

## EN

### 1. GENERAL INSTRUCTIONS

- Carefully read 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, according to current regulations and 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 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 attempt to repair it or directly intervene. Contact professionally qualified personnel. Repair/replacement of the products must only be carried out by professionally qualified using original spare 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 considered improper and therefore dangerous.
- 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 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**, a boiler with base **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** 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 shell** consists of a patented stainless steel helical tube exchanger and a **premix burner** in steel, equipped with electronic ignition and ionization flame control, a modulating speed fan and a modulating gas valve. **QUADRIFOGLIO** is a heat generator arranged to operate alone or in cascade.

#### 2.2 Control panel

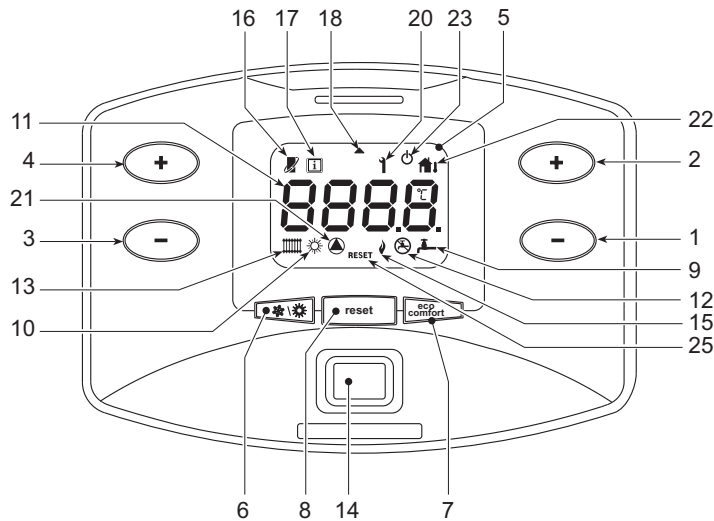


fig. 1 - Control panel

Key

- 1 = DHW temperature setting decrease button (with optional hot water tank installed)
- 2 = DHW temperature setting increase button (with optional hot water tank installed)
- 3 = Heating system temperature setting decrease button
- 4 = Heating system temperature setting increase button
- 5 = Display
- 6 = Summer/Winter mode selection button
- 7 = Economy/Comfort mode selection (with optional hot water tank installed) and unit On/Off button
- 8 = Reset button
- 9 = DHW operation (with optional hot water tank installed)
- 10 = Summer mode
- 11 = Multifunction

- 12 = Eco (Economy) mode (with optional hot water tank installed)
- 13 = Heating mode
- 14 = Unit On / Off button
- 15 = Burner On
- 16 = Appears on connecting the Remote Timer Control (optional)
- 17 = Information symbol
- 18 = Arrow symbol
- 20 = Fault
- 21 = Circulating pump On
- 22 = Appears on connecting the external probe (optional)
- 23 = Boiler Off
- 25 = Fault reset request

#### Indication during operation

##### Heating

A heating demand (generated by the Room Thermostat or Remote Timer Control or 0-10 Vdc signal) is indicated by activation of the circulating pump and the radiator (details 13 and 21 - fig. 1).

The display (detail 11 - fig. 1) shows the actual heating delivery temperature, and during DHW standby time, the message "d".

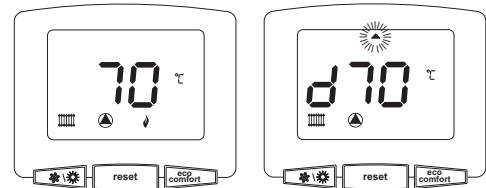


fig. 2

##### DHW circuit (with optional hot water tank installed)

A hot water tank heating demand is indicated by activation of the circulating pump and the tap (details 9 and 21 - fig. 1). The display (detail 11 - fig. 1) shows the actual hot water tank sensor temperature, and during heating standby time, the message "d".

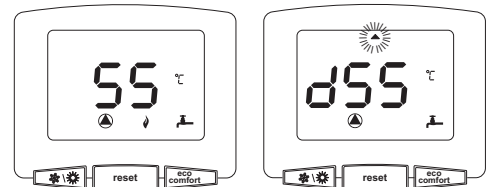


fig. 3 -

#### Exclude hot water storage tank (economy)

Hot water tank temperature maintaining/heating can be excluded by the user. If excluded, domestic hot water will not be delivered. The hot water tank can be deactivated by the user (ECO mode) by pressing the **eco/comfort** button (detail 7 - fig. 1). In ECO mode the display activates the symbol (detail 12 - fig. 1). To activate the COMFORT mode, press the **eco/comfort** button (detail 7 - fig. 1) again.

#### 2.3 Lighting and turning off

##### Boiler lighting

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

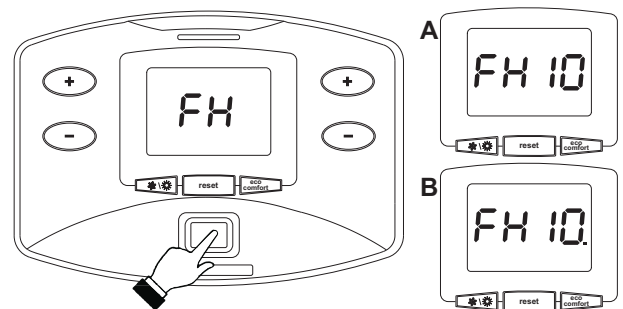


fig. 4 - Boiler lighting

- For the following 120 seconds the display will show FH which identifies the heating system air venting cycle.
- During the first 10 seconds the display will also show the card software release (A = Display card software release / B = Controller software release).
- 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.

## Turning the boiler off

Press the button  (detail 7 - fig. 1) for 5 seconds.

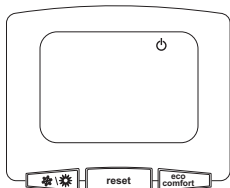


fig. 5 - Turning the boiler off

When the boiler is turned off, the PCB is still powered.

Domestic hot water (with optional hot water tank installed) and heating operation are disabled. The antifreeze system remains activated.

To relight the boiler, press the button  (detail 7 fig. 1) again for 5 seconds.



fig. 6

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

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



The antifreeze system does not work when the power and/or gas to the unit are turned off. To avoid damage caused by freezing during long idle periods in winter, it is advisable to drain all water from the boiler, DHW circuit and system; or drain just the DHW circuit and add a suitable antifreeze to the heating system, complying with that prescribed in sec. 3.3.

## 2.4 Adjustments

### Summer/Winter Switchover

Press the button  detail 6 - fig. 1 for 1 second.

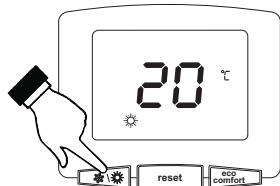


fig. 7

The display activates the Summer symbol detail 10 - fig. 1. The heating function is deactivated, whereas the possible production of domestic hot water (with optional external hot water tank) remains activated. The antifreeze system remains activated.

To deactivate Summer mode, press the button  (detail 6 - fig. 1) again for 1 second.

### 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 90°C.

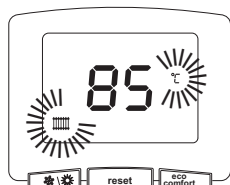


fig. 8

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

Use the DHW buttons (details 1 and 2 - fig. 1) to adjust the temperature from a min. of 10°C to a max. of 65°C.

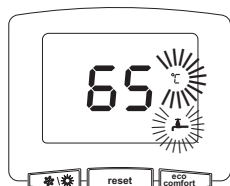


fig. 9

## 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 the optional external probe is installed the corresponding symbol (detail 22 fig. 1) is activated on the control panel display (detail 5 - fig. 1). The boiler control system works with "Sliding Temperature". In this mode, the heating system temperature is controlled according to the outside weather conditions in order to ensure high comfort and energy saving throughout the year. In particular, as the outside temperature increases, the system delivery temperature is decreased according to a specific "compensation curve".

With 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. Adjustments can in any case be made by the user to improve comfort.

