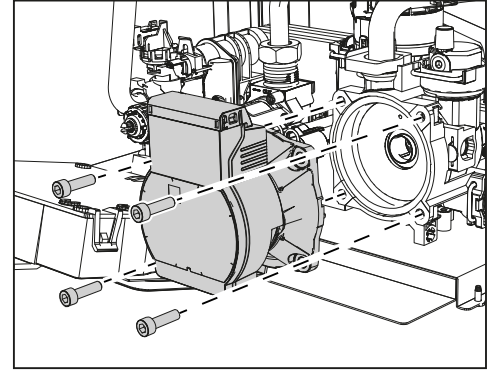


fig. 33

- Disconnect the power supply and turn off the gas cock ahead of the valve.
- Electrically disconnect the circulating pump, releasing the connections by raising detail “1” of fig. 31.
- Drain the water in the boiler (see “System draining” on page 9).
- Unscrew and remove the circulating pump motor assembly (fig. 33)



Replacing the main exchanger



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

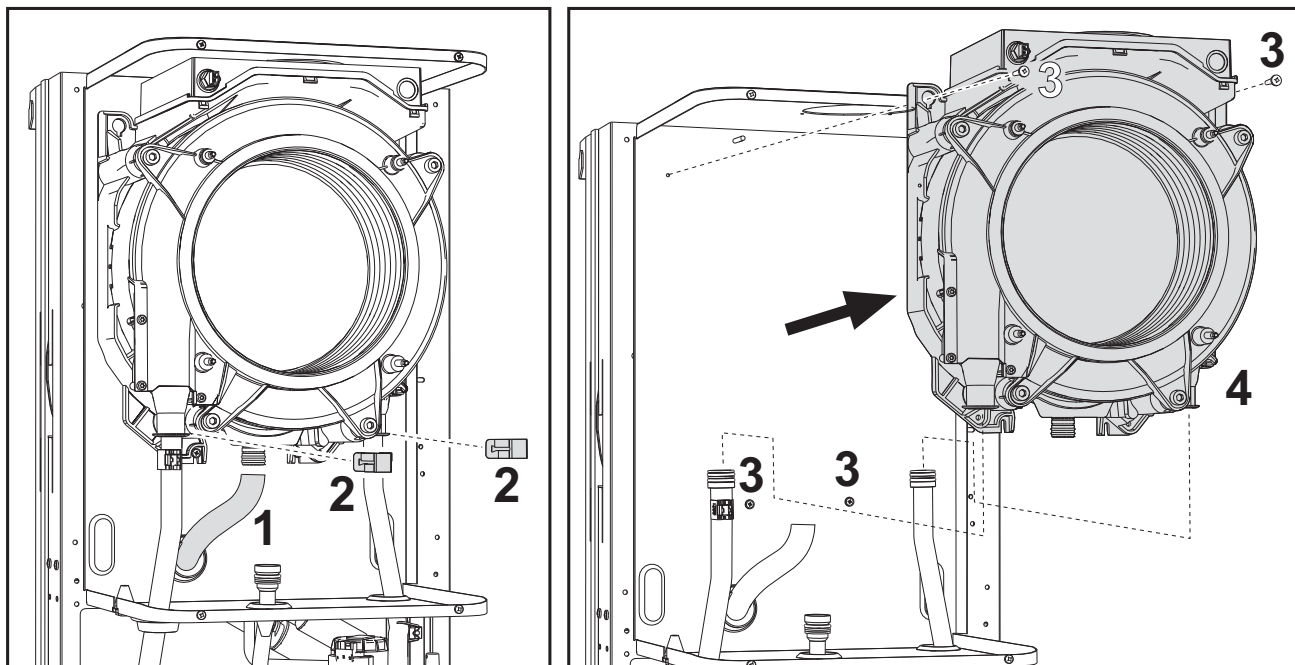


fig. 34- Main exchanger

- Disconnect the power supply and close the gas cock ahead of the valve
- Disconnect the fume sensor connector
- Disconnect the fan connector
- Disconnect the connector of the ignition electrode connected to the board.
- Drain the water from the boiler heating circuit.
- Extract 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
- Remove the 2 top **screws "3"** securing the exchanger to the frame (fig. 34)
- Loosen the 2 bottom **screws "3"** securing the exchanger to the frame (fig. 34)
- Remove the exchanger
- Fit the new exchanger on the bottom **screws "3"**
- For assembly, proceed in reverse order

Disassembling the burner and cleaning the exchanger

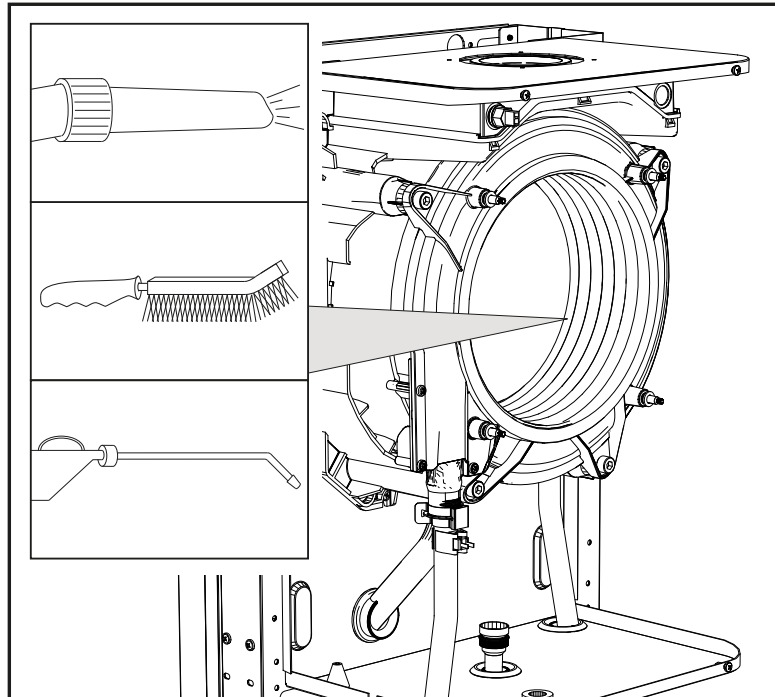
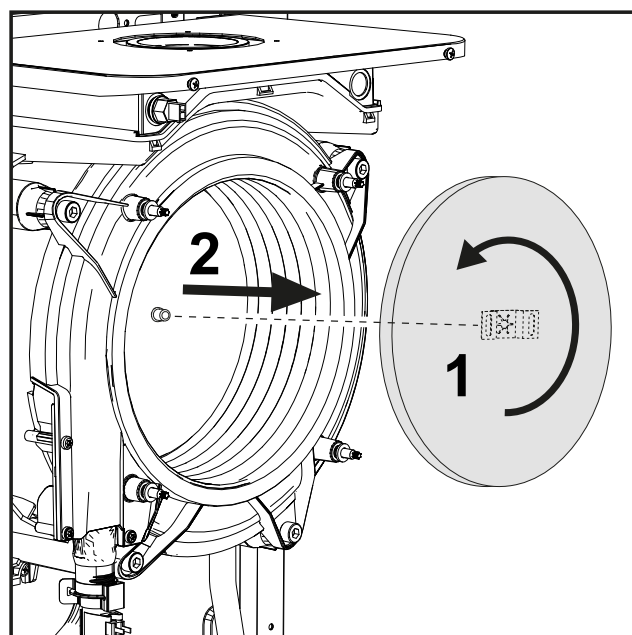


