

QUADRIFOGLIO B



CE

IT - ISTRUZIONE PER L'USO L'INSTALLAZIONE E LA MANUTENZIONE

ES - INSTRUCCIONES DE USO, INSTALACIÓN Y MANTENIMIENTO

TR - KULLANMA, KURULUM VE BAKIM TALIMATLARI

EN - INSTRUCTIONS FOR USE, INSTALLATION AND MAINTENANCE

FR - INSTRUCTIONS D'UTILISATION, D'INSTALLATION ET D'ENTRETIEN

RU - РУКОВОДСТВО ПО ЭКСПЛУАТАЦИИ, МОНТАЖУ И ТЕХОБСЛУЖИВАНИЮ

UA - ІНСТРУКЦІЯ З ЕКСПЛУАТАЦІЇ, МОНТАЖУ ТА ОБСЛУГОВУВАННЯ

2.2 Control panel

1. GENERAL WARNINGS

- Carefully read and follow the instructions contained in this instruction booklet.
- After boiler installation, inform the user regarding its operation and give him this manual, which is an integral and essential part of the product and must be kept with care for future reference.
- Installation and maintenance must be carried out by professionally qualified personnel, in compliance with the current regulations and according to the manufacturer's instructions. Do not carry out any operation on the sealed control parts.
- Incorrect installation or inadequate maintenance can result in damage or injury. The Manufacturer declines any liability for damage due to errors in installation and use, or failure to follow the instructions.
- Before carrying out any cleaning or maintenance operation, disconnect the unit from the electrical power supply using the 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 original replacement parts. Failure to comply with the above could affect the safety of the unit.
- This unit must only be used for its intended purpose. Any other use is deemed improper and therefore hazardous.
- The packing materials are potentially hazardous and must not be left within the reach of children.
- The unit must not be used by people (including children) with limited physical, sensory or mental abilities or without experience and knowledge of it, unless instructed or supervised in its use by someone responsible for their safety.
- The unit and its accessories must be appropriately disposed of, in compliance with the 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.

2. OPERATING INSTRUCTIONS

2.1 Introduction

Dear Customer,

Thank you for choosing **QUADRIFOGLIO B**, a floor-standing boiler **FERROLI** featuring advanced design, cutting-edge technology, high reliability and quality construction. Please read this manual carefully since it provides important information on safe installation, use and maintenance.

QUADRIFOGLIO B is a high efficiency, low emissions **premix condensing** heat generator for heating, running on natural gas or LPG and equipped with a microprocessor control system.

The **boiler body** consists of a patented stainless-steel helical tube heat exchanger and a **premix burner** in stainless steel, equipped with electronic ignition with ionisation flame control, modulating speed fan and modulating gas valve. **QUADRIFOGLIO B** is a heat generator arranged to operate alone or in cascade.

FERROLI supplies (on request) all the plumbing fittings and fume manifolds for the connection of 2 or 3 units in cascade in configurations of 70 + 70 kW to 320 + 320 + 320 kW.

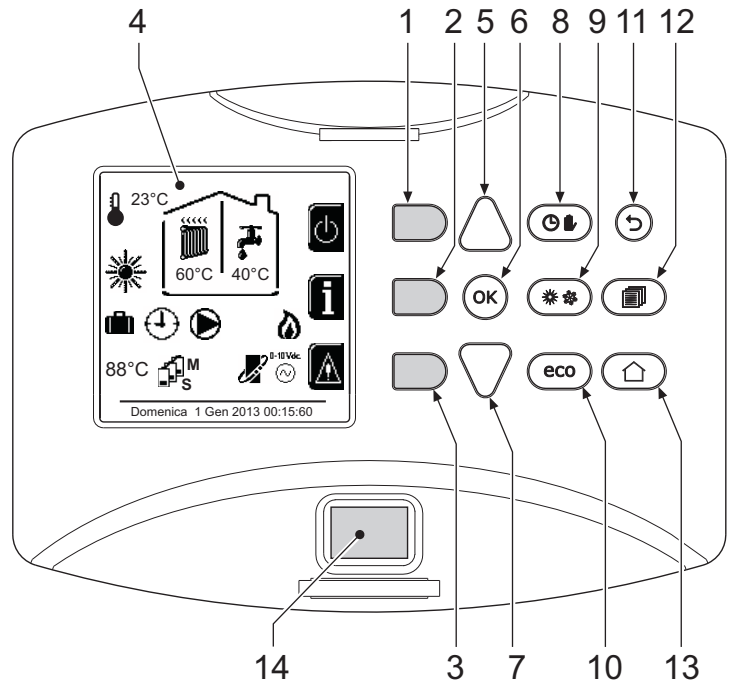


fig. 1 - Control panel

Legend

- 1 = Contextual button 1
- 2 = Contextual button 2
- 3 = Contextual button 3
- 4 = Dot matrix display (example main screen)
- 5 = Menu navigation button
- 6 = Confirm/menu access button
- 7 = Menu navigation button
- 8 = Automatic/Manual Heating/DHW button
- 9 = Summer/Winter mode selection button
- 10 = Economy/Comfort mode selection button
- 11 = Menu exit button
- 12 = Main menu button
- 13 = Home button (back to main screen)
- 14 = Main switch

Contextual button

The contextual buttons (details 1, 2, 3 - fig. 1) are grey, with no screen print, and take on a different meaning depending on the menu selected. It is essential to observe the indication provided by the display (icons and text). In fig. 1 for example, using the contextual button 2 (detail 2 - fig. 1) it is possible access unit information such as: temperature of sensors, work power, etc.

Direct buttons

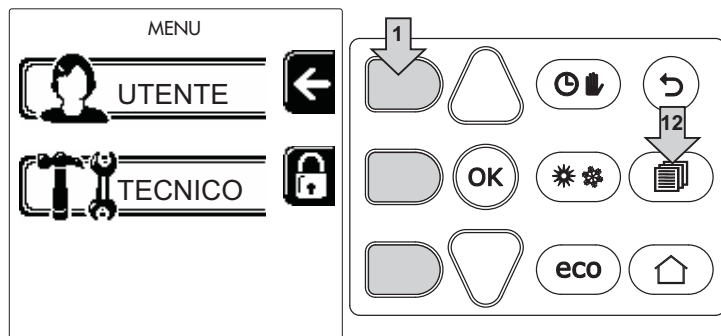
The direct buttons (details 8, 9, 10 - fig. 1) always have the same function.

Menu/navigation buttons

The menu/navigation buttons (details 5, 6, 7, 11, 12, 13 - fig. 1) are used to navigate among the various menus implemented in the control panel.

Menu structure

From the main screen (Home), press the Main menu button (detail 12 - fig. 1).



Access the "User" menu by pressing the contextual button 1 (detail 1 - fig. 1). Then use the "menu/navigation" buttons to access the various levels described in the following table.

USER MENU				
HEATING				
	Adjustment Temp		See fig. 12	
	Reduction Adjustment Temp		See fig. 13	
	Sliding Temperature	Curve1		See fig. 26
		Offset1		See fig. 27
		Outside Temp Heat Off		See page 84
		Curve2		/
		Offset2		/
Time Program	See "Time programming" on page 82			
DOMESTIC HOT WATER				
	Adjustment Temp		See fig. 14	
	Reduction Adjustment Temp		See fig. 15	
	Legionella	See "Legionella programming (with optional hot water tank installed)" on page 84		
	Time Program	See "Time programming" on page 82		
HOLIDAY FUNCTION				
	See "Holiday Function" on page 84			
MAINTENANCE				
	Test mode	Test mode	See fig. 63	
		Gas Type Selection	See fig. 58	
		Cascade Test Mode	See "CASCADE TEST mode activation" on page 95	
	Service Information	See "Service Information" on page 84		
	Service Intervention Date	See "Service Intervention Date" on page 84		
SETTINGS				
	Language		See fig. 7	
	Unit of Measure		/	
	Set Date		See fig. 8	
	Set Time		See fig. 9	

Indication during operation

Heating

A heating demand (generated by the Room Thermostat, Remote Timer Control or 0-10 Vdc signal) is indicated by activation of the circulating pump and by the hot air above the radiator (fig. 2).

Configuration "Heating only/Double circulating pump"

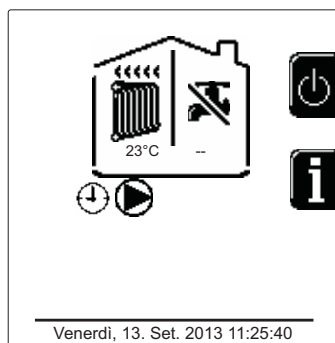


fig. 2

Configuration "Circulating pump and 3-way valve"

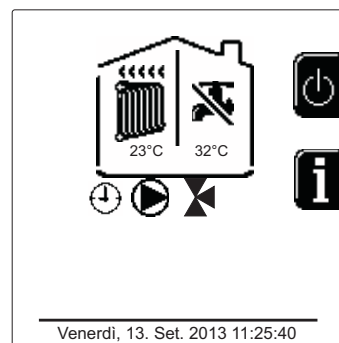


fig. 3

DHW (with optional hot water tank installed)

A hot water tank heating demand is indicated by activation of the drop under the tap (fig. 4 and fig. 5).

Configuration "Double circulating pump"

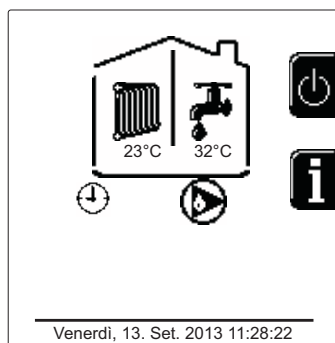


fig. 4

Configuration "Circulating pump and 3-way valve"

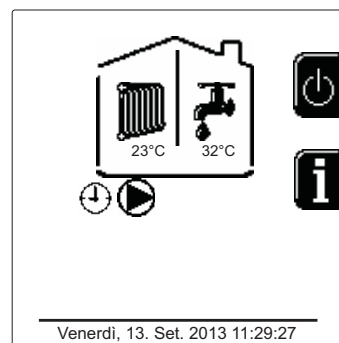


fig. 5

Exclude hot water tank (economy)

Hot water tank temperature maintaining/heating can be excluded by the user. In case of exclusion, there will be no delivery of domestic hot water. The hot water tank can be deactivated by the user (ECO mode) by pressing the **eco/comfort button** (detail 10 - fig. 1). In ECO mode, the display activates the symbol . To activate the COMFORT mode, press the **eco/comfort button** (detail 10 - fig. 1) again.



fig. 6 - Economy

Information

From the main screen (Home), press the contextual button 2 (detail 2 - fig. 1). Then use the "Menu Navigation" buttons to display the following values:

Heating demand	OT means OpenTherm control demand
	TA means room thermostat demand
	0-10Vdc means 0-10Vdc signal demand
	TA2 means second room thermostat demand
Heating circulating pump	ON/OFF
Heating 3-way valve	ON/OFF
DHW 3-way valve	ON/OFF
Standby time	ON/OFF
T Delta protection	ON/OFF
Flame Supervisor	ON/OFF
Heating sensor1	°C
Heating sensor2	°C
Return sensor	°C
DHW sensor	°C
External probe	°C
Fume sensor	°C
Cascade heating sensor	°C
Fan frequency	Hz
Burner load	%
System water pressure	1.4bar = ON, 0.0 bar = OFF
Modulating circulating pump	%
Cascade modulating circulating pump	%
Ionisation current	uA
Input 0-10Vdc	Vdc
Heating adjustment temperature	Setpoint (°C)
Power level adjustment 0-10Vdc	Setpoint (%)

2.3 Lighting and shutdown

Boiler lighting

Press the On/Off button (detail 14 - fig. 1).

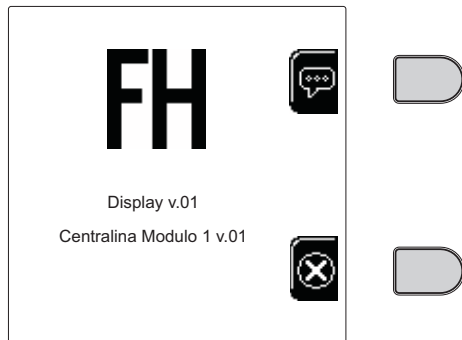


fig. 7 - Boiler lighting

Press the contextual button 1 to select the language, confirming it by pressing "OK".

Press the contextual button 3 to stop FH mode.

If none of the two selections described above is made, proceed as follows.

- For the following 300 seconds the display will show FH which identifies the heating system air venting cycle.
- The display also shows the firmware version of the cards.
- Open the gas cock ahead of the boiler.
- When the message FH disappears, the boiler is ready to operate automatically in case of a room thermostat demand.

Settings

Contrast adjustment

To adjust the display contrast, press the **contextual button 2** and the **OK button together**. Then press the button ref. 5 of fig. 1 to increase the contrast or the button ref. 7 of fig. 1 to decrease it.

Setting the Date and Time

Reach the screen shown in fig. 8, navigating in the menu and following the path "USER MENU" → "Settings" → "Date Setting". Press the navigation buttons 5 and 7 to select the value and modify it with the contextual buttons 1 and 2. Confirm with the OK button.

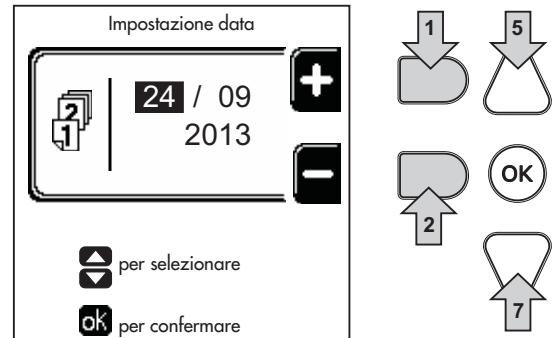


fig. 8 - Setting the Date

Reach the screen shown in fig. 9, navigating in the menu and following the path "USER MENU" → "Settings" → "Time Setting". Press the navigation buttons 5 and 7 to select the value and modify it with the contextual buttons 1 and 2. Confirm with the OK button.

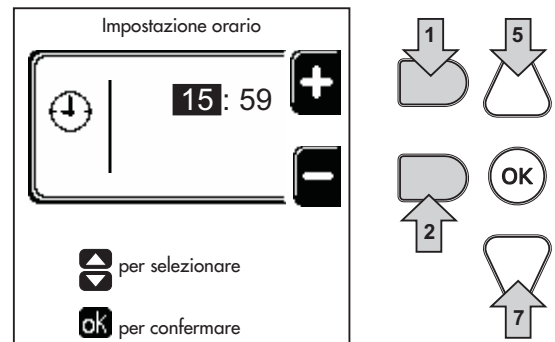


fig. 9 - Setting the Time

Boiler shutdown

From the main screen/Home, press the contextual button and confirm with the button .

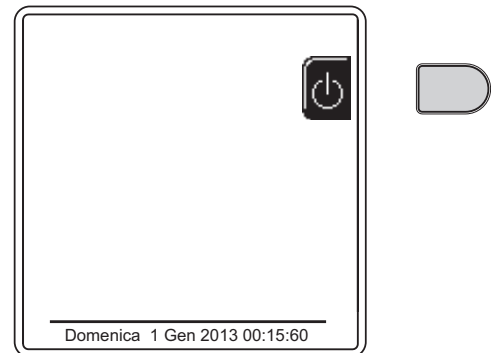


fig. 10 - Boiler shutdown

When the boiler is shut down, the PCB is still powered.

DHW mode (with optional hot water tank installed) and heating mode are disabled. The frost protection system remains activated.

To relight the boiler, press the contextual button again .

The boiler will be immediately ready to operate whenever domestic hot water is drawn (with optional hot water tank installed) or when there is a room thermostat demand.

To completely disconnect the power supply to the unit, press the button detail 14 fig. 1.

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. 3.3.

2.4 Adjustments

Summer/Winter Switchover

Press the button (detail 9 - fig. 1) for 1 second.

The display activates the symbol **Summer**. The heating function is deactivated, whereas the possible production of domestic hot water (with optional external hot water tank) remains activated. The frost protection system remains activated.

To deactivate Summer mode, press the button (detail 9 - fig. 1) again for 1 second.

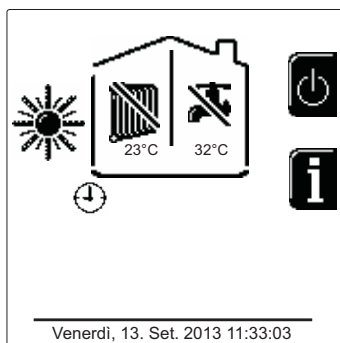


fig. 11 - Summer

Heating temperature adjustment

Access the menu "Adjustment Temp" to vary the temperature from a minimum of 20°C to a maximum of 80°C. Confirm with the OK button.

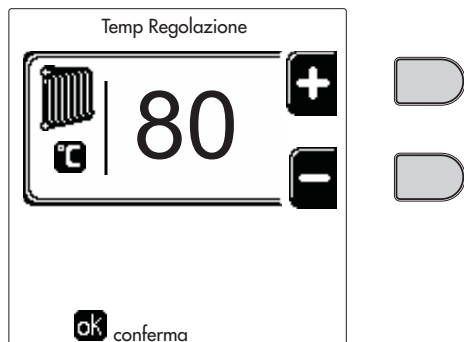


fig. 12

The boiler is sold with time program not activated. Therefore, if requested, this is the setpoint value.

Heating temperature reduction

Access the menu "Reduction Adjustment Temp" to vary the temperature from a minimum of 0°C to a maximum of 50°. Confirm with the OK button.



fig. 13

This parameter is used only if time programming is activated. See *** 'Time programming' on page 82 ***

DHW temperature reduction adjustment (with optional hot water tank installed)

Access the menu "Adjustment Temp" to vary the temperature from a minimum of 10°C to a maximum of 65°C. Confirm with the OK button.

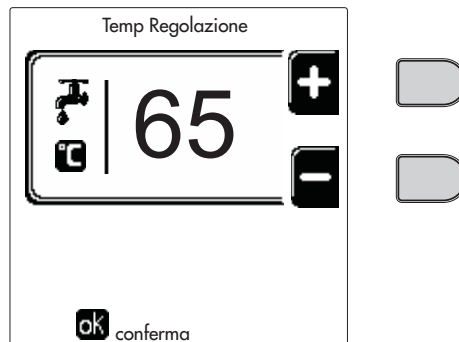


fig. 14

The boiler is sold with time program not activated. Therefore, if requested, this is the setpoint value.