Compensation curve and curve offset

Press the **reset** button fig. 1 (detail 8 - ) for 5 seconds, to display the actual compensation curve (fig. 10) which can be modified with the **DHW buttons** (details 1 and 2 - fig. 1).

Adjust the required curve from 1 to 10 according to the characteristic (fig. 12).

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



fig. 10 - Compensation curve

Press the **heating buttons** (details 3 and 4 - fig. 1) to access parallel curve offset (fig. 13), modifiable with the **DHW buttons** (details 1 and 2 - fig. 1).

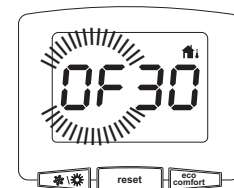


fig. 11 - Curve parallel offset

Press the **reset** button (detail 8 - fig. 1) again for 5 seconds to exit parallel curve adjustment mode.

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.

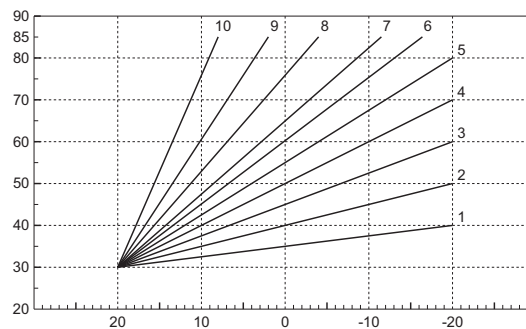


fig. 12 - Compensation curves

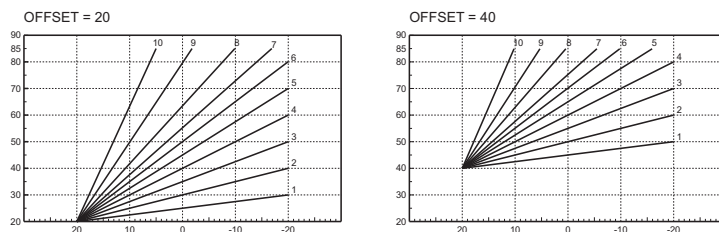


fig. 13 - Example of compensation parallel curve offset

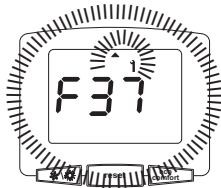
If the Remote Timer Control (optional) is connected to the boiler, the above adjustments are managed according to that given in table 1.

**Table. 1**

<b>Heating temperature adjustment</b>	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
<b>DHW temperature adjustment (with optional hot water tank installed)</b>	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
<b>Summer/Winter Switchover</b>	Summer mode has priority over a possible Remote Timer Control heating demand.
<b>Eco/Comfort selection (with optional hot water tank installed)</b>	On disabling DHW from the Remote Timer Control menu, the boiler selects the Economy mode. In this condition, the button fig. 1detail 7 - on the boiler panel is disabled.
	On enabling DHW from the Remote Timer Control menu, the boiler selects the Comfort mode. In this condition it is possible select one of the two modes with the button detail 7 -fig. 1.
<b>Sliding Temperature</b>	Both the Remote Timer Control and the boiler card manage Sliding Temperature adjustment: of the two, the Sliding Temperature of the boiler card has priority.

### Plumbing system pressure adjustment

The filling pressure with the system cold must be approx. 1.0 bar. If the system pressure falls to values below minimum, the boiler card will activate fault F37 (fig. 14).



**fig. 14 - Low system pressure fault**

Once the system pressure is restored, the boiler will activate the 120-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 is a heat generator arranged to operate alone or in cascade (bank).

The boiler's electronics can in any case manage a cascade of **up to 6 modules**. To create systems in cascade it is necessary to have suitably sized water / gas manifolds complete with all the safety devices required by the current regulations, as well as single fume exhausts or fume manifolds in low pressure (not supplied) installed by a qualified technician.

When two or more generators QUADRIFOGLIO are installed in cascade, respecting the instructions given in this manual, they can be considered as a single equivalent heat generator with a total capacity equal to the sum of powers of all the units connected cascade.

All the requirements of the current standards and regulations applicable to this "equivalent" generator with 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.

In fact, each QUADRIFOGLIO is a complete and independent heat generator, equipped with its own safety devices. In the event of over-temperature, a lack of water or of circulation in the unit, the protection devices cause the unit to switch off or shut down, preventing it from working.

The installation instructions given in the following paragraphs concern both single units and connection in cascade.

### 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 of not more than 0.5 metres, with no shut-off devices in between. The unit is not supplied with an expansion tank or a safety valve, therefore their connection must 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.

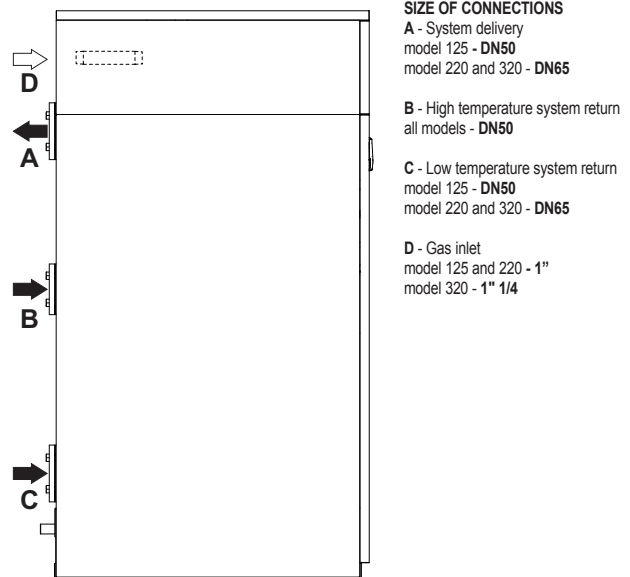
Before installation, carefully clean all the system pipes to remove any residuals or impurities that could affect proper operation of the unit.



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.



**fig. 15 - Connections**

In case of installation in bank, the hydraulic circuit of each boiler must have a non-return valve or a motor-operated valve (controlled by the unit, see wiring diagram fig. 44) that prevents reverse circulation when the boiler is not working.

The following optional kits are available for this purpose:

**052000X0** - MOTOR-OPERATED BUTTERFLY VALVE DN50

**052001X0** - MOTOR-OPERATED BUTTERFLY VALVE DN65

### System water characteristics

In the presence of water harder than 25° Fr (1°F = 10ppm CaCO<sub>3</sub>), the use of suitably treated water is advisable in order to avoid possible scaling in the boiler. The treatment must not in any case reduce the hardness to values below 15°F (Decree 236/88 for uses of water intended for human consumption). Water treatment is indispensable in the case of very large systems or with frequent replenishing of water in the system. If partial or total emptying of the system becomes necessary in these cases, it is advisable to refill it with treated water.

### Antifreeze system, antifreeze fluids, additives and inhibitors

The boiler is equipped with an antifreeze system that turns on the boiler in heating mode when the system delivery water temperature falls under 6°C. The device will not come on if the electricity and/or gas supply to the unit are cut off. If it becomes necessary, it is permissible to use antifreeze fluid, additives and inhibitors only if the manufacturer of these fluids or additives guarantees they are suitable for this use and cause no damage to the heat exchanger or other components and/or materials of the boiler unit and system. It is prohibited to use generic antifreeze fluid, additives or inhibitors that are not expressly suited for use in heating systems and compatible with the materials of the boiler unit and system.

**Water circuit examples**

Key of examples

- I\* ISPEL safety devices (When required - not supplied)
- 32 Circulating pump (not supplied)
- 72 Room thermostat (not supplied)
- 72b Room thermostat (not supplied)
- 95 Three-way valve - with spring return: at rest on DHW side (not supplied)
- 130 Hot water tank circulating pump (not supplied)
- 138 External probe (not supplied)
- 139 Remote Control (not supplied)
- 155 Hot water tank temperature probe (not supplied)
- 298 Cascade temperature sensor (not supplied)
- 306 Heating system circulating pump (not supplied)
- 307 Heating system second circulating pump (not supplied)
- EL Solenoid valve (optional)
- SM Delivery probe (supplied with kit FZ4)
- TS Safety thermostat (not supplied)
- PR Heating pump (not supplied)
- PZ Zone pump (not supplied)
- FZ4 Zone regulator

**Parameters**

Each system requires a different parametrisation. Follow the procedure for accessing the two menus, given below; for the parameters to be modified, refer to the tables given alongside the plumbing diagrams.

