IST 03 C 688 - 02

ITACA CTFS 24 - 28 - 32
ITACA RTFS 24 - 28 - 32

INSTALLATION, USE AND MAINTENANCE

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EN

Translation of the original instructions (in Italian)

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

CAUTION

- **We inform users that:**
- **Boilers shall be installed by an authorised company possessing the requirements set forth by the prevailing rules and operating in full compliance with the prevailing standards.**
- **Anyone entrusting installation to an unqualified installer will be subject to administrative sanctions.**
- **Any maintenance (and repair) work must only be carried out by qualified personnel, possessing the requirements set forth by the prevailing rules.**

We hereby inform the customers that certain models, versions and/or accessories relevant to the products this manual refers to, might not be available in some countries.

Therefore, it is recommended to contact the manufacturer or the importer in order to get the necessary information about the actual availability of such models, versions and/or accessories.

The manufacturer reserves the right to modify his/her products as deemed necessary, without altering the basic characteristics of the products themselves.

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.

DANGER

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.

After removing the packaging ensure that all packaging materials (staples, plastic bags, styrofoam, etc.) are not left within the reach of children since they can be a source of danger.

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.

CAUTION

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 Manufacturer recommends the user to have the boiler serviced and repaired by a qualified Service Centre. Its staff must be fully qualified to carry out the above mentioned maintenance operations and possess the requirements set forth by the prevailing rules.

In the event of long periods of inactivity of the boiler, disconnect it from power mains and close the gas cock. **If the boiler is disconnected from the power mains and the gas supply cock is closed the electronic freeze-protection function is not active.**

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.use specific anti-freeze products suitable for multi-metal heating systems.

DANGER

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.

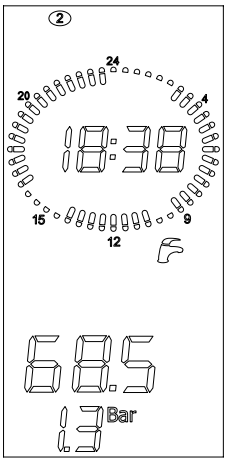
CAUTION

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

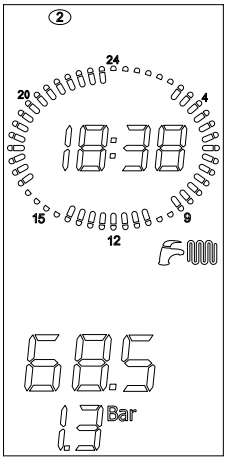
If any accessories have been fitted on the boiler, these instructions will not cover them. You will therefore have to refer to the full boiler instructions as well as to the specific instructions for the accessories.

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 turns on.
3. If you do not wish to activate the heating function, press the button until it will display the symbol : only the DHW function will be enabled.



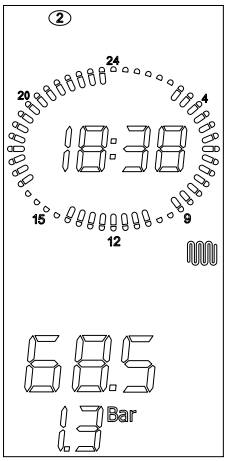
4. If you wish to activate both the heating and DHW functions, press button until symbol is displayed.



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. Set desired DHW water temperature via DHW +/- buttons **+/- DHW**.
7. Set desired heating water temperature via **+/- CH** buttons.
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 button Reset

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



1. Instructions for the user

1.1 Control panel

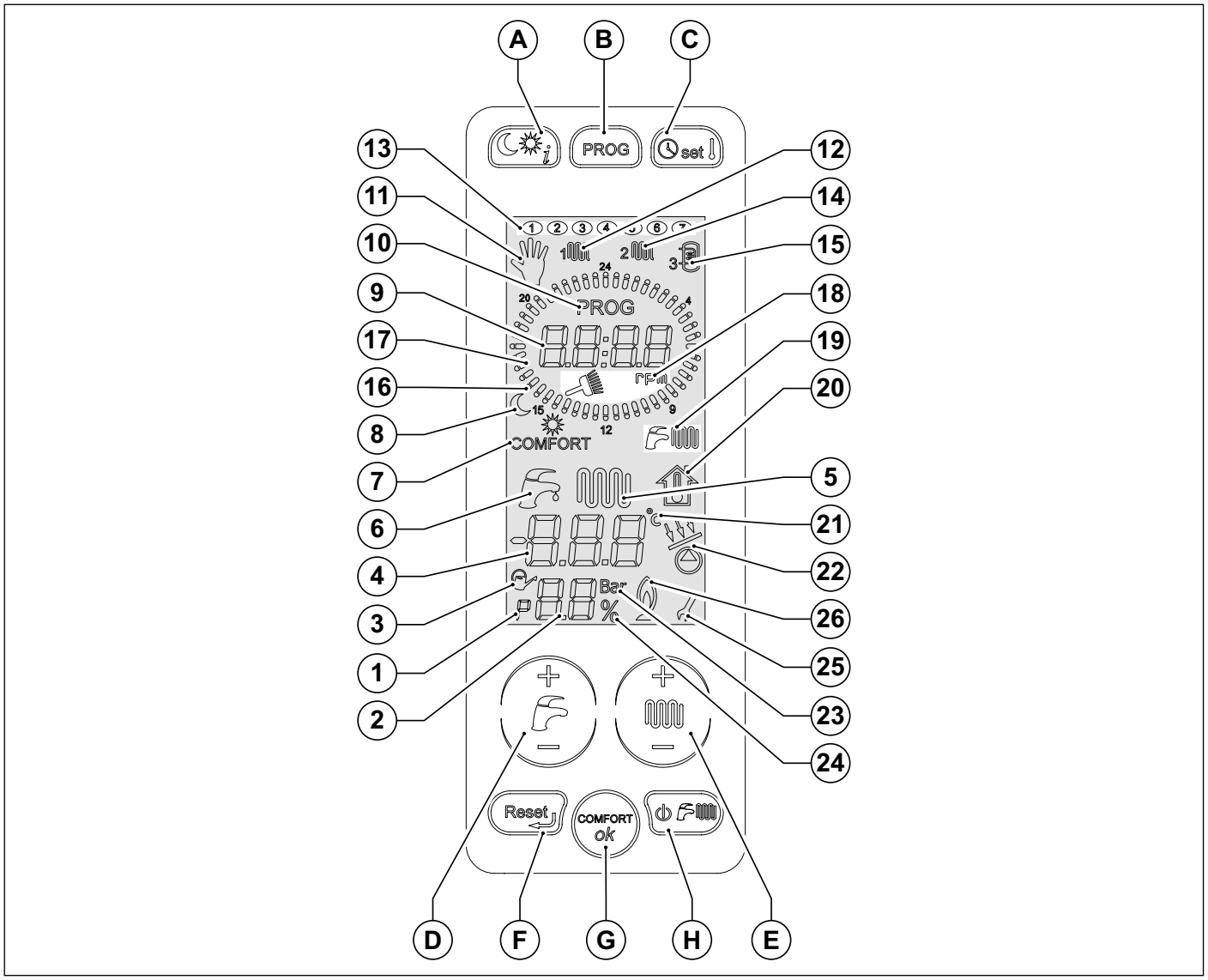


Fig. 1 Control panel

A. Temperature selection (day/night) and information recall.

B. Weekly programme for temperature zones and manual programme selection.

C. Time and ambient temperature setting,

D. DHW temperature setting **(+/- DHW)**.

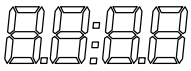
E. CH water temperature and parameter setting **(+/- CH)**.

F. Alarm reset and back to the starting page during parameter selection.

G. DHW comfort function setting and confirm button

H. Operating mode selection.

To gain access to the interface, touch the display area. Once active, the interface enables all the buttons. 15 seconds after the last button has been touched, the interface disables all the buttons.

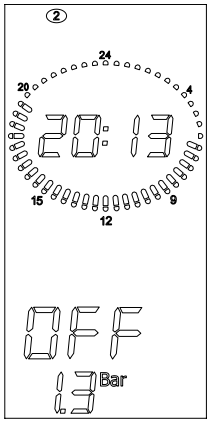
Ref.	SYMBOL	STEADY	FLASHING
1		Indication of "parameter" inside the parameter menu	Not applicable
2		Displaying of the number of parameters, or of the system pressure, or of the burner power percentage	Not applicable
3		Automatic filling procedure is active	Not applicable
4		Indication of the temperatures and values of fault and shutdown parameters	Not applicable
5		A heating request is present	Display of CH temperature set-point
6		A DHW request is present	Display of DHW temperature set-point
7		DHW "Comfort" function enabled	Not applicable
8		Current temperature (sun = day; moon = night)	Setting of the two temperatures associated with the sun and the moon
9		Display of current time/fan revolutions	Not applicable
10		This indicates that you are in time slot programming mode	Not applicable
11		Manual mode operation	Manual mode setting
12		Display of zone 1 heating programme	Edit zone 1 CH programme
13		Current week day	Edit day of the week
14		Display of zone 2 heating programme	Edit zone 2 CH programme
15		Display of water heater programme	Edit water heater programme
16		Night time temperature indication	Not applicable
17		Daytime temperature indication	All lights flashing: automatic mode setting
18		Displaying of the flue cleaning function	This indicates that you are accessing the flue cleaning function
19		Instantaneous DHW production and heating functions enabled	Not applicable
20		Not applicable	Display of set-point

Ref.	SYMBOL	STEADY	FLASHING
21	°C	Indication of the centigrade degrees	Not applicable
22		Solar pump or solar valve active	Not applicable
23	Bar	System pressure measurement unit	Not applicable
24	%	Percentage indication	Not applicable
25		During parameter editing, the wrench symbol stays on until the set datum is confirmed.	Not applicable
26		Lit flame indication	Not applicable

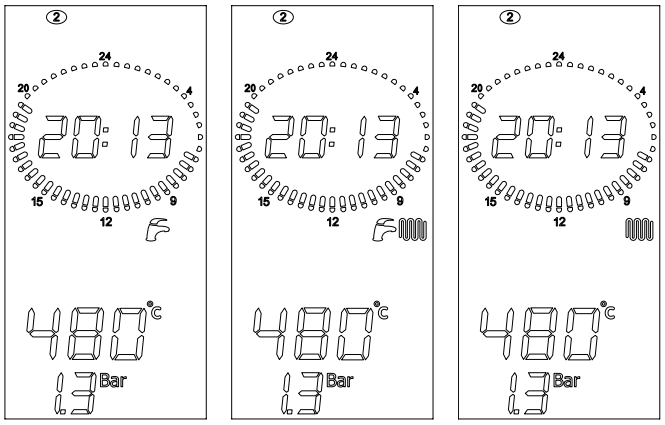
1.2 Boiler status - LCD Display indications

1.2.1 Normal operation

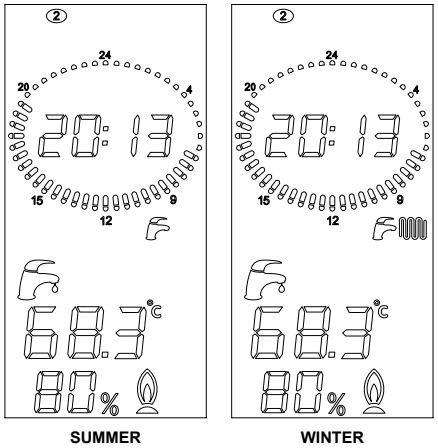
Boiler switch in OFF mode



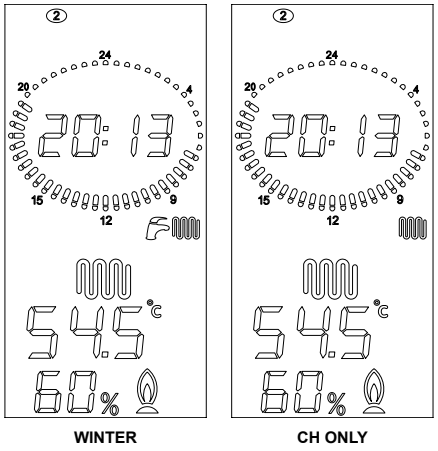
Boiler switch in SUMMER or WINTER or CH ONLY mode
No function is enabled.
CH flow temperature and CH system pressure are displayed.



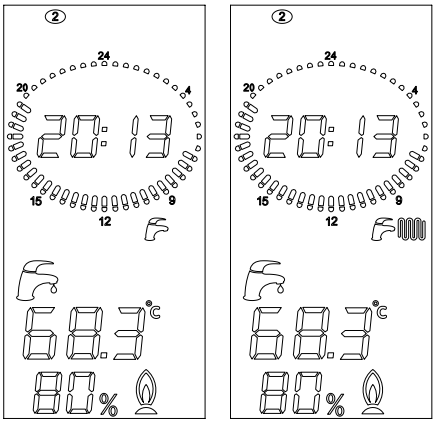
Boiler switch in SUMMER or WINTER mode
DHW function enabled.
DHW temperature is displayed.
(Only for models with DHW production).



Boiler switch in SUMMER or WINTER mode
CH function enabled.
CH flow temperature is displayed.



Boiler switch in SUMMER or WINTER mode
External water heater active, DHW function active.
DHW temperature is displayed.
(Only for models featuring this function, fitted with optional external water heater).



1.2.2 Malfunction

To identify the malfunction refer to paragraph *Troubleshooting* on page *83*.

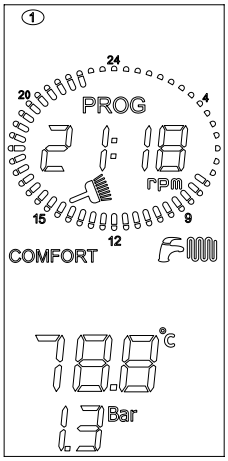
1.3 Enable/disable "comfort" function

This function keeps the plate heat exchanger hot, to minimise the waiting time for the production of DHW.When the "comfort" icon is on, the function is enabled. When it is off the function is disabled and the boiler is in standard DHW operating mode for an instant boiler.For CH-only models (RTFS) the "comfort" function is not available. The "comfort" icon on the display is always OFF.

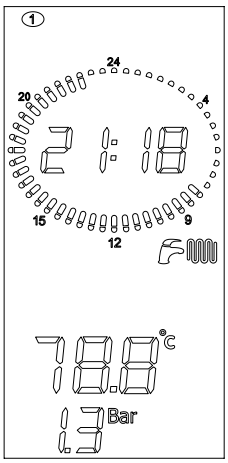
If "comfort" function is enabled (“comfort”), press "OK" button to disable it.

If "comfort" function is disabled (“comfort” icon OFF), press "OK" button to enable it.

1. "Comfort" function enabled
2. Press button **OK**



3. "Comfort" function disabled

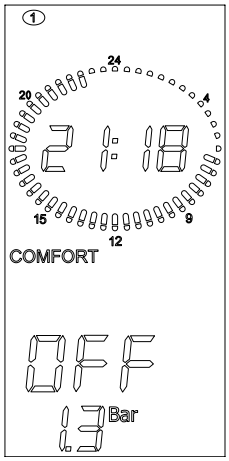


1.4 Selecting the operating mode

Whenever button  is pressed, the "SUMMER", “WINTER” , “CH ONLY”, “OFF” modes are enabled in sequence.
At this stage, all buttons are enabled.

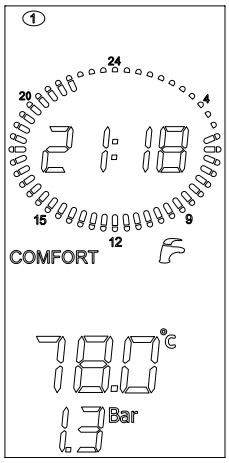
1. Operating mode "OFF"

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



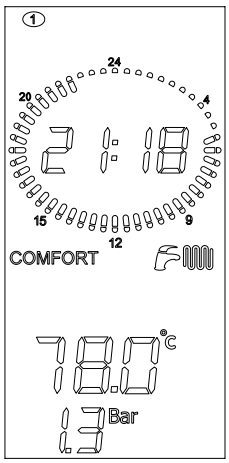
2. Operating mode "SUMMER"

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



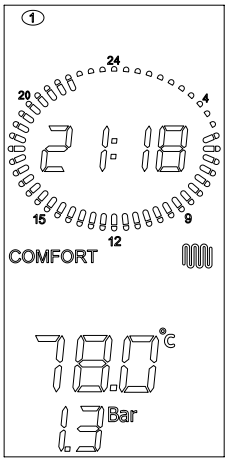
3. Operating mode "WINTER"

When the "WINTER" mode is enabled, both functions are active: DHW production.



4. Operating mode "HEATING ONLY"

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



1.5 Adjusting CH and DHW water temperature

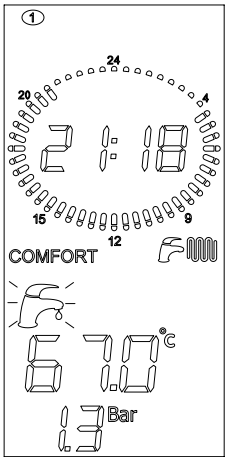
Press button **+/- DHW** to select the desired DHW temperature.

During selection, icon will flash

When the icon is flashing, only the buttons to adjust the water temperature are enabled.

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.



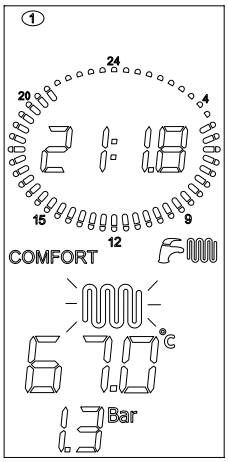
Press button **+/- CH** to select the desired flow water temperature.

During selection, icon will flash

When the icon is flashing, only the buttons to adjust the water temperature are enabled.

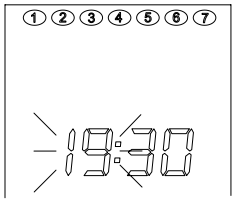
As soon as button is released, icon will continue flashing for approx. 3 seconds, and temperature value will flash as well.

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

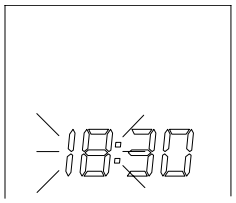


1.6 Time setting

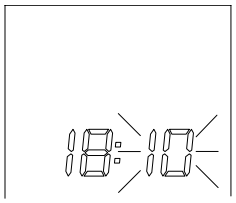
1. To set time, minutes and day of the week, press button set.



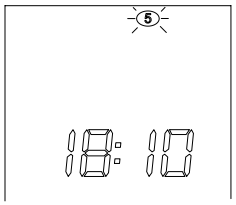
2. Flashing values can be edited by pressing **+/- CH** buttons. The first editable value is the one relative to the HOUR.



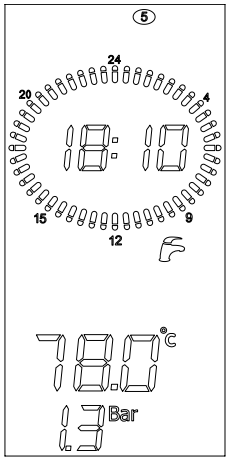
3. Press **OK** to confirm the edited value and shift to next parameter. The second editable value is the one relative to the MINUTE. Flashing values can be edited by pressing **+/- CH** buttons.
4. Press button set to access the day and night setting function described in the following paragraph.



5. Press **OK** to confirm the edited value and shift to next parameter. The third value to set is "DAYS". The day of the week can be selected by pressing **+/- CH** buttons.



6. Press **OK** to confirm the edited value. Press button Reset to quit the function and go back to starting page.



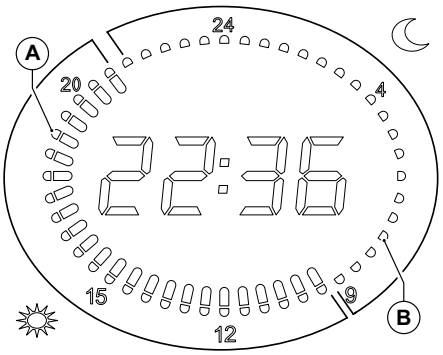
1.7 Day temperature and "night temperature" setting

When one or more ambient probes are connected to boiler electronic board, two levels of desired 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.

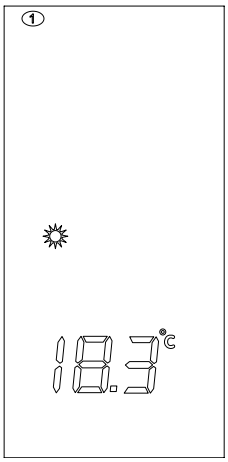
"Day" temperature is identified by the symbol ☼, while "night" temperature by the symbol ☾.

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

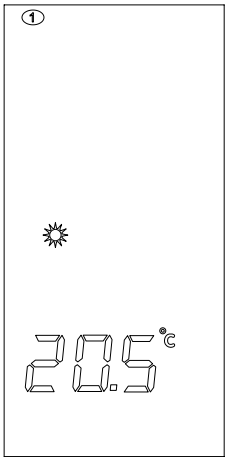


A Bars "on"
B Bars "off"

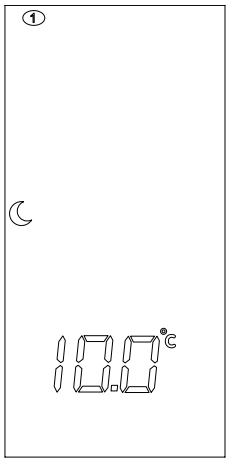
1. Press set twice to access the "day temperature" setting mode.



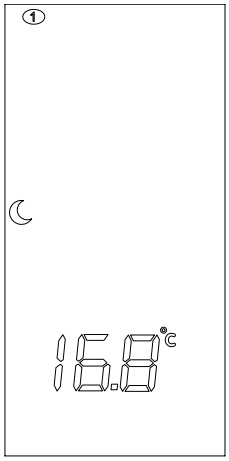
2. Press button **+/- CH** to edit "day temperature" values.



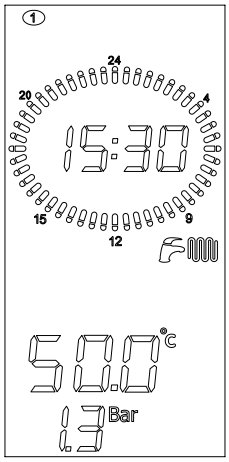
3. Press **OK** to confirm the edited values and enter the "night temperature" setting mode.



4. Press buttons **+/- CH** to edit "night temperature" values.



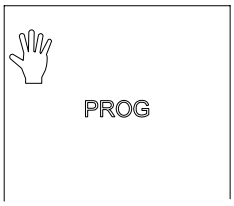
5. Press **OK** to confirm the edited values and leave the setting mode.



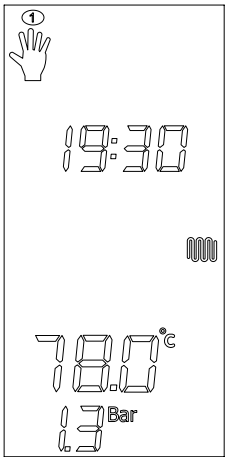
1.8 Manual programme setting

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.
External water heater, if there is one, is heated according to the specific programme.

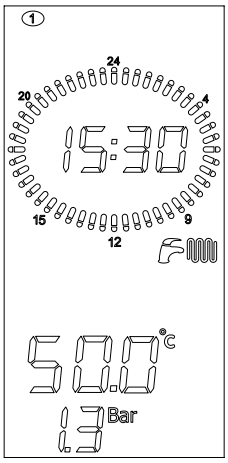
1. Press PROG to access the manual programme setting mode.



2. Press button **OK** to confirm.



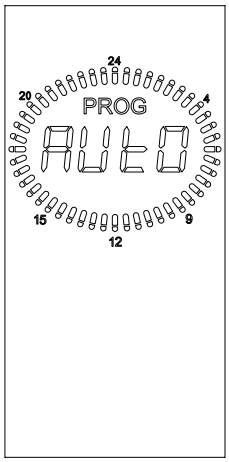
3. Press button Reset to quit the function and go back to starting page, namely to quit the function.



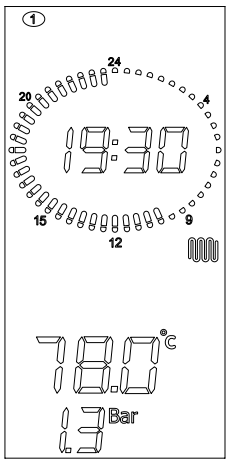
1.9 Automatic programme setting

The selection of "automatic" mode, identified by symbol AUTO, 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 button **PROG** twice to access the "automatic programme" setting mode.



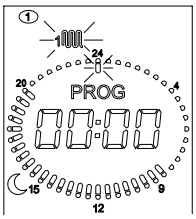
2. Press button **OK** to confirm.
3. Press button Reset to quit the function and go back to starting page, namely to quit the function.



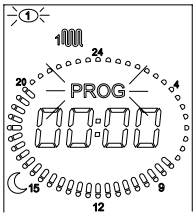
1.10 CH programme mode

To access zone 1 heating programme displaying or editing, press PROG button twice.

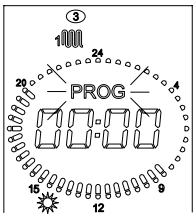
1. The display shows zone 1 symbol flashing, sun or moon symbols, bars on or off, respectively, at 00:00.Clock lights display the programming connected to day 1 (Monday) and 00:00 bar is flashing.



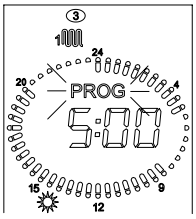
2. Press button **OK** to access zone programming function."Prog" wording starts flashing together with number 1 (Monday).



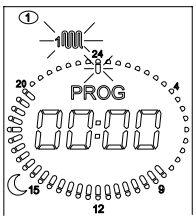
3. Press **+/- CH** buttons to select the desired day of the week.
4. Press button **OK** to select the day.
5. Now you can associate the day/night level to the desired time of the day.