fig. 35

- Disconnect the power supply and turn off the gas cock ahead of the valve.
- Undo the 4 screws securing the exchanger burner group.
- Check the correct distance of the electrodes.
- Clean the inside of the exchanger with the accessories indicated in fig. 35.
Do not use metal brushes which could damage the exchanger.

Exchanger insulation replacement



- Disconnect the power supply and turn off the gas cock ahead of the valve.
- Remove the cover of the heat exchanger and the burner (see fig. 35).
- Rotate the insulating disc "1" and remove it "2".



Fan

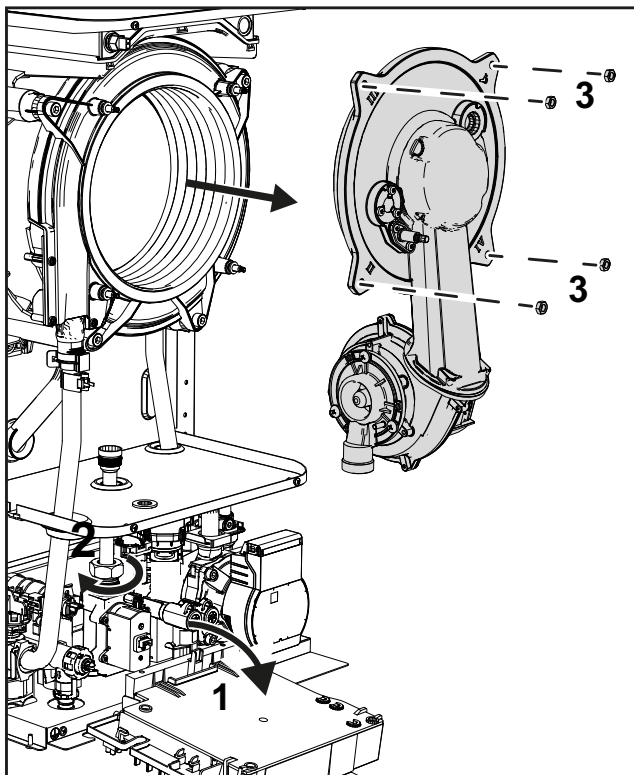


fig. 36

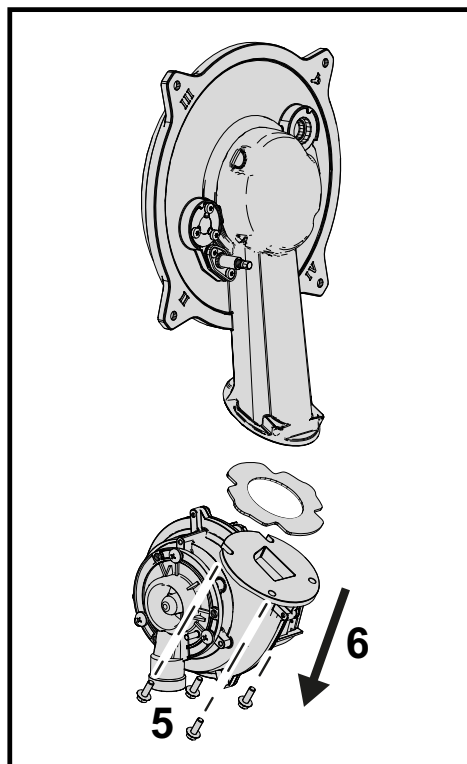


fig. 37

- Disconnect the power supply and turn off the gas cock ahead of the valve.
- Remove the connector from the fan
- Rotate the panel “1” and slacken the gas ring “2”.
- Undo the screws “3” and remove the fan unit.
- Undo the screws “5” to separate the fan “6”.

