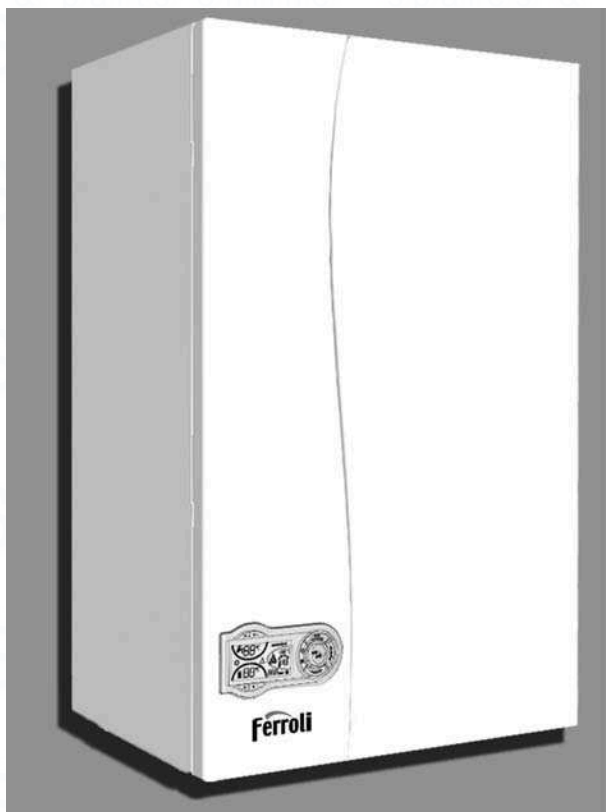


DIVAtop F 24

ISO 9001 : 2000
CERTIFIED COMPANY



cod. 3540E821 - 11/2008 (Rev. 00)



INSTRUCTIONS FOR USE, INSTALLATION AND MAINTENANCE
INSTRUCTIONS D'UTILISATION, D'INSTALLATION ET D'ENTRETIEN
ΟΔΗΓΙΕΣ ΧΡΗΣΗΣ, ΕΓΚΑΤΑΣΤΑΣΗΣ ΚΑΙ ΣΥΝΤΗΡΗΣΗΣ
KULLANMA, KURULUM VE BAKIM TALIMATLARI



- Carefully read the warnings in this instruction booklet since they provide important information on safe installation, use and maintenance.
- This instruction booklet is an integral part of the product and must be carefully kept by the user for future reference.
- If the unit is sold or transferred to another owner or if it is to be moved, always make sure that the booklet accompanies the boiler so that it can be consulted by the new owner and/or installer.
- Installation and maintenance must be carried out by professionally qualified personnel, according to current regulations and the manufacturer's instructions.
- Incorrect installation or poor maintenance can cause damage or physical injury. The manufacturer declines any responsibility for damage caused by errors in installation and use or by failure to follow the manufacturer's 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 the unit breaks down and/or functions poorly, deactivate it, do not make any attempt to repair it or directly intervene. Contact professionally qualified personnel. Any repair/replacement of products must only be carried out by qualified professional personnel using exclusively genuine parts. Failure to comply with the above could affect the safety of the unit.
- Periodical maintenance carried out by qualified personnel is essential for guaranteeing good operation of the unit.
- This unit must only be used for the purpose for which it was designed. Any other use is considered improper and therefore hazardous.
- After removing the packing, check the integrity of the contents. Packing materials must not be left within the reach of children as they are potentially hazardous.
- In case of doubt do not use the unit, and contact the supplier.
- The images shown in this manual are a simplified representation of the product. In this representation there may be slight, unimportant differences with the supplied product.

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

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 90/396
- Efficiency Directive 92/42
- Low Voltage Directive 73/23 (amended by 93/68)
- Electromagnetic Compatibility Directive 89/336 (amended by 93/68)

President and Legal Representative
Cav. del Lavoro
Dante Ferroli

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1. Operating instructions

1.1 Introduction

Dear Customer

Thank you for choosing a wall-mounted boiler featuring **FERROLI** 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.

DIVAtop F 24 is a high-efficiency heat generator for heating and domestic hot water production, running on natural gas or LPG, equipped with an open-flue burner with electronic ignition, sealed chamber, modulating fan and microprocessor control system,

1.2 Control panel

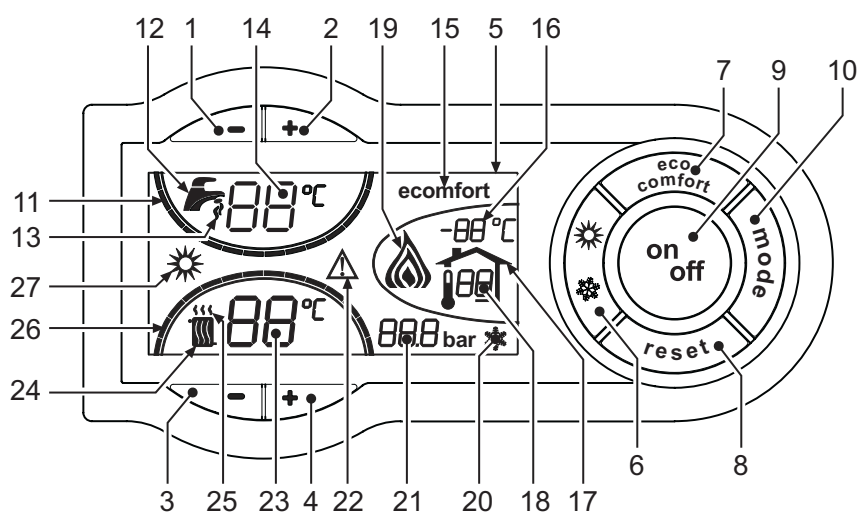


fig. 1 - Control panel

Legend

- | | |
|--|--|
| 1 = Button to decrease the hot tap water temperature setting | 17 = Appears upon connecting the Outside Sensor or the Remote Timer Control (optional items) |
| 2 = Button to increase the hot tap water temperature setting | 18 = Room temperature (with optional Remote Timer Control) |
| 3 = Button to decrease the heating system temperature setting | 19 = Indicator for burner on and current power |
| 4 = Button to increase the heating system temperature setting | 20 = Antifreeze operation indicator |
| 5 = Display | 21 = Heating system pressure indicator |
| 6 = Summer / Winter mode selection button | 22 = Fault indicator |
| 7 = Economy / Comfort mode selection button | 23 = Setting / temperature of heating delivery |
| 8 = Reset Button | 24 = Heating symbol |
| 9 = Unit on / off button | 25 = Heating operation indicator |
| 10 = "Sliding Temperature" menu button | 26 = Indicator for reaching set heating delivery temperature |
| 11 = Indicator for reaching set hot tap water temperature | 27 = Summer mode indicator |
| 12 = Hot tap water symbol | |
| 13 = Tap water operation indicator | |
| 14 = Setting / temperature of hot tap water outlet | |
| 15 = Eco (Economy) or Comfort mode indicator | |
| 16 = Outside sensor temperature (with optional outside sensor) | |

Indicator during operation

Heating

The call for heating (generated by the Room Thermostat or Remote Timer Control) is indicated by the hot air flashing above the radiator (part 24 and 25 - fig. 1).

The graduated heating marks (part 26 - fig. 1) light up as the heating sensor temperature reaches the setting.

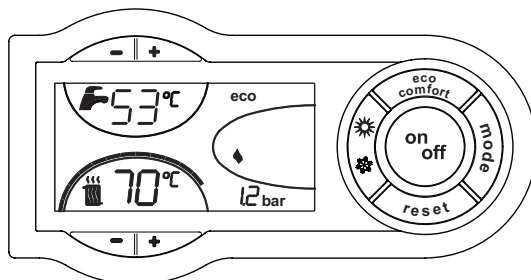


fig. 2

Hot water

The call for hot water (generated by drawing off hot tap water) is indicated by the hot water flashing under the tap (part 12 and 13 - fig. 1).

The graduated hot tap water marks (part 11 - fig. 1) light up as the tap water sensor temperature reaches the setting.

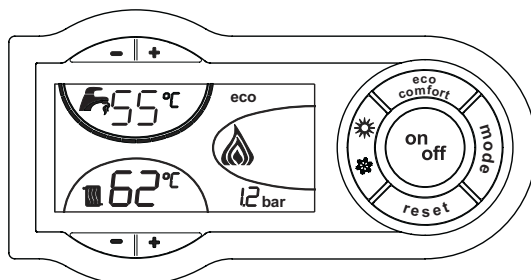


fig. 3

Comfort

The call for Comfort (restoring the internal temperature of the boiler) is indicated by the Comfort symbol flashing (part 15 and 13 - fig. 1).

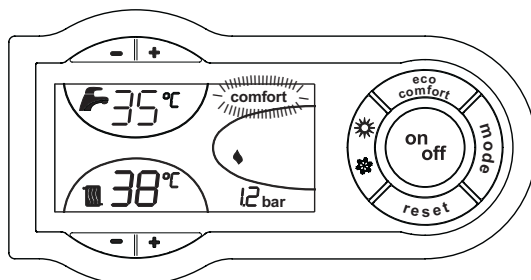


fig. 4

1.3 Turning on and off

Boiler not electrically powered

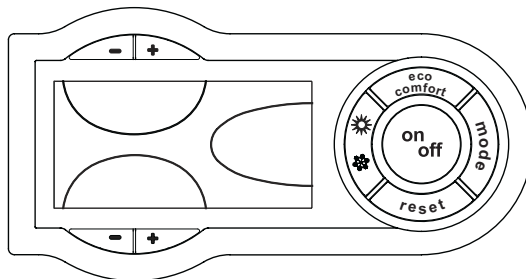


fig. 5 - Boiler not powered



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 the 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. 2.3.

Boiler ignition

Supply the unit with electricity.

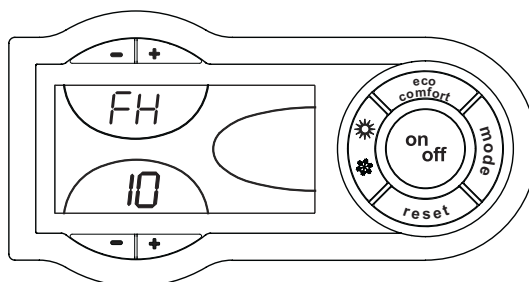


fig. 6 - Boiler ignition

- For the following 120 seconds the display will show FH that identifies the air venting cycle for the heating system.
- During the first 5 seconds the display will show the software release of the card too.
- Open the gas valve ahead of the boiler.
- When FH vanishes, the boiler is ready to work automatically whenever hot tap water is drawn or the room thermostat requests heating.

