



GIAVA

KRB 12 - 24 - 28 - 32

INSTALLATION, USE AND MAINTENANCE



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Dear Sirs,

Thank You for choosing and buying one of our boilers. Please read these instructions carefully in order to properly install, operate, and maintain the equipment.



**We inform users that:**

- **boilers shall be installed by an authorised company in full compliance with the prevailing standards;**
- **the installing company is required by law to issue a declaration of conformity with the current Standards concerning the performed installation;**
- **anyone entrusting installation to an unqualified installer will be subject to administrative sanctions;**
- **boilers can be maintained by authorised personnel only, under the requirements set forth by the prevailing rules.**

## General notes for installing and maintenance technicians, and users

This instruction manual is an integral and essential part of the product. It shall be supplied by the installer to the user who shall keep it carefully to consult it whenever necessary.

This document shall be supplied together with the equipment in case the latter is sold or transferred to others.



**This equipment has been manufactured to be connected to a room heating system and to a DHW distribution system. Any other use shall be considered unsuitable and dangerous for people, animals, and/or property.**

The equipment shall be installed in compliance with the prevailing standards and in accordance with the manufacturer's instructions specified in this manual: the manufacturer will not be held responsible for injuries to people and animals and/or damages to property resulting from an incorrect installation.

Damage and/or injury caused by incorrect installation or use and/or damage and/or injury due to non-observance of the manufacturer's instructions shall release the manufacturer from any and all contractual and extra-contractual liability.

Before installing the boiler, check that the technical data correspond to the requirements for its correct use in the system.

Check that the boiler is intact and it has not been damaged during transport and handling. Do not install equipment which is clearly damaged and/or faulty.

Do not obstruct the air intake openings.

Only original accessories or optional kits (including the electric ones) are to be installed.

Properly dispose of the packaging as all the materials can be recycled. The packaging must therefore be sent to specific waste management sites.

The packages can be dangerous: keep them out of the reach of children.

In the event of failure and/or faulty functioning, switch off the boiler. Do not attempt to make repairs: contact qualified technicians. Original parts must be used for all repairs to the boiler.

Non-observance of the above requirements may affect the safety of the boilers and endanger people, animals and/or property.



**Routine boiler maintenance should be performed according to the schedule in the relevant section of this manual. Appropriate maintenance will keep the boiler working in optimum conditions, ensuring environmental protection and total safety for persons, animals and/or property. Incorrect and irregular maintenance can be a source of danger for people, animals and property.**

The user is strongly advised to have the boiler serviced and repaired by a qualified Service Centre.

In the event of long periods of inactivity of the boiler, disconnect it from the electrical power mains and close the gas cock.

**Warning: Should power mains be disconnected, boiler electronic freeze protection function will not be operative.**

Should there be a risk of freezing, add anti-freeze: it is not advisable to drain the system as this may result in damage; use specific anti-freeze products suitable for multi-metal heating systems.



**With gas fired boilers, take the following measures if you smell gas:**

- do not turn on or off electric switches and do not turn on electric appliances;
- do not ignite flames and do not smoke;
- close the main gas cock;
- open doors and windows;
- contact a Service Centre, a qualified installer or the gas supply company.

**Never use a flame to locate a gas leak.**



**The boiler is designed for installation in the countries indicated on the technical data plate: installation in any other country may be a source of danger for people, animals and/or property.**

**The manufacturer will bear no contractual and tortious liability for failure to comply with all the instructions above.**

## Rapid operating instructions

The following instructions will help you to switch the boiler on quickly and regulate it for immediate use.



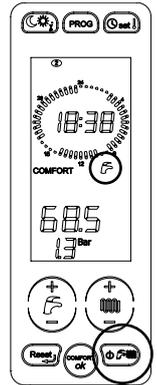
**It is presumed that the boiler has been installed by a qualified installer, it has been commissioned and is ready to operate correctly.**

**If any accessories have been fitted on the boiler, these instructions will not cover them. You will therefore have to refer to the full boiler instructions as well as to the specific instructions for the accessories.**

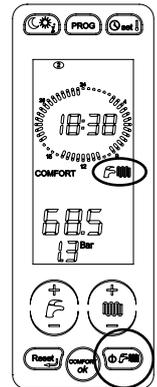
This manual contains full details of how the boiler works, and full operating and safety instructions.

1. Open the gas cock installed ahead of the boiler.
2. Turn the master switch installed ahead of the boiler ON: the boiler display (fig. 1) turns on.

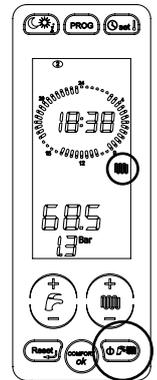
3. If you **do not wish** to activate the heating function, press the "operating mode selection" button  until it will display the symbol : only the DHW function will be enabled.



4. If you **wish** to activate both the heating and DHW functions, press the "operating mode selection" button  until displaying the symbol .



5. If you **do not wish** to activate the DHW function, press the "operating mode selection" button  until displaying the symbol : only the CH function will be enabled.



6. To set the DHW water temperature press "DHW + and -" buttons (**D**, fig. 1). Set temperature as required.

7. To set the heating water temperature, press "CH + and -" buttons (**E**, fig. 1). Set temperature as required.

8. Set the desired temperature on the (optional) ambient thermostat in the building.

The boiler is now ready to operate.

If the boiler shuts down, press "reset" button (**F**, fig. 1).

If the boiler does not resume its standard operation after three attempts, contact a qualified Service Centre.

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	<b>SYMBOL</b>	<b>STEADY</b>	<b>FLASHING</b>
1		Indication of "parameter" inside the parameter menu.	
2		Displaying of the number of parameters, or of the system pressure, or of the burner power percentage.	
3		Indication of the temperatures, parameter values, faults and shut-downs.	
4		Boiler is working in CH mode.	CH water temperature adjustment with buttons ( <b>E</b> , fig. 1).
5		Boiler is working in DHW mode.	DHW temperature adjustment with buttons ( <b>D</b> , fig. 1).
6	COMFORT	Display of DHW "comfort" state: wording ON = comfort enabled; wording OFF = comfort disabled	
7		Current temperature (sun = day; moon = night)	Setting of the two temperatures associated with the day and the night.
8		Display of current time/fan revolutions.	
9	PROG	Indicates if the unit is in time slot programming mode.	
10		Manual mode operation.	Manual mode setting.
11		Display of zone 1 CH programme.	Edit zone 1 CH programme.
12		Current day of the week.	Edit day of the week.
13		Display of zone 2 CH programme.	Edit zone 2 CH programme.
14		Display of water heater programme	Edit water heater programme
15		Night time temperature indication.	
16		Daytime temperature indication.	All lights flashing: automatic mode setting.
17		Display of the flue cleaning function and of the "rpm" wording to show the number of revolutions per minute of the fan.	Indicates that you are accessing the flue cleaning function.
18		Symbols for instantaneous DHW, CH. Symbol ON = function enabled, OFF = function disabled.	
19			With external probe installed, it flashes when the calculated ambient temperature is being set through the buttons ( <b>E</b> , fig. 1).
20		Indication of the centigrade degrees.	
21	Bar	Indication of system pressure measurement unit.	
22		Percentage indication.	
23		During parameter editing, the wrench symbol stays on until the set datum is confirmed.	
24		Lit flame indication on the burner.	

## 1.2. Interpreting BOILER STATUS from LCD DISPLAY INDICATIONS

### Normal operation

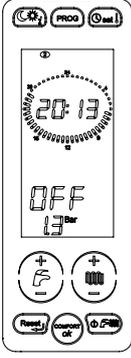
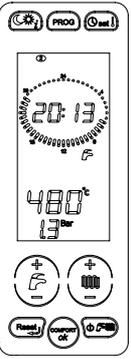
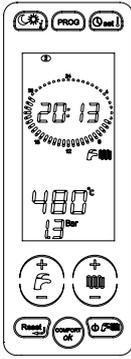
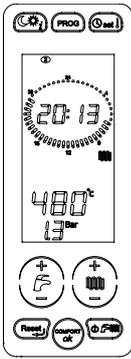
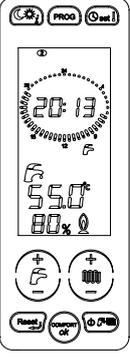
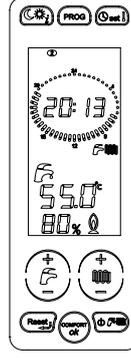
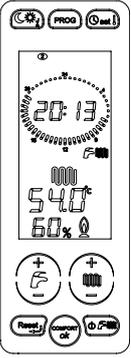
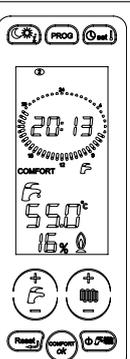
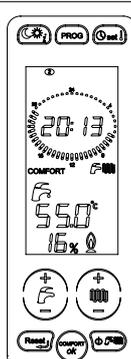
<p><b>Boiler switch in OFF mode</b></p>	
<p><b>Boiler switch in SUMMER or WINTER mode or CH ONLY</b>  <b>No active function</b>  <b>The flow temperature and the heating system pressure are displayed.</b></p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   <b>SUMMER</b> </div> <div style="text-align: center;">   <b>WINTER</b> </div> <div style="text-align: center;">   <b>CENTRAL HEATING ONLY</b> </div> </div>
<p><b>Boiler switch in SUMMER or WINTER mode</b>  <b>Water heater enabled, DHW function active</b>  <b>DHW temperature displayed</b></p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   <b>SUMMER</b> </div> <div style="text-align: center;">   <b>WINTER</b> </div> </div>
<p><b>Boiler switch in WINTER mode or CH ONLY</b>  <b>CH function active</b>  <b>The flow water temperature is displayed</b></p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   <b>WINTER</b> </div> <div style="text-align: center;">   <b>CENTRAL HEATING ONLY</b> </div> </div>
<p><b>Boiler switch in SUMMER or WINTER mode</b>  <b>Comfort function in progress</b>  <b>The flow water temperature is displayed</b></p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   <b>SUMMER</b> </div> <div style="text-align: center;">   <b>WINTER</b> </div> </div>

Table 1 - BOILER STATUS - LCD DISPLAY INDICATIONS during normal operation

## Malfunction

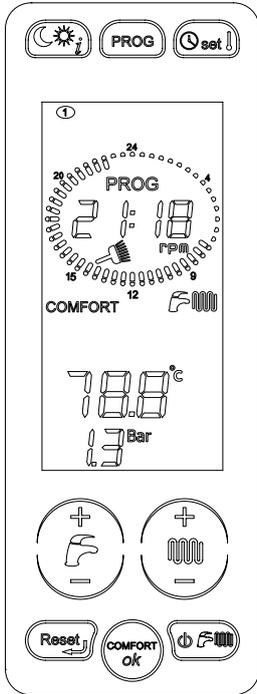
<b>No flame</b>	E01
<b>Triggering of double flow probe</b>	E02
<b>Triggering of flue gas thermostat</b>	E03
<b>Insufficient system pressure</b>	E04
<b>Flow probe failure</b>	E05
<b>Flue probe failure</b>	E07
<b>Too high system pressure</b>	E09
<b>Water heater probe failure</b>	E12
<b>Return probe failure</b>	E15
<b>Remote Control connection failure (only shown on Remote Control panel)</b>	E31
<b>Triggering of safety thermostat in mixed zone 2</b>	E35
<b>Flow probe failure in mixed zone 2</b>	E36 02
<b>Flow probe failure in mixed zone 3</b>	E36 03
<b>Fan failure</b>	E40
<b>Communication failure between peripheral devices (zone boards)</b>	E41
<b>Hydraulic configuration not allowed (wrong P03 and P18 parameter setting)</b>	E42
<b>Zone configuration error (ambient probe, Remote Control and ambient thermostat). Wrong setting of P61 parameter.</b>	E43
<b>Ambient probe 1 failure</b>	E44
<b>Ambient probe 2 failure</b>	E45
<b>Pressure transducer failure</b>	E46
<b>External probe fault with connected ambient probe (displayed if P57=2 or P57=3)</b>	E47

<b>Communication error between main board and interface board</b>	E49
<b>Shut-down due to safety circuit hardware fault</b>	E51 E52 E53
<b>Incompatibility between boiler board and interface board</b>	E73
<b>Offset error <math>\Delta T</math> max</b>	E80
<b>Flow or return probe &gt; 120°C</b>	E85
<b>Maximum flow derivative exceeded</b>	E86
<b>Maximum return derivative exceeded</b>	E87
<b>Flue gas temperature lower than heating return temperature</b>	E89
<b>Flue gas maximum threshold exceeded</b>	E90
<b>Flue gas maximum derivative exceeding alarm</b>	E91
<b>Max. number of reset attempts from touch screen reached</b>	E98
<b>Max. number of reset attempts from Remote Control reached (optional, if connected)</b>	E99

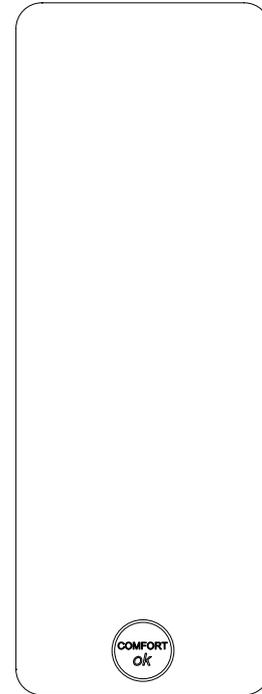
Table 2 - BOILER STATUS - LCD indications in the event of malfunction

### 1.3. "Comfort" enable/disable function

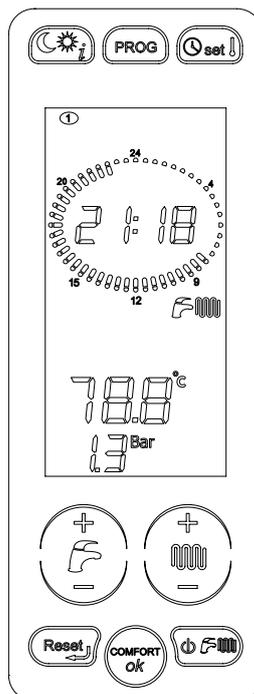
This function keeps the water heater hot ignoring the existing water heater heating programming, if any (par. 1.10). When the "COMFORT" icon (6, fig. 1) is on, the function is enabled. When it is off the function is disabled and the boiler follows the set water heater hour programming. If "COMFORT" function is enabled (icon "COMFORT" 6 in fig. 1 ON) press "COMFORT" button (G, fig. 1) to disable it. If "COMFORT" function is disabled (icon "COMFORT", 6 in fig. 1 OFF) press "COMFORT" button to enable it. The water heater heating through "COMFORT" function, or programming, is carried out only if the boiler is in SUMMER or WINTER operating mode. If the boiler is in CH ONLY or OFF operating mode the water heater is not heated.



1. "COMFORT" FUNCTION ENABLED



2. PRESS THE COMFORT BUTTON



3. "COMFORT" FUNCTION DISABLED

## 1.4. Selecting the operating mode

Whenever button  is pressed, the "SUMMER" , "WINTER" , "CH ONLY" , "OFF" modes are enabled in sequence.

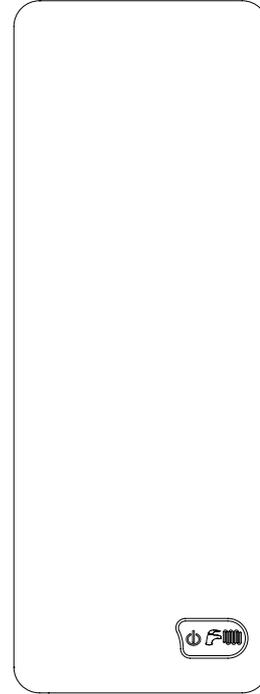
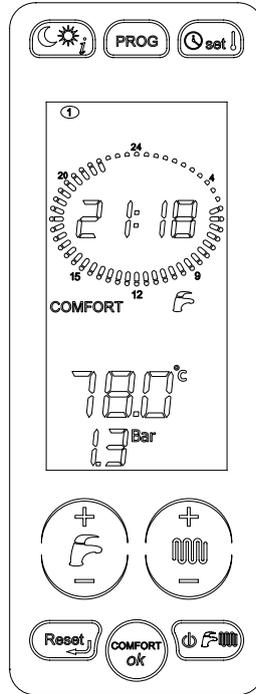
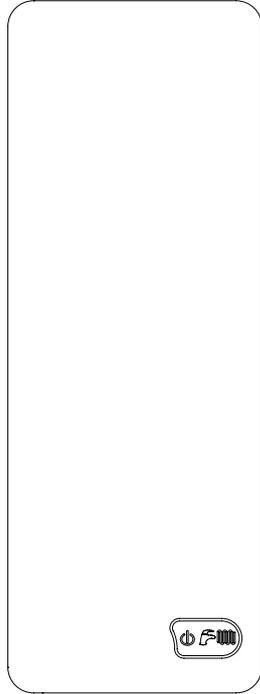
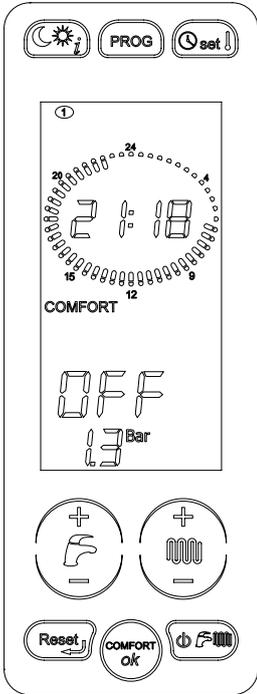
At this stage, all buttons are enabled.

When the "SUMMER" mode is enabled, only the DHW production function is active.

When the "CH ONLY" mode is enabled, only the heating water production function is active.

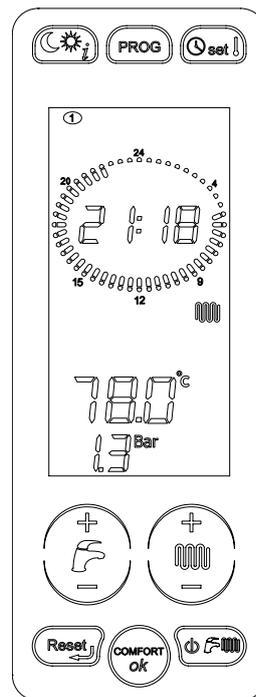
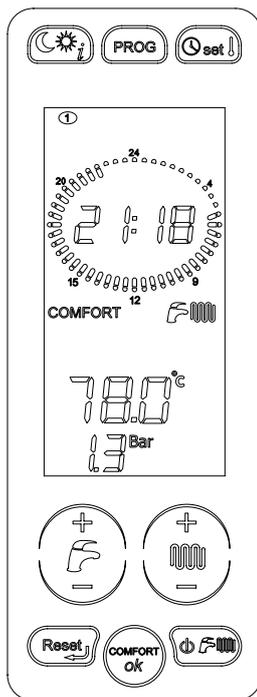
When the "WINTER" mode is enabled, both DHW and CH functions are active.

When the "OFF" mode is enabled, no function is active.



1. OPERATING STATUS  
OFF

2. OPERATING STATUS  
SUMMER



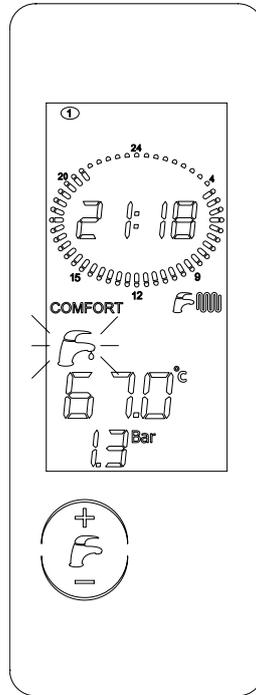
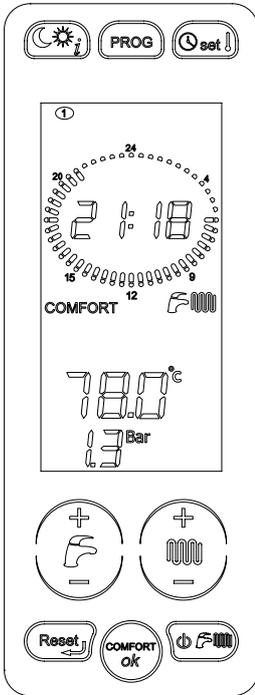
3. OPERATING STATUS  
WINTER

4. OPERATING STATUS  
CENTRAL HEATING ONLY

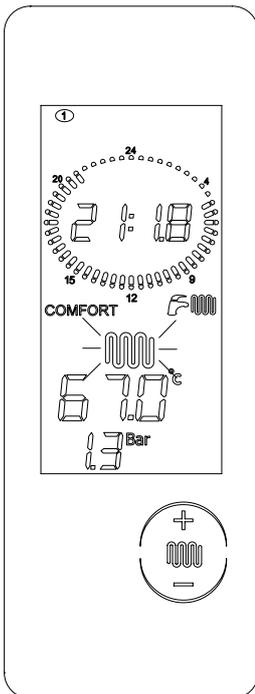
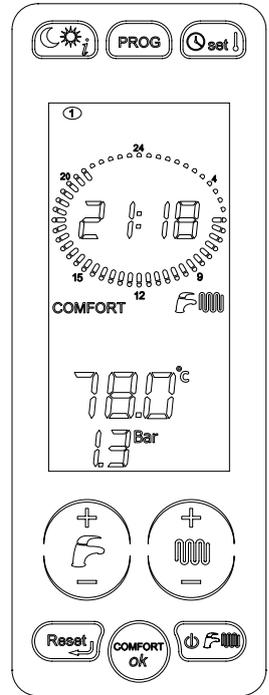
## 1.5. Adjusting CH and DHW temperature

Press the "DHW + and -" button (D, fig.1) to select the desired domestic hot water temperature (refer to paragraph 1.14.3). During selection, DHW icon (5, fig. 1) will flash. As soon as button is released, icon will continue flashing for approx. 3 seconds, and temperature value will flash as well. After this time, value is stored and display standard operation will be restored. In the phase in which the icon is flashing, only the buttons to adjust the temperature of the DHW are enabled.

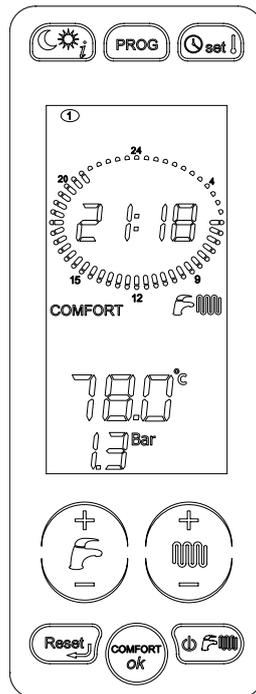
Press the "CH + and -" button (E, fig. 1) to select the desired flow water temperature. During selection, CH icon (4, fig. 1) will flash. As soon as button is released, icon will continue flashing for approx. 3 seconds, and temperature value will flash as well. After this time, value is stored and display standard operation will be restored. In the phase in which the icon is flashing, only the buttons to adjust the heating temperature are enabled.



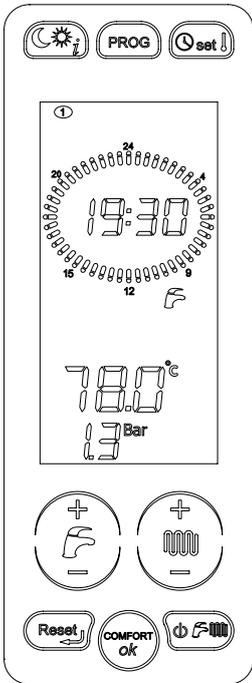
1. DHW TEMPERATURE SETTING



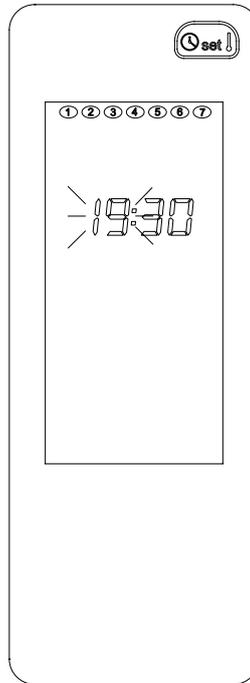
2. CH TEMPERATURE SETTING



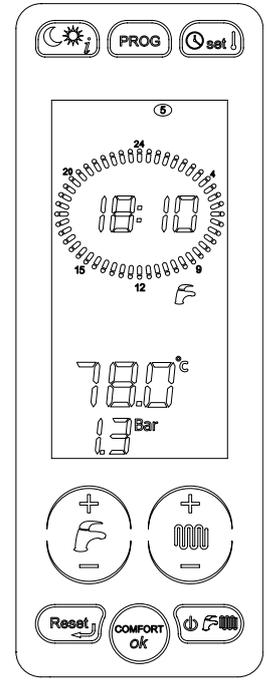
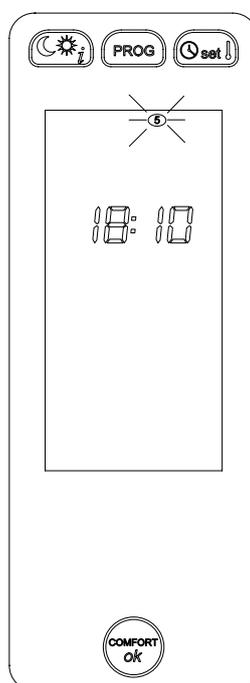
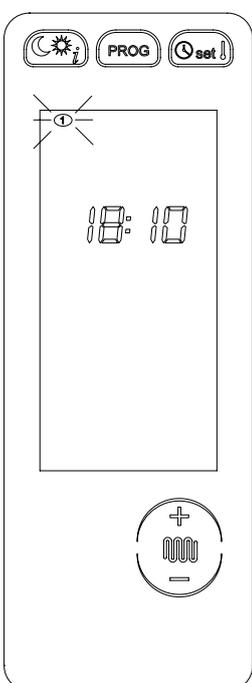
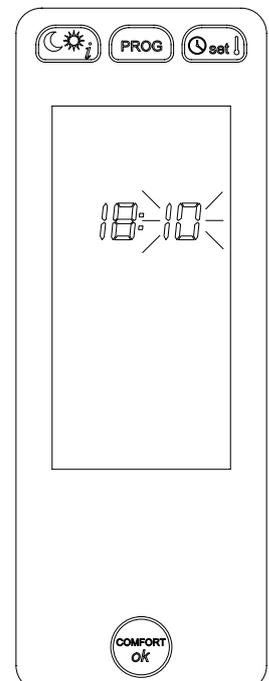
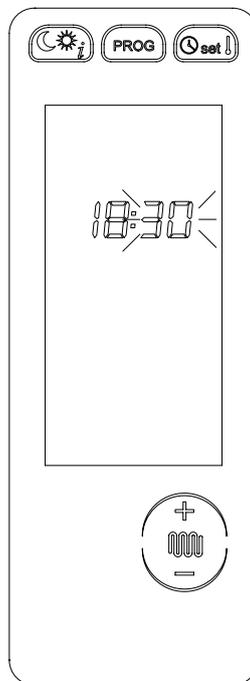
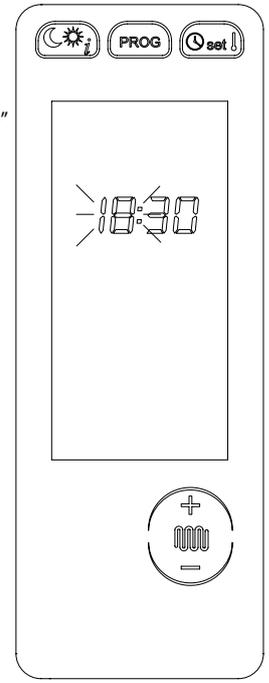
## 1.6. Time setting



1- To set time, minutes and day of the week, press "set".



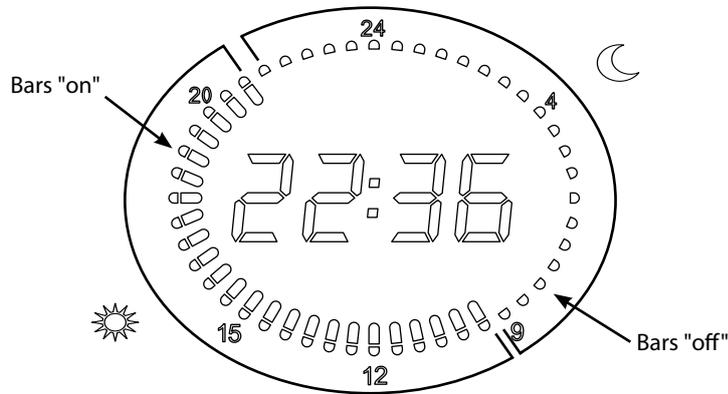
2- Flashing values can be edited by pressing "CH + and -" buttons. Press "ok" to confirm the edited value and shift to next parameter, press "reset" to quit the function and go back to starting page. Press "set" to access the day and night setting function described in the following paragraph.