Replacing the electronic board

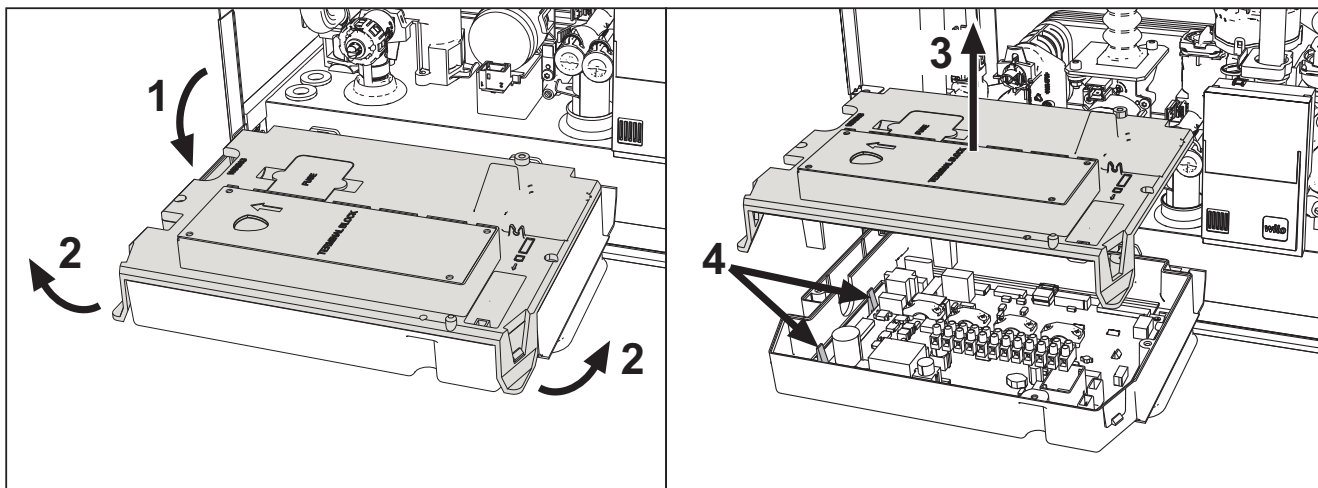


fig. 38

- Disconnect the power supply and turn off the gas cock ahead of the valve.
- After rotating the control panel, lift the cover by operating on the tabs “2”.
- Remove all the electrical connectors
- Lift the board after removing the screw.
- Insert the new board and reconnect the electrical connections.

Replacing the electrode and maintenance

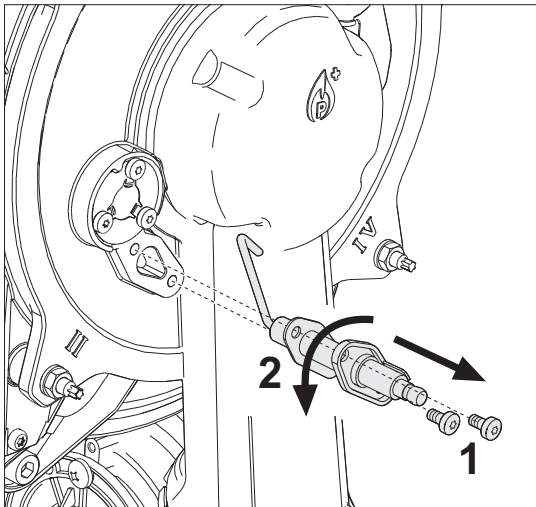


fig. 39

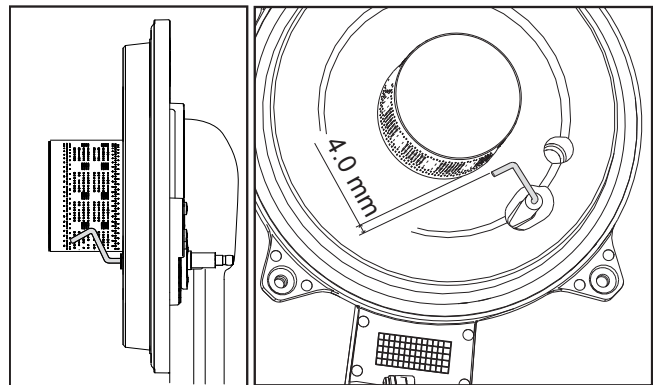


fig. 40

- Disconnect the power supply and turn off the gas cock ahead of the valve.
- Electrically disconnect the electrode and remove it by undoing the screws "1".
- Remove the burner assembly (see fig. 35).
- Clean the electrode (see fig. 35).
- Refit the clean or new electrode and secure it, interposing the gasket "2".
- After fastening, carefully check the distance between the electrodes and burner (see fig. 40).
- Refit and secure the burner assembly (see fig. 35)

Removing the diverter valve



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

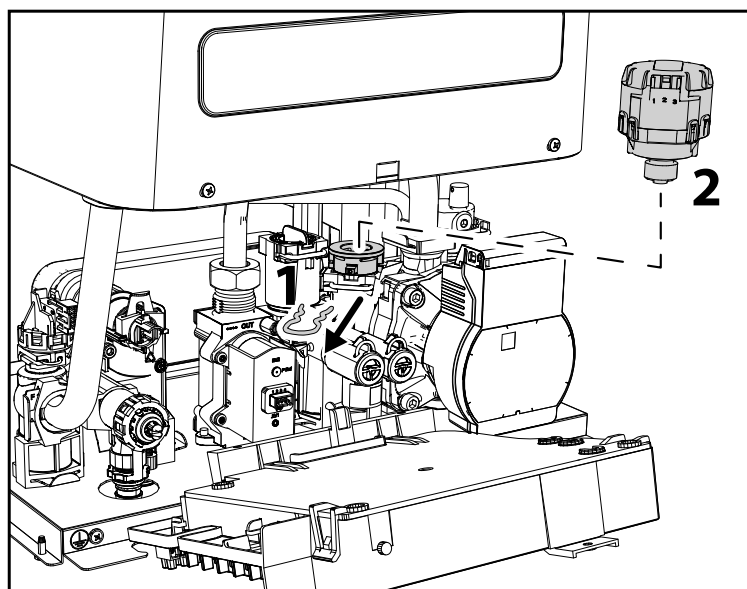



fig. 41

- Disconnect the power supply and turn off the gas cock ahead of the valve.
- Remove the diverter valve connector.
- Remove the clip "1" and remove the diverter valve "2".