DHW temperature reduction (with optional hot water tank installed)

Access the menu "Reduction Adjustment Temp" to vary the temperature from a minimum of 0°C to a maximum of 50°C. Confirm with the OK button.



fig. 15

This parameter is used only if time programming is activated. See *** 'Time programming' on page 82 ***

Time programming

Programming the time is done in the same way both for heating and for DHW; the two programs are independent.

To program **Heating** access the "Time Program" menu following the path "USER MENU → "HEATING" → "Time Program".

To program **Domestic hot water (DHW)** access the "Time Program" menu following the path "USER MENU → "DOMESTIC HOT WATER" → "Time Program".

Choose the desired type of programming and follow the instructions given below.

Select the day (fig. 16) or the interval of days to be programmed (fig. 17) and confirm with the **OK button**.

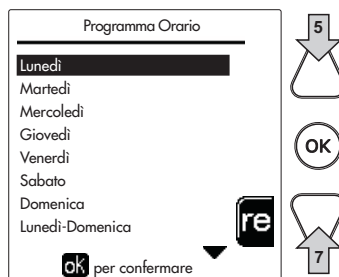


fig. 16

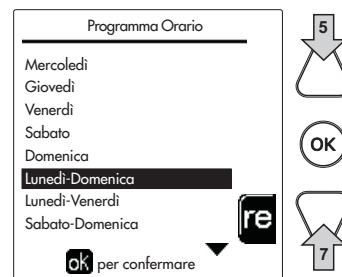


fig. 17

The program is weekly, which means that 6 independent time bands can be set for each day of the week (fig. 18); 4 options can be selected for each time band:

- **ON**. In case of a Heating/DHW demand, the boiler works at the set Heating/DHW (fig. 12/fig. 14) Adjustment Temperature.
- **ir**. In case of a Heating/DHW demand, the boiler works at the Reduced Adjustment Temperature. The Reduced temperature is obtained by subtracting the Reduction Adjustment Temperature value (fig. 13/fig. 15) from the set Heating/DHW Adjustment Temperature (fig. 12/fig. 14).
- **OFF**. In case of a Heating/DHW demand, the boiler will not activate the Heating/DHW mode.
- **-- : -- OFF**. Time band disabled.

The boiler is sold with time program not activated. In fact, every day it will be programmed from 00:00h to 24:00h in ON mode (fig. 18).

First, set the start time of the first time band (fig. 18) using the contextual buttons 1 and 2.



fig. 18

Press the navigation button 7 to move to the end time of the first time band (fig. 19) and set it to the desired value using the contextual buttons 1 and 2.



fig. 19

Press the navigation button 7 and use the contextual buttons 1 and 2 to set the work mode during the first time band (fig. 20)



fig. 20

Then, press the navigation button 7 to set (if necessary) the next time bands (fig. 21, fig. 22 and fig. 23).



fig. 21



fig. 22



fig. 23

When the day has been programmed, press the OK button; the item "Save & exit" will be automatically selected (fig. 24). Use the navigation buttons 5 and 7 to change the previous settings, or press OK to confirm: in this case the display will again show the day (fig. 16) or the interval of days to be programmed (fig. 17). The same procedure can therefore be followed to complete the desired weekly program.

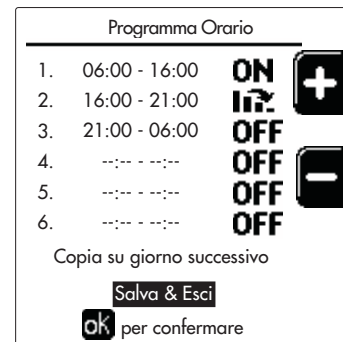


fig. 24

To program the next day in the same way, select "Copy to next day" and press OK to confirm (fig. 24).

To reset the time program to the default values, press the contextual button 3 in the Time Program menu (fig. 25) and confirm with OK.

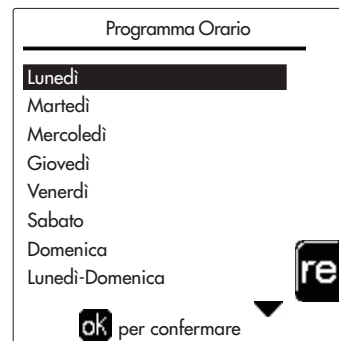


fig. 25

The two Heating and DHW time programs are independent even in case of resetting to default values.

Legionella programming (with optional hot water tank installed)

This function must be activated by enabling an installer parameter.

Access the "Legionella" menu through the path "USER MENU ➔ "DOMESTIC HOT WATER" ➔ "Legionella" to set:



- **Antilegionella Day.** Defines the day of the week during which the function will be activated.
- **Time of Antilegionella Day.** Defines the function start time.
- **Antilegionella Duration.** Defines the duration (in minutes) of the function.
- **Antilegionella Adjustment Temp..** Defines the DHW Adjustment temperature during the function.

Holiday Function

Access the "HOLIDAY FUNCTION" menu through the path "USER MENU ➔ "HOLIDAY FUNCTION" to set:

- Holiday start date.
- Holiday end date.

The display can activate two types of icons:

-  - The Holiday function is programmed but not yet active.
-  - The Holiday function is in progress. The boiler will behave as if Summer mode and Economy mode were active (with optional hot water tank installed). The frost protection and Legionella functions will remain active (if activated).

Service Intervention Date

This informs when the alert of programmed maintenance by the technician will be activated. It does not represent an alarm or a fault but just a notice. After that date, whenever the Main menu is accessed, the boiler will activate a screen indicating that programmed maintenance is due.

Service Information

This information shows the telephone number to contact in case of assistance (if programmed by the technician).

Room temperature adjustment (with optional room thermostat)

Using the room thermostat, set the temperature required in the rooms.

Room temperature adjustment (with optional remote timer control)

Using the remote timer control, set the temperature desired in the rooms. The boiler unit will set the system water according to the required room temperature. For information on the remote timer control, please refer to its user's manual.

Sliding temperature

When an external probe (optional) is installed, the corresponding symbol of the outside temperature is activated on the control panel display. The boiler adjustment system works with "Sliding Temperature". In this mode, the temperature of the heating system is adjusted according to the outside weather conditions, to ensure a high level of comfort and energy saving throughout the year. In particular, as the outside temperature increases, the system delivery temperature decreases according to a specific "compensation curve".

With Sliding Temperature adjustment, the "Heating adjustment" temperature 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. Adjustments can in any case be made by the user to improve comfort.

Compensation curve and curve offset

Access the Sliding Temperature menu. Adjust the required curve from 1 to 10 according to the characteristic (fig. 28) through the parameter "Curve1" and confirm with the OK button.

By setting the curve to 0, the sliding temperature adjustment is disabled.

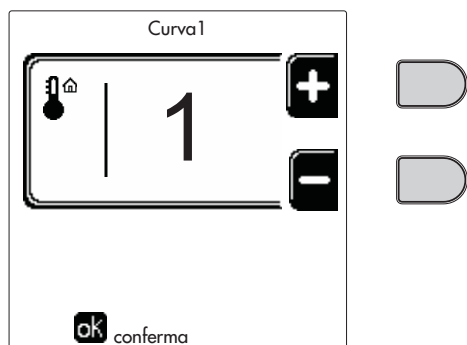


fig. 26 - Compensation curve

Adjust the parallel offset of the curves from 20 to 60 °C (fig. 29), through the parameter "Offset1" and confirm with the OK button.

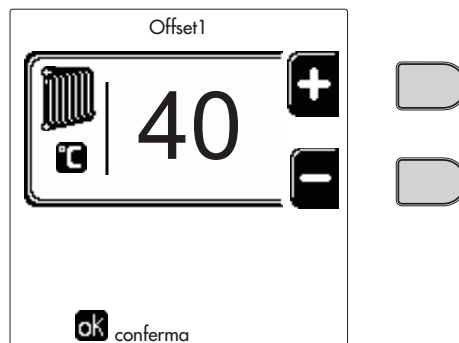


fig. 27 - Curve parallel offset

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.

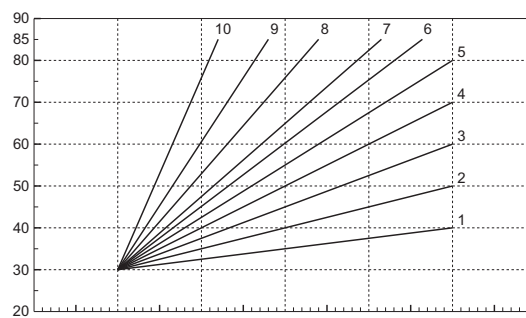


fig. 28 - Compensation curves

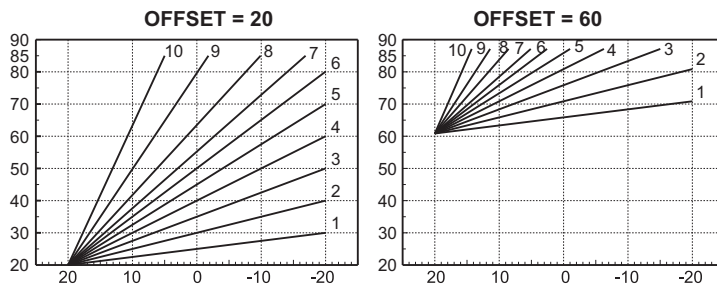



fig. 29 - Example of parallel offset of compensation curves

 This parameter is used only if time programming has been activated. See *** "Time programming" on page 82 ***

Outside Temperature Heating OFF

Access the "Out Temp Heat Off" to activate the function: between 7°C and 30°C.

If activated, this function will deactivate the heating demand whenever the temperature measured by the external probe is higher than the programmed value.

The heating demand will be reactivated as soon as the temperature measured by the external probe is lower than the programmed value.

Adjustments from remote timer control


 If the Remote Timer Control (optional) is connected to the boiler, the above adjustments are managed according to that given in table 1.

Table 1

Heating temperature adjustment	The adjustment can be made from the Remote Timer Control menu and the boiler control panel.
DHW temperature adjustment (with optional hot water tank installed)	The 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 (with optional hot water tank installed)	On disabling DHW from the Remote Timer Control menu, the boiler will select the Economy mode. In this condition, the button detail 10 - fig. 1 on the boiler panel is disabled. On enabling DHW from the Remote Timer Control menu, the boiler will select the Comfort mode. In this condition, with the button detail 10 - fig. 1 on the boiler panel it is possible to select one of two modes.
Sliding Temperature	Both the Remote Timer Control and the boiler card manage Sliding Temperature adjustment: Sliding Temperature overrides the boiler card.

System water pressure adjustment

The filling pressure with system cold must be approx. 1.0 bar. If the system pressure falls to values below minimum, the boiler card will activate **fault 37** (fig. 30).

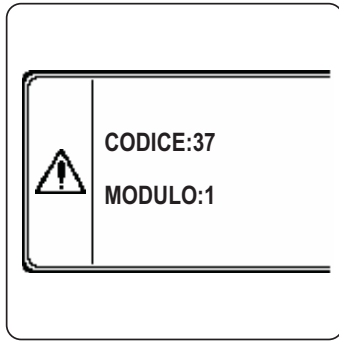


fig. 30 - Low system pressure fault

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

3. INSTALLATION

3.1 General Instructions

THE BOILER MUST ONLY BE INSTALLED BY QUALIFIED PERSONNEL, IN COMPLIANCE WITH ALL THE INSTRUCTIONS GIVEN IN THIS TECHNICAL MANUAL, THE PROVISIONS OF CURRENT LAW, THE NATIONAL AND LOCAL REGULATIONS, AND THE RULES OF PROPER WORKMANSHIP.

QUADRIFOGLIO B is a heat generator arranged to operate alone or in cascade (bank).

FERROLI S.p.A. supplies (on request) all the plumbing fittings and fume manifolds for the connection of 2 or 3 units in cascade in configurations of 70 + 70 kW to 320 + 320 kW.

When the generators QUADRIFOGLIO B are installed in cascade with the accessories provided for by FERROLI, they can be considered as a single heat generator with equivalent total capacity equal to the sum of the powers of all the units connected in cascade. All requirements of the current rules and regulations applicable to this generator of "equivalent" total heating capacity must be met. In particular the place of installation, safety devices and fume exhaust system must be adequate for the total heating capacity of the bank of units. The requirements given in this manual apply to the single unit as well as connection in cascade. For further information regarding the installation of generators in cascade, refer to the manual supplied with the cascade connection kits.

The boiler electronics have a function for a managing a cascade of up to 6 units. To create cascade systems with more than three units without using the accessories provided for by FERROLI, it is necessary to arrange hydraulic/gas manifolds of appropriate size and complete with all the safety devices required by the current regulations, as well as single fume exhausts or manifolds appropriately sized by a qualified technician.

3.2 Place of installation

The generator must be installed in an appropriate room with ventilation openings towards the outside in conformity with the current regulations. If there are several burners or exhausters that can work together in the same room, the ventilation openings must be sized for simultaneous operation of all the units. The place of installation must be free of flammable materials or objects, corrosive gases, powders or volatile substances. The room must be dry and not exposed to rain, snow or frost. For positioning, leave sufficient room around the unit for normal maintenance operations. In particular, check that the burner door can open freely.

3.3 Plumbing connections

The heating capacity of the unit must be previously established by calculating the building's heat requirement according to the current regulations. The system must be provided with all the components for correct and regular operation. In particular, provide for all the protection and safety devices required by the current regulations for the complete modular generator. They must be installed on the hot water circuit delivery piping, immediately after the last module, within a distance not more than 0.5 metres, with no shut-off devices in between. **The unit is not supplied with an expansion tank or safety valve, their connection must therefore be carried out by the Installer.**



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.

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



Before installation, carefully wash all the pipes of the system to remove any residuals or impurities that could affect proper operation of the unit. Use chemical conditioners that are suitable for the purpose, i.e. able to remove from the walls and bottom of the pipes and the various components of the system, sludge, metal oxides and, in low temperature systems, also biomass, with just the circulation of the water, with system hot and/or cold. The products used must not be corrosive and/or aggressive for metals and plastics and must not significantly alter the natural pH of the water.



Also, a filter must be installed on the system return piping to prevent impurities or sludge from the system clogging and damaging the heat generators.

The filter must be installed when replacing generators in existing systems. The manufacturer declines any liability for damage caused to the generator by failure to install or inadequate installation of this filter.

Carry out the relevant connections according to the diagram in sec. 5.1 and the symbols given on the unit.

Table 2 - SIZE OF CONNECTIONS

MODEL	B 70 B 125	B 220	B 320
A - System delivery	1" 1/4 threaded	2" threaded	DN65 flanged
B - HIGH TEMPERATURE system return	1" 1/4 threaded	2" threaded	DN65 flanged
C - LOW TEMPERATURE / main system return	1" 1/4 threaded	2" threaded	DN65 flanged
D - Gas inlet	1" threaded	1" threaded	1" threaded

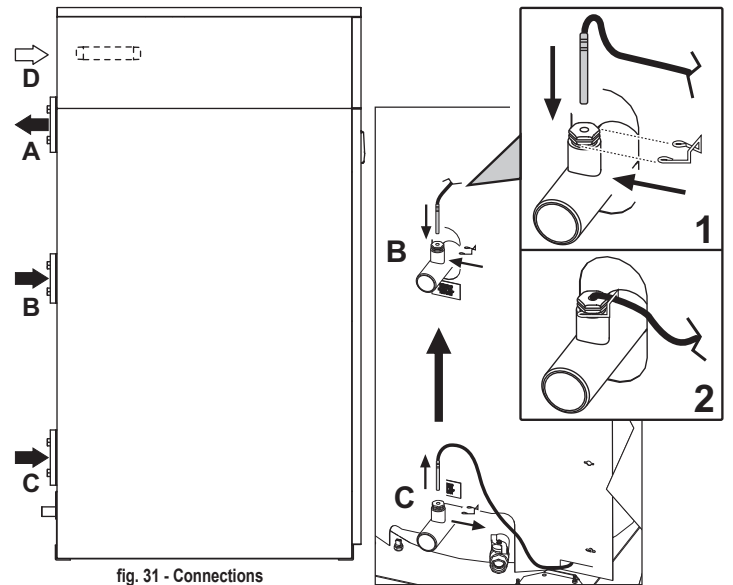


fig. 31 - Connections

fig. 32 - Probe positioning

If only one system return is used, connect to the main return connection C.

If two system returns are used, connect the low temperature return (e.g. floor system) to connection C and the high temperature return to connection B (e.g. hot water storage tank or radiators). Also, the system return probe must be moved from the pocket in return pipe C to the pocket in return pipe B. Once the probe is repositioned, make sure to secure it with the special clip (see fig. 32).

In case of installation in bank, the water circuit of each boiler must be fitted with a motor-operated shutoff valve (controlled by the unit, see wiring diagram fig. 87) that prevents reverse circulation with the boiler not working.

A single safety valve must also be provided for each boiler in accordance with the requirements of "file R".

The following optional kits are available for this purpose:

052000X0 - MOTOR-OPERATED BUTTERFLY VALVE DN50

052001X0 - MOTOR-OPERATED BUTTERFLY VALVE DN65

If the adjustment of the distribution system is independent from the electronics of the generators, the creation of a bypass between the delivery manifold and that of the system return is advisable in order to protect the circulating pumps.


Characteristics of the water system


The boilers **QUADRIFOGLIO B** are suitable for installation in heating systems with non-significant entry of oxygen (ref. systems "case I" Standard EN14868). A separator must be provided in systems with continuous entry of oxygen (e.g. underfloor systems without antidiffusion pipes), or intermittent (e.g. in case of frequent replenishments).


The water inside a heating system must have the characteristics indicated by Standard UNI 8065, and the provisions of Standard EN 14688 (protection of metallic materials against corrosion) must be complied with.

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. In case of hardness above 15 °F suitable softening treatment and/or the use of suitable anti-fouling agents must be provided for.

The water contained 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, a pH above 7 and below 8.5, an iron content (Fe) below 0.5 mg/l, a copper content (Cu) below 0.1 mg/l, a chloride content below 50mg/l, 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 systems at low temperature.