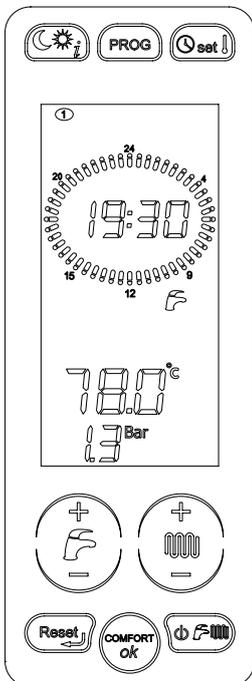
## 1.7. "Day temperature" and "night temperature" setting

When one or more ambient probes are connected to boiler electronic board, two levels of ambient temperatures can be set. Boiler will manage the heating request based on the set temperatures, as follows. If no ambient probe is connected to the boiler, temperatures cannot be set.

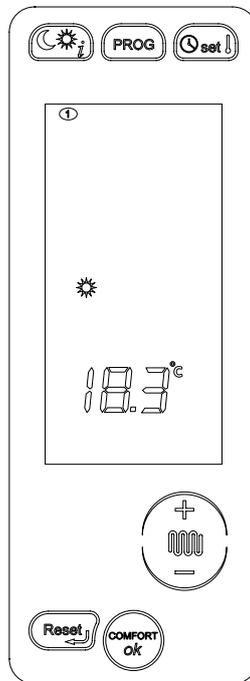
"Day" temperature is identified by the symbol ☀, while "night" temperature by the symbol ☾.



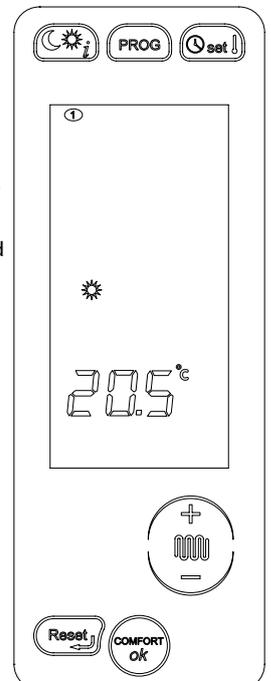
The "day temperature" is active when bars are on, while "night" temperature is active when bars are off.



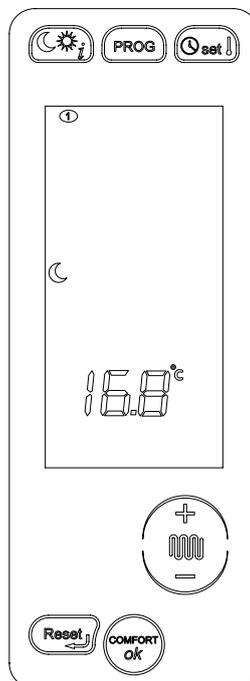
1- Press "set" twice to access the "day temperature" setting mode.



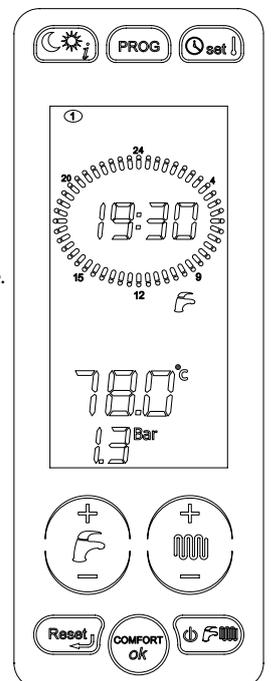
2- Press "CH + and -" buttons to edit "day temperature" values. Press "ok" to confirm the edited values and enter the "night temperature" setting mode.



3- Press "CH + and -" buttons to edit "night temperature" values.

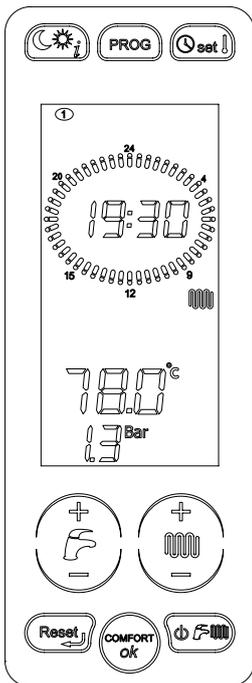


4- Press "ok" to confirm the edited values and quit the "day and temperature" setting mode.

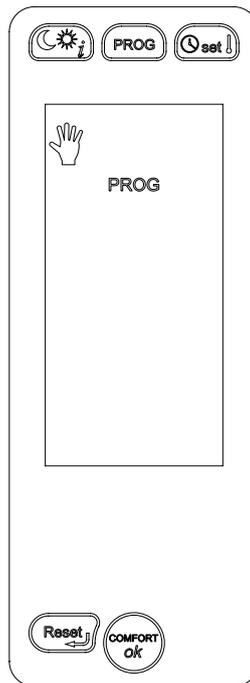


## 1.8. "Manual" programme setting

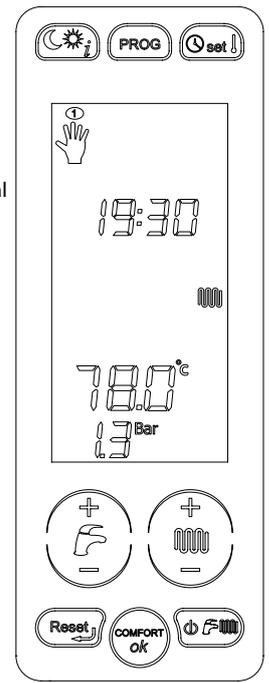
The "manual" mode selection indicated with symbol , allows activating the heating function, 24 hours a day, in both zones at the "day temperature", disabling at the same time zone 1 and zone 2 programming. The water heater on the other side, is heated according to the specific programme.



1- Press "prog" to access the manual programme setting mode.

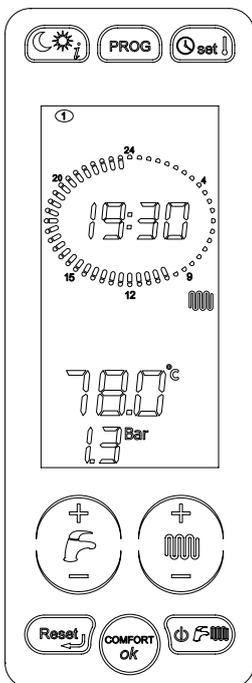


2- Press "ok" to confirm manual programming activation. Press "reset" to go back to the starting page, namely to quit the function.

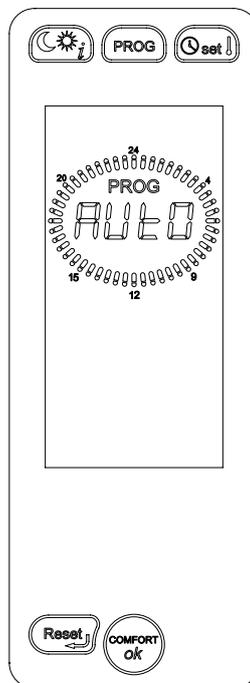


## 1.9. "Automatic" programme setting

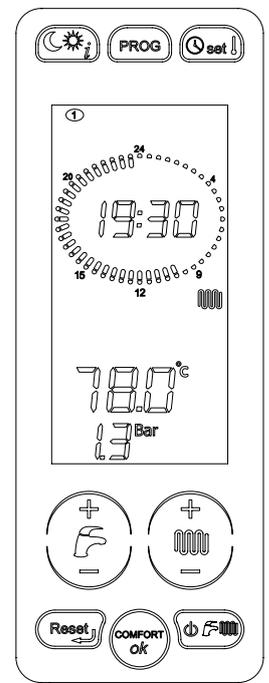
The selection of "automatic" mode, identified by symbol , allows boiler to enable heating of both zones in "day temperature" or "night temperature", based on the programming envisaged for zone 1 and zone 2.



1- Press "prog" to access the automatic programme setting mode.

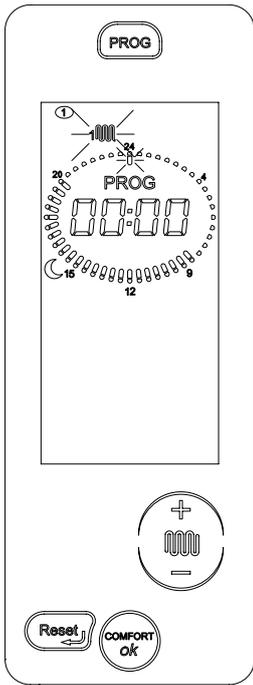


2- Press "ok" to confirm automatic programming activation. Press "reset" to go back to the starting page, namely to quit the function.

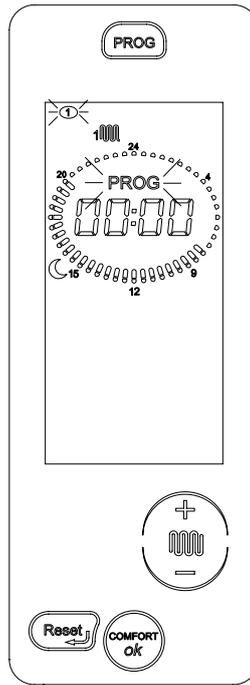


## 1.10. CH and water heater programme mode

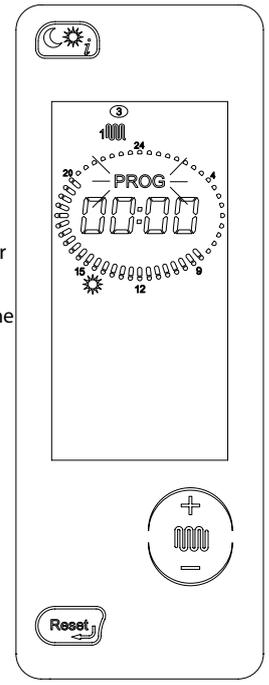
To access zone 1 CH programme displaying or editing, press "prog" button twice.



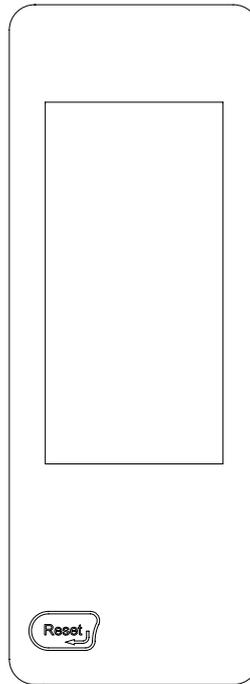
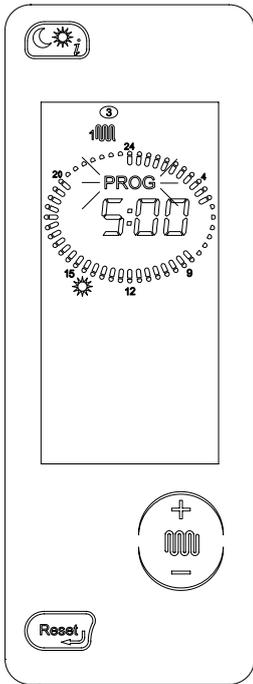
1- The display shows zone 1 symbol flashing, sun or moon symbols, bars on or off, respectively, at 00:00. Clock lights display the programming connected to day 1 (Monday) and 00:00 bar is flashing.



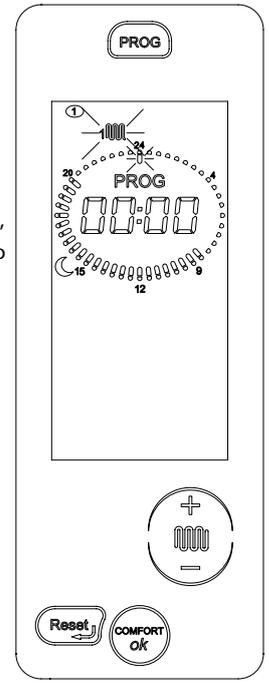
2- Press "ok" to access zone programming function. "Prog" wording starts flashing together with number 1 (Monday). Press "CH + and -" buttons to select the desired day of the week. Press "ok" to select the desired day. Now you can associate the day/night level to the desired time of the day.



3- Whenever "day/night" button (A, fig. 1) is pressed, the sun and moon symbols are alternatively activated (sun = day level; moon = night level). At the same time, close to the current time (flashing bar) clock bar comes on if the "sun" icon is on, and turns off the "moon" icon is off. Current time is indicated by both the clock and the flashing bar. Press "CH + and -" buttons to move inside the different times of the day.



4- To program other days of the week or to program zone 2, press "reset". You will go back to the starting page.



Whatever part of the programme can be quit by pressing the "reset" button twice. The procedure to program zone 2 and water heater, is very similar to the one followed to program zone 1. Press the "prog" button to access, in sequence, to the following 4 programmes: manual; zone 1; zone 2; water heater.

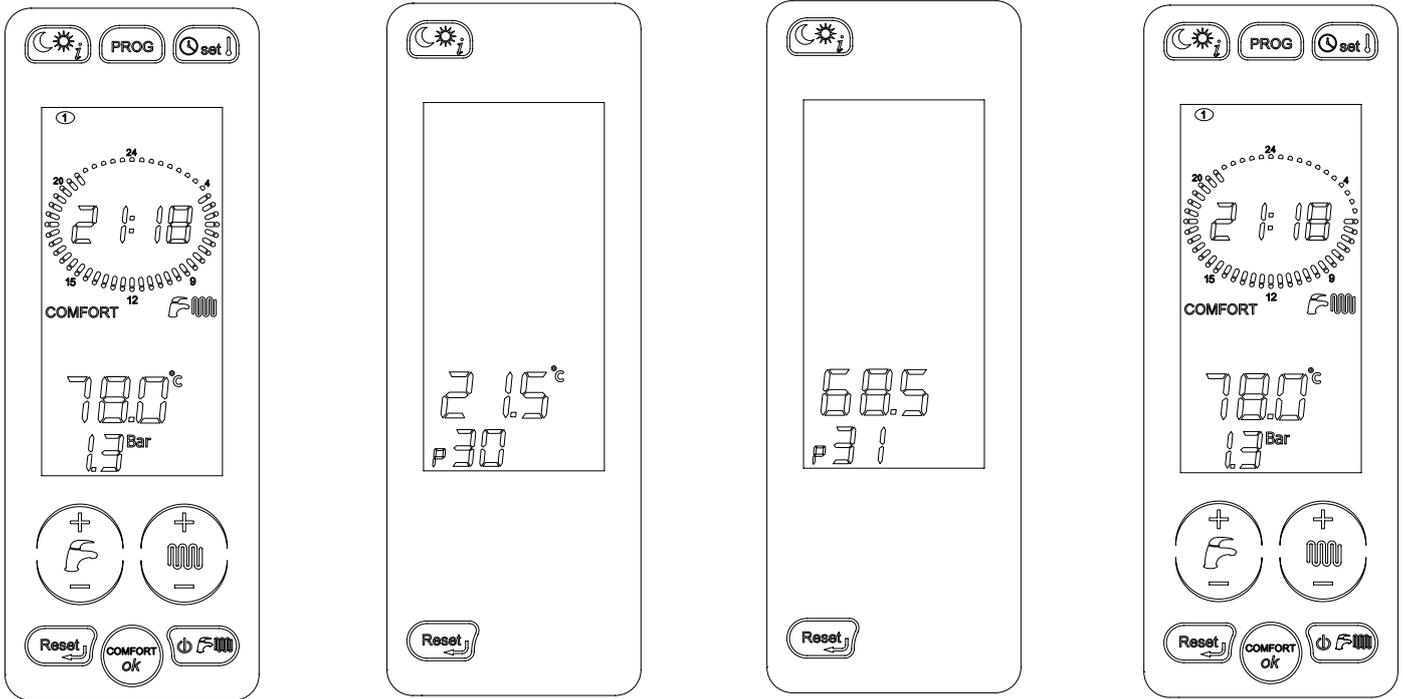
If ambient probes are connected, the "day temperature" level and the "night temperature" will acquire the temperature value, and heating will be active until the temperature measured by the ambient probe reaches the preset value for the different time slots.

When no ambient probe is connected, the two day/night levels will acquire the on and off values. So heating is ON in the selected periods with the sun symbol, while it is OFF in the selected periods with the moon symbol.

In case of connection with Open Therm remote control, that zone shall not be managed by boiler boards, as it will be directly managed by the Remote Control and, as a consequence, zone programming will be inhibited.

## 1.11. Parameter display

Press "Info" (A, fig. 1) to scroll the different parameter values. You can quit this function at any time by simply pressing the "Reset" button. Paragraph 3.2.14 describes the meaning of all parameters.

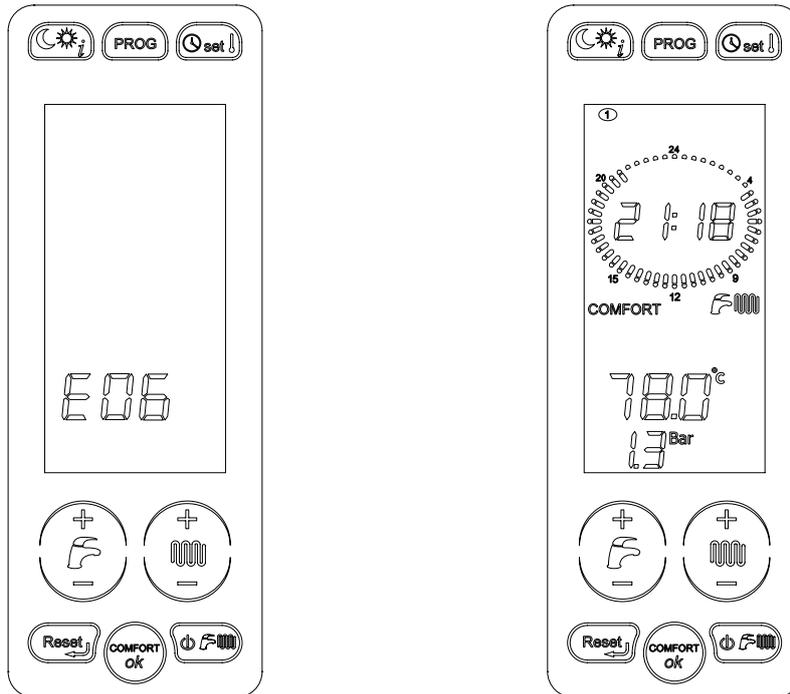


PARAMETERS	DESCRIPTION
P30 - TSP30	External temperature displaying (if an external probe is present).
P31	Flow temperature displaying.
P32	Calculated nominal flow temperature displaying. If no external probe is installed, the flow temperature manually set on boiler will be displayed. If an external probe is installed, the flow temperature boiler calculated through the curves on fig. 27 will be displayed
P33	Displaying of flow temperature set for zone 2 (V versions)
P34	Displaying of flow temperature currently detected for zone 2 (V versions)
P36	Displaying of flow temperature set for zone 3 (Z versions)
P37	Displaying of flow temperature currently detected for zone 3 (Z versions)
P43	Displaying of return temperature.
P44	Displaying of water heater temperature.
P45	Displaying of flue gas temperature.
P49	Displaying of ambient probe 1 temperature (if ambient probe is connected).
P50	Displaying of ambient probe 2 temperature (if ambient probe is connected).

Table 3 - Displayable parameters with info button

### 1.12. Failures that cannot be reset

The display shows the failure based on the corresponding error code (see paragraph 1.2). Some failures can be reset through the reset key, while some others are self-resettable. Refer to the following paragraph ("Resume boiler function"). If failures cannot be reset but are of the self-resettable type, no key will be enabled and only the LCD back-lighting will be on. As soon as the error cause is eliminated, the failure signal will disappear from the interface, this latter will be enabled and, 15 seconds after no key is touched, all the keys but the one around the LCD will be disabled.

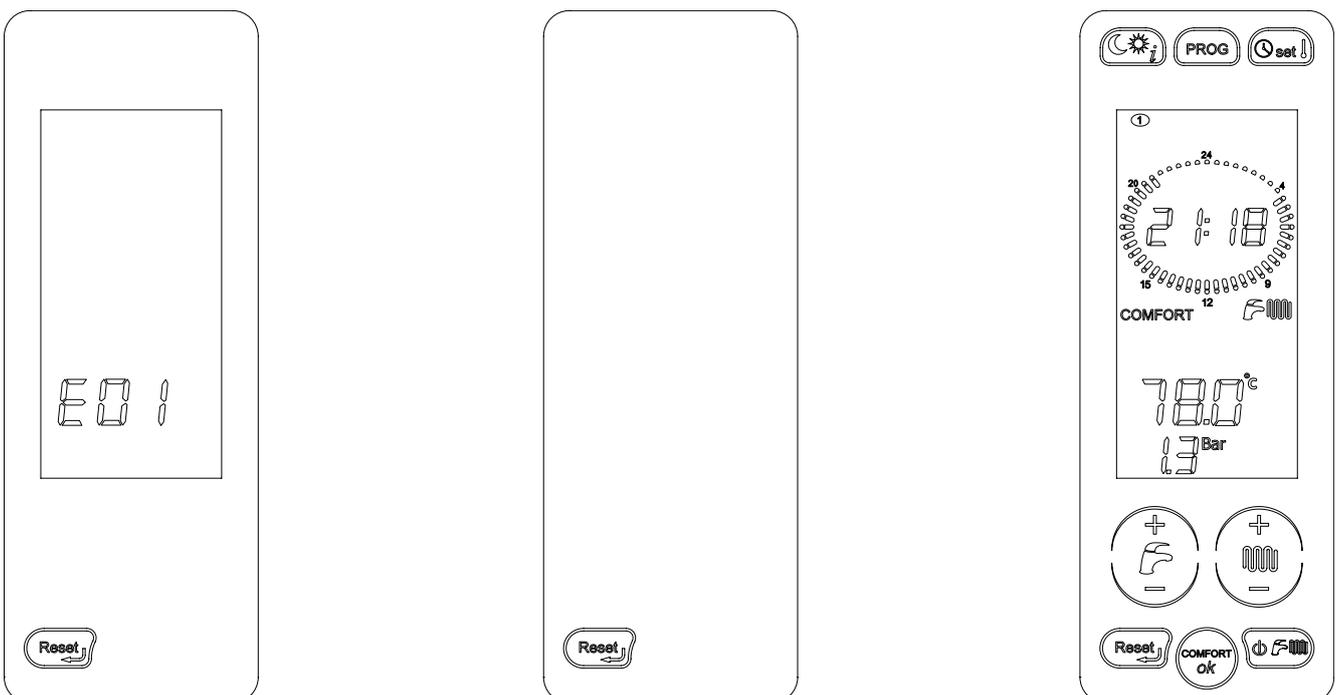


### 1.13. Resume boiler function

The display shows the failure based on the corresponding error code (see paragraph 1.2). Some failures can be reset through the reset key, while some others are self-resettable.

If shut-downs can be reset (E01, E02, E03, E40, E80, E86, E87), the reset key will always be on as well as the LCD back-lighting. The only active key you can press is the "reset" key.

When the reset key is pressed and boiler is under the correct conditions, the error is reset. The failure signal will disappear from the interface, this latter will be enabled and, 15 seconds after no key is touched, all the keys but the one around the LCD will be disabled.



## 1.14. Boiler operation

### 1.14.1. Switching on



**It is presumed that the boiler has been installed by a qualified installer, it has been commissioned and is ready to operate correctly.**

- Open the gas stop cock;
- turn the master switch installed ahead of the boiler ON. The display turns on and indicates the function currently active (see tables 1 and 2);
- select boiler operating mode pressing "Operating mode selection" button on the touch-screen (**H**, fig.1): OFF, SUMMER, WINTER, CH ONLY (paragraph 1.4.);
- set desired CH temperature (see par. 1.14.2);
- set the desired DHW temperature value by pressing the "DHW + and -" buttons (**D**, fig. 1);
- if one or more ambient probes or a thermostat are present, set the desired ambient temperature value and the weekly programming.

#### **WARNING**

**Should the boiler be left inactive for a long time, particularly when boiler is propane-fired, ignition might be difficult. Before starting the boiler switch on another gas powered device (e.g. kitchen range).**

**Beware that even by following this procedure, the boiler might still experience some starting difficulties and shut down once or twice. Reset boiler operation by pressing the "reset" button (**F**, fig. 1).**

### 1.14.2. CH function

- Set desired heating water temperature via "CH + and -" buttons (**E**, fig. 1).  
Heating temperature adjustment range depends on the selected operating range:
- **standard range:** 20°C to 78°C (press "CH + and -" buttons **E**, fig. 1);
  - **reduced range:** 20°C to 45°C (press "CH + and -" buttons).

The operating range shall be selected by the installing technician or by a qualified Service Centre (see paragraph 3.2.10). During temperature setting, the CH symbol (**4**, fig.1) on the screen flashes and the CH current setting is displayed.

For models with double or triple outlet for high-temperature and low-temperature zones (V, Z versions) the boiler operating range in CH mode must be set to standard range. The mixing valve on the low-temperature zone flow will adjust the flow to the correct temperature, based on the signal coming from the relevant zone.

When the central heating system requests heat from the boiler, the LCD displays the CH symbol steady on (**4**, fig.1) and the current CH flow water temperature. The burner on symbol (**24**, fig.1) only shows while the burner is operating. The waiting time between one boiler ignition and the following one, used to prevent boiler frequent turning on and off, ranges between 0 and 10 minutes (default value: 4 min.), and can be edited with the **P11** parameter. Should water temperature in the system fall below set minimum value, between 20°C and 78°C (default value for standard range: 30°C, default value for reduced range: 20°C) to be edited with the **P27** parameter, the waiting time is reset and the boiler re-ignites (see paragraph 3.2.10).

### 1.14.3. DHW function

The boiler is equipped with water heater with 130 litres single coil.

- DHW production function may be enabled by the user in two ways:
- setting a water heater hour programming on the boiler (paragraph 1.10);
  - using COMFORT function (paragraph 1.3).

The domestic hot water temperature can be set from 35 °C to 65 °C by means of the "DHW + and -" keys (**D**, fig. 1). During temperature setting, the DHW symbol on the LCD appears and the DHW setting is displayed.

Water heater heating, through the COMFORT function or programming, is carried out only if the boiler is in SUMMER or WINTER mode. If the boiler is in CH ONLY or OFF operating mode the water heater is not heated.

Boiler electronics always gives priority to DHW over CH supply.

### 1.14.4. Freeze protection function

This boiler is fitted with a freeze protection system, which works when the following functions are activated: OFF/SUMMER/WINTER/CH ONLY.



**The freeze protection function only protects the boiler, not the whole heating system. Ambient probes or a room thermostat must be used to provide freeze protection for the central heating system. Bear in mind, however, that they are disabled when the boiler is in OFF operating mode. To protect the system, as well as the boiler, set the boiler to WINTER operating mode /f.**

The CH system can be effectively protected against icing by using specific anti-freeze products that are suitable for multi-metal systems. **Do not use anti-freeze products for car engines, and check the effectiveness of the product used over time.**

In case burner cannot be ignited due to the lack of gas, the freeze protection functions are anyway enabled through the circulation pumps.

#### 1.14.4.1. Ambient probe freeze protection function

If the boiler board is OFF, or WINTER, and the ambient probes detect a temperature below 5°C, a heating request to heat the probe-controlled room is launched. The heating function ends when the probe ambient temperature reading reaches 6°C.

#### 1.14.4.2. Flow freeze protection function

When the heating water temperature sensor detects a water temperature of 5°C, the boiler switches on and stays on at its minimum heat output until the temperature reaches 30°C or 15 minutes have elapsed.

The pump continues to operate even if the boiler shuts down.

#### 1.14.4.3. Water heater freeze protection function

The water heater probe is used to measure water heater temperature and, when this latter is below 5°C, an operation request in water heater antifreeze mode is launched: the circulation pump will thus be started and the burner ignited.

The anti-freeze function also protects the water heater. When water heater temperature sensor detects a water temperature of 5°C, the boiler switches on and stays on at its minimum heating output until the temperature of the water in the heater reaches 10°C or 15 minutes have elapsed.

The pump continues to operate even if the boiler shuts down.

During the water heater anti-freeze operation the temperature detected by the flow probe is constantly checked, and in case it reaches 60°C the burner is switched off. The burner is switched on again if the operation request in anti-freeze mode is still present and the flow temperature is below 60°C.

#### 1.14.5. Pump and valve anti-shutdown function

If the boiler remains inactive and connected to the power mains, the circulation pump and the deviating valve will be shortly enabled every 24 hours so as to avoid any shut-down.