6. Whenever ☼ / ☾ button is pressed, the sun and moon symbols are alternatively activated (sun = day level; moon = night level).
7. At the same time, close to the current time (flashing bar) clock bar comes on if the ☼ icon is on, or turns off if the ☾ icon is on.
8. Current time is indicated by both the clock and the flashing bar.
9. Press **+/- CH** buttons to move inside the different times of the day.



10. To programme other days of the week, zone 2 or water heater (for models RTFS with optional water heater probe), press Reset.
11. You will be brought back to the start.



The programming mode can be quit at any moment by pressing the Reset button twice.

The procedure to program zone 2 and water heater, is quite the same as the one followed to program zone 1.

By pressing "prog" you will access the 4 following programmes: manual ; zone 1 ; zone 2 ; water heater.

In case of connection to ambient probes the "day temperature" and "night temperature" levels correspond to the temperature value and CH system will remain active until the temperature read by the temperature probe reaches the value set for the various time periods.

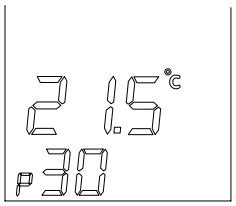
When no ambient probe is connected, the two day/night levels will acquire the on and off values.

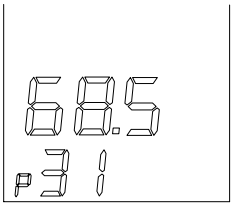
CH is active in periods selected with icon ☼ while it is Off in periods selected with ☾.

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 button to scroll the different parameter values.
You can quit this function at any time by simply pressing the Reset button.
To check the meaning of all parameters, see *TSP parameters* on page 59.





Parameter	DESCRIPTION
P30 - TSP30	**external temperature** displayed (if an external probe is installed).
P31	**Flow temperature** is displayed.
P32	**Calculated nominal flow temperature** is displayed. If an external probe is not installed the flow temperature manually set on the boiler is displayed. If an external probe is installed the flow temperature automatically set by the boiler on the basis of the thermoregulation curves is displayed.
P42	**DHW temperature** is displayed (for model CTFS).
P44	**Water heater temperature** is displayed (for model RTFS, if optional water heater probe is installed).
P46	**Solar collector temperature** is displayed (if optional solar collector probe is installed).
P47	**Solar valve temperature** is displayed (if optional solar valve probe is installed).

Table 1 Parameters displayable with “info” button

1.12 Failures that cannot be reset

The display shows the failure based on the corresponding fault code (see *Troubleshooting* on page *83*).

Some failures can be reset through the Reset button (refer to the following paragraph), while some others are self-resettable.

If failures cannot be reset but are of the self-resettable type, no button will be enabled and only the LCD backlighting will be on.

As soon as the error cause is eliminated, the failure signal will disappear from the interface, the latter will be enabled and display standard operation will be restored.

The interface activates and after 15 seconds it deactivates, unless a button is pressed.

1.13 Boiler reset

The display shows the failure based on the corresponding fault code (see *Troubleshooting* on page *83*).

Some failures can be reset through the Reset, button, while some others are self-resettable

If failures can be reset (E01, E02, E03, E08, E09) the reset button and the touch screen backlighting will be on.

The only active button that can be pressed is Reset.

When the reset button is pressed and boiler is under the correct conditions, the error is reset. The failure signal will disappear from the interface.

The interface activates and after 15 seconds it deactivates, unless a button is pressed.

1.14 Boiler operation

1.14.1 Switching on

DANGER

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 cock.
- Turn the master switch installed ahead of the boiler to ON.
- The display turns on and indicates the function currently active (see *Boiler status - LCD Display indications* on page *12*).
- Select boiler operating mode by pressing button on the touch-screen: OFF, SUMMER, WINTER, CH ONLY. *Selecting the operating mode* on page *15*).
- Set desired CH temperature (see *CH function* on page *25*).
- Set desired DHW temperature (see *DHW function* on page*26*).
- If one or more ambient probes or a thermostat are present, set the desired ambient temperature value and the weekly programming.

ATTENTION

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.

1.14.2 CH function

To set the heating water temperature, press **+/- CH** buttons.
The CH temperature setting range is from 35°C to 78°C.
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 minutes), and can be edited with the **P11** parameter.
During temperature setting, the symbol flashes on the screen and the CH current temperature setting is displayed.
When the CH system requests heat from the boiler, the LCD displays the CH symbol and the current CH flow water temperature.
The burner ON symbol shows while the burner is operating.
Should water temperature in the system fall below set minimum value, between 35°C and 78°C (default value 40°C) to be edited with the **P27** parameter, the waiting time is reset and the boiler re-ignites.

1.14.3 DHW function

The DHW production function is enabled on the CTFS and on RTFS models with external water heater (optional).
Such function has always priority over CH water supply.
Set desired DHW water temperature via DHW +/- buttons **+/- DHW**.
During temperature setting, the  symbol flashes on the screen and the DHW current temperature setting is displayed.
The burner ON symbol  shows while the burner is operating.

Model CTFS

For model CTFS the DHW temperature setting range is from 35°C to 57°C.
Available DHW litres per minute at the desired temperature depend on boiler heat output and water mains supply temperature, and can be calculated according to the following formula:
l = DHW litre per min. = K/ΔT
where:
K = 348 for model CTFS 24
K = 426 for model CTFS 28
K = 453 for model CTFS 32
ΔT = hot water temperature – cold water temperature
For instance, with model CTFS 24, if the cold water is at 8°C and you want hot water at 38°C for a shower, the value of ΔT is:
ΔT = 38°C - 8°C = 30°C
and the number of DHW litres per minute available at 38°C is:
l = 348/30 = 11.6 [litres per minute] (water mixed at cock)

Model RTFS

On RTFS models with external water heater (optional) fitted with a temperature probe (optional, supplied by the Manufacturer) the temperature can be set within a range from +35 °C to +65 °C.
The external water heater can be enabled/disabled for DHW production by pressing button  on the touch screen.
Water heater is enabled when boiler is in one of the following operating modes: SUMMER, WINTER.
On RTFS models with external water heater (optional) fitted with a temperature probe (optional, supplied by the Manufacturer), every 15 days the anti-legionella function will be enabled, consisting in raising the water heater temperature to 65°C for 30 minutes independently of other settings.

1.14.4 Comfort function

The COMFORT function keeps the plate heat exchanger hot, to minimise the waiting time for the production of DHW.
Enable COMFORT function by pressing the corresponding button on the display (see *Enable/disable "comfort" function* on page *14*).

1.14.5 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.

DANGER

The freeze protection function only protects the boiler, not the whole heating system.

The CH system can be effectively protected against icing by using specific anti-freeze products that are suitable for multi-metal systems.

ATTENTION

Do not use anti-freeze products for car engines, and check the effectiveness of the product used over time.

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

1.14.5.1 Ambient probe freeze protection function

If the boiler board is OFF, or DHW ONLY, and the ambient probes detect a temperature below 5°C, a heating request to heat the probe-controlled room is launched.

The ambient probe freeze protection function ends when the probe ambient temperature reading reaches +6°C.

1.14.5.2 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.

1.14.5.3 Plate DHW freeze protection function (CTFS)

When the DHW temperature sensor detects a water temperature of +5°C, the boiler switches on and stays on at its minimum heat output until the DHW temperature reaches +10°C or 15 minutes have elapsed (the deviating valve is in the DHW position).

During the DHW freeze protection 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 freeze protection mode is still present and the flow temperature is below +60 °C.

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

1.14.5.4 Water heater freeze protection function

In RTFS models featuring an external water heater (optional) for the production of DHW with a NTC temperature probe (10 kQ @ ß=3435) the freeze protection function also protects the water heater.

When water heater temperature probe detects a water temperature of +5°C, the boiler switches on and stays on at its minimum heat output until the temperature of the water heater water reaches +10°C or 15 minutes have elapsed.

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

During the water heater freeze protection 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 freeze protection mode is still present and the flow temperature is below +60 °C.

1.14.6 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.

The same applies to the relay which can be freely programmed whenever this latter is used to power a recirculation pump or a deviating valve.

1.14.7 Operation with (optional) external probe

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. The maximum temperature is respected all the same.

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** buttons are no longer used to set heating 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 and the value being set is shown.

For curve optimal setting, a position close to 20° C is recommended.

For further details on "cruising temperature" operation, see *Installation of the (optional) external probe and “sliding temperature” operation* on page *57*.

ATTENTION

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.

1.14.8 Operation with (optional) remote control

The boiler can be connected to a Remote Control (optional - not compulsory, supplied by the manufacturer) so as to manage several boiler parameters, such as:

- boiler mode selection
- ambient temperature selection
- CH system water temperature selection
- DHW temperature selection
- CH system and (optional) external water heater activation time programming
- boiler diagnostics display
- boiler reset and other parameters

For instructions on how to connect the Remote Control, see *Installation and operation with Open Therm Remote Control (optional)* on page*56*.

ATTENTION

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 (see *Boiler status - LCD Display indications* on page *12*).

To determine the possible causes of malfunction (see *Troubleshooting* on page *83*).

Below is a list of shut-down types and the procedure to follow in each case.

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 to restore burner operation: if, after three attempts, the boiler still fails to start and enters the shut-down mode again, contact a Service Centre or qualified personnel for maintenance.

CAUTION

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

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

In case of a malfunction of air intake and/or flue gas venting ducts, the boiler is shut down and flashing **E03** code is displayed (flue gas thermostat has tripped)

Contact a service centre or a qualified engineer for maintenance.

1.15.3 Shut-down due to low water pressure

1.15.3.1 Automatic filling function enabled (P94 = 1)

In case the system pressure falls below 0.4 bar, the water pressure switch triggers and the display shows both fault code **E04** and the current pressure.

All buttons are disabled.

When automatic filling is activated, symbol and pressure current value are displayed.

As soon as pressure reaches 1 bar, automatic filling will be completed, and display standard screen will appear again.

If, on the other hand, automatic filling cannot be successfully completed, error **E08** will occur (see *Shut-down due to automatic filling failure* on page 31).

1.15.3.2 Automatic filling function disabled (P94 = 0)

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 (see Fig. 2 Model CTFS filler cock and Fig. 3 Model RTFS filler cock).

E04 error is displayed when system pressure drops below 0.4 bar; error will be automatically reset as soon as system pressure reaches 1.0 bar.

Water pressure must be 1-1.3 bars while the boiler is cold.

In order to restore water pressure, proceed as follows:

Turn filler cock anticlockwise **A** to fill the boiler with water.

Keep filler cock **A** open until the control panel shows a value of 1÷1.3 bar;

Close the filler cock or close the cock on the cold water supply pipe. Vent the air through the safety valves on the radiators.

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

DANGER

Make sure you close filler cock (A) carefully after filling procedure is completed.
If the filler cock is not correctly closed, when the pressure increases, error E09 may be displayed and the heating system safety valve may activate and discharge water.

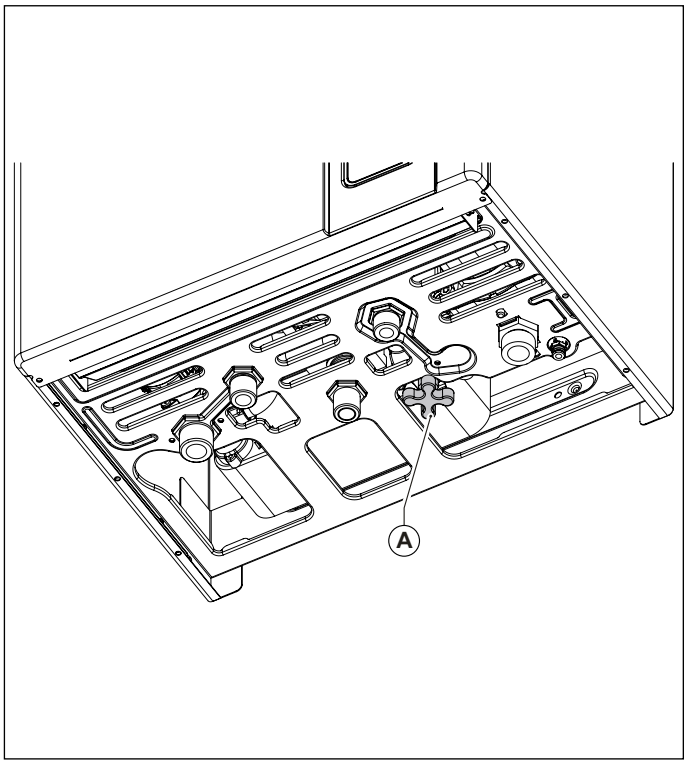


Fig. 2 Model CTFS filler cock

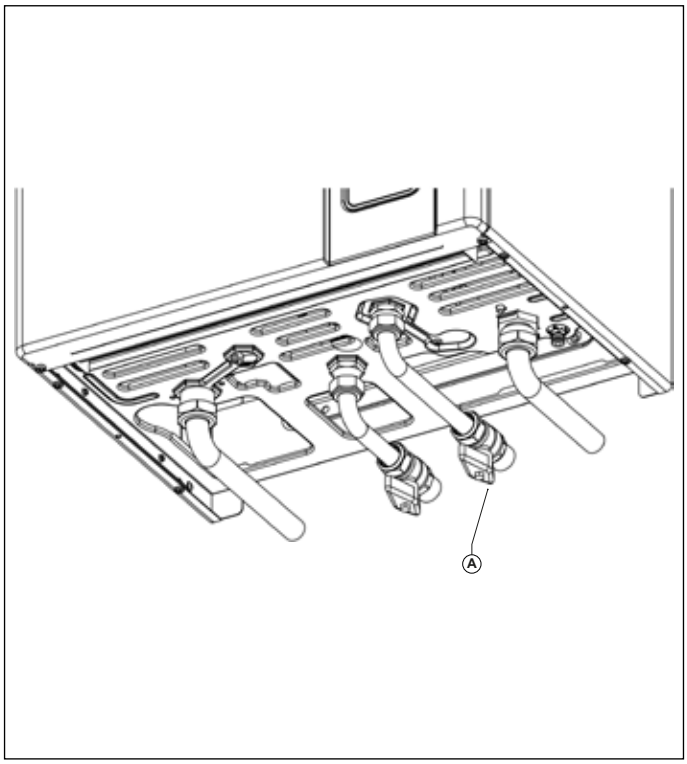


Fig. 3 Model RTFS filler cock

1.15.4 Shut-down due to automatic filling failure

Error **E08** indicates that the automatic filling procedure has not been successfully completed.
Two cases are possible:

1. System pressure above 0.4 bar
2. System pressure below 0.4 bar

System pressure above 0.4 bar

When **RESET** button is pressed, boiler shuts down and display goes back to standard screen.
If the automatic filling occurs correctly the display shows the standard screen.
If automatic filling is not correctly carried out, error **E08** will be displayed again.

System pressure below 0.4 bar

When **RESET** button is pressed, boiler shuts down and display goes back to standard screen.
If the automatic filling occurs correctly the display shows the standard screen.
If automatic filling is not correctly carried out, error **E08** will be displayed again.

1.15.5 Alarm due to temperature probes 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 does not work.
- **E06** for the DHW probe (CTFS models only): in this case, the boiler works in CH mode only while the DHW function is disabled.
- **E12** for the water heater probe (RTFS models only): in this case, the boiler works in CH mode only, while the DHW function is disabled.

CAUTION

In all cases, contact a Service Centre or a qualified engineer 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, ignoring the remote control settings.

CAUTION

Contact a service centre or a qualified engineer for 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

ATTENTION

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.

Any maintenance (and repair) work must only be carried out by qualified personnel, possessing the requirements set forth by the prevailing rules.

1.17 Notes for the user

ATTENTION

The user may only access parts of the boiler that can be reached without using special equipment or tools. The user is therefore 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 pump.

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 an integrated gas atmospheric burner. The following models are available:

- **CTFS** sealed chamber, forced draught boiler with electronic ignition for heating and instantaneous DHW supply.
- **RTFS** sealed chamber, forced draught boiler with electronic ignition for heating only.

The following power rates are available:

- **CTFS 24**, **RTFS 24**: with heat input of 25.5 kW
- **CTFS 28**, **RTFS 28**: with heat input of 30.5 kW
- **CTFS 32**, **RTFS 32**: with heat input of 33.0 kW

All models are equipped with electronic ignition and ionisation flame sensing device.
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.

2.1.1 Manufacturing characteristics

- IPX5D electrically protected control panel.
- Integrated, modulating electronic safety board.
- Electronic start-up with built-in igniter and ionisation flame detection.
- Stainless steel, atmospheric burner that can run on several gases.
- Mono-thermal, high performance, copper heat exchanger.
- Twin shutter modulating gas valve.
- 3-speed CH circulation pump with built-in air purging device.
- CH pressure probe
- Air pressure switch
- Integrated, automatic by-pass
- 7 litre expansion vessel.
- System water discharge tap.
- Automatic filling solenoid valve.
- CH flow temperature probe.

Only for CTFS models

- Stainless steel plate heat exchanger for DHW production.
- Motorised deviating valve.
- Flow meter for DHW flow measurement.
- Cold domestic water probe.
- DHW probe.

2.1.2 User interface

- Touch-screen interface with built-in LCD to display and control boiler operating condition: OFF, SUMMER, WINTER and CH ONLY
- CH temperature regulator: temperature range 35-78 °C.
- DHW temperature regulator: 35-57 °C (CTFS) - 35-65 °C (RTFS with optional water heater probe)

2.1.3 Operating features

- CH electronic flame modulation with timer-controlled rising ramp (60 seconds, adjustable).
- Flow freeze protection function: ON 5°C; OFF 30°C or after 15 minutes of operation if CH temperature > 5 °C.
- Timer-controlled flue cleaning function: 15 minutes.
- CH Maximum heat input parameter adjustment.
- Ignition heat input adjustment parameter.
- Ignition flame propagation function.
- CH thermostat timer: 240 seconds (adjustable).
- Heating pump post-circulation function in CH, freeze protection and flue cleaning modes: 30 seconds (adjustable).
- Post-circulation function for heating temperature > 78 °C: 30 seconds.
- Post-ventilation function after working: 10 seconds.
- Post-ventilation function for heating temperature > 95°C.
- Circulation pump and deviating valve anti shut-down function: 30 seconds of operation after 24 hours of inactivity.
- Ready for connection to an ambient thermostat.
- Ready for operation with an external probe (optional, supplied by the manufacturer).
- Ready for operation with an OpenTherm remote control (optional, supplied by the manufacturer).
- Ready for operation with a module for different temperature zones.
- Ready for integration with solar collectors.
- Ready for chronothermostat function on the boiler, in combination with two ambient probes.
- Water hammer protection function (CTFS): can be set from 0 to 3 seconds through parameter P15.

Only for CTFS models

- DHW freeze protection function (CTFS): ON 5°C; OFF 10 °C or after 15 minutes of operation if DHW temperature > 5 °C.

Only for CTFS and RTFS model equipped with external water heater

- Electronic flame modulation in DHW mode.
- DHW priority function.
- DHW post-circulation function: 30 seconds.

Only for RTFS models equipped with external water heater and NTC probe

- Anti-legionella function.
- Water heater freeze protection function: ON 5°C; OFF 10 °C or after 15 minutes of operation if boiler temperature > 5 °C (with water heater probe installed).

2.2 Sizes

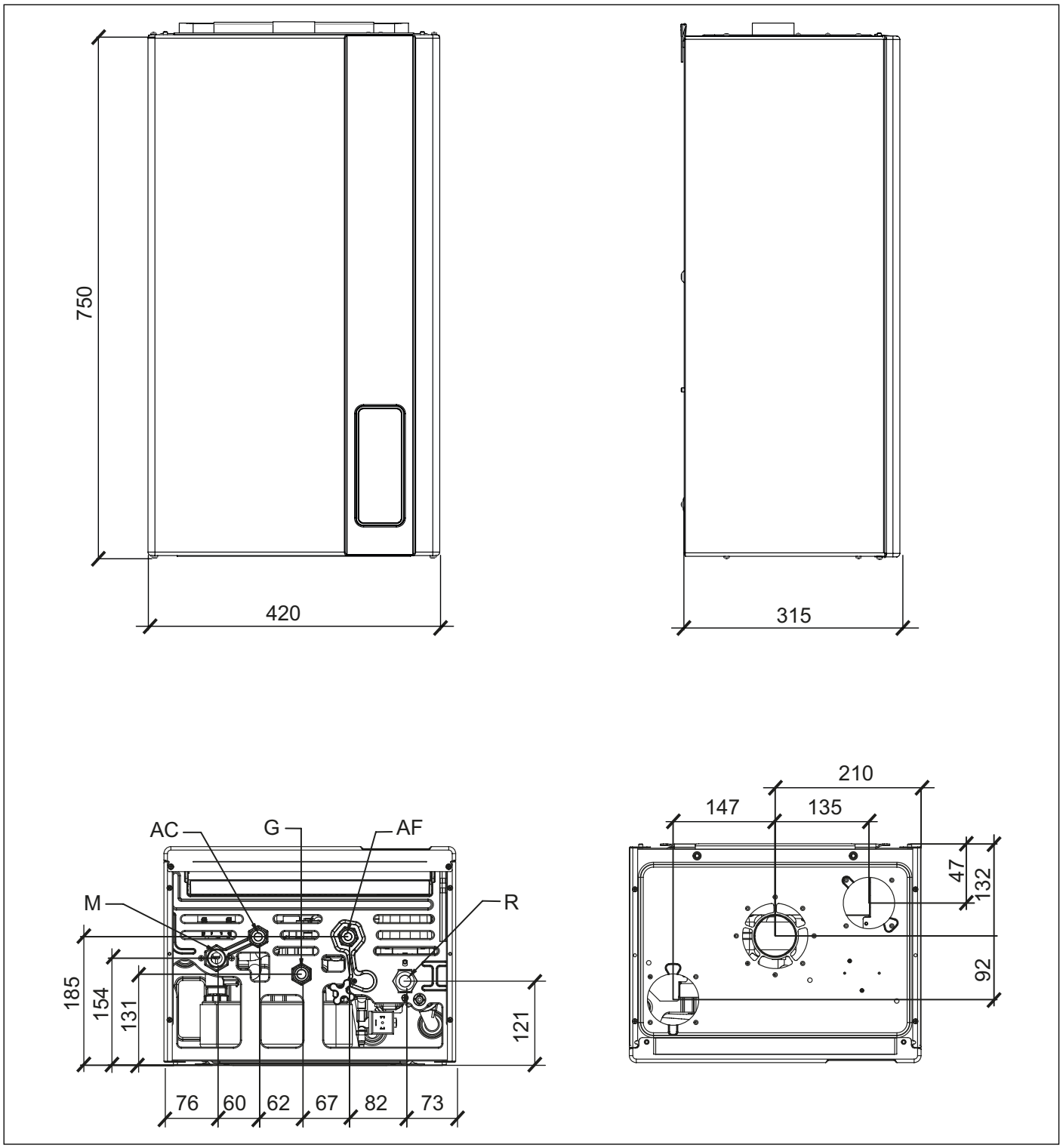


Fig. 4 Sizes

AF Cold water inlet
G Gas inlet
M CH system flow
AC DHW outlet (CTFS only)
R CH system return

2.3 Boiler layouts

2.3.1 Boiler layout CTFS

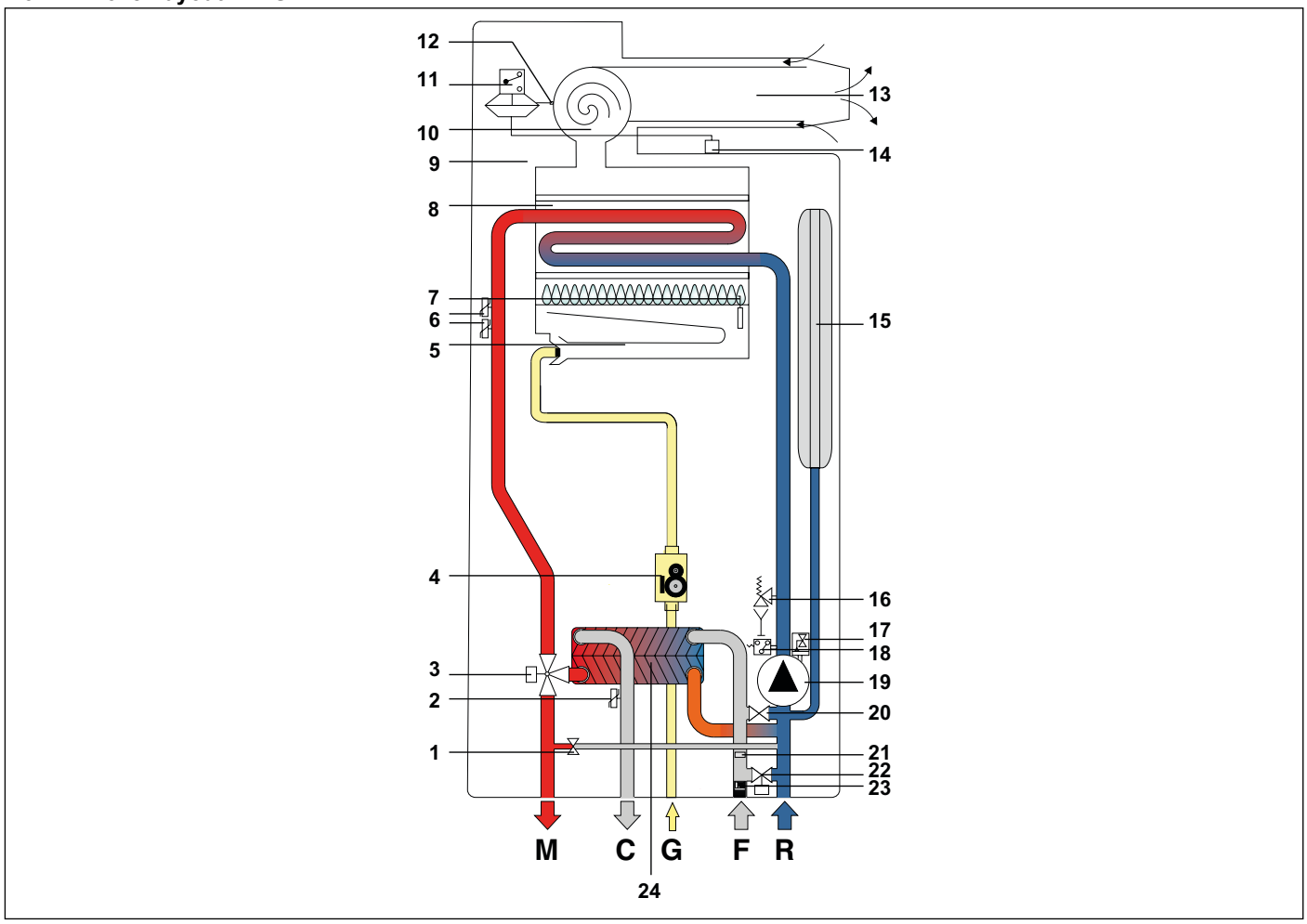


Fig. 5 Boiler layout

1. Automatic by-pass
2. DHW temperature probe
3. Motorised 3-way valve
4. Modulating gas valve
5. Burner
6. Flow temperature twin probe
7. Ignition/detection electrode
8. Mono-thermal heat exchanger
9. Sealed combustion chamber
10. Flue gas extraction fan
11. Flue gas circuit safety pressure switch
12. Pressure testing point on flue gas duct
13. Air intake and flue gas venting duct
14. Pressure testing point on flue gas duct
15. Expansion vessel
16. 3-bar safety valve
17. Air-purging device
18. Pressure transducer
19. Manual 3-speed circulation pump
20. Automatic filling solenoid valve
21. DHW flow rate limiting device
22. Filler cock
23. Cold water flow meter with filter
24. Insulated secondary plate exchanger