 Conditioners, additives, inhibitors and antifreeze liquids can be used only and exclusively if the producer guarantees their suitability for use in heating systems and that they do not cause damage to the boiler's heat exchanger or other components and/or materials of the boiler and system. The use of generic chemicals not specific for use in heating systems and/or incompatible with the materials of the boiler and system is forbidden. Chemical conditioners must ensure complete deoxygenation of the water, must contain specific protection for yellow metals (copper and its alloys), anti-fouling agents for scale at least up to 15°F, neutral pH stabilizers and, in low-temperature systems, specific biocides for use in heating systems.

 The unit is equipped with an antifreeze system that activates the boiler in heating mode when the system delivery water temperature drops 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.

 Regarding domestic hot water, no type of treatment that can prevent its possible food use can be provided for.

Water circuit examples

In the examples described below the checking/change of some parameters may be required.

To do this it is necessary to access the Technician menu.

From the main screen (Home), press the main Menu button (detail 12 - fig. 1).

Access the "Technician" menu by pressing the contextual button 2 (detail 2 - fig. 1).

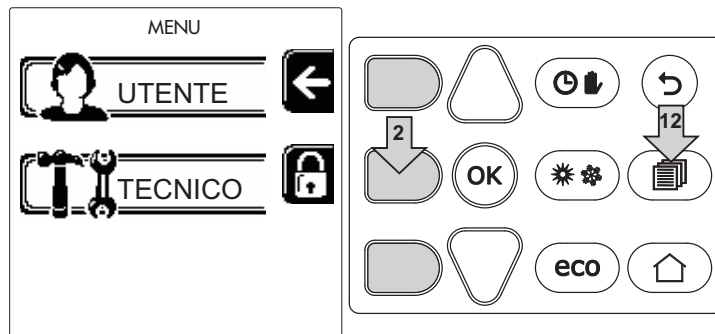


fig. 33

Enter the code "4 1 8" with contextual buttons 1 and 2. Confirm each number with the OK button.

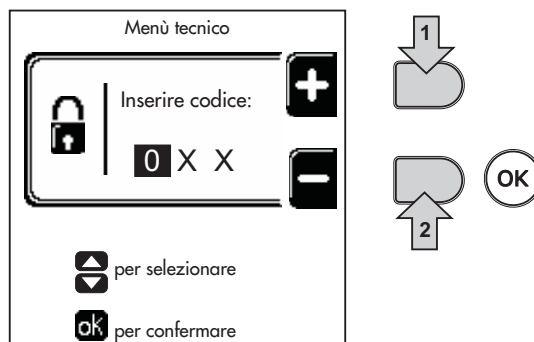


fig. 34

Access the Parameters menu by pressing the OK button.

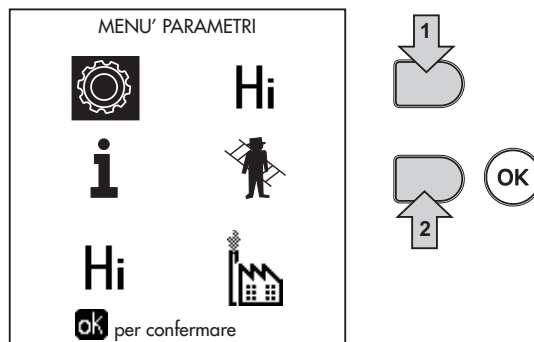


fig. 35

Access the "Configuration Menu" or "System Type Menu" according to the parameter to be modified as given in each water circuit example.

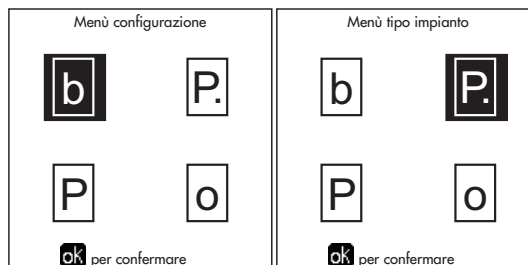


fig. 36

Two direct heating circuits

- Schematic diagram

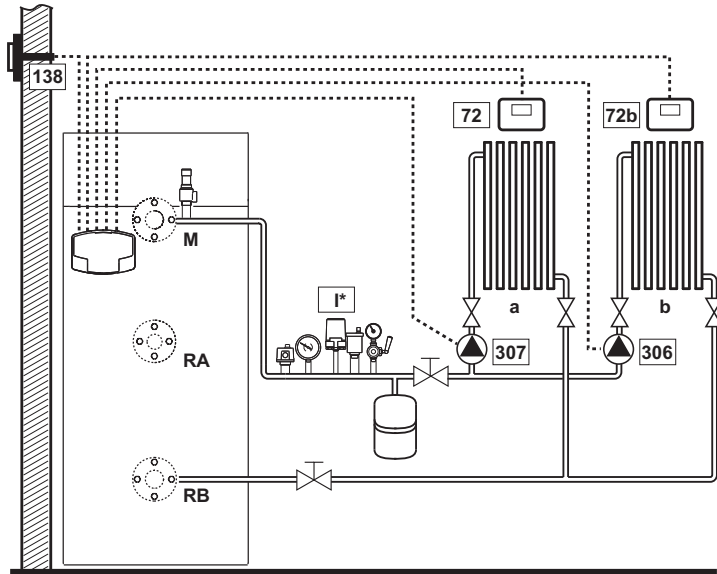


fig. 37

- Electrical connections

After installation, carry out the necessary electrical connections as shown on the wiring diagram.

Then configure the controller as described in the specific section.

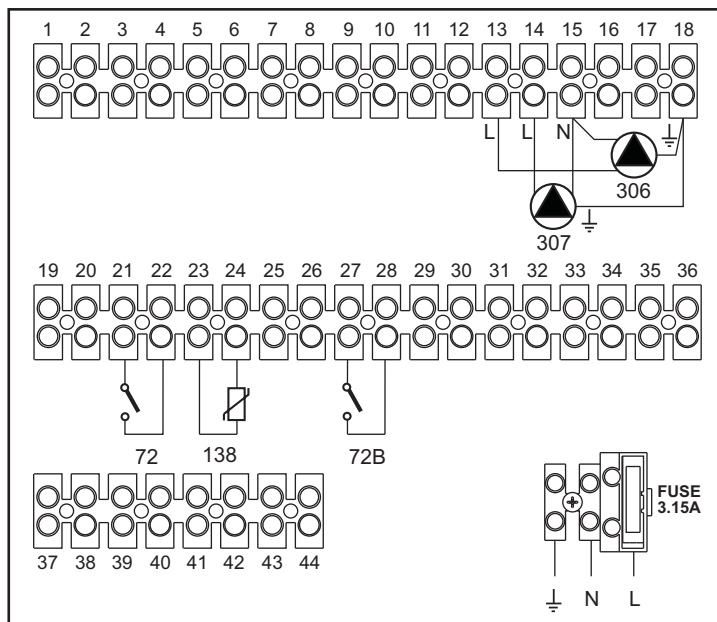


fig. 38

Legend

- | | |
|--|----------------------------|
| 72 Room thermostat 1st zone (direct) | a 1st zone (direct) |
| 72b Room thermostat 2nd zone (direct) | b 2nd zone (direct) |
| 138 External probe | M Delivery |
| 307 Circulating pump 1st zone (direct) | RA High Temperature Return |
| 306 Circulating pump 2nd zone (direct) | RB Low Temperature Return |
| I* ISPEL safety devices (When required - not supplied) | |

To manage sliding temperature it is necessary to purchase the external probe accessory code 013018X0

- Parameters

Each system requires a different parameterisation. Follow the access procedure given below.

“System Type Menu”

- Change parameter **P.01** of the “System Type Menu” to **4**.
- Change parameter **P.09** of the “System Type Menu” to **1**.

- Optional functions

As well as the electrical connections of the previous figure (required for this system configuration) there are options that do not require settings.

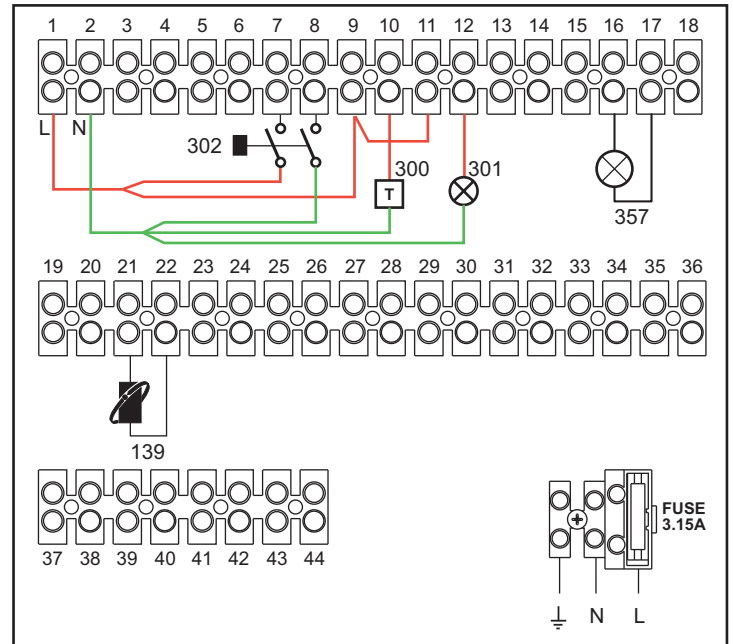


fig. 39

Legend

- 139 Remote Control: it can be installed in place of 72 to manage the request of the 1st zone (direct)
- 301 Fault indication (voltage-free contact output): the example shows the connection of a lamp at 230Vac
- 302 Remote reset input (230Vac): the example shows the connection of a double-pole switch at 230Vac, allowing the resetting of a block type fault
- 357 Fault indication (230Vac): the example shows the connection of a lamp at 230Vac

One direct heating circuit and one DHW circuit with circulating pump

- Schematic diagram

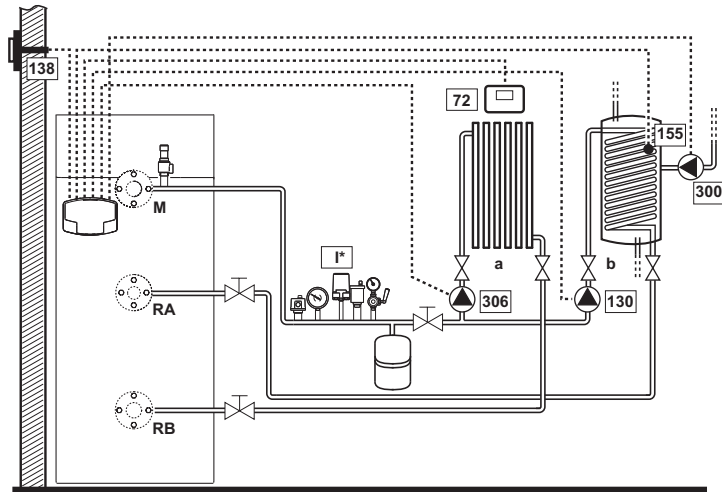


fig. 40

- Electrical connections

After installation, carry out the necessary electrical connections as shown on the wiring diagram.

Then configure the controller as described in the specific section.

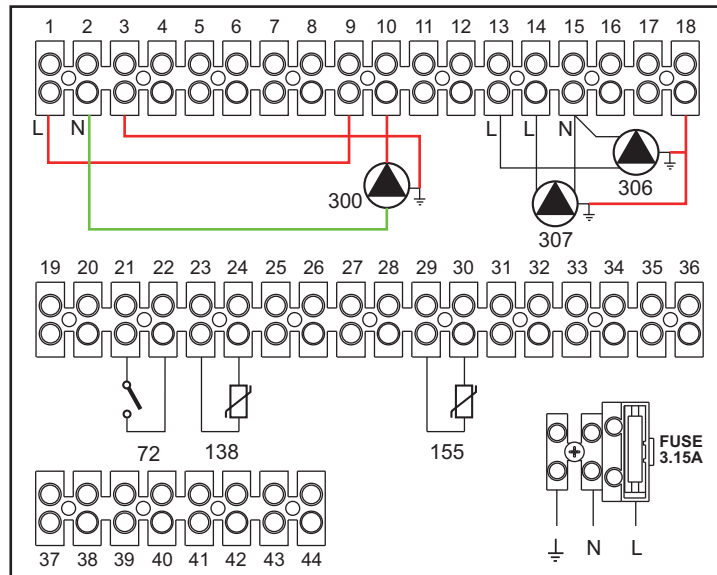


fig. 41

Legend

- | | |
|--|----------------------------|
| 72 Room thermostat 1st zone (direct) | a 1st zone (direct) |
| 130 Hot water tank circulating pump | b Hot water tank circuit |
| 138 External probe | M Delivery |
| 155 Hot water tank probe | RA High Temperature Return |
| 300 Legionella protection circulating pump | RB Low Temperature Return |
| 306 Circulating pump 1st zone (direct) | |
| I* ISPEL safety devices (When required - not supplied) | |

To manage sliding temperature it is necessary to purchase the external probe accessory code 013018X0

If a hot water tank probe (not supplied) is used, it is necessary to purchase the NTC probe accessory code 1KWMA11W (2 mt.) or code 043005X0 (5 mt.)

If a hot water tank thermostat (not supplied) is used, it is necessary to purchase the kit accessory code 013017X0 (to be connected in place of the Hot Water Tank Probe)

- Parameters

Each system requires a different parameterisation. Follow the access procedure given below.

“Service Menu”

Check/change parameter **b02** of the “Transparent Parameters Menu” to **8** (for models B 70, B 125 and B 320) and to **5** (for model B 220)

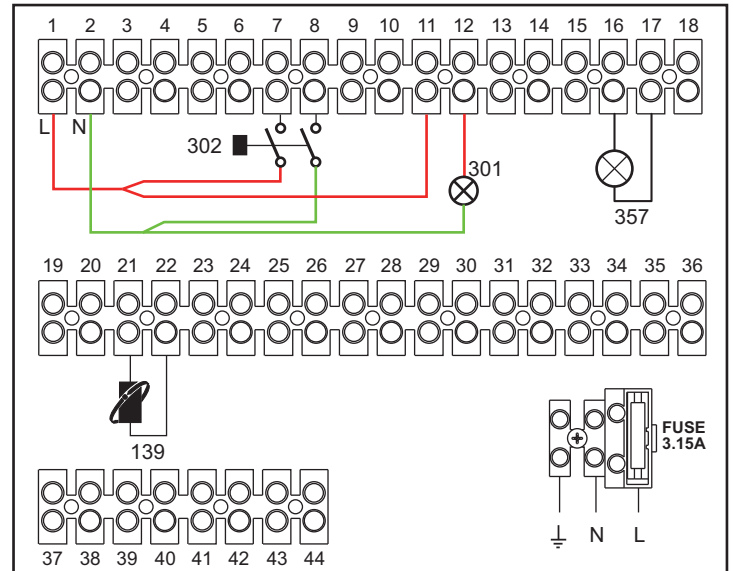
Check/change parameter **b08** of the “Transparent Parameters Menu” to **1**

“System Type Menu”

Change parameter **P.09** of the “System Type Menu” to **1**.

- Optional Functions

As well as the electrical connections of the previous figure (required for this system configuration) there are options that do not require settings.



Legend

- 139 Remote Control: it can be installed in place of 72 to manage the request of the 1st zone (direct)
- 301 Fault indication (voltage-free contact output): the example shows the connection of a lamp at 230Vac
- 302 Remote reset input (230Vac): the example shows the connection of a double-pole switch at 230Vac, allowing the resetting of a block type fault
- 357 Fault indication (230Vac): the example shows the connection of a lamp at 230Vac

A direct heating circuit and a DHW circuit with diverter valve (3-wire)

- Schematic diagram

Use diverter valves with 3 wires:

- OPENING PHASE 230V
- CLOSING PHASE 230V
- NEUTRAL

with switching times (from all closed to all open) of not more than 90 seconds.

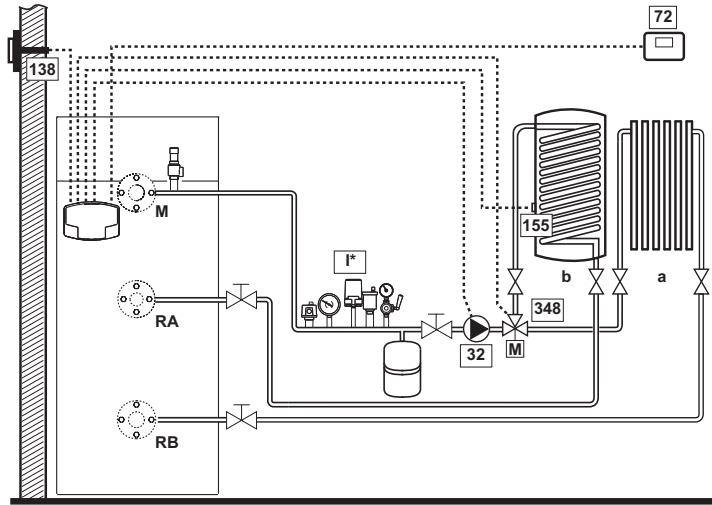


fig. 42

- Electrical connections

After installation, carry out the necessary electrical connections as shown on the wiring diagram.

Then configure the controller as described in the specific section.

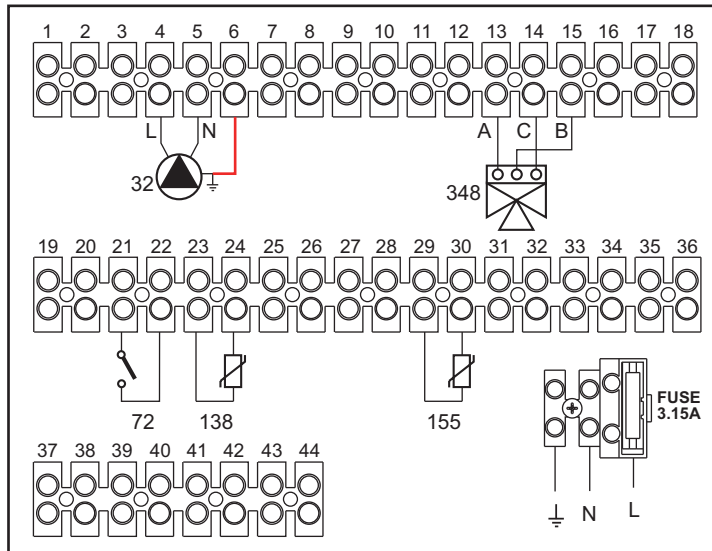


fig. 43

Legend

- | | |
|--|----------------------------|
| 32 Heating circulating pump | a 1st zone (direct) |
| 72 Room thermostat 1st zone (direct) | b Hot water tank circuit |
| 138 External probe | M Delivery |
| 155 Hot water tank probe | RA High Temperature Return |
| 306 Circulating pump 1st zone (direct) | RB Low Temperature Return |
| 348 3-way valve (3-wire) | |
| A = OPENING PHASE | |
| B = NEUTRAL | |
| C = CLOSING PHASE | |
| I* ISPEL safety devices (When required - not supplied) | |

To manage sliding temperature it is necessary to purchase the external probe accessory code 013018X0
 If a hot water tank probe (not supplied) is used, it is necessary to purchase the NTC probe accessory code 1KWMA11W (2 mt.) or code 043005X0 (5 mt.)
 If a hot water tank thermostat (not supplied) is used, it is necessary to purchase the kit accessory code 013017X0 (to be connected in place of the Hot Water Tank Probe)

- Parameters

Each system requires a different parameterisation. Follow the access procedure given below.