On models with high- and low-temperature outlet (V, Z versions, only) the high- and low-temperature zone pumps and the mixing valve are equipped with an anti-shutdown function. In particular, the pumps are enabled for 10 seconds and the valve carries out a complete cycle after 24 hours of inactivity.

#### 1.14.6. Operation with external probe (optional)

Boiler can be connected to a probe measuring the external temperature (optional - not compulsory, supplied by the manufacturer). Once the external temperature value is known, the boiler will automatically adjust the heating water temperature: increasing it as the external temperature decreases and decreasing it as the external temperature increases. This will both improve room comfort and reduce fuel consumption. Standard and reduced range max. temperature values will nevertheless be respected.

This boiler operating mode is called "sliding temperature operation".

Heating water temperature varies based on a programme written inside boiler electronic microprocessor.

**When working with an external probe, the "CH + and -" buttons (B, fig. 1) are no longer used to set CH water temperature but to edit calculated ambient temperature, namely the desired theoretical temperature.**

During temperature setting, the calculated ambient temperature symbol flashes on the display (19, fig. 1) and the value being set is shown.

For curve optimal setting, a position close to 20° C is recommended. For further details on sliding temperature, refer to paragraph 3.2.13.



**Only original external temperature probes supplied by the manufacturer must be used. The use of non-original external temperature probes, with technical specifications differing from those required by the managing electronics, may affect boiler and external probe operation.**

#### 1.14.7. Operation with (optional) remote control

Boiler interface includes all the possible functions of a Fondital Remote Control, and can control up to two heating zones. User can also connect the boiler to a Remote Control (optional - not compulsory, supplied by the manufacturer) so as to manage several boiler parameters, such as:

- boiler status selection;
- ambient temperature selection;
- CH water temperature selection;
- DHW temperature selection;
- CH activation time programming and water heater temperature lack of variations;
- boiler diagnostics display;
- boiler reset;
- and others.

For instructions on how to connect the Remote Control, refer to par. 3.2.12 and to its own instruction booklet.



**Only original remote controls supplied by the manufacturer must be used. The use of non-original remote controls, not supplied by the manufacturer, may affect Remote Control and boiler operation.**

### 1.15. Boiler shut-down

The boiler shuts down automatically if a malfunction occurs. Refer to Tables 1 and 2 to identify the boiler operating mode. To determine the possible causes of malfunction, see also paragraph 6. The troubleshooting section is at the end of this manual. Below is a list of kinds of shut-down and the procedure to follow in each.

#### 1.15.1. Burner shut-down

Fault code **E01** is displayed flashing on the display in the event of burner shut-down due to missing flame. If this happens, proceed as follows:

- check that the gas cock is open and light a kitchen gas ring for example to check the gas supply;
- once having checked if the fuel is available, press the "reset" button (**F**, fig. 1) to restore burner operation: if, after two starting attempts, the boiler still fails to start and enters the shut-down mode again, contact a Service Centre or qualified personnel for maintenance.

If the burner shuts down frequently, there is a recurring malfunction, so contact a Service Centre or a qualified service engineer.

#### 1.15.2. Shut-down due to incorrect air/flue gas system draught

If the air/flue gas system malfunctions, the boiler shuts down. The code **E03** (flue gas thermostat) is displayed flashing on the display.

Contact a Service Centre or a qualified service engineer to carry out the maintenance.

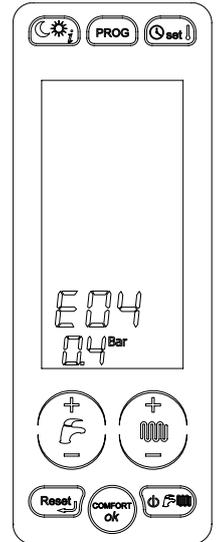
#### 1.15.3. Shut-down due to low water pressure

If "shutdown due to insufficient pressure in system" error **E04** starts flashing (indicating safety water pressure switch triggering), fill the system by opening the filler cock as shown in fig. 2. **E04** error is displayed when system pressure drops below 0.4 bar and error will be automatically reset as soon as system pressure reaches 0.8 bar. Water pressure must be 1-1.3 bars while the boiler is cold.

In order to restore water pressure, proceed as follows:

- turn the filler cock (fig. 2) anticlockwise to allow water to enter the boiler;
- keep the cock open until the control panel shows a value of 1÷1,3 bar;
- turn cock clockwise to close it.

If the boiler still fails to operate, contact a Service Centre or a qualified service engineer.



**Make sure you close the cock carefully after filling. If you do not, when the pressure increases, error E09 may be displayed and the heating system safety valve may activate and discharge water.**

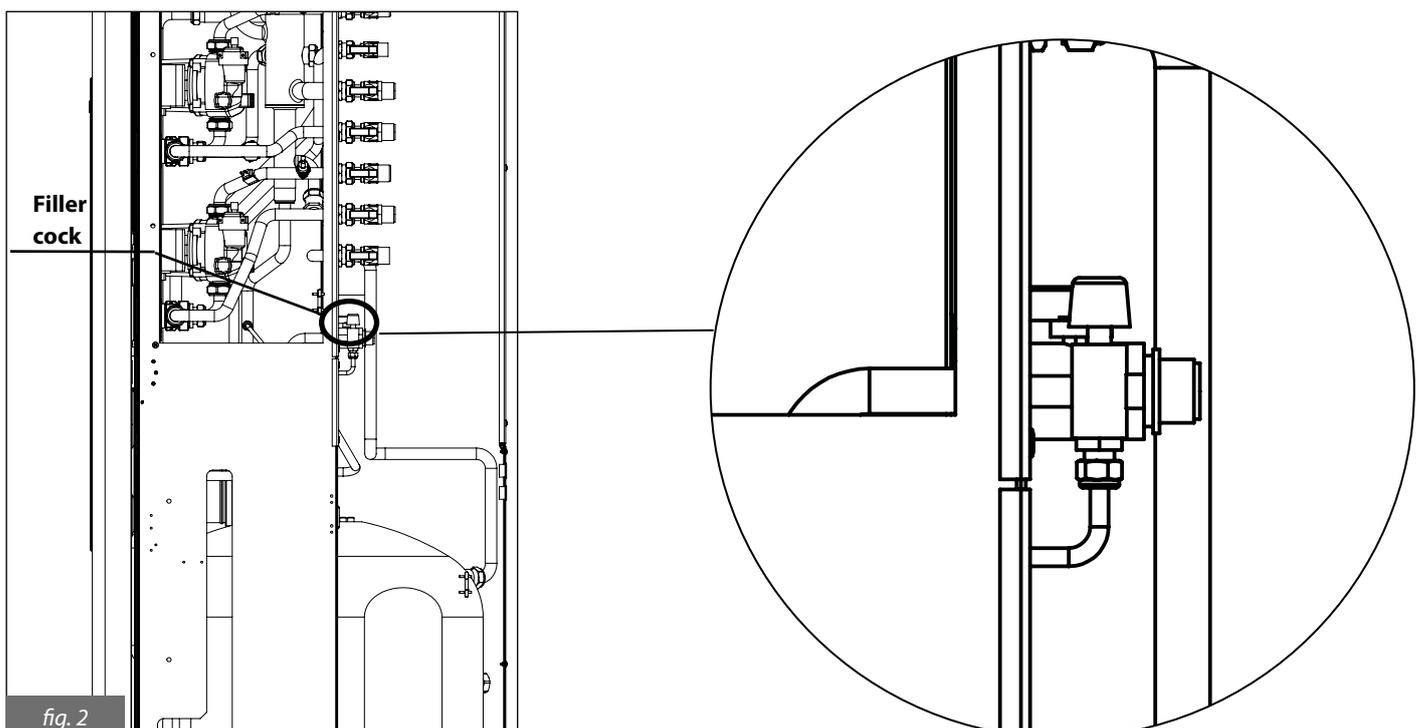


fig. 2

#### 1.15.4. Shut-down for fan malfunction

The fan operation is constantly monitored and in case of malfunction the burner goes off; the code **E40** flashes on the display. This mode is maintained until the fan recovers normal working parameters.

**If the boiler does not start and remains in this mode, contact a Service Centre or a qualified service engineer.**

#### 1.15.5. Alarm due to temperature probe malfunction

The following fault codes are shown on the display in the event of burner shut-down due to a temperature probe fault:

- **E05** for the CH probe. In this case the boiler ignition is disabled.
- **E12** for the water heater probe. In this case, the boiler works in standard mode, "comfort" function excluded.
- **E15** for the return probe. In this case the boiler does not work.
- **E36** for CH flow probe in one of the installed zones (V and Z versions). In this case boiler ignition is disabled only for the zone affected by the fault. All other zones operate correctly.

**In any case, contact a Service Centre or qualified personnel for maintenance.**

#### 1.15.6. Alarm due to (optional) Remote Control connection malfunction

The boiler recognises whether or not there is a Remote Control (optional).

If the boiler does not receive information from the Remote Control after the Remote Control itself is connected, the boiler attempts to re-establish communication for 60 seconds, after which the fault code **E31** is shown on the Remote Control display.

The boiler will continue to operate according to the settings on the touch screen panel and ignore the Remote Control settings.

**Contact a Service Centre or a qualified service engineer to carry out the maintenance.**

The remote control can indicate faults or shut-down conditions and can also restore boiler operation after shut-down up to a maximum of 3 times in a 24 hour period. If the maximum number of attempts is reached, fault code **E99** is shown on the boiler display. To reset error **E99**, disconnect and re-connect again boiler from/to power mains.

#### 1.16. Maintenance

The boiler must be serviced periodically as indicated in the relevant section of this manual.

Appropriate boiler maintenance ensures efficient operation, environment preservation, and safety for people, animals and objects.

Any maintenance (and repair) work must only be carried out by qualified personnel.

The user is strongly advised to have the boiler serviced and repaired by a qualified Service Centre.

See *chapter 5 Maintenance* for maintenance operations.

The user may only clean the external casing of the boiler, employing common household products.

Do not use water!

#### 1.17. Notes for the user

**The user may only access parts of the boiler that can be reached without using special equipment or tools. The user is not authorised to remove the boiler casing or to operate on any internal parts.**

**No one, including qualified personnel, is authorised to modify the boiler.**

**The manufacturer shall not be held responsible for damage to people, animals, or property due to tampering with or improper intervention to the boiler.**

**If the boiler remains inactive and the power supply is switched off for a long time, it may be necessary to reset the pumps.**

**This involves removing the casing and accessing internal parts, so it must only be carried out by suitably qualified personnel.**

**Pump failure can be avoided by adding to the water filming additives suitable for multi-metal systems.**

## 2. TECHNICAL FEATURES AND DIMENSIONS

### 2.1. Technical features

The boiler is equipped with a built-in fully pre-mixed gas burner, condensing heat exchanger and single coil water heater. The following models are available:

- **KRB 12** - Condensing boiler with single coil water heater, 12 kW heat input.
- **KRB 24** - Condensing boiler with single coil water heater, 23.7 kW heat input.
- **KRB 28** - Condensing boiler with single coil water heater, 26.4 kW heat input.
- **KRB 32** - Condensing boiler with single coil water heater, 30.4 kW heat input.
- **KRBS 12 V** - Condensing boiler with single coil water heater, 12 kW heat input. Version preset for connection to a high-temperature and a low-temperature zone.
- **KRBS 24 V** - Condensing boiler with single coil water heater, 23.7 kW heat input. Version preset for connection to a high-temperature and a low-temperature zone.
- **KRBS 28 V** - Condensing boiler with single coil water heater, 26.4 kW heat input. Version preset for connection to a high-temperature and a low-temperature zone.
- **KRBS 32 V** - Condensing boiler with single coil water heater, 30.4 kW heat input. Version preset for connection to a high-temperature and a low-temperature zone.
- **KRBS 12 Z** - Condensing boiler with single coil water heater, 12 kW heat input. Version preset for connection to a high-temperature zone and two low-temperature zones.
- **KRBS 24 Z** - Condensing boiler with single coil water heater, 23.7 kW heat input. Version preset for connection to a high-temperature zone and two low-temperature zones.
- **KRBS 28 Z** - Condensing boiler with single coil water heater, 26.4 kW heat input. Version preset for connection to a high-temperature zone and two low-temperature zones.
- **KRBS 32 Z** - Condensing boiler with single coil water heater, 30.4 kW heat input. Version preset for connection to a high-temperature zone and two low-temperature zones.

The boilers meet local applicable Directives enforced in the country of destination, which are stated on their rating plate. Installation in any other country may be a source of danger for people, animals and property.

The key technical features of the boilers are listed below.

#### Manufacturing characteristics:

- IPX5D electrically protected control panel;
- Integrated, modulating electronic safety board;
- Electronic start-up with igniter and ionisation flame detection;
- Stainless steel, fully pre-mixed burner;
- Mono-thermal, high efficiency, composite and stainless steel heat exchanger with air purging device;
- Twin shutter modulating gas valve with constant air/gas ratio;
- Modulating, electronically managed combustion fan;
- 3-speed CH circulation pump with built-in air purging device;
- CH pressure sensor;
- Hydraulic separator, mixing valves and circulation pumps for high- and low-temperature outlets (**V and Z versions**);
- CH water temperature probe, DHW temperature probe, water heater temperature probe;
- Safety limit thermostat on low-temperature flow zones;
- Double safety probe on CH flow;
- Flue gas thermostat on discharge tower;
- Flue gas probe on primary heat exchanger;
- Integrated, automatic by-pass;
- 10-litre CH expansion vessel, 5-litre DHW expansion vessel;
- CH system filling and draining cocks;
- Water heater discharge cock;
- CH 3-bar safety valve;
- DHW 6-bar safety valve;
- CH motorised deviating valve;

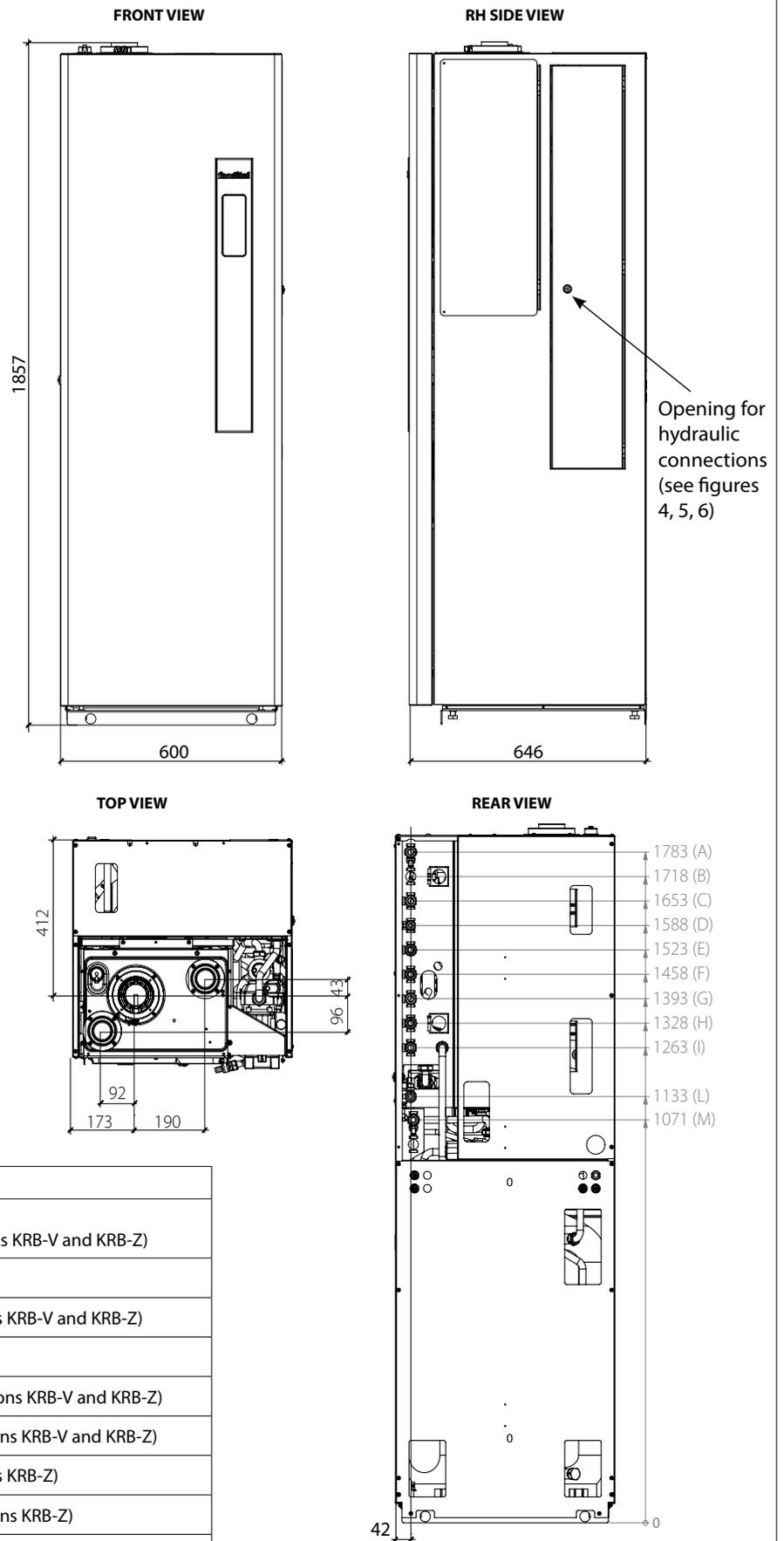
#### User interface

- Touch interface with built-in LCD to display and control boiler operating condition: OFF, WINTER, SUMMER and CH ONLY;
- CH water temperature regulator: 20/78 °C (standard range) – 20/45 °C (reduced range);
- DHW temperature regulator on the control panel: 35/65 °C.

## Operating features

- CH electronic flame modulation with timer-controlled rising ramp (60 seconds, adjustable);
- Electronic flame modulation in DHW mode;
- DHW priority function;
- Flow freeze protection function: ON 5°C; OFF 30°C or after 15 minutes of operation if CH temperature > 5 °C;
- DHW freeze protection function: ON 5°C; OFF 10 °C or after 15 minutes of operation if DHW temperature > 5 °C;
- Ambient probe freeze protection function: ON at 5 °C; OFF at 6 °C;
- Timer-controlled flue cleaning function: 15 minutes;
- Ignition flame propagation function;
- Possibility to select the heating range: standard or reduced;
- CH maximum heat input parameter adjustment;
- Ignition heat input adjustment parameter;
- CH thermostat timer: 240 seconds (adjustable);
- CH pump post-circulation function, freeze protection and flue cleaning modes: 30 seconds (adjustable);
- DHW post-circulation function: 30 seconds;
- Post-circulation function for CH water temperature > 78 °C: 30 seconds;
- Post-ventilation function: at the end of each operation request, the fan continues to operate for 10 seconds;
- Safety post-ventilation function: with flow temperature > 95 °C, the fan is activated until the flow temperature drops below 90 °C;
- CH pump and deviating valve anti-shutdown function: 30 seconds of operation every 24 hours with boiler not in use;
- Anti-shutdown function for zone pumps and mixing valve (the latter for **V and Z versions only**): 10 seconds of operation every 24 hours with boiler not in use;
- Anti-water hammer function: can be set from 0 to 10 seconds through parameter P15;
- High- and low-temperature zone CH system supply (**V and Z versions**);
- Ready for chronothermostat function on the boiler, in combination with two ambient probes;
- Ready for operation with an OpenTherm remote control (optional, supplied by the manufacturer).
- Ready for operation with external temperature probe (standard on V and Z versions, optional on all other versions).

## 2.2. Dimensions



Connessione		Descrizione
A	¾"	CH flow (version KRB) High-temperature CH flow zone 1 (versions KRB-V and KRB-Z)
B	¾"	CH Return (versione KRB)
C	¾"	Low-temperature CH flow zone 2 (versions KRB-V and KRB-Z)
D	½"	Gas
E	¾"	High-temperature CH return zone 1 (versions KRB-V and KRB-Z)
F	¾"	Low-temperature CH return zone 2 (versions KRB-V and KRB-Z)
G	¾"	Low-temperature CH flow zone 3 (versions KRB-Z)
H	¾"	Low-temperature CH return zone 3 (versions KRB-Z)
I	¾"	DHW outlet
L	½"	Cold water inlet
M	¾"	Recirculation pump (optional)

fig. 3

## HYDRAULIC CONNECTIONS

### GIAVA KRB

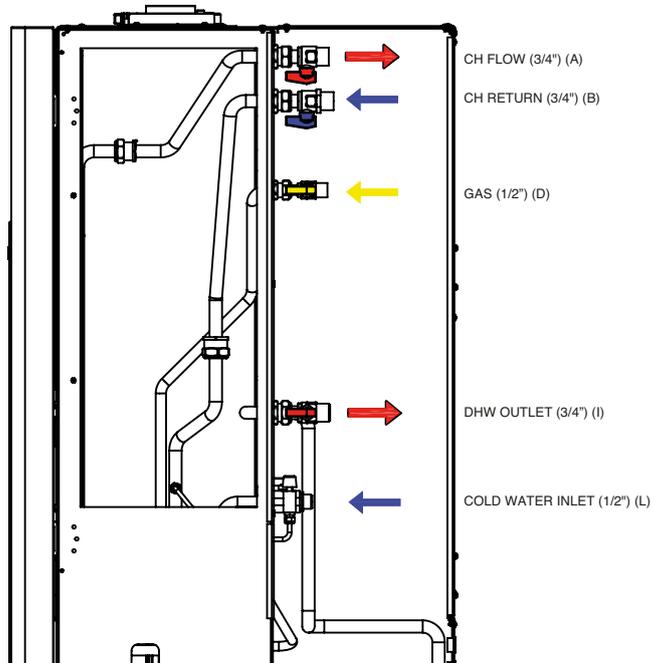


fig. 4

## HYDRAULIC CONNECTIONS

### GIAVA KRB V

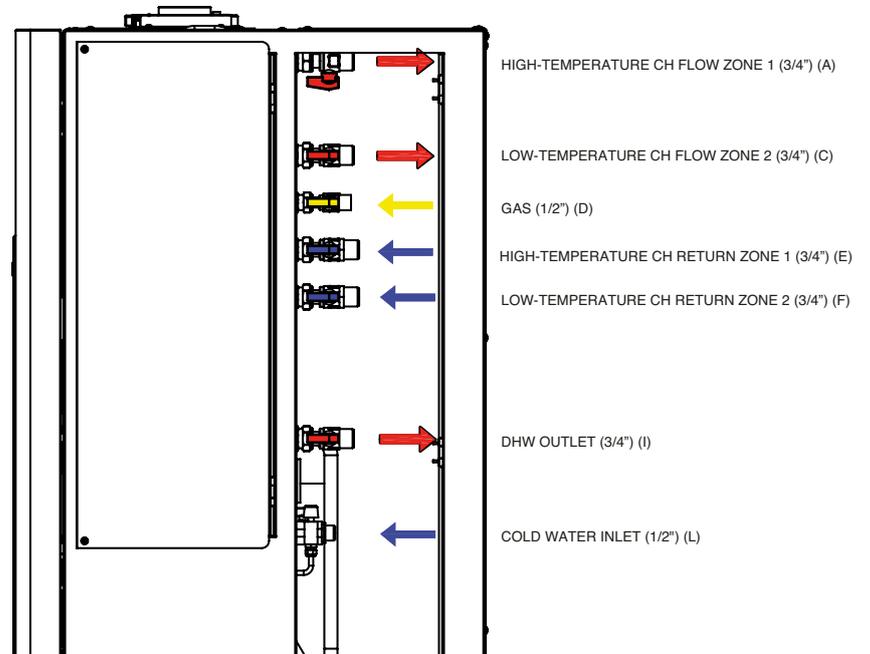


fig. 5

## HYDRAULIC CONNECTIONS

### GIAVA KRB Z

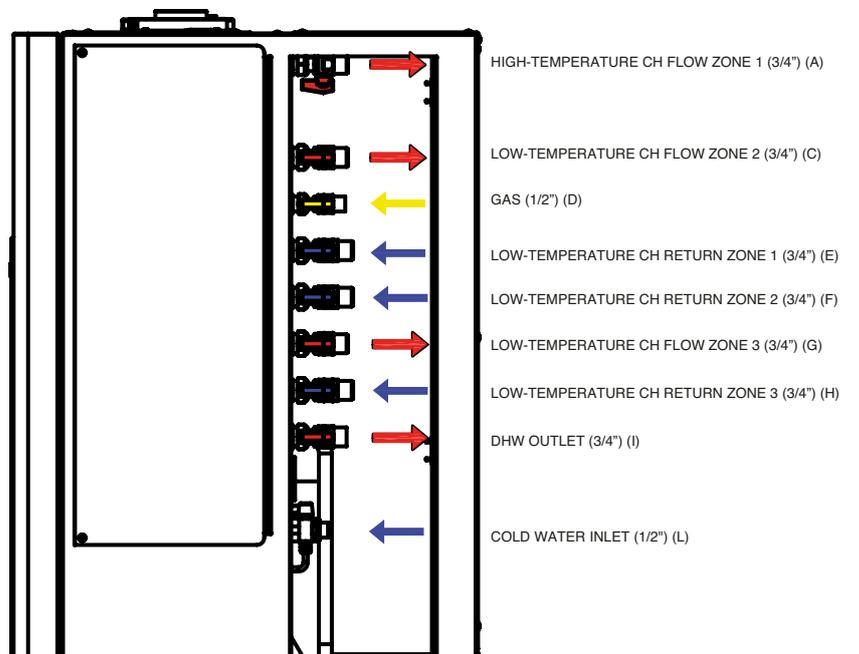
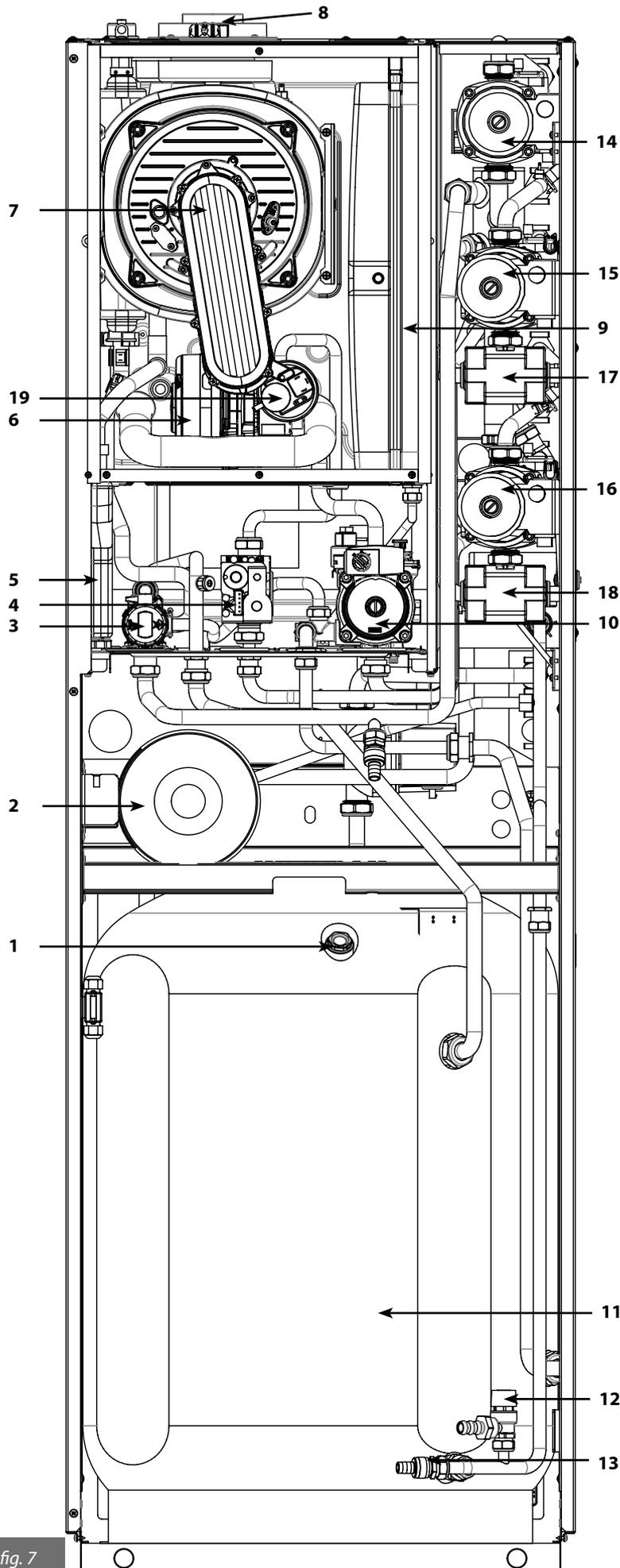