Replacing the water pressure switch

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

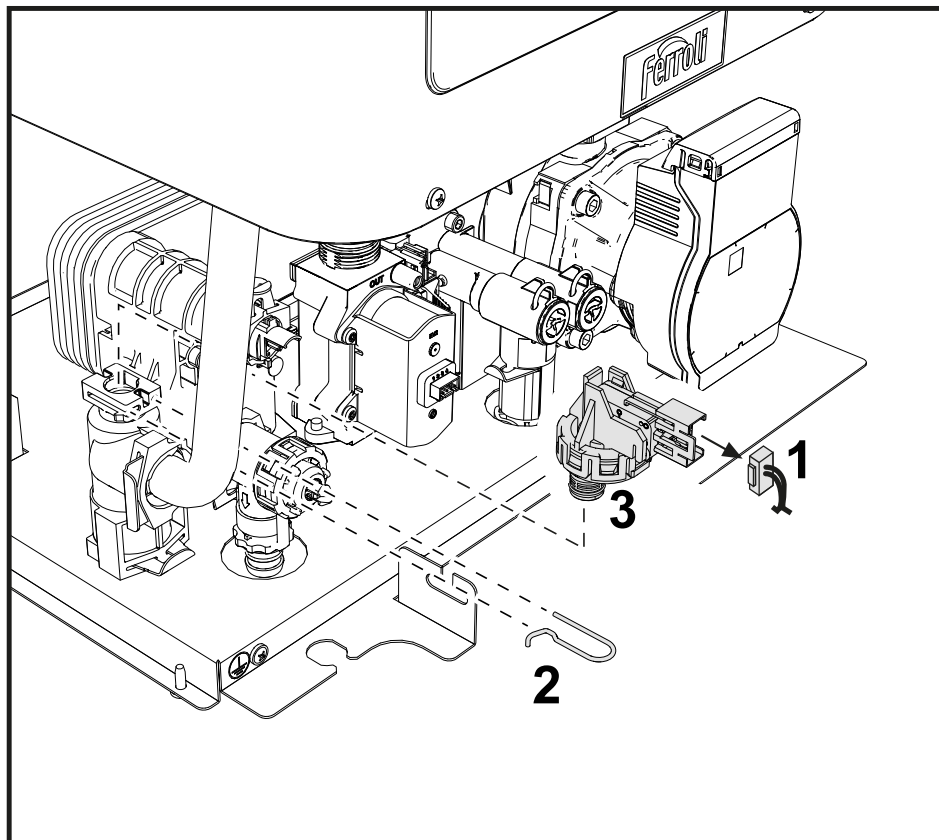


fig. 42

- Disconnect the power supply and turn off the gas cock ahead of the valve.
- Completely drain the water contained in the boiler heating circuit.
- Remove the connector "1" and fastening clip "2".
- Remove the water pressure switch "3".

Cleaning or replacing the flowmeter

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

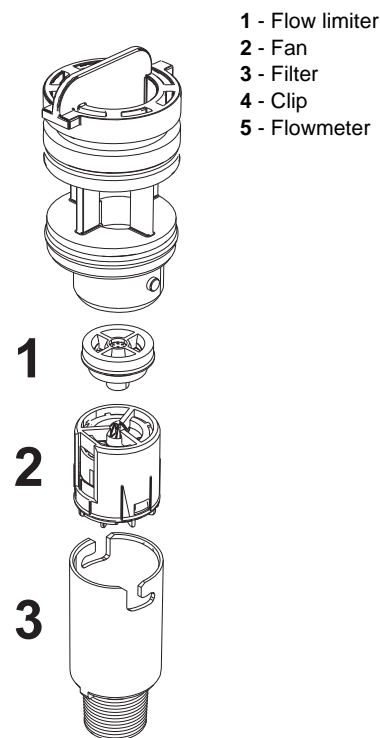
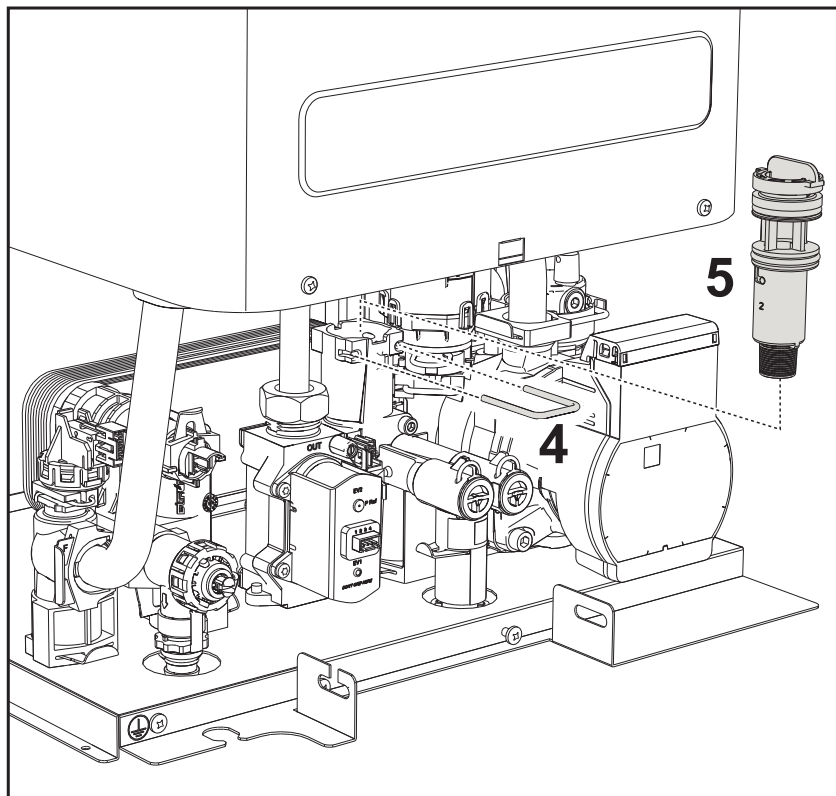


fig. 43- Flowmeter

- Disconnect the power supply and turn off the gas cock ahead of the valve.
- Remove the diverter valve connector
- Close the cold water inlet and turn on the DHW system taps
- Release the fork "4" and remove the flowmeter assembly "5".
- The flowmeter components can thus be cleaned (see fig. 44 and fig. 45) or replaced.

Wash the filter with clean water.