“Service Menu”

Check/change parameter **b02** of the “Transparent Parameters Menu” to **9** (for models B 70, B 125 and B 320) and to **6** (for model B 220).

- Optional functions

As well as the electrical connections of the previous figure (required for this system configuration) there are options that do not require settings.

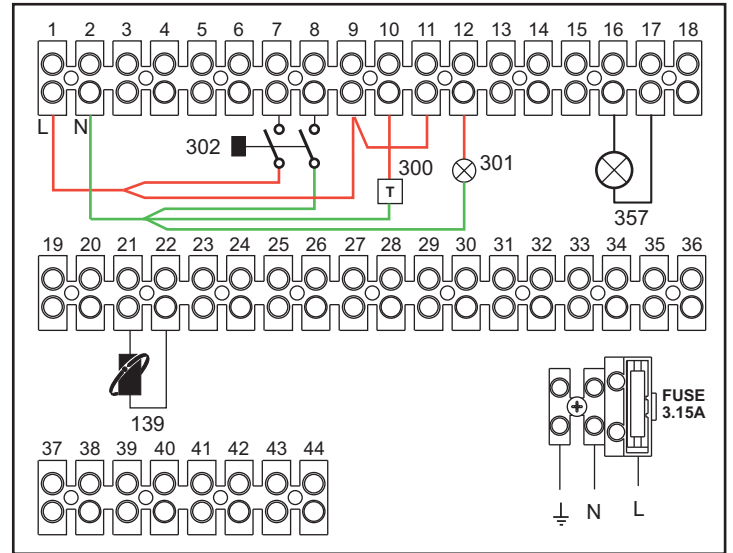


fig. 44

Legend

- 139 Remote Control: it can be installed in place of 72 to manage the request of the 1st zone (direct)
- 300 Burner On indication (voltage-free output): the example shows the connection of an hour counter at 230Vac
- 301 Fault indication (voltage-free contact output): the example shows the connection of a lamp at 230Vac
- 302 Remote reset input (230Vac): the example shows the connection of a double-pole switch at 230Vac, allowing the resetting of a block type fault
- 357 Fault indication (230Vac): the example shows the connection of a lamp at 230Vac

Two mixed heating circuits, one direct heating circuit and one DHW circuit with circulating pump

- Schematic diagram

The **zone control card FZ4B** can manage different types of systems. An example is given.

Use diverter valves with 3 wires:

- OPENING PHASE 230V
- CLOSING PHASE 230V
- NEUTRAL

with switching times (from all closed to all open) of not more than 180 seconds.

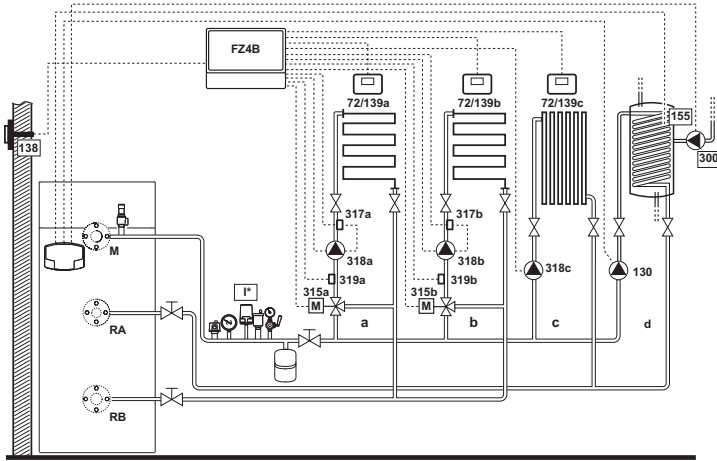


fig. 45

- Electrical connections

After installation, carry out the necessary electrical connections as shown on the wiring diagram.

Then configure the controller as described in the specific section.

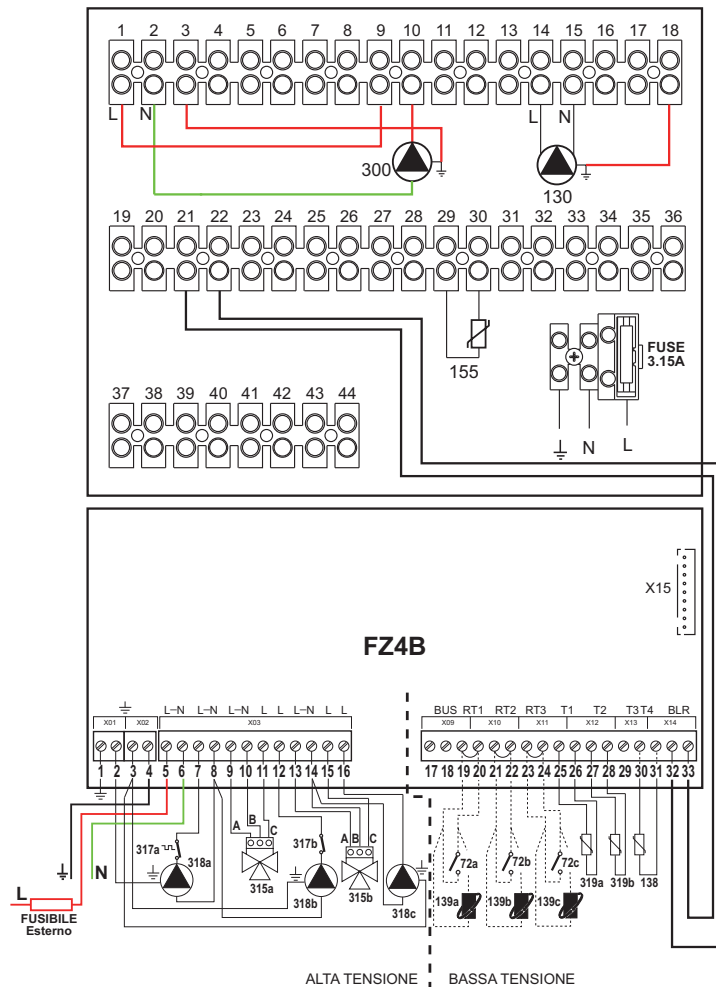


fig. 46

Legend

- 72a Room thermostat 1st zone (mixed)
- 72b Room thermostat 2nd zone (mixed)
- 72c Room thermostat 3rd zone (direct)
- 130 Hot water tank circulating pump
- 138 External probe
- 139a Remote Timer Control 1st zone (mixed)
- 139b Remote Timer Control 2nd zone (mixed)
- 139c Remote Timer Control 3rd zone (direct)
- 155 Hot water tank probe
- 300 Legionella protection circulating pump
- 315a Mixing valve 1st zone (mixed)
- 315b Mixing valve 2nd zone (mixed)
- 317a Safety thermostat 1st zone (mixed)
- 317b Safety thermostat 2nd zone (mixed)
- 318a 1st zone (mixed) circulating pump
- 318b 2nd zone (mixed) circulating pump
- 318c 3rd zone (direct) circulating pump
- 319a Delivery sensor 1st zone (mixed)
- 319b Delivery sensor 2nd zone (mixed)
- M Delivery
- RA High Temperature Return
- RB Low Temperature Return
- a 1st zone (mixed)
- b 2nd zone (mixed)
- c 3rd zone (direct)
- d Hot water tank circuit
- A = OPENING PHASE
- B = NEUTRAL
- C = CLOSING PHASE
- I* ISPEL safety devices (When required - not supplied)

To manage sliding temperature it is necessary to purchase the external probe accessory code 013018X0
 If a hot water tank probe (not supplied) is used, it is necessary to purchase the NTC probe accessory code 1KWMA11W (2 mt.) or code 043005X0 (5 mt.)
 If a hot water tank thermostat (not supplied) is used, it is necessary to purchase the kit accessory code 013017X0 (to be connected in place of the Hot Water Tank Probe)

- Parameters

Each system requires a different parameterisation. Follow the access procedure given below.

“Service Menu”

Check/change parameter **b02** of the “Transparent Parameters Menu” to **8** (for models B 70, B 125 and B 320) and to **5** (for model B 220).

Check/change parameter **b08** of the “Transparent Parameters Menu” to **1**.

“System Type Menu”

Change parameter **P.09** of the “System Type Menu” to **1**.

- Parameters FZ4B

See relevant manual in Kit.

- Optional functions

As well as the electrical connections of the previous figure (required for this system configuration) there are options that do not require settings.

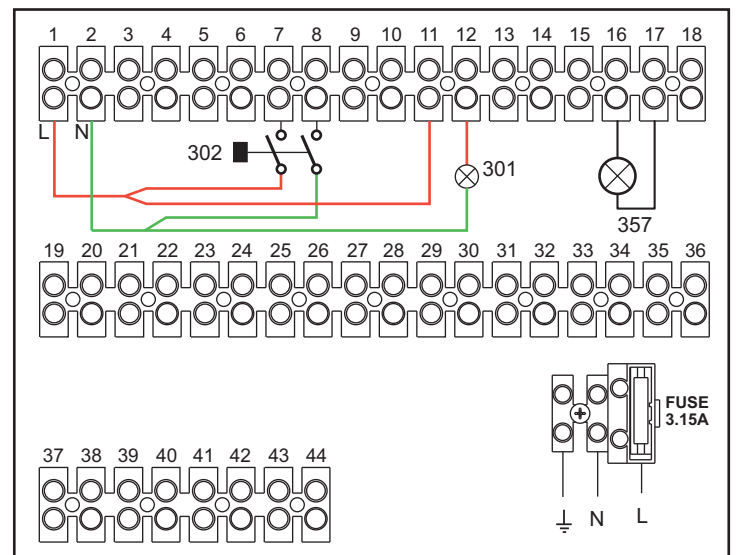


fig. 47

- 301 Fault indication (voltage-free contact output): the example shows the connection of a lamp at 230Vac
- 302 Remote reset input (230Vac): the example shows the connection of a double-pole switch at 230Vac, allowing the resetting of a block type fault
- 357 Fault indication (230Vac): the example shows the connection of a lamp at 230Vac

Generators in cascade: one direct heating circuit and one DHW circuit with circulating pump

Schematic diagram

The boiler's electronics can manage up to **6 modules**. 3 are given in the example.

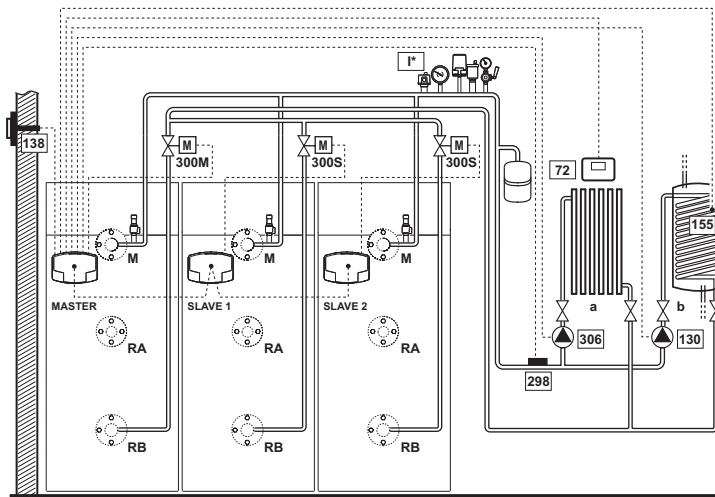


fig. 48

Electrical connections

After installation, carry out the necessary electrical connections as shown on the wiring diagram.

Then configure the controller as described in the specific section.

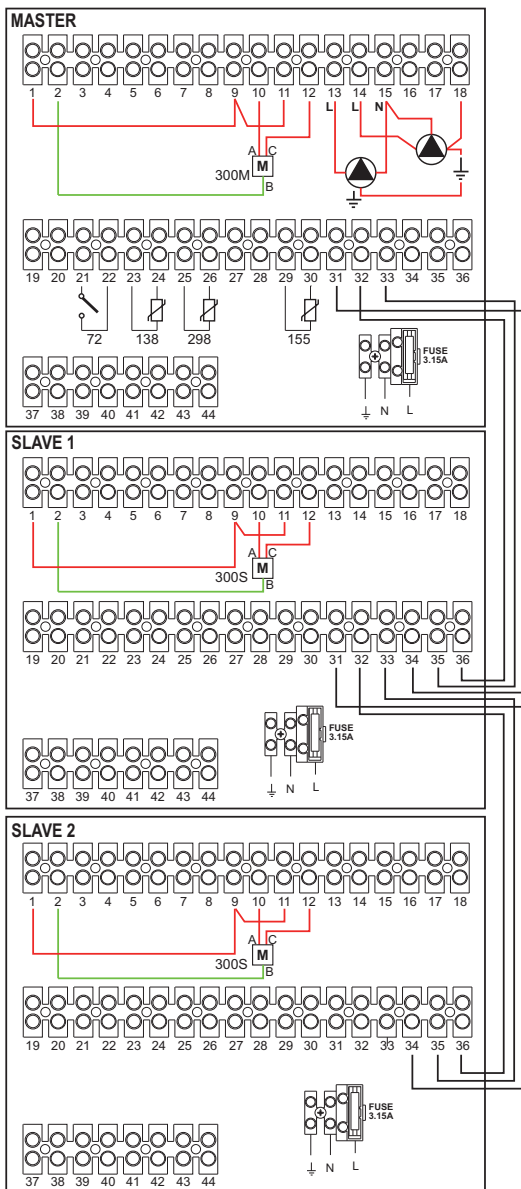


fig. 49

Legend

- 72 Room thermostat 1st zone (direct)
- 130 Hot water tank circulating pump
- 138 External probe
- 155 Hot water tank probe
- 298 Cascade temperature sensor
- 300M MASTER boiler motor-operated butterfly valve
- 300S SLAVE boiler motor-operated butterfly valve
- 306 1st zone (direct) circulating pump
- a 1st zone (direct)
- b Hot water tank circuit
- M Delivery
- RA High Temperature Return
- RB Low Temperature Return
- A = OPENING PHASE
- B = NEUTRAL
- C = CLOSING PHASE
- A = OPENING PHASE
- B = NEUTRAL
- C = CLOSING PHASE
- I* ISPEL safety devices (When required - not supplied)

To manage sliding temperature it is necessary to purchase the external probe accessory code 013018X0
If a hot water tank probe (not supplied) is used, it is necessary to purchase the NTC probe accessory code 1KWMA11W (2 mt.) or code 043005X0 (5 mt.)
If a hot water tank thermostat (not supplied) is used, it is necessary to purchase the kit accessory code 013017X0 (to be connected in place of the Hot Water Tank Probe)
If a cascade probe (not supplied) is used, it is necessary to purchase the NTC probe accessory code 1KWMA11W (2 mt.) or code 043005X0 (5 mt.)

Parameters

Each system requires a different parameterisation. Follow the access procedure given below for the **MASTER boiler** and the **SLAVE boilers**.

"Service Menu"

Check/change parameter **b02** of the "Transparent Parameters Menu" to **8**. (for models B 70, B 125 and B 320) and to **6** (for model B 220)

Check/change parameter **b08** of the "Transparent Parameters Menu" to **3**.

"System Type Menu"

Change parameter **P.02** of the "System Type Menu" to **1**.

Change parameter **P.09** of the "System Type Menu" to **1**.

- Optional functions

As well as the electrical connections of the previous figure (required for this system configuration) there are options that do not require settings.

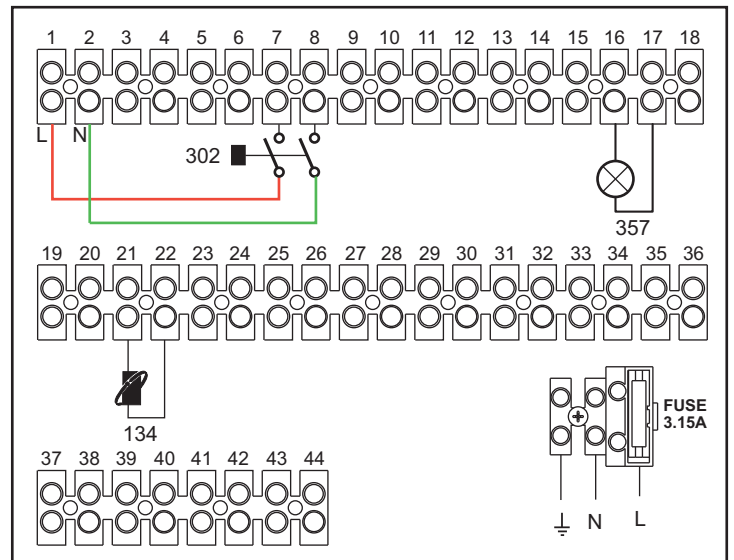


fig. 50 - MASTER

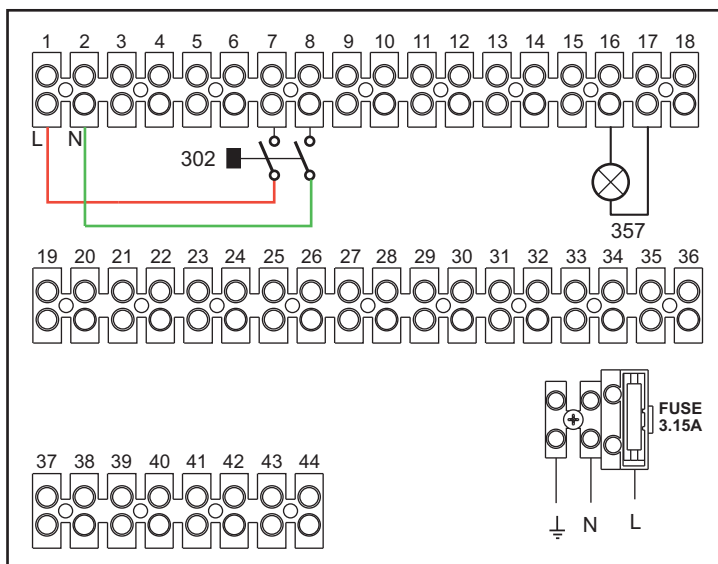


fig. 51 - SLAVE

Legend

- 139 Remote Control: it can be installed in place of 72 to manage the request of the 1st zone (direct)
- 302 Remote reset input (230Vac): the example shows the connection of a double-pole switch at 230Vac, allowing the resetting of a block type fault
- 357 Fault indication (230Vac): the example shows the connection of a lamp at 230Vac

3.4 Gas connection

! Before making the connection, make sure the unit is arranged for operation with the type of fuel available and carefully clean all the pipes of the gas system to remove any residues that could affect proper functioning of the boiler.