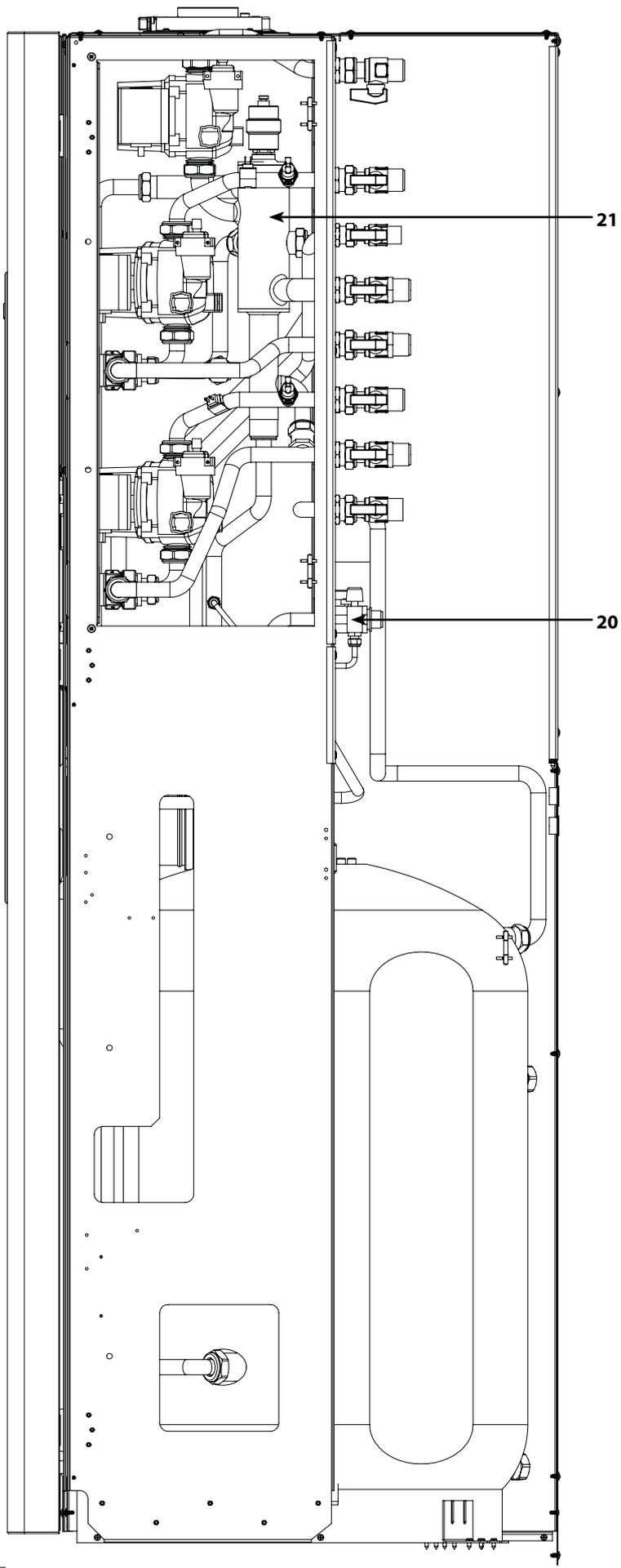
fig. 6

2.3. Key components



Ref. no.	Description
1	Water heater protective anode
2	DHW expansion vessel
3	Motorised 3-way deviating heating valve
4	Gas valve
5	Condensate trap
6	Modulating fan
7	Pre-mixed burner
8	Flue gas discharge tower
9	10 litre CH expansion vessel
10	CH pump
11	130-litre water heater
12	DHW 6-bar safety valve
13	System discharge cock
14	Zone 1 high-temperature pump (V and Z versions)
15	Zone 2 low-temperature pump (V and Z versions)
16	Low-temperature pump (Z versions)
17	Zone 2 low-temperature mixing valve (V and Z versions)
18	Zone 3 low-temperature mixing valve (Z versions)
19	Air pressure switch

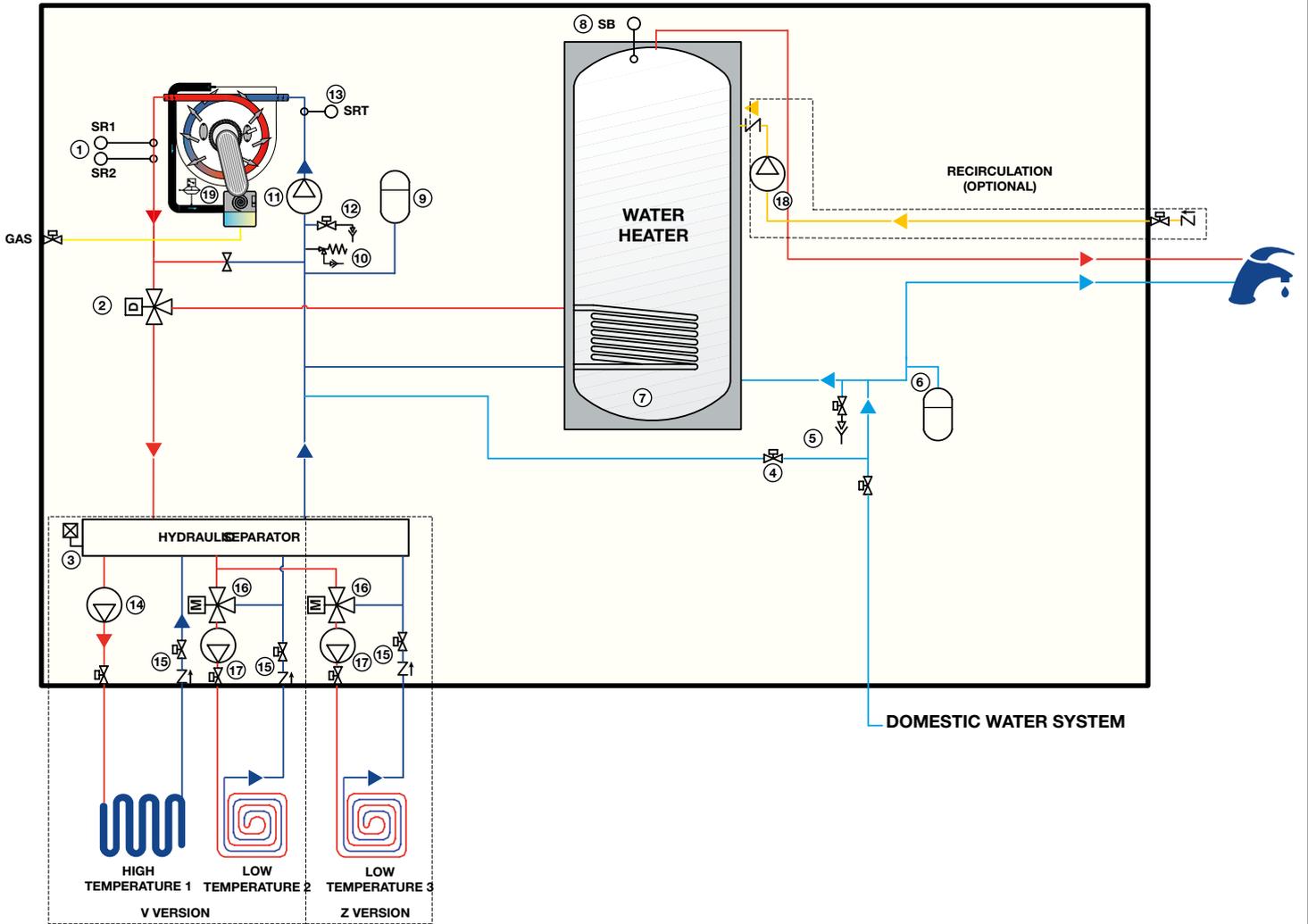
fig. 7



Ref. no.	Description
20	CH system filler cock
21	Hydraulic separator

fig. 8

## 2.4. Boiler operation layout



Ref.	Description	Ref.	Description
1	Double CH flow probe	11	CH circulation pump
2	Three-way motorised deviating valve	12	CH system discharge cocks
3	Automatic gas purging device	13	CH return probe
4	CH system filler cock	14	High-temperature zone circulation pump (V and Z versions)
5	Water heater drain cock	15	Cock with non-return valve
6	5 litre DHW expansion vessel	16	Motorised 3-way mixing valve
7	130 litre water heater	17	Low-temperature zone circulation pump (V and Z versions)
8	Water heater probe	18	Pump of recirculation kit (optional)
9	10 litre CH expansion vessel	19	Air pressure switch
10	3-bar safety valve		

fig. 9

## 2.5. Operating data

Burner pressures reported in the following page must be verified after the boiler has been operating for 3 minutes.

### KRB 12

Type of gas	CH max. heat input [kW]	CH heat output (80-60°C) [kW]		CH heat output (50-30°C) [kW]		DHW heat output [kW]		Gas mains pressure [mbar]	Nozzle [mm/100]	Diaphragm diameter [mm]	CO <sub>2</sub> values of the flue gas [%]
		min.	max.	min.	max.	min.	max.				
Methane gas G20	12.0	1.8	11.7	2.1	12.6	1.8	17.5	20	3.05	-	9 ÷ 9.3
Propane Gas G31	12.0	1.8	11.7	2.1	12.6	1.8	17.5	37	2.50	-	10 ÷ 10.3

Table 4 – KRB 12 model adjustment rates

### KRB 24

Type of gas	CH max. heat input [kW]	CH heat output (80-60°C) [kW]		CH heat output (50-30°C) [kW]		DHW heat output [kW]		Gas mains pressure [mbar]	Nozzle [mm/100]	Diaphragm diameter [mm]	CO <sub>2</sub> values of the flue gas [%]
		min.	max.	min.	max.	min.	max.				
Methane gas G20	23.7	2.6	23.0	3.2	25.0	2.7	26.8	20	3.7	-	9 ÷ 9.3
Propane Gas G31	23.7	2.6	23.0	3.2	25.0	2.7	26.8	37	3.0	-	10

Table 5 – KRB 24 model adjustment rates

### KRB 28

Type of gas	CH max. heat input [kW]	CH heat output (80-60°C) [kW]		CH heat output (50-30°C) [kW]		DHW heat output [kW]		Gas mains pressure [mbar]	Nozzle [mm/100]	Diaphragm diameter [mm]	CO <sub>2</sub> values of the flue gas [%]
		min.	max.	min.	max.	min.	max.				
Methane gas G20	26.4	3.0	25.5	3.5	28.0	3.0	29.3	20	4.0	-	9 ÷ 9.3
Propane Gas G31	26.4	3.0	25.5	3.5	28.0	3.0	29.3	37	3.3	-	10 ÷ 10.3

Table 6 – KRB 28 model adjustment rates

### KRB 32

Type of gas	CH max. heat input [kW]	CH heat output (80-60°C) [kW]		CH heat output (50-30°C) [kW]		DHW heat output [kW]		Gas mains pressure [mbar]	Nozzle [mm/100]	Diaphragm diameter [mm]	CO <sub>2</sub> values of the flue gas [%]
		min.	max.	min.	max.	min.	max.				
Methane gas G20	30.4	3.9	29.4	4.4	32.3	3.9	33.4	20	4.45	-	9.0 ÷ 9.3
Propane Gas G31	30.4	3.9	29.4	4.4	32.3	3.9	33.4	37	3.55	7.2	10

Table 7 – KRB 32 model adjustment rates

## 2.6. General Characteristics

		<b>KRB 12</b>	<b>KRB 24</b>	<b>KRB 28</b>	<b>KRB 32</b>
Device category	-	II2H3P	II2H3P	II2H3P	II2H3P
CH system max. and min. pressure	bar	3.0 - 0.5	3.0 - 0.5	3.0 - 0.5	3.0 - 0.5
DHW system max. and min. pressure	bar	6.0 - 0.5	6.0 - 0.5	6.0 - 0.5	6.0 - 0.5
Specific flow rate $\Delta T = 30\text{ }^{\circ}\text{C}$ - EN 625	l/10'	195	220	225	234
DHW production rating - EN 13203-1		★★★	★★★	★★★	★★★
Draw capacity for 10 min. - EN 13203-1	l/min	17.5	20.3	21.5	21.3
Cocks - EN 13203-1	1..4	3	4	4	4
Power supply: Voltage ~ Frequency	V ~ Hz	230 ~ 50	230 ~ 50	230 ~ 50	230 ~ 50
Power mains supply fuse	A	3.15	3.15	3.15	3.15
Power absorption (version without zones)	W	107	115	117	126
Power absorption (version V)	W	283	292	294	302
Power absorption (version Z)	W	387	395	398	406
Stand-by power absorption (version without zones)	W	2.5	2.5	2.5	2.5
Stand-by power absorption (version V)	W	3.5	3.2	3.5	3.5
Stand-by power absorption (version Z)	W	4.5	4.2	4.5	4.5
Pump absorption in CH mode (version without zones)	W	73	73	73	73
Pump absorption in CH mode (V version)	W	245	245	245	245
Pump absorption in CH mode (Z version)	W	343	343	343	343
Electric protection rating	IP	X5D	X5D	X5D	X5D
Total boiler weight (*)	Kg.	165	166	167	168
Methane gas consumption at maximum CH output (*)	m <sup>3</sup> /h	1.27	2.51	2.79	3.22
Propane gas consumption at maximum CH output (*)	Kg/h	0.93	1.84	2.05	2.36
Maximum CH working temperature	°C	78 + 5	78 + 5	78 + 5	78 + 5
Maximum DHW working temperature	°C	65	65	65	65
Heating expansion vessel total capacity	l	10	10	10	10
DHW expansion vessel total capacity	l	5	5	5	5
Maximum recommended system capacity (***)	l	200	200	200	200

Table 8 - Technical features

(\*) Weight of empty water heater and boiler without optional components (high- and low-temperature heating outlet)

(\*\*) Value referred to 15 °C - 1013 mbar

(\*\*\*) Maximum water temperature 78 °C. expansion vessel pressure 1 bar

<b>KRB 12</b>		<b>Max. output</b>	<b>Min. output</b>	<b>30% load</b>
Casing heat loss with burner on	%	0.40	7.85	-
Casing heat loss with burner off	%		0.53	
Flue system heat loss with burner on	%	2.50	1.85	-
Flue system mass capacity	g/s	8.25	0.89	-
Flue gas temp. – air temp.	°C	57.9	34.5	-
Maximum heat output efficiency rating (60/80°C)	%	97.1	-	-
Maximum heat output efficiency rating (30/50°C)	%	105.1	-	-
Minimum heat output efficiency rating (60/80°C)	%	-	90.3	-
Minimum heat output efficiency rating (30/50°C)	%	-	105.0	-
30% heat output efficiency rating	%	-	-	106.0
Efficiency rating (according to 92/42/EC)	-		★★★★	
NO <sub>x</sub> emission class	-		6	

Table 9 – Combustion specifications, model KRB 12

<b>KRB 24</b>		<b>Max. output</b>	<b>Min. output</b>	<b>30% load</b>
Casing heat loss with burner on	%	0.44	984	-
Casing heat loss with burner off	%		0.21	
Flue system heat loss with burner on	%	2.72	2.02	-
Flue system mass capacity	g/s	12.43	1.33	-
Flue gas temp. – air temp.	°C	61	33	-
Maximum heat output efficiency rating (60/80°C)	%	96.8	-	-
Maximum heat output efficiency rating (30/50°C)	%	105.6	-	-
Minimum heat output efficiency rating (60/80°C)	%	-	88.1	-
Minimum heat output efficiency rating (30/50°C)	%	-	106.9	-
30% heat output efficiency rating	%	-	-	107.4
Efficiency rating (according to 92/42/EC)	-		★★★★	
NO <sub>x</sub> emission class	-		6	

Table 10 - Combustion specifications, model KRB 24

<b>KRB 28</b>		<b>Max. output</b>	<b>Min. output</b>	<b>30% load</b>
Casing heat loss with burner on	%	1.04	6.13	-
Casing heat loss with burner off	%		0.20	
Flue system heat loss with burner on	%	2.26	1.89	-
Flue system mass capacity	g/s	13.93	1.47	-
Flue gas temp. – air temp.	°C	60	45	-
Maximum heat output efficiency rating (60/80°C)	%	96.7	-	-
Maximum heat output efficiency rating (30/50°C)	%	106.0	-	-
Minimum heat output efficiency rating (60/80°C)	%	-	92.0	-
Minimum heat output efficiency rating (30/50°C)	%	-	105.6	-
30% heat output efficiency rating	%	-	-	107.4
Efficiency rating (according to 92/42/EC)	-		★★★★	
NO <sub>x</sub> emission class	-		6	

Table 11 - Combustion specifications, model KRB 28

<b>KRB 32</b>		<b>Max. output</b>	<b>Min. output</b>	<b>30% load</b>
Casing heat loss with burner on	%	0.87	5.10	-
Casing heat loss with burner off	%		0.19	
Flue system heat loss with burner on	%	2.33	2.00	-
Flue system mass capacity	g/s	15.81	1.87	-
Flue gas temp. – air temp.	°C	60	40.5	-
Maximum heat output efficiency rating (60/80°C)	%	96.8	-	-
Maximum heat output efficiency rating (30/50°C)	%	106.2	-	-
Minimum heat output efficiency rating (60/80°C)	%	-	92.9	-
Minimum heat output efficiency rating (30/50°C)	%	-	104.8	-
30% heat output efficiency rating	%	-	-	108.3
Efficiency rating (according to 92/42/EC)	-		★★★★	
NO <sub>x</sub> emission class	-		6	

Table 12 - Combustion specifications, model KRB 32

## 2.7. CH circulation pump available head

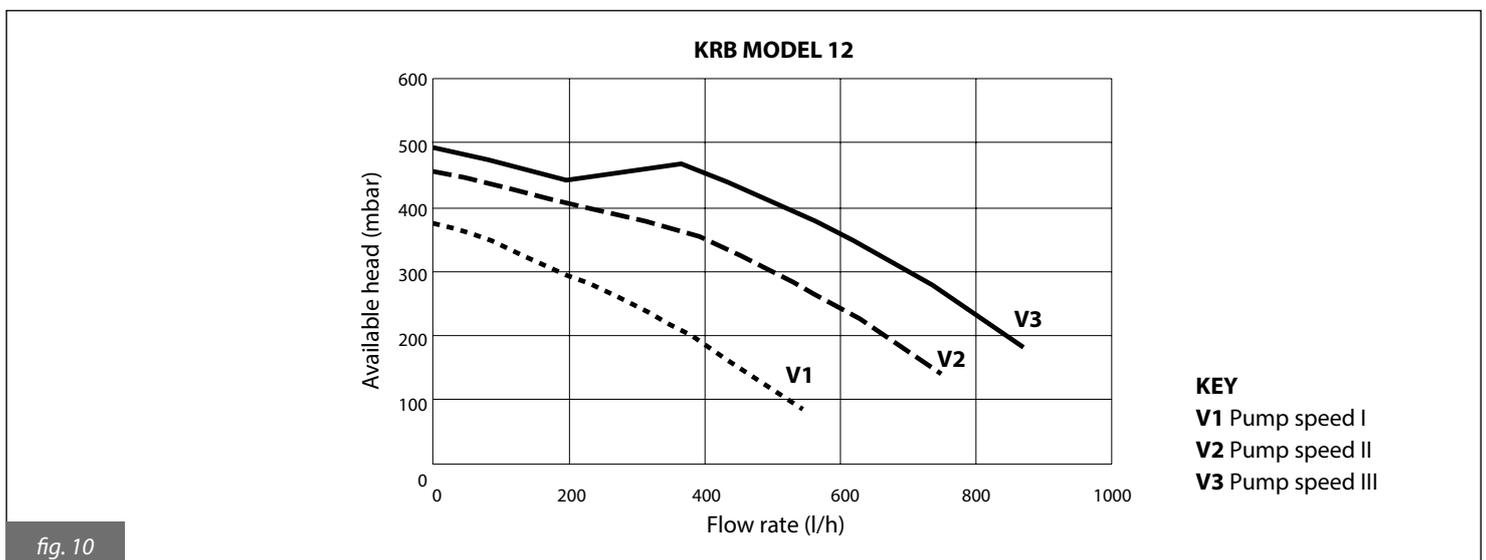
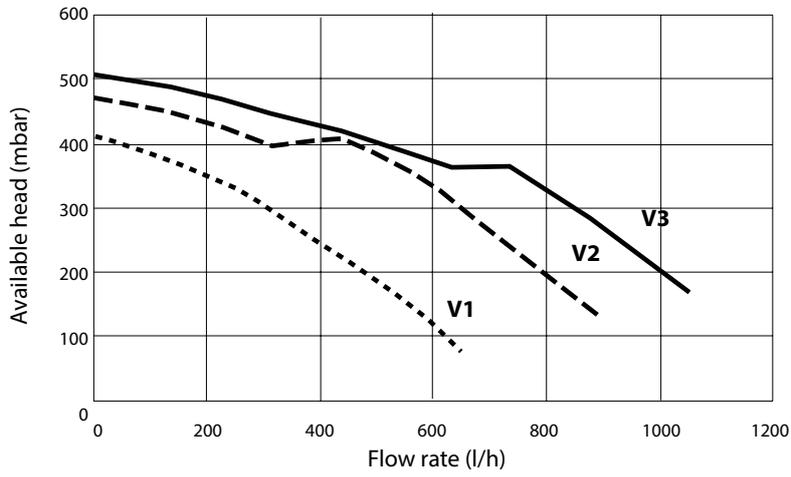