M CH system flow
C DHW outlet
G Gas inlet
F Cold water inlet
R CH system return

2.3.2 Boiler layout RTFS

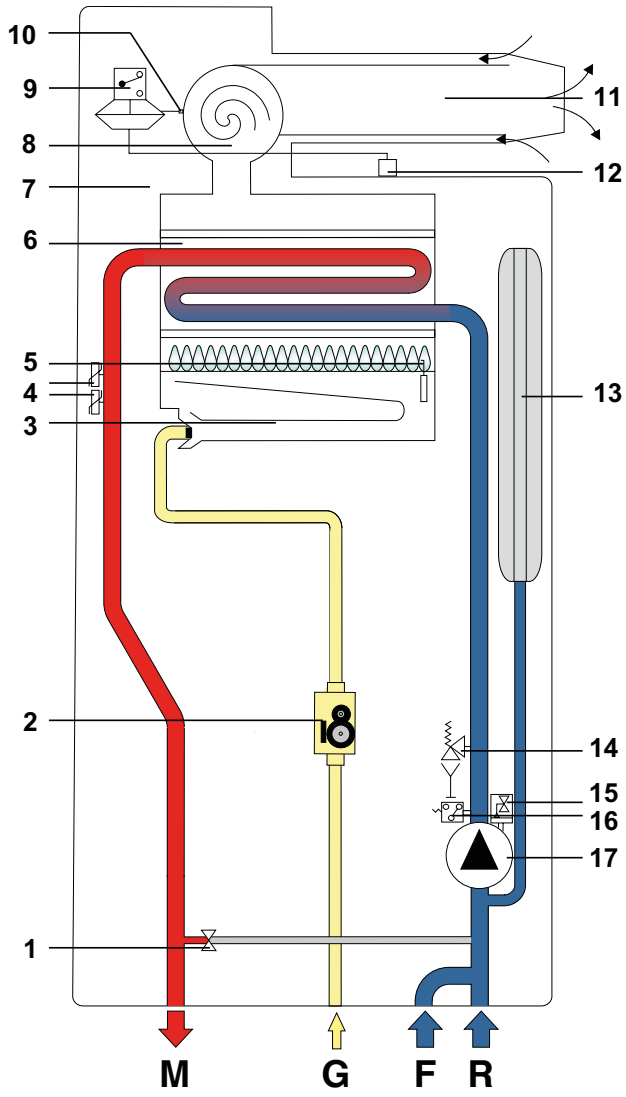


Fig. 6 Boiler layout

1. Automatic by-pass
2. Modulating gas valve
3. Burner
4. Flow temperature twin probe
5. Ignition/detection electrode
6. Mono-thermal heat exchanger
7. Sealed combustion chamber
8. Flue gas extraction fan
9. Flue gas circuit safety pressure switch
10. Pressure testing point on flue gas duct
11. Air intake and flue gas venting duct
12. Pressure testing point on flue gas duct
13. Expansion vessel
14. 3-bar safety valve
15. Air-purging device
16. Pressure transducer
17. Manual 3-speed circulation pump

M CH system flow
G Gas inlet
F Cold water inlet
R CH system return

2.4 Operating data

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

Fuel type	Gas mains pressure [mbar]	Nozzle [mm]	Min pressure at the burner [mbar]	Max pressure at the burner [mbar]
Methane G20	20	1,35	3,2	12,2
Butane gas G30	29	0,78	7,5	28,3
Propane gas G31	37	0,78	7,6	34,2

Table 2 CTFS 24 - RTFS 24 adjustment rates

- DHW supply with ΔT 45°C = 7.7 l/min
- DHW supply with ΔT 40°C = 8.7 l/min
- DHW supply with ΔT 35°C = 9.9 l/min
- DHW supply with ΔT 30°C = 11.6 l/min(water mixed at tap)
- DHW supply with ΔT 25°C = 13.9 l/min(water mixed at tap)

Fuel type	Gas mains pressure [mbar]	Nozzle [mm]	Min pressure at the burner [mbar]	Max pressure at the burner [mbar]
Methane G20	20	1,35	2,7	12,4
Butane gas G30	29	0,78	6,0	29,3
Propane gas G31	37	0,78	8,1	36,3

Table 3 CTFS 28 - RTFS 28 adjustment rates

- DHW supply with ΔT 45°C = 9.4 l/min
- DHW supply with ΔT 40°C = 10.7 l/min
- DHW supply with ΔT 35°C = 12.2 l/min
- DHW supply with ΔT 30°C = 14.2 l/min(water mixed at tap)
- DHW supply with ΔT 25°C = 17.0 l/min(water mixed at tap)

Fuel type	Gas mains pressure [mbar]	Nozzle [mm]	Min pressure at the burner [mbar]	Max pressure at the burner [mbar]
Methane G20	20	1,35	2,84	11,11
Butane gas G30	29	0,77	7,1	28,7
Propane gas G31	37	0,77	9,46	35,3

Table 4 CTFS 32 - RTFS 32 adjustment rates

- DHW supply with ΔT 45°C = 10.1 l/min
- DHW supply with ΔT 40°C = 11.3 l/min
- DHW supply with ΔT 35°C = 12.9 l/min
- DHW supply with ΔT 30°C = 15.1 l/min(water mixed at tap)
- DHW supply with ΔT 25°C = 18.0 l/min(water mixed at tap)

DHW production values are referred to model CTFS.

2.5 General characteristics

Description	m.u.	CTFS 24	RTFS 24	CTFS 28	RTFS 28	CTFS 32	RTFS 32
Category	-	II2H3+		II2H3+		II2H3+	
Burner nozzles	no.	11		13		15	
Nominal heat input	kW	25,5		30,5		33	
Max heat output	kW	23,7		28,6		30,8	
Min heat output	kW	11,1		12		14,3	
Minimum CH system pressure	bar	0,5		0,5		0,5	
Maximum CH system pressure	bar	3,0		3,0		3,0	
Minimum DHW system pressure	bar	0,5	n.a.	0,5	n.a.	0,5	n.a.
Maximum DHW system pressure	bar	6,0	n.a.	6,0	n.a.	6,0	n.a.
DHW specific flow rate (Δt 30 K)	l/min	11,6	n.a.	14,2	n.a.	15,1	n.a.
Electric power supply – voltage / frequency	V - Hz	230 - 50		230 - 50		230 - 50	
Power mains supply fuse	A	3,15		3,15		3,15	
Maximum power consumption	W	122		134		134	
Electric protection rating	IP	X5D		X5D		X5D	
Net weight	kg	34,5	32,2	35,5	33,2	35,8	33,5
Methane gas consumption at maximum CH output (Value referred to 15°C - 1013 mbar)	m3/h	2,70		3,23		3,49	
Butane gas consumption at maximum CH output	kg/h	2,01		2,41		2,60	
Propane gas consumption at maximum CH output	kg/h	1,98		2,37		2,56	
Maximum CH working temperature	°C	83		83		83	
Maximum DHW working temperature	°C	62	65 (*)	62	65 (*)	62	65 (*)
Total capacity of expansion vessel	l	10		10		10	
Maximum recommended system capacity (Maximum water temperature 83°C, expansion vessel pressure 1 bar)	l	200		200		200	

Table 5 General data

(*) With water heater probe installed.

Description	m.u.	Max heat input	Min heat input	30% load
Heat loss from the boiler casing	%	1,05	0,63	-
Flue system heat loss with burner on	%	5,97	10,37	-
Flue system mass capacity	g/s	15,44	16,38	-
Flue gas temperature - Air temperature	°C	95	77	-
CO2 value	%	6,1	2,7	-
Maximum heat output efficiency rating (60/80°C)	%	93,0	89,0	90,2
Efficiency rating (according to 92/42/EC)	-	★★★		
NOx emission class	-	3		

Table 6 CTFS 24 - RTFS 24 combustion data

Description	m.u.	Max heat input	Min heat input	30% load
Heat loss from the boiler casing	%	0,76	1,01	-
Flue system heat loss with burner on	%	5,54	10,09	-
Flue system mass capacity	g/s	17,29	17,75	-
Flue gas temperature - Air temperature	°C	101	87	-
CO2 value	%	7,0	2,9	-
Maximum heat output efficiency rating (60/80°C)	%	93,7	88,9	90,6
Efficiency rating (according to 92/42/EC)	-	★★★		
NOx emission class	-	3		

Table 7 CTFS 28 - RTFS 28 combustion data

Description	m.u.	Max heat input	Min heat input	30% load
Heat loss from the boiler casing	%	1,37	1,40	-
Flue system heat loss with burner on	%	5,23	9,20	-
Flue system mass capacity	g/s	17,8	19,7	-
Flue gas temperature - Air temperature	°C	105	73	-
CO2 value	%	7,4	3,3	-
Maximum heat output efficiency rating (60/80°C)	%	93,4	89,4	91,0
Efficiency rating (according to 92/42/EC)	-	★★★		
NOx emission class	-	3		

Table 8 CTFS 32 - RTFS 32 combustion data

3. Instructions for the installer

3.1 Installation standards

This boiler must be installed in compliance with the laws and standards in force in the country of installation, which are herein considered as entirely transcribed.
For gas category and other technical data refer to the operating data and general characteristics shown on previous pages.

DANGER

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.

3.1.1 Packaging

Boiler is shipped in a sturdy cardboard box.
Remove boiler from cardboard box 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 for damage to people, animals, or property due to tampering with or improper intervention to the boiler.
Packaging includes:

- the hydraulic kit with copper pipes for boiler connection to gas mains;
- the hydraulic kit with copper pipes for boiler connection to the heating system;
- the hydraulic kit with copper pipes for boiler connection to DHW system;
- gas shut-off cock;
- cold water shut-off cock;
- a wall bracket:
- a bag containing:
  - » the present boiler installation, use and maintenance manual;
  - » the template for mounting the boiler on a wall (see Fig. 7 Paper template).
  - » 2 screws and relevant wall blocks for fixing the boiler to the wall.

3.2 Choosing where to install the boiler

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

- indications contained in paragraph *Air intake and flue gas venting system* on page *45* and its sub-paragraphs.
- check the wall for sturdiness, avoiding weak areas;
- do not install the boiler over appliances which may affect boiler operation (e.g. cookers, which produce steam and grease, washing machines etc.).

3.3 Positioning the boiler

Each boiler is supplied with a paper template, found inside the packaging (see Fig. 7 Paper template).

The template allows you to ensure that the pipes connected to the CH system, the DHW system and the gas mains, and the air intake/flue gas venting ducts are all laid out correctly during the realisation of the water system and before installation of the boiler.

This template is made of heavy-duty paper and must be fixed, with the help of a level, onto the wall where the boiler is to be mounted.

The template provides all the indications required to drill the boiler mounting holes to the wall, procedure which is done using two screws and wall blocks.

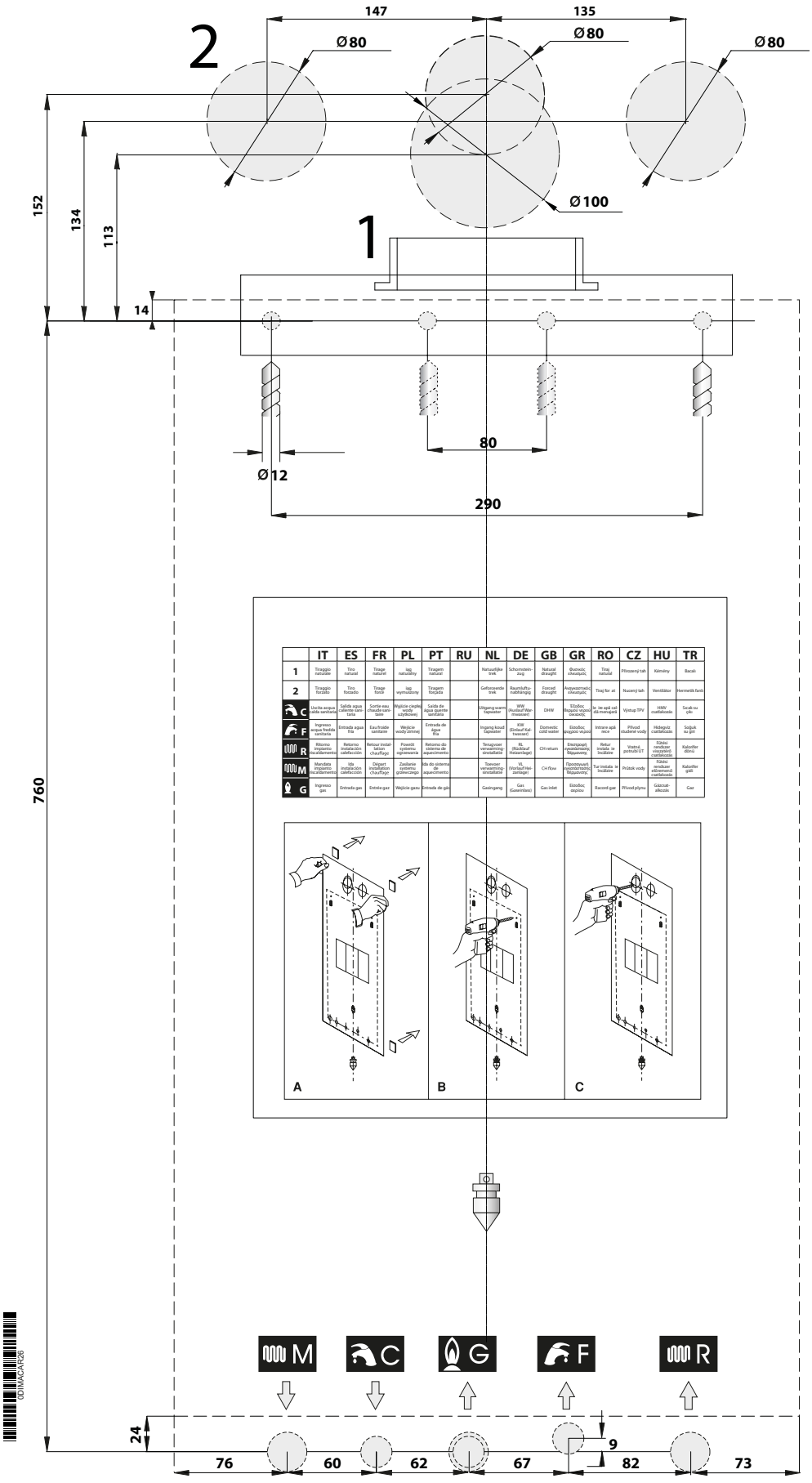
The lower area of the template shows where to mark the exact point at which the couplings are to be positioned for boiler connection to the gas supply pipe, cold water mains supply pipe, hot water outlet, CH flow and return pipes.

The upper area of the template shows where air intake and flue gas ducts are to be positioned.

DANGER

Since the temperature of the walls on which the boiler is mounted and external temperature of coaxial air/flue gas system do not exceed 60°C, no minimum distance from flammable walls is to be accounted for.

For boilers with split air intake and flue gas venting ducts, in the case of proximity with flammable walls and passages through walls, apply insulating material between the wall and the flue gas venting duct.



	IT	ES	FR	PL	PT	RU	NL	DE	GB	GR	RO	CZ	HU	TR
1	Tiraggio naturale	Tiro natural	Tirage naturel	ciąg naturalny	Tiragem natural		Natuurlijke trek	Schornstein-zug	Natural draught	Φυσικός ελκυσμός	Tiraj natural	Přirozený tah	Kéményhúzás	Bacalı
2	Tiraggio forzato	Tiro forzado	Tirage forcé	ciąg wymuszony	Tiragem forçada		Geforceerde trek	Raumluftunabhängig	Forced draught	Αναγκαστικός ελκυσμός	Tiraj for at	Nucený tah	Ventilátor	Hermetik fanlı
C	Uscita acqua calda sanitaria	Salida agua caliente sanitaria	Sortie eau chaude sanitaire	Wyjście ciepłej wody użytkowej	Saída de água quente sanitária		Uitgang warm tapwater	WW (Kontur/Warmwasser)	DHW	Έξοδος θερμού νερού οικιακής	Ieșire apă caldă menajeră	Výtlak TPV	HMV csatlakozás	Sıcak su çıkı
F	Ingresso acqua fredda sanitaria	Entrada agua fría	Eau froide sanitaire	Wejście wody zimnej	Entrada de água fria		Ingang koud tapwater	KW (Einlauf Kaltwasser)	Domestic cold water	Είσοδος ψυχρού νερού	Intrare apă rece	Přívod studené vody	Hidegvíz csatlakozás	Soğuk su giri
R	Ritorno impianto riscaldamento	Retorno instalación calefacción	Retour instal-lation chauffage	Powrót systemu ogrzewania	Retorno de sistema de aquecimento		Teruggroei verwarmings-installatie	RL (Rücklauf Heizanlage)	CH return	Επιστροφή εγκατάστασης θέρμανσης	Retur instala-ție încălzire	Vratná potrubí ÚT	Fűtési rendszer visszatérő csatlakozás	Kalorifer dönüş
M	Mandata impianto riscaldamento	Ida instalación calefacción	Départ installation chauffage	Zasilanie systemu grzewczego	Ida do sistema de aquecimento		Toevoer verwarmings-installatie	VL (Vorlauf Heizanlage)	CH flow	Προσαγωγή εγκατάστασης θέρμανσης	Tur instala-ție încălzire	Průtok vody	Fűtési rendszer előremenő csatlakozás	Kalorifer gidiş
G	Ingresso gas	Entrada gas	Entrée gaz	Wejście gazu	Entrada de gás		Gastoegang	Gas (Gaseinlass)	Gas inlet	Είσοδος αερίου	Racord gaz	Přívod plynu	Gázcsatlakozás	Gaz

Fig. 7 Paper template

3.4 Installing the boiler

DANGER

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 CH 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 for damage to people, animals, or property due to tampering with or improper intervention to the boiler.

In order to install the boiler proceed as follows:

- affix the template to the wall.
- Drill two Ø 12 mm holes in the wall to accommodate the boiler bracket wall blocks;
- If necessary, provide holes in the wall to allow air intake and/or flue gas venting ducts to pass through it;
- Secure the supporting bracket to the wall using the blocks supplied with the boiler;
- position the connections for the gas mains pipe **G**, the cold water inlet pipe **F**, the hot water outlet pipe **C** (CTFS model only), the heating flow **M** and return pipe **R**, as indicated at the bottom of the template;
- hook boiler to supporting bracket;
- Connect the boiler to mains pipes by means of the coupling kit supplied with the boiler (see *Hydraulic connections* on page *54*).
- Provide an outlet for the 3-bar safety valve;
- Connect the boiler to the air intake and flue gas venting system (see *Air intake and flue gas venting system* on page *45*).
- connect power supply, ambient thermostat (when available) and other available accessories (refer to the following paragraphs).

3.5 Flue gas extractor fan

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.

DANGER

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.

3.6 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.

DANGER

The boiler is equipped with safety devices checking correct flue gas exhaustion.
In case of a malfunction of air intake and/or flue gas venting ducts, the boiler is shut down and flashing E03 code is displayed.
It is strictly forbidden to tamper with and/or prevent operation of such safety devices.
Should the boiler repeatedly shut down, it is necessary to have the boiler air intake/flue gas venting ducts checked, since they could be obstructed or incorrectly sized for flue gas discharge into the atmosphere.

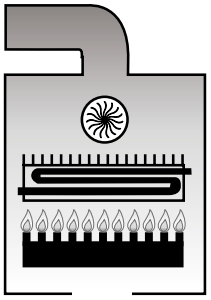
Flue gas discharge into the atmosphere and air intake/flue gas venting terminals must comply with applicable laws and standards in the country of installation that are considered as fully transcribed herein.

Damage and/or injury caused by incorrect installation and/or incorrect use and/or unauthorized changes to the boiler and/or non-observance of the manufacturer's instructions and/or of the relative standards/laws in force in the country of installation, shall release the manufacturer from any and all liability.

3.6.1 Configuration of air intake and flue gas venting ducts

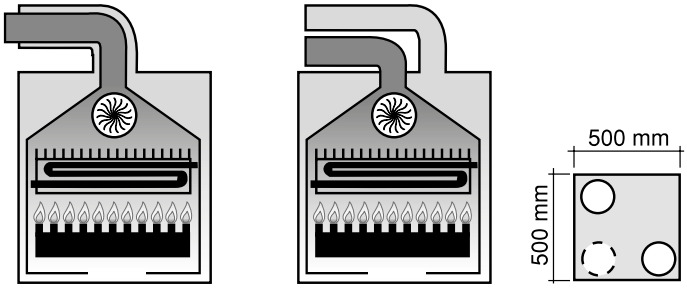
Type B22

- Boiler intended for connection to a chimney pipe or a device for flue gas venting 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 downstream of the combustion chamber/heat exchanger.



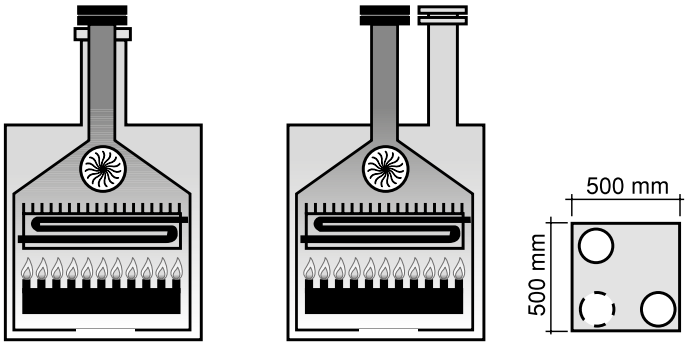
Type C12

- Boiler intended for connection to horizontal flue gas venting 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 (see figure opposite), whereas both terminals must be contained within a square measuring 500 x 500mm.



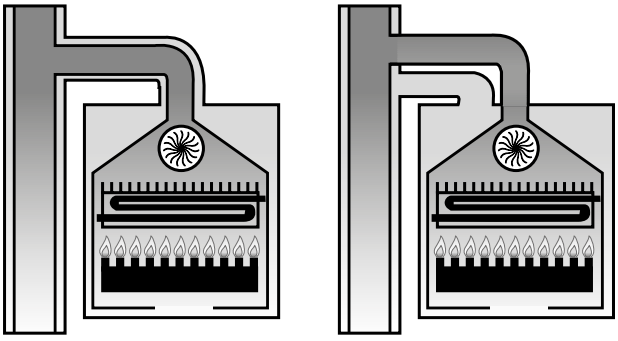
Type C32

- Boiler intended for connection to vertical flue gas venting 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 (see figure opposite), whereas both terminals must be contained within a square measuring 500 x 500mm.



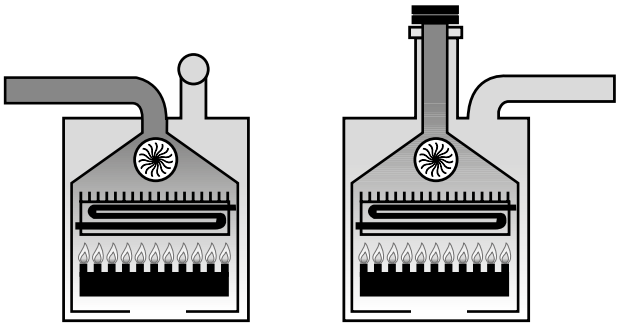
Type C42

- Boiler intended for connection to collective chimney pipe system that includes two ducts, air intake and flue gas venting.
- The chimney must be compliant with applicable legislation and standards.



Type C52

- Boiler with split ducts for combustion air intake and flue gas venting.
- These flues may discharge in areas at a different pressure. The terminals may not face each other from opposed walls.
- The terminals may not face each other from opposed walls.

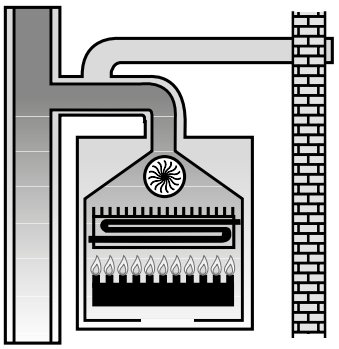


Type C62

- Boiler designed to be sold without air intake or flue gas venting ducts.
- Flue gas venting and air intake to be ensured by using commercially available pipes, which are to be certified separately.