**"Service Menu"**

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

Press the Heating buttons to select "tS", "In", "Hi" or "rE". "tS" means Transparent Parameters Menu, "In" Information Menu, "Hi" History Menu, and "rE" History Menu Reset. Select "tS" and press the Reset button.

The card is equipped with 29 transparent parameters also modifiable from Remote Control (Service Menu).

Press the Heating buttons to scroll the list of parameters in increasing or decreasing order. Press the DHW buttons to modify the value of a parameter: the change will be automatically saved.

Press the Reset button to return to the Service Menu. Press the Reset button for 10 seconds to exit to the card Service Menu.

**"System Type Menu"**

Press the Summer/Winter button for 10 seconds to access the card System Type Menu.

The card has 21 transparent parameters.

Press the Heating buttons to scroll the list of parameters in increasing or decreasing order. Press the DHW buttons to modify the value of a parameter: the change will be automatically saved.

Press the Summer/Winter button for 10 seconds to exit the card System Type Menu.

**One direct heating circuit**

Check/Change parameter P02 of the "Transparent Parameters Menu" to 4.

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

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

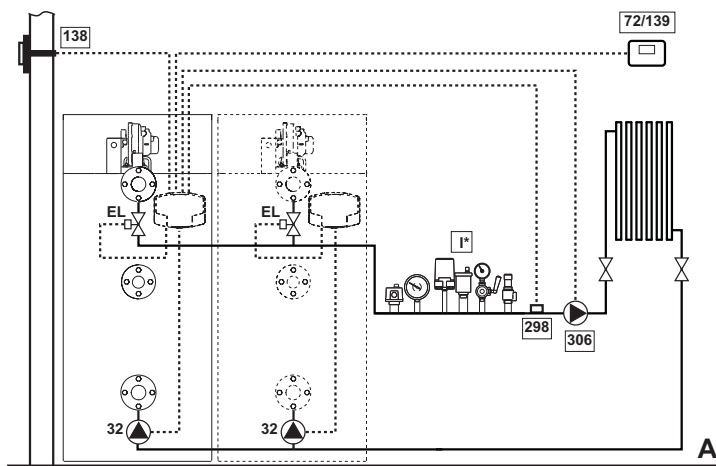


fig. 16

**One direct heating circuit and one DHW circuit with diverter valve**

Check/Change parameter P02 of the "Transparent Parameters Menu" to 6.

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

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

Change parameter P.11 of the "System Type Menu" to 1

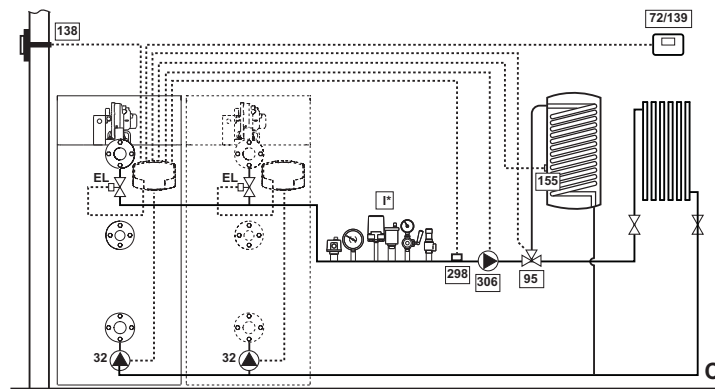


fig. 17

**Two direct heating circuits**

Check/Change parameter P02 of the "Transparent Parameters Menu" to 4.

Change parameter P.01 of the "System Type Menu" to 4

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

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

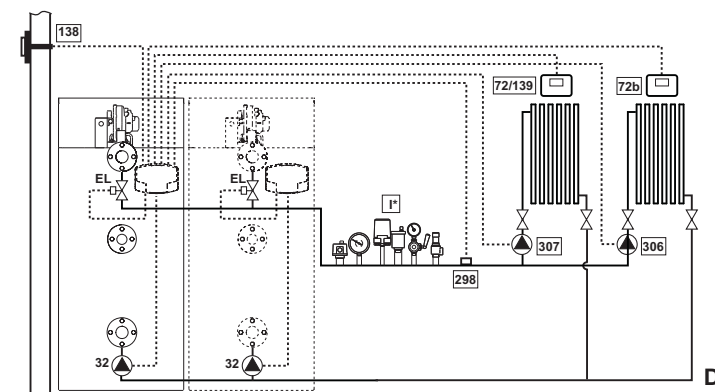


fig. 18

**Two mixed heating circuits and one direct heating circuit**

Check/Change parameter P02 of the "Transparent Parameters Menu" to 4.

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

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

For the electrical connection and the zone system settings, refer to the "FZ4 zone regulator" handbook

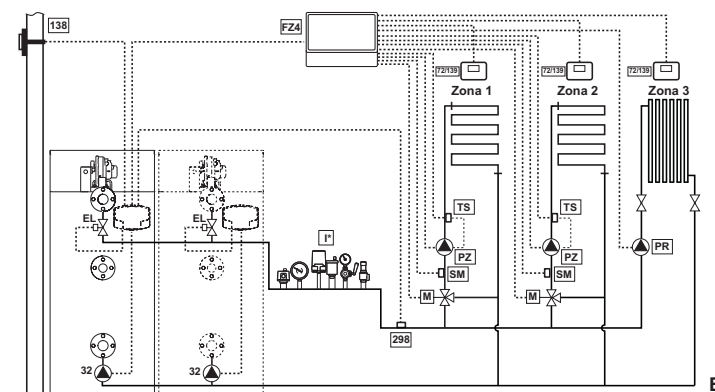


fig. 19



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

Check/Change parameter P02 of the "Transparent Parameters Menu" to 5.

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

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

For the electrical connection and the zone system settings, refer to the "FZ4 zone regulator" handbook

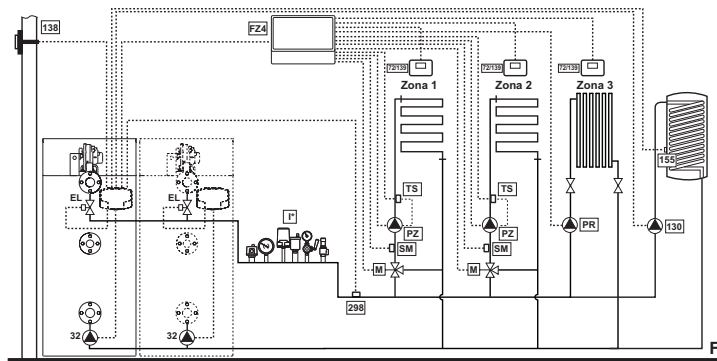


fig. 20

### 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. 37 and fig. 38) in conformity with current standards, with a rigid metal pipe or with a continuous surface flexible s/steel tube, installing a gas cock between the system and boiler. Make sure all the gas connections are tight. The gas meter capacity must be suitable for the simultaneous use of all the units connected to it. The diameter of the gas pipe leaving the boiler does not determine the diameter of the pipe between the unit and the meter; it must be chosen according to its length and loss of head, in conformity with current standards.

**!** 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 mm<sup>2</sup> 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.

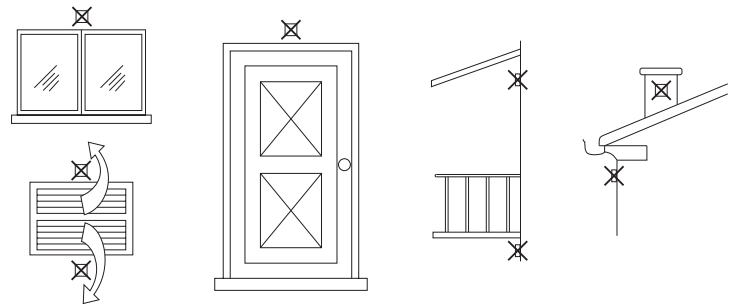


fig. 21 - Inadvisable positioning of external probe

### Accessing electrical terminal block

The electrical terminal block is located inside a sealed box at the bottom left of the cabinet. Make the electrical connections as shown in the wiring diagram on fig. 44 and run the cables through the special cable glands.