Turning the boiler off

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

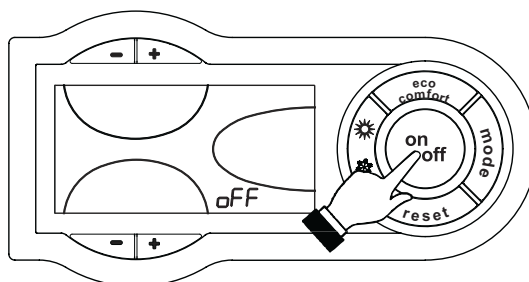


fig. 7 - Turning the boiler off

When the boiler is turned off, the electronic board is still powered.

Domestic hot water and heating operation are disabled. The antifreeze system remains activated.

To re-light the boiler, press the button  (detail 9 fig. 1) again for 1 second.

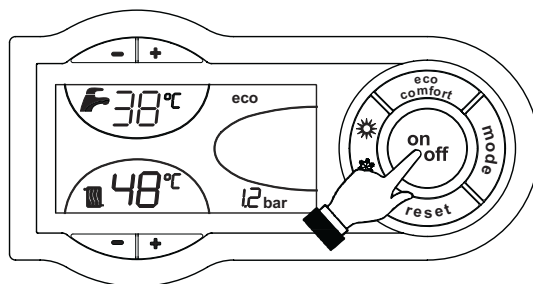


fig. 8

The boiler will be immediately ready to operate whenever domestic hot water is drawn or in case of a room thermostat demand.

1.4 Adjustments

Summer/Winter Switchover

Press the button  (part 6 - fig. 1) for 1 second.

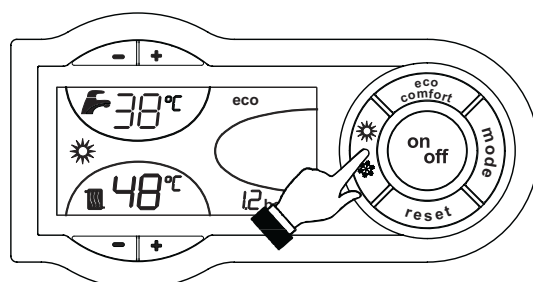
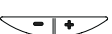


fig. 9

The display will activate the Summer symbol (part 27 - fig. 1): the boiler will deliver tap water only. The antifreeze system stays on.

To turn off Summer mode, press button  (part 6 - fig. 1) again for 1 second.

Heating temperature setting

Use the heating buttons  (part 3 and 4 - fig. 1) to change the temperature from a minimum of 30 °C to a maximum of 85 °C; it is anyhow advisable not to operate the boiler below 45 °C.

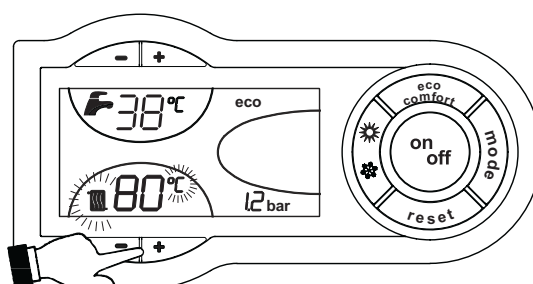


fig. 10

Domestic hot water temperature adjustment

Operate the DHW buttons  (details 1 and 2 - fig. 1) to vary the temperature from a minimum of 40°C to a maximum of 55°C.

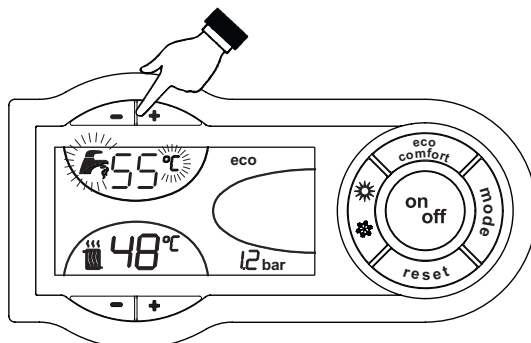


fig. 11

Room temperature adjustment (with optional room thermostat)

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

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.

ECO/COMFORT selection

The unit is equipped with a function that ensures a high hot-water delivery speed and excellent user comfort. When the device is working (COMFORT mode), the water in the boiler is kept at temperature, which means that hot water is available at the boiler outlet as soon as a tap is opened, with no waiting.

The user can turn the device off (ECO mode) by pressing the button  (part 7 - fig. 1). To turn on COMFORT mode, press the button again  (part 7 - fig. 1).

Sliding temperature

When the optional external probe is installed the control panel display (detail 5 - fig. 1) shows the actual outside temperature read by the probe. The boiler control system operates with "Sliding Temperature". In this mode, the temperature of the heating system 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 decreases 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 the maximum value to allow system adjustment throughout its useful working 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 button  (detail 10 - fig. 1) once to display the actual compensation curve (fig. 12), 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. 14).

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

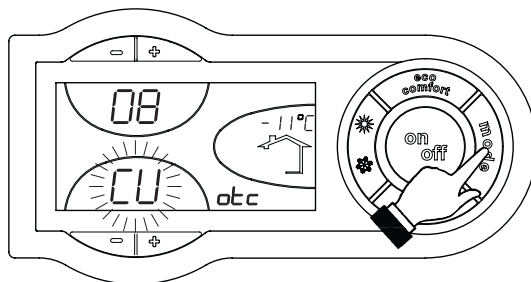
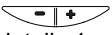


fig. 12 - Compensation curve

Press the heating buttons  (details 3 and 4 - fig. 1) to access parallel curve offset (fig. 15), modifiable with the DHW buttons  (details 1 and 2 - fig. 1).

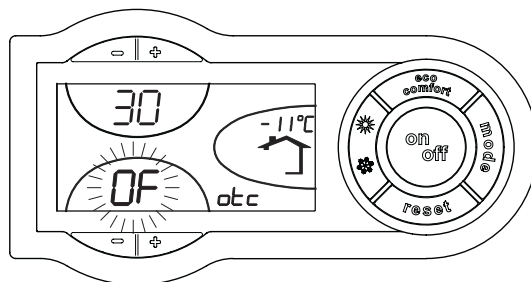


fig. 13 - Parallel curve shift

Press the button  (detail 10 - fig. 1) again 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.

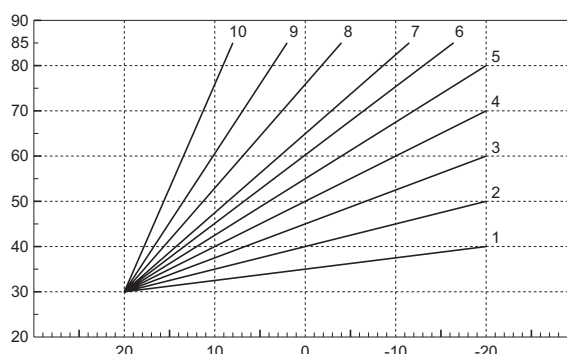


fig. 14 - Compensation curves

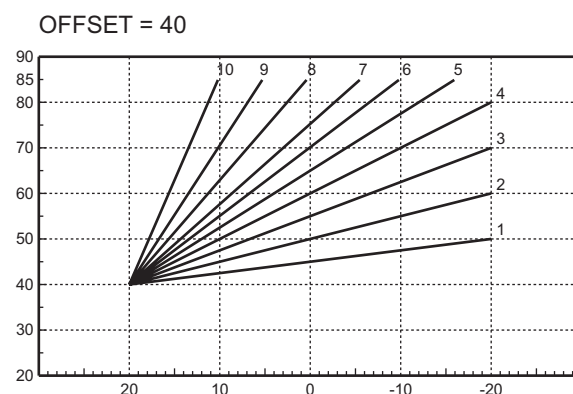
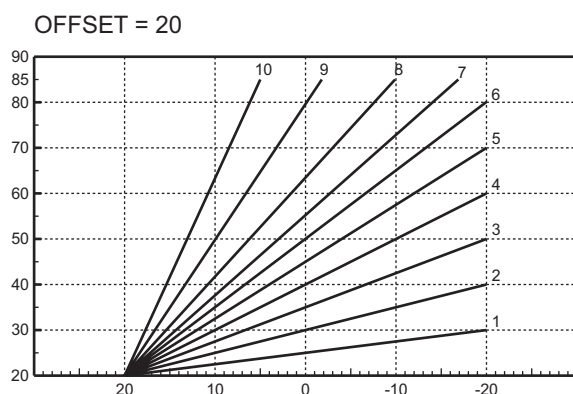


fig. 15 - Example of parallel compensation curve shift

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. Also, the control panel display (detail 5 - fig. 1) shows the actual room temperature read by the Remote Timer Control.

Table. 1

Heating temperature adjustment	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
Domestic hot water temperature adjustment	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
Summer/Winter switchover	Summer mode has priority over a possible Remote Timer Control heating demand.
Eco/Comfort selection	On disabling DHW from the Remote Timer Control menu, the boiler selects the Economy mode. In this condition, the button 7 - fig. 1 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 7 - fig. 1 on the boiler panel.
Sliding Temperature	Both the Remote Timer Control and the boiler card manage Sliding Temperature adjustment: of the two, the boiler card Sliding Temperature has priority.

Water system pressure adjustment

The filling pressure with system cold, read on the boiler water gauge, must be approx. 1.0 bar. If the system pressure falls to values below minimum, the boiler card will activate fault F37 (fig. 16).

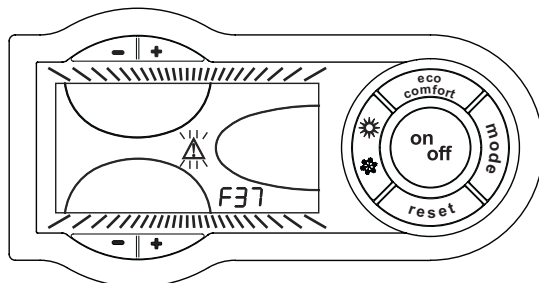


fig. 16 - Low system pressure fault

Operate the filling cock (detail 1 - fig. 17) and bring the system pressure to a value above 1.0 bar.

At the bottom of the boiler there is a pressure gauge (detail 2 - fig. 17) to show the pressure even when there is no power supply.