Type C82

- Boiler intended to be connected to combustion air terminal and to a single flue gas venting terminal or collective chimney.
- The chimney must be compliant with applicable legislation and standards.



3.6.2 Air intake and flue gas venting via 100/60 mm coaxial ducts

3.6.2.1 Installation types: C12 and C32

Provisions for models CTFS 24 and RTFS 24

- The minimum permissible length of **horizontal coaxial** ducts is 0.5 metres, including the first elbow connected to the boiler.
- The maximum allowed length of **horizontal coaxial** ducts is 6 metres, including the first elbow connected to the boiler.
- For each additional elbow the maximum permissible length must be reduced by 1 meter.
- The duct is to be tilted down by 1% toward its outlet, to prevent rain water from entering the boiler
- With "wall-mounted terminal", maximum permissible length is to be reduced by 1 meter.
- The minimum permissible length of **vertical coaxial** ducts is 1 metre, including the first elbow connected to the boiler.
- The maximum allowed length of **vertical coaxial** ducts is 6 metres, including the first elbow connected to the boiler.
- For each additional elbow the maximum permissible length must be reduced by 1 meter.
- With "roof-mounted terminal", maximum permissible length is to be reduced by 1.5 meters.
- **Using the diaphragms supplied with the boiler.**

Pipe length (m)	Flue gas venting diaphragm diameter
0.5 < L < 2*	Ø 39.8
2 < L < 3*	Ø 42
3 < L < 4*	Ø 45
4 < L < 5*	Ø 49
5 < L < 6*	-

Table 9 Flue gas venting duct length and diaphragm diameter

(*) for C12 installation type the value includes the starting elbow.

Provisions for models CTFS 28 and RTFS 28

- The minimum permissible length of **horizontal coaxial** ducts is 0.5 metres, including the first elbow connected to the boiler.
- The maximum allowed length of **horizontal coaxial** ducts is 7 metres, including the first elbow connected to the boiler.
- For each additional elbow the maximum permissible length must be reduced by 1 meter.
- The duct is to be tilted down by 1% toward its outlet, to prevent rain water from entering the boiler
- With "wall-mounted terminal", maximum permissible length is to be reduced by 1 meter.
- The minimum permissible length of **vertical coaxial** ducts is 1 metre, including the first elbow connected to the boiler.
- The maximum allowed length of **vertical coaxial** ducts is 7 metres, including the first elbow connected to the boiler.
- For each additional elbow the maximum permissible length must be reduced by 1 meter.
- With "roof-mounted terminal", maximum permissible length is to be reduced by 1.5 meters.
- **Using the diaphragms supplied with the boiler.**

Pipe length (m)	Flue gas venting diaphragm diameter
0.5 < L < 2*	Ø 39
2 < L < 4*	Ø 41
4 < L < 6*	Ø 47
6 < L < 7*	-

Table 10 Flue gas venting duct length and diaphragm diameter

(*) for C12 installation type the value includes the starting elbow.

Provisions for models CTFS 32 and RTFS 32

- The minimum permissible length of **horizontal coaxial** ducts is 0.5 metres, including the first elbow connected to the boiler.
- The maximum allowed length of **horizontal coaxial** ducts is 5 metres, including the first elbow connected to the boiler.
- For each additional elbow the maximum permissible length must be reduced by 1 meter.
- The duct is to be tilted down by 1% toward its outlet, to prevent rain water from entering the boiler
- With "wall-mounted terminal", maximum permissible length is to be reduced by 1 meter.
- The minimum permissible length of **vertical coaxial** ducts is 1 metre, including the first elbow connected to the boiler.
- The maximum allowed length of **vertical coaxial** ducts is 5 metres, including the first elbow connected to the boiler.
- For each additional elbow the maximum permissible length must be reduced by 1 meter.
- With "roof-mounted terminal", maximum permissible length is to be reduced by 1.5 meters.
- **Using the diaphragms supplied with the boiler.**

Pipe length (m)	Flue gas venting diaphragm diameter
0.5 < L < 2*	Ø 39.8
2 < L < 3*	Ø 41
3 < L < 4*	Ø 44
4 < L < 5*	Ø 47

Table 11 Flue gas venting duct length and diaphragm diameter

(*) for C12 installation type the value includes the starting elbow.

DANGER

The boiler is equipped with safety devices checking correct flue gas exhaustion.
In case of a malfunction of air intake and/or flue gas venting ducts, the boiler is shut down and flashing E03 code is displayed (see *Shut-down due to incorrect air/flue gas system draught* **on page** 29**).**

coaxial duct kit 0KITCONC00

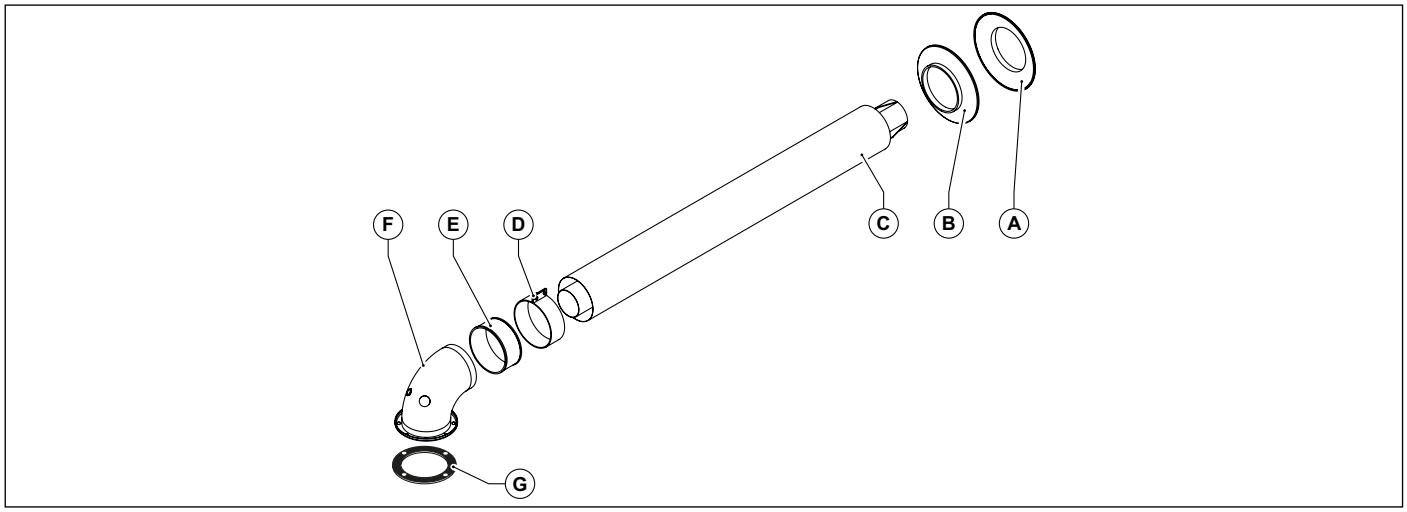


Fig. 8 coaxial duct kit 0KITCONC00

A. Endcap
B. Endcap
C. 1 mt. coaxial duct
D. Rubber hose
E. Plastic hose
F. Elbow
G. Neoprene gasket

Air intake and flue gas venting via coaxial ducts

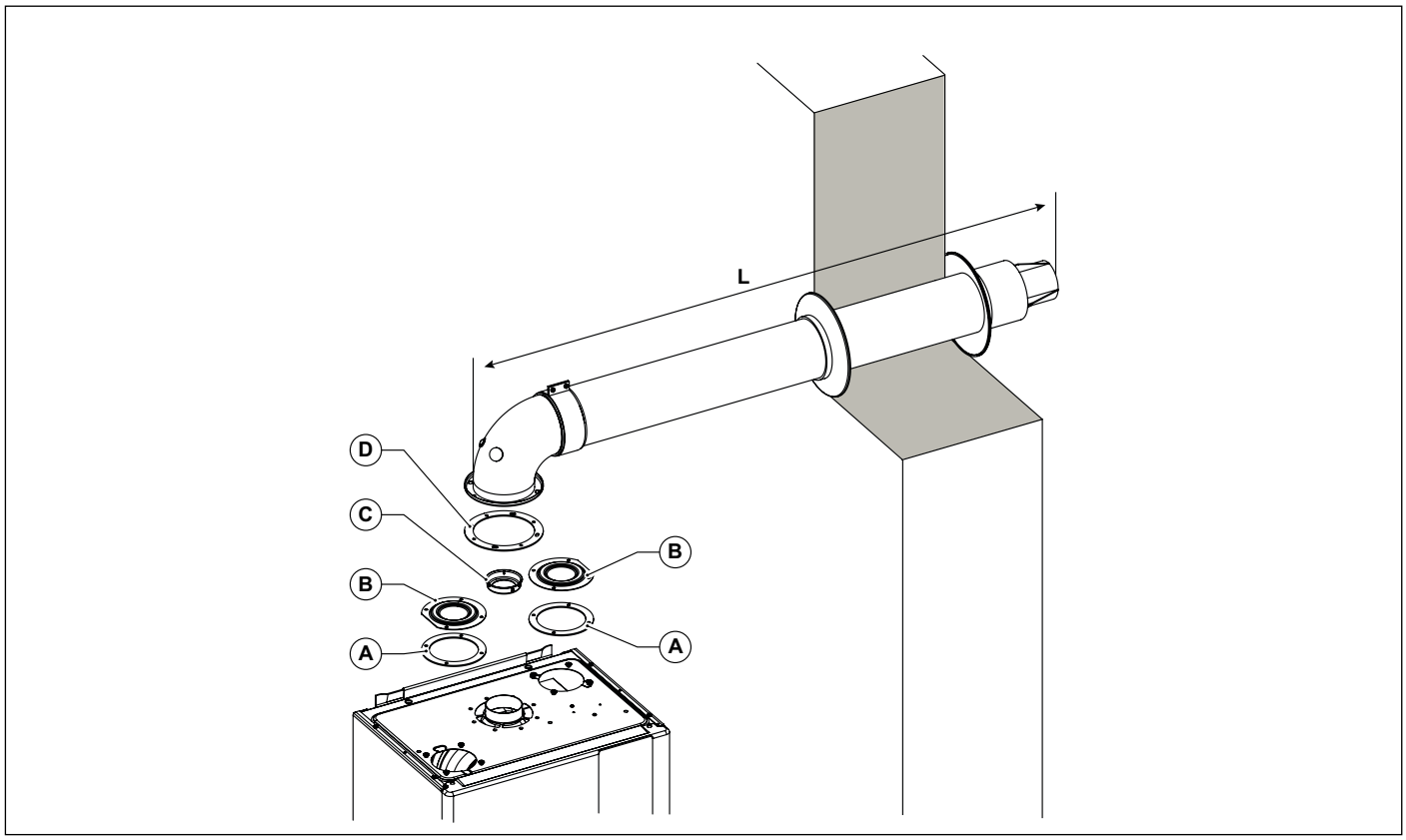


Fig. 9 Air intake and flue gas venting via coaxial ducts

A. Neoprene gasket
B. Blanking cap
C. Diaphragm
D. Neoprene gasket

L = from 0.5 m to 7 m (28 kW)

Dimensions for connection to coaxial air intake/flue gas venting duct

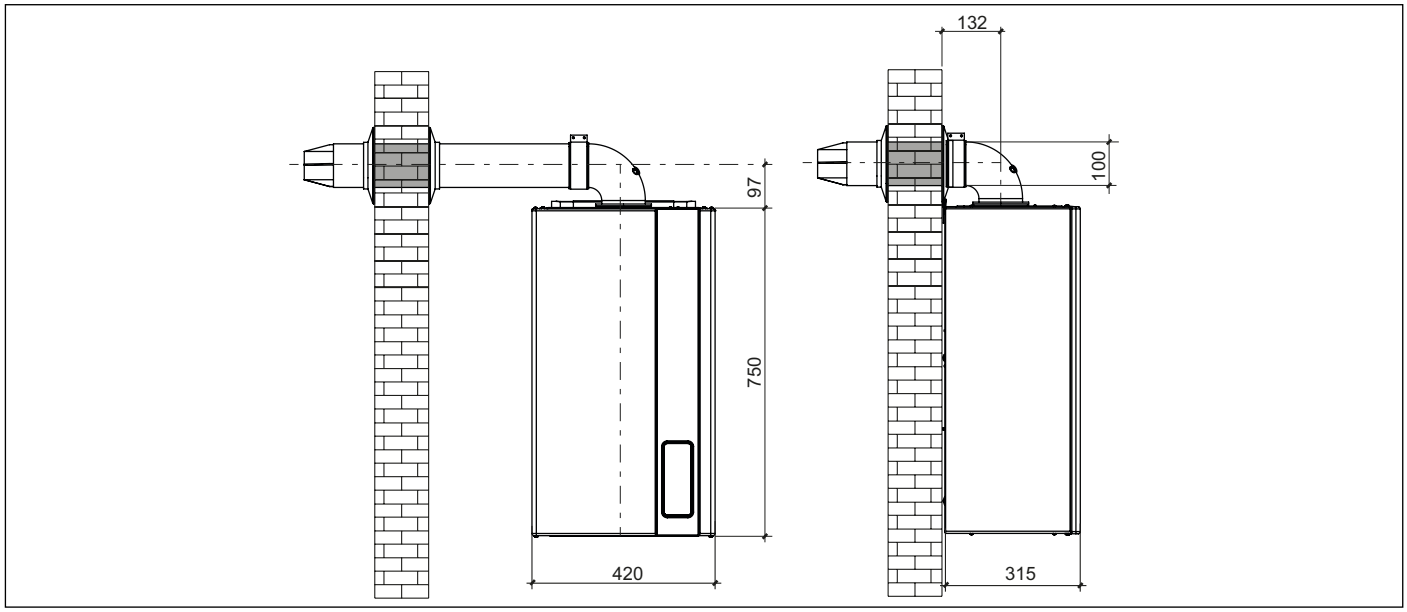


Fig. 10 Dimensions for connection to coaxial air intake/flue gas venting duct

3.6.3 Air intake and flue gas venting via 80 mm split ducts

3.6.3.1 Installation types: C42, C52 and C82

For all systems with separate air intake and flue gas vent pipes, the suitable standard split pipe kit (0SDOPPIA13) must be used, it includes two air deflectors, retaining screws, seals and the following parts:

A. a female flanged stub pipe Ø 80 mm for connecting air intake duct;

B. a female flanged stub pipe Ø 80 mm for connecting flue gas venting duct with relevant deflector;

DANGER

If the original standard split ducts kit is not used, correct boiler operation is not guaranteed.

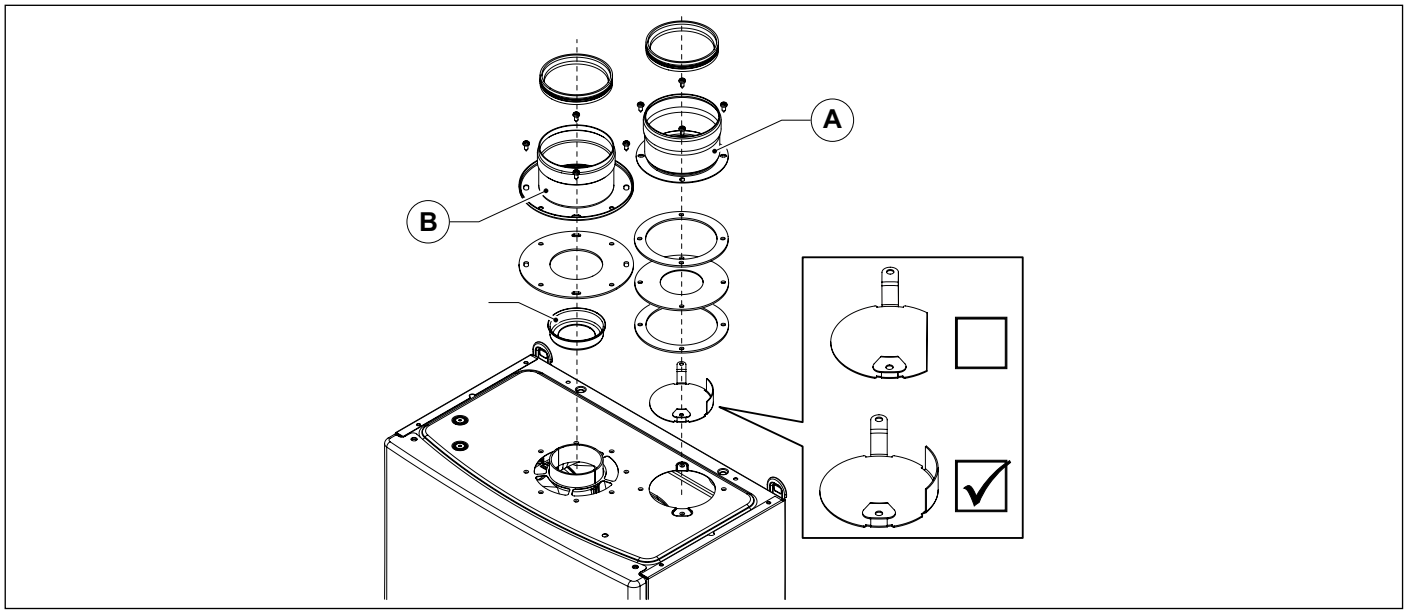


Fig. 11 Split ducts kit 0SDOPPIA13

Provisions for models CTFS 24 and RTFS 24

Air intake

- Minimum permissible length of air intake duct is 1 meter.
- Each wide radius 90° elbow (R=D) in air intake equals a 0.8 m long straight pipe section.
- Each narrow radius 90° elbow (R<D) in air intake is equivalent to a 1.7 metre long straight pipe section.
- Every air intake duct length of one metre is equivalent to a 0.6 metre long straight pipe section.
- Every split ducts chimney in air intake is equivalent to a 4.2 metre long straight pipe section.
- air intake duct flow resistance shall not be considered.
- Install the standard air deflector. (see *Fig. 11 Split ducts kit 0SDOPPIA13*)

Flue gas venting

- Each wide radius 90° elbow (R=D) in flue gas venting equals a 1.4 m long straight pipe section.
- Each wide radius 90° elbow (R<D) in flue gas venting equals a 2.8 m long straight pipe section.
- Every flue gas venting duct length of one metre is equivalent to a 1.0 metre long straight pipe section.
- Every split ducts chimney in flue gas venting is equivalent to a 5.7 metre long straight pipe section.

Pipe length (m)	Flue gas venting diaphragm diameter
0.5 < L < 3*	Ø 39.8
3 < L < 14*	Ø 42
14 < L < 26*	Ø 45
26 < L < 34*	Ø 49
34 < L < 42*	-

Table 12 Flue gas venting duct length and diaphragm diameter

Provisions for models CTFS 28 and RTFS 28

Air intake

- Minimum permissible length of air intake duct is 1 meter.
- Each wide radius 90° elbow (R=D) in air intake equals a 0.8 m long straight pipe section.
- Each narrow radius 90° elbow (R<D) in air intake is equivalent to a 1.7 metre long straight pipe section.
- Every air intake duct length of one metre is equivalent to a 0.6 metre long straight pipe section.
- Every split ducts chimney in air intake is equivalent to a 4.3 metre long straight pipe section.
- air intake duct flow resistance shall not be considered.
- Install the standard air deflector. (see *Fig. 11 Split ducts kit 0SDOPPIA13*)

Flue gas venting

- Each wide radius 90° elbow (R=D) in flue gas venting equals a 1.4 m long straight pipe section.
- Each wide radius 90° elbow (R<D) in flue gas venting equals a 2.8 m long straight pipe section.
- Every flue gas venting duct length of one metre is equivalent to a 1.0 metre long straight pipe section.
- Every split ducts chimney in flue gas venting is equivalent to a 5.9 metre long straight pipe section.

Pipe length (m)	Flue gas venting diaphragm diameter	Air intake diaphragm diameter
1 < L < 18*	Ø 45	Ø 55.5
18 < L < 23*	Ø 47	Ø 55.5

Table 13 Flue gas venting duct length and diaphragm diameter

Provisions for models CTFS 32 and RTFS 32

Air intake

- Minimum permissible length of air intake duct is 1 meter.
- Each wide radius 90° elbow (R=D) in air intake equals a 0.8 m long straight pipe section.
- Each narrow radius 90° elbow (R<D) in air intake is equivalent to a 1.7 metre long straight pipe section.
- Every air intake duct length of one metre is equivalent to a 0.6 metre long straight pipe section.
- Every split ducts chimney in air intake is equivalent to a 4.3 metre long straight pipe section.
- air intake duct flow resistance shall not be considered.
- Install the standard air deflector. (see *Fig. 11 Split ducts kit 0SDOPPIA13*)

Flue gas venting

- Each wide radius 90° elbow (R=D) in flue gas venting equals a 1.4 m long straight pipe section.
- Each wide radius 90° elbow (R<D) in flue gas venting equals a 2.8 m long straight pipe section.
- Every flue gas venting duct length of one metre is equivalent to a 1.0 metre long straight pipe section.
- Every split ducts chimney in flue gas venting is equivalent to a 5.9 metre long straight pipe section.

Pipe length (m)	Flue gas venting diaphragm diameter	Air intake diaphragm diameter
1 < L < 5*	Ø 44	Ø 55.5
5 < L < 12*	Ø 45	Ø 55.5
12 < L < 19*	Ø 47	Ø 55.5
19 < L < 24*	Ø 49	Ø 55.5

Table 14 Flue gas venting/air intake duct length and diaphragm diameter

3.6.3.2 Installation type: C62

Chimney maximum residual head (air intake/flue gas outlet): 105 Pa (models CTFS 24 and RTFS 24); 70 Pa (CTFS 28 and RTFS 28); 78 Pa (CTFS 32 and RTFS 32).

Avoid condensate build-up inside the equipment.

Maximum flue gas recirculation: 10%.

3.7 Checking combustion efficiency

3.7.1 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 button and keep it pressed for 5 seconds.

When the flue cleaning function is activated with the boiler in WINTER mode, the boiler performs the ignition sequence and then operates at a fixed power output.

The flue cleaning function is active when the display shows: the fixed symbol, the symbol (if burner is on), the flow temperature **A**, the CH system pressure **B** and the gas valve modulation coil input current value **C**.

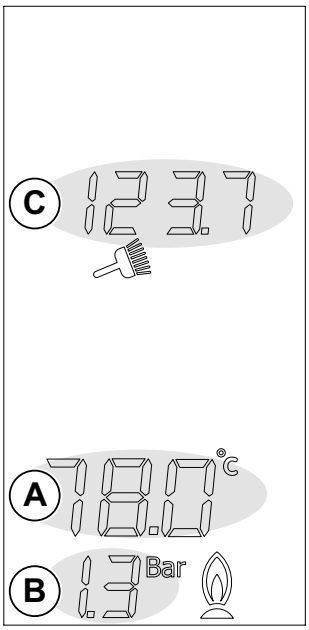
The buttons active in this function are: Reset and **+/- DHW**.

The flue cleaning function lasts 15 minutes.

To quit the flue cleaning function, press Reset button and you will go back to the standard operating mode.

Use **+/- DHW** buttons to change current input to gas valve modulation coil from a minimum value (parameter P96) to a maximum value (parameter P95) automatically set according to boiler type.

The display shows symbol when the parameter is being changed, symbol, the gas valve modulation coil input current value and if burner is on.



3.7.2 Measurements

coaxial duct system

- assess combustion air from opening 2 (see ref. **A** Fig. 12 Examples of flue gas testing points).
- assess flue gas temperature and CO2 from no. 1 opening (see **B**) ref. **A** Fig. 12 Examples of flue gas testing points).

split ducts system

- assess combustion air from opening 2 (see ref. **B** Fig. 12 Examples of flue gas testing points).
- assess flue gas temperature and CO2 from no. 1 opening (see **B**) ref. **B** Fig. 12 Examples of flue gas testing points).
- Allow boiler to reach working temperature before taking any measurement.

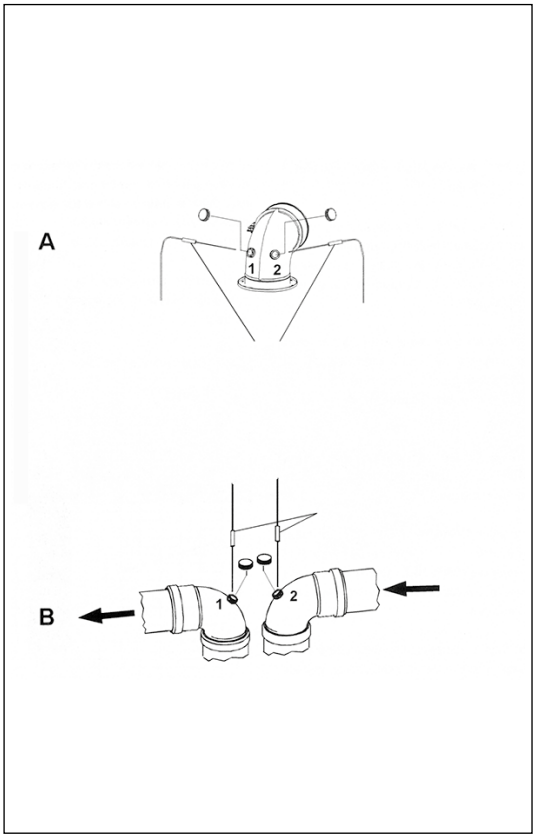


Fig. 12 Examples of flue gas testing points

3.8 Connection to the gas mains

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

DANGER

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 (A) made from suitable material (see Fig. 13 Connection to the gas mains).

The boiler gas inlet coupling is NOT suitable for hemp, teflon tape or similarly made gaskets.