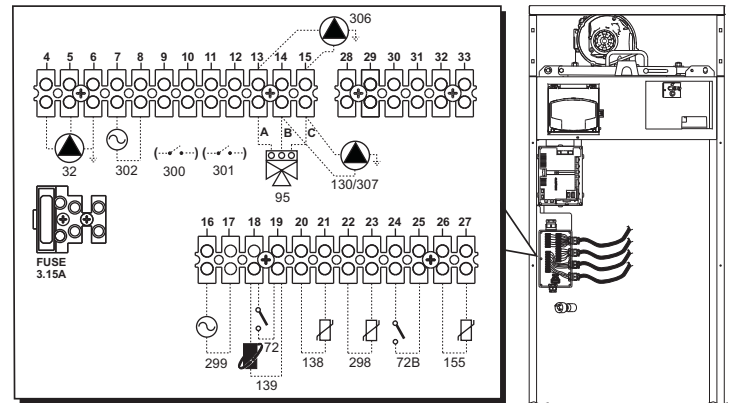


fig. 22 - Electrical terminal block

32 Heating circulating pump (not supplied)	139 Remote timer control (not supplied)
72 Room thermostat (not supplied)	155 DHW temperature sensor (not supplied)
72b Room thermostat (not supplied)	298 Cascade temperature sensor (not supplied)
138 External probe (not supplied)	
95 Diverter valve (not supplied)	299 Input 0-10 Vdc
A = Heating phase	300 Burner lit contact (voltage-free contact)
B = DHW phase	301 Fault contact (voltage-free contact)
C = Neutral	302 Remote reset input (230 Volt)
<b>Note:</b> For valves with 2 wires and spring return, use the connections B and C	306 Heating system circulating pump (not supplied)
130 DHW circulating pump (not supplied)	307 Heating system second circulating pump (not supplied)

### For the connection in cascade

**Note:** The boiler's electronics can manage up to 6 modules.

1. Connect the modules as shown in fig. 23 (example with 4 modules)

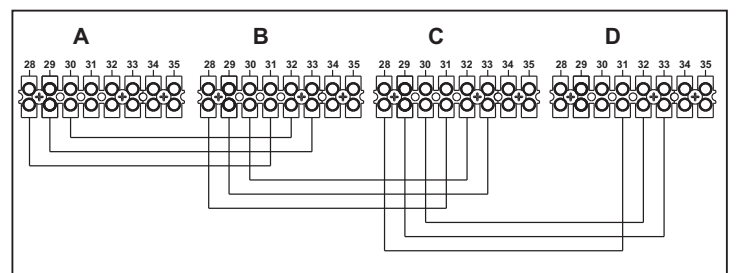


fig. 23 - Connection in cascade

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

2. Carry out all the electrical connections (terminals 4 to 27) on module no. 1

3. On the remaining modules, only connect the power supply and possible 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 "FH" procedure, check correct operation of the cascade:
  - Module 1: arrow symbol at top left of the display
  - Module 2: arrow symbol at bottom right of the display
  - Module 3: arrow symbol at bottom right of the display
  - Module 4: arrow symbol at top right of the display

If this does not occur, disconnect the power and check the wiring in fig. 23.

### 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

#### Warnings

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 airtight. In particular, joints must be condensation-proof. In addition, make provision for adequate condensate drainage points, connected via an air-trap to prevent the condensation in the flues running into the generators.



Each device is provided with two chimney connections to offer greater installation flexibility. Use only one of the outlets and check that the other one is correctly plugged (see fig. 24). When installing in a bank with the fumes outlets connected to a single chimney or manifold **it is mandatory to install a fume anti-backflow valve on each outlet** to prevent operating trouble or the onset of dangerous conditions. Make sure to use the optional kits FERROLI, provided with special anti-backflow valves

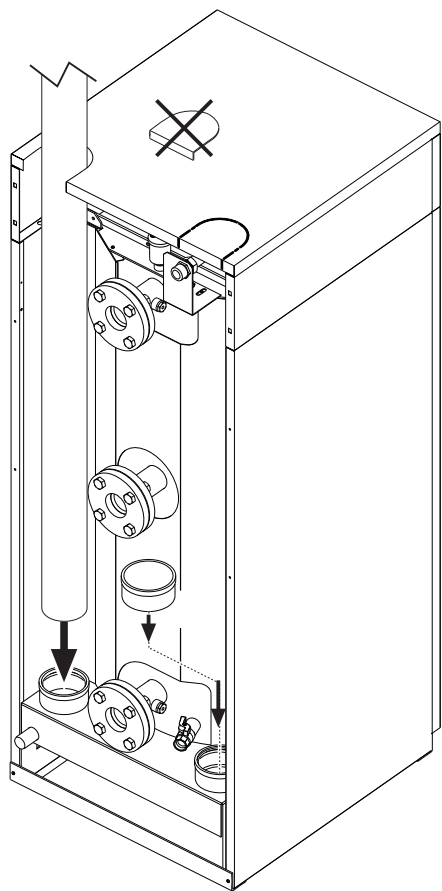


fig. 24 - Fume outlet



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 greatest available head indicated in table 2.

Table. 2 - Maximum flue length

	Model "125" Ø 100	Model "220" Ø 160	Model "320" Ø 200
Maximum flue head	150 Pa	200 Pa	200 Pa

### 3.7 Condensate drain connection

The boiler is equipped with a trap to drain condensate. Carry out the following instructions for fitting.

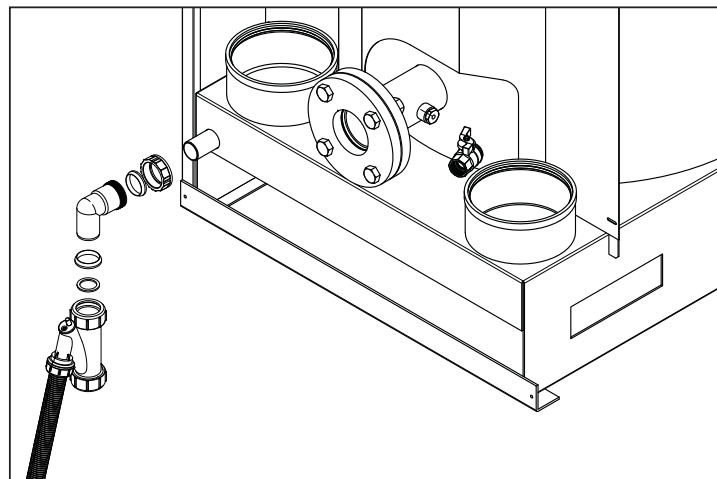


fig. 25 - Condensate outlet connection

### 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, startup and maintenance operations described below must only be carried out by Qualified Personnel (meeting the professional technical requirements prescribed by 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 unauthorized 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 dataplate. 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. Unscrew the knob "A" fastening the gas valve (see fig. 26, fig. 27 and fig. 28 for the various models).
5. Undo the fixing screws "E" and remove the gas valve.
6. Replace the gas valve "F" positioning it inside the gasket "G" with that contained in the conversion kit. Refit the parts and check the tightness.
7. Modify the parameter for the type of gas:
  - put the boiler in standby mode
  - press the DHW buttons simultaneously (part 1 and 2 - fig. 1) for 10 seconds. the display shows "P01" flashing.
  - press the DHW buttons simultaneously (part 1 and 2 - fig. 1) to set parameter **00** (for operation with natural gas) or **01** (for operation with LPG).
  - press the DHW buttons simultaneously (part 1 and 2 - fig. 1) for 10 seconds. The boiler will return to standby mode
8. Apply the label, contained in the conversion kit, near the dataplate.
9. Using a combustion analyzer connected to the boiler fume outlet, make sure the CO<sub>2</sub> 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.