fig. 10

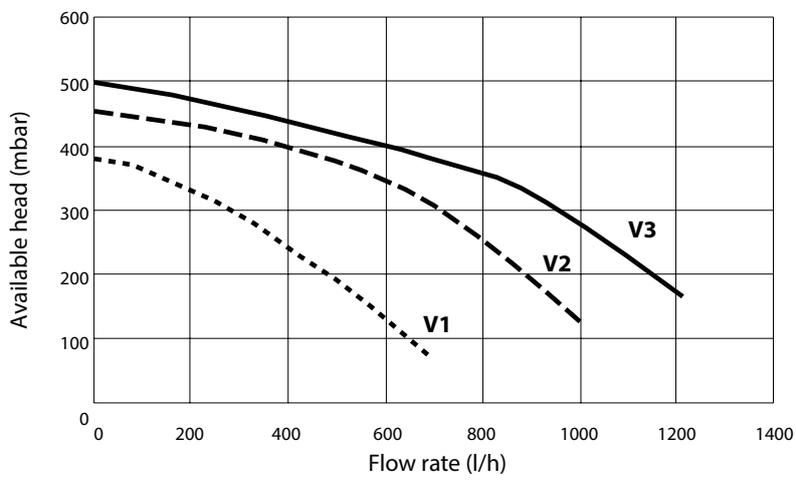
KRB MODEL 24



**KEY**  
V1 Pump speed I  
V2 Pump speed II  
V3 Pump speed III

fig. 11

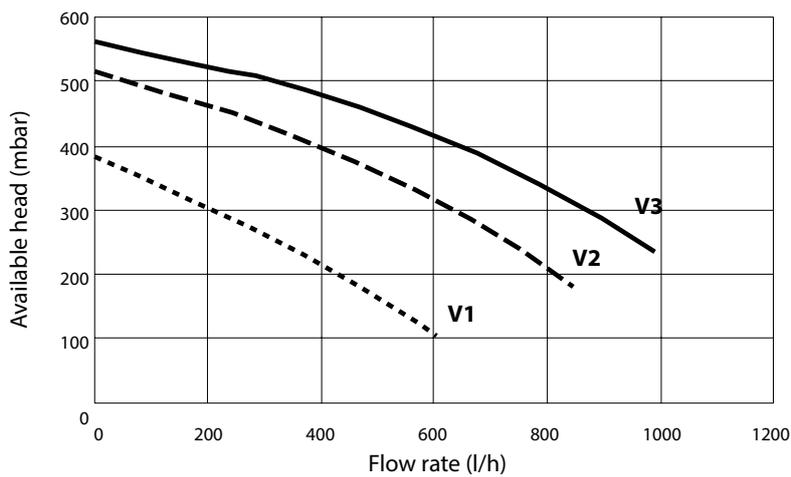
KRB MODEL 28



**KEY**  
V1 Pump speed I  
V2 Pump speed II  
V3 Pump speed III

fig. 12

KRB MODEL 32



**KEY**  
V1 Pump speed I  
V2 Pump speed II  
V3 Pump speed III

fig. 13

2.8. Low and high temperature circulation pump available head (V versions)

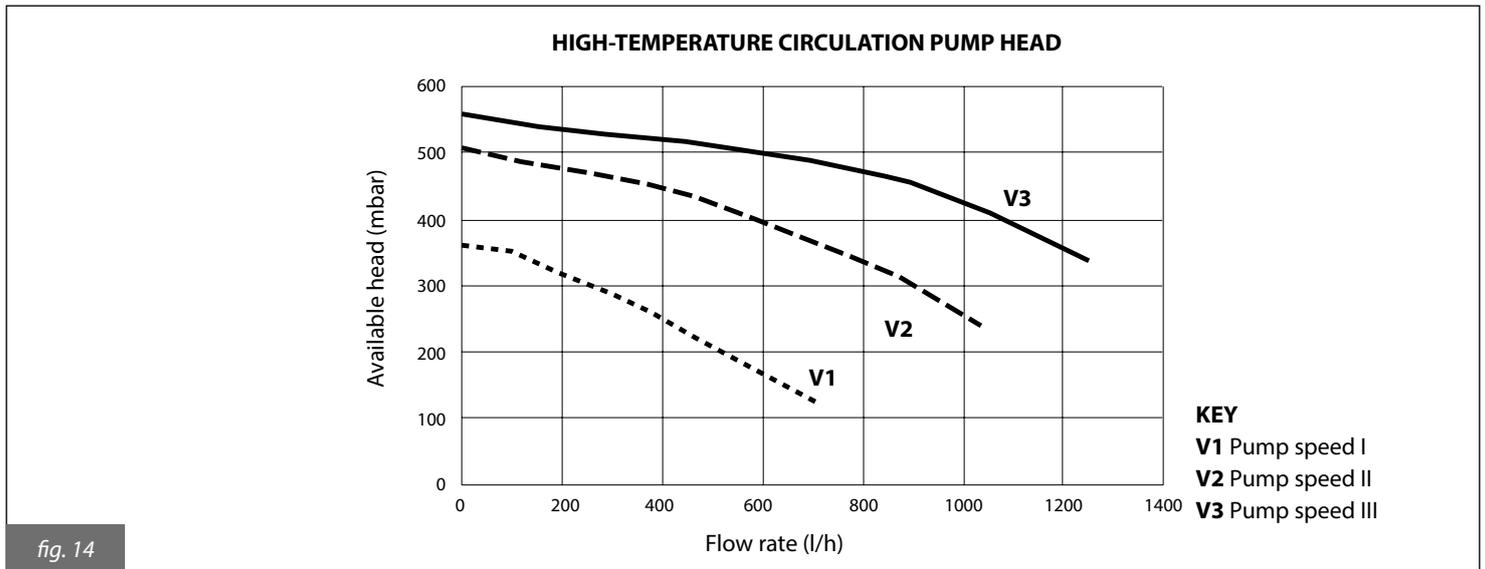


fig. 14

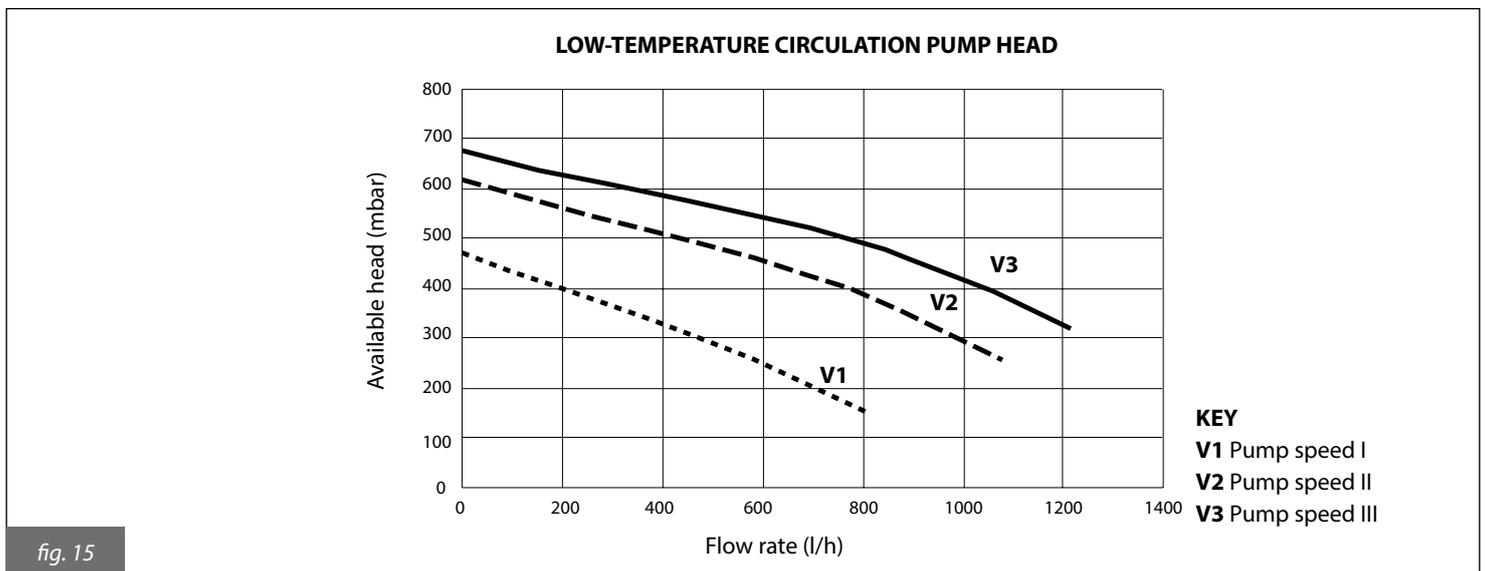


fig. 15

2.9. Low and high temperature circulation pump available head (Z versions)

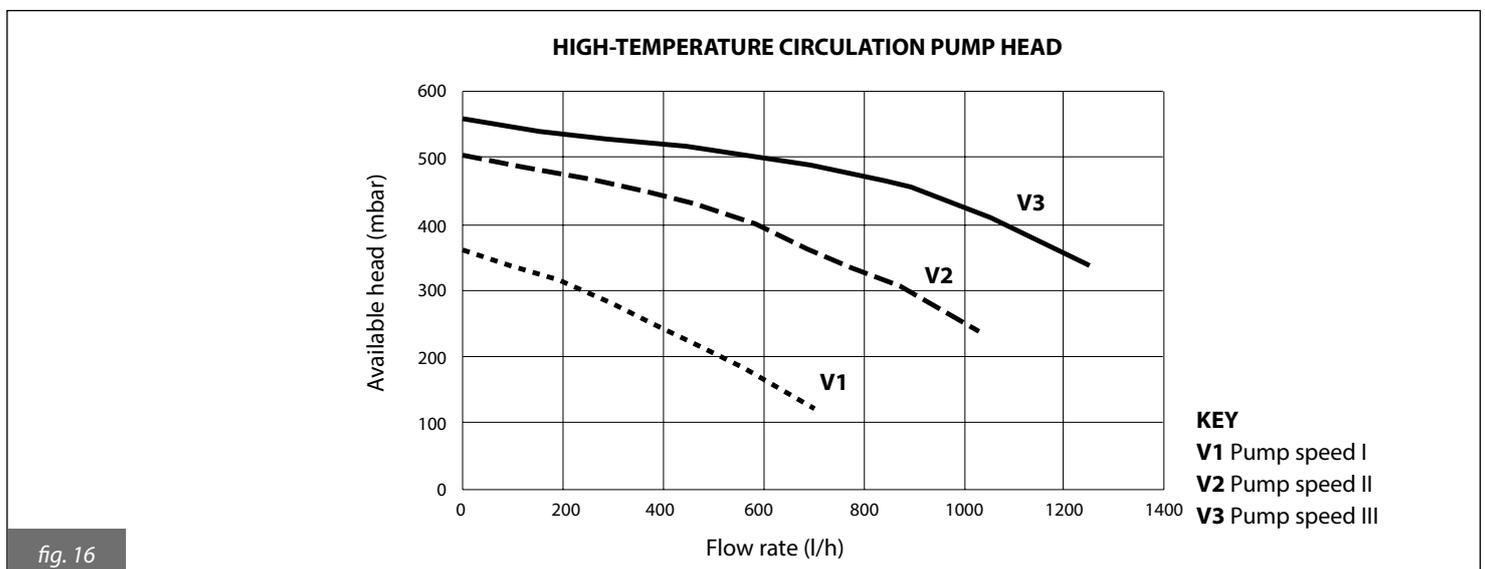


fig. 16

### ZONE 1 LOW-TEMPERATURE CIRCULATION PUMP HEAD

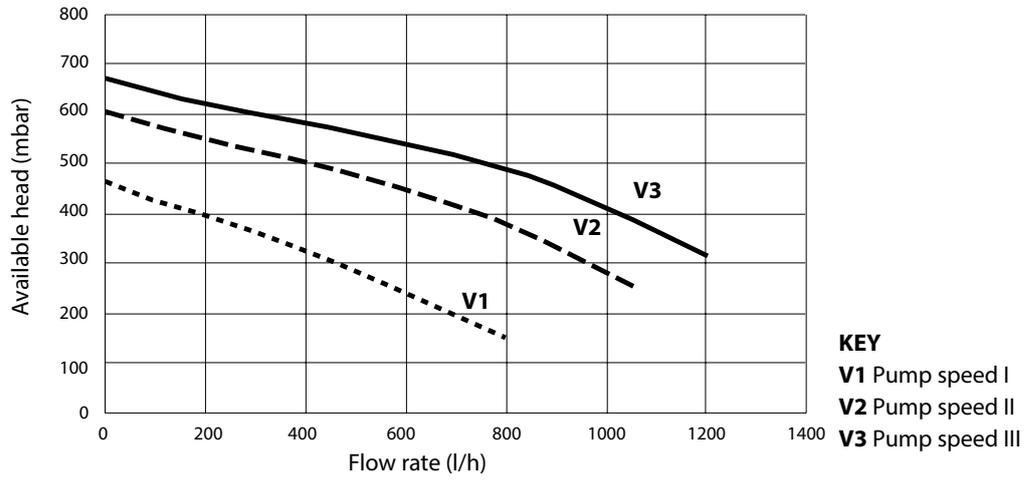


fig. 17

### ZONE 2 LOW-TEMPERATURE CIRCULATION PUMP HEAD

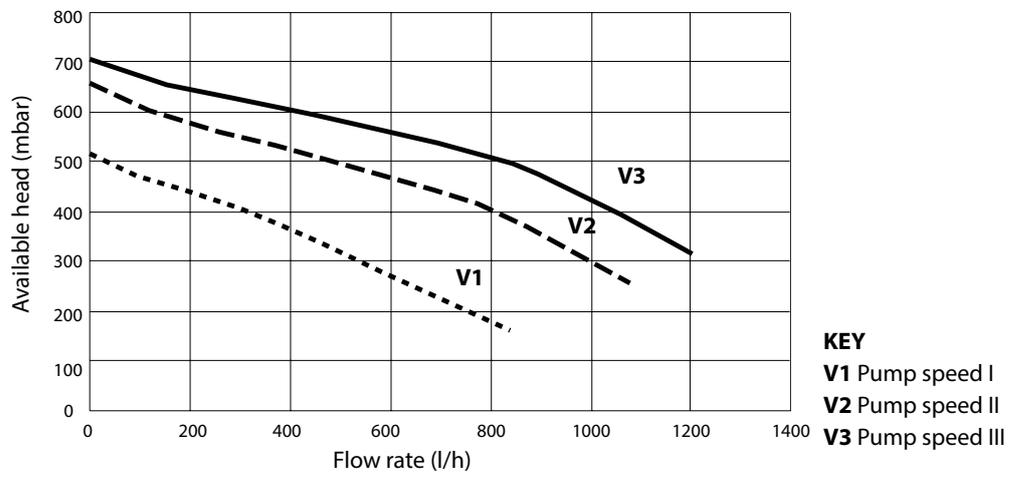


fig. 18

### 3. INSTRUCTIONS FOR THE INSTALLER

#### 3.1. Installation standards

This is an II2H3P category boiler and must be installed in compliance with the laws and standards in force in the country of installation, which are herein considered as entirely transcribed.

#### 3.2. Installation



**Accessories and spare parts for installation and service procedures are to be supplied by the Manufacturer. Should non original accessories and spare parts be employed, boiler proper performance is not guaranteed.**

##### 3.2.1. Packaging

The boiler is shipped in a wooden cage and secured to a wooden pallet with 4 screws. Remove boiler from wooden cage and check its integrity. The packing materials can be recycled. Disposal must be managed via appropriate waste collection sites. Keep packaging out of reach of children, as it may be dangerous.

The manufacturer shall not be held responsible in case of damage to people, animals, or property due to failure in following the above mentioned information.

The packaging contains a bag, which includes:

- this boiler installation, use and maintenance manual;
- air-intake blanking cap kit.

##### 3.2.2. Choosing where to install the boiler

The following must be taken into account when choosing where to install the boiler:

- it is recommended to leave at least a 50-cm clearance on each side of the boiler and a 10-cm clearance on the rear side to facilitate maintenance operations;
- avoid installation in damp or dusty environments;
- the place of installation must not be accessible to strangers, children and animals.

##### 3.2.3. Installing the boiler



**Before connecting the boiler to CH and DHW networks, clean the pipes carefully.**

**- Before commissioning a NEW system, clean it to remove any metal chips due to machining and welding, and any oil and grease that might negatively affect boiler operation or even damage it in case they get inside it.**

**- Before commissioning a RECONDITIONED system (where radiators have been added, the boiler has been replaced, etc.) thoroughly clean it to remove any sludge and residues.**

**Clean the system using standard non acid products, available on the market.**

**Do not use solvents as they could damage system components.**

**Furthermore, in the central heating system (either new or reconditioned), it is always advisable to add to water a suitable percentage of corrosion protectants for multi-metal systems that will create a protective film onto all internal surfaces.**

**The manufacturer shall not be held responsible in case of damage to people, animals, or property due to failure to follow the above mentioned instructions.**



**For all boiler installation types, it is necessary to install a filter which can be inspected (Y-shaped type) with Ø 0.4mm-mesh, on the return pipe before the boiler.**

After transporting the boiler to the place of installation, proceed as follows to install it:

- unscrew the screws securing the boiler to the wooden pallet;
- lift the boiler from the pallet and position it on the floor, taking care not to damage it;
- adjust the supporting feet, ensuring that the boiler is stable;
- provide a condensate drain (see fig. 26) and an outlet for the 3-bar and 6-bar safety valves;
- connect the boiler to cold water supply pipes, the CH flow and return pipes, the DHW flow pipes from the heat water;
- connect the boiler to pipe for condensate drain (refer to paragraph 3.2.8).
- provide a system for relieving the 3-bar safety valve and the 6-bar safety valve. Otherwise, the boiler manufacturer shall not be held responsible if the safety valves are activated and the room is flooded;
- connect the boiler to the air intake and flue gas venting system (refer to paragraph 3.2.5);
- connect the boiler to the gas supply system (refer to paragraph 3.2.7);
- connect electric power supply, ambient thermostat (optional) and other available accessories (refer to the paragraphs 3.2.9 and following).

### 3.2.4. Boiler room ventilation

The boiler has sealed combustion chamber. Combustion air is not drawn from boiler room, therefore no specific recommendations need to be applied concerning the boiler room or openings and ventilation provided to the boiler room.

 **The boiler must be installed in a room that is compliant with the legislation and standards in force in the country of installation, which are herein considered as entirely transcribed.**

### 3.2.5. Air intake and flue gas venting system

Flue gas discharge into the atmosphere and air intake/flue gas venting systems must comply with applicable laws and standards in the country of installation that are considered as fully transcribed herein.

 **The boiler is equipped with safety devices checking correct flue gas exhaustion. Should an air intake/flue gas venting system malfunction occur, the safety devices will shut-down the boiler and the E03 code will be flashing. It is strictly forbidden to tamper with and/or prevent operation of such safety devices. In the event of repeated boiler arrest, the air intake/flue gas venting ducts must be inspected, as they may be obstructed or inadequately sized to vent the flue gases correctly into the atmosphere.**

 **For the air intake/flue gas venting systems, specific, manufacturer approved, condensate acid-resistant pipes and systems must be used, suitable for condensing boilers. Flue gas venting pipes are to be installed tilted toward the boiler so that condensate runs toward the combustion chamber, which is designed for condensate collection and drainage. Should the above procedure not be possible, it is necessary to install, in condensate stagnation areas, devices designed for condensate collection and conveying to the condensate drain system. It is necessary to avoid formation of condensate stagnation areas in the flue gas venting system, with the exception of the condensate trap possibly connected to the venting system itself.**

**The manufacturer cannot be held responsible for any damage caused by inappropriate boiler installation or operation, modification to the boiler, or due to non-observance of the instructions provided by the manufacturer or of legislation and standards applicable for the materials installed.**

When positioning the boiler exhaust terminals onto the wall, comply with the distances specified in the applicable standards and regulations in force in the Country of installation, which are herein considered as entirely transcribed.

### 3.2.5.1. Configuration of air intake and flue gas venting ducts: B23, B53, C13, C33, C43, C53, C83



The information given above is with reference to air intake/flue gas venting ducts made from smooth, rigid pipes approved and supplied by the manufacturer.

#### **B23 installation type**

Boiler intended for connection to an existing flue system external to the boiler room. Combustion air is taken directly from the boiler room itself while flue gas is conveyed to the outside.

The boiler is not to be fitted with anti-wind gust device; it has to be equipped with a fan mounted before the combustion chamber/heat exchanger.

#### **B53 installation type**

Boiler intended for connection, via an independent duct, to the flue gas venting terminal. Combustion air is taken directly from the boiler room itself while flue gas is conveyed to the outside.

The boiler is not to be fitted with anti-wind gust device; it has to be equipped with a fan mounted before the combustion chamber/heat exchanger.

#### **C13 installation type**

Boiler intended for connection to horizontal outlet and intake ducts connected to the outside by means of coaxial or split ducts.

The minimum distance between the air intake duct and the flue gas venting duct must be at least 250 mm, whereas both terminals must be contained within a square measuring 500 x 500 mm.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

#### **C33 installation type**

Boiler intended for connection to vertical outlet and intake ducts connected to the outside by means of coaxial or split ducts.

The minimum distance between the air intake duct and the flue gas venting duct must be at least 250 mm, whereas both terminals must be contained within a square measuring 500 x 500 mm.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

#### **C43 installation type**

Boiler intended for connection to collective chimney pipe system that includes two ducts, air intake and flue gas exhaust. These ducts may be coaxial or split.

The chimney must be compliant with applicable legislation and standards.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

#### **C53 installation type**

Boiler with separate pipes for combustion air intake and flue gas evacuation.

These flues may discharge in areas at a different pressure.

The terminals may not face each other from opposed walls.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

#### **C83 installation type**

Boiler intended to be connected to combustion air terminal and to a single flue gas terminal or collective chimney.

The chimney must be compliant with applicable legislation and standards.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

### 3.2.5.2. Ø 100/60 mm and Ø 125/80 mm air/flue gas coaxial duct system



The information given above is with reference to air intake/flue gas venting ducts made from smooth, rigid pipes approved and supplied by the manufacturer.

#### **C13 installation type**

##### **12 kW**

Minimum permissible length of horizontal coaxial pipes is 1 meter.

Maximum permissible length of Ø100/60 mm horizontal coaxial pipes is 9 meters.

Maximum permissible length of Ø125/80 mm horizontal coaxial pipes is 30 meters.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The wall terminal reduces maximum permissible length by 1.5 meters.

The flow resistance of the first elbow shall not be taken into account to calculate maximum permissible length.

The air intake duct is to be tilted down by 1% toward its exit, in order to avoid rain water to enter it.

### **24 kW**

Minimum permissible length of horizontal coaxial pipes is 1 meter.

Maximum permissible length of Ø100/60 mm horizontal coaxial pipes is 10 meters.

Maximum permissible length of Ø125/80 mm horizontal coaxial pipes is 30 meters.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The wall terminal reduces maximum permissible length by 1.5 meters.

The flow resistance of the first elbow shall not be taken into account to calculate maximum permissible length.

The air intake duct is to be tilted down by 1% toward its exit, in order to avoid rain water to enter it.

### **28 kW**

Minimum permissible length of horizontal coaxial pipes is 1 meter.

Maximum permissible length of Ø100/60 mm horizontal coaxial pipes is 9 meters.

Maximum permissible length of Ø125/80 mm horizontal coaxial pipes is 30 meters.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The wall terminal reduces maximum permissible length by 1.5 meters.

The flow resistance of the first elbow shall not be taken into account to calculate maximum permissible length.

The air intake duct is to be tilted down by 1% toward its exit, in order to avoid rain water to enter it.

### **32 kW**

Minimum permissible length of horizontal coaxial pipes is 1 meter.

Maximum permissible length of Ø100/60 mm horizontal coaxial pipes is 7 meters.

Maximum permissible length of Ø125/80 mm horizontal coaxial pipes is 30 meters.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The wall terminal reduces maximum permissible length by 1.5 meters.

The flow resistance of the first elbow shall not be taken into account to calculate maximum permissible length.

The air intake duct is to be tilted down by 1% toward its exit, in order to avoid rain water to enter it.

## **C33 installation type**

### **12 kW**

Minimum permissible length of vertical coaxial pipes is 1 meter.

Maximum permissible length of Ø 100/60 mm vertical coaxial pipes is 9 meters.

Maximum permissible length of Ø 125/80 mm vertical coaxial pipes is 30 meters.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The roof vent terminal reduces maximum permissible length by 1.5 meters.

### **24 kW**

Minimum permissible length of vertical coaxial pipes is 1 meter.

Maximum permissible length of Ø 100/60 mm vertical coaxial pipes is 10 meters.

Maximum permissible length of Ø 125/80 mm vertical coaxial pipes is 30 meters.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meters.

The roof vent terminal reduces maximum permissible length by 1.5 meters.

### **28 kW**

Minimum permissible length of vertical coaxial pipes is 1 meter.

Maximum permissible length of Ø 100/60 mm vertical coaxial pipes is 9 meters.

Maximum permissible length of Ø 125/80 mm vertical coaxial pipes is 30 meters.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The roof vent terminal reduces maximum permissible length by 1.5 meters.

### **32 kW**

Minimum permissible length of vertical coaxial pipes is 1 meter.

Maximum permissible length of Ø 100/60 mm vertical coaxial pipes is 7 meters.

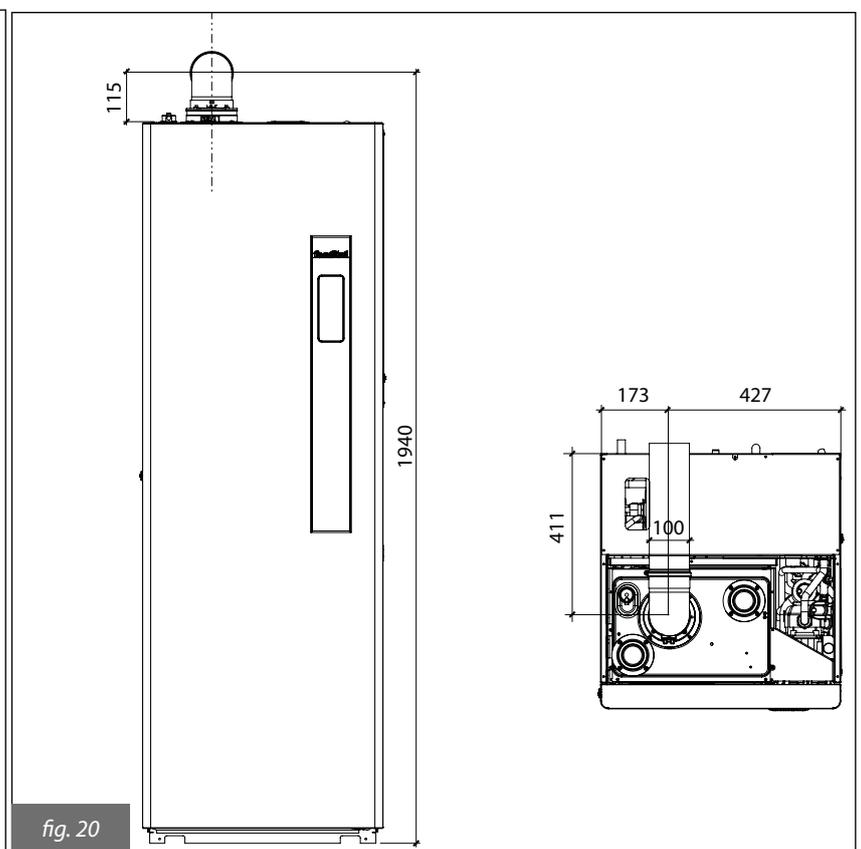
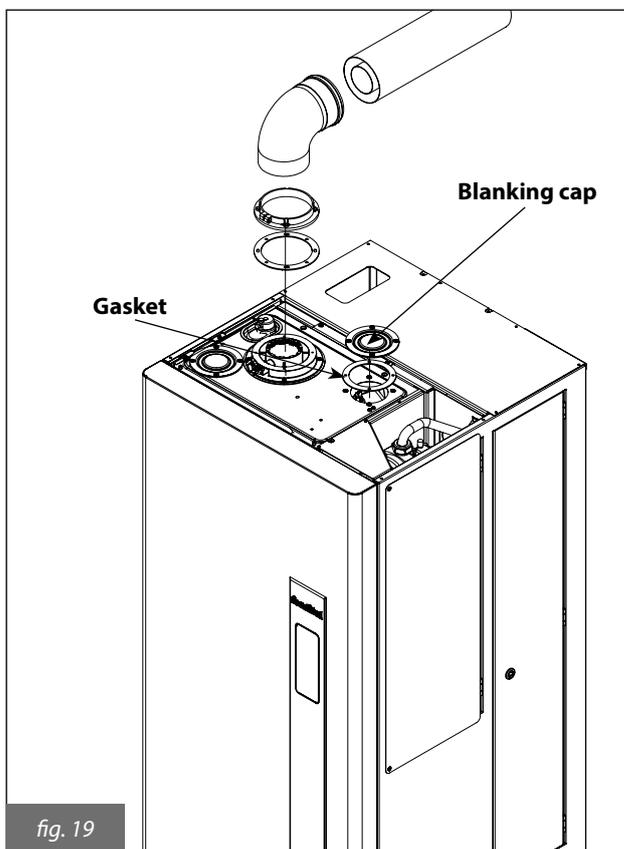
Maximum permissible length of Ø 125/80 mm vertical coaxial pipes is 30 meters.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The roof vent terminal reduces maximum permissible length by 1.5 meters.



The illustrations are indicative only. When installing accessories, refer to the instructions supplied with the accessories themselves.

### 3.2.5.3. Air intake and flue gas venting via Ø 80 mm split pipes

 **The information given above is with reference to air intake/flue gas venting ducts made from smooth, rigid pipes approved and supplied by the manufacturer.**

#### Installation types C43 - C53 - C83

##### 12 kW

- Minimum permissible length of air intake pipe is 1 meter.
- Minimum permissible length of flue gas venting pipe is 1 meter.
- Maximum permissible length of intake/flue gas venting pipes is 152 meters (combined length of air intake and flue gas venting pipe).
- For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.
- For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.
- For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 metres for flue gas venting pipes and by 1.0 metre for air intake pipes.
- The roof terminal reduces maximum permissible length by 5 meters.
- The wall terminal reduces maximum permissible length by 4.5 meters.

##### 24 kW

- Minimum permissible length of air intake pipe is 1 meter.
- Minimum permissible length of flue gas venting pipe is 1 meter.
- Maximum permissible length of air intake/flue gas discharge pipes is 84 meters (combined length of air intake and flue gas discharge pipe length).
- For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.
- For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.
- For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meters.
- The roof terminal reduces maximum permissible length by 5.5 meters.
- The wall terminal reduces maximum permissible length by 5 meters.

##### 28 kW

- Minimum permissible length of air intake pipe is 1 meter.
- Minimum permissible length of flue gas venting pipe is 1 meter.
- Maximum permissible length of intake/flue gas venting pipes is 91 meters (combined length of air intake and flue gas venting pipe).
- For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.
- For each additional 90° elbow, maximum permissible length is to be reduced by 1.5 meter.
- For each additional 45° elbow, maximum permissible length is to be reduced by 1 meter.
- The roof terminal reduces maximum permissible length by 5.5 meters.
- The wall terminal reduces maximum permissible length by 5.5 meters.

### 32 kW

Minimum permissible length of air intake pipe is 1 meter.

Minimum permissible length of flue gas venting pipe is 1 meter.

Maximum permissible length of intake/flue gas venting pipes is 78 meters (combined length of air intake and flue gas venting pipe).

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1.5 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 1 meter.

The roof terminal reduces maximum permissible length by 6 meters.

The wall terminal reduces maximum permissible length by 5.5 meters.

#### 3.2.5.4. Air intake and flue gas venting via 60 mm split pipes

##### Installation types C43 - C53 - C83

##### 12 kW - 24 kW - 28 kW - 32 kW

Minimum permissible length of air intake pipe is 1 meter.

Minimum permissible length of flue gas venting pipe is 1 meter.

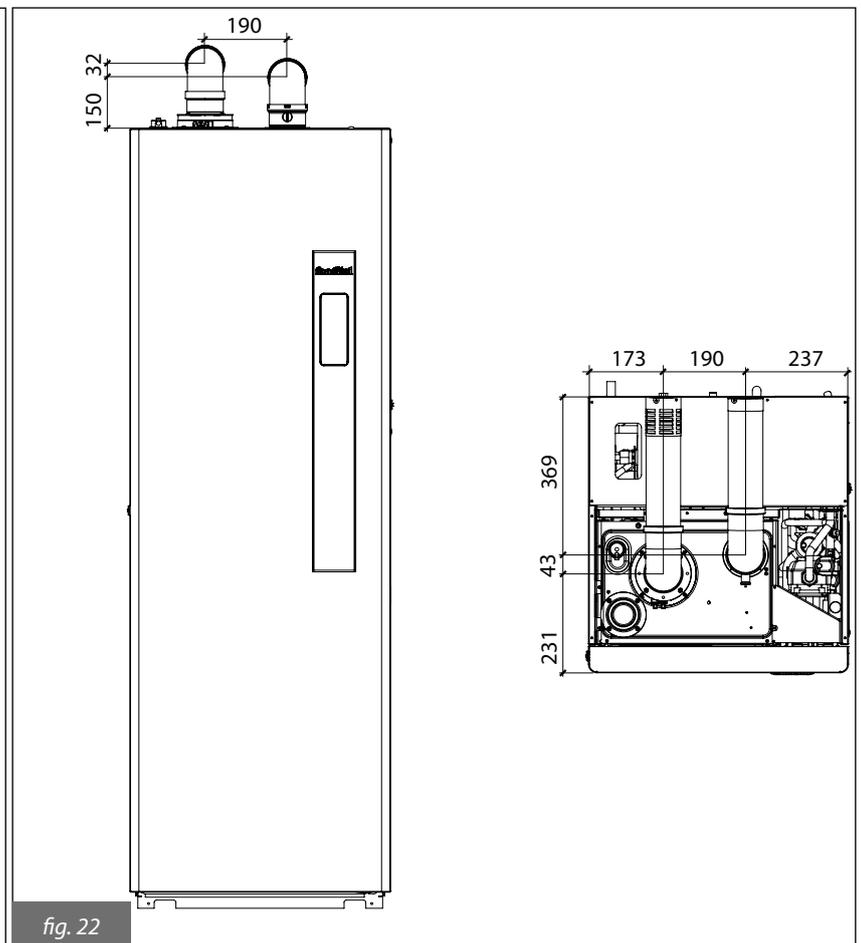
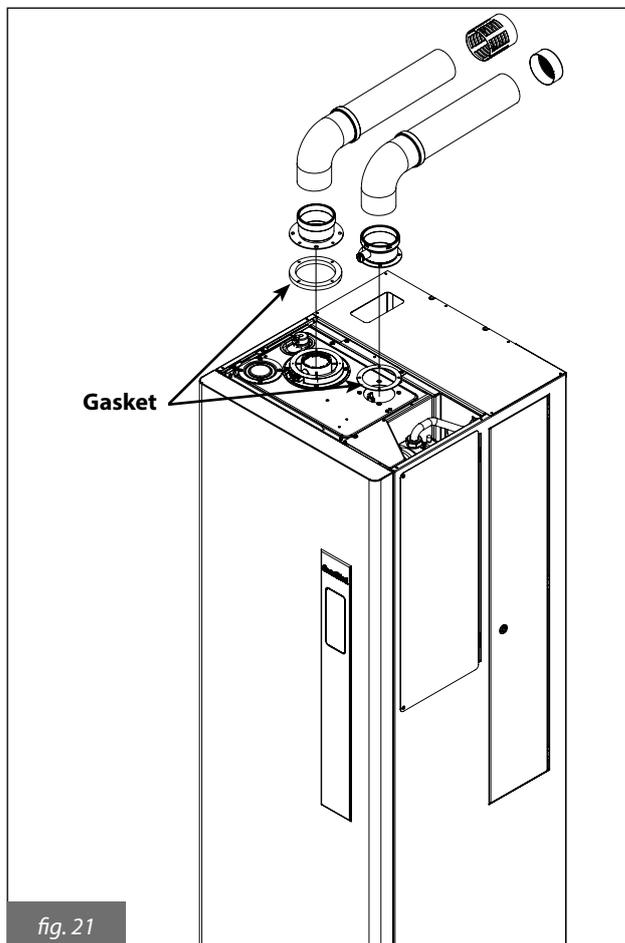
Maximum permissible length of air intake/flue gas venting pipes is 24 metres for the 12 kW model, 23 metres for 24 kW - 28 kW models and 20 metres for 32 kW model (combined length of air intake and flue gas venting pipe length).