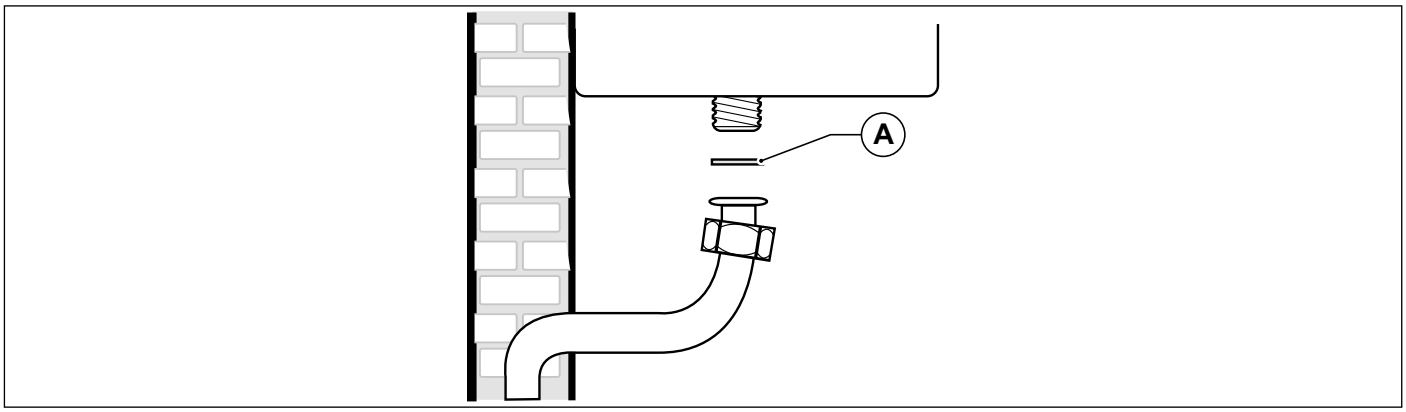


Fig. 13 Connection to the gas mains

3.9 Hydraulic connections

3.9.1 CH system

Prior to installing the boiler, the hydraulic system is to be cleaned in order to remove impurities; they could be present in system components and damage the pump and the heat exchanger.
The CH flow and return pipes must be connected to the respective 3/4” connectors **M** and **R** (see Fig. 7 Paper template).
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.

CAUTION

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.

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

3.9.2 DHW system

Prior to installing the boiler, the hydraulic system is to be cleaned in order to remove impurities; they could be present in system components and damage the pump and the heat exchanger.

The cold water inlet and the DHW outlet must be connected to the respective 1/2" connectors **C** and **F** on the boiler (see Fig. 7 Paper template).

Hardness of water supplied to the boiler may increase the plate heat exchanger cleaning/replacement intervals.

CAUTION

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.

3.10 Connection to the 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 230V-50Hz electrical power supply.

When connecting the boiler 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.

CAUTION

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.

3.11 Connection to ambient thermostat (optional)

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 terminals 1 and 2 of the electronic board (see Fig. 16 Wiring diagram RTFS) after eliminating the jumper supplied as a standard with the boiler.

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

3.12 Installation and operation with Open Therm Remote Control (optional)

CAUTION

Only original remote controls supplied by the manufacturer must be used.

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.

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.

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

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.

Remote Control cables shall be connected to terminals 3 and 4 of the electronic board (see Fig. 16 Wiring diagram RTFS).

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

CAUTION

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

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 the power cables may compromise the functions of the Remote Control;

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.

As to the boiler mode, the boiler display shows the settings made on the Remote Control.

The remote control may be used to view and set a number of special parameters denominated **TSP** parameters and reserved solely for qualified technicians.

TSP0 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.

3.12.1 Installation of the (optional) external probe and “sliding temperature” operation

The boiler can be connected to an (optional) external temperature probe (optional, provided by the manufacturer) for sliding temperature operation.

CAUTION

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 terminals 5-6 of boiler electronic board (see Fig. 16 Wiring diagram RTFS and Fig. 20 Wiring diagram CTFS).

CAUTION

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.

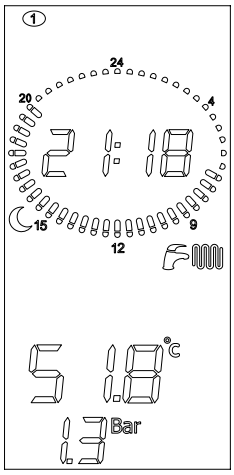
Do not install near a window, ventilation openings or sources of heat.

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

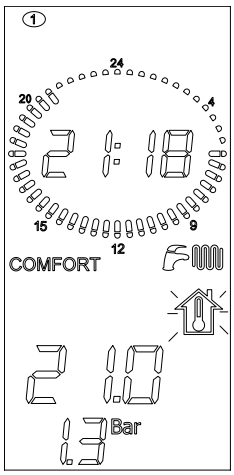
- The measured external temperature;
- Selected thermoregulation curve.
- The selected calculated ambient temperature.

The calculated ambient temperature is set using **+/- CH** buttons that, with the external temperature probe installed, no longer work to set the heating water temperature (see *Operation with (optional) external probe* on page *28*).

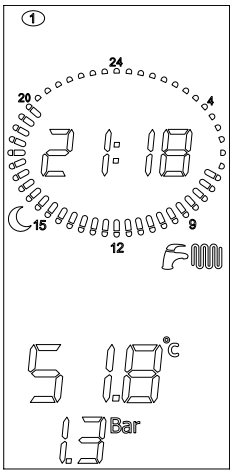
P30 parameter shows the external temperature read by the external probe.



With installed external probe , press **+/- CH** buttons to set calculated ambient temperature. As soon as "ambient temperature" button is released, icon will continue flashing for approx. 3 seconds, and the calculated ambient temperature value will flash as well.



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



In the following figure the curves are shown for a calculated ambient temperature of 20°C.Parameter **P10** allows selecting the curve value (see Fig. 14 Thermoregulation curves).
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 external temperature is - 4°C, the CH flow temperature will be 50°C.

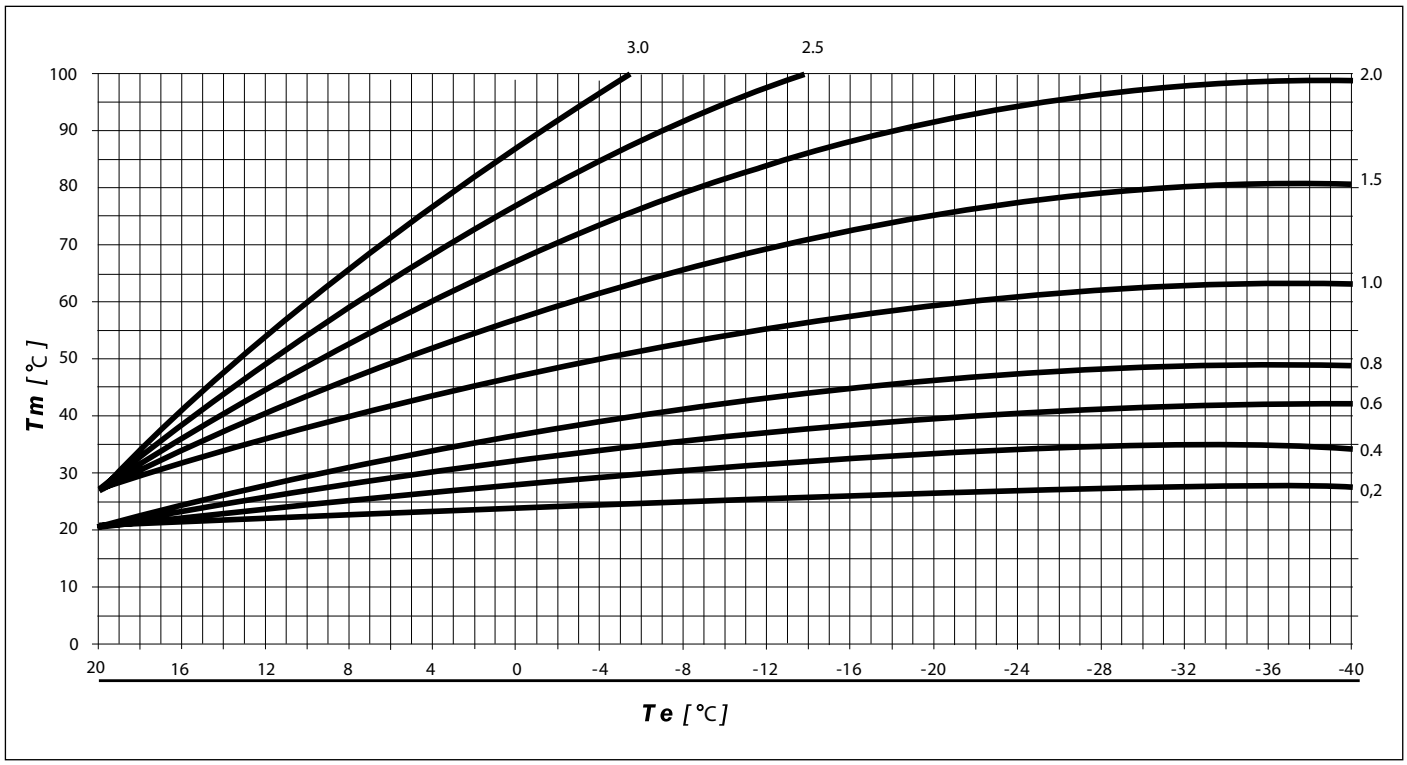


Fig. 14 Thermoregulation curves

Tm indicates the flow water temperature in *C

Te indicates the external temperature in *C

3.13 TSP parameters

Parameter	Settable values	Default values	Notes
P0 - TSP0 Boiler power selection	0 ÷ 5	According to the model	0 = 24 kW LPG; 1 = 24 kW Methane; 2 = 28 kW LPG; 3 = 28 kW Methane; 4 = 32 kW LPG; 5 = 32 kW Methane.
P3 - TSP3 Boiler type selection	1 ÷ 3	According to the model	1 = combined instantaneous, 2 = heating only, 3 = with water heater
P6 - TSP6 Ignition power setting	0 ÷ 100 % (min-max)	0 %	With P6=0 ignition with ramp - With P6≠0 ignition at the set power (P6=1 minimum power ÷ P6=100 maximum power)
P7 - TSP7 Heating power maximum setting	10 ÷ 100%	100%	n.a.
P10 - TSP10 Heating output curves	0 ÷ 3	1,5	Resolution 0.05
P11 - TSP11 Heating thermostat timing	0 ÷ 10 min.	4	n.a.
P12 - TSP12 CH power rising ramp timer	0 ÷ 10 min.	1	n.a.
P13 - TSP13 Timer for CH post-circulation, freeze protection and flue cleaning function	30 ÷ 180 sec.	30	n.a.
P14 - TSP14 Setting of "solar" DHW thermostats	0 ÷ 1	0	0 = normal - 1 = solar
P15 - TSP15	0 ÷ 3 sec.	0	n.a.
P16 - TSP16 Ambient thermostat reading delay / OT	0 ÷ 199 sec.	0	n.a.
P17 - TSP17 Multifunction relay setting	0 ÷ 3	0	0 = shut-down and malfunction; 1 = ambient thermostat request 1/Remote control; 2 = solar; 3 = ambient thermostat request 2
P18 - TSP18 Solar system selection	0 ÷ 1	0	0 = solar valve; 1 = solar pump
P19 - TSP19 Water heater set-point setting	10 ÷ 90 °C	60 °C	only with P18 = 1
P20 - TSP20 ΔT ON (diff. for solar pump switch-on)	1 ÷ 30 °C	6 °C	n.a.
P21 - TSP21 ΔT OFF (diff. for solar pump shut-down)	1 ÷ 30 °C	3 °C	n.a.
P22 - TSP22 Maximum collector temperature	80 ÷ 140 °C	120 °C	n.a.
P23 - TSP23 Minimum collector temperature	0 ÷ 95 °C	25 °C	n.a.
P24 - TSP24 Solar collector freeze protection	0 ÷ 1	0	0 = freeze protection inactive; 1 = freeze-protection active (only with P18 = 1)
P25 - TSP25 Solar load forcing	0 ÷ 1	0	0 = automatic operation; 1 = always active
P26 - TSP26 Enabling of water heater cooling	0 ÷ 1	0	0 = disabled; 1 = enabled (with P18 = 1 only)

Parameter	Settable values	Default values	Notes
P27 - TSP27 Heating timer reset temperature	35 ÷ 78 °C	40 °C	n.a.
P28 - TSP28 Hydraulic selection for deviating valve relay control	0 ÷ 1	0	0 = recirculating pump + deviating valve; 1 = double pump
P29 - TSP29 Default parameter setting (except P00, P01, P02, P17, P28)	0 ÷ 1	0	0 = user parameters; 1 = default parameters
P30 - External temperature	n.a.	n.a.	only with external probe connected
P31 - Flow temperature	n.a.	n.a.	n.a.
P32 Nominal calculated flow temperature	n.a.	n.a.	only with external probe connected
P33 Set point of zone 2 flow temperature	n.a.	n.a.	only with at least one zone board connected
P34 Current zone 2 flow temperature	n.a.	n.a.	only with at least one zone board connected
P36 Set point of zone 3 flow temperature	n.a.	n.a.	only with two zone boards connected
P37 Current zone 3 flow temperature	n.a.	n.a.	only with two zone boards connected
P39 Set point of zone 4 flow temperature	n.a.	n.a.	only with three zone boards connected
P40 Current zone 4 flow temperature	n.a.	n.a.	only with three zone boards connected
P42 Plate DHW temperature	n.a.	n.a.	n.a.
P44 Water heater temperature	n.a.	n.a.	n.a.
P46 Water heater temperature (RTFS)) or domestic cold water temperature (CTFS)	n.a.	n.a.	only with solar collector probe connected
P47 Temperature of water heater or solar valve from boiler	n.a.	n.a.	only with water heater probe or solar valve connected
P48 Temperature of water heater or solar valve from solar board	n.a.	n.a.	As above, but only with solar board connected
P49 Ambient probe 1 (SA1) temperature	n.a.	n.a.	only with connected ambient probe
P50 Ambient probe 2 (SA2) temperature	n.a.	n.a.	only with connected ambient probe
P51 SA1 Ambient probe triggering differential OFF	0.0 ÷ 1.0 °C	0.0 °C	only with connected ambient probe
P52 SA2 Ambient probe triggering differential ON	-1.0 ÷ -0.1 °C	-0.5 °C	only with connected ambient probe
P53 Ambient probe SA1 correction range	-5.0 ÷ 5.0 °C	0.0 °C	only with connected ambient probe
P54 SA2 Ambient probe triggering differential OFF	0.0 ÷ 1.0 °C	0.0 °C	only with connected ambient probe
P55 SA2 Ambient probe triggering differential ON	-1.0 ÷ -0.1 °C	-0.5 °C	only with connected ambient probe
P56 Ambient probe SA2 correction range	-5.0 ÷ 5.0 °C	0.0 °C	only with connected ambient probe

Parameter	Settable values	Default values	Notes
P57 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
P58 Ambient probe weight during modulation	0 ÷ 20 °C	8 °C	used for thermoregulation with P57=3
P59 Type of temperature visualization on display	0 ÷ 7	0	0 = flow temp.; 1 = SA1 probe temp.; 2 = SA2 probe temp.; 3 = external temp.; 4 = water heater temp.; 5 = solar coll. temp.; 6 = solar valve temp.; 7 = solar valve temp from solar board
P60 Number of additional boards connected	0 ÷ 4	0	Maximum 4 boards (3 zone board + 1 solar board)
P61 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 zone1 / 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.
P62 Selection of zone 2 curve	0 ÷ 3	0,6	only with zone board connected
P63 Zone 2 set-point	15 ÷ 35 °C	20 °C	only with zone board connected
P66 Selection of zone 4 curve	0 ÷ 3	0,6	only with two zone boards connected
P67 Zone 3 set-point	15 ÷ 35 °C	20 °C	only with two zone boards connected
P70 Zone 4 set-point	0 ÷ 3	0,6	only with three zone boards connected
P71 Zone 4 set-point	15 ÷ 35 °C	20 °C	only with three zone boards connected
P74 Low temperature zone mixer valve opening time	0 ÷ 300 sec.	140 sec.	only with zone boards connected
P75 Rise in nominal boiler temperature with zone board	0 ÷ 35 °C	5 °C	only with zone boards connected
P76 Thermal discharge enabling with solar board	0 ÷ 1	0	0 = disabled; 1 = enabled
P78 Interface back-lighting switching on	0 ÷ 2	0	0 = standard; 1 = LCD always on 2 = LCD and buttons always on

Parameter	Settable values	Default values	Notes
P80 Multifunction relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay energised
P81 Zone 2 pump relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay energised
P82 Zone 2 mixing valve forcing	0 ÷ 2	0	0 = standard function; 1 = force opening; 2 = force closing
P84 Zone 3 pump relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay energised
P85 Zone 3 mixing valve forcing	0 ÷ 2	0	0 = standard function; 1 = force opening; 2 = force closing
P87 Zone 4 pump relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay energised
P88 Zone 4 mixing valve forcing	0 ÷ 2	0	0 = standard function; 1 = force opening; 2 = force closing
P91 Solar board relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay energised
P92 Solar board valve relay forcing	0 ÷ 2	0	0 = standard function; 1 = force opening; 2 = force closing
P94 Automatic filling enabled	0 ÷ 1	1	0 = disabled; 1 = enabled

3.14 Filling the system

Once all boiler connections have been completed, CH system can be filled.
The procedure is to be cautiously carried out, following each step:

- Open the bleeding valves on all radiators and verify the boiler automatic valve operation.
- Gradually open the filler cock, checking any automatic bleeding valves installed in the system work properly (see Fig. 2 Model CTFS filler cock and Fig. 3 Model RTFS filler cock).
- Close all radiator bleeding valves as soon as water starts coming out.
- Check on pressure gauge that water pressure reaches the 1÷1.3 bar reading.
- Close the filler cock or close the cock on the cold water supply pipe. Vent the air through the safety valves on the 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 water pressure to 1÷1.3 bars.

ATTENTION

After long inactivity of the boiler, its pump may be stuck.
Before starting up the boiler, make sure that the pump is operating, with the following procedure:

- **Remove the boiler outer casing.**
- **Unscrew the protective cap at the centre of the pump motor.**
- **When the protection cap is removed, some water may flow out.**
- **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.**
- **Before reinstalling the boiler casing, make sure all internal surfaces are dry.**

ATTENTION

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).
Water pressure in the CH system must not be lower than 1 bar. In case it is not so, fill the system with water (see *Shut-down due to low water pressure* **on page** *29***).**
The procedure is to be followed while the system is cold.
The digital pressure gauge is used to read pressure inside the heating circuit.

CAUTION

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.

3.15 Starting up the boiler

3.15.1 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 is 230 V – 50 Hz.
- The 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 *Adaptation to other gas types and burner adjustment* on page 77). This operation is to be exclusively carried out by qualified 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 3-bar safety valve is not stuck.
- There are no water leaks.
- The pump has not seized.

ATTENTION

If you wish to set a pump speed different from the factory-set one, taking into account the water circulation requirements in the boiler (assured by the main water flow switch) and the 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).

3.15.2 Switching on and switching off

To switch the boiler on and off, refer to the **Instructions for the User** (see *Instructions for the user* on page 9).