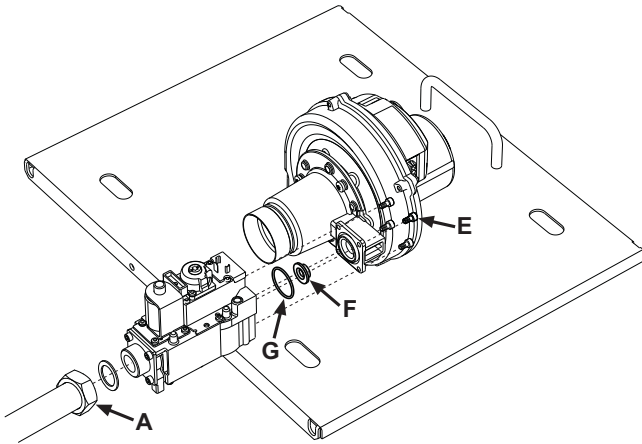


fig. 26 - Model QUADRIFOGLIO 125

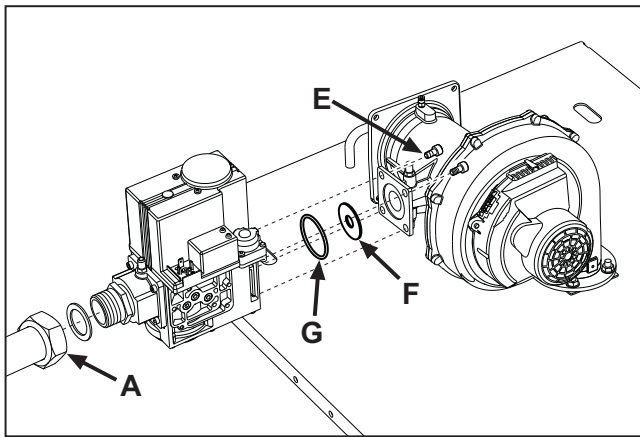


fig. 27 - Model QUADRIFOGLIO 220

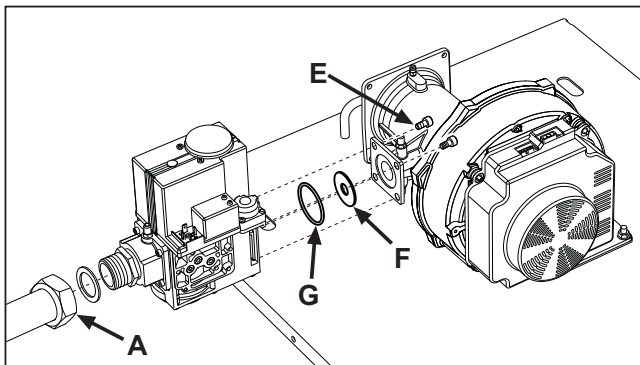


fig. 28 - Model QUADRIFOGLIO 320

### TEST mode activation

Press the **heating buttons** (details 3 and 4 - fig. 1) together for 5 seconds to activate the **TEST** mode. The boiler lights , gradually reaching the maximum heating power, set as described in the following section.

The heating symbol (detail 13 - fig. 1) and DHW symbol (detail 9 - fig. 1) flash on the display; the heating power will be displayed alongside.

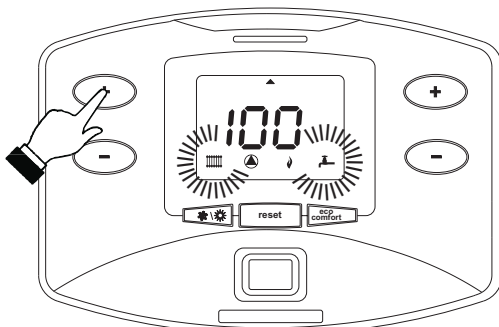


fig. 29 - TEST mode (heating power = 100%)

To deactivate the TEST mode, repeat the activation sequence.

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

### Heating power adjustment

To adjust the heating power, switch the boiler to TEST mode (see sec. 4.1).

Press the **heating buttons** (details 3 and 4 - fig. 1) to increase or decrease the power (min. = 00 - max. = 100).

Press the **reset button** (detail 8 - fig. 1) within 5 seconds; the max. power will remain that just set. Exit the TEST mode (see sec. 4.1).

### 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 prefiling 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 CO<sub>2</sub> 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 check

To keep the unit working properly over time, it is necessary to have qualified personnel make an annual check that includes the following tests:

- The control and safety devices (gas valve, flow meter, thermostats, etc.) must function correctly.
- The fume extraction circuit must be fully efficient.
- The airtight chamber must be sealed
- The air-fume end piece and ducts must be free of obstructions and leaks
- The condensate evacuation system must be efficient with no leakage or obstructions.
- The burner and exchanger must be clean and free of scale. When cleaning, do not use chemical products or wire brushes.
- The electrode must be free of scale and properly positioned.
- The gas and water systems must be airtight.
- The water pressure in the cold water system must be about 1 bar; otherwise, bring it to that value.
- The circulation pump must not be blocked.
- The expansion tank must be filled.
- The gas flow and pressure must correspond to that given in the respective tables.



The boiler casing, panel and aesthetic parts can be cleaned with a soft damp cloth, possibly soaked in soapy water. Do not use any abrasive detergents and solvents.

## Opening the casing

To open the boiler casing (fig. 30)

1. Remove the upper panel (A)
2. Unscrew the two screws (B)
3. Remove the panel (C)

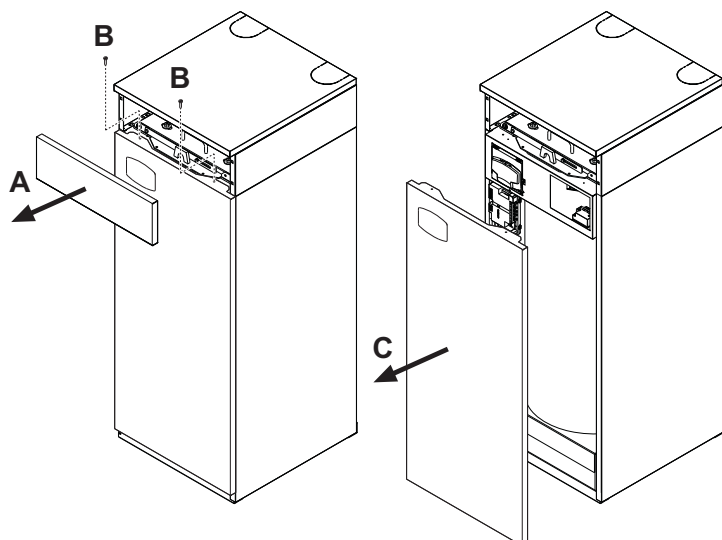


fig. 30 - Opening the casing

## Burner door opening

To access the burner observe the following instructions.

1. Remove the cover and the front top panel.
2. Remove the two top side panels.
3. Remove the four nuts and washers (fig. 32).
4. Unscrew the gas connection (box fig. 32).
5. Open the burner door (fig. 33).