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The wall terminal reduces maximum permissible length by 4 metres for the 12 kW model and by 4.5 metres for the 24 kW - 28 kW - 32 kW models.



### 3.2.6. Checking combustion efficiency

#### 3.2.6.1. Flue cleaning function

The boiler features a flue cleaning function which must be used to measure combustion efficiency during operation and to adjust the burner.

To enable the flue cleaning function, press the "reset" key and keep it pressed for about three seconds. If the "reset" key is released before the three seconds have lapsed, the boiler continues to operate normally.

The "broom" symbol steady on and the fan speed indicate that the flue cleaning function is active.

The display shows the flow temperature and the lit flame on, if burner is on. The boiler performs the ignition sequence and then operates at the burner maximum output (parameter P4). The keys active in this function are: "reset" and "DHW + and -".

By pressing the "DHW + and -" key it is possible to change the fan speed from P5 (minimum speed) to P4 (maximum speed). The display shows the wrench symbol (indicating that the parameter is being edited), the broom, the H letter (indicating Hertz), the speed set-point value in Hz, the fan current speed, and the lit flame on symbol if burner is on.

As soon as the "DHW + and -" key is released again, the display will show fan current rpm value, flow temperature, system pressure, the lit flame on symbol, the "broom" symbol to indicate that the flue cleaning function is active.

The flue cleaning function lasts 15 minutes. To quit this function, press "reset" and you will go back to the standard operating mode.

#### 3.2.6.2. Measurement procedure

The boiler is equipped with a tower allowing for air intake/flue gas venting pipe connection (fig. 23 and 24).

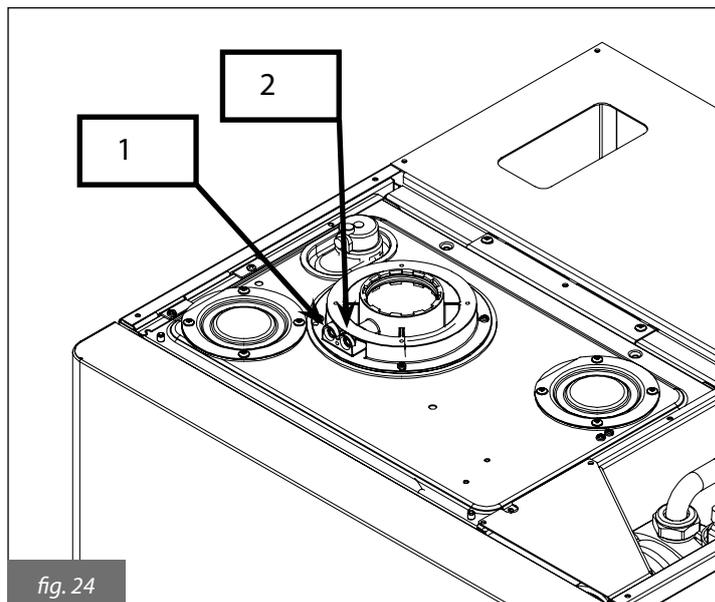
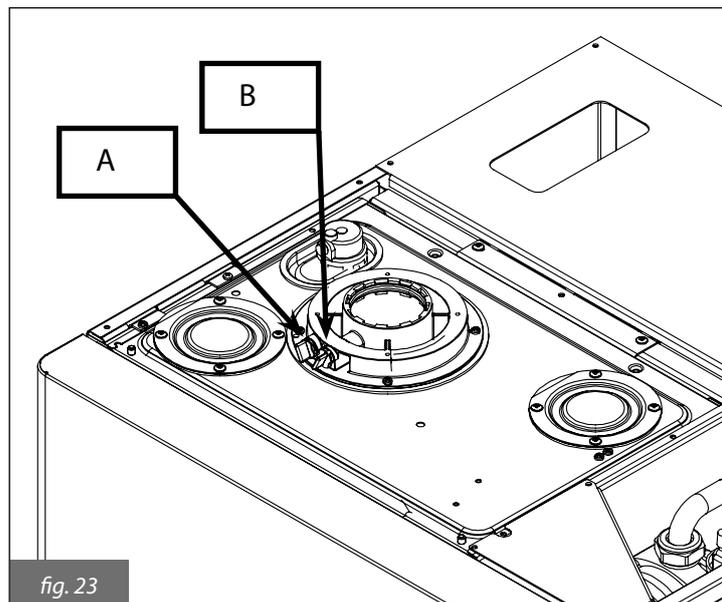
The tower is designed with two pre-arranged openings directly accessing air and flue gas ducts (fig. 23).

Remove caps A and B from the pre-arranged openings on the tower, before starting combustion checking procedure (fig. 23).

In order to verify combustion efficiency the following measurements must be implemented:

- assess combustion air from no. 1 opening (fig. 24);
- assess flue gas temperature and CO<sub>2</sub> from no. 2 opening (fig. 24).

Allow boiler to reach working temperature before taking any measurement.



### 3.2.7. Connection to gas mains

Gas supply pipe cross-section must be equal or greater than boiler gas pipe.  
Cross-section gas pipe size depends on its length, layout pattern, gas flow rate. Gas pipe size is to be selected accordingly.

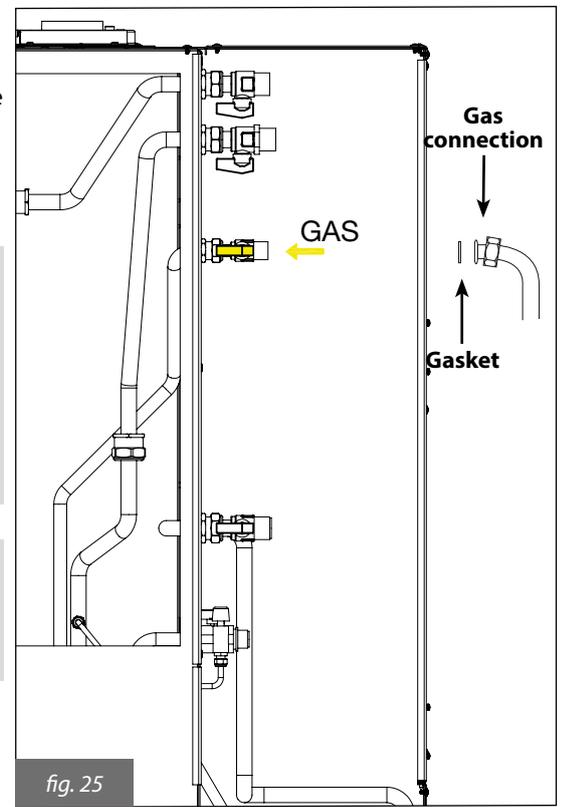
**Comply with installation standards enforced in the country where the boiler is installed which are considered as fully transcribed in this booklet.**



**Remember that before operating an indoor gas distribution system and before connecting it to a meter, it must be checked for leaks. If some system parts are not visible, the leak test is to be carried out before the pipes are covered. Leak test is NOT to be carried out employing flammable gas: use air or nitrogen for this purpose. Once gas is in the pipes, leak test by a naked flame is forbidden; use specific products available on the market.**



**When connecting the boiler to gas supply network, it is COMPULSORY to install an appropriately sized gasket made from suitable material (fig. 25). The boiler gas inlet coupling is NOT SUITABLE for hemp, teflon tape or similarly made gaskets.**



### 3.2.8. Hydraulic connections

Prior to installing the boiler, the hydraulic system is to be cleaned in order to remove impurities as much as possible; they could be present in system components and damage the pump and the heat exchanger (see paragraph 3.2.3).

#### CH

In the version without zones, the CH flow and return pipes must be connected to the boiler through the relevant fittings as shown in figure 4. For versions V and Z see figures 5 and 6, respectively.

When calculating the cross section of CH system pipes, bear in mind load losses induced by radiators, thermostatic valves, radiator gate valves, and the configuration of the system itself.



**It is advisable to convey the discharge flow of boiler safety valve to the sewer system. Should the above precaution not be implemented and the safety valve be activated, boiler room flooding may occur. Manufacturer shall not be held responsible for any damage resulting as failure in observing the above mentioned technical precaution.**

#### DOMESTIC HOT WATER

Cold water inlet and DHW outlet shall be connected to the boiler through the dedicated fittings as shown in figure 4. For versions V and Z see figures 5 and 6, respectively.



**Depending on the hardness of the mains water supply, ascertain whether or not to install appropriate domestic water treatment systems using water treatment products suitable for drinking water and compliant with the standards in force in the country of installation. Water treatment is always advisable when water supplied to the boiler is more than 20°F hard. Water supplied by commonly marketed water softeners, due to PH level induced in water, may not be compatible with some components in the system.**

### CONDENSATE DRAIN

Comply with condensate drain laws and standards applicable in the country of installation, which are considered herein integrally transcribed.

Unless forbidden, the condensate produced by combustion is to be routed (via the condensate drain in fig. 26) through a discharge system connected to the domestic sewer, which due to its basicity, counteracts flue gas condensate acidity.

In order to avoid domestic sewer odour to reach the premises, it is advisable to install an appropriate device between the discharge system and the domestic sewer.

The condensate drain system and the domestic discharge system are to be made of an adequate, condensate-resistant material.

The manufacturer disclaims any liability in case of damage to people, animals, or property resulting from user's failure to follow the above mentioned instructions.

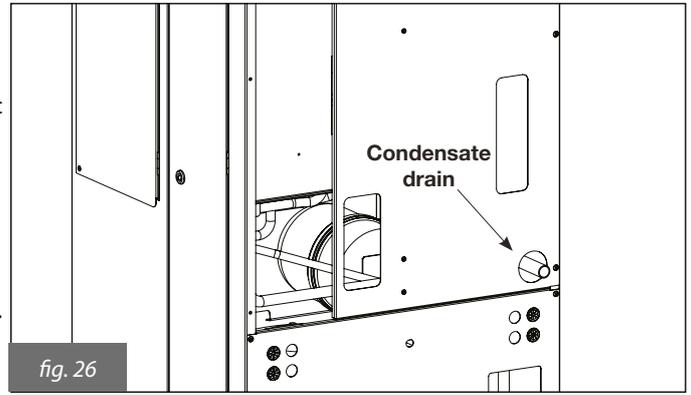


fig. 26

### 3.2.9. Connection to electrical mains

The boiler is supplied with a three-poled power cable, already connected to the electronic board and it is provided with a safety clamp.

The boiler is to be connected to a 230 V ~ 50 Hz electrical power supply.

**When connecting it to power mains, follow correct phase / neutral polarity sequence.**

Installation standards must be complied with and they are herein considered as entirely transcribed.

An easily accessible two-poled switch, with a minimum 3 mm distance between contacts, is to be installed ahead of the boiler. The switch is to allow power supply cut-off in order to safely perform maintenance and service procedures.

Power supply to the boiler must be fitted with a residual-current circuit breaker having suitable disconnection capacity. Electric power supply must be properly earthed.

The above mentioned safety measure must be verified. If in doubt, ask a qualified technician to thoroughly check the power network.



**The manufacturer cannot be held responsible for any damage caused by failure to earth the system correctly: gas, water, or CH system pipes are not suitable for grounding power networks.**

### 3.2.10. Selecting the operating range in CH mode

CH temperature adjustment range depends on the selected operating range:

- **standard range:** 20°C to 78°C (press "CH + and -" keys on the display, **E**, fig.1);

- **reduced range:** 20°C to 45°C (press "CH + and -" keys on the display, **E**, fig.1);

The standard range is active with curves **P10** ≥ 1, while the reduced range is active with curves **P10** < 1.

The two ranges can also be selected even with the external probe disconnected.

The waiting time between one boiler ignition and the following one, used to prevent boiler frequent turning on and off is 4 minutes for both ranges, and can be edited with the parameter P11.

If system water temperature decreases below a certain value, the waiting time is reset and the boiler re-ignited, as shown in the following table:

Operation range selection is to be implemented by an installer or a qualified Service Centre.

Selected range	Re-ignition temperature
Standard range	< 30°C (P27)
Reduced range	< 20°C

Table 13 - Boiler re-ignition temperatures

### 3.2.11. Connection to (optional) ambient thermostat

The boiler is designed to be connected to an ambient thermostat (optional, not compulsory).

Ambient thermostat contacts must be properly sized in compliance with a load of 5 mA at 24 Vdc.

Ambient thermostat cables shall be connected to electronic board pins **1** and **2** (fig. 28, 29 and 30), after having eliminated the jumper supplied as a standard with the boiler.

**The ambient thermostat cables are not to be grouped together in the same sheath as power mains supply cables.**

### 3.2.12. Installation and operation with (optional) Open Therm Remote Control

The boiler may be connected to an Open Therm Remote Control (non-compulsory optional accessory supplied by manufacturer).

**The Remote Control must only be installed by qualified personnel.**



**Only use original Remote Control Units supplied by the manufacturer. The correct operation of the Remote Control itself and of the boiler is not guaranteed if non original Remote Control units not supplied by the manufacturer are used.**

To install the Remote Control, refer to the instructions provided with the Remote Control itself.

Please note the following precautions when installing the Remote Control:

- **the Remote Control wiring must not be grouped together in the same sheath as the power cables:** if the cables are sheathed together, electrical interference from other power cables may compromise the functions of the Remote Control;
- the Remote Control must be installed on an indoor wall at a height of approximately 1.5 m from the floor and in a suitable location for measuring ambient temperature: do not install in recess or corners, behind doors or curtains, and install away from heat sources, direct sunlight, air draughts and water sprays.

The Remote Control connector is protected against inverted polarity, and the connections may be inverted.



**Do not connect the remote control to mains electrical power 230 V ~ 50 Hz.**

For complete instructions on how to program the Remote Control, refer to the instruction manual included in the Remote Control kit.

Board and Remote Control communicate in each operating mode: OFF, SUMMER, WINTER, CH ONLY; boiler display layout corresponds to the setting made from the Remote Control, as for the operating mode.

The Remote Control may be used to view and set a number of special parameters denominated TSP parameters and reserved solely for qualified technicians (tables 14 and 15).

TPS0 parameter sets default data table and restores all factory settings, cancelling all preceding modifications on single parameters.

If a single parameter is found to be incorrect, the value given in the default value table is restored.

If the user attempts to set a value not within the permissible range for the parameter, the new value is rejected and the existing value is maintained.

Parameter	Configurable value range	Default 12 kW Methane gas	Default 12 kW Propane gas	Default 24 kW Methane gas	Default 24 kW Propane gas	Default 28 kW Methane gas	Default 28 kW Propane gas	Default 32 kW Methane gas	Default 32 kW Propane gas
<b>P0 - TSP0</b> Equipment type and default data chart	0 ÷ 7	0	5	1	3	2	4	6	7
<b>P4 - TSP4</b> Fan speed at burner maximum output (DHW)	TSP5 ÷ 250 Hz	182 Hz	177 Hz	197 Hz	192 Hz	205 Hz	200 Hz	208 Hz	206 Hz
<b>P5 - TSP5</b> Fan speed at burner minimum output (DHW and CH)	25 ÷ 120 Hz	37 Hz	38 Hz	40 Hz	40 Hz	39 Hz	39 Hz	43 Hz	43 Hz
<b>P6 - TSP6</b> Fan speed at ignition power and propagation	25 ÷ 160 Hz	68 Hz	68 Hz	58 Hz	58 Hz	60 Hz	60 Hz	76 Hz	76 Hz
<b>P7 - TSP7</b> Upper limit for maximum CH heat output	10 ÷ 100 %	76%	74%	88%	88%	89%	88%	89%	88%
<b>P8 - TSP8</b> Negative ramp start minimum speed	P5 ÷ P6	56	56	56	56	60	60	60	60
<b>P9 - TSP9</b> Negative ramp time	0 ÷ 30 (1 = 10 sec.)	18	18	25	25	18	18	18	18
<b>P10 - TSP10</b> CH curves	0 ÷ 3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Table 14 - Limits to be set for TSP parameters and default values in relation to boiler type (TSP0)

### 3.2.13. Connection to the external probe (optional) and “sliding temperature” operation

The boiler can be connected to an external temperature probe (optional - not compulsory) for sliding temperature operation.

**Only original external temperature probes supplied by the manufacturer must be used. If non-original external temperature probes are used, correct operation of the boiler and external probe cannot be guaranteed.**

The external temperature probe must be connected by means of a double insulated wire, minimum cross-section 0.35 sq.mm. The external probe must be connected to pins 5-6 of boiler electronic board (see fig. 28, 29 and 30).

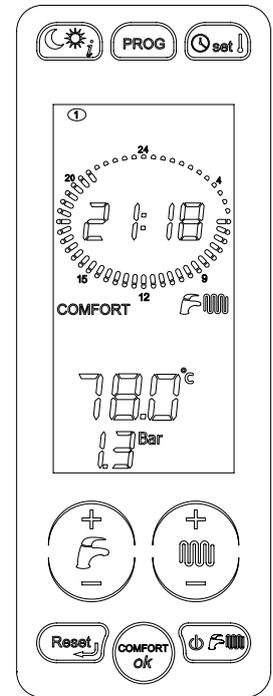
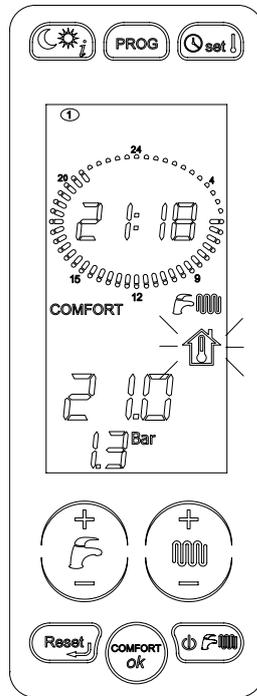
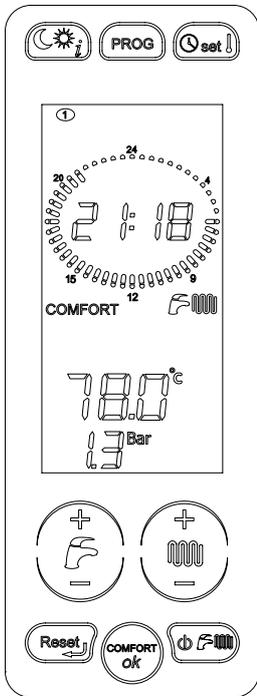
**The temperature probe cables must NOT be routed together with power cables.**

The temperature probe must be installed on an outside wall facing NORTH - NORTH EAST, in a position protected from weather. Do not install near a window, ventilation openings or sources of heat.

The external temperature probe automatically modifies the CH flow temperature in relation to:

- the outdoor temperature measured;
- the thermoregulation curve selected;
- the calculated ambient temperature selected.

The calculated ambient temperature is set using “CH + and -” buttons (E, fig.1) that, with external probe installed, no longer work to set the heating water temperature. The external temperature value detected by the external probe can be displayed through boiler P30 parameter.



**1-** With external probe installed press “CH + and -” buttons (E, fig. 1) to set the calculated room temperature. As soon as “ambient temperature” button is released icon will continue flashing for approx. 3 seconds, and set-point value will flash as well.

**2-** After this time, value is stored and display standard operation will be restored.

Figure 27 shows the curves for a calculated ambient temperature of 20°C. Parameter **P10** allows selecting the curve value shown in fig. 27. If calculated ambient temperature value is edited on boiler display, the curves shift up or down, respectively, by the same amount. With a calculated ambient temperature setting of 20°C, for example, if you select the curve corresponding to parameter 1 and the outdoor temperature is -4°C, the CH flow temperature will be 50°C.

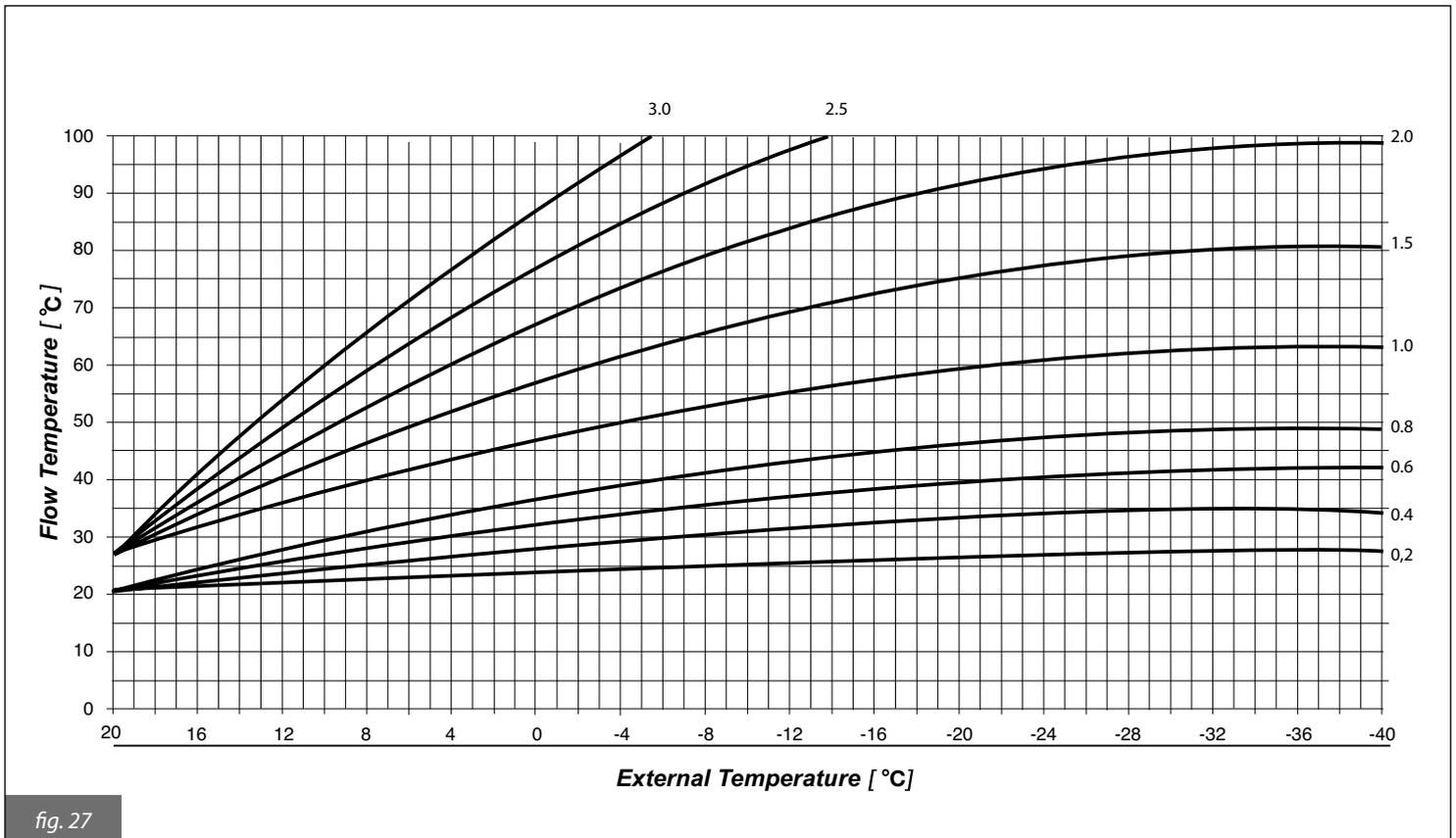


fig. 27

### 3.2.14. TSP parameters that can be set from interface or Remote Control

Parameter	Settable values	Default values	Notes
<b>P0 - TSP0</b> Boiler power selection	0 ÷ 7	According to the model	0 = 12 kW Methane gas; 1 = 24 kW Methane gas; 2 = 28 kW Methane gas; 3 = 24 kW Propane gas; 4 = 28 kW Propane gas; 5 = 12 kW Propane gas; 6 = 32 kW Methane gas; 7 = 32 kW Propane gas.
<b>P3 - TSP3</b> Boiler type selection	3	3	
<b>P4 - TSP4</b> Fan speed at burner maximum output	Value of P5 ÷ 250 Hz	According to the model	12 kW Methane gas = 182; 12 kW propane = 177 24 kW Methane gas = 197; 24 kW propane = 192 28 kW Methane gas = 205; 28 kW propane = 200 32 kW Methane gas = 208; 32 kW propane = 206
<b>P5 - TSP5</b> Fan speed at burner minimum output	25 ÷ 120 Hz	According to the model	12 kW natural gas = 37; 12 kW propane = 38 24 kW = 40; 28 kW = 39; 32 kW = 43
<b>P6 - TSP6</b> Fan speed at ignition power	25 ÷ 160 Hz	According to the model	12 kW = 68; 24 kW = 58 28 kW = 60; 32 kW = 76
<b>P7 - TSP7</b> Fan speed at heating maximum output	10 ÷ 100%	According to the model	12 kW natural gas = 76; 12 kW propane = 74 24 kW natural gas = 88; 24 kW propane = 88 28 kW natural gas = 89; 28 kW propane = 88 32 kW natural gas = 89; 32 kW propane = 88
<b>P8 - TSP8</b> Negative ramp start minimum speed	P5 ÷ P6	According to the model	12 kW = 56; 24 kW = 56 28 kW = 60; 32 kW = 60
<b>P9 - TSP9</b> Negative ramp time	0 ÷ 30 (1 = 10 sec.)	According to the model	12 kW, 24 kW, 32 kW = 18 28 kW = 25
<b>P10 - TSP10</b> CH curves	0 ÷ 3	1.5	
<b>P11 - TSP11</b> Heating thermostat timing	0 ÷ 10 min.	4	
<b>P12 - TSP12</b> CH power rising ramp timer	0 ÷ 10 min.	1	
<b>P13 - TSP13</b> Timer for CH post-circulation, freeze protection and flue cleaning function, configurable	30 ÷ 180 sec.	30	
<b>P14 - TSP14</b> Setting of "solar" DHW thermostats	0 ÷ 1	0	0 = normal 1 = solar
<b>P15 - TSP15</b> Water hammer protection delay, configurable	0 ÷ 10 sec.	0	
<b>P16 - TSP16</b> Ambient thermostat reading delay / OT	0 ÷ 199 sec.	0	
<b>P17 - TSP17</b> Multifunction relay setting	0 ÷ 3	0	0 = shut-down and failure; 1 = remote relay / TA1; 2 = solar relay; 3 = TA2 request
<b>P27 - TSP27</b> CH timer reset temperature	20 ÷ 78 °C		P10 < 1 (low temp.) = 20 °C P10 > 1 (high temp.) = 30 °C
<b>P29 - TSP29</b> Setting of default parameters (except P0, P1, P2, P17)	0 ÷ 1	0	
Display only	<b>P30</b> External temperature		only with external probe connected
	<b>P31</b> Flow temperature		
	<b>P32</b> Nominal calculated flow temperature		only with external probe connected
	<b>P33</b> Set point of zone 2 flow temperature		in V versions
	<b>P34</b> Current zone 2 flow temperature		in V versions
	<b>P36</b> Set point of zone 3 flow temperature		in Z versions
	<b>P37</b> Current zone 3 flow temperature		in Z versions
	<b>P39</b> Set point of zone 4 flow temperature		only with three zone boards connected (optional)
	<b>P40</b> Current zone 4 flow temperature		only with three zone boards connected (optional)
	<b>P42</b> DHW plate heat exchanger temperature		
	<b>P43</b> Boiler return temperature		
	<b>P44</b> Water heater temperature		

Display only	<b>P45</b> Flue gas temperature			
	<b>P49</b> Ambient probe SA1 temperature			only with connected ambient probe
	<b>P50</b> Ambient probe SA2 temperature			only with connected ambient probe
<b>P51</b> SA1 ambient probe triggering differential OFF	0.0 ÷ 1.0 °C	0.0 °C		only with connected ambient probe
<b>P52</b> SA1 ambient probe triggering differential ON	-1.0 ÷ -0.1 °C	-0.5 °C		only with connected ambient probe
<b>P53</b> Ambient probe SA1 correction range	-5.0 ÷ 5.0 °C	0.0 °C		only with connected ambient probe
<b>P54</b> SA2 ambient probe triggering differential OFF	0.0 ÷ 1.0 °C	0.0 °C		only with connected ambient probe
<b>P55</b> SA2 ambient probe triggering differential ON	-1.0 ÷ -0.1 °C	-0.5 °C		only with connected ambient probe
<b>P56</b> Ambient probe SA2 correction range	-5.0 ÷ 5.0 °C	0.0 °C		only with connected ambient probe
<b>P57</b> Type of modulation with connected ambient probes (only with P61 set between 03 and 07)	0 ÷ 4	4		0 = on/off; 1 = ambient probe modulation; 2 = external probe modulation; 3 = ambient probe and external probe modulation; 4 = no ambient probe connected.
<b>P58</b> Ambient probe weight during modulation	0 ÷ 20 °C	8 °C		used for thermoregulation with P57=3
<b>P59</b> Type of temperature visualization on display	0, 1, 2, 3, 4	0		0 = flow temp.; 1 = probe SA1 temp.; 2 = probe SA2 temp.; 3 = external temp.; 4 = water heater temp.
<b>P60</b> Number of additional boards connected	0 ÷ 4	0		Maximum 4 boards (3 zone)
<b>P61</b> Association between remote and ambient thermostats	00 ÷ 07	00		00 = remote zone 2 / TA2 zone 1; 01 = TA1 zone 2 / TA2 zone 1; 02 = TA2 zone 2 / remote zone 1; 03 = SA1 zone 1 / TA2 zone 2; 04 = SA1 zone 1 / SA2 zone 2; 05 = remote zone 1 / SA2 zone 2; 06 = zone 1 not managed / SA2 zone 2; 07 = TA1 zone 1 / SA2 zone 2.
<b>P62</b> Selection of zone 2 curve	0 ÷ 3	0.6		only with zone board connected
<b>P63</b> Zone 2 set-point	15 ÷ 35 °C	20 °C		only with zone board connected
<b>P66</b> Selection of zone 3 curve	0 ÷ 3	0.6		only with two zone boards connected
<b>P67</b> Zone 3 set-point	15 ÷ 35 °C	20 °C		only with two zone boards connected
<b>P70</b> Selection of zone 4 curve	0 ÷ 3	0.6		only with three zone boards connected
<b>P71</b> Zone 4 set-point	15 ÷ 35 °C	20 °C		only with three zone boards connected
<b>P74</b> Low temperature zone mixer valve opening time	0 ÷ 300 sec.	140 sec.		only with zone boards connected
<b>P75</b> Rise in nominal boiler temperature with zone board	0 ÷ 35 °C	5 °C		only with zone boards connected
<b>P78</b> Interface back-lighting switching on	0 ÷ 2	0		0 = standard; 1 = LCD always on 2 = LCD and keys always on
System check	<b>P80</b> Multifunction relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay energised
	<b>P81</b> Zone 2 pump relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay energised
	<b>P82</b> Zone 2 mixing valve forcing	0 ÷ 2	0	0 = standard function; 1 = force opening; 2 = force closing
	<b>P84</b> Zone 3 pump relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay energised
	<b>P85</b> Zone 3 mixing valve forcing	0 ÷ 2	0	0 = standard function; 1 = force opening; 2 = force closing
	<b>P87</b> Zone 4 pump relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay energised
	<b>P88</b> Zone 4 mixing valve forcing	0 ÷ 2	0	0 = standard function; 1 = force opening; 2 = force closing
<b>P93</b> DHW 3-star function with connected remote control	0 ÷ 1	0		0 = OFF; 1 = ON

Table 15 - General table of parameters

### 3.3. Filling the system

Once all boiler connections have been completed, CH system can be filled.