The gas must be connected to the relevant connection (see fig. 76 and fig. 77) in conformity with the current regulations, using a continuous-surface stainless steel hose, placing a gas cock between the system and the boiler.

! To allow easy opening of the burner door during periodic maintenance, the last section of the connection between the system and the unit must have a continuous-surface stainless steel hose.

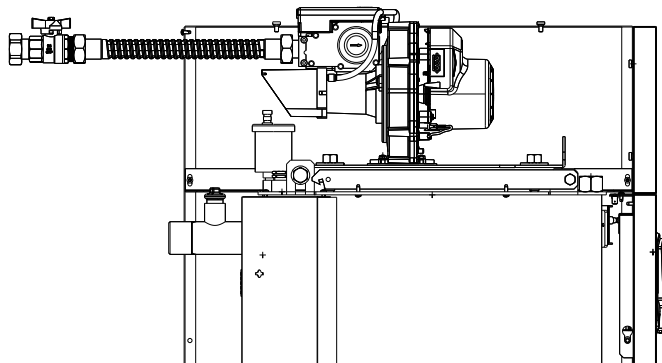


fig. 52

Make sure that all gas connections are tight. The capacity of the gas meter must be sufficient for the simultaneous use of all units connected to it. The diameter of the gas pipe leaving the boiler is not decisive for choosing the diameter of the pipe between the unit and the meter; it must be chosen according to its length and pressure losses, in conformity with the current regulations.

! Do not use the gas pipes to earth electrical appliances. In case of connection in cascade, make sure to install a fuel shutoff valve externally with respect to the modules.

3.5 Electrical connections

Connection to the electrical grid

! The unit's electrical safety is only guaranteed when correctly connected to an efficient earthing system executed according to current safety standards. Have the efficiency and suitability of the earthing system checked by professionally qualified personnel. The manufacturer is not responsible for any damage caused by failure to earth the system. Also make sure that the electrical system is adequate for the maximum power absorbed by the unit, as specified on the boiler dataplate.

The boiler is prewired and provided with a Y-cable and plug for connection to the electricity 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. It is important to respect the polarities (LINE: brown wire / NEUTRAL: blue wire / EARTH: yellow-green

wire) in making connections to the electrical line. During installation or when changing the power cable, the earth wire must be left 2 cm longer than the others.

! The user must never change the unit's power cable. If the cable gets damaged, switch off the unit and have it changed solely by professionally qualified personnel. If changing the electric power cable, use solely "HAR H05 VV-F" 3x0.75 mm² cable with a maximum outside diameter of 8 mm.

Room thermostat (optional)

! CAUTION: The room thermostat must have clean contacts. CONNECTING 230 V. TO THE TERMINALS OF THE ROOM THERMOSTAT WILL IRREPARABLY DAMAGE THE ELECTRONIC CARD.

When connecting a remote timer control or a timer switch, do not take the power supply for these devices from their cut-out contacts. Their power supply must be taken with a direct connection from the mains or with batteries, depending on the kind of device.

External probe (optional)

Connect the probe to the respective terminals. The maximum permissible length of the electric cable connecting the boiler - external probe is 50 m. A common 2-wire cable can be used. The external probe should preferably be installed on the North, North-West wall or on the wall facing most of the main living-room. The probe must never be exposed to the early morning sun, and in general (as far as possible) it should not be exposed to direct sunlight; protect it if necessary. In any case, the probe must not be installed near windows, doors, vents, flues or heat sources that could affect the reading.

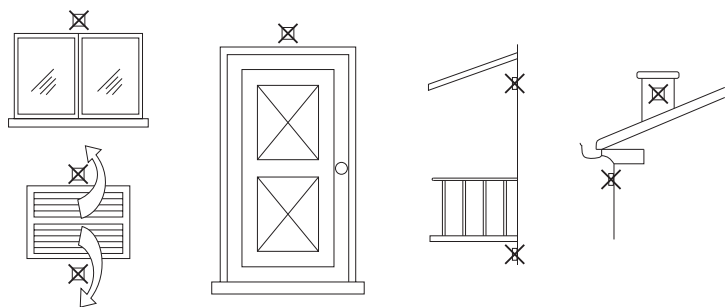


fig. 53 - Inadvisable positioning of external probe

Accessing the electrical terminal block

The electrical terminal block is located in the rear of the control panel. Make the connections as shown in the wiring diagram on fig. 87 and run the cables through the special cable glands.

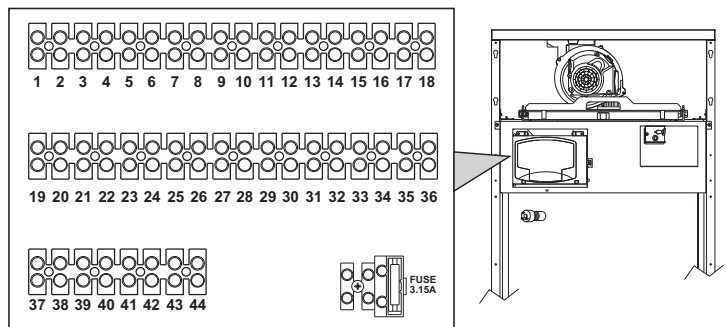


fig. 54 - Electrical terminal block

For connection in cascade

NOTE: The boiler's electronics can manage a maximum of 6 modules.

1. Connect the modules as shown in fig. 55 (example con 4 modules)

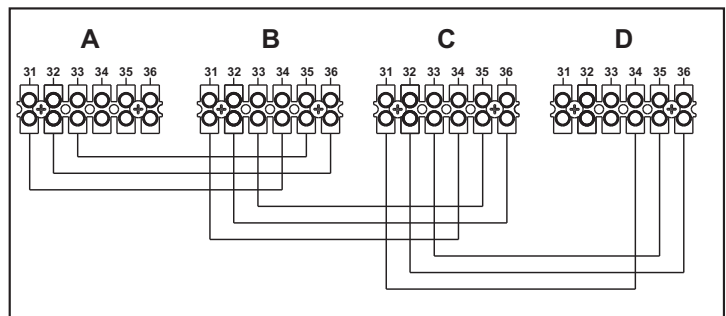


fig. 55 - Connection in cascade

- A 1st Module
- B 2nd Module
- C 3rd Module
- D 4th Module

2. Make all the electrical connections (terminals 1 to 30) on module no. 1
3. On the remaining modules only connect the power supply and possibly the contacts for: burner lit (300), fault contact (301) and remote reset input (302).
4. Switch on the power to the entire cascade
5. After the procedure "FH", check the correct operation of the cascade:
 - Module 1: MASTER icon
 - Module 2: SLAVE icon
 - Module 3: SLAVE icon
 - Module 4: SLAVE icon

If this does not occur, disconnect the power supply and check the wiring in fig. 55.

Settings

All adjustments must be made on all the modules.

Possible faults

If the electrical connection of a module is disconnected for any reason, module 1 will activate fault **F70**.

If the electrical connection of a module is disconnected for any reason, the next module will activate fault **F71**.

3.6 Flue connection

Important

The unit is a B23 type with combustion air drawn from the installation room and fume exhaust by means of a fan (operation with flue pressurised), and must be connected to one of the discharge systems indicated below. Before proceeding with installation, check and carefully comply with the local regulations and provisions. Also, comply with the provisions on the positioning of wall and/or roof terminals and the minimum distances from windows, walls, ventilation openings, etc.

Manifold, ducts and flue must be suitably sized, designed and made in compliance with current regulations. They must be made of suitable materials, i.e. resistant to heat and corrosion, smooth on the inside and tight. In particular, joints must be condensate proof. Also provide suitable condensate drainage points, connected to a trap to prevent the condensation formed in the flues from running into the generators.

Each unit is provided with two flue connections to offer greater installation flexibility. Use only one of the outlets and make sure the other is properly plugged (see fig. 56). In case of installation in bank with fume outlets connected to a single flue or manifold, **a fume anti-backflow valve must be installed on each outlet** to avoid malfunctioning or possible dangerous conditions. Make sure to use the optional kits FERROLI, provided with special anti-backflow valves.

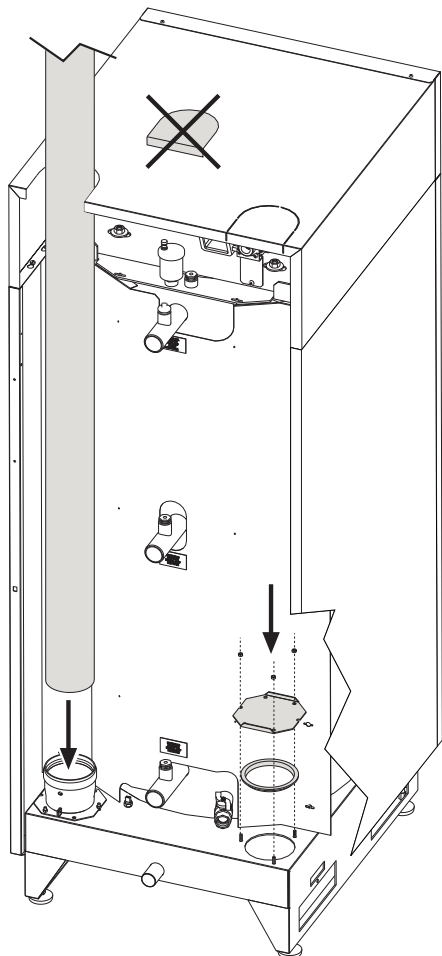


fig. 56 - Fume outlet

Before carrying out the flue connection, make sure to fill the condensate trap with approx. 0.5 litres of water through the flue connections.

To calculate the maximum length of the flues, refer to the max. available head indicated in table 3.

Table 3 - Maximum flue pipe length

	Model "B 70" Ø 80	Model "B 125" Ø 100	Model "B 220" Ø 160	Model "B 320" Ø 200
Maximum flue head	200 Pa	200 Pa	200 Pa	200 Pa

3.7 Condensate drain connection

The boiler has a trap to drain condensate. Carry out the following instructions for fitting.

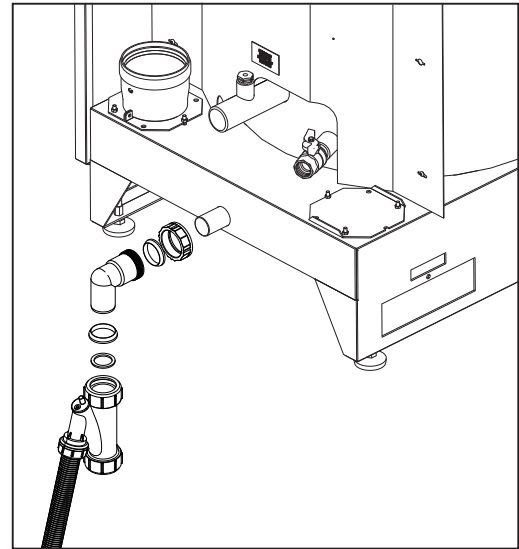


fig. 57 - Condensate outlet connection

Neutralizer kit

The following condensate neutralizer kits are available on request:

- code 051000X0** up to 320 kW (per single device)
- code 051000X0** up to 1500 kW (per bank)

Connect these neutralizers directly to the boiler outlet without putting the trap in between. The trap function is carried out by the neutralizer.

4. SERVICE AND MAINTENANCE

All adjustment, conversion, commissioning and maintenance operations described below must only be carried out by Qualified Personnel (meeting the professional technical requirements prescribed by the current regulations) such as those of the Local After-Sales Technical Service.

FERROLI declines any liability for damage and/or injury caused by unqualified and unauthorised persons tampering with the unit.

4.1 Adjustments

Gas conversion

The unit can operate on Natural Gas or LPG and is factory-set for use with one of these two gases, as clearly shown on the packing and on the data plate. Whenever a different gas to that for which the unit is set has to be used, the special conversion kit will be required, proceeding as follows:

1. Disconnect the power supply to the boiler.
2. Remove the panels.
3. Detach the electrical connections from the gas valve controller.
4. Undo the fixing screws "E" and remove the gas valve.
5. Replace the gas nozzle "F" positioning it inside the seal "G" with the one contained in the conversion kit. Refit the parts and check the tightness.
6. Modify the parameter for the type of gas as described below.
Reach the screen shown in fig. 58, navigating in the menu and following the path "USER MENU → Maintenance → Test Mode → Gas Type Selection". Press the contextual buttons 1 and 2 to choose the type of gas. Confirm with the OK button.

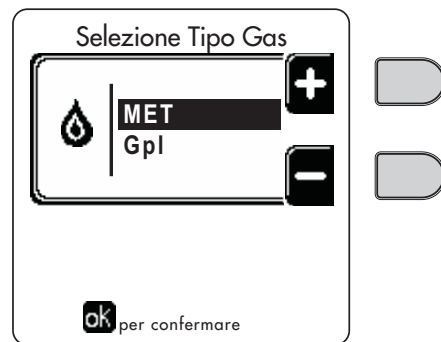


fig. 58 - Gas type selection

7. Apply the label, contained in the conversion kit, near the data plate.
8. Using a combustion analyzer connected to the boiler fume outlet, make sure the CO₂ content in the fumes, with the boiler operating at max. and min. output, complies with that given in the technical data table for the corresponding type of gas.

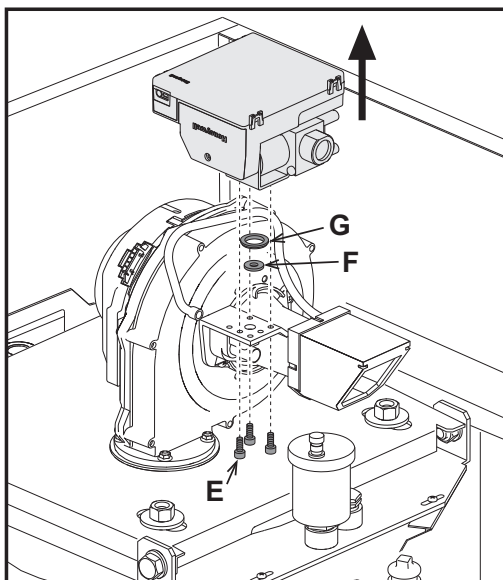


fig. 59 - Model QUADRIFOGLIO B 70

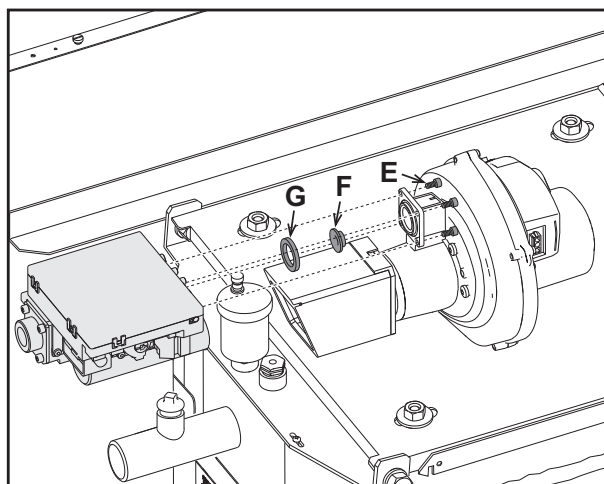


fig. 60 - Model QUADRIFOGLIO B 125

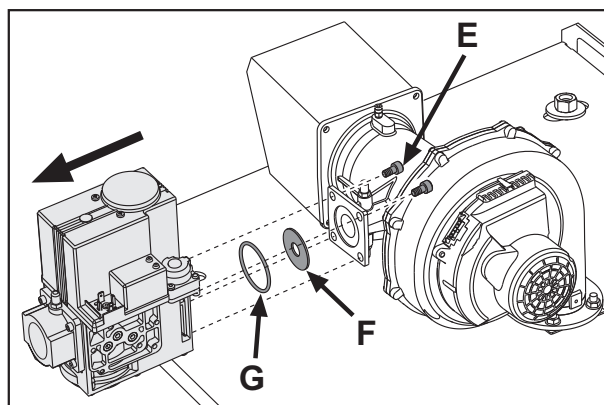


fig. 61 - Model QUADRIFOGLIO B 220

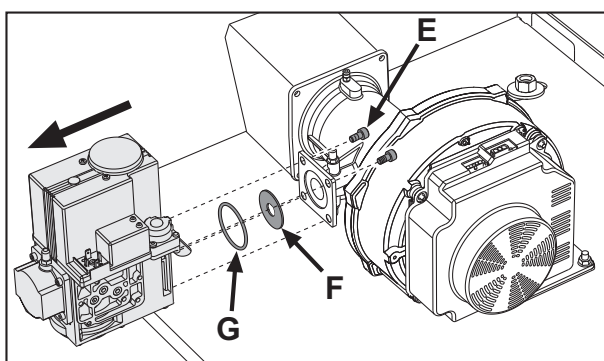


fig. 62 - Model QUADRIFOGLIO B 320

TEST mode activation

Reach the screen shown in fig. 63, navigating in the menu and following the path "USER MENU → Maintenance → Test Mode → Test mode".

The boiler will light, gradually reaching the maximum heating power (Range Rated) set as described in the next section.

The display will show the actual heating power and that set.