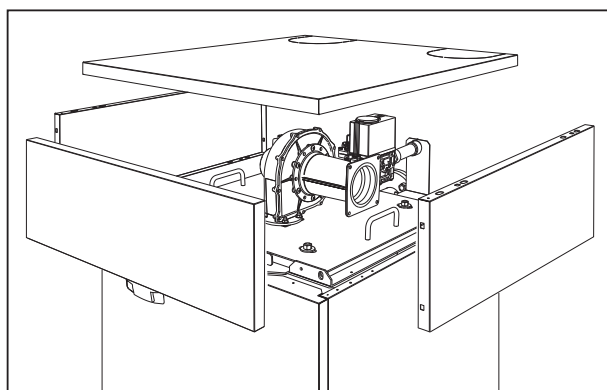


fig. 31

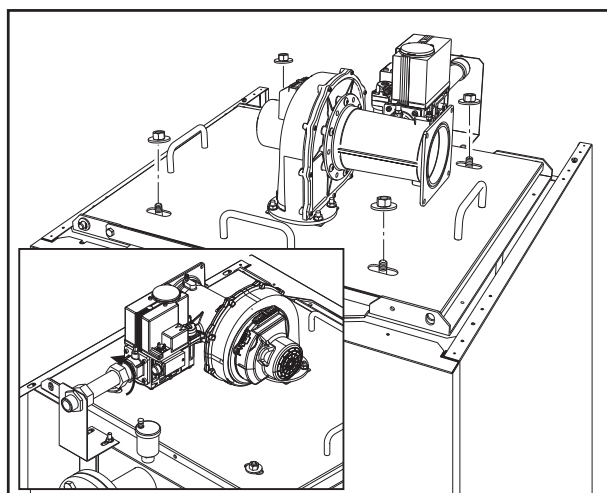


fig. 32

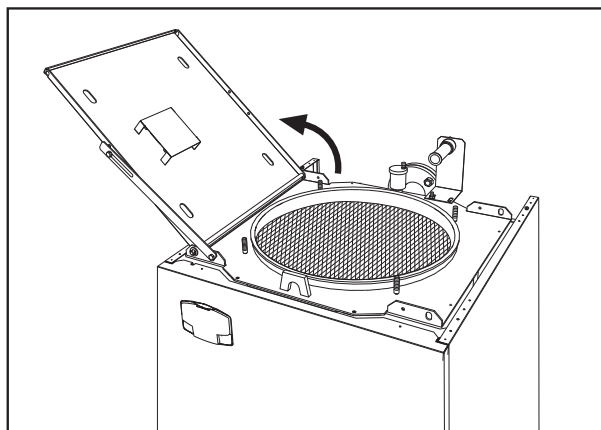


fig. 33

To close it, repeat these operations in reverse order.



Thoroughly tighten the 4 nuts (fig. 32).

**Then check the tightness of the gas circuit.**

If it is necessary to change the direction of opening the burner door observe the following instructions.

1. Extract the rotation pin and insert it into the seat on the other side.
2. Unscrew the bracket, rotate it and then fix it again as shown in fig. 34.

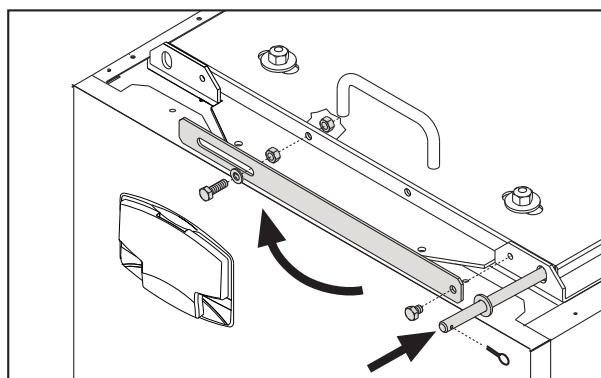
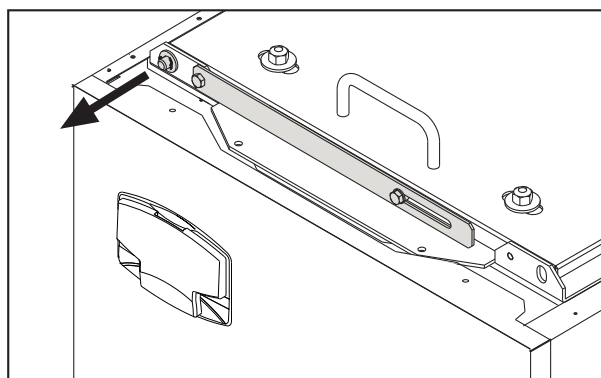


fig. 34 - Changing opening side



## 4.4 Troubleshooting

### Diagnostics

The boiler is equipped with an advanced self-diagnosis system. In case of a boiler fault, the display will flash together with the fault symbol (detail 20 - fig. 1) indicating the fault code.

There are faults that cause permanent shutdowns (marked with the letter "A"): to restore operation it is sufficient to press the **RESET** button (part 8 - 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 resolve the fault first.

Other faults cause temporary shutdowns (marked with the letter "F") that are automatically reset as soon as the value in question returns to within the boiler's normal working range.

### Table of faults

Table 3 - 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
		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	Check and replace it if necessary
A02	Flame present signal with burner off	Electrode fault	Check the ionisation electrode wiring
		Card fault	Check the card
A03	Overtemperature protection activation	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 activation	Fault F07 generated 3 times in the last 24 hours	See fault F07
A05	Fan protection activated	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 the flue, fume extraction 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

Fault code	Fault	Possible cause	Cure
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
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
F42	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	
A61	Controller DBM27 fault	Controller DBM27 internal error	Check the earth connection and replace the controller if necessary.
A62	No communication between electronic controller and gas valve	Controller not connected	Connect the controller to the gas valve
		Valve damaged	Replace the valve
A63 A64 A65 F66	Controller DBM27 fault	Controller DBM27 internal error	Check the earth connection and replace the controller if necessary.

## 5. TECHNICAL DATA AND CHARACTERISTICS

Key of figures cap. 5

- 7 Gas inlet
    - Model 125 = 1"
    - Model 220 = 1"
    - Model 320 = 1" 1/4
  - 10 System delivery
  - 16 Fan
  - 32 Heating circulating pump (not supplied)
  - 36 Automatic air vent
  - 44 Gas valve
  - 67 Ignition transformer
  - 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 outlet pipe
  - 155 Hot water tank temperature probe (not supplied)
  - 186 Return sensor
  - 191 Fume temperature sensor
  - 220 Ignition card
  - 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
  - 347 Electric box

	A	B	C	D	E	H
QUADRIFOGLIO 125	/	/	720	/	/	/
QUADRIFOGLIO 220	780	1820	870	515	1660	Ø160
QUADRIFOGLIO 320	900	1850	1020	570	1700	Ø200