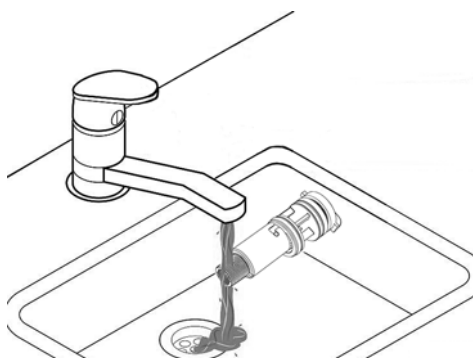


fig. 44

Lubricate the flowmeter gaskets with silicone grease.

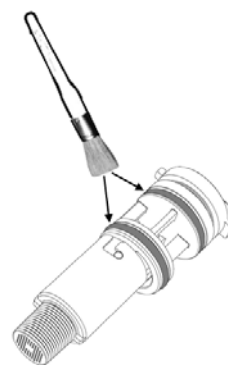


fig. 45

Water inlet filter cleaning

- Disconnect the power supply and turn off 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.

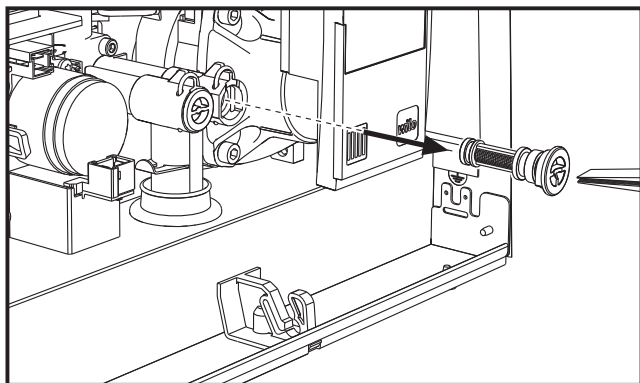


fig. 46

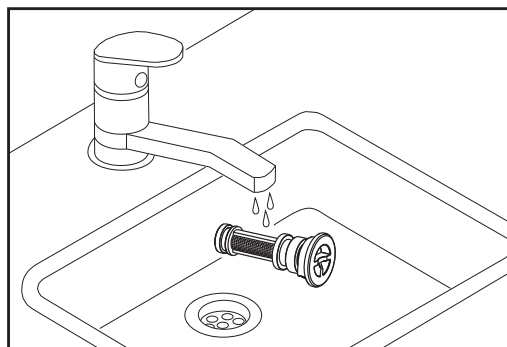


fig. 47

3.4 Troubleshooting

Diagnostics

LCD Off

Make sure the card is powered: using a digital multimeter, check for the presence of supply voltage.

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. 19.

LCD On

In case of operating problems or trouble, the display flashes and the fault identification code appears

There are faults that cause permanent shutdowns (marked with the letter "A"): to restore operation it is sufficient to press the **reset** button (detail 6 - fig. 1) for 1 second or use the RESET on the remote timer control (optional) if installed; if the boiler does not restart, it is necessary to, firstly, eliminate the fault.

Other faults cause temporary shutdowns (marked 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 12- 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 a complete manual calibration.
		Faulty gas valve	Check the gas valve and replace it if necessary

Fault code	Fault	Possible cause	Cure
A02	Flame present signal with burner off	Electrode fault	Check the ionization electrode wiring
			Check the condition of the electrode
			Electrode to earth
			Cable to earth
		Check the trap and clean it if necessary	
		Card fault	Check the card
F05	Fan fault	No 230V power supply	Check the 5-pin connector wiring
		Tachometric signal interrupted	
		Fan damaged	Check the fan
A06	No flame after the ignition phase	Ionization electrode fault	Check the position of the ionisation electrode and replace it 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 a complete manual calibration.
F15 - A07	High fume temperature	The fume probe detects an excessive temperature	Check the exchanger
			Check the flue gas probe
			Check the flue material parameter
A08	Overtemperature protection intervention	Sensor not correctly positioned on flow pipe or damaged	Check the correct positioning and operation of the heating sensor and replace it if necessary
		No water circulation in the system	Check the circulating pump
		Air in the system	Vent the system
A09	Exchanger protection activation	No water circulation in the system	Check the circulating pump
		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
		Air in the system	Vent the system
F10	Delivery sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
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 F07
F34	Supply voltage under 180V	Electric mains trouble	Check the electrical system
F35	Wrong supply frequency	Electric mains trouble	Check the electrical system



Fault code	Fault	Possible cause	Cure
A23-A24-A26-F20 F21-F40-F47-F51	Water pressure switch fault	Wrongly configured parameter	Check if parameter b04 is configured correctly (default 0=pressure switch)
		System pressure problems (transducer)	System pressure value outside set limits (transducer)
		b06 set to 3	
F37	Incorrect system water pressure	Pressure too low	Fill the system
		Water pressure switch damaged or disconnected	Check the water pressure switch
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
F19	Card parameter fault	Wrong card parameter setting	Check the card parameters and modify if necessary. TSP15
F50 - F53	Limit thermostat fault with parameter b06 = 1 o 4	No/poor water circulation in the system	Check the circulating pump
		Air in the system	Vent the system
		Incorrect parameter	Check the correct parameter setting
A64	Maximum number of consecutive Resets exceeded	Maximum number of consecutive Resets exceeded	Turn off the power to the boiler for 60 seconds and then reinstate the boiler
F62	Calibration required	New card or boiler not yet calibrated	Perform calibration
A88	Specific combustion control errors or gas valve	Combustion problem, gas valve failure or electronic board	Perform calibration or replace the gas valve. Replace the electronic board if necessary.
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 a manual calibration to adjust the CO ₂ . If necessary, do a complete manual calibration. If the problem persists, replace the electronic board.
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 a manual calibration to adjust the CO ₂ . If necessary, do a complete manual calibration. If the problem persists, replace the electronic board.
A98	Too many SW errors or error occurred during board replacement	Board Replacement	Reset the fault and proceed with complete manual calibration.
		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 a complete manual calibration and, if necessary, replace the electronic board.
A99	Generic error	Electronic board hardware or software error	Reset the fault and check for correct ignition. Do a complete manual calibration and, if necessary, replace the electronic board.
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.
A44	Multiple requests error	Repeated short-term requests	Check if there are pressure peaks in the DHW circuit. If necessary, modify parameter b11.
A80	Parasite flame signal after valve closing	Electrode problem. Gas valve problem. Electronic board problem.	Check the correct position and condition of the electrode. Check the electronic board. Check the gas valve and replace it if necessary.