3.16 Available head

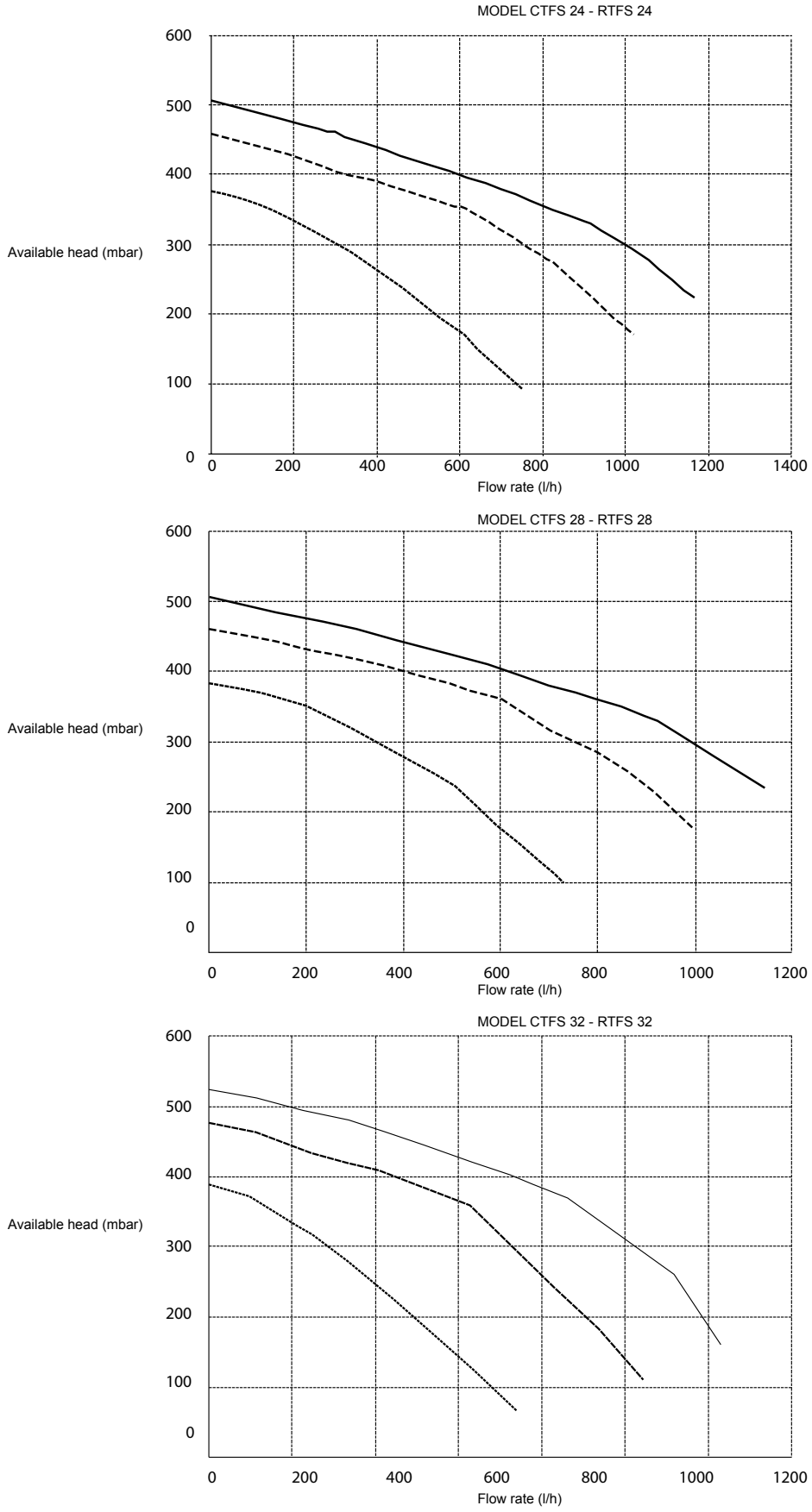


Fig. 15 Available heads

3.17 Wiring diagrams

3.17.1 RTFS

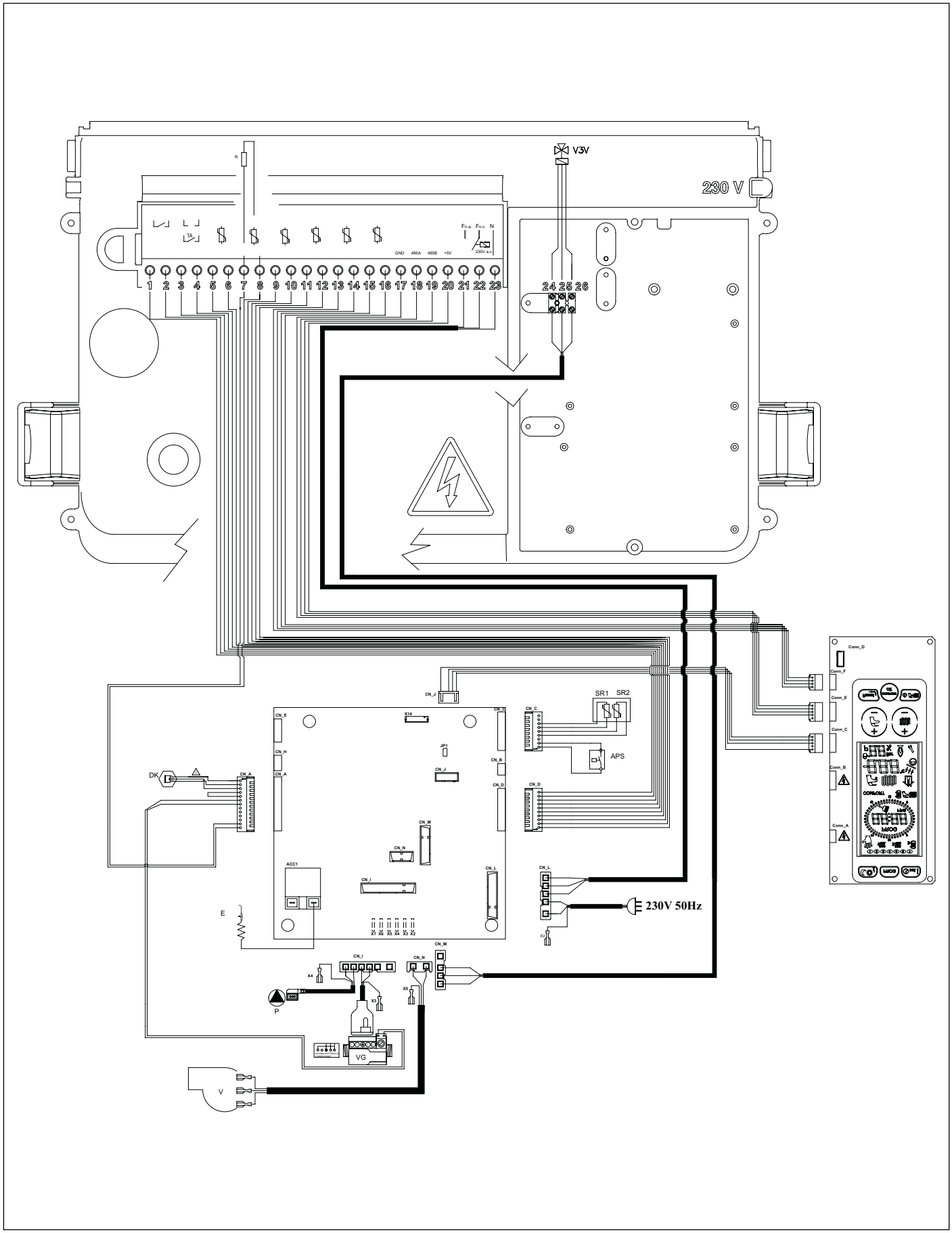


Fig. 16 Wiring diagram RTFS

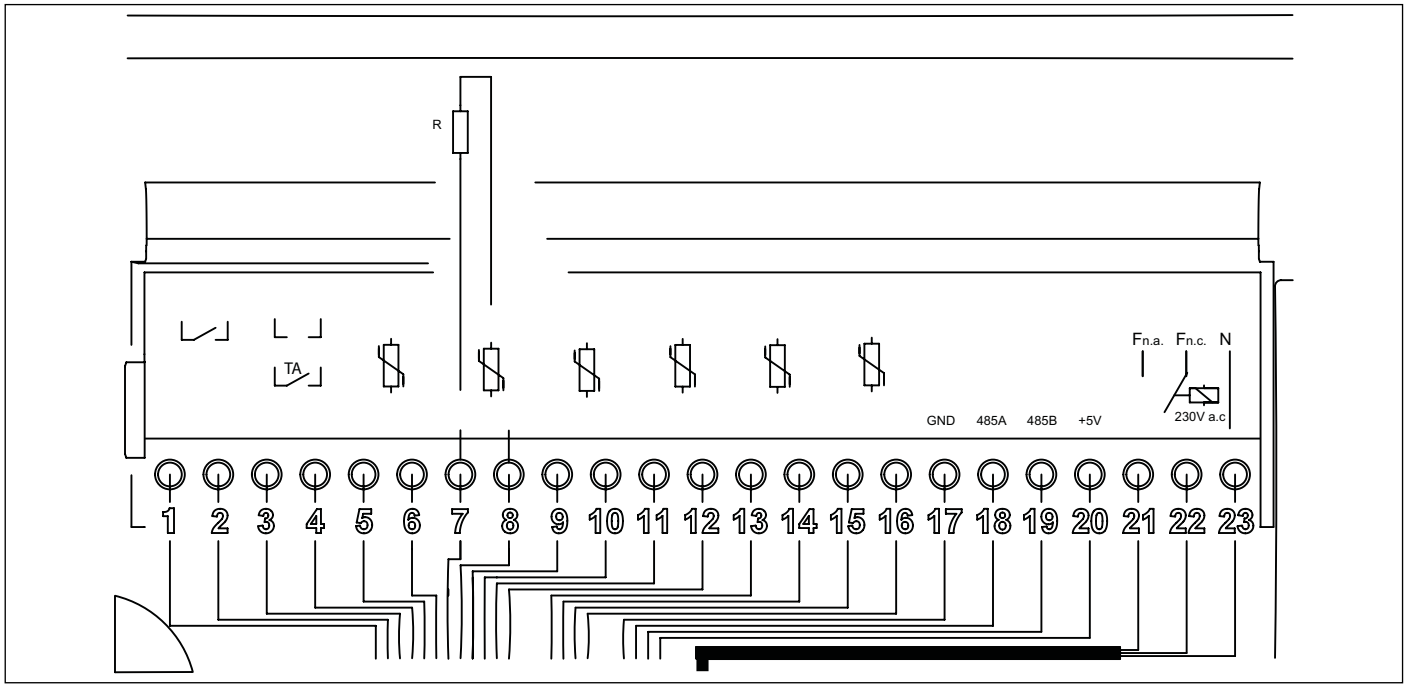


Fig. 17 Wiring diagram (detail) RTFS

Internal connections

DK: . . . . . Pressure transducer
SR1-SR2: . . . . . CH NTC probe 10k Ohm at 25°C B=3435 (double)
ASP: . . . . . Air pressure switch
VG: . . . . . Gas valve
P: . . . . . Boiler pump
R: . . . . . 10k Ohm 1/4 watt el.resistance
V3V: . . . . . 3-way valve (for the installer only)
E: . . . . . Ignition/flame detection electrode
V: . . . . . Fan
CN_A-CN_M: . . Load/signal connectors
X2-X7: . . . . . Ground connectors

CONNECTIONS PERFORMED BY THE INSTALLER

1-2: . . . . . TA2 - Ambient thermostat 2
3-4: . . . . . OT or TA1 - Remote Control or ambient thermostat
5-6: . . . . . external probe (10K Ohm B=3977)
7-8: . . . . . Water heater probe (connected to boiler) (10K Ohm B=3435)
9-10: . . . . . Solar water heater probe (PT1000)
11-12: . . . . . Solar collector probe (PT1000)
13-14: . . . . . Ambient probe 1 (10K Ohm B=3977)
15-16: . . . . . Ambient probe 2 (10K Ohm B=3977)
17-18-19-20: . . . 485 port for connection of additional boards
17: . . . . . GND
18: . . . . . A
19: . . . . . B
20: . . . . . +5V
21-22-23: . . . . . Programmable relay
21: . . . . . N
22: . . . . . F (NC)
23: . . . . . F (NO)

3.17.2 Wiring diagram for forced circulation solar system with CH only boiler

Parameters setting

P03 : 3

P17 : 2

P18 : 1

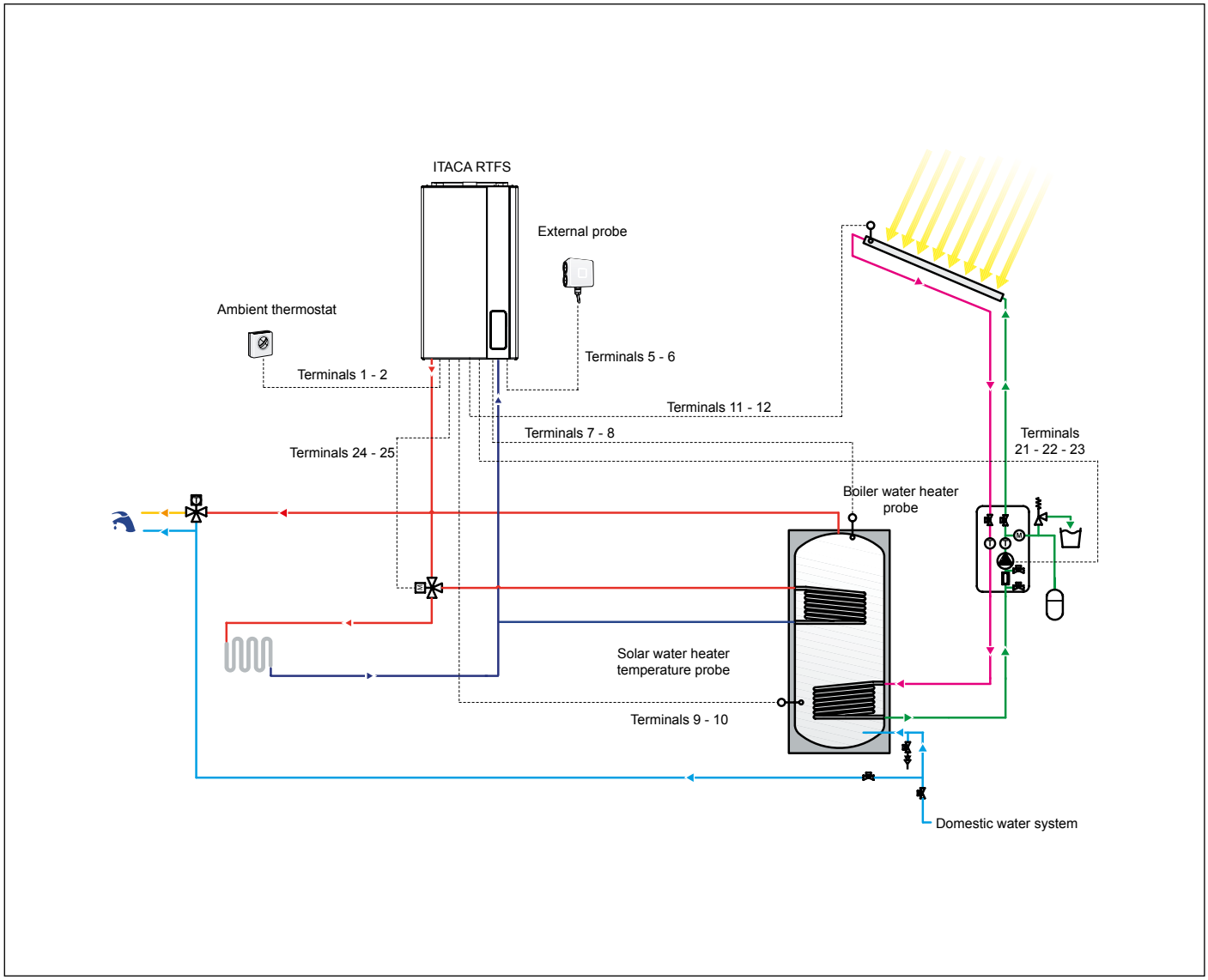


Fig. 18 Wiring diagram for forced circulation solar system with CH only boiler

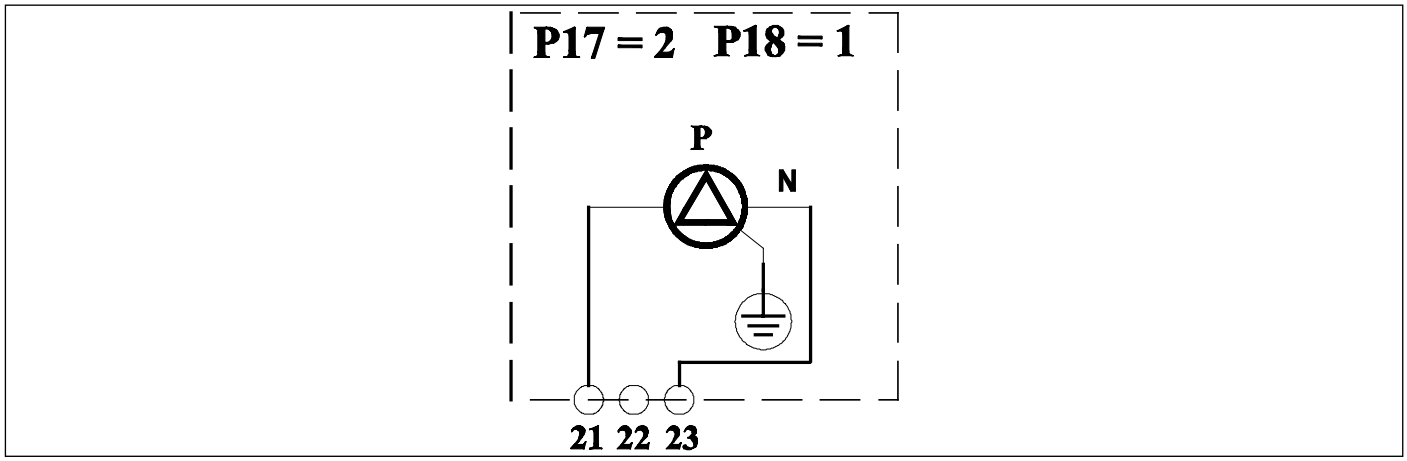


Fig. 19 Multifunction relay connecting diagram

3.17.3 CTFS

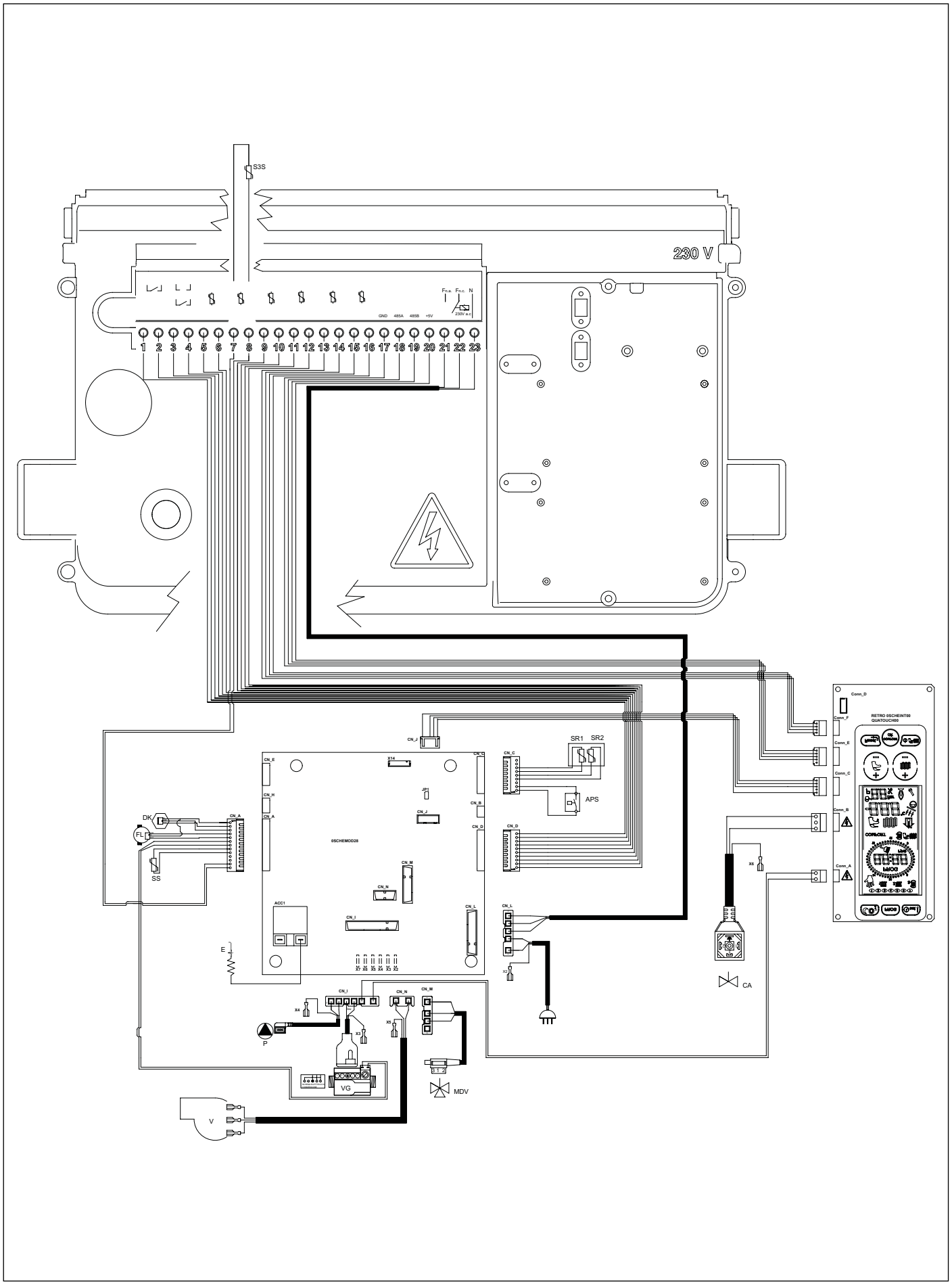


Fig. 20 Wiring diagram CTFS

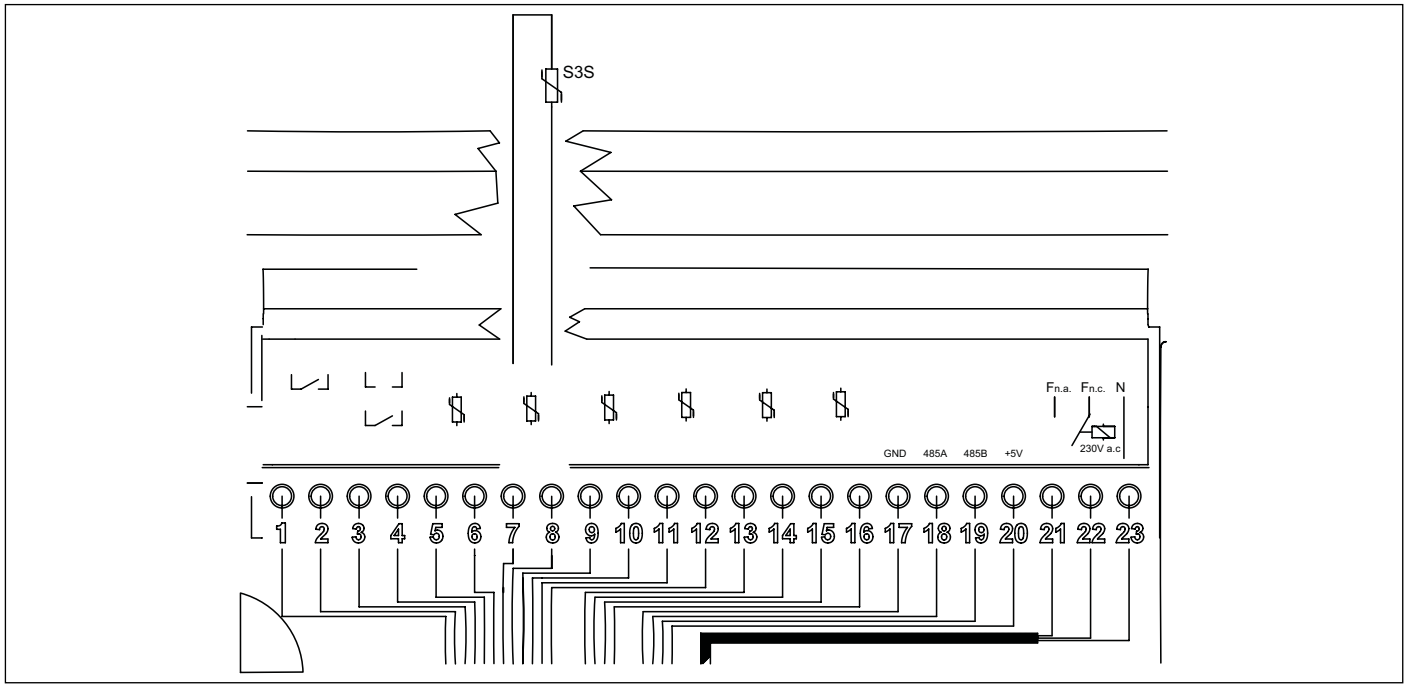


Fig. 21 Wiring diagram (detail) CTFS

Internal connections

DK: . . . . . Pressure transducer
FL: . . . . . Flow meter
SS: . . . . . DHW temperature OUT (NTC 10k Ohm B=3435)
S3S: . . . . . DHW temperature IN (NTC 10k Ohm B=3435)
SR1-SR2: . . . . . CH temperature probe (NTC 10k Ohm B=3435, doppia)
ASP: . . . . . Air pressure switch
VG: . . . . . Gas valve
P: . . . . . Boiler pump
MDV: . . . . . Electric deviating valve
CA: . . . . . Automatic filling valve
E: . . . . . Ignition/flame detection electrode
V: . . . . . Fan
CN_A-CN_M: . . Load/signal connectors
X2-X7: . . . . . Ground connectors

CONNECTIONS PERFORMED BY THE INSTALLER

1-2: . . . . . TA2 - Ambient thermostat 2
3-4: . . . . . OT or TA1 - Remote Control or ambient thermostat
5-6: . . . . . external probe (10K Ohm B=3977)
7-8: . . . . . Not available
9-10: . . . . . Solar water heater probe (PT1000)
11-12: . . . . . Solar collector probe (PT1000)
13-14: . . . . . Ambient probe 1 (10K Ohm B=3977)
15-16: . . . . . Ambient probe 2 (10K Ohm B=3977)
17-18-19-20: . . . 485 port for connection of additional boards
17: . . . . . GND
18: . . . . . A
19: . . . . . B
20: . . . . . +5V
21-22-23: . . . . . Programmable relay
21: . . . . . N
22: . . . . . F (NC)
23: . . . . . F (NO)

3.17.4 Wiring diagram for forced circulation solar system with combi boiler

Parameters setting

P03 : 1

P17 : 2

P18 : 1

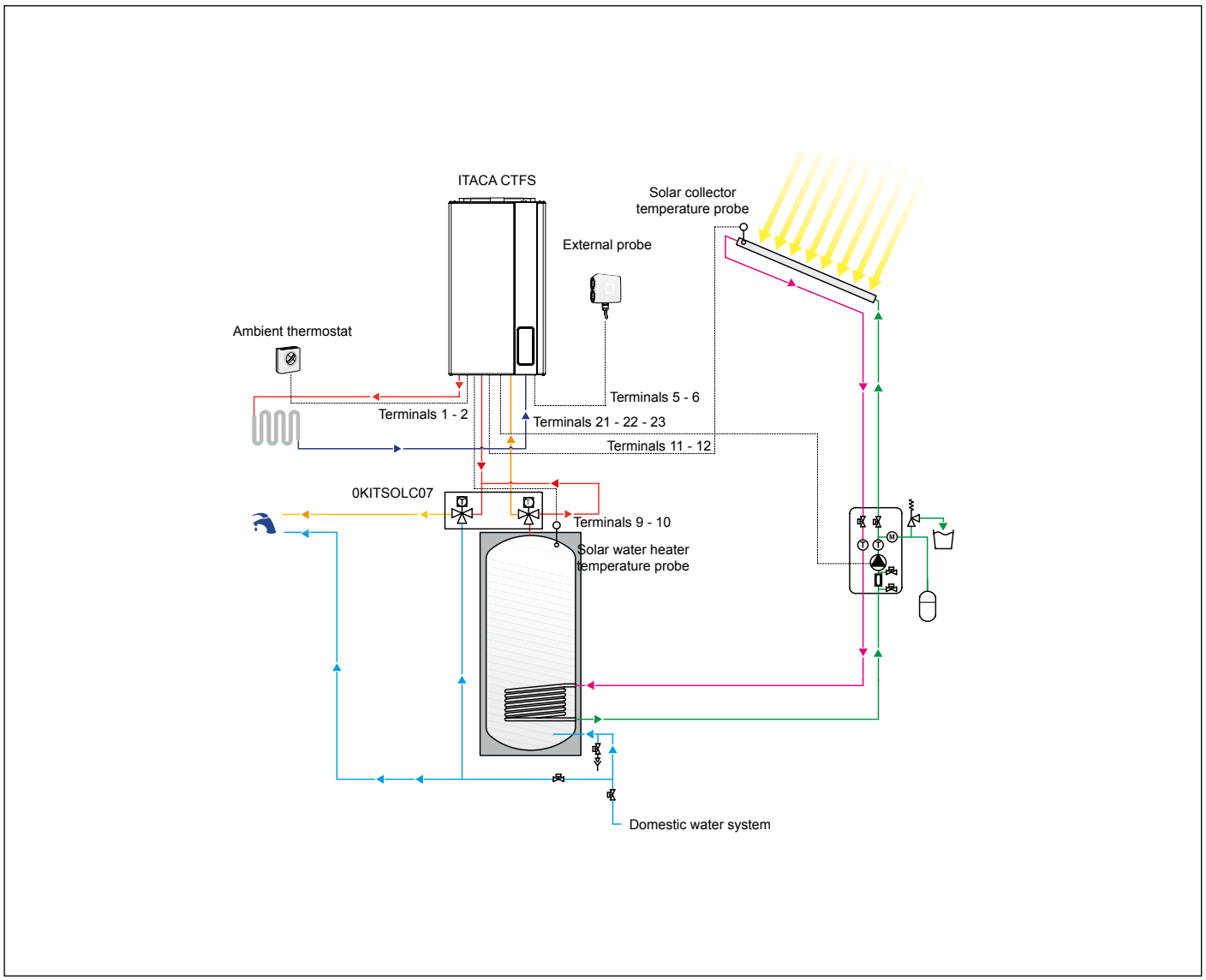


Fig. 22 Wiring diagram for forced circulation solar system with combi boiler

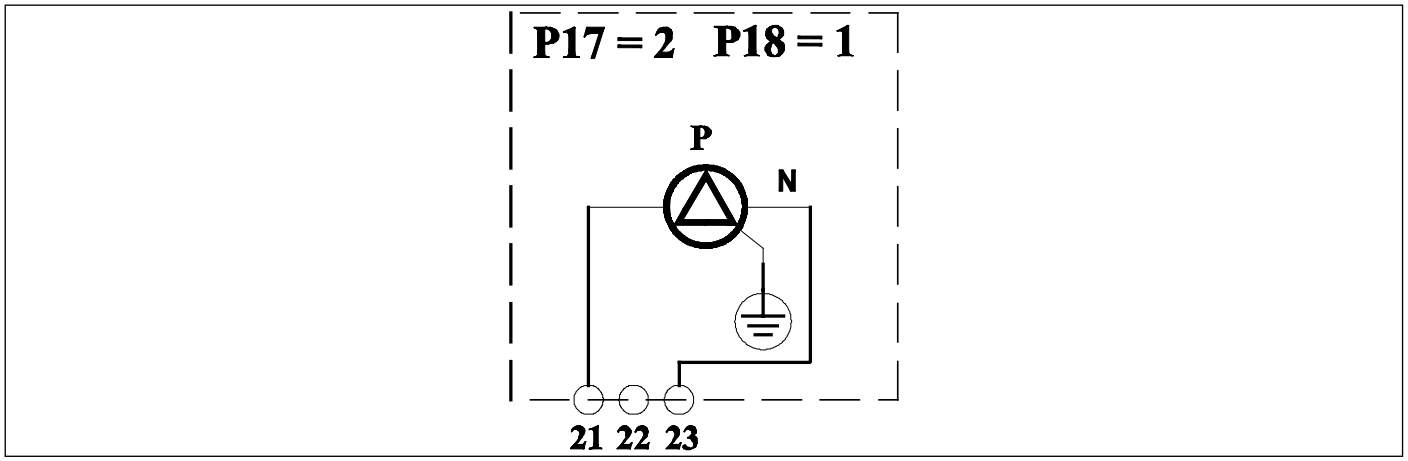


Fig. 23 Multifunction relay connecting diagram

3.17.5 Solar collector freeze protection function

Solar collector freeze protection function is enabled by setting parameter P24 = 1.