5.1 Dimensions, connections and main components

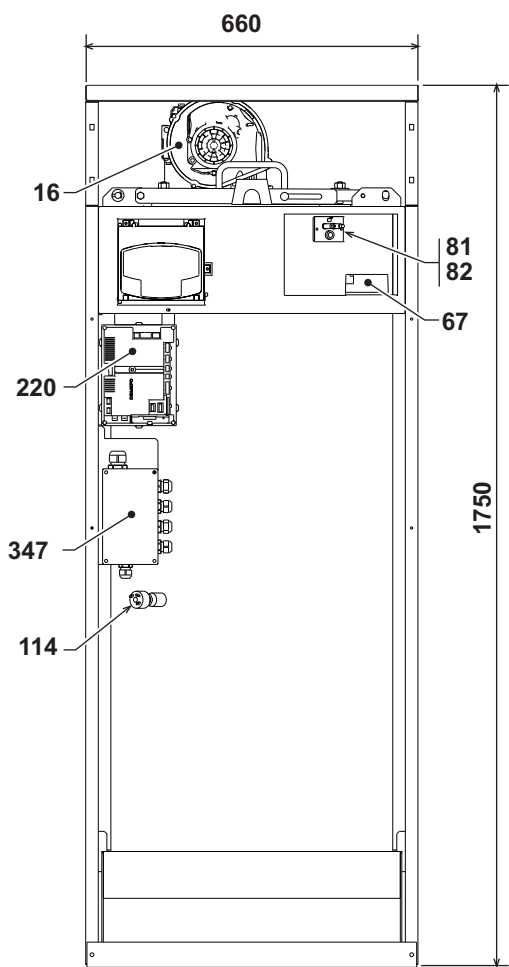


fig. 35 - Front view model 125

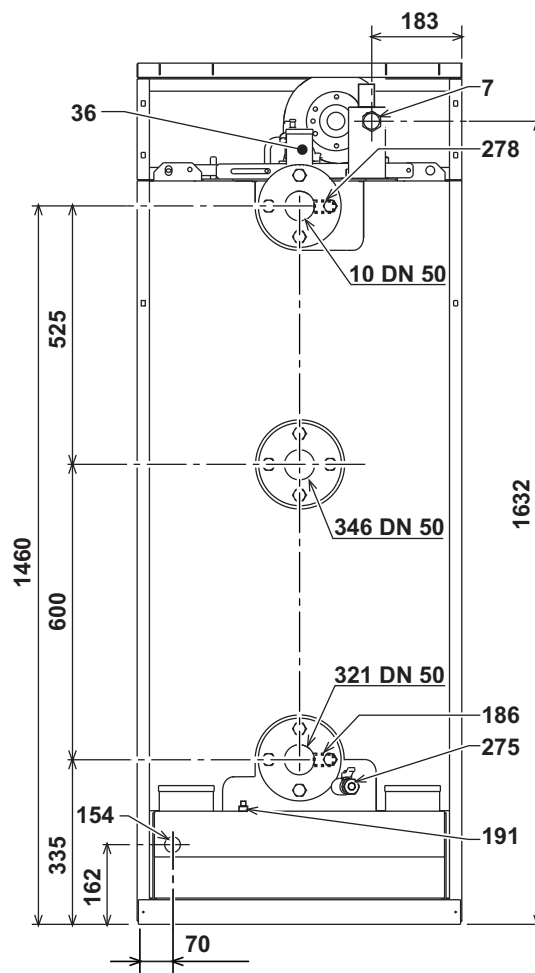


fig. 37 - Rear view model 125

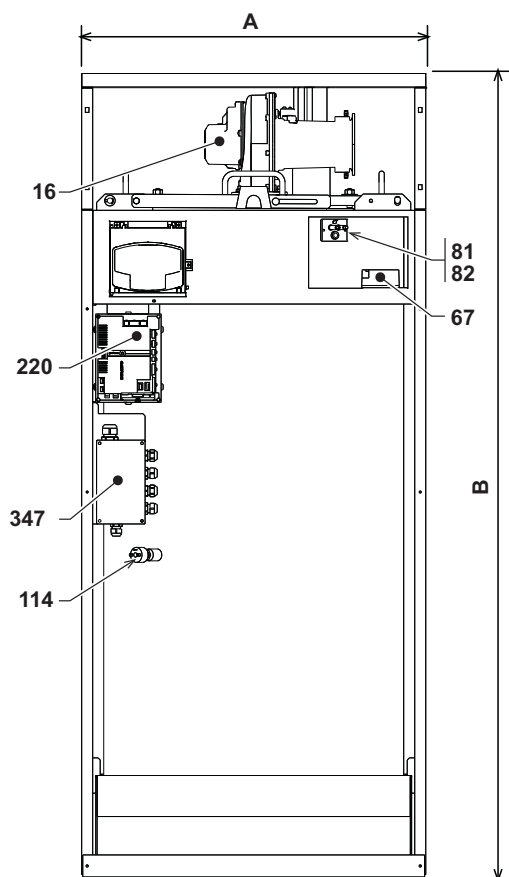


fig. 36 - Front view models 220/320

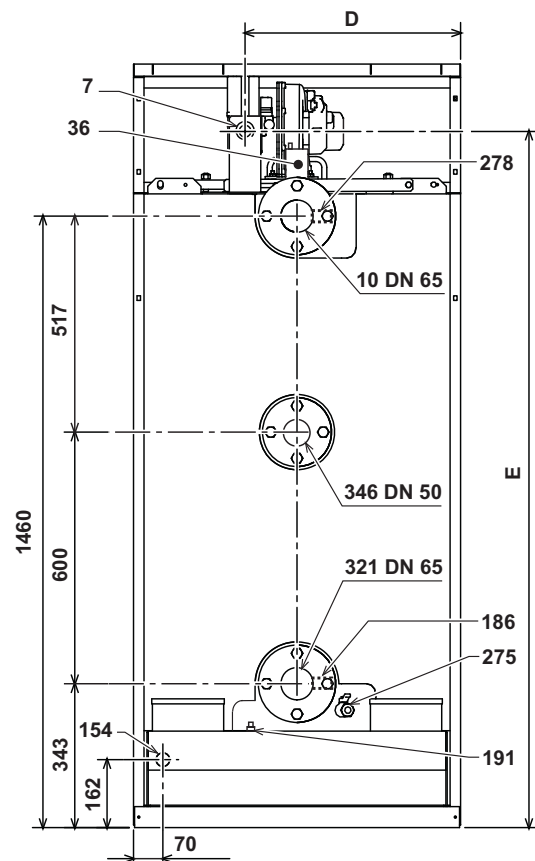


fig. 38 - Rear view models 220/320

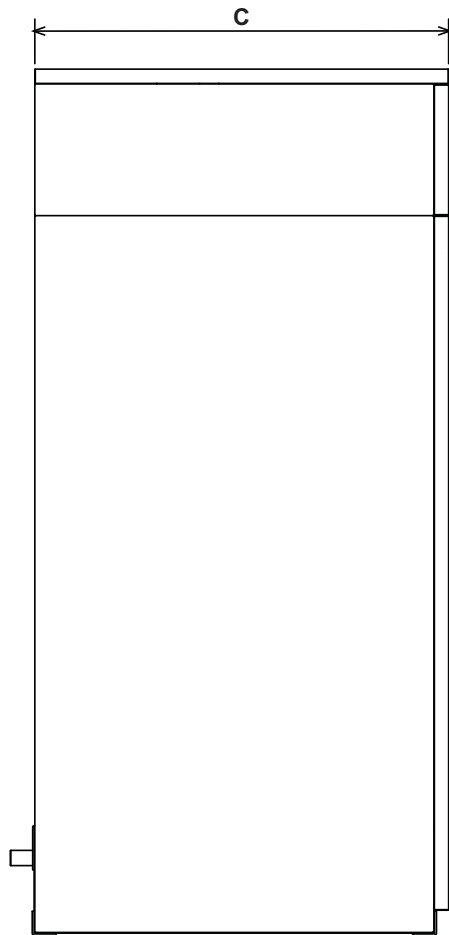


fig. 39 - Side view

## 5.2 Hydraulic circuit

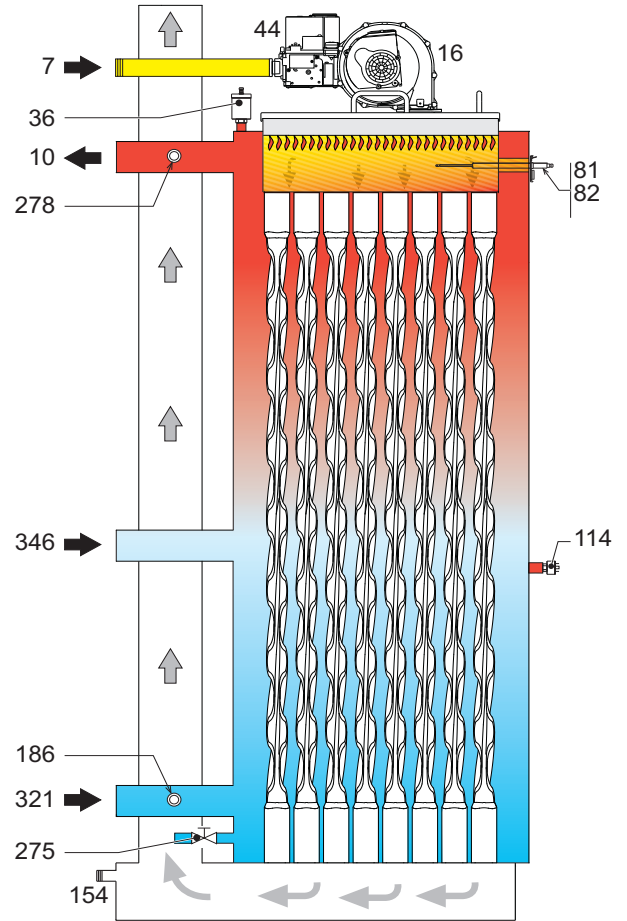


fig. 42 - Hydraulic circuit

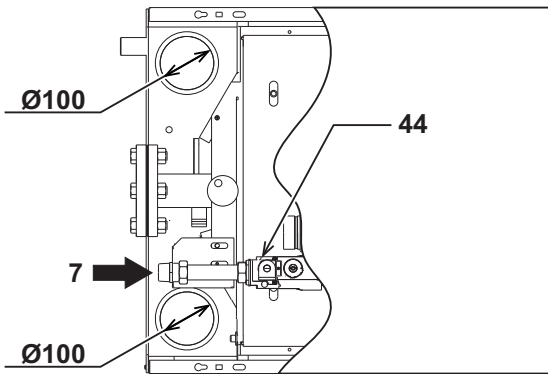


fig. 40 - Top view model 125

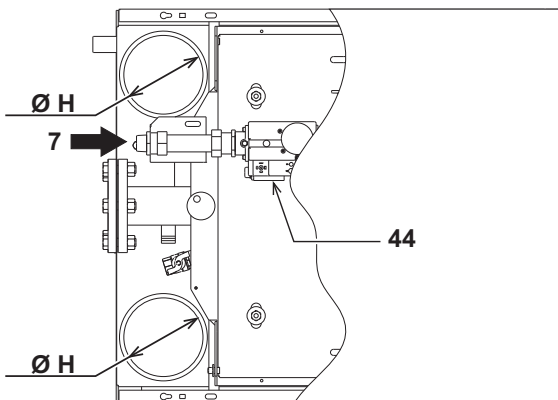


fig. 41 - Top view models 220/320

### 5.3 Technical data table

The column on the right gives the abbreviation used on the dataplate.