4. Technical data and characteristics

4.1 Dimensions and connections

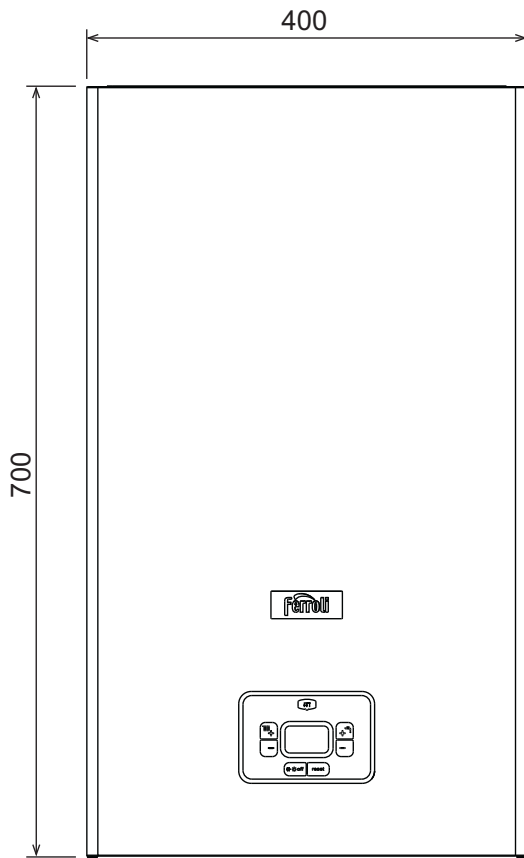


fig. 48- Front view

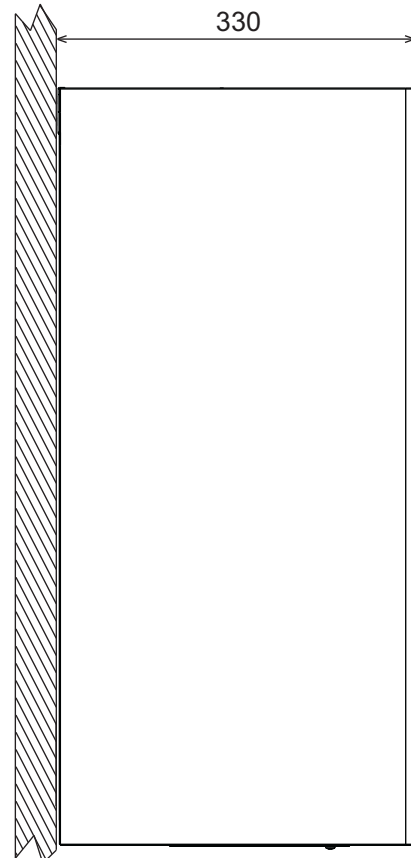


fig. 49- Side view

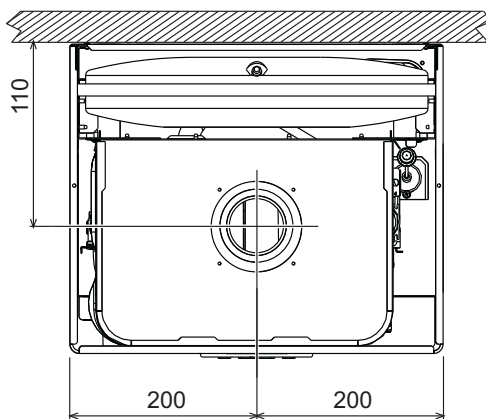


fig. 50- Top view

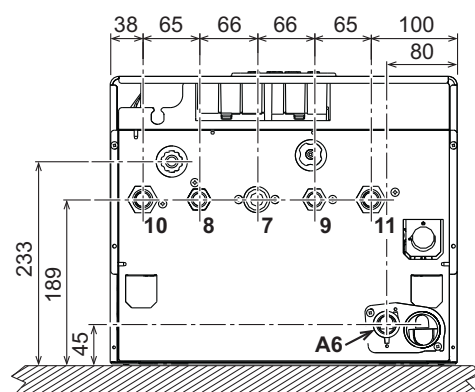
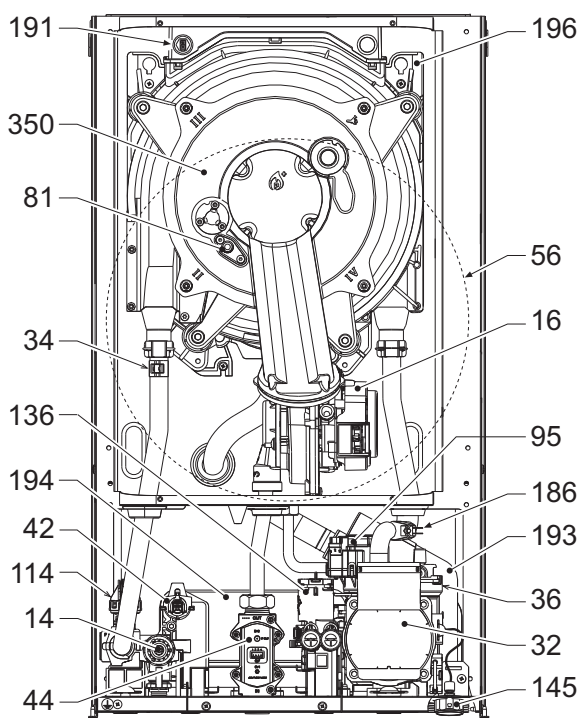


fig. 51- Bottom view

- 7 Gas inlet - Ø 3/4"
- 8 DHW outlet - Ø 1/2"
- 9 Cold water inlet - Ø 1/2"
- 10 System delivery - Ø 3/4"
- 11 System return - Ø 3/4"
- A6 Condensate discharge connection