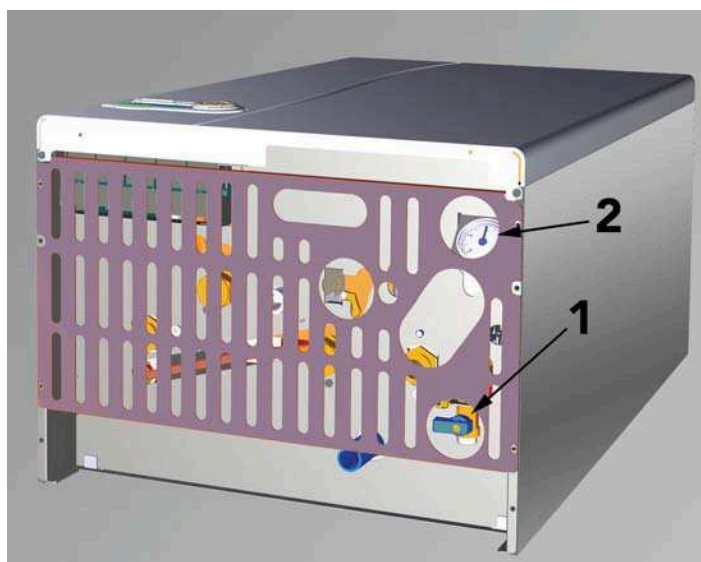


fig. 17 - Filling cock



Once the system pressure is restored, the boiler will activate the 120-second air venting cycle indicated on the display by FH.

At the end of the operation always close the filling cock (detail 1 - fig. 17)

2. Installation

2.1 General Instructions

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

2.2 Place of installation

The unit's combustion circuit is sealed off from the installation room and therefore the unit can be installed in any kind of room. However, the installation room must be sufficiently well ventilated to prevent any dangerous conditions from forming in the event of even slight gas leakage. This safety standard is required by the EEC Directive no. 90/396 for all gas units, including those with a so-called sealed chamber.

Therefore the place of installation must be free of dust, flammable materials or objects or corrosive gases. The room must be dry and not subject to freezing.

The boiler is fitted to be installed on a wall and is equipped as standard with a bracket. Secure the bracket to the wall as described in sec. 4.1 and hook on the boiler. On request, there is a metal template to mark the drilling points on the wall. The wall fixing must ensure a stable and effective support for the generator.

 If the unit is enclosed in furniture or mounted alongside, there must be space for removing the casing and for normal maintenance work

2.3 Plumbing connections

The heating capacity of the unit must be previously established by calculating the building's heat requirement according to current regulations. The system must be provided with all the components for correct and regular operation. It is advisable to install on-off valves between the boiler and heating system allowing the boiler to be isolated from the system if necessary.

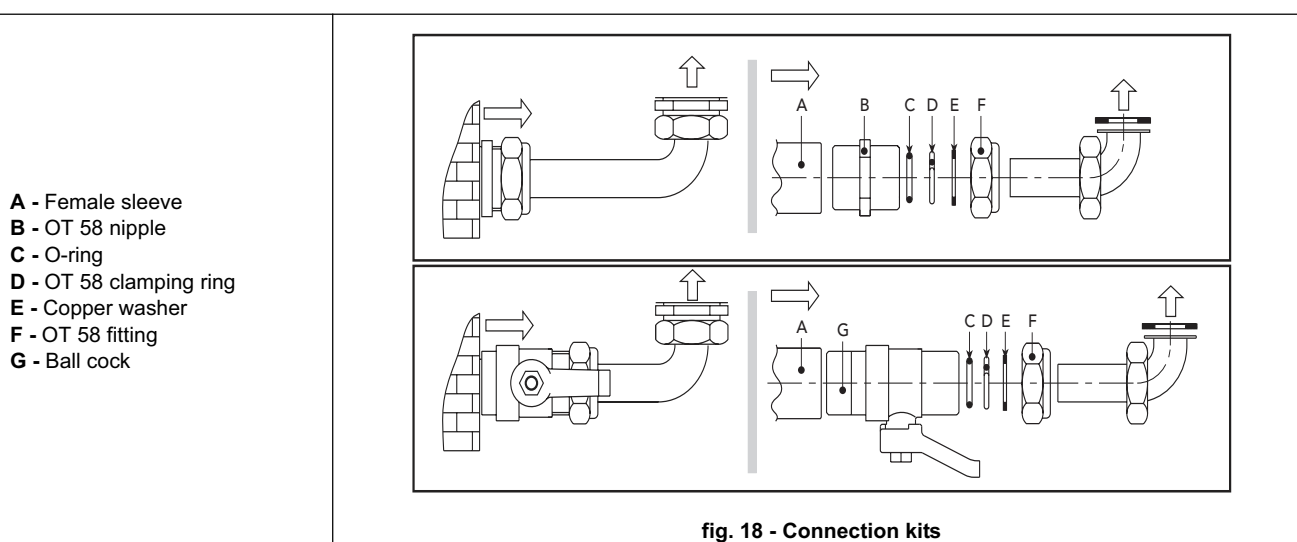
 The safety valve outlet must be connected to a funnel or collection pipe, to prevent water spurting onto the floor in case of overpressure in the heating circuit. Otherwise, if the discharge valve cuts in and floods the room, the boiler manufacturer cannot be held liable.

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

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

Make the connections to the corresponding connections according to the diagram in sec. 4.1 and the symbols given on the unit.

The connection kits shown in the figure below (fig. 18) are supplied standard



System water characteristics

In the presence of water harder than 25° Fr (1°F = 10ppm CaCO₃), 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.

2.4 Gas connection



Before making the connection, ensure that 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 good functioning of the boiler.

The gas must be connected to the relative connector (see fig. 30) in conformity with current standards, with rigid metal pipes or with continuous flexible s/steel wall tubing, placing a gas cock between the system and the boiler. Make sure that all the gas connections are tight. The capacity of the gas meter must be sufficient for the simultaneous use of all equipment 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.

2.5 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)



IMPORTANT: THE ROOM THERMOSTAT MUST HAVE VOLTAGE-FREE CONTACTS. CONNECTING 230 V TO THE ROOM THERMOSTAT TERMINALS WILL PERMANENTLY DAMAGE THE ELECTRONIC BOARD.

When connecting time controls or a timer, do not take the power supply for these devices from their breaking contacts. Their power supply must be by means of direct connection from the mains or with batteries, depending on the kind of device.



Accessing the electrical terminal block

After removing the front panel of the boiler (see fig. 28), the terminal block can be accessed for connecting the external probe (detail 3 fig. 19) of the room thermostat (detail 1 fig. 19) or the remote timer control (detail 2 fig. 19).

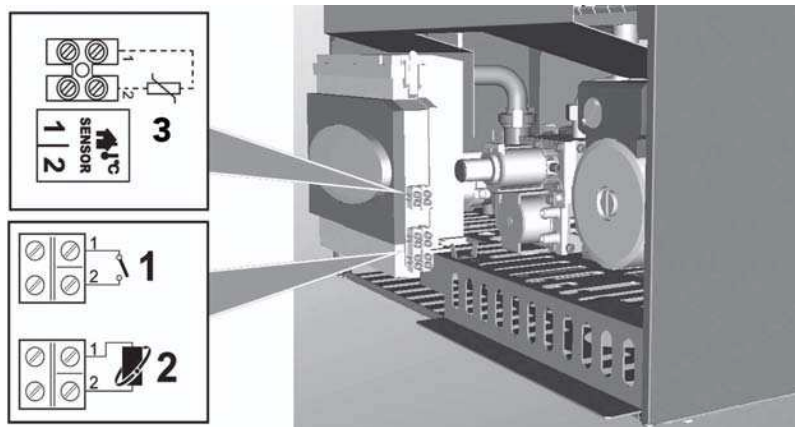


fig. 19 - Accessing the terminal block

2.6 Air/fume ducts

Warnings

The unit is "type C" with an airtight chamber and forced draught, the air inlet and fume outlet must be connected to one of the following extraction/suction systems. The unit is type-approved to work with all the Cxy flue configurations stated on the technical data plate (some setups are given by way of example in this chapter). It is however possible that some setups are expressly limited or not permitted by law, standards or local regulations. Before proceeding with installation, check and meticulously observe the above-mentioned prescriptions. In addition, comply with the provisions concerning the positioning of wall and/or roof end pieces and the minimum distances from windows, walls, ventilation openings, etc.



This C-type unit must be installed using the fume extraction and outlet ducts supplied by the manufacturer in accordance with UNI-CIG 7129/92. Failure to use them automatically forfeits all warranty and liability of the manufacturer.

Expansion



For fume ducts longer than one metre, in the phase of installation it is necessary to take account of the natural expansion of the materials during operation.

To prevent buckling leave an expansion gap of approximately 2 -- 4 mm for each metre of ducting.

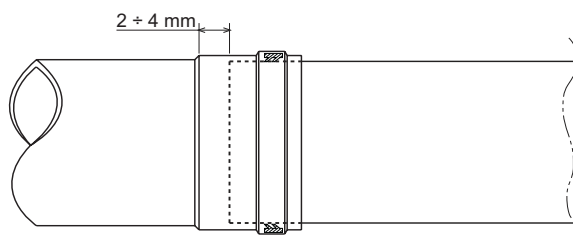


fig. 20 - Expansion

Modulating fan

The unit has an advanced air / fumes flow control system, with modulating fan and pressure sensor.

With this device the unit automatically adapts its operation to the flue type and length, without requiring adjustments during installation or the use of baffles in the combustion circuit.

Moreover, in daily operation the unit constantly and automatically regulates the air / fume flow according to the change in thermal load. In this way, combustion and heat exchange always occur in optimum conditions and the unit's thermal efficiency remains high throughout its power range.