Data	Unit	Value	Value	Value	
<b>Model</b>		<b>125</b>	<b>220</b>	<b>320</b>	
Max. heating capacity	kW	116.0	207.0	299.0	(Q)
Min. heating capacity	kW	23.0	41.0	62.0	(Q)
Max. Heat Output in heating (80/60 °C)	kW	114.0	204.0	294.5	(P)
Min. Heat Output in heating (80/60 °C)	kW	22.5	40.2	60.8	(P)
Max. Heat Output in heating (50/30 °C)	kW	125	220	320	(P)
Min. Heat Output in heating (50/30 °C)	kW	24.8	44.2	66.8	(P)
Efficiency Pmax (80/60 °C)	%	98.3	98.5	98.5	
Efficiency Pmin (80/60 °C)	%	98.0	98.0	98.0	
Efficiency Pmax (50/30 °C)	%	106.8	106.8	106.8	
Efficiency Pmin(50/30 °C)	%	107.7	107.7	107.7	
Efficiency 30%	%	109.6	109.6	109.6	
Efficiency class Directive 92/42 EEC	-	★★★★			
NOx emission class	-	5	5	5	(NOx)
Gas supply pressure G20	mbar	20	20	20	
Max. gas delivery G20	m <sup>3</sup> /h	12.8	21.9	31.6	
Min. gas delivery G20	m <sup>3</sup> /h	2.4	4.3	6.5	
Gas supply pressure G31	mbar	37	37	37	
Max. gas delivery G31	kg/h	9.0	16.2	23.4	
Min. gas delivery G31	kg/h	1.8	3.2	4.8	
Max. working pressure in heating	bar	6	6	6	(PMS)
Min. working pressure in heating	bar	0.8	0.8	0.8	
Max. heating temperature	°C	95	95	95	(tmax)
Heating water content	litres	265	380	530	
Protection rating	IP	X0D	X0D	X0D	
Power supply voltage	V/Hz	230/50	230/50	230/50	
Electrical power input	W	200	260	370	
Empty weight	kg	280	400	500	
Type of unit		B <sub>23</sub>			
PIN CE		0085CL0441			

### 5.4 Diagrams

#### Loss of head

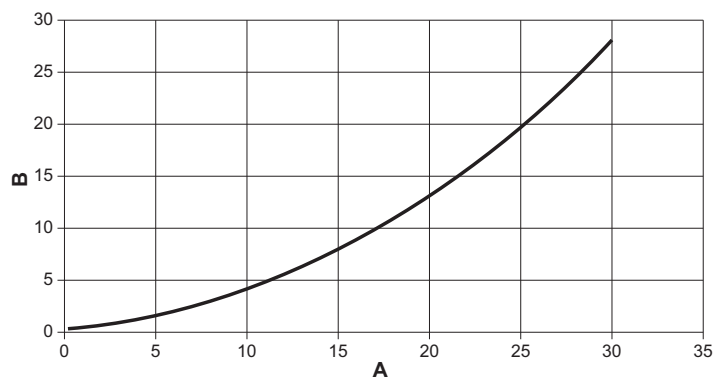


fig. 43 - Pressure loss diagram

A Flow rate - m<sup>3</sup>/h  
B mbar



## 5.5 Wiring diagram

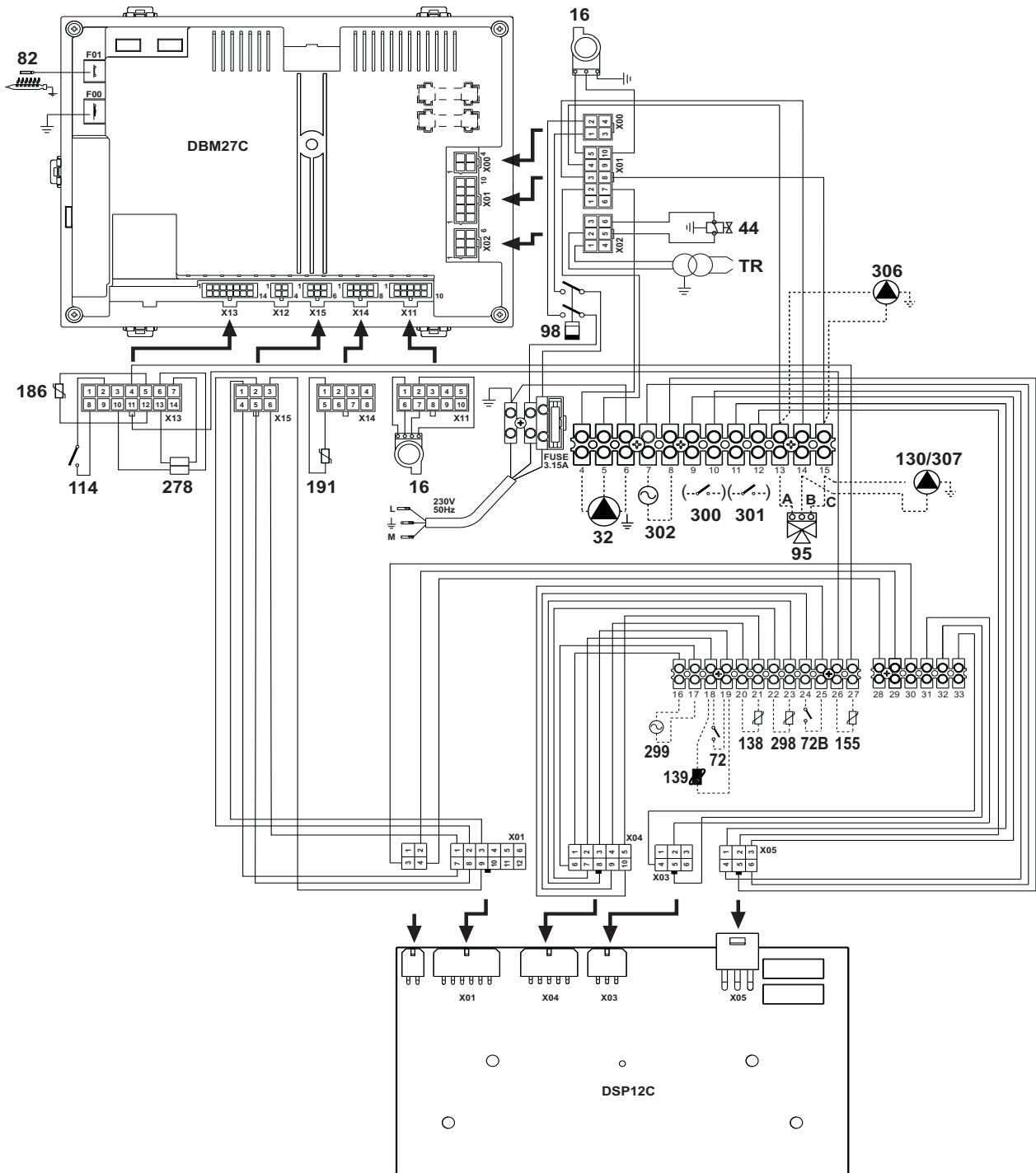


fig. 44 - Wiring diagram