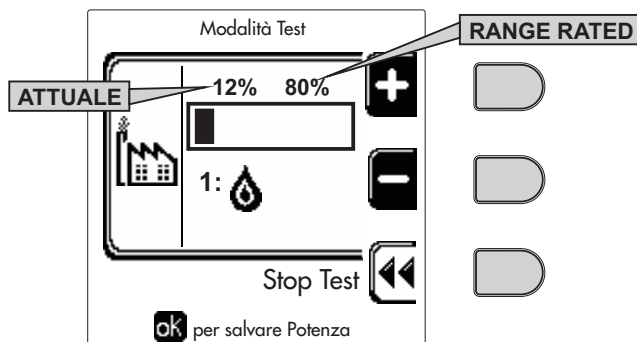


fig. 63 - Test mode (example heating power = 80%)

Press the contextual buttons 1 and 2 to increase the maximum power.

To deactivate the TEST mode, press the contextual button 3.

The TEST mode is automatically disabled in any case after 15 minutes.

Heating Capacity Adjustment (RANGE RATED)

This is a "RANGE RATED" boiler (according to EN 483) and can be adjusted to the system's thermal requirement by setting the maximum heating capacity for operation in heating mode, as follows:

- Put the boiler in TEST mode (see sec. 4.1).
- Press the **contextual buttons 1 and 2** to increase or decrease the heating capacity (minimum = 00 - maximum = 100). See the diagram "Heating Capacity Adjustment" (fig. 64).
- By pressing the **OK button** (detail 6 - fig. 1) the maximum heating capacity will remain that just set. Exit TEST mode (see sec. 4.1).

After setting the desired heating capacity, write the value on the sticker provided and place it on the boiler under the data plate. For subsequent checks and adjustments, refer to the set value.

THE HEATING CAPACITY ADJUSTMENT THUS SET ENSURES KEEPING OF THE EFFICIENCY VALUES DECLARED ON cap. 5.3

Heating power adjustment diagram

A = kW - B = Electronic Board Parameter

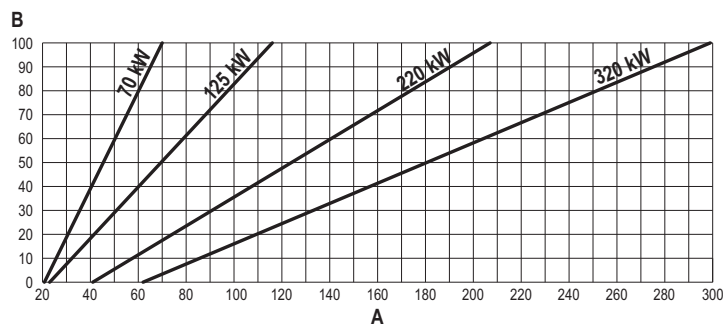



fig. 64

CASCADE TEST mode activation

This function allows all the modules connected in cascade (RANGE RATED) to be activated at the same heating power. From the panel of the Master boiler (identified by the icon ) , reach the screen viewed fig. 65, navigating in the menu and following the path "USER MENU → Maintenance → Test Mode → Cascade Test mode".

The modules will light, reaching the maximum heating power (Range Rated) gradually.

The display will show the actual heating power (fig. 65 - example with two modules).

- 5% = Actual heating power
- 1/2 = Modules lit/modules connected

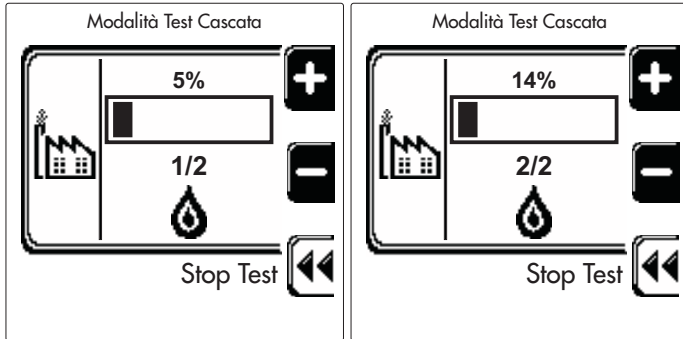


fig. 65 - Cascade TEST mode (example with two modules)

Press the contextual buttons 1 and 2 to increase the maximum power of all modules.

To deactivate the CASCADE TEST mode, press the contextual button 3.

The CASCADE TEST mode is disabled automatically after 15 minutes.

4.2 Start-up



Checks to be made at first lighting, and after all maintenance operations that involved disconnection from the systems or an operation on safety devices or parts of the boiler:

Before lighting the boiler

- Open any on-off valves between the boiler and the systems.
- Check the tightness of the gas system, proceeding with caution and using a soap and water solution to detect any leaks in connections.
- Check correct prefilling of the expansion tank (ref. sec. 5.3).
- Fill the water system and make sure all air contained in the boiler and the system has been vented, by opening the air vent valve on the boiler and any vent valves on the system.
- Fill the condensate trap and check correct connection of the condensate elimination system.
- Make sure there are no water leaks in the system, DHW circuits, connections or boiler.
- Check correct connection of the electrical system and efficiency of the earthing system
- Make sure the gas pressure value for heating is that required.
- Make sure there are no flammable liquids or materials in the immediate vicinity of the boiler

Checks during operation

- Turn the unit on as described in sec. 2.3.
- Make sure the fuel circuit and water systems are tight.
- Check the efficiency of the flue and air-fume ducts while the boiler is working.
- Check the correct tightness and functionality of the condensate elimination system and trap.
- Make sure the water is circulating properly between the boiler and the systems.
- Make sure the gas valve modulates correctly in the heating and domestic hot water production phases.
- Check proper boiler lighting by doing several tests, turning it on and off with the room thermostat or remote control.
- Using a combustion analyser connected to the boiler fume outlet, check that the CO₂ content in the fumes, with the boiler operating at max. and min. output, corresponds to that given in the technical data table for the corresponding type of gas.
- Make sure the fuel consumption indicated on the meter matches that given in the technical data table on sec. 5.3.
- Check the correct programming of the parameters and carry out any necessary customization (compensation curve, power, temperatures, etc.).

4.3 Maintenance

Periodical inspection

To ensure proper operation of the unit, it is necessary to have an annual inspection carried out by qualified personnel, providing for the following:

- heat exchanger check and cleaning with suitable products if dirty or clogged
- check and possible cleaning of burner (do not use chemical products or wire brushes)
- check and cleaning of electrodes, which must be free of deposits and properly positioned
- seal and gasket check (burner, sealed chamber, etc.)
- check and cleaning of sludge remover filters and system filters
- check, cleaning and filling of condensate drain traps
- check of wiring, contacts, electrical actuators
- check and cleaning of generator air inlets and boiler room air intakes
- check and cleaning of fume evacuation duct-manifold-flue system.
- expansion tank check and prefilling
- check of correct and stable system water pressure, ensuring conformity with the required working pressure.



The use of automatic filling systems for reinstatement of operating conditions must provide for adequate treatment of the water (ref. *** 'Characteristics of the water system' on page 86 ***)

- check of heating system water chemical and physical parameters (ref. *** 'Characteristics of the water system' on page 86 ***)
- water and gas system tightness check
- check of correct and stable gas supply pressure to plant (20 mbar for operation with natural gas); any fluctuations or pressure drops below the declared value can create malfunctioning and stops with need for manual resetting.
- burner ignition and control and safety device check (gas valve, flowmeter, thermostats, etc.)
- circulating pump check, freeing when necessary
- fume analysis and check of combustion parameters



The casing, control panel and aesthetic parts of the boiler can be cleaned with a soft damp cloth, possibly soaked in soapy water. All abrasive detergents and solvents should be avoided.

Opening the casing

To open the boiler casing (fig. 66):

1. Undo the two screws and remove the cover A.

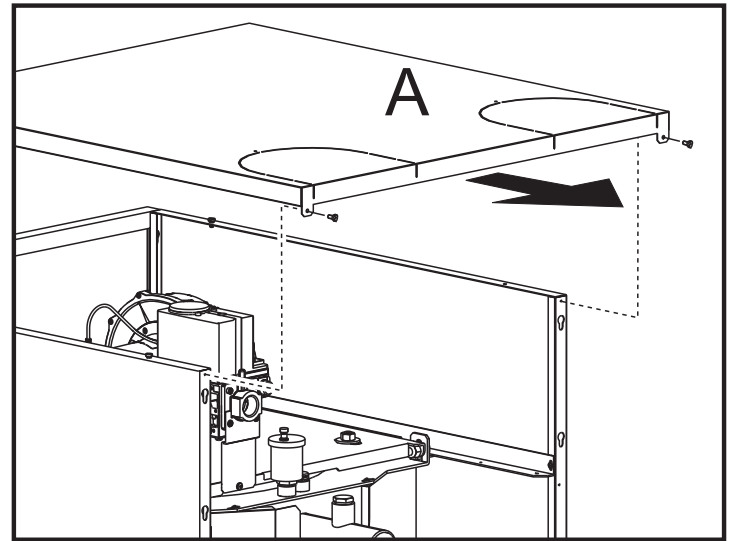


fig. 66

1. Unhook and remove the top panel B.
2. Undo the two screws and remove the bottom panel C.

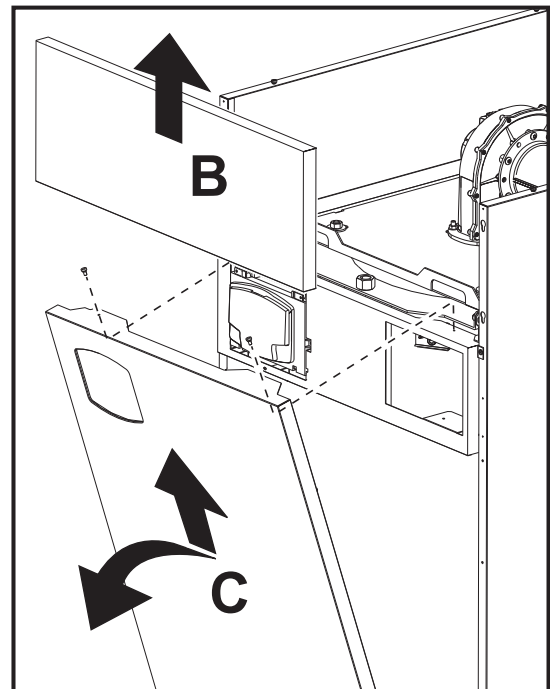


fig. 67

Burner door opening

To access the burner observe the following instructions.

1. Remove the top front panel and cover (fig. 68).
2. Remove the four nuts and washers (fig. 69).
3. Open the burner door (fig. 69).

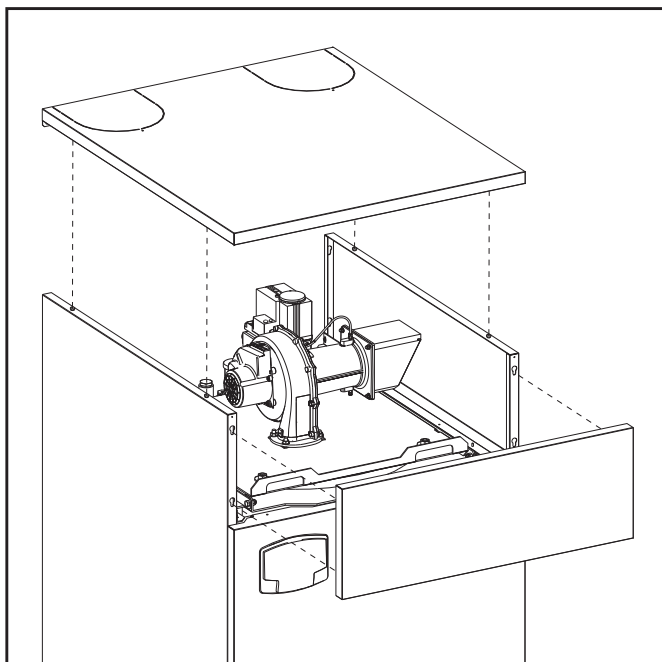


fig. 68

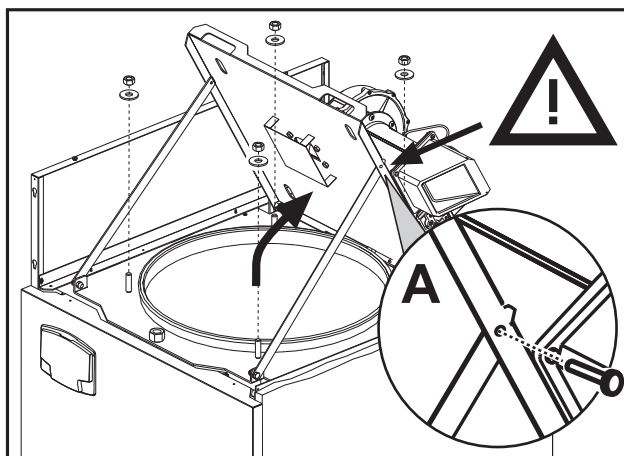


fig. 69

! After opening the burner door and hooking it to the support arms a pin must (compulsory) be inserted in the safety hole (ref. A - fig. 69), to avoid the risk of accidental release during maintenance operations.

To close it, repeat these operations in reverse order.

! Tighten down the 4 nuts (fig. 70).
Then check the perfect tightness of the gas circuit.

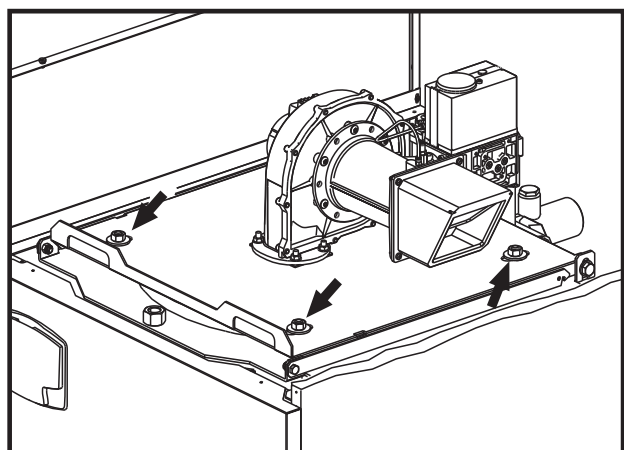


fig. 70

4.4 Troubleshooting

Diagnostics

The boiler is equipped with an advanced self-diagnosis system. In the case of a boiler fault, the display will light up, indicating the fault code and, in case of connection in cascade, the number of the module.

There are faults that cause permanent shutdown (marked by the symbol **OK** to reset): to restore operation, just press the **OK button** for 1 second or **RESET** on the remote timer control (optional) if installed; if the boiler fails to start, the fault must be eliminated first.

Other faults cause temporary shutdowns which are automatically reset as soon as the value returns within the boiler's normal working range.

Table of faults

Table. 4 - List of faults

Fault code	Fault	Possible cause	Cure
A01	No burner ignition	No gas	Check the regular flow of gas 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
		Faulty gas valve	Check the gas valve and replace it if necessary
		Insufficient gas supply pressure	Check the gas supply pressure
		Trap blocked	Check the trap and clean it if necessary
		Faulty ignition transformer (only models B 220 and B 320)	Check and replace it if necessary
A02	Flame present signal with burner off	Electrode fault Card fault	Check the ionisation electrode wiring Check the card
A03	Overtemperature protection intervention	Heating sensor damaged	Check the correct positioning and operation of the heating sensor
		No water circulation in the system	Check the circulating pump
		Air in the system	Vent the system
A04	Fume extraction duct safety device intervention	Fault F07 generated 3 times in the last 24 hours	See fault F07
A05	Fan protection intervention	Fault F15 generated for 1 hour (consecutive)	See fault F15
A06	No flame after ignition stage (6 times in 4 minutes)	Ionisation electrode fault	Check the position of the ionisation electrode and replace it if necessary
		Flame unstable	Check the burner
		Gas valve Offset fault	Check the Offset adjustment at minimum power
		air/fume ducts obstructed	Remove the obstruction from flue, fume exhaust ducts and air inlet and terminals
		Trap blocked	Check the trap and clean it if necessary
F07	High fume temperature	Flue partially obstructed or insufficient	Check the efficiency of the flue, fume extraction ducts and outlet terminal
		Fume sensor position	Check the correct positioning and operation of the fume sensor
F10	Delivery sensor 1 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 sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F14	Delivery sensor 2 fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F15	Fan fault	No 230V power supply	Check the 3-pin connector wiring
		Tachometric signal interrupted	Check the 5-pin connector wiring
		Fan damaged	Check the fan
F34	Supply voltage under 170V	Electric mains trouble	Check the electrical system
F35	Faulty mains frequency	Electric mains trouble	Check the electrical system
F37	Pressure switch contact open	Low system pressure	Check the system water pressure
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

Fault code	Fault	Possible cause	Cure
A41	Sensor positioning	Delivery sensor disconnected from the pipe	Check the correct positioning and operation of the heating sensor
A42	Heating sensor fault	Sensor damaged	Replace the sensor
F50	Cascade temperature sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F52	Heating sensor fault	Sensor damaged	Replace the sensor
A61	Faulty controller	Controller ABM03	Check the earth connection and replace the controller if necessary.
A62	No communication between controller and gas valve	Controller not connected	Connect the controller to the gas valve
		Valve damaged	Replace the valve
A63 A64 A65 F66	Faulty controller	Controller ABM03	Check the earth connection and replace the controller if necessary.