Connection with coaxial pipes

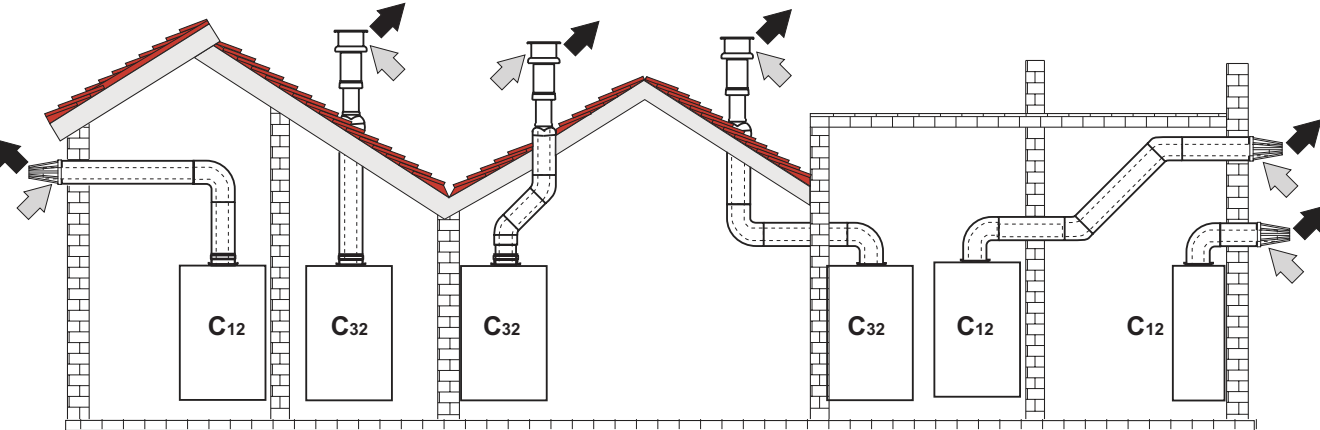


fig. 21 - Examples of connection with coaxial pipes (⇨ = Air / ⇨ = Fumes)

For coaxial connection, fit the unit with one of the following starting accessories. For the wall hole dimensions refer to sec. 4.1. Any horizontal sections of the fume exhaust must be kept sloping slightly towards the outside, to prevent possible condensate from flowing back towards the unit.

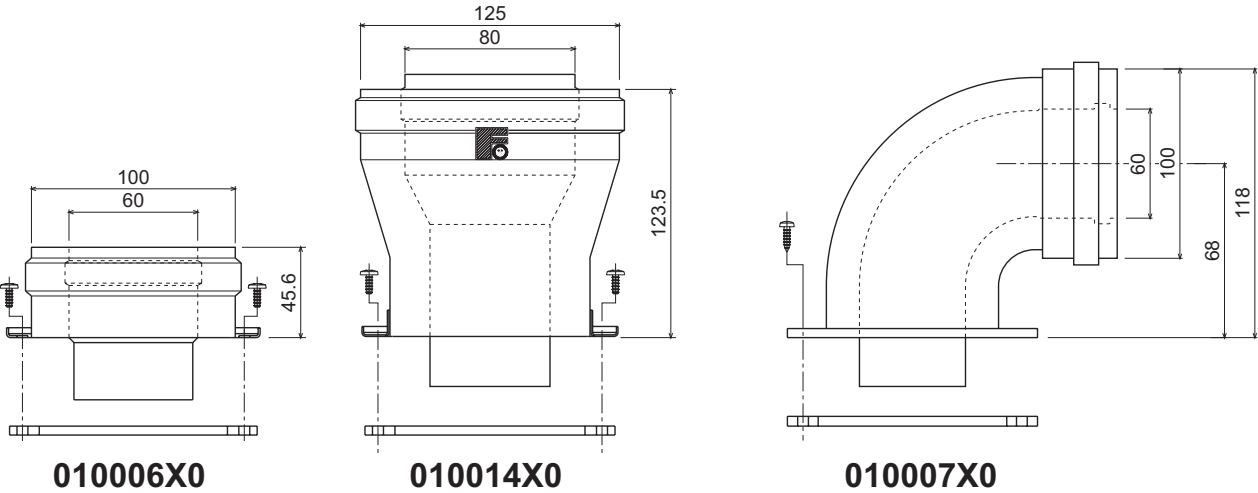


fig. 22 - Starting accessories for coaxial ducts

Before proceeding with installation, check that the maximum permissible length is not exceeded, bearing in mind that every coaxial bend gives rise to the reduction indicated in the table. For example, a Ø 60/100 duct comprising a 90° bend + 1 horizontal metre has a total equivalent length of 2 metres.

Table. 2 - Max. length coaxial ducts

	Coaxial 60/100	Coaxial 80/125
Max. permissible length	5 m	10 m
Reduction factor 90° bend	1 m	0.5 m
Reduction factor 45° bend	0.5 m	0.25 m

Connection with separate pipes

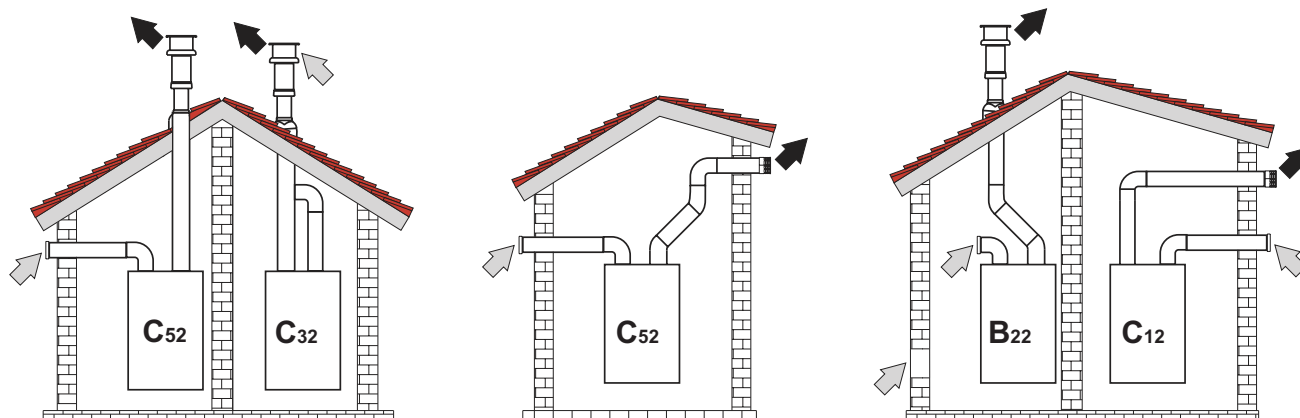


fig. 23 - Examples of connection with separate pipes (→ = Air / → = Fumes)

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

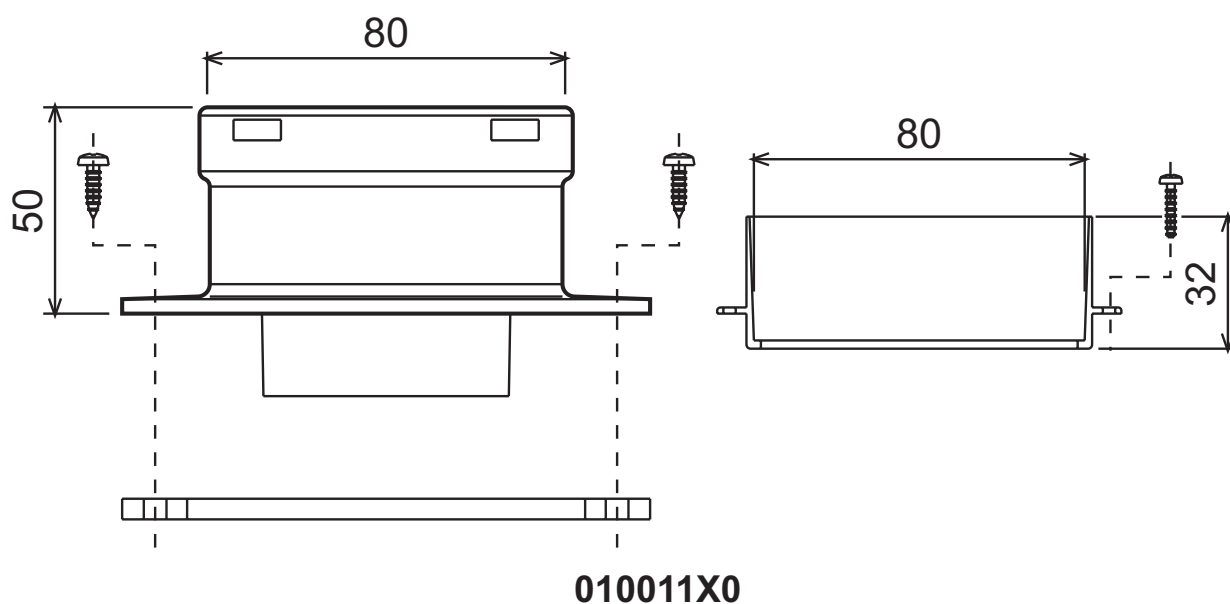


fig. 24 - Starting accessories for separate ducts

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

1. Establish the layout of the system of split flues, including accessories and outlet terminals.
2. Consult the table 4 and identify the losses in m_{eq} (equivalent metres) of every component, according to the installation position.
3. Check that the sum total of losses is less than or equal to the maximum permissible length in table 3.

Table. 3 - Max. length for separate ducts

	Separate ducts
Max. permissible length	60 m_{eq}

Table. 4 - Accessories

				Losses in m_{eq}		
				Air inlet	Fume exhaust	
					Vertical	Horizontal
Ø 80	PIPE	0.5 m M/F	1KWMA38A	0.5	0.5	1.0
		1 m M/F	1KWMA83A	1.0	1.0	2.0
		2 m M/F	1KWMA06K	2.0	2.0	4.0
	BEND	45° F/F	1KWMA01K	1.2	2.2	
		45° M/F	1KWMA65A	1.2	2.2	
		90° F/F	1KWMA02K	2.0	3.0	
		90° M/F	1KWMA82A	1.5	2.5	
		90° M/F + Test point	1KWMA70U	1.5	2.5	
	PIPE SECTION	with test point	1KWMA16U	0.2	0.2	
		for condensate drain	1KWMA55U	-	3.0	
	TEE	with condensate drain	1KWMA05K	-	7.0	
	TERMINAL	air, wall	1KWMA85A	2.0	-	
		fumes, wall with antiwind	1KWMA86A	-	5.0	
	FLUE	Air/fumes split 80/80	1KWMA84U	-	12.0	
		Fume outlet Ø80	1KWMA83U + 1KWMA86U	-	4.0	
Ø 100	REDUCTION	from Ø80 to Ø100	1KWMA03U	0.0	0.0	
		from Ø100 to Ø80		1.5	3.0	
	PIPE	1 m M/F	1KWMA08K	0.4	0.4	0.8
	BEND	45° M/F	1KWMA03K	0.6	1.0	
		90° M/F	1KWMA04K	0.8	1.3	
	TERMINAL	air, wall	1KWMA14K	1.5	-	
		fumes, wall antiwind	1KWMA29K	-	3.0	