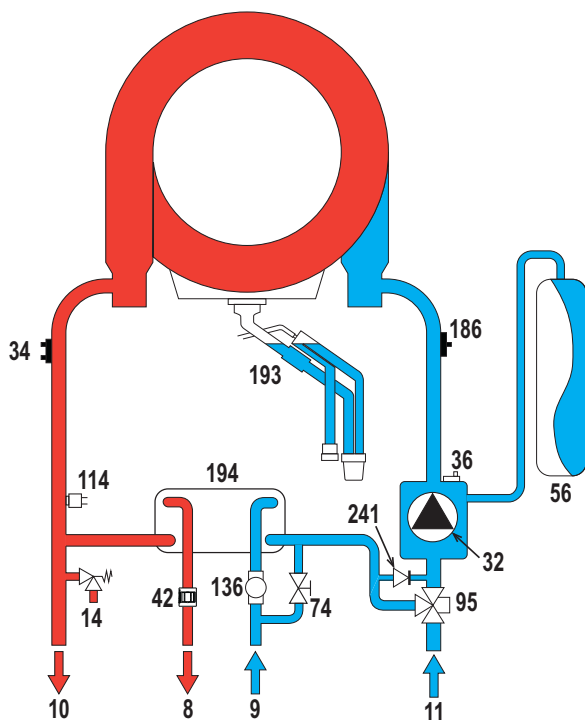
4.2 General view



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

fig. 52- General view

4.3 Hydraulic circuit



- 8 DHW outlet
- 9 Cold water inlet
- 10 System delivery
- 11 System return
- 14 Safety valve
- 32 Heating circulating pump
- 34 Heating temperature sensor
- 36 Automatic air vent
- 42 DHW temperature probe
- 56 Expansion vessel
- 74 System filling cock
- 95 Diverter valve
- 114 Water pressure switch
- 136 Flow meter
- 186 Return sensor
- 193 Trap
- 194 DHW exchanger
- 241 Automatic bypass (inside the pump unit)

fig. 53- Hydraulic circuit

4.4 Technical data table

Table 13- Technical data table

Data	Unit	BLUEHELIX PRIMA 24 C	
PRODUCT IDENTIFICATION CODES		0TPB2AWA	
COUNTRIES OF DESTINATION		--	
GAS CATEGORY		--	
Max. heating capacity	kW	20.6	Q
Min. heating capacity	kW	4.2	Q
Max. Heat Output in heating (80/60°C)	kW	20.0	P
Min. Heat Output in heating (80/60°C)	kW	4.1	P
Max. Heat Output in heating (50/30°C)	kW	21.8	
Min. Heat Output in heating (50/30°C)	kW	4.5	
Max. heating capacity in DHW	kW	25.0	
Min. heating capacity in DHW	kW	4.2	
Max. Heat Output in DHW	kW	24.3	
Min. Heat Output in DHW	kW	4.1	
Efficiency Pmax (80-60°C)	%	97.1	
Efficiency Pmin (80-60°C)	%	97.0	
Efficiency Pmax (50-30°C)	%	105.8	
Efficiency Pmin (50-30°C)	%	106.9	
Efficiency 30%	%	108.8	
Gas supply pressure G20	mbar	20	
Max. gas flow G20	m ³ /h	2.65	
Min. gas flow G20	m ³ /h	0.44	
CO ₂ - G20	%	9 ±0.8	
Gas supply pressure G31	mbar	37	
Max. gas flow G31	kg/h	1.94	
Min. gas flow G31	kg/h	0.33	
CO ₂ - G31	%	10 ±0.8	
NOx emissions class	-	6	NOx
Max. working pressure in heating	bar	3	TDC
Min. working pressure in heating	bar	0.8	
Heating adjustment max. temperature	°C	95	tmax
Heating water content	liters	2.9	
Heating expansion vessel capacity	liters	8	
Heating expansion vessel precharge pressure	bar	0.8	
Max. working pressure in DHW	bar	9	PMW
Min. working pressure in DHW	bar	0.3	
DHW flow rate Dt 25°C	l/min	14.0	
DHW flow rate Dt 30°C	l/min	11.7	D
Protection rating	IP	IPX4D	
Power supply voltage	V/Hz	230V/50Hz	
Electrical power input	W	73	
Empty weight	kg	25	
Type of unit		C13-C23-C33-C43-C53 C63-C83-B23-B33	



ErP product fiche

MODEL: BLUEHELIX PRIMA 24C - (0TPB2AWA)

Trademark: FERROLI			
Condensing boiler: YES			
Low-temperature boiler (**): YES			
B1 Boiler: NO			
Combination heater: YES			
Cogeneration space heater: NO			
Item	Symbol	Unit	Value
Seasonal space heating energy efficiency class (from A+++ to D)			
Seasonal space heating energy efficiency class (from A+++ to D)			A
Rated heat output	Pn	kW	20
Seasonal space heating energy efficiency	η_s	%	93
Useful heat output			
Useful heat output at rated heat output and high-temperature regime (*)	P4	kW	20,0
Useful heat output at 30% of rated heat output and low-temperature regime (**)	P1	kW	4,1
Useful efficiency			
Useful efficiency at rated heat output and high-temperature regime (*)	η_4	%	87,5
Useful efficiency at 30% of rated heat output and low-temperature regime (**)	η_1	%	98,0
Auxiliary electricity consumption			
At full load	elmax	kW	0,031
At part load	elmin	kW	0,011
In standby mode	PSB	kW	0,003
Other items			
Standby heat loss	Pstby	kW	0,041
Ignition burner power consumption	Pign	kW	0,000
Annual energy consumption	QHE	GJ	37
Sound power level	LWA	dB	50
Emissions of nitrogen oxides	NOx	mg/kWh	38
For combination heaters			
Declared load profile			XL
Water heating energy efficiency class (from A+ to F)			A
Daily electricity consumption	Qelec	kWh	0,167
Annual electricity consumption	AEC	kWh	36
Water heating energy efficiency	η_{wh}	%	85
Daily fuel consumption	Qfuel	kWh	22,869
Annual fuel consumption	AFC	GJ	19