#### 3.3.1. Filling the heating system

The procedure is to be cautiously carried out, following each step:

- open the air purging valves on all radiators and verify the boiler automatic valve operation;
- gradually open the relevant filler cock, checking any automatic bleeding valves installed in the system properly work;
- close all radiator air purging valves as soon as water starts coming out;
- ensure that boiler water pressure gauge does not exceed  $1 \div 1.3$  bars reading;
- shut the filler cock and bleed any air out again, by opening the air bleeding valves on radiators;
- start the boiler and bring the system to working temperature, stop the pump, and repeat air bleeding procedure;
- allow the system to cool and restore system pressure to  $1 \div 1.3$  bars.

#### WARNING

**As for water treating in the domestic heating systems in order to optimise efficiency and safety, ensure a long life, trouble-free operation of auxiliary equipment, minimise power consumption, thereby integrating the standards and rules in force in the country of installation, it is recommended to use specific products suitable for multi-metal heating systems.**

#### WARNING

**Pressure sensor will not electrically enable the burner ignition when water pressure is below 0.4 bar (this parameter can be edited by qualified professional staff).**

**CH water pressure must not to be less than 1 bar. Restore proper value as needed, via the filler cock of the boiler (fig. 2). The procedure is to be followed while the system is cold. The digital pressure gauge fitted on the boiler control panel indicates the pressure in the system.**

#### WARNING

**After long inactivity of the boiler, its pumps may be stuck.**

**Before starting up the boiler, make sure that the pumps are operating, with the following procedure:**

- **unscrew the protective cap at the centre of the pump motor;**
- **put a screwdriver into the hole and manually rotate the circulation pump shaft clockwise;**
- **once the unblocking operation is completed, screw the protective cap back on and check for water leaks.**

**When the protection cap is removed, some water may flow out. Before reinstalling the boiler casing, make sure all internal surfaces are dry.**

### 3.4. Starting up the boiler

#### 3.4.1. Preliminary checks

Before starting the boiler, check that:

- the flue gas venting duct and the relevant terminal are installed in conformity with the instructions: with the boiler operating, there must be no leakage of combustion by-products from any of the gaskets;
- the supply power to the boiler must be 230 V ~ 50 Hz;
- the system is correctly filled with water (stream gauge reading 1 to 1.3 bar);
- any shut-off cocks in the system pipes are open;
- the mains gas type is correct for the boiler calibration: convert the boiler to the available gas when necessary (see paragraph 3.6. Adaptation to other gas types): this operation must only be performed by qualified technical personnel;
- the gas supply cock is open;
- there are no gas leaks;
- the main switch installed ahead of the boiler is turned on;
- boiler safety valves are not stuck;
- there are no water leaks;
- pumps are not stuck;
- the condensate trap installed on the boiler is discharging condensate correctly and is not stuck.

**The boiler is equipped with a CH three-speed circulation pump; three different residual head values correspond to each speed, according to the system's residual head values (see fig. 10, 11, 12 and 13). The boiler is delivered with this circulation pump set at the third speed setting.**

**If you wish to set a different speed, taking into account the water circulation requirements in the boiler and the hydraulic resistance properties of the system, check operation of the boiler in all the conditions dictated by the features of the system (e.g. closure of one or more heating zones or of thermostat-controlled valves).**

#### 3.4.2. Switching on and switching off

To switch the boiler on and off, refer to the "Instructions for the User".

3.5. Connection wiring diagrams

KRB version

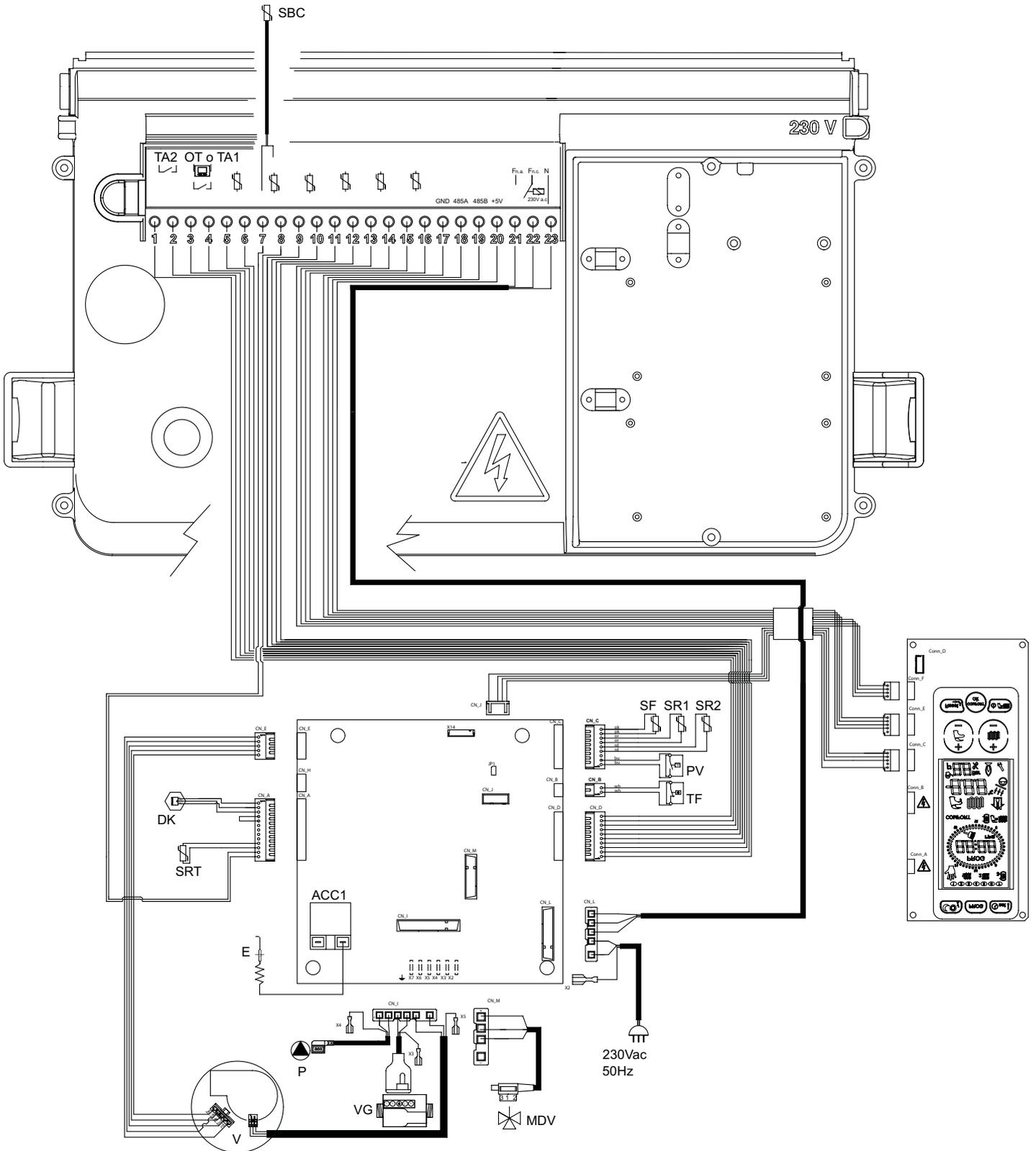
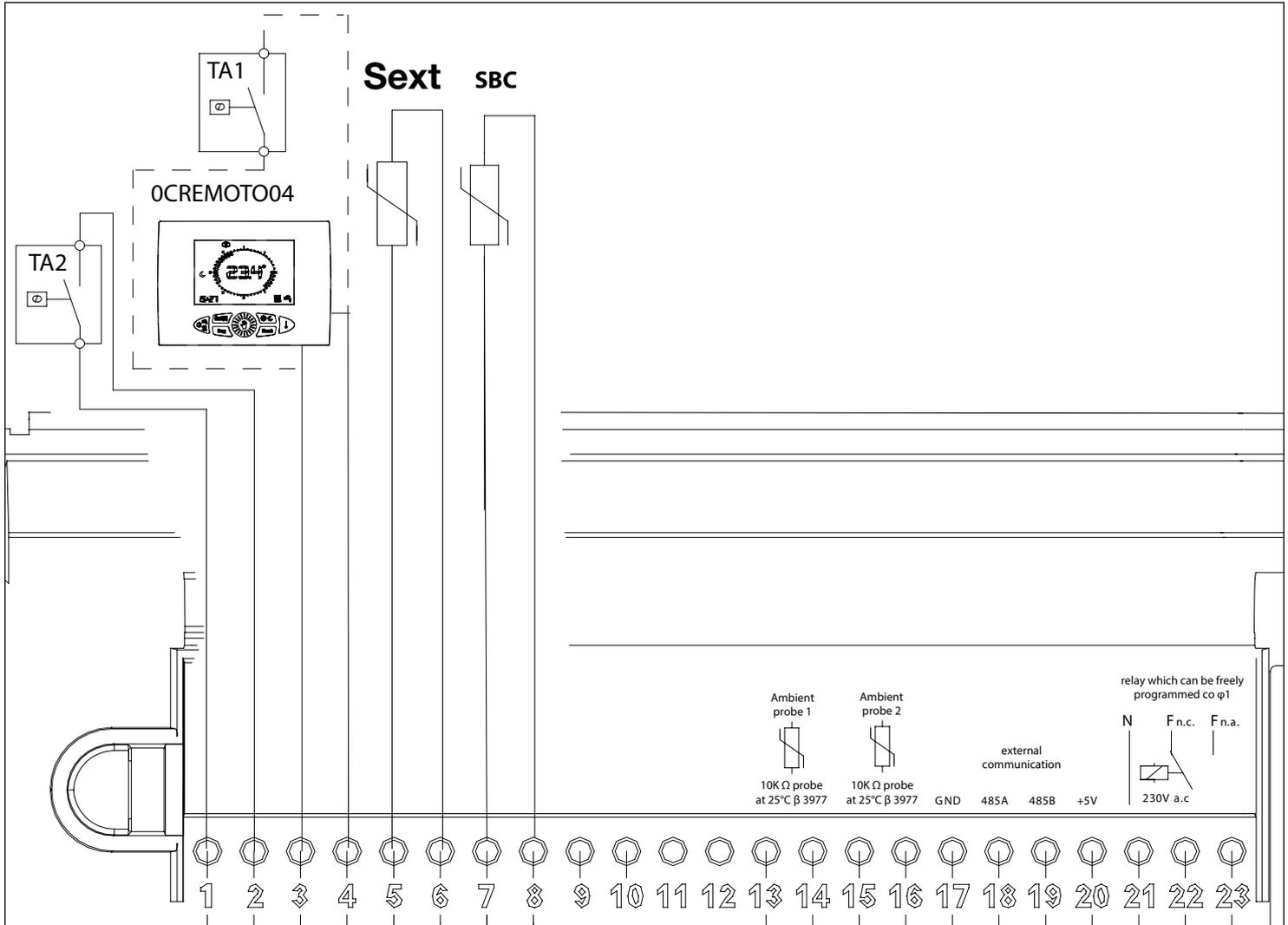


fig. 28

## KEY

**0SCHEMOD27:** boiler board  
**0SCHEINT00:** interface board  
**DK:** pressure transducer  
**SRT:** return NTC probe 10 kOhm at 25 °C B=3435  
**SR1-SR2:** CH NTC probe 10 kOhm at 25 °C B=3435  
**SF:** flue gas NTC probe 10 kOhm at 25 °C B=3435  
**PV:** Air pressure switch  
**Sext:** NTC external probe 10K Ohm B=3977  
**TA1:** zone 1 ambient thermostat (use a contact free from potential)  
**TA2:** zone 2 ambient thermostat (use a contact free from potential)  
**SBC:** NTC water heater probe 10 kOhm at 25 °C B=3435

**TF:** flue gas thermostat  
**VG:** gas valve  
**P:** boiler circulation pump  
**MDV:** electric deviating valve  
**E:** ignition/flame detection electrode  
**V:** brushless fan  
**ACC1:** ignition transformer  
**CN\_A-CN\_M:** signal/load connectors  
**X2-X7:** ground connectors  
**0CREMOTO04:** opentherm Fondital remote control  
**0SONDAES01:** external probe to be used with 0CREMOTO04 remote control



## PANEL ELECTRICAL CONNECTIONS

**1-2:** ambient thermostat contact 2  
**3-4:** ambient thermostat contact 1 or opentherm  
**5-6:** external probe  
**7-8:** water heater probe  
**13-14:** ambient probe 1  
**15-16:** ambient probe 2  
**17:** serial input GND  
**18:** serial input 485A  
**19:** serial input 485B  
**20:** serial input +5V  
**21:** relay neutral  
**22:** 'normally closed' phase  
**23:** 'normally open' phase

## ELECTRICAL CONNECTIONS TO BE MADE BY THE INSTALLER

**TA (PIN1 and 2):** ambient thermostat 2 contact  
**(PIN 3 and 4):** ambient thermostat 1 contact or Opentherm Remote Control  
**Sext (PIN 5 and 6):** NTC external probe 10K Ohm at 25 °C B=3977  
**(PIN 13 and 14):** ambient probe 1  
**(PIN 15 and 16):** ambient probe 2

KRB V version

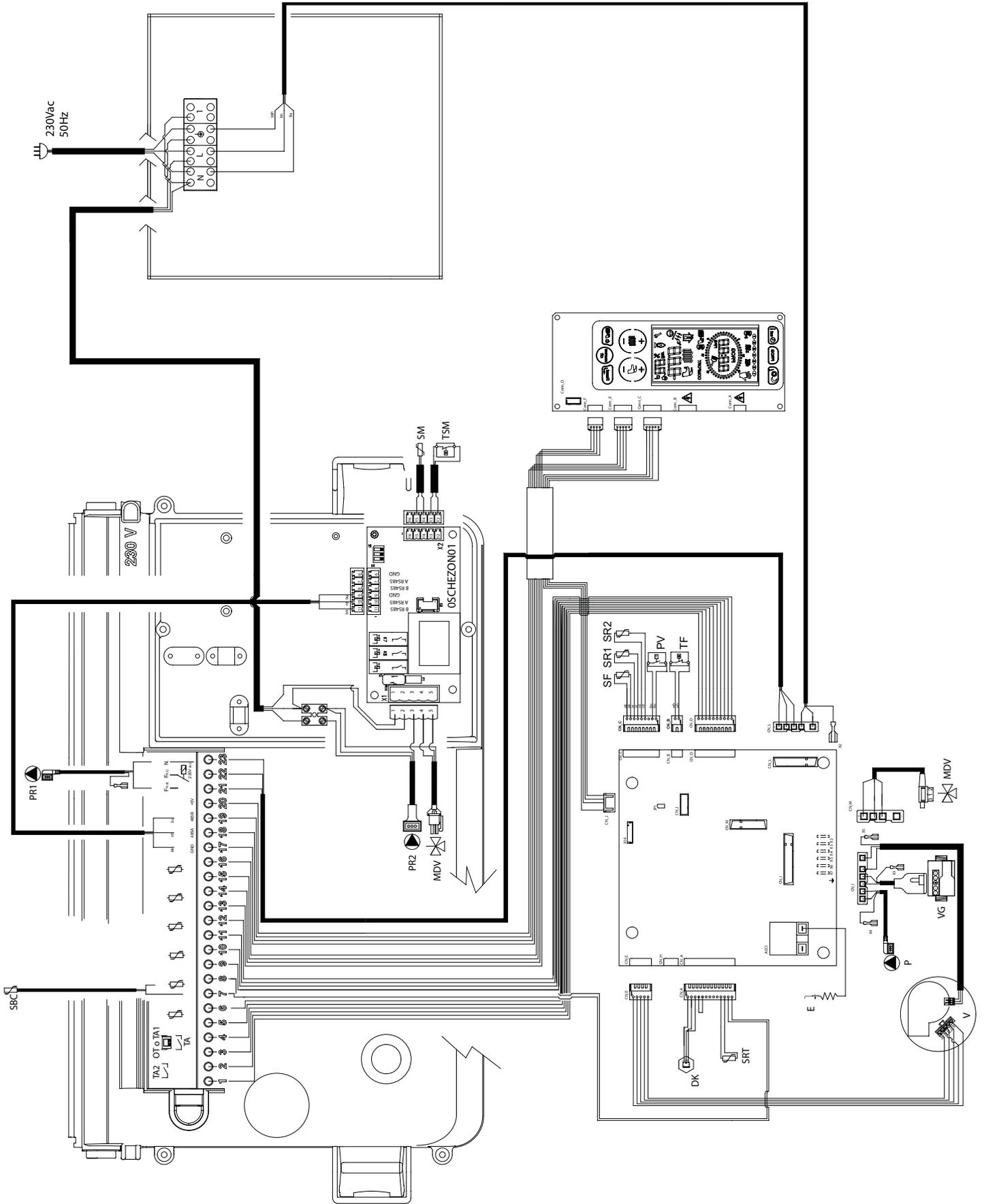
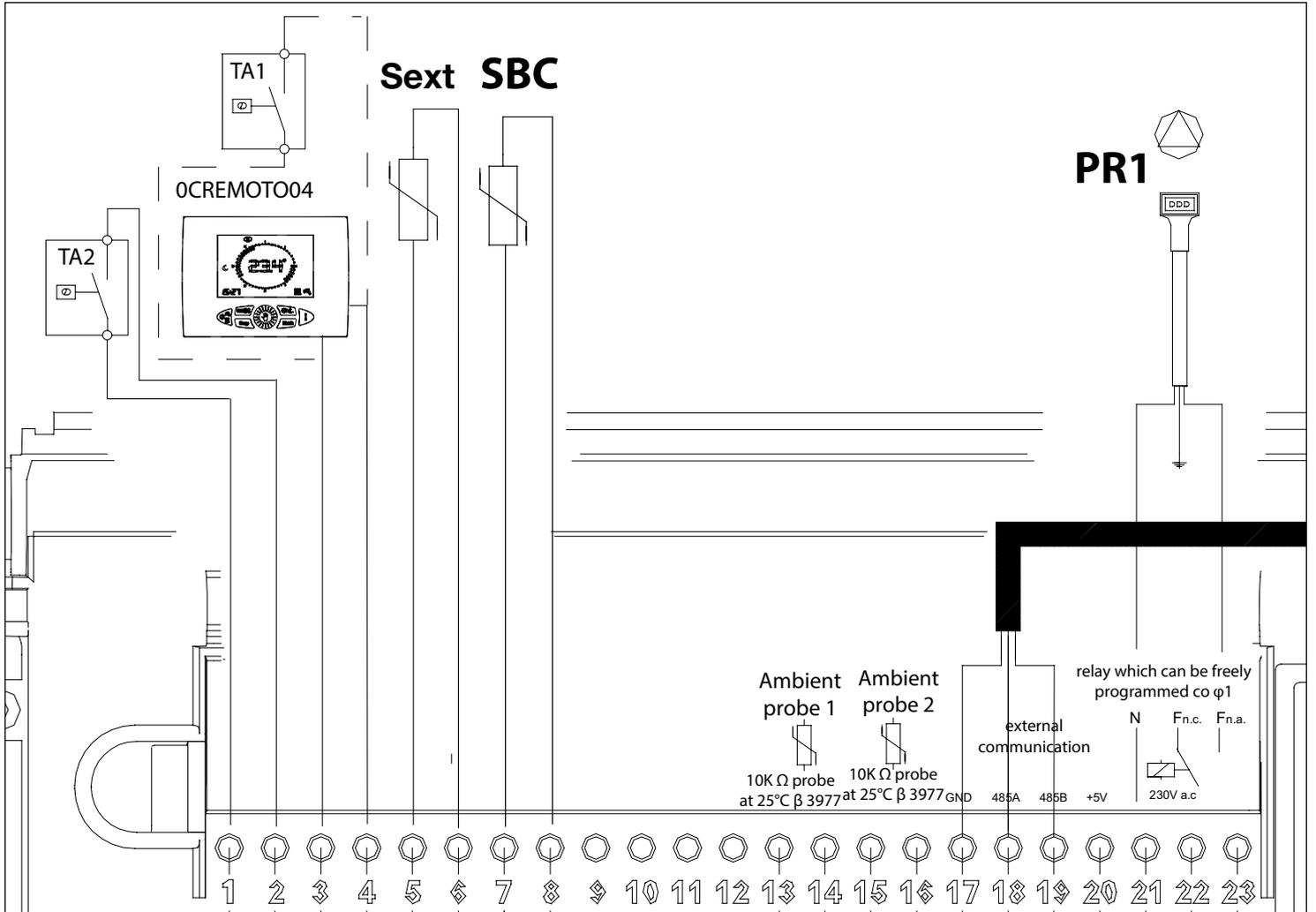


fig. 29

## KEY

**0SCHEMOD27:** boiler board  
**0SCHEINT00:** interface board  
**DK:** pressure transducer  
**SRT:** return NTC probe 10 kOhm at 25 °C B=3435  
**SR1-SR2:** CH NTC probe 10 kOhm at 25 °C B=3435  
**SF:** flue gas NTC probe 10 kOhm at 25 °C B=3435  
**PV:** Air pressure switch  
**Sext:** NTC external probe 10K Ohm B=3977  
**TA1:** zone 1 ambient thermostat (use a contact free from potential)  
**TA2:** zone 2 ambient thermostat (use a contact free from potential)  
**SBC:** NTC water heater probe 10 kOhm at 25 °C B=3435  
**TF:** flue gas thermostat  
**VG:** gas valve

**P:** boiler circulation pump  
**MDV:** electric deviating valve  
**E:** ignition/flame detection electrode  
**V:** brushless fan  
**ACC1:** ignition transformer  
**CN\_A-CN\_M:** signal/load connectors  
**X2-X7:** ground connectors  
**0CREMOTO04:** opentherm Fondital remote control  
**0SONDAES01:** external probe to be used with 0CREMOTO04 remote control  
**PR1:** zone 1 circulation pump  
**PR2:** zone 2 circulation pump  
**SM:** mixed zone flow probe  
**TSM:** mixed zone flow safety thermostat  
**0SCHEZON01:** zone management board



## PANEL ELECTRICAL CONNECTIONS

**1-2:** ambient thermostat contact 2  
**3-4:** ambient thermostat contact 1 or opentherm  
**5-6:** external probe  
**7-8:** water heater probe  
**13-14:** ambient probe 1  
**15-16:** ambient probe 2  
**17:** serial input GND  
**18:** serial input 485A  
**19:** serial input 485B  
**20:** serial input +5V  
**21:** relay neutral  
**22:** 'normally closed' phase  
**23:** 'normally open' phase

## ELECTRICAL CONNECTIONS TO BE MADE BY THE INSTALLER

**TA (PIN 1 and 2):** ambient thermostat 2 contact  
**(PIN 3 and 4):** ambient thermostat 1 contact or Opentherm Remote Control  
**Sext (PIN 5 and 6):** NTC external probe 10K Ohm at 25 °C B=3977  
**(PIN 13 and 14):** ambient probe 1  
**(PIN 15 and 16):** ambient probe 2