Connection to collective flues

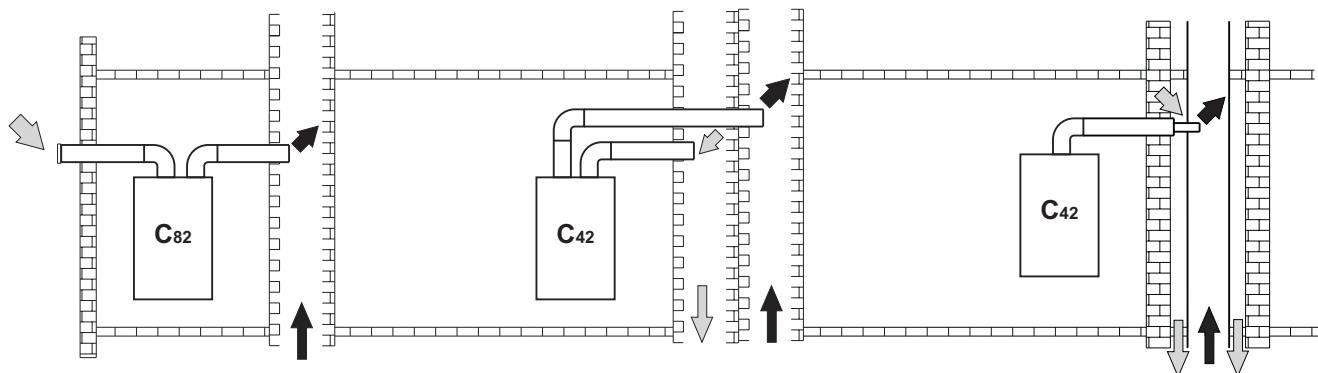


fig. 25 - Examples of connection to flues (⇐ = Air / ➡ = Fumes)

If you are then going to connect the **DIVAtop F 24** boiler to a collective flue or a single flue with natural draught, the flue must be expressly designed by professionally qualified technical personnel in conformity with the current standards and be suitable for airtight chamber units equipped with a fan.

In particular, flues must have the following characteristics:

- Be sized according to the method of calculation stated in the current standards.
- Be airtight to the products of combustion, resistant to the fumes and heat and waterproof for the condensate.
- Have a circular or quadrangular cross-section, with a vertical progression and with no constrictions.
- Have the ducts conveying the hot fumes adequately distanced or isolated from combustible materials.
- Be connected to just one unit per floor.
- Be connected to just one type of unit (or all and only forced draught units or all and only natural draught units).
- Have no mechanical suction devices in the main ducts.
- Be at a lower pressure, all along their length, under conditions of stationary operation.
- Have at their base a collection chamber for solid materials or condensation equipped with a metal door with an airtight closure.

3. Service and maintenance

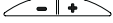
All adjustment, conversion, system start-up and maintenance operations described hereunder must be carried out solely by Qualified Personnel (with the professional technical requirements prescribed by current regulations) such as the personnel of the Local After-Sales Technical Service.

FERROLI declines any responsibility for damage or physical injury caused by unqualified and unauthorized persons tampering with the device.

3.1 Adjustments

Gas supply conversion

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

1. Replace the nozzles at the main burner, inserting the nozzles specified in the technical data table of sec. 4.4, according to the type of gas used
2. Edit the parameter for the type of gas:
 - turn the boiler onto standby
 - press the RESET button  (part 8 - fig. 1) for 10 seconds: the display will show "TS" blinking
 - press the RESET button  (part 8 - fig. 1): the display will show "P01".
 - Press the tap water buttons  (part 1 and 2 - fig. 1) to set parameter 00 (for natural gas operation) or 01 (for LPG operation).
 - Press the RESET button  (part 8 - fig. 1) for 10 seconds.
 - the boiler will go back onto standby
3. Adjust the burner minimum and maximum pressures (ref. relevant paragraph), setting the values given in the technical data chart for the type of gas used
4. Apply the sticker contained in the conversion kit, near the dataplate as proof of the conversion.

Turning on TEST mode

Press the heating buttons  (part 3 and 4 - fig. 1) simultaneously for 5 seconds to turn on **TEST** mode. The boiler will ignite at the maximum heating power set as described in the following paragraph.

On the display, the heating (part 24 - fig. 1) and tap water (part 12 - fig. 1) symbols will blink; alongside, it will show the heating power and the ignition power respectively.

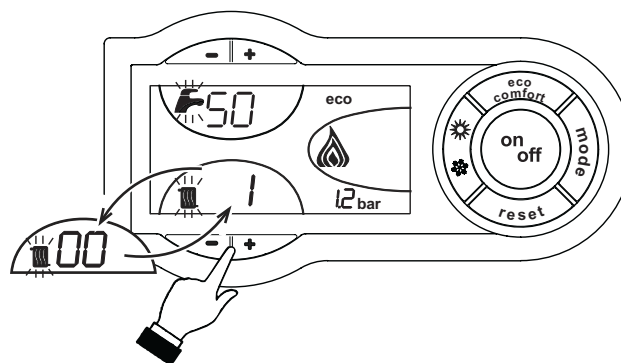


fig. 26 - TEST mode (heating power = 100%)

To turn off TEST mode, repeat the sequence for turning it on.

TEST mode anyhow turns off automatically after 15 minutes.

Adjustment of pressure at burner

Since this unit has flame modulation, there are two fixed pressure values: minimum and maximum, which must be those given in the technical data table according to the type of gas.

- Connect a suitable pressure gauge to the pressure point "B" downstream of the gas valve.
- Disconnect the pressure compensation tube "N".
- Remove the protection cap "D".
- Operate the boiler in **TEST** fig. 1 mode.
- Adjust the maximum pressure setting by turning the screw "G" clockwise to increase the pressure and anticlockwise to decrease it.
- Disconnect one of the two fastons "C" from modureg "F" on the gas valve.
- Adjust the minimum pressure setting by turning the screw "E" clockwise to increase the pressure and anticlockwise to decrease it.
- Turn the burner on and off, checking that the minimum pressure value remains stable.
- Reconnect the faston "C" detached from modureg "F" on the gas valve.
- Check that the maximum pressure has not changed.
- Reconnect the pressure compensation tube "N".
- Refit the protection cap "D".
- To end the **TEST** mode, repeat the activation sequence or wait 15 minutes.

 After checking or adjusting the pressure, seal the adjustment screw with paint or a suitable seal.

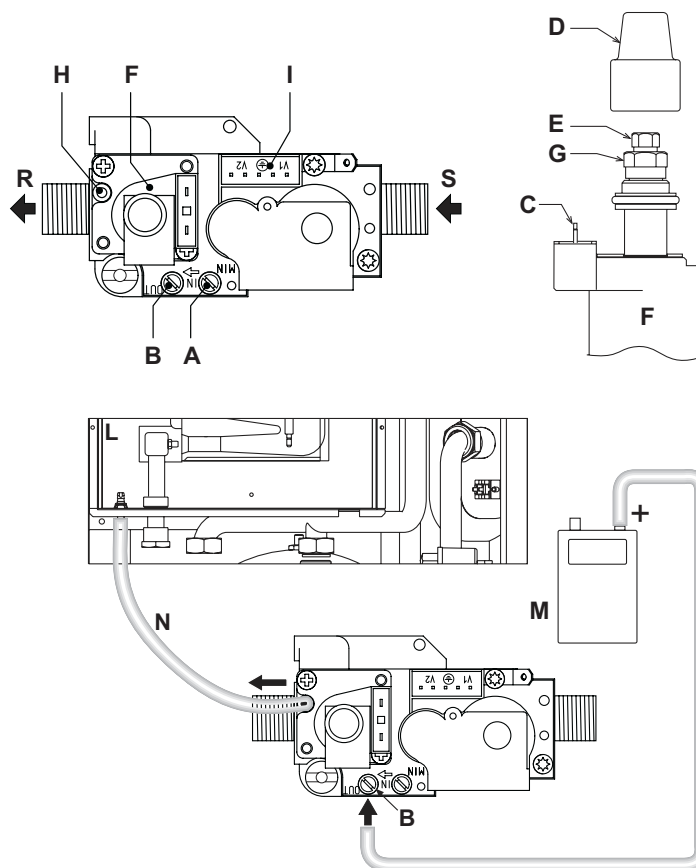


fig. 27 - Gas valve

- | | | | |
|---|-------------------------------|---|---------------------------------|
| A | Pressure point upstream | H | Compensation tube connection |
| B | Pressure point downstream | I | Gas valve electrical connection |
| C | Modureg electrical connection | L | Sealed chamber |
| D | Protection cap | M | Pressure gauge |
| E | Minimum pressure adjustment | N | Compensation tube |
| F | Modureg | R | Gas outlet |
| G | Maximum pressure adjustment | S | Gas inlet |

Heating power adjustment

To adjust the heating power, set the boiler on TEST operation (see sec. 3.1). Press the heating buttons  (part 3 and 4 - fig. 1) to increase or decrease the power (minimum = 00 - Maximum = 100). Press the RESET button  within 5 seconds and the maximum power will remain as has just been set. Exit TEST operation (see sec. 3.1).

Ignition power adjustment

To adjust the ignition power, set the boiler on TEST operation (see sec. 3.1). Press the tap water buttons  (part 1 and 2 - fig. 1) to increase or decrease the power (minimum = 00 - Maximum = 60). Press the button  within 5 seconds and the ignition power will remain as has just been set. Exit TEST operation (see sec. 3.1).

3.2 System start-up



Checks to be made at first ignition, and after all maintenance operations that involved disconnecting from the systems or an intervention 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 the correct preloading of the expansion tank (ref. sec. 4.4)
- Fill the water system and make sure that 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.
- Make sure there are no water leaks in the system, hot water circuits, connections or boiler.
- Check the correct connection of the electric system and the functioning of the earth system. I
- Check that the gas pressure value for heating is as required.
- Make sure there are no flammable liquids or materials in the immediate vicinity of the boiler

Checks during operation

- Ignite the appliance as described in sec. 1.3.
- Check the airtightness of the fuel circuit and water systems.
- Check the efficiency of the flue and air-fume ducts while the boiler is working.
- Check that the water is circulating properly between the boiler and the systems.
- Make sure that the gas valve modulates correctly in both the heating and hot water production phases.
- Check the proper ignition of the boiler by performing various tests, turning it on and off with the room thermostat or remote control.
- Make sure that the fuel consumption indicated on the meter corresponds to that given in the technical data table in sec. 4.4.
- Make sure that with no call for heating the burner correctly ignites on opening a hot water tap. Check that during heating operation, on opening a hot water tap, the heating circulator stops and there is a regular production of hot water.
- Check the parameters are programmed correctly and perform any required customization (compensation curve, power, temperatures, etc.)