With this function, solar pump is activated as soon as solar collector probe detects a temperature of 4° C

3.17.6 Collector heat transfer function

This function prevents that solar collectors in stagnation state are exposed to high thermal stresses.

With the boiler in SUMMER, WINTER or CH ONLY mode, if the temperature read by solar collector probe is between 110°C and 115°C (editable with parameter P22) and the temperature measured by the solar water heater probe is below 93 °C, solar pump is enabled to fill water heater.

Solar pump operation is disabled as soon as solar collector temperature goes below 108 °C or solar water heater probe detects a temperature above 95°C.

3.17.7 Water heater cooling function

This function consists in cooling water heater down to the temperature value set by the user by transferring excess heat from the boiler to the solar collector.

With the boiler in SUMMER, WINTER or CH ONLY mode, if water heater temperature is 2°C higher than set-point temperature and collector probe temperature is 6°C lower than solar water heater probe temperature (editable with parameter P20), solar pump is enabled to cool water heater.

Function is interrupted as soon as water heater temperature reaches the set-point value set by the user, or when solar collector probe temperature is 3°C lower than solar water heater probe temperature (editable with parameter P21).

Function can be disabled with parameter P26 (P26 = 1 enabled; P26 = 0 disabled).

3.17.8 Solar mode operation and failure signal

When solar pump is active, symbol  appears on the display.

If solar collector probe or solar water heater probe are faulty, error codes **E24** and **E28** will be displayed, respectively. Solar pump will be turned off.

3.17.9 Wiring diagram for natural circulation solar system with combi boiler

Parameters setting

P03 : 1

P17 : 2

P18 : 0

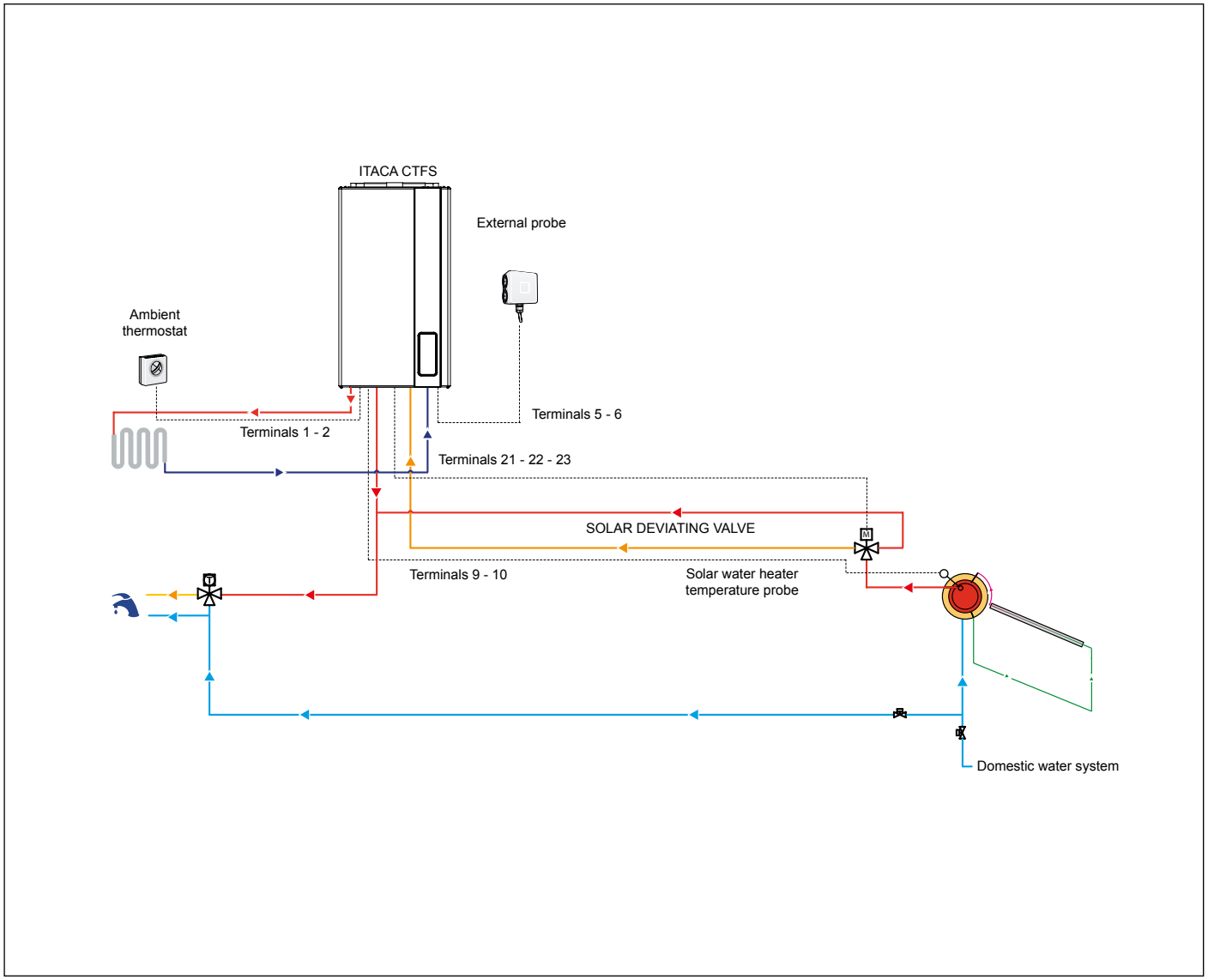


Fig. 24 Wiring diagram for natural circulation solar system with combi boiler

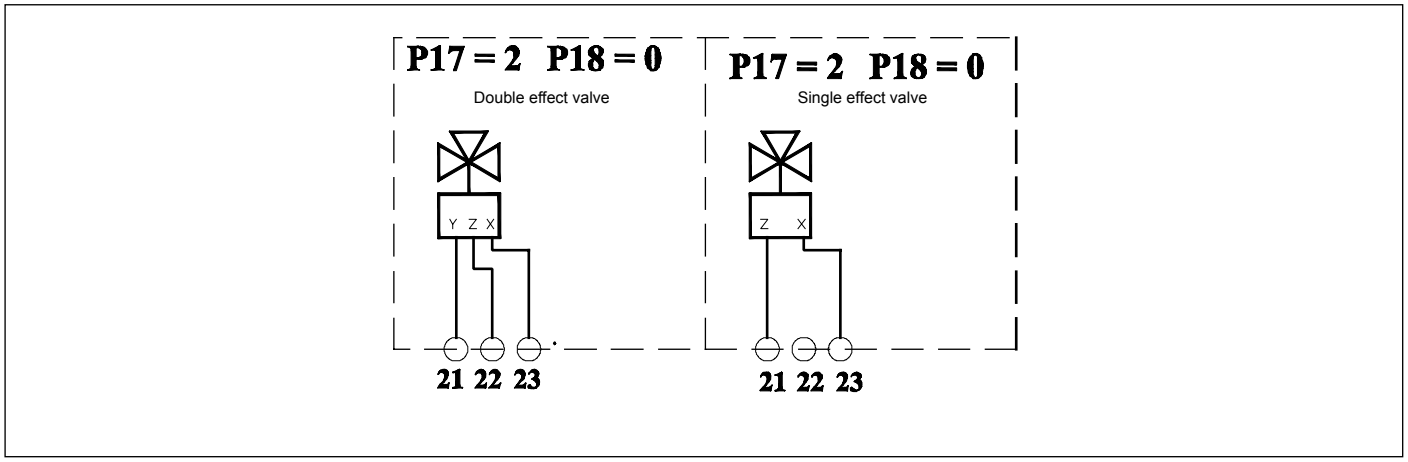


Fig. 25 Multifunction relay connecting diagram (Z = neutral; Y = to boiler; Z = to collector)

3.17.10 Multifunction relay setting diagrams

The control panel features a multifunction relay, to be set through the parameter **P17-TSP17**

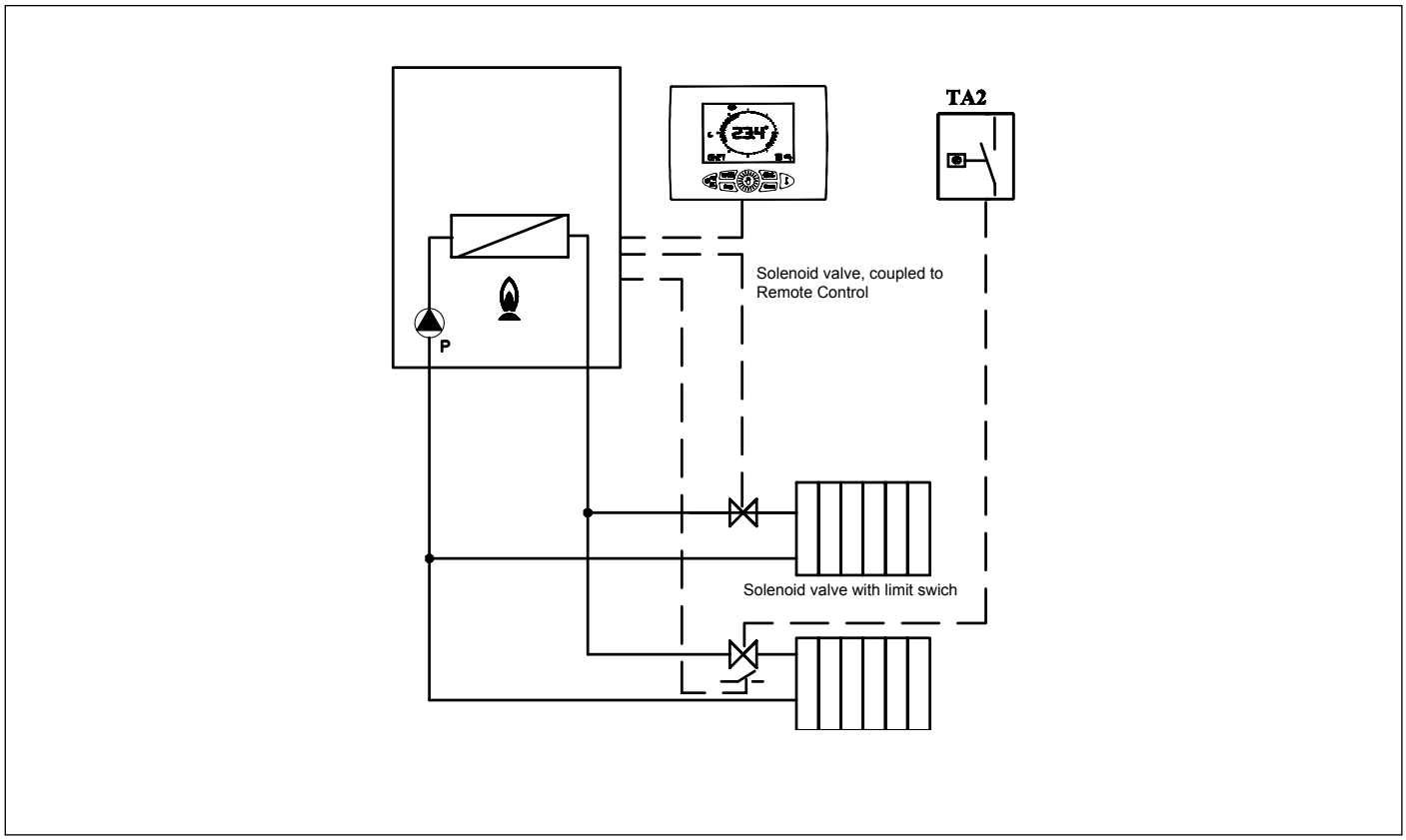


Fig. 26 Relay with remote control and TA2

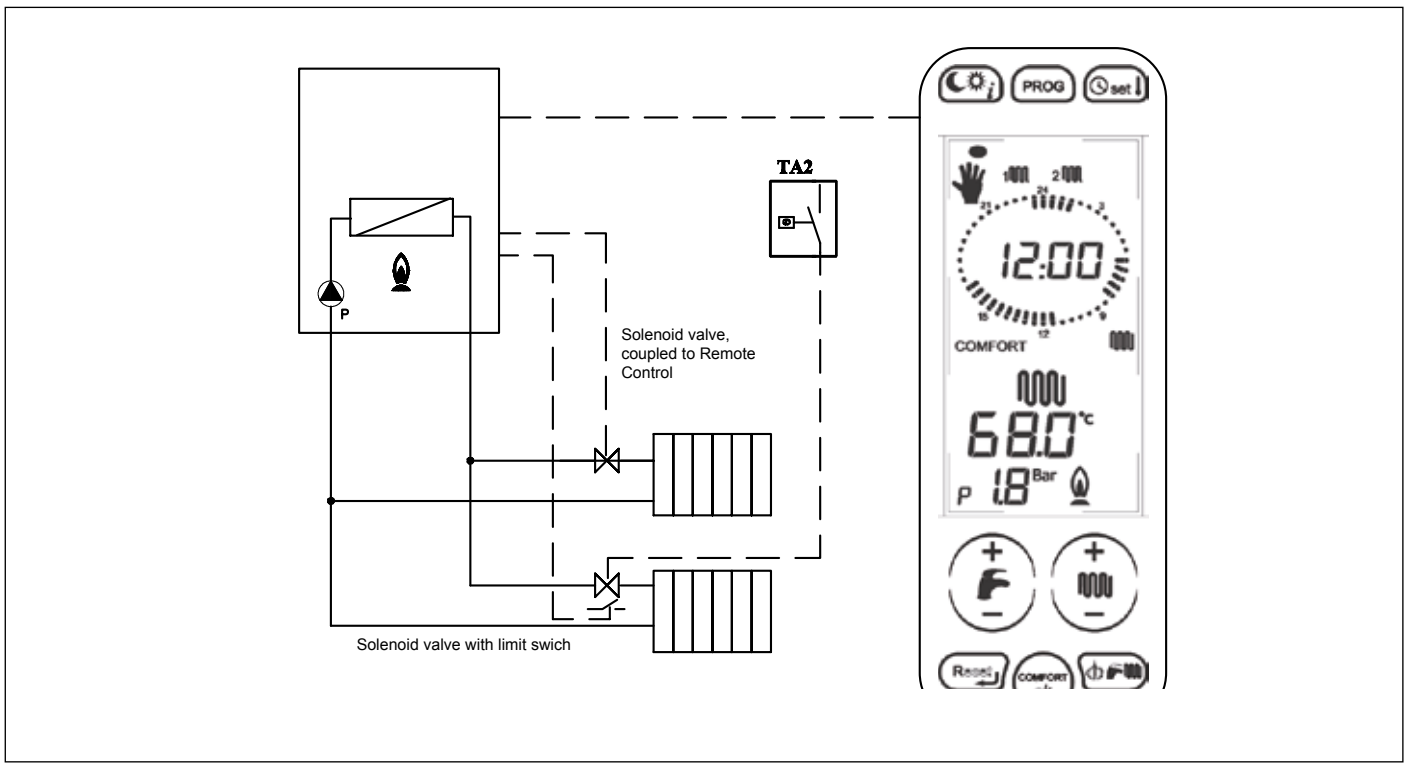


Fig. 27 Relay with interface and TA2

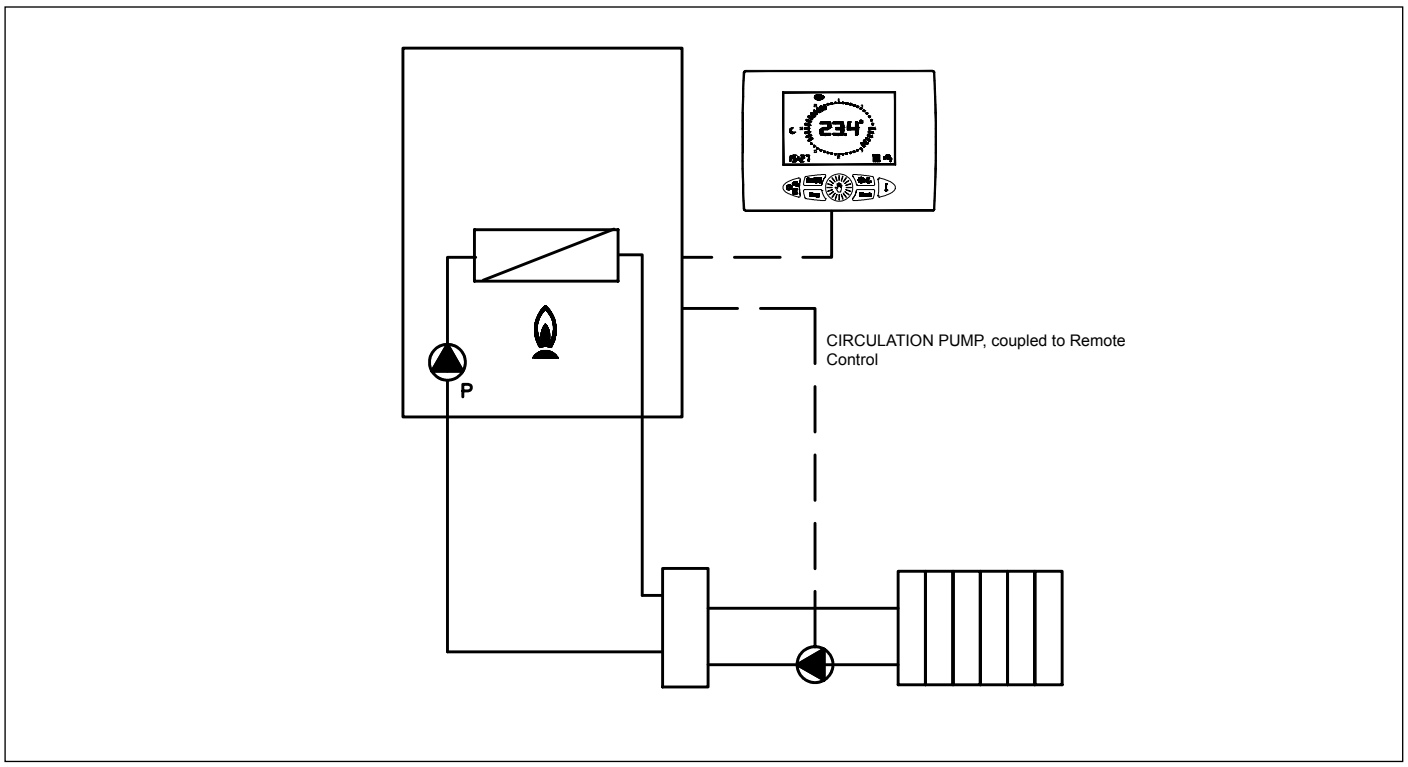


Fig. 28 Relay with remote request (P17=1)

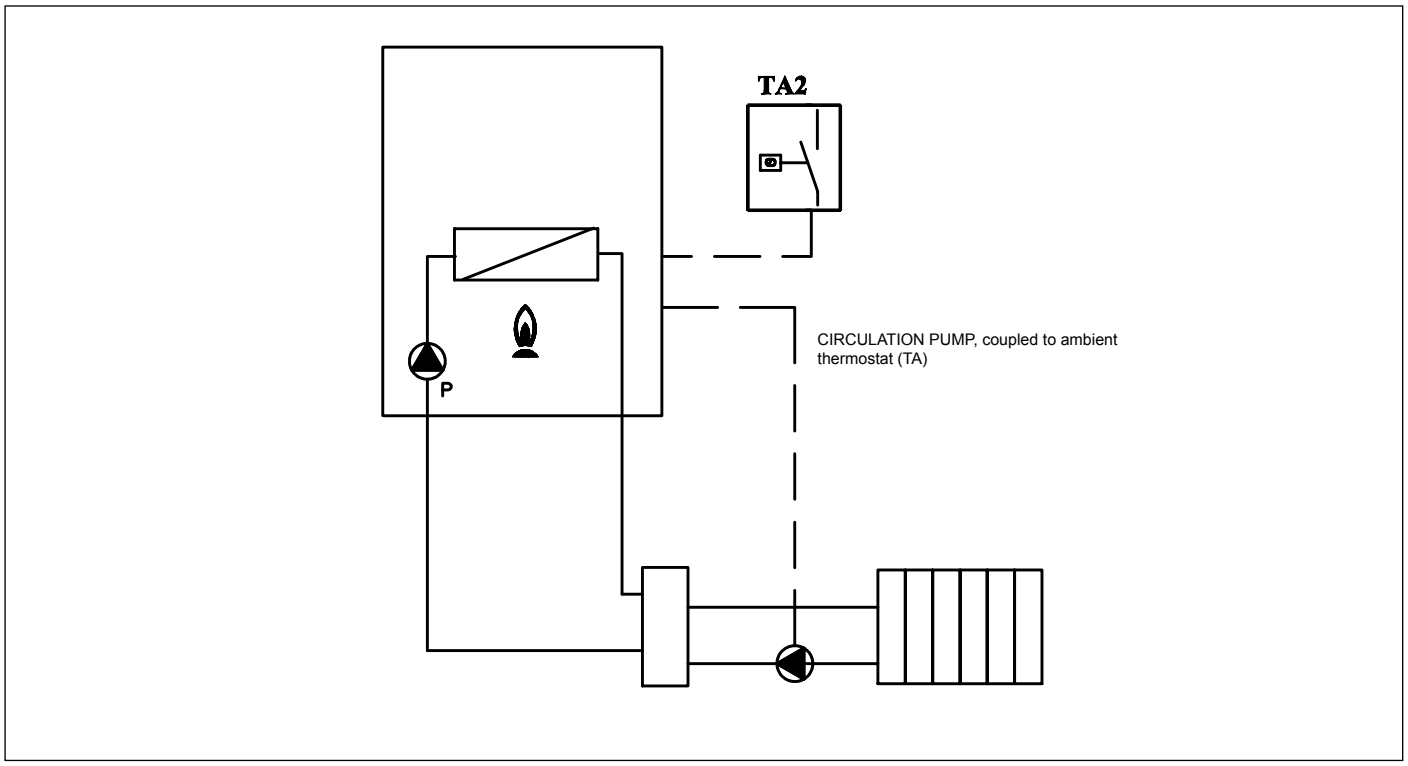


Fig. 29 Relay with TA2 request (P17 = 3)

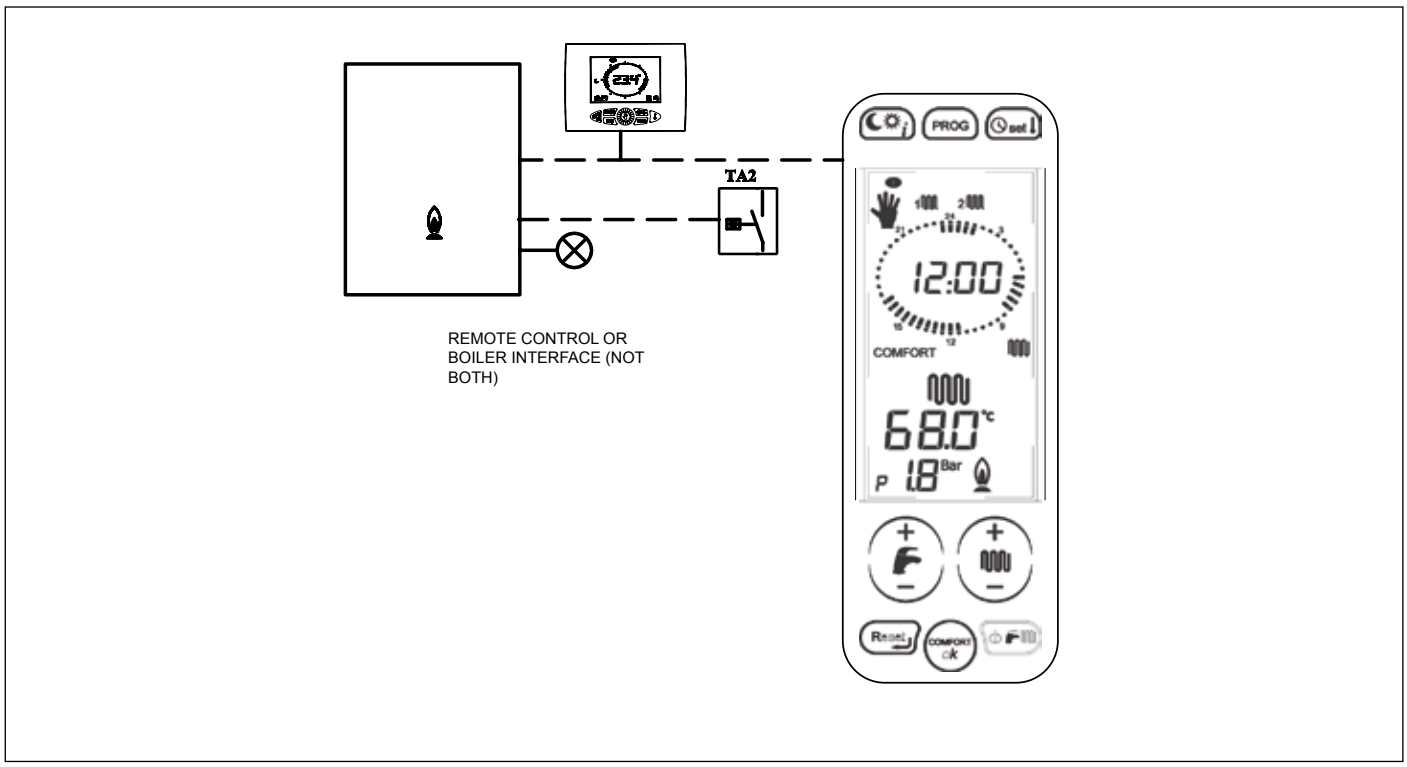


Fig. 30 Relay with alarm alert (P17 = 0)

DIAGRAM PARAMETER SETTING (SOLAR PLANT EXCLUDED)	P17
Error signalling relay	0
Relay controlled by TA1 or by the Remote Control	1
Relay controlled by TA2 or by the interface	3

Table 15 Parameters setting

3.17.11 Relationship between temperature and nominal resistance of all NTC probes.

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	1767
80	1670	1578	1492	1412	1336
90	1266	1199	1137	1079	1023

Table 16 Relationship between "Temperature and Nominal resistance" for temperature probes

3.18 Adaptation to other gas types and burner adjustment

CAUTION

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.