KRB Z version

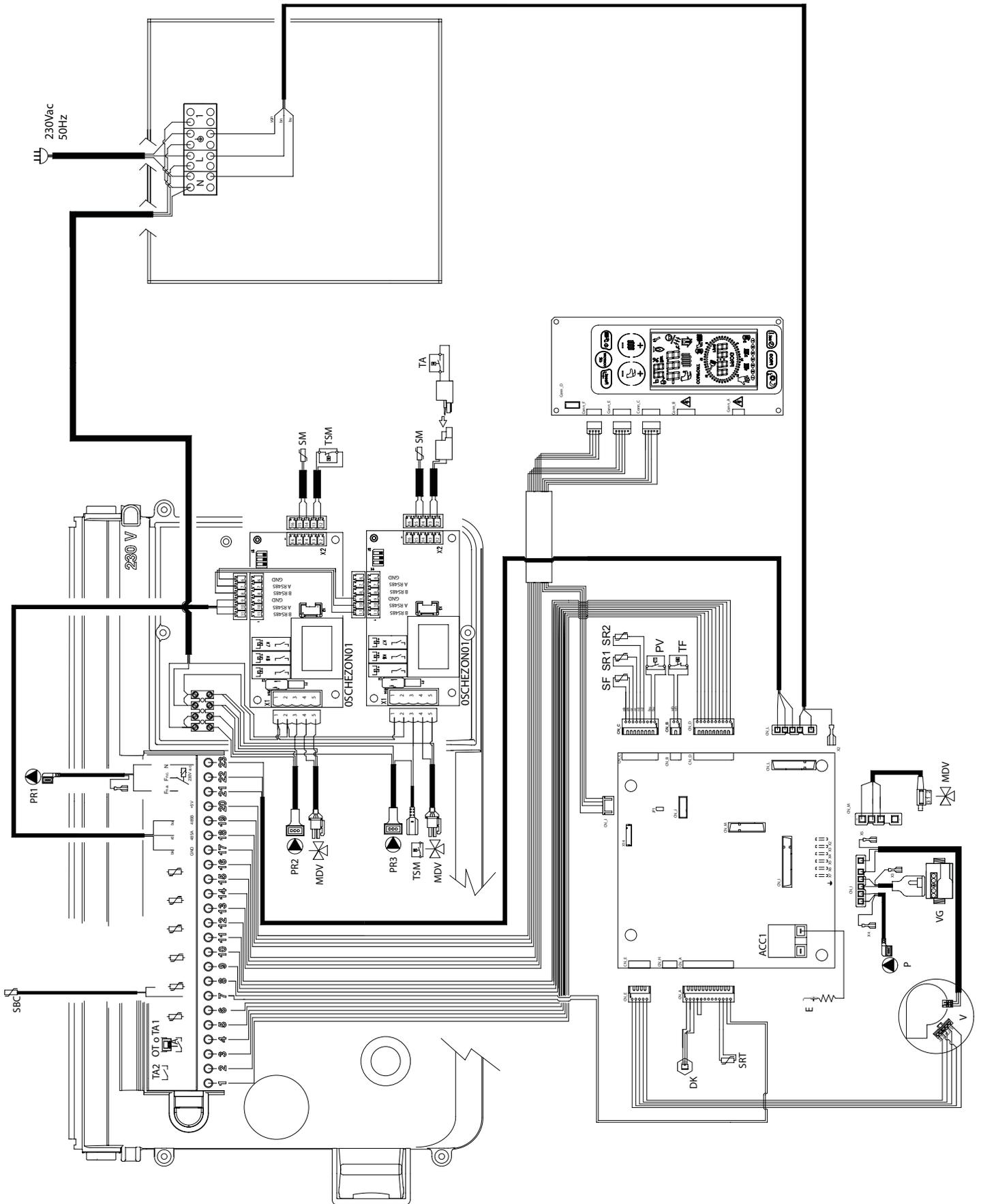


fig. 30

## KEY

**0SCHEMOD27:** boiler board

**0SCHEINT00:** interface board

**DK:** pressure transducer

**SRT:** return NTC probe 10 kOhm at 25 °C B=3435

**SR1-SR2:** CH NTC probe 10 kOhm at 25 °C B=3435

**SF:** flue gas NTC probe 10 kOhm at 25 °C B=3435

**PV:** Air pressure switch

**Sext:** NTC external probe 10K Ohm B=3977

**TA1:** zone 1 ambient thermostat (use a contact free from potential)

**TA2:** zone 2 ambient thermostat (use a contact free from potential)

**SBC:** NTC water heater probe 10 kOhm at 25 °C B=3435

**TF:** flue gas thermostat

**VG:** gas valve

**P:** boiler circulation pump

**MDV:** electric deviating valve

**E:** ignition/flame detection electrode

**V:** brushless fan

**ACC1:** ignition transformer

**CN\_A-CN\_M:** signal/load connectors

**X2-X7:** ground connectors

**0CREMOTO04:** opentherm Fondital remote control

**0SONDAES01:** external probe to be used with 0CREMOTO04 remote control

**PR1:** zone 1 circulation pump

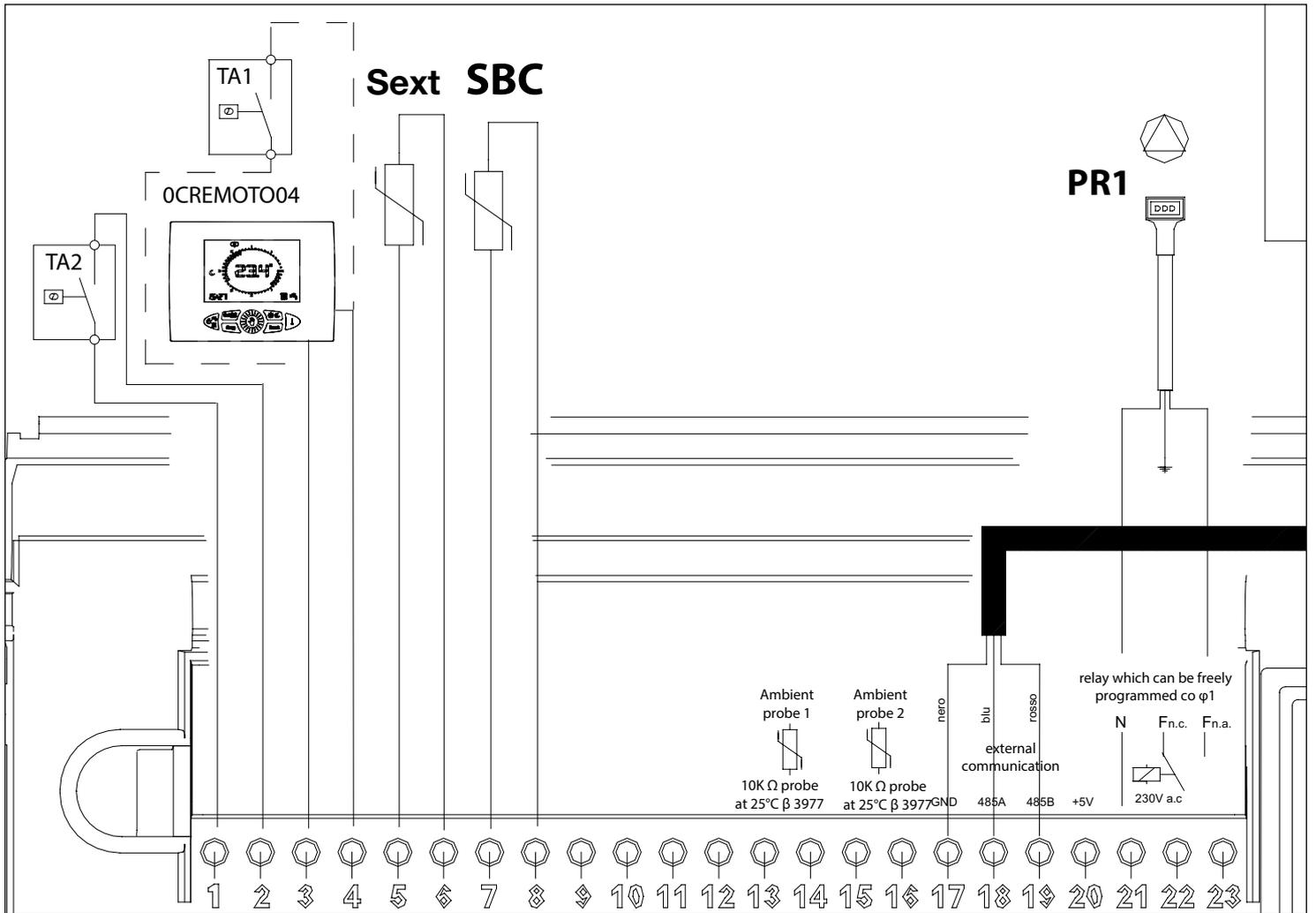
**PR2:** zone 2 circulation pump

**PR3:** zone 3 circulation pump

**SM:** mixed zone flow probe

**TSM:** mixed zone flow safety thermostat

**0SCHEZON01:** zone management board



### PANEL ELECTRICAL CONNECTIONS

**1-2:** ambient thermostat contact 2

**3-4:** ambient thermostat contact 1 or opentherm

**5-6:** external probe

**7-8:** water heater probe

**13-14:** ambient probe 1

**15-16:** ambient probe 2

**17:** serial input GND

**18:** serial input 485A

**19:** serial input 485B

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**21:** relay neutral

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### ELECTRICAL CONNECTIONS TO BE MADE BY THE INSTALLER

**TA (PIN1 and 2):** ambient thermostat 2 contact

**(PIN 3 and 4):** ambient thermostat 1 contact or Opentherm Remote Control

**Sext (PIN 5 and 6):** NTC external probe 10K Ohm at 25 °C B=3977

**(PIN 13 and 14):** ambient probe 1

**(PIN 15 and 16):** ambient probe 2

T (°C)	0	2	4	6	8
0	27203	24979	22959	21122	19451
10	17928	16539	15271	14113	13054
20	12084	11196	10382	9634	8948
30	8317	7736	7202	6709	6254
40	5835	5448	5090	4758	4452
50	4168	3904	3660	3433	3222
60	3026	2844	2674	2516	2369
70	2232	2104	1984	1872	1769
80	1670	1578	1492	1412	1336
90	1266	1199	1137	1079	1023

Table 16 - Relationship between temperature (°C) and nominal resistance (Ohm) of all NTC probes

### 3.6. Adaptation to other gas types and burner adjustment

This boiler is built to run on the type of gas specified on the order, which is shown on the packaging and on the boiler rating plate. Any later transformation is to be exclusively carried out by qualified personnel, using manufacturer designed accessories and following the procedure and adjustment instructions for an accurate boiler setting-up.

#### 3.6.1. Adapting the boiler from METHANE to PROPANE

- Disconnect the boiler from the electric power supply.
- Open the boiler front casing.
- Loosen the three screws securing combustion chamber front panel to frame, then remove panel.
- Loosen the screw securing intake pipe to mixer, and remove pipe (fig. 31).
- Disconnect the gas pipe from the mixer (fig. 31).
- Loosen the three socket head screws, and remove the mixer (fig. 32).
- Loosen the two retaining screws, and slide out mixer plastic body (fig. 33).
- Using a 6 mm Allen wrench, loosen the two mixer nozzles (fig. 33).
- Screw the new nozzles for propane listed in tab. 18, **taking care to drive them fully home, without tightening.**
- Only for 32 kW versions model, insert the 7.2 mm diaphragm on the outlet of the gas valve.

 **In case the nozzle idles when reaching the bottom of the nozzle threaded seat, it means that the thread is damaged and perfect sealing is not ensured. The whole mixer shall be replaced.**

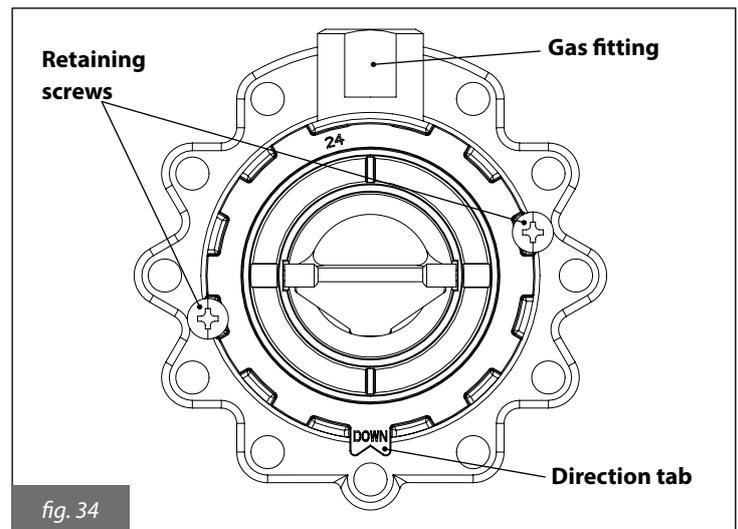
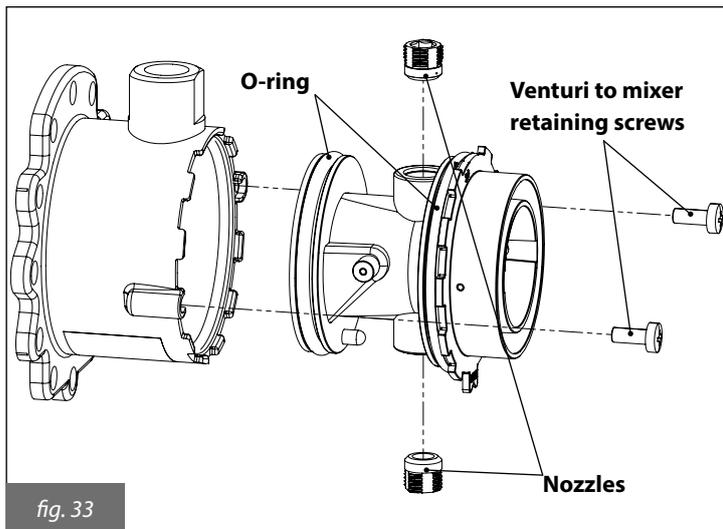
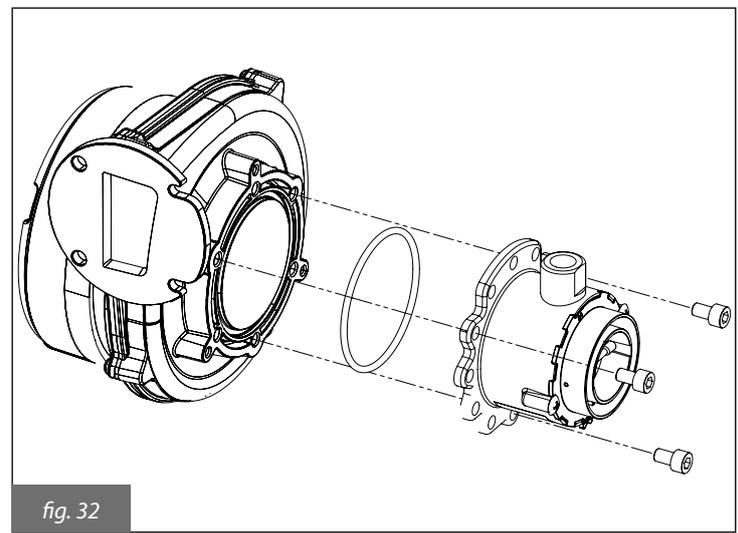
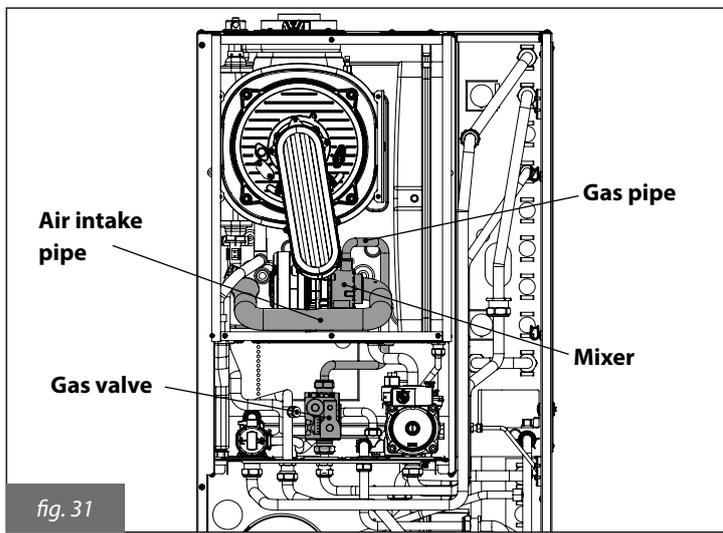
- To refit the plastic body (Venturi), insert it inside mixer and secure it in place with the retaining screws. **Take care not to damage the O-rings assembled on plastic body ends (fig. 33) and to respect the assembling direction (fig. 34).**
- Refit the reassembled mixer onto the fan with the socket head screws, making sure to insert the O-ring between mixer and fan (fig. 33).
- Reconnect boiler to electric power supply, and open the gas cock.
- Access the programming page to set the parameters P4-P5-P6-P7 to the propane gas values, as described in tab. 14.
- Adjust the gas valve (see next paragraph, 3.6.3.).

#### 3.6.2. Adapting the boiler from PROPANE to METHANE

- Disconnect the boiler from the electric power supply.
- Open the boiler front casing.
- Loosen the three screws securing combustion chamber front panel to frame, then remove panel.
- Loosen the screw securing intake pipe to mixer, and remove pipe (fig. 31).
- Disconnect the gas pipe from the mixer (fig. 31).
- Loosen the three socket head screws, and remove the mixer (fig. 32).
- Loosen the two retaining screws, and slide out mixer plastic body (fig. 33).
- Using a 6 mm Allen wrench, loosen the two mixer nozzles (fig. 33).
- Screw the new nozzles for methane listed in tab. 18, **taking care to drive them fully home, without tightening.**
- Only for 32 kW versions model, remove the 7.2 mm diaphragm on the outlet of the gas valve.

 **In case the nozzle idles when reaching the bottom of the nozzle threaded seat, it means that the thread is damaged and perfect sealing is not ensured. The whole mixer shall be replaced.**

- To refit the plastic body (Venturi), insert it inside mixer and secure it in place with the retaining screws. **Take care not to damage the O-rings assembled on plastic body ends (fig. 33) and to respect the assembling direction (fig. 34).**
- Refit the reassembled mixer onto the fan with the socket head screws, making sure to insert the O-ring between mixer and fan (fig. 33).
- Reconnect boiler to electric power supply, and open the gas cock.
- Access the programming page to set the parameters P4-P5-P6-P7 to the propane gas values, as described in tab. 14.
- Adjust the gas valve (see next paragraph, 3.6.3.).



### 3.6.3. Gas valve setting

#### 3.6.3.1. Maximum heating output adjustment

- Make sure that the ambient thermostat (optional), if fitted, is set to ON.
- Select the "heating" mode on the control panel pressing key n times until symbol is displayed.
- Start the 'flue cleaning' function by keeping key pressed until symbol stops flashing. Boiler switches to max. output operation.
- If a gas switching has been made, access the programming page and set the P0-P4-P5-P6-P7-P8 parameters based on the power and on the gas, as specified in tab. 14.
- Set the flue (CO<sub>2</sub>) rate by turning the ratio adjuster **B** (fig. 35) and ensure that reading falls within the limits of tab. 17. Let boiler flue cleaning function on and continue with the next point "Minimum heating output adjustment" .

#### 3.6.3.2. Minimum heating output adjustment

- Set boiler min. output operation by keeping symbol '-' pressed on the DHW temperature adjustment key until the value corresponding to fan min. speed for the output and boiler gas (refer to tab. 14) is displayed.
- Boiler switches to min. output operation.
- Set the flue (CO<sub>2</sub>) rate by turning the offset adjuster **C** (fig. 35) and ensure that reading falls within the limits of tab. 17.
- Keep key pressed to end the flue cleaning function.

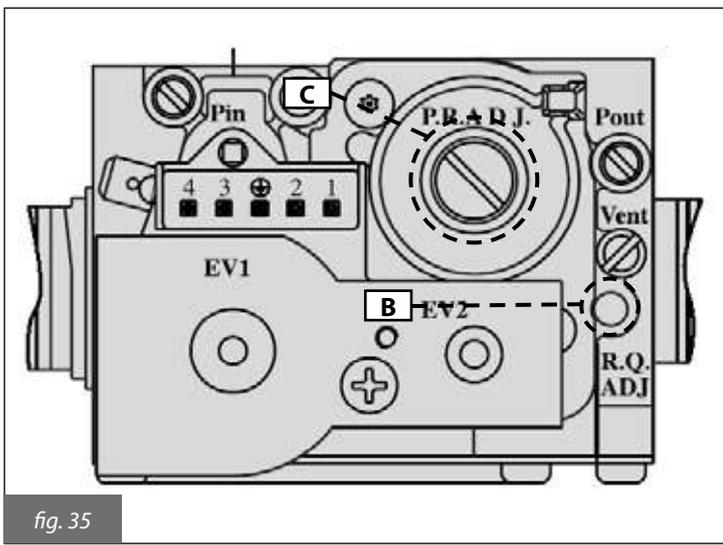


fig. 35

FLUE CO <sub>2</sub> RATE	
Fuel	CO <sub>2</sub> rate (%)
12 kW Methane gas	9.0 - 9.3
12 kW Propane gas	10.0 - 10.3
24 kW Methane gas	9.0 - 9.3
24 kW Propane gas	10
28 kW Methane gas	9.0 - 9.3
28 kW Propane gas	10 - 10.3
32 kW Methane gas	9.0 - 9.3
32 kW Propane gas	10

Table 17 - CO<sub>2</sub> rates

DIAMETER OF NOZZLES / DIAPHRAGMS (mm)		
	Methane gas	Propane gas
12 kW	3.05	2.50
24 kW	3.70	3.00
28 kW	4.00	3.30
32 kW	4.45	3.55 + diaphragm Ø 7.2

Table 18 - Diameter of nozzles - diaphragms

## 4. TESTING THE BOILER

### 4.1. Preliminary checks

Before testing the boiler, it is recommended to check the following:

- the installation is compliant with the prevailing standards;
- the flue gas venting duct and the relative terminal are installed in conformity with the instructions: **with the boiler operating there must be no leakage of combustion by-products from any of the gaskets;**
- the boiler is powered by a 230 V - 50 Hz mains supply;
- the heating system is correctly filled with water (pressure gauge reading 1 to 1.3 bar);
- any shut-off cocks in the system pipes are open;
- the mains gas type is correct for the boiler calibration: convert the boiler to the available gas when necessary (see paragraph 3.6.); this operation must only be performed by qualified technical personnel;
- the gas supply cock is open;
- **there are no fuel gas leaks;**
- the main switch installed ahead of the boiler is turned on;
- the safety valves of the CH and DHW circuits are not stuck;
- there are no water leaks;
- pumps are not stuck;
- the condensate trap installed on the boiler is discharging condensate correctly and is not stuck.



**Should the boiler not be installed in compliance with the prevailing laws and standards, notify the system supervisor and do not test the boiler.**

### 4.2. Switching on and switching off

To switch the boiler on and off, refer to the **“Instructions for the User”**.

## 5. MAINTENANCE

**Any maintenance (and repair) work must only be carried out by qualified personnel.**

The user is strongly advised to have the boiler serviced and repaired by a qualified Service Centre.

Appropriate boiler maintenance ensures efficient operation, environment preservation, and safety for people, animals and objects.

### 5.1. Maintenance schedule

**The boiler must be serviced at least once every year.**



**Disconnect electric power supply before starting any maintenance procedure, involving replacement of components and/or cleaning inside parts of boiler.**

Maintenance operations include check and cleaning procedures. In particular:

#### **Boiler checks:**

- check general integrity of the boiler;
- check boiler and network gas supply for leakage;
- check gas supply pressure to boiler;
- check boiler ignition sequence;
- check the condition and seal integrity of the flue gas venting pipes;
- check boiler combustion parameters by flue gas analysis;
- check fan hall sensor operation;
- check integrity of safety devices of the boiler in general;
- check for water leaks and oxidised areas on the boiler's couplings;
- check efficiency of the system safety valves;
- check CH and DHW expansion vessel filling pressure;
- check water heater magnesium anode integrity;
- check correct draining of condensate from the condensate trap installed on the boiler;

#### **The following cleaning is to be done:**

- clean the general interior of the boiler;
- clean the air intake and flue gas venting circuits;
- clean the heat exchanger;
- clean the condensate discharge ducts.
- clean the condensate trap installed on the boiler.

#### **When checking the boiler for the very first time, also verify:**

- system declaration of conformity;
- user manual.
- boiler room suitability;
- diameter and length of flue gas system ducts;
- boiler installation in accordance to this "Installation use and maintenance" manual instructions.

**Should the boiler not operate correctly, while not posing danger to people, animals or property, notify the system supervisor both verbally and in writing.**

### 5.2. Combustion analysis

The combustion parameters of the boiler, which have to be checked in order to determine efficiency and emissions, must be measured in compliance with applicable legislation and standards.

## 6. TROUBLESHOOTING

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	SOLUTION
E01*	Burner does not ignite.	Gas supply failure.	Check gas supply. Check gas supply cock or gas network safety valve intervention.
		Gas valve is disconnected.	Reconnect it.
		Gas valve is faulty.	Replace it.
		The board is faulty.	Replace it.
	Burner does not ignite: there is no spark.	Ignition relay is faulty.	Replace the electrode.
		Electronic board does not ignite. It is faulty.	Replace electronic board.
	Burner ignites for a few seconds and goes off.	Electronic board does not detect flame: inverted phase and neutral.	Check the correct phase-neutral connection to the power supply.
		Detection electrode cable is interrupted.	Reconnect or replace wire.
		Detection electrode is faulty.	Replace the electrode.
		Electronic board does not detect flame: it is faulty.	Replace electronic board.
		Ignition heat input setting is too low.	Increase it.
		Minimum heat input is not set correctly.	Check burner setting.
E02*	Flow temperature exceeded the max. allowed value.	Circulation pump is blocked or faulty.	Check the circulation pump.
		The system is leaking.	Check system.
E03*	Flue thermostat triggering.	Poor flue draught.	Check the chimney and ambient air suction openings.
		Flue vent / air intake duct is obstructed.	Check for any duct obstruction, and eliminate.
		Flue gas thermostat is faulty.	Replace it.
E04**	CH system water pressure is low.	The system is leaking.	Check system.
		Pressure transducer is disconnected.	Reconnect it.
		Pressure transducer is faulty.	Replace it.
E05**	CH probe failure.	Flow probe is electrically disconnected.	Reconnect it.
		Flow probe faulty.	Replace it.
E07**	Flue gas probe failure.	Flue gas probe is electrically disconnected.	Reconnect it.
		Flue gas probe is faulty.	Replace it.
E09	System pressure is too close to the max. limit.	During manual filling, a system pressure too close to the safety valve drain value has been restored.	Progressively drain the system until the error symbol disappears.
E12**	Water heater probe failure.	Probe is disconnected.	Reconnect it.
		Probe is faulty.	Replace it.
E15**	Return probe failure.	Probe is disconnected.	Reconnect it.
		Probe is faulty.	Replace it.
E31**	Remote Control connection failure (only shown on Remote Control display).	The Remote Control is not connected to boiler board.	Reconnect it.
		Remote control faulty.	Replace it.
		Boiler board is faulty.	Replace it.
E35**	Safety thermostat triggering to protect the mixed "zone 2" (on versions V and Z, only).	Mixer valve is faulty.	Replace it.
		Thermostat is disconnected.	Reconnect it.
		Thermostat is faulty.	Replace it.
E36**	Flow probe failure on one of the installed zones.	Probe is disconnected.	Reconnect it.
		Probe is faulty.	Replace it.
E40*	Fan failure.	Fan disconnected.	Reconnect it.
		Fan faulty.	Replace it.

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	SOLUTION
<b>E41**</b>	No communication between board and peripheral devices (panel interface and/or zone boards).	Interface display is disconnected.	Reconnect it.
		Zone boards are disconnected.	Reconnect them.
		Interface display and/or zone boards are faulty.	Replace them.
<b>E42</b>	Solar system setting error.	Wrong boiler board or solar board setting parameters.	Check that the P03 and P18 parameter set values match with those specified on the reference tables.
<b>E43</b>	Zone configuration error. Wrong setting of P61 parameter.	Setting parameters for boiler board are not correct.	Check that the P61 parameter set values match with those specified on the reference tables.
<b>E44**</b>	Ambient probe 1 failure.	Ambient probe is disconnected.	Reconnect it.
		Ambient probe is faulty.	Replace it.
<b>E45**</b>	Ambient probe 2 failure.	Ambient probe is disconnected.	Reconnect it.
		Ambient probe is faulty.	Replace it.
<b>E46</b>	Pressure transducer failure.	Pressure transducer is disconnected.	Reconnect it.
		Pressure transducer is faulty.	Replace it.
<b>E47</b>	External probe with connected ambient probe error.	External probe is disconnected.	Reconnect it.
		External probe is faulty.	Replace it.
<b>E49</b>	The interface does not work.	The interface does not communicate with the boiler board.	Replace it.
<b>E80*</b>	The $\Delta T$ between flow and return is not within the limits.	Flow and/or return probes are faulty.	Replace them.
		Obstructed bypass pipe	Remove any obstructions, or replace the pipe.
		The bypass valve is not assembled or wrongly assembled.	Restore bypass valve correct assembling.
		Heat exchanger primary circuit is obstructed.	Clean or replace the exchanger.
<b>E86*</b>	Flow temperature increases too quickly.	Pump is seized.	Unseize the pump.
		Pump is faulty.	Replace it.
		Air present inside heating system.	Bleed the air from the boiler by opening the jollies on the exchanger and pump.
<b>E87*</b>	Return temperature increases too quickly.	Circulation of foreign water in boiler.	Check that there are no other boilers or additional cascading heat sources.
		Air present inside heating system.	Bleed the air from the boiler by opening the jollies on the exchanger and pump.
<b>E89***</b>	Faulty flue temperature value.	Flue probe on heat exchanger is faulty or damaged.	Replace it.
<b>E98</b>	The max. number of resets from the boiler touch screen has been reached.	The user has reached the max. number of resettable errors from boiler control panel.	Power off and then on using the switch installed ahead of the boiler.
<b>E99</b>	The max. number of resets from the Remote Control has been reached.	The user has reached the max. number of resettable values from the Remote Control.	Reset boiler interface.

\* errors that can be reset by the user by keeping the 'Reset' button pressed

\*\* self-resettable errors, they automatically reset as soon as the failure is fixed

\*\*\* errors that can be reset only by the Technical Service personnel

In case errors **E51**, **E52**, **E53**, **E73**, **E85**, **E89**, **E90** and **E91** might occur, contact a qualified service centre.







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