3.3 Maintenance

Periodical check

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

- The control and safety devices (gas valve, flowmeter, thermostats, etc.) must function correctly.
- The fume exhaust circuit must be perfectly efficient.
(Sealed chamber boiler: fan, pressure switch, etc. - The sealed chamber must be tight: seals, cable glands, etc.)
(Open chamber boiler: anti-backflow device, fume thermostat, etc.)
- The air/fume terminal and ducts must be free of obstructions and leaks
- The burner and exchanger must be clean and free of deposits. For 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 tight.
- The water pressure in the cold water system must be approx. 1 bar; otherwise bring it to that value.
- The circulating pump must not be blocked.
- The expansion tank must be filled.
- The gas flowrate and pressure must match that given in the respective tables.

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

Opening the casing

To open the boiler casing:

1. Unscrew the screws A (see fig. 28).
2. Pivot the casing upwards (see fig. 28).
3. Raise the casing.



Before carrying out any operation inside the boiler, disconnect the electrical power supply and close the gas cock upstream

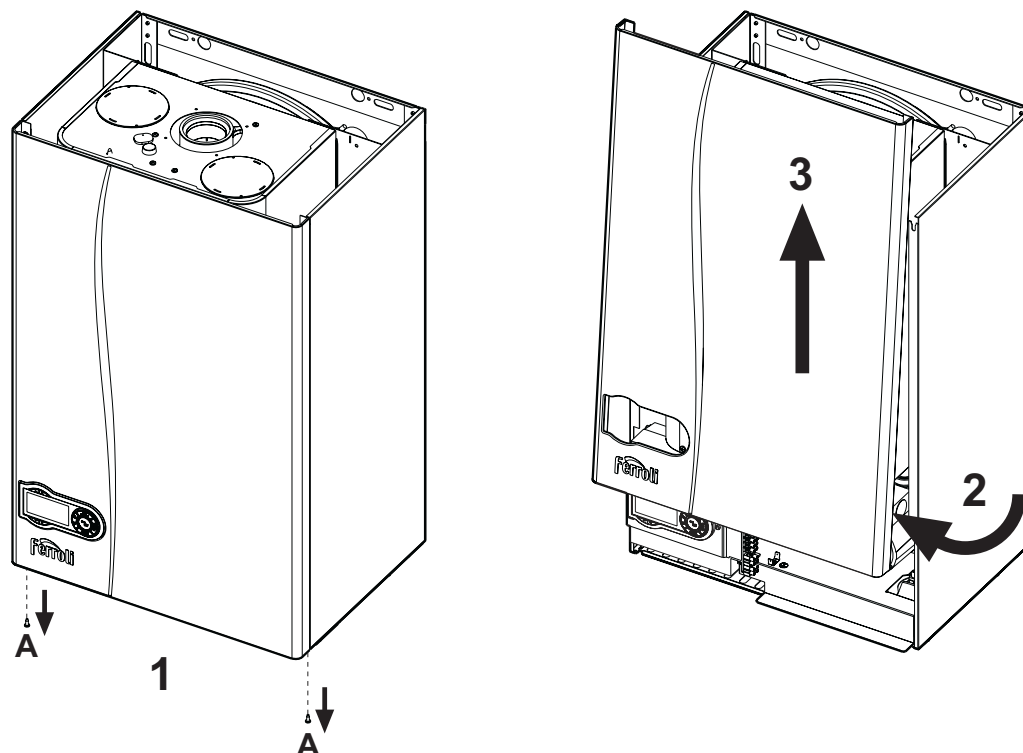


fig. 28 - Opening the casing

Combustion analysis

Two sampling points have been included at the top of the boiler, one for fumes and the other for air. To take samples:

1. Open the air/fume outlet plug;
2. Insert the probes as far as the stop;
3. Check that the safety valve is connected to a drain funnel;
4. Turn on TEST mode;
5. Wait 10 minutes for the boiler to stabilize;
6. Take the measurement.

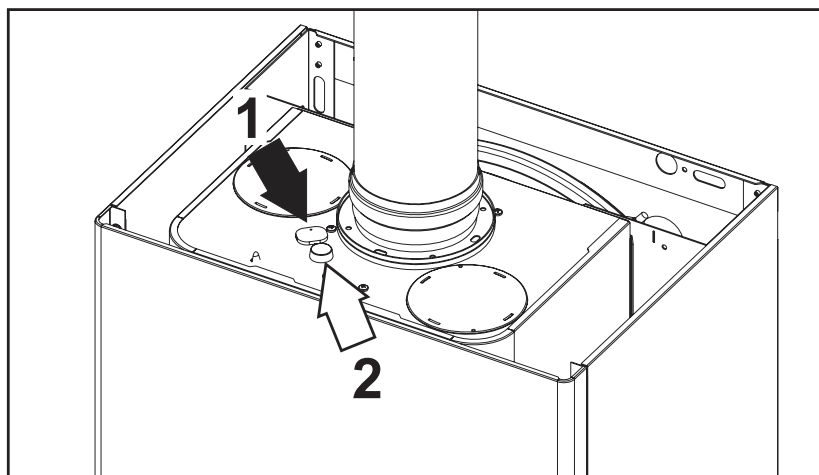


fig. 29 - Fume analysis

- 1 = Fumes
2 = Air



3.4 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 22 - fig. 1) indicating the fault code.

There are faults that cause permanent shutdown (marked with the letter "A"): to restore operation just press the RESET button (detail 8 - fig. 1) for 1 second or RESET on the optional remote timer control if installed; if the boiler fails to start, it is necessary to first eliminate the fault.

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

Table of faults

Table. 5 - 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
		Ignition power too low	Adjust the ignition power
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
F05	The air pressure transducer does not receive a sufficient minimum value within 25 seconds	Incorrect air pressure transducer wiring	Check the wiring
		Flue not correctly sized or obstructed	Check the length of flue and that it is clean
A06	No flame after the ignition stage	Low pressure in the gas system	Check the gas pressure
		Burner minimum pressure setting	Check the pressures
F10	Delivery sensor 1 fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F11	DHW 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	
F34	Supply voltage under 170V.	Electric mains trouble	Check the electrical system
F35	Anomalous mains frequency	Electric mains trouble	Check the electrical system
F37	Incorrect system water pressure	Pressure too low	Fill the system
		Sensor damaged	Check the sensor
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
F40	Incorrect system water pressure	Pressure too high	Check the system
			Check the safety valve
			Check the expansion tank
A41	Sensor positioning	Delivery sensor disconnected from the pipe	Check the correct positioning and operation of the heating sensor
F42	Heating sensor fault	Sensor damaged	Replace the sensor
F43	Exchanger protection activation.	No system H ₂ O circulation	Check the circulating pump
		Air in the system	Vent the system
F47	System water pressure sensor fault	Wiring disconnected	Check the wiring
F50	Modureg fault	Wiring disconnected	Check the wiring