3.18.1 Replacing the nozzles

- Disconnect the boiler from the electric power supply.
- Remove boiler outer front panel (see Fig. 31 Front casing opening).

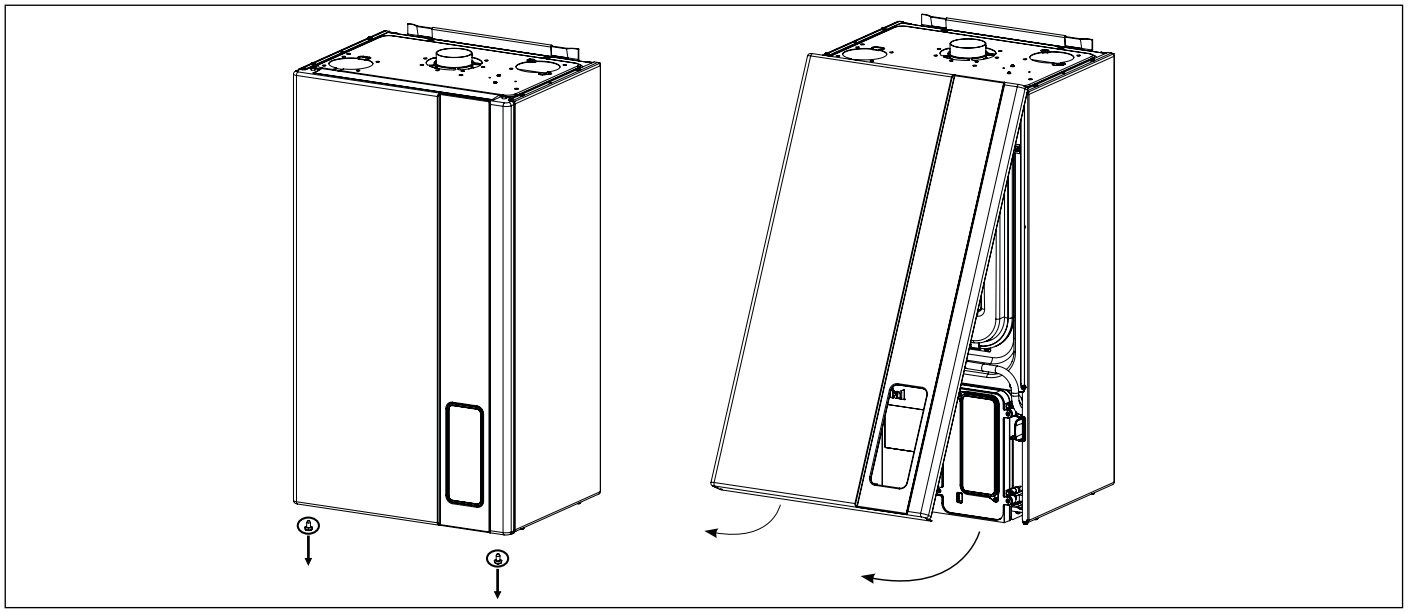


Fig. 31 Front casing opening

- Remove the front panel of the combustion chamber, and remove expansion vessel (see Fig. 32 Expansion vessel mounting bracket removal and Fig. 33 Expansion vessel bracket).

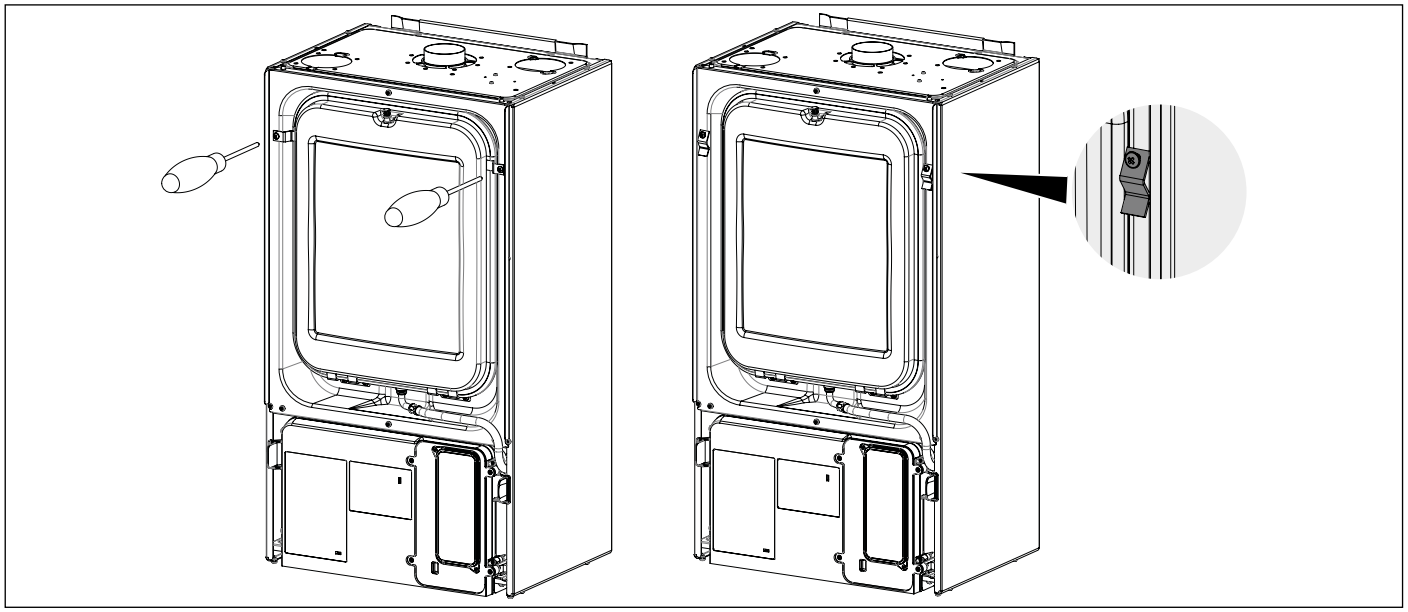


Fig. 32 Expansion vessel mounting bracket removal

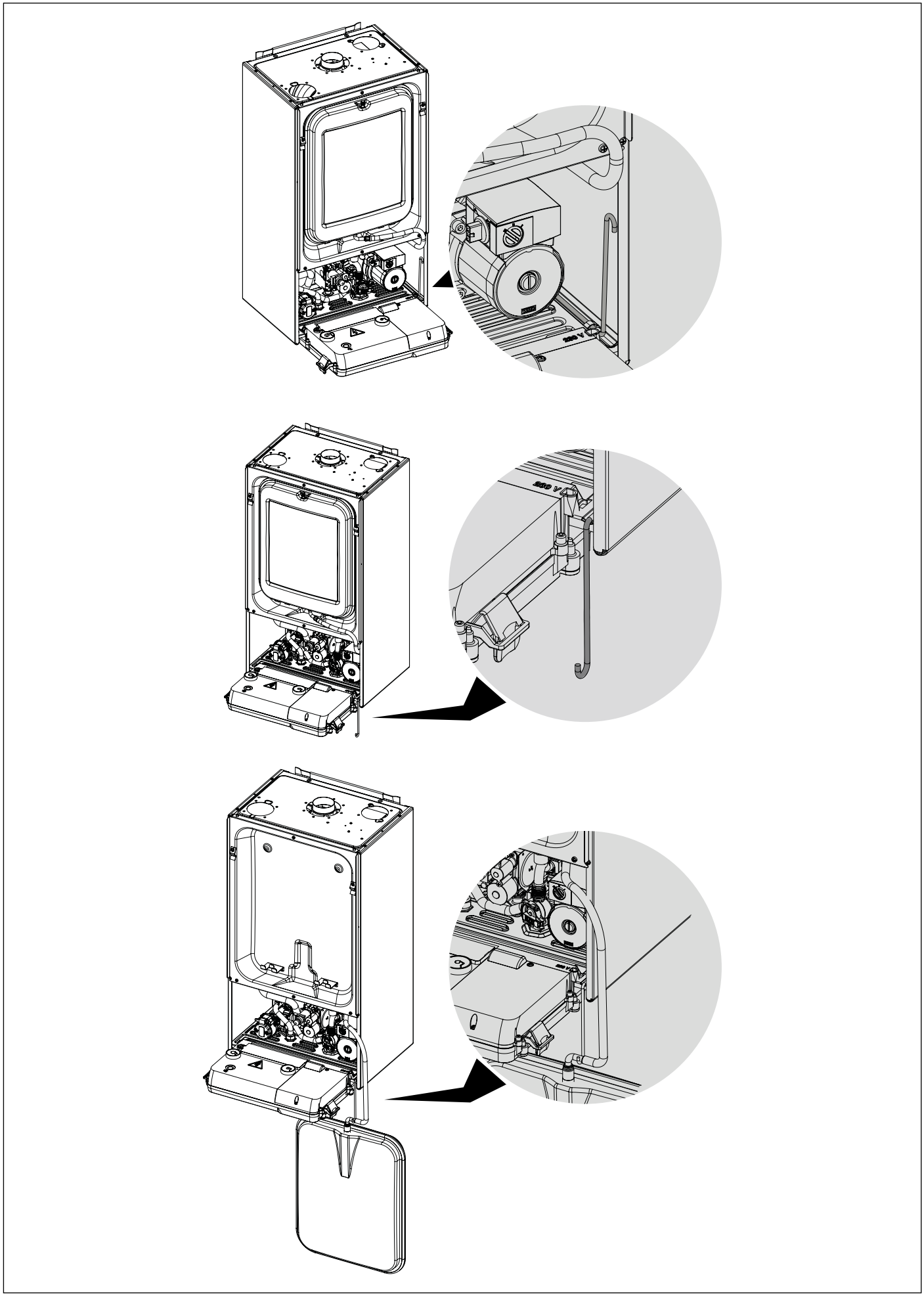


Fig. 33 Expansion vessel bracket

- Remove the front panel of the combustion chamber (see Fig. 34 Combustion chamber removal).

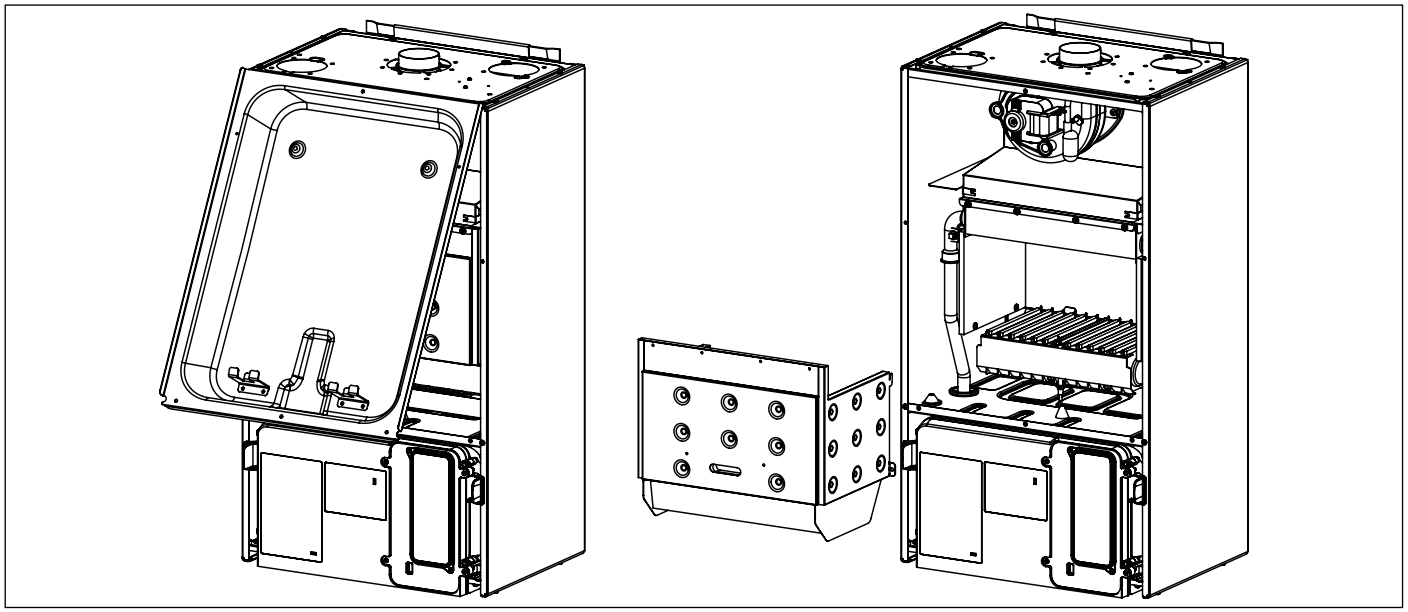


Fig. 34 Combustion chamber removal

- Remove the main burner.
- Remove nozzles from main burner replacing them by new gas type correct diameter ones (see *Operating data* on page 38).

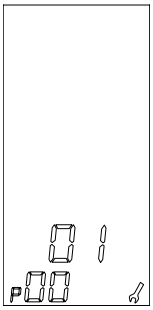
ATTENTION

The copper gaskets must be installed.

- Reinstall the main burner.
- Change **P0-TSP0** parameter value according to the boiler heat output (see Table 17 P0-TSP0 parameter setting).

CH programme mode

1. Press the Reset and **ON** buttons at the same time and keep them pressed for 3 seconds.
2. Parameters can be scrolled by pressing buttons **+/- CH**. As soon as you reach the one to be modified, press **OK**.
3. The wrench symbol turns on and indicates you can edit the parameter value.
4. The parameter setting can be modified with the **+/- CH** buttons.
5. To confirm modification you must press button **Ok**.
6. To exit the editing mode without actually changing the parameter, press button Reset.



Boiler setting	Parameter P0-TSP0 value
24 kW LPG	0
24 kW Methane	1
28 kW LPG	2
28 kW Methane	3
32 kW LPG	4
32 kW Methane	5

Table 17 P0-TSP0 parameter setting

- Adjust the gas valve (see *Gas valve setting* on page 80).

3.18.2 Gas valve setting

Maximum heat output adjustment

- Check the flow pressure value (see *Operating data* on page *38*).
- Remove plastic cap **C** (see Fig. 35 Gas valve modulation coil) at the top of the modulation coil, protecting the pressure regulator adjuster screws.
- Connect a pressure gauge to pressure testing point **V** (see Fig. 36 Pressure testing point).
- Select the "WINTER" mode on the control panel pressing button n times until symbol is displayed.
- Start the flue cleaning function by pressing button tasto Reset until symbol simbolo stops flashing. The boiler starts operating at maximum heat output.
- turn nut **K**CLOCKWISE (see Fig. 37 Gas valve setting) the pressure at nozzles increases, by turning ANTICLOCKWISE the pressure at nozzles decreases.
- for LPG operation, turn brass nut **K** fully CLOCKWISE.

Minimum heat output adjustment

- Disconnect modulation coil from electric wiring.
- Switch on the burner and check that the "MINIMUM" pressure value matches the value indicated (see *Operating data* on page *38*).
- Adjust pressure as follows: hold nut K with a 10 mm wrench, then turn screw **W** CLOCKWISE to increase pressure, COUNTER CLOCKWISE to decrease it (see Fig. 37 Gas valve setting).
- Re-connect the electrical wiring to modulation coil.

Final settings

- After leaving the flue cleaning function (see *Flue cleaning function* on page *53*) make sure the burner works correctly and silently.
- Check once again minimum and maximum gas pressures to gas valve.
- Adjust as necessary.
- Fit on plastic protective cap **C**.
- Close gas pressure check openings.
- There are no gas leaks.

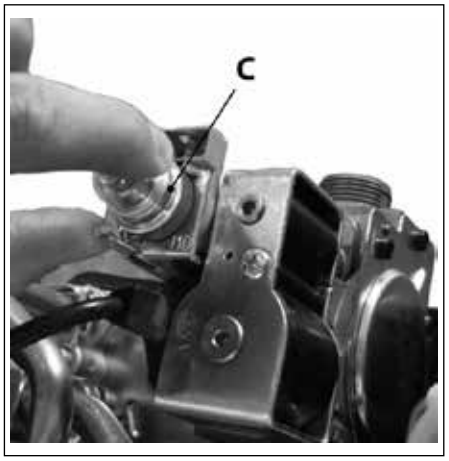


Fig. 35 Gas valve modulation coil

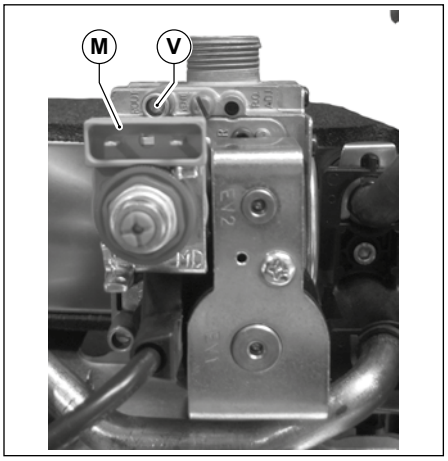


Fig. 36 Pressure testing point

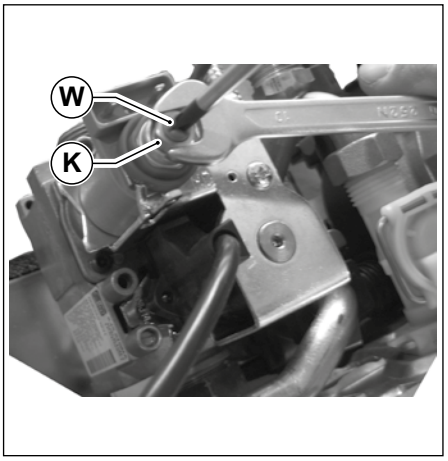


Fig. 37 Gas valve setting

4. Testing the boiler

4.1 Preliminary checks

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

- the flue gas venting duct and the relative terminal are installed in conformity with the instructions: **there must be no leakage of combustion by-products from any of the gaskets**.
- the supply power to the boiler is 230 V – 50 Hz.
- The 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; 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 3-bar safety valve is not stuck.
- There are no fuel gas leaks.
- The pump has not seized.

CAUTION

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

CAUTION

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

The Manufacturer recommends the user to have the boiler serviced and repaired by a qualified Service Centre.

Appropriate maintenance will keep the boiler working in optimum conditions, ensuring environmental protection and total safety for persons, animals and/or property.

The boiler must be serviced at least once every year.

CAUTION

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

5.1 Maintenance schedule

Maintenance operations include check and cleaning procedures. In particular:

Inspections and checks:

- Check general integrity of the boiler.
- Check boiler and network gas supply for leakage.
- Check gas supply pressure to boiler.
- Check minimum and maximum gas pressures to boiler nozzles.
- Check boiler ignition sequence.
- Check the condition and seal integrity of the flue gas venting ducts.
- Check air pressure switch 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 valve.
- Check expansion vessel filling pressure.
- Check water pressure switch efficiency.

Cleaning:

- Clean the general interior of the boiler.
- Clean the gas nozzles.
- Clean the air intake and flue gas venting ducts.
- Clean the heat exchanger.

Also check:

- Boiler room suitability.
- Diameter and length of flue gas system ducts.
- Boiler installation in accordance to this "Installation use and maintenance" manual instructions.

CAUTION

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

6.1 Troubleshooting

BOILER STATUS	MALFUNCTION	POSSIBLE CAUSE	WHAT SHOULD THE USER DO	WHAT SHOULD QUALIFIED PERSONNEL DO
E01*	Burner does not ignite.	Gas supply failure.	Check for gas presence. Check for gas presence. Check gas supply cock or gas network safety valve intervention.	
		Gas valve is disconnected.	Contact a qualified installer	Reconnect it.
		Gas valve is faulty.	Contact a qualified installer	Replace it.
		The board is faulty.	Contact a qualified installer	Replace it.
	Burner does not ignite: no spark.	Ignition electrode is faulty.	Contact a qualified installer	Replace electrode.
		Ignition transformer is faulty.	Contact a qualified installer	Replace ignition transformer.
		Electronic board does not ignite. It is faulty.	Contact a qualified installer	Replace electronic board.
	Burner ignites for a few seconds and goes off.	Electronic board does not detect flame: inverted phase and neutral.	Contact a qualified installer	Verify correct neutral and phase connection.
		Detection electrode cable is interrupted.	Contact a qualified installer	Reconnect or replace the cable.
		Flame detection electrode is faulty.	Contact a qualified installer	Replace electrode.
		Electronic board does not detect flame: it is faulty.	Contact a qualified installer	Replace electronic board.
		Ignition heat input setting is too low.	Contact a qualified installer	Increase it.
		Minimum heat input is not set correctly.	Contact a qualified installer	Check burner setting.
E02*	Flow temperature exceeded the max. allowed value.	Circulation pump is faulty.	Contact a qualified installer	Replace it.
		Circulation pump is seized.	Contact a qualified installer	Check pump electrical connection.
E03*	Air pressure switch triggering.	Flue gas pressure switch is faulty.	Contact a qualified installer	Check pressure switch: replace it if faulty.
		The silicone pipes are disconnected or damaged.	Contact a qualified installer	Connect or replace silicone pipes.
		Air intake or flue gas venting flow is not correct.	Contact a qualified installer	Check air intake/flue gas vent ducts: clean or replace as necessary.
		Fan is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Fan is faulty.	Contact a qualified installer	Replace it.
		The board is faulty.	Contact a qualified installer	Replace it.
E04**	CH system water pressure is low.	Possible water leaks in the heating system.	Check the system.	
		Pressure transducer is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Pressure transducer is faulty.	Contact a qualified installer	Replace it.

BOILER STATUS	MALFUNCTION	POSSIBLE CAUSE	WHAT SHOULD THE USER DO	WHAT SHOULD QUALIFIED PERSONNEL DO
E05**	Flow probe failure	Flow probe is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Flow probe faulty.	Contact a qualified installer	Replace it.
E06**	DHW probe failure	DHW probe is electrically disconnected.	Contact a qualified installer	Reconnect it.
		DHW probe faulty.	Contact a qualified installer	Replace it.
E08	Automatic filling function failure.	System pressure is not enough for filling (not enough water inside the system or no water at all).	Restore system pressure.	
		Solenoid valve is obstructed.	Contact a qualified installer	Remove any obstruction inside the solenoid valve.
		Solenoid valve is faulty.	Contact a qualified installer	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 (model RTFS with external water heater, optional, and NTC probe).	Probe is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Probe is faulty	Contact a qualified installer	Replace it.
E23**	External probe failure	Probe is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Probe is faulty	Contact a qualified installer	Replace it.
E24**	Solar collector probe failure.	Probe is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Probe is faulty	Contact a qualified installer	Replace it.
E27**	Solar valve probe failure.	Probe is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Probe is faulty	Contact a qualified installer	Replace it.
E28**	Solar water heater probe failure.	Probe is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Probe is faulty	Contact a qualified installer	Replace it.
E31**	Remote Control connection failure (only shown on Remote Control display)	The Remote Control is not connected to the boiler board.	Contact a qualified installer	Reconnect it.
		Remote control faulty.	Contact a qualified installer	Replace it.
		Boiler board is faulty.	Contact a qualified installer	Replace it.
E35**	Safety Thermostat triggering to protect the mixed "zone 2" (with zone kit "0KITZONE05" installed, only).	Mixer valve is faulty.	Contact a qualified installer	Replace it.
		Thermostat is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Thermostat is faulty.	Contact a qualified installer	Replace it.

BOILER STATUS	MALFUNCTION	POSSIBLE CAUSE	WHAT SHOULD THE USER DO	WHAT SHOULD QUALIFIED PERSONNEL DO
E36**	Flow probe failure on one of the installed zones (with zone kit “0KITZONE05” installed, only).	Probe is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Probe is faulty	Contact a qualified installer	Replace it.
E41**	No communication between board and peripheral devices (panel interface and/or zone/ solar boards).	Interface display is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Zone/solar boards are disconnected.	Contact a qualified installer	Reconnect them.
		Interface display and/or zone/solar boards are faulty.	Contact a qualified installer	Replace them.
E42	Hydraulic system setting error.	Wrong boiler board or solar board setting parameters.	Contact a qualified installer	Check that the P17 and P18 parameter set values match with those specified on the reference tables.
E43	Zone Remote Control, or zones, configuration fault.	Wrong boiler board setting parameters.	Contact a qualified installer	Check that the P61 parameter set value matches with that specified on the reference tables.
E44	Ambient probe 1 failure	Disconnected or short-circuited probe.	Contact a qualified installer	Reconnect it or replace it.
E45	Ambient probe 2 failure	Disconnected or short-circuited probe.	Contact a qualified installer	Reconnect it or replace it.
E46	Pressure transducer failure	Pressure transducer is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Pressure transducer is faulty.	Contact a qualified installer	Replace it.
E49	Communication error between boiler board and touch screen.	The interface is faulty.	Contact a qualified installer	Replace interface.
E51	Shut-down due to safety circuit hardware fault	Boiler electronic board is faulty.	Contact a qualified installer	Check boiler electronic board.
E52				
E53				
E72	Air pressure switch recognition failure	Air pressure switch is electrically disconnected.	Contact a qualified installer	Reconnect it.
		Air pressure switch is faulty.	Contact a qualified installer	Replace it.
E76	Gas valve modulation coil is not working.	Electronic board and gas valve link is electrically disconnected or faulty.	Contact a qualified installer	Check connection to the gas valve.
		Gas valve modulation coil is faulty.	Contact a qualified installer	Replace gas valve modulation coil.
E98	The max. number of resets from the boiler interface has been reached.	The user has reached the max. number of resettable errors from boiler.	Press RESET button	
E99	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.	Press RESET button	

* 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 corrected

*** errors that can be reset only by a qualified Service Centre

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