5.1 Dimensions, connections and main components

5. TECHNICAL DATA AND CHARACTERISTICS

Key of figures cap. 5

- 7 Gas inlet
- 10 System delivery
- 16 Fan
- 32 Heating circulating pump (not supplied)
- 36 Automatic air vent
- 44 Gas valve
- 72 Room thermostat (not supplied)
- 72b Second room thermostat (not supplied)
- 81 Ignition electrode
- 82 Detection electrode
- 95 Diverter valve (not supplied)

A = Heating phase

B = DHW phase

C = Neutral

NOTE: For valves with 2 wires and spring return, use the connections B and C

- 98 Switch
- 114 Water pressure switch
- 130 DHW circulating pump (not supplied)
- 138 External probe (not supplied)
- 139 Remote timer control (not supplied)
- 154 Condensate drain pipe
- 155 Hot water tank temperature probe (not supplied)
- 186 Return sensor
- 188 Ignition/Ionisation electrode
- 191 Fume temperature sensor
- 220 Ignition card
- 256 Modulating heating circulating pump signal
- 275 Heating system drain cock
- 278 Double sensor (Safety + Heating)
- 298 Cascade temperature sensor (not supplied)
- 299 Input 0-10 Vdc
- 300 Burner lit contact (voltage-free contact)
- 301 Fault contact (voltage-free contact)
- 302 Remote reset input (230 Volt)
- 306 Heating system circulating pump (not supplied)
- 307 Heating system second circulating pump (not supplied)
- 321 Low temperature return
- 346 High temperature return
- 357 Faulty contact (230 Vac)
- 361 Cascade connection of next module
- 362 Cascade connection of previous module
- 363 MODBUS communication

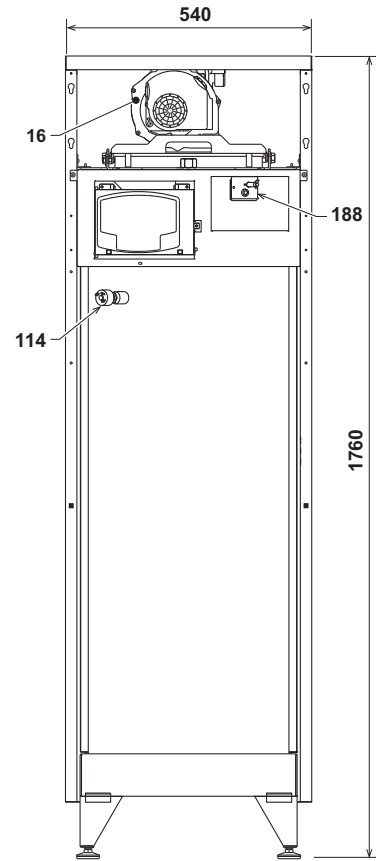


fig. 71 - Front view model B 70

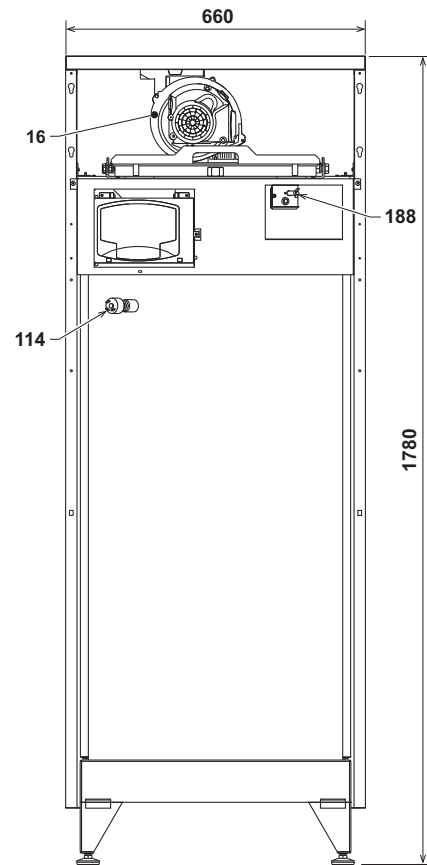


fig. 72 - Front view model B 125

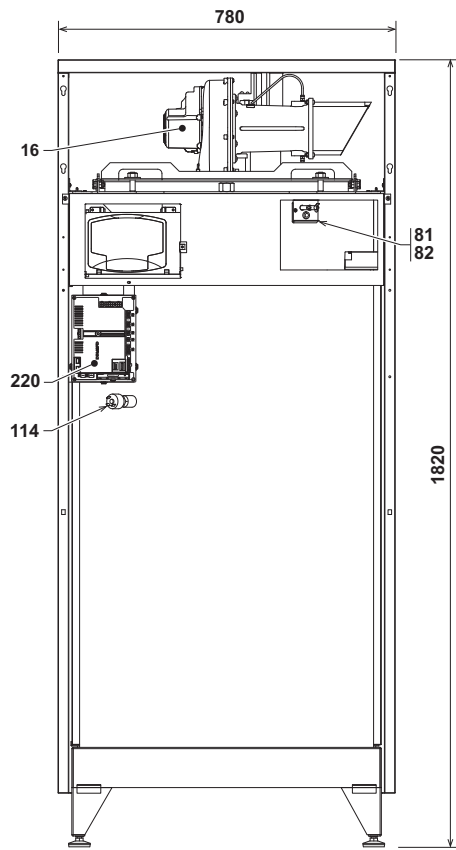


fig. 73 - Front view model B 220

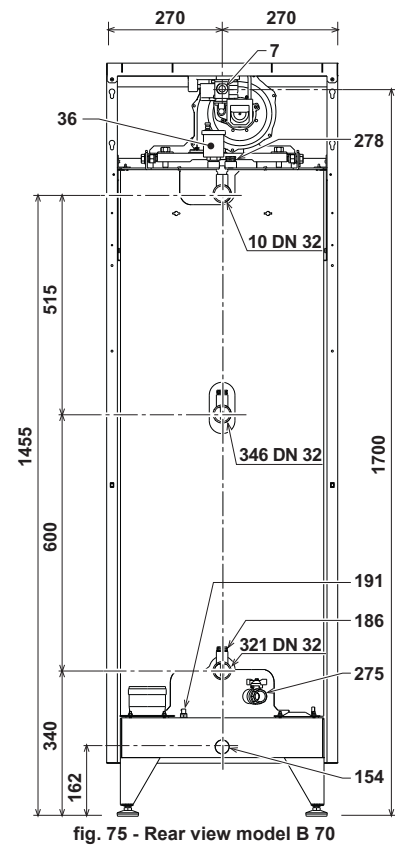


fig. 75 - Rear view model B 70

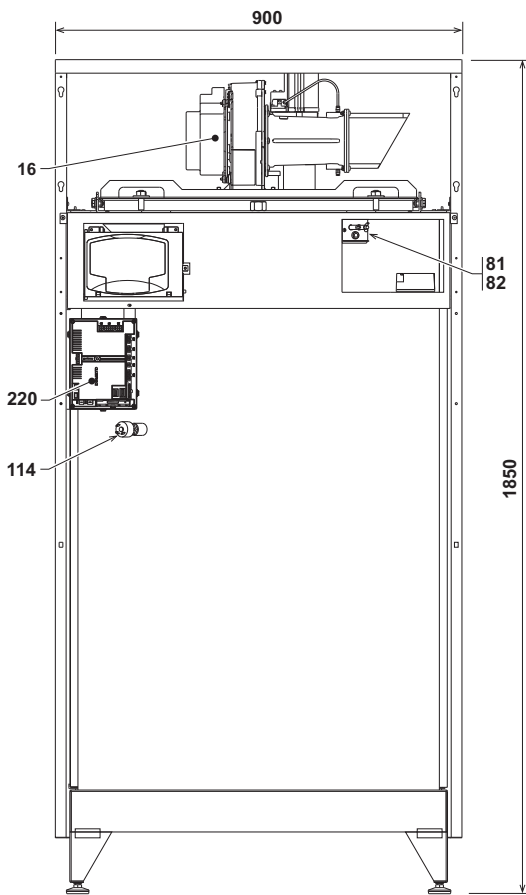


fig. 74 - Front view model B 320

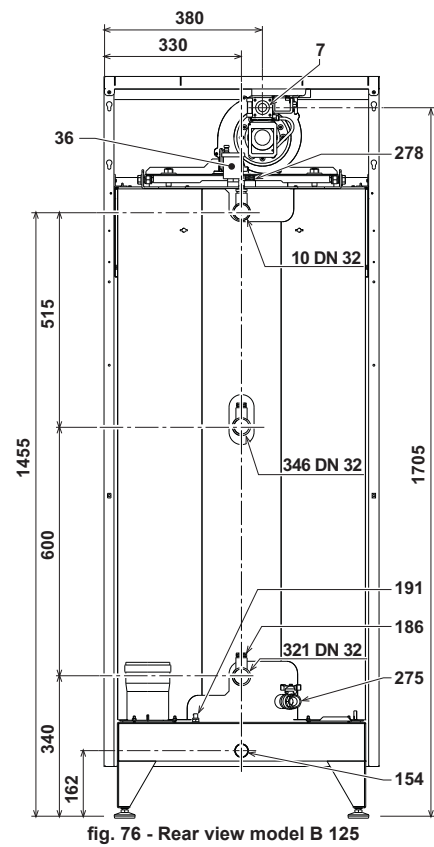


fig. 76 - Rear view model B 125

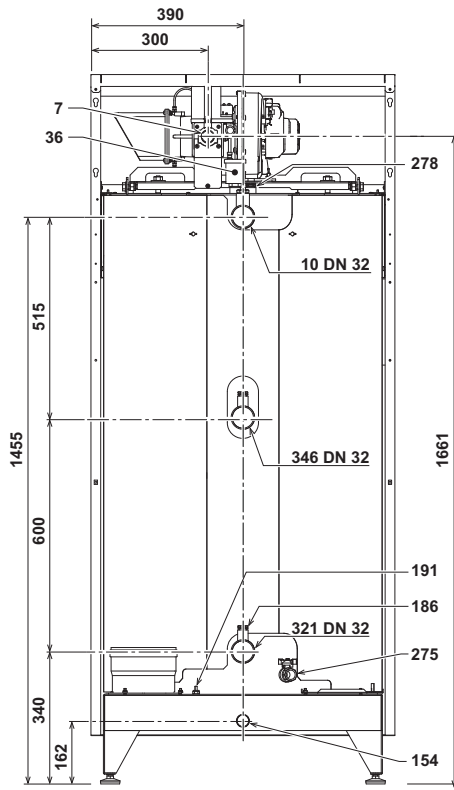


fig. 77 - Rear view model B 220

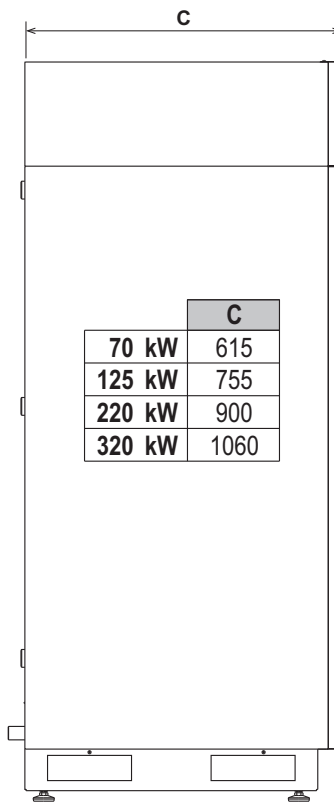


fig. 79 - Side view

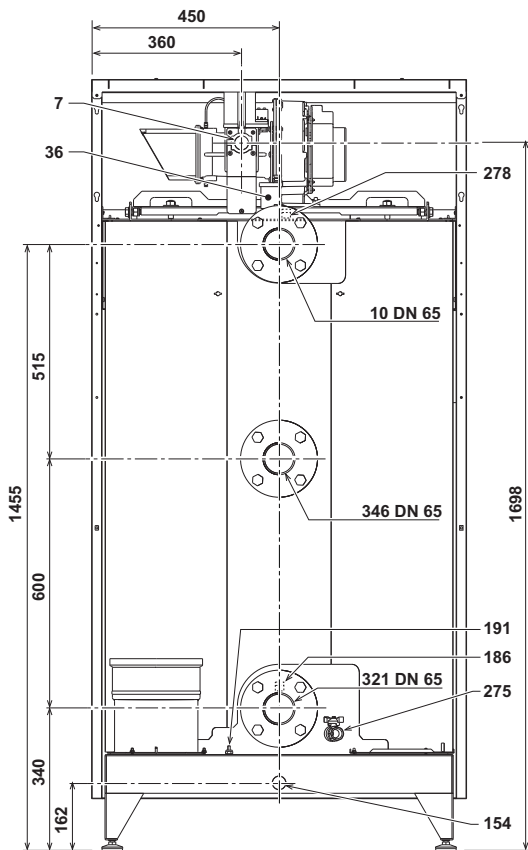


fig. 78 - Rear view model B 320

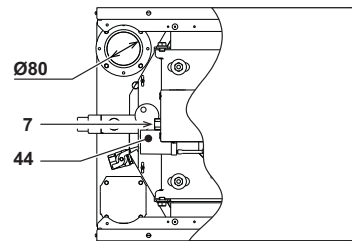


fig. 80 - Top view model B 70

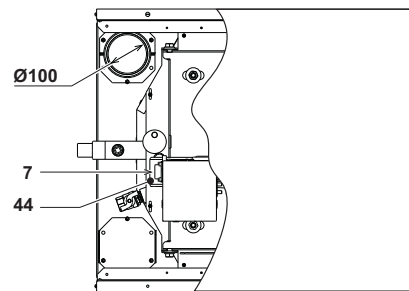


fig. 81 - Top view model B 125

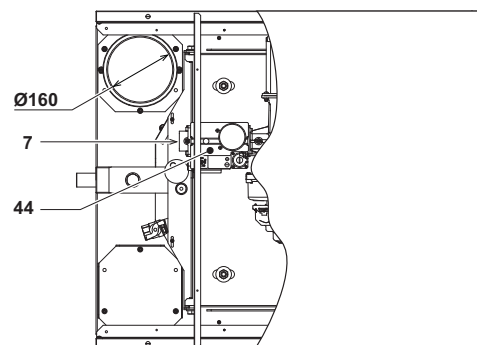


fig. 82 - Top view model B 220

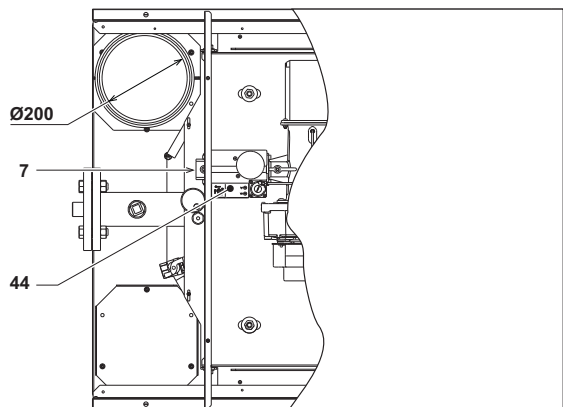


fig. 83 - Top view model B 320

5.2 Water circuit

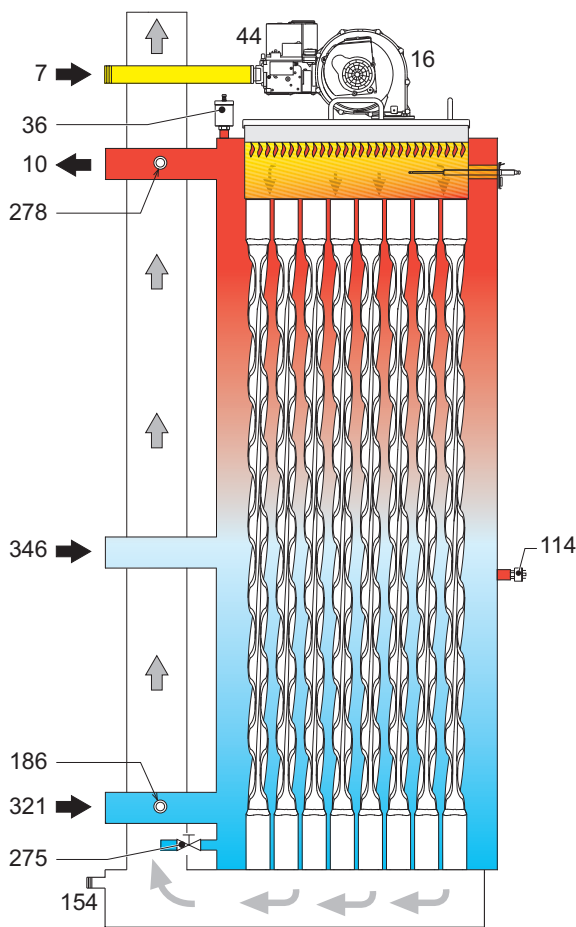


fig. 84 - Water circuit

5.3 Technical data table

The column on the right gives the abbreviation used on the technical data plate.

Data	Unit	Value	Value	Value	Value	
Model		B 70	B 125	B 220	B 320	
Max. heating capacity	kW	65.5	116.0	207.0	299.0	(Q)
Min. heating capacity	kW	14.0	23.0	41.0	62.0	(Q)
Max. Heat Output in heating (80/60 °C)	kW	64.4	114.0	204.0	294.5	(P)
Min. Heat Output in heating (80/60 °C)	kW	13.7	22.5	40.2	60.8	(P)
Max. Heat Output in heating (50/30 °C)	kW	69.9	125	220	320	(P)
Min. Heat Output in heating (50/30 °C)	kW	15.0	24.8	44.2	66.8	(P)
Efficiency Pmax (80/60 °C)	%	98.3	98.3	98.5	98.5	
Efficiency Pmin (80/60 °C)	%	98.0	98.0	98.0	98.0	
Efficiency Pmax (50/30 °C)	%	106.8	106.8	106.8	106.8	
Efficiency Pmin(50/30 °C)	%	107.7	107.7	107.7	107.7	
Efficiency 30%	%	109.6	109.6	109.6	109.6	
Efficiency class Directive 92/42 EEC	-	★★★★				
NOx emission class	-	5	5	5	5	(NOx)
Gas nozzle G20	Ø	6.7	9.4	15.5	17.0	

Data	Unit	Value	Value	Value	Value	
Model		B 70	B 125	B 220	B 320	
Gas supply pressure G20	mbar	20	20	20	20	
Max. gas delivery G20	m ³ /h	6.93	12.8	21.9	31.6	
Min. gas delivery G20	m ³ /h	1.48	2.4	4.3	6.5	
CO ₂ max G20	%	9.00	9.00	9.00	9.00	
CO ₂ min G20	%	8.50	8.50	8.50	8.50	
Gas nozzle G31	Ø	5.2	7.4	12.5	12.5	
Gas supply pressure G31	mbar	37	37	37	37	
Max. gas delivery G31	kg/h	5.13	9.0	16.2	23.4	
Min. gas delivery G31	kg/h	1.10	1.8	3.2	4.8	
CO ₂ max G31	%	10.50	10.50	10.50	10.50	
CO ₂ min G31	%	9.50	9.50	9.50	9.50	
Max. working pressure in heating	bar	6	6	6	6	(PMS)
Min. working pressure in heating	bar	0.5	0.5	0.5	0.5	
Max. heating temperature	°C	95	95	95	95	(tmax)
Heating water content	litres	160	265	380	530	
Protection rating	IP	X5D	X0D	X0D	X0D	
Power supply voltage	V/Hz	230/50	230/50	230/50	230/50	
Electrical power input	W	95	200	260	370	
Empty weight	kg	180	280	400	500	
Type of unit		B ₂₃				
PIN CE		0085CL0441				

These boilers can operate correctly with a minimum flow of 0 litres/hour.