4. Technical data and characteristics

4.1 Dimensions and connections

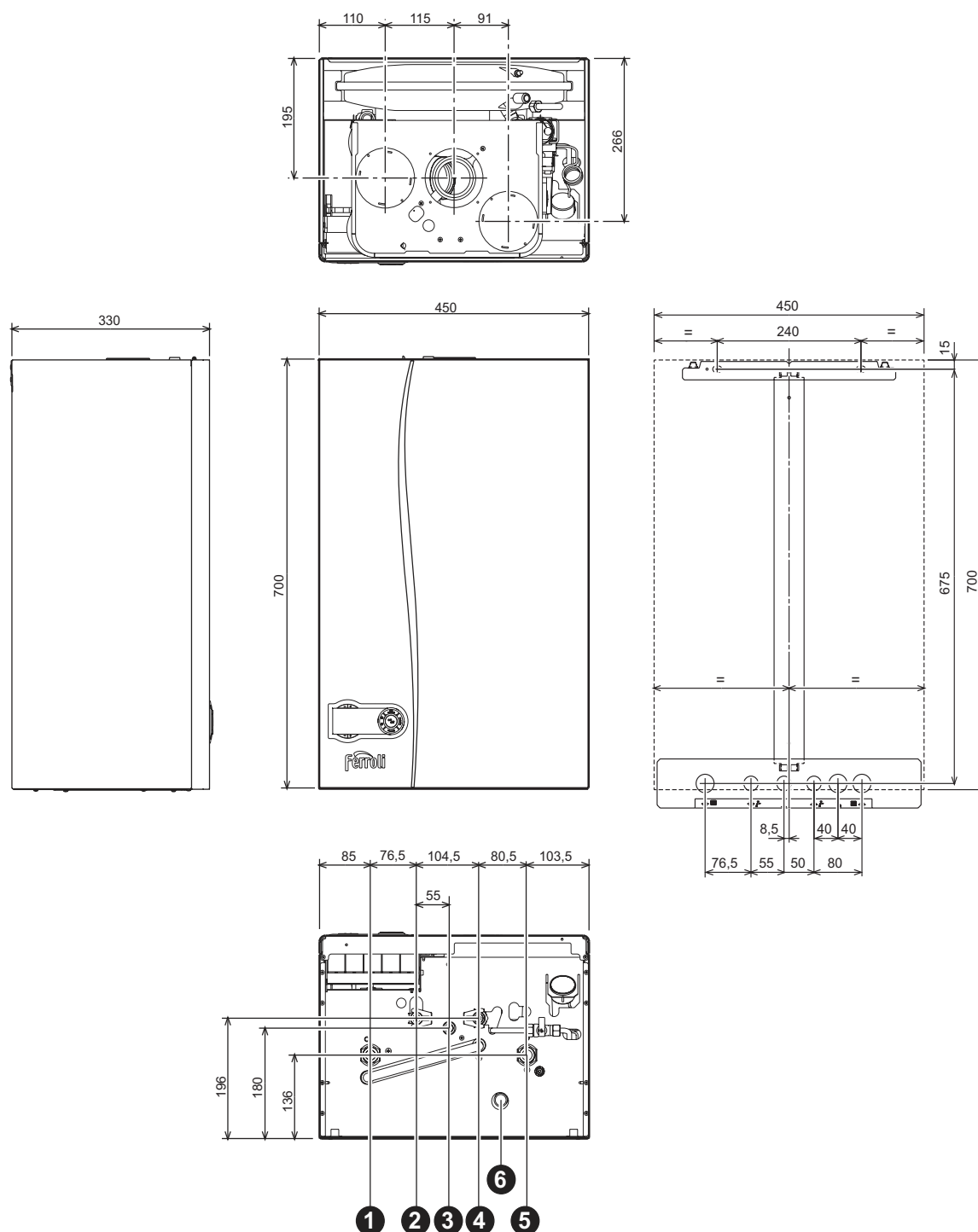


fig. 30 - Dimensions and connections

- 1 = Heating system delivery
- 2 = Tap water outlet
- 3 = Gas inlet

- 4 = Tap water inlet
- 5 = Heating system return
- 6 = Safety valve drain

4.2 General view and main components

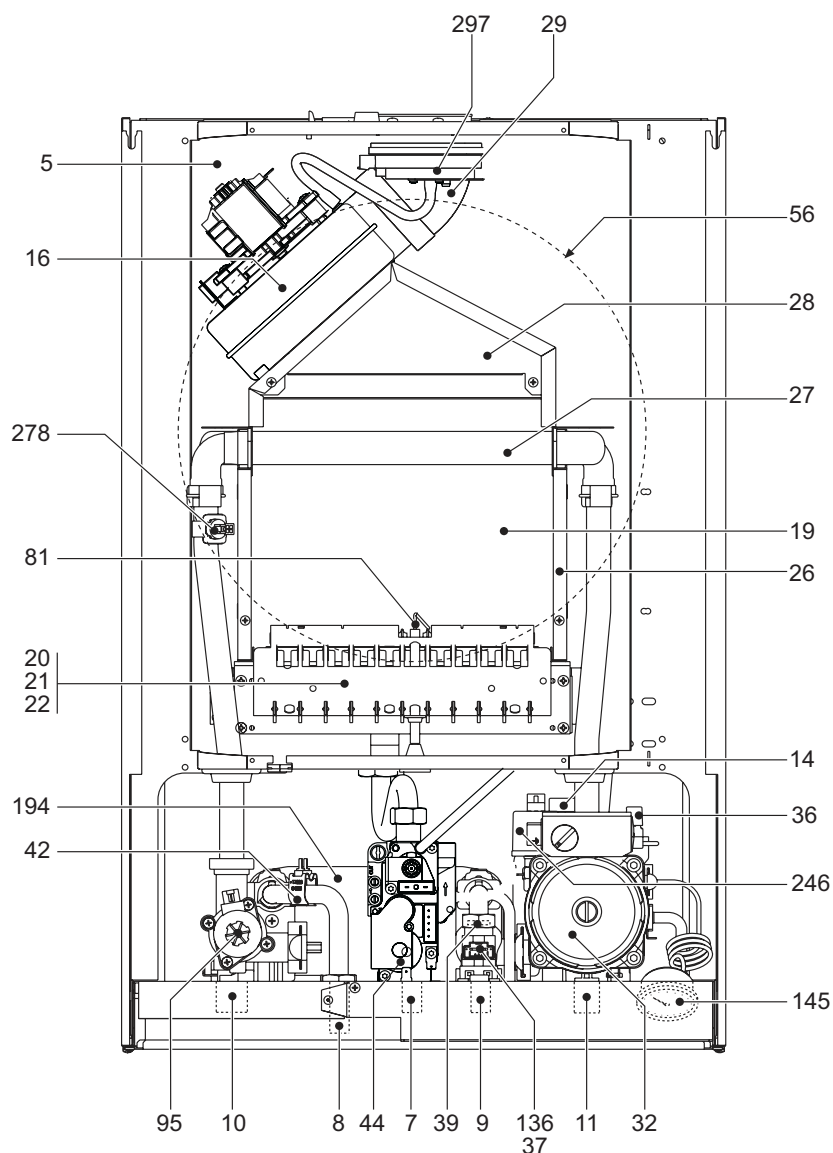


fig. 31 - General view

- | | | | |
|----|--|-----|----------------------------------|
| 5 | Sealed chamber | 32 | Heating circulating pump |
| 7 | Gas inlet | 36 | Automatic air vent |
| 8 | Domestic hot water outlet | 37 | Water inlet filter |
| 9 | Cold water inlet | 39 | Flow regulator |
| 10 | System delivery | 42 | DHW temperature sensor |
| 11 | System return | 44 | Gas valve |
| 14 | Safety valve | 56 | Expansion tank |
| 16 | Modulating fan | 81 | Ignition and detection electrode |
| 19 | Combustion chamber | 95 | Diverter valve |
| 20 | Burner assembly | 136 | Flow meter |
| 21 | Main nozzle | 145 | Pressure gauge |
| 22 | Burner | 194 | Exchanger |
| 26 | Combustion chamber insulation | 246 | Pressure transducer |
| 27 | Copper exchanger for heating and hot water | 278 | Double sensor (Safety + Heating) |
| 28 | Fume manifold | 297 | Air pressure transducer |
| 29 | Fume outlet manifold | | |

4.3 Plumbing circuit

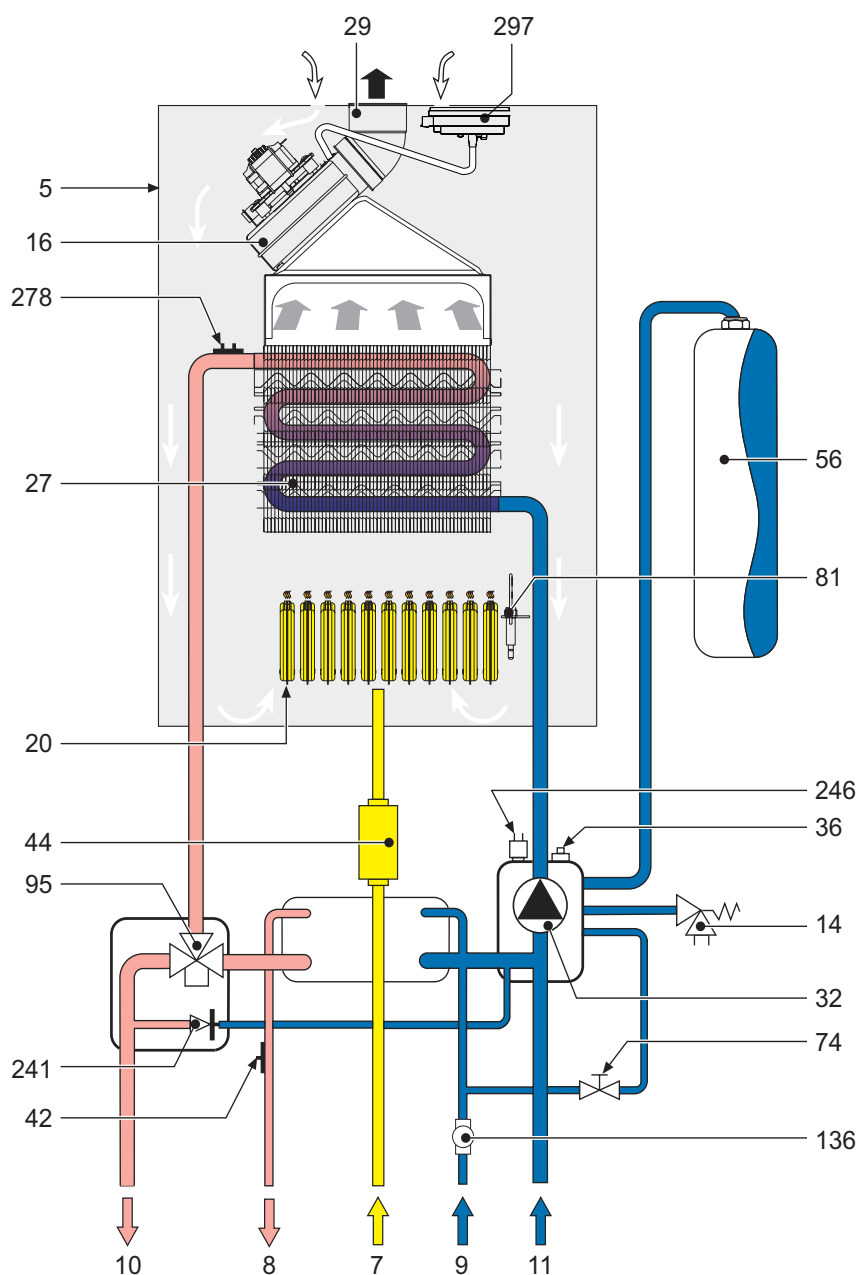


fig. 32 - Plumbing circuit

- | | | | |
|----|--|-----|----------------------------------|
| 5 | Sealed chamber | 36 | Automatic air vent |
| 7 | Gas inlet | 42 | DHW temperature sensor |
| 8 | Domestic hot water outlet | 44 | Gas valve |
| 9 | Cold water inlet | 56 | Expansion tank |
| 10 | System delivery | 74 | System filling cock |
| 11 | System return | 81 | Ignition and detection electrode |
| 14 | Safety valve | 95 | Diverter valve |
| 16 | Modulating fan | 136 | Flow meter |
| 20 | Burner assembly | 241 | Automatic bypass |
| 27 | Copper exchanger for heating and hot water | 246 | Pressure transducer |
| 29 | Fume outlet manifold | 278 | Double sensor (Safety + Heating) |
| 32 | Heating circulating pump | 297 | Air pressure transducer |

4.4 Technical data table

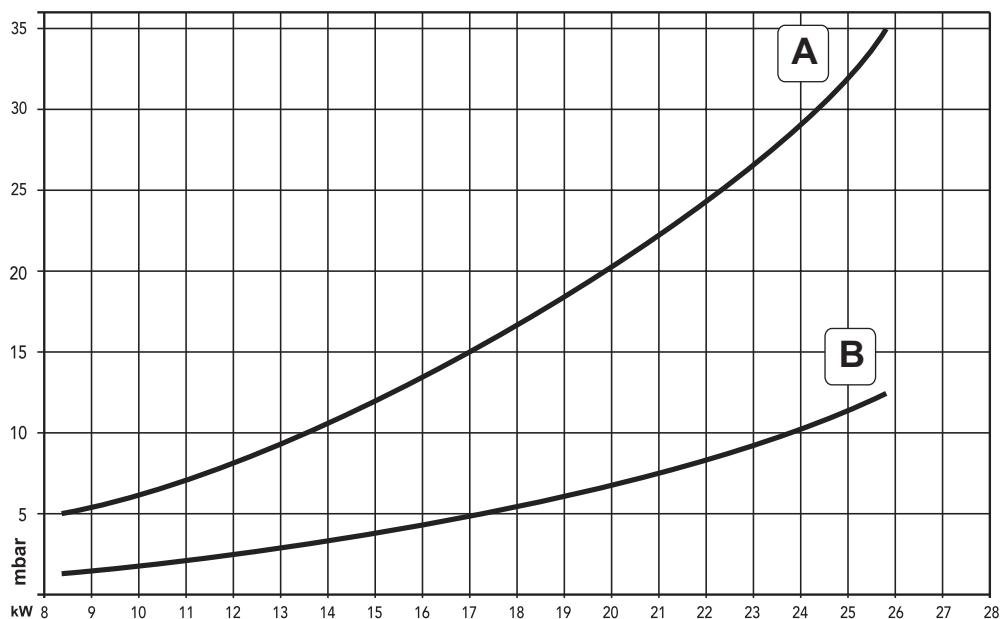
The column on the right gives the abbreviation used on the technical data plate.