(*) 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 PRIMA 24 C

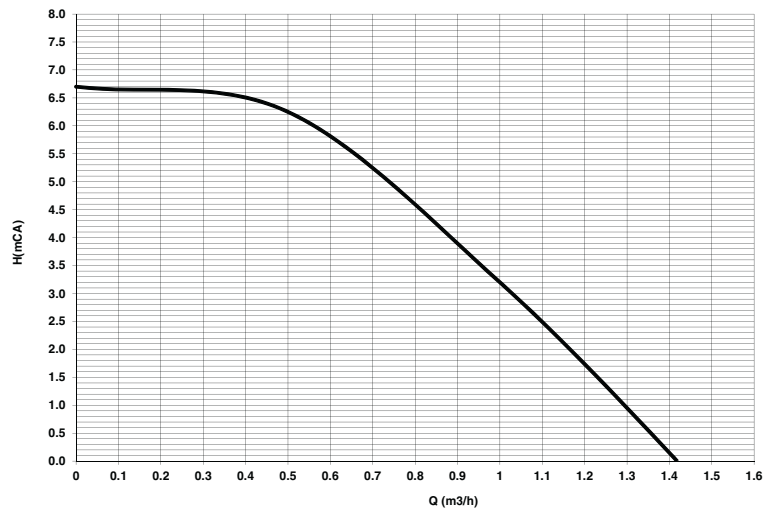


fig. 54- Residual head available for system



4.6 Wiring diagram

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

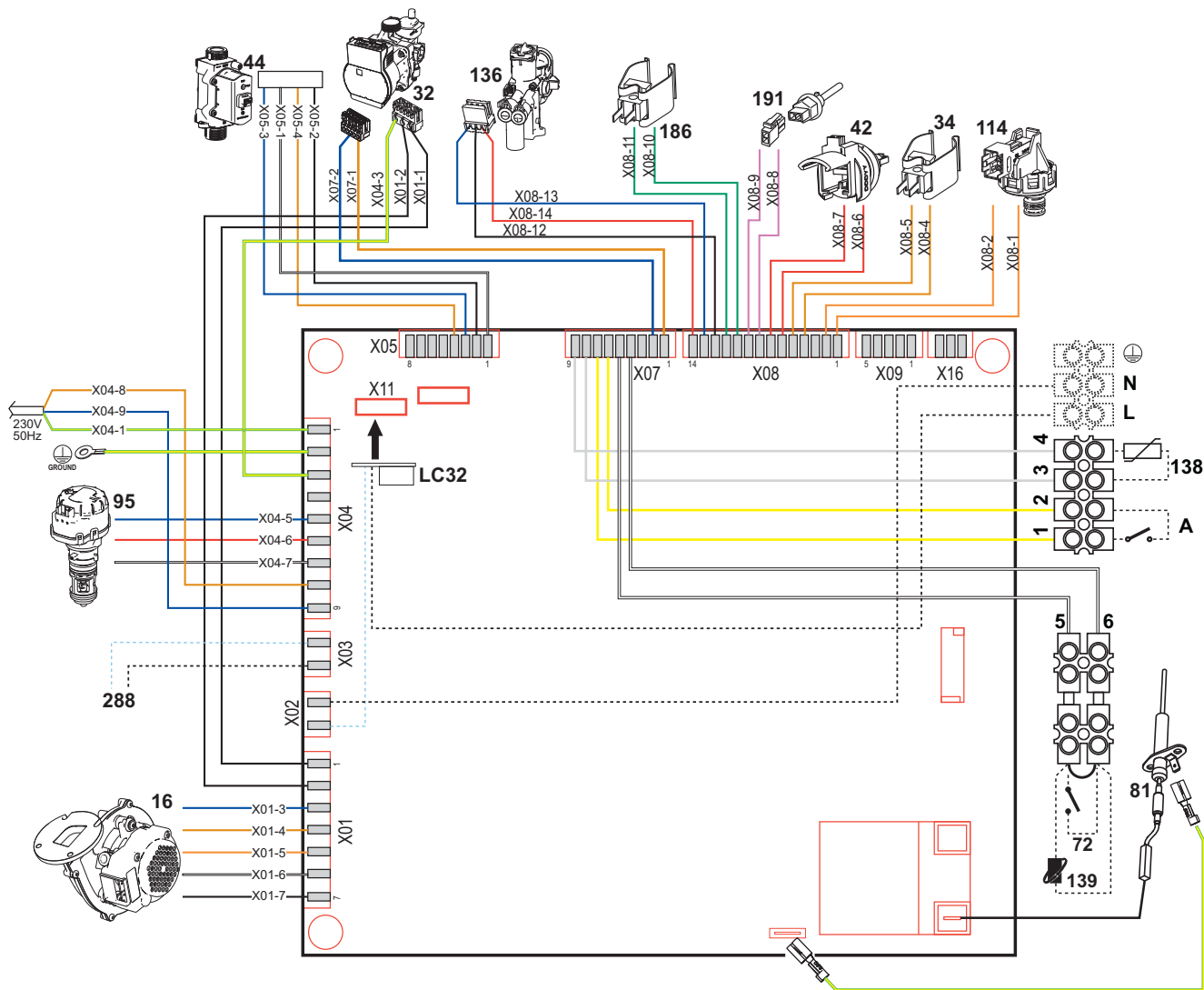


fig. 55- Wiring diagram

Attention: Remove the jumper on the terminal block before connecting the **room thermostat** or the **remote timer control**.

To connect multiple zones of the plumbing system controlled by thermostats with voltage-free contact and there is a need to use the timer control as a function of remote boiler controls, it is necessary to connect the voltage-free contacts of the zones 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).

The logo for Ferroli features the word "ferroli" in a bold, lowercase, sans-serif font. A grey, curved graphic element arches over the top of the letters "e" and "r".

ferroli

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