5.4 Diagrams

Pressure loss

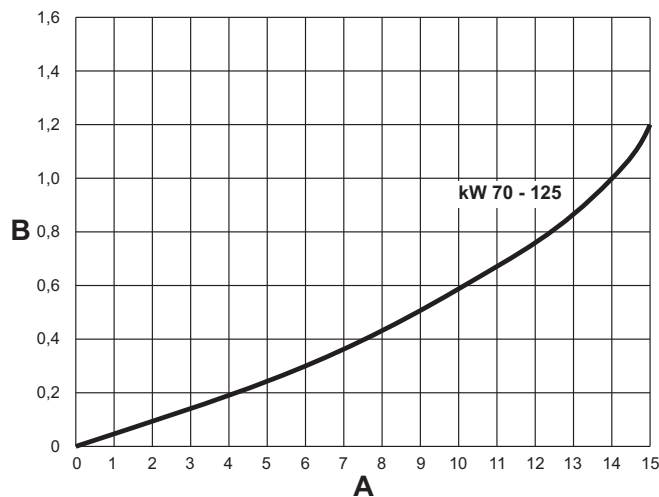


fig. 85 - Pressure loss diagram models B 70 - B 125

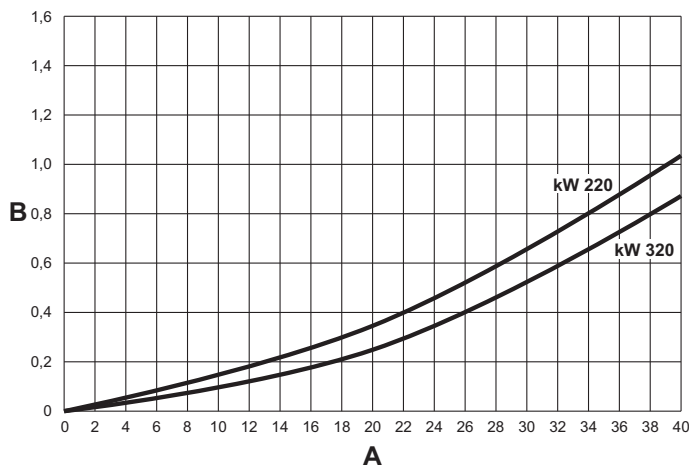


fig. 86 - Pressure loss diagram models B 220 and B 320

A Flow rate - m³/h
B m H₂O

5.5 Wiring diagrams

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

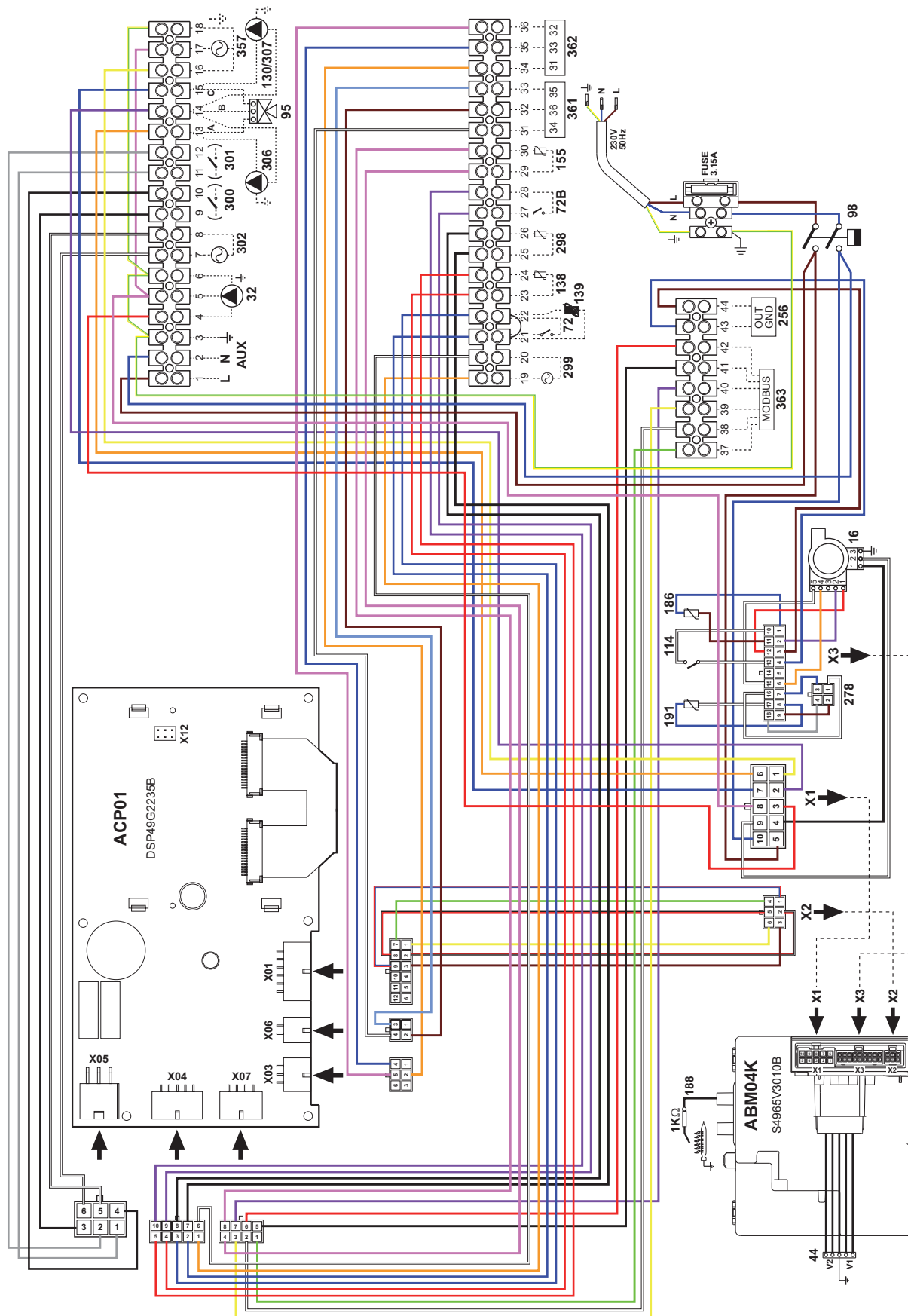


fig. 87 - Wiring diagram QUADRIFOGLIO B 70

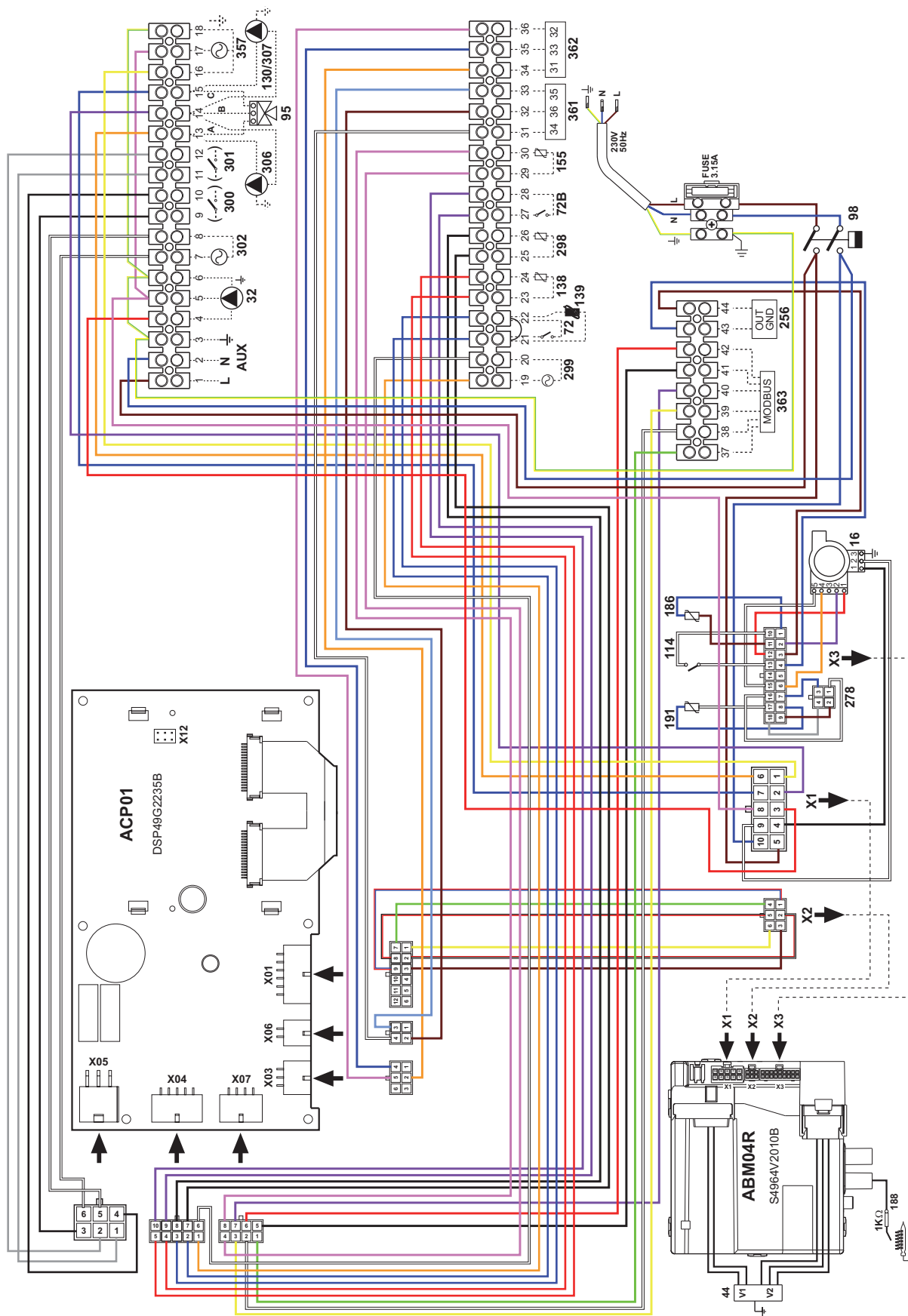


fig. 88 - Wiring diagram QUADRIFOGLIO B 125

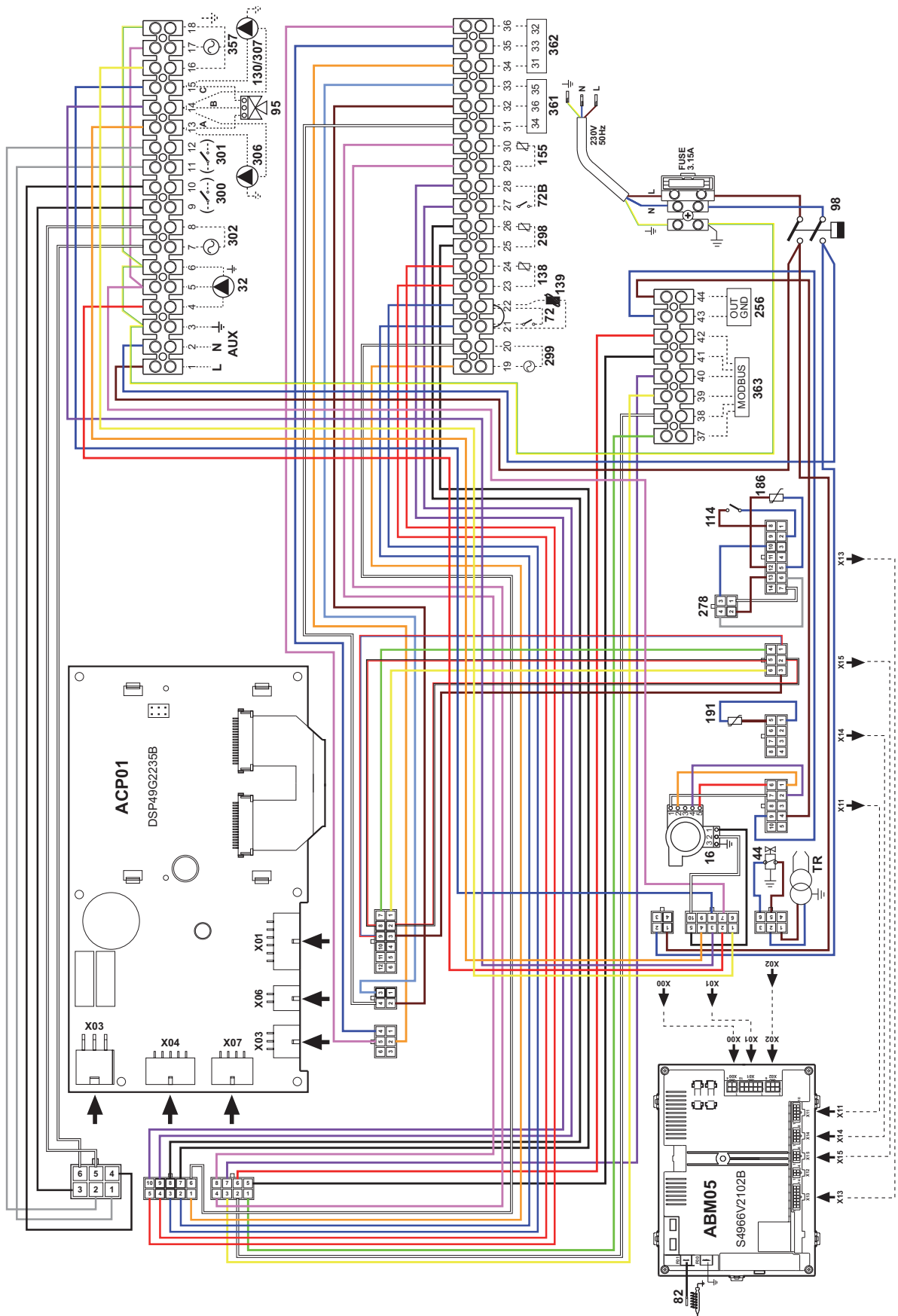


fig. 89 - Wiring diagram QUADRIFOGLIO B 220 / B 320

IT

Dichiarazione di conformità

Il costruttore: FERROLI S.p.A.

Indirizzo: Via Ritonda 78/a 37047 San Bonifacio VR

dichiara che questo apparecchio è conforme alle seguenti direttive CEE:

- Direttiva Apparecchi a Gas 2009/142
- Direttiva Rendimenti 92/42
- Direttiva Bassa Tensione 2006/95
- Direttiva Compatibilità Elettromagnetica 2004/108

Presidente e Legale rappresentante

Cav. del Lavoro

Dante Ferroli



CE

ES

Declaración de conformidad

El fabricante: FERROLI S.p.A.

Dirección: Via Ritonda 78/a 37047 San Bonifacio (Verona)

declara que este equipo satisface las siguientes directivas CEE:

- Directiva de Aparatos de Gas 2009/142
- Directiva de Rendimientos 92/42
- Directiva de Baja Tensión 2006/95
- Directiva de Compatibilidad Electromagnética 2004/108

Presidente y representante legal

Caballero del Trabajo

Dante Ferroli



CE

TR

Uygunluk beyanı

İmalatçı: FERROLI S.p.A.

Adres: Via Ritonda 78/a 37047 San Bonifacio VR

bu cihazın; aşağıda yer alan AET(EEC) yönergelerine uygunluk içinde olduğunu beyan etmektedir:

- 2009/142 Gazla çalıştırılan üniteler için Yönetmelik
- 92/42 Randıman/Verimlilik Yönetmeliği
- Yönerge 73/23, Düşük Voltaj 2006/95
- 89/336 Elektromanyetik Uygunluk Yönetmeliği 2004/108

Baskan ve yasal temsilci

İş. Dep.

Dante Ferroli



CE

EN

Declaration of conformity

Manufacturer: FERROLI S.p.A.

Address: Via Ritonda 78/a 37047 San Bonifacio VR Italy

declares that this unit complies with the following EU directives:

- Gas Appliance Directive 2009/142
- Efficiency Directive 92/42
- Low Voltage Directive 2006/95
- Electromagnetic Compatibility Directive 2004/108

President and Legal Representative

Cav. del Lavoro

Dante Ferroli



CE

FR

Déclaration de conformité

CE

Le constructeur : FERROLI S.p.A.

Adresse: Via Ritonda 78/a 37047 San Bonifacio VR

déclare que cet appareil est conforme aux directives CEE ci-dessous:

- Directives appareils à gaz 2009/142
- Directive rendements 92/42
- Directive basse tension 2006/95
- Directive Compatibilité Electromagnétique 2004/108

Président et fondé de pouvoirs

Cav. du travail

Dante Ferrolì

**RU**

Декларация соответствия

CE

Изготовитель: FERROLI S.p.A.,

адрес: Via Ritonda 78/a 37047 San Bonifacio VR,

заявляет, что настоящее изделие соответствует следующим директивам CEE:

- Директива по газовым приборам 2009/142
- Директива по К.П.Д. 92/42
- Директива по низкому напряжению 2006/95
- Директива по электромагнитной совместимости 2004/108

Президент и уполномоченный представитель

Кавалере дель лаворо (почетный титул, присуждаемый государством за заслуги в руководстве промышленностью)

Dante Ferrolì

**UA**

Декларація про відповідність

CE

Виробник: компанія FERROLI S.p.A.

за адресою: Via Ritonda 78/a 37047 San Bonifacio VR

заявляє, що цей апарат відповідає усім наступним Директивам ЄС:

- Директива ЄС 2009/142 (Директива про зближення правових норм країн-членів ЄС для газо-розхідних установок)
- Директива ЄС 92/42 (Директива про вимоги КПД для нових водогрійних котлів, працюючих на рідинному і газоподібному паливі)
- Директива ЄС 2006/95 (Директива про зближення правових норм країн-членів ЄС, що стосуються електрообладнання, яке використовується в певних межах напруги)
- Директива ЄС 2004/108 (Директива про приведення у відповідність законодавств країн-членів в області електромагнітної сумісності).

Президент і законний представник
Кавалер праці

Dante Ferrolì



FERROLI S.p.A.

Via Ritonda 78/a

37047 San Bonifacio - Verona - ITALY

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