Data	Unit	Value	
Max. heating capacity	kW	25.8	(Q)
Min. heating capacity	kW	8.3	(Q)
Max. Heat Output in heating	kW	24.0	(P)
Min. Heat Output in heating	kW	7.2	(P)
Max. Heat Output in hot water production	kW	24.0	
Min. Heat Output in hot water production	kW	7.2	
Burner nozzles G20	no. x Ø	11 x 1.35	
Gas supply pressure G20	mbar	20	
Max. gas pressure at burner (G20)	mbar	12.0	
Min. gas pressure at burner (G20)	mbar	1.5	
Max. gas delivery G20	m ³ /h	2.73	
Min. gas delivery G20	m ³ /h	0.88	
Burner nozzles G31	no. x Ø	11 x 0.79	
Gas supply pressure G31	mbar	37	
Max. gas pressure at burner (G31)	mbar	35.0	
Min. gas pressure at burner (G31)	mbar	5.0	
Max. gas delivery G31	kg/h	2.00	
Min. gas delivery G31	kg/h	0.65	

Efficiency class directive 92/42 EEC	-	★★★	
NOx emission class	-	3 (<150 mg/kWh)	(NOx)
Max working pressure in heating	bar	3	(PMS)
Min working pressure in heating	bar	0.8	
Max heating temperature	°C	90	(tmax)
Heating water content	litres	1.0	
Heating expansion tank capacity	litres	8	
Heating expansion tank pre-filling pressure	bar	1	
Max working pressure in hot water production	bar	9	(PMW)
Min working pressure in hot water production	bar	0.25	
Hot water content	litres	0.2	
Hot water flow rate Dt 25°C	l/min	13.7	
Hot water flow rate Dt 30°C	l/min	11.4	(D)
Protection class	IP	X5D	
Supply voltage	V/Hz	230V/50Hz	
Electrical power input	W	110	
Electrical power input in hot water production	W	110	
Weight with no load	kg	33	
Type of unit		C12-C22-C32-C42-C52- C62-C72-C82-B22	
PIN CE		0461BR0844	

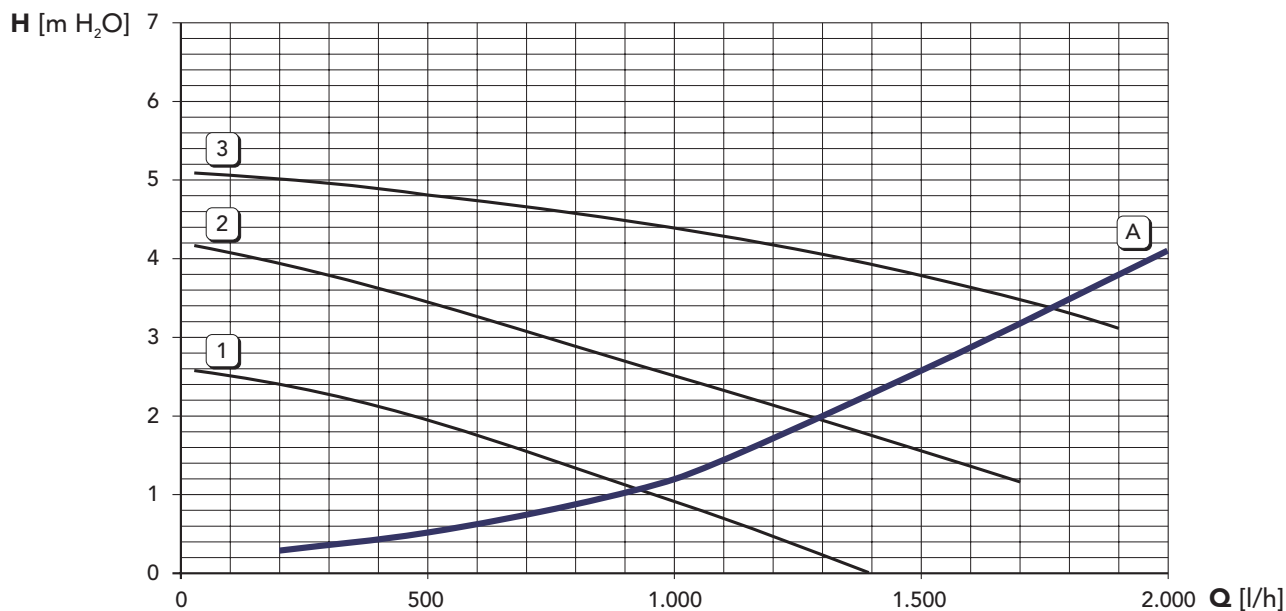
4.5 Diagrams

Pressure - power diagrams



A LPG
B NATURAL GAS

Losses of load / head of circulators



A Boiler losses of head
1 - 2 - 3 Circulator speed

4.6 Wiring diagram

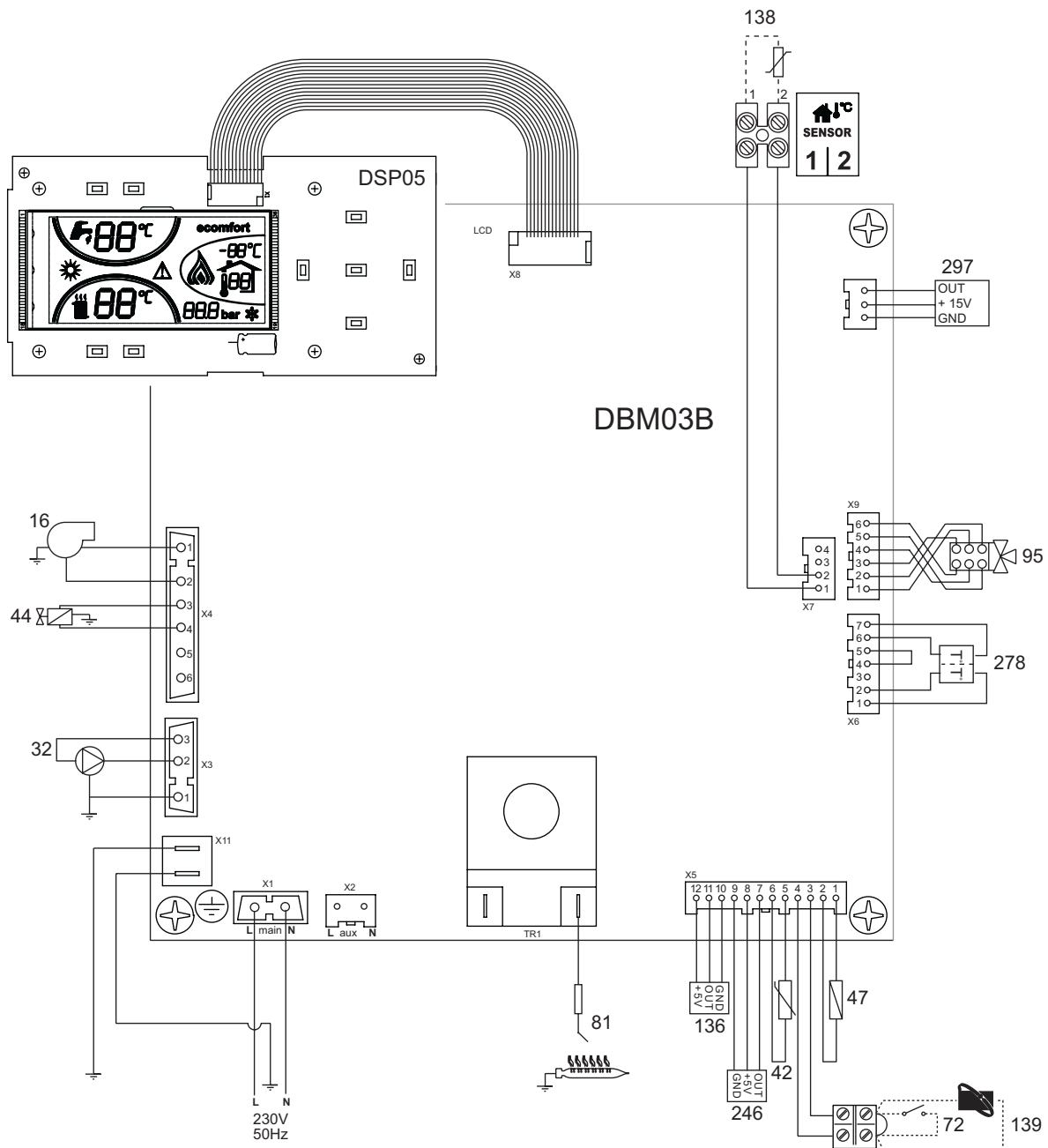


fig. 33 - Wiring diagram



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

Key

- 16 Modulating fan
- 32 Heating circulating pump
- 42 DHW temperature sensor
- 44 Gas valve
- 47 Modureg
- 72 Room thermostat
- 81 Ignition/detection electrode

- 95 Diverter valve
- 136 Flow meter
- 138 External probe
- 139 Remote timer control (OpenTherm)
- 246 Pressure transducer
- 278 Double sensor (Safety + Heating)
- 297 Air pressure transducer