

FORMENTERA
CTFS/RTFS/RBTFS 24-28-32
CTN/RTN/RBTN 24-28

INSTALLATION, USE AND MAINTENANCE



EN

Translation of the original
instructions (in Italian)



Dear Sirs,
thank You for choosing and buying one of our products. Please read these instructions carefully in order to properly install, operate, and maintain the product.



WARNING

- **Boilers shall be installed by an authorised company under the requirements set forth by the prevailing rules, in full compliance with the prevailing regulations and standards.**
 - **Anyone entrusting installation to an unqualified installer will be subject to administrative sanctions.**
 - **Boilers must be maintained by qualified personnel only, under the requirements set forth by the prevailing rules.**
-

We hereby inform you 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 the products and/or its components as deemed necessary, in any moment and without prior notice.

This instruction manual is available in two languages, Italian and English, without prejudice to the prevalence of Italian language in case of differences in translation and/or dispute on construction of the text.

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, make sure that its elements (clips, plastic bags, foam polystyrene etc.) are not left within the reach of children as they are potential hazard sources.

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.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.



WARNING

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

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

Incorrect and irregular maintenance can be a source of danger for people, animals and property.

The user is strongly advised to have the system serviced and repaired by qualified personnel, satisfying all prevailing law requirements, and trained to properly carry out these operations.

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



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.





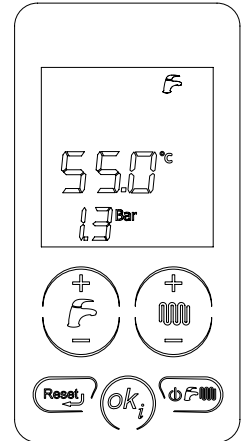
WARNING



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

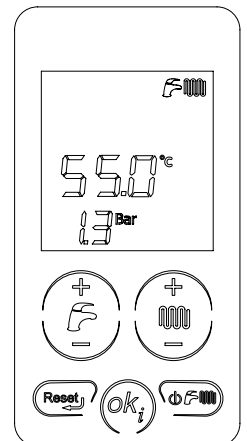
If any accessories have been fitted on the boiler, these instructions will not cover them. You will therefore have to refer to the full boiler instructions as well as to the specific instructions for the accessories.



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 CH function, press the  button until displaying the symbol : only the DHW function will be enabled.



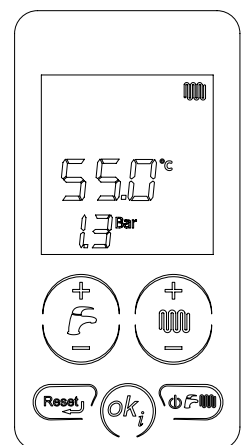
4. If you wish to activate both the heating and DHW functions, press the  button until displaying the symbol .



5. If you do not wish to activate the DHW function, press the  button until displaying the symbol : only the CH function will be enabled.
6. To set the domestic hot water temperature, press **DHW +/-** buttons.
7. To set the heating water temperature, press **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 

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



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1. Instructions for the user

1.1 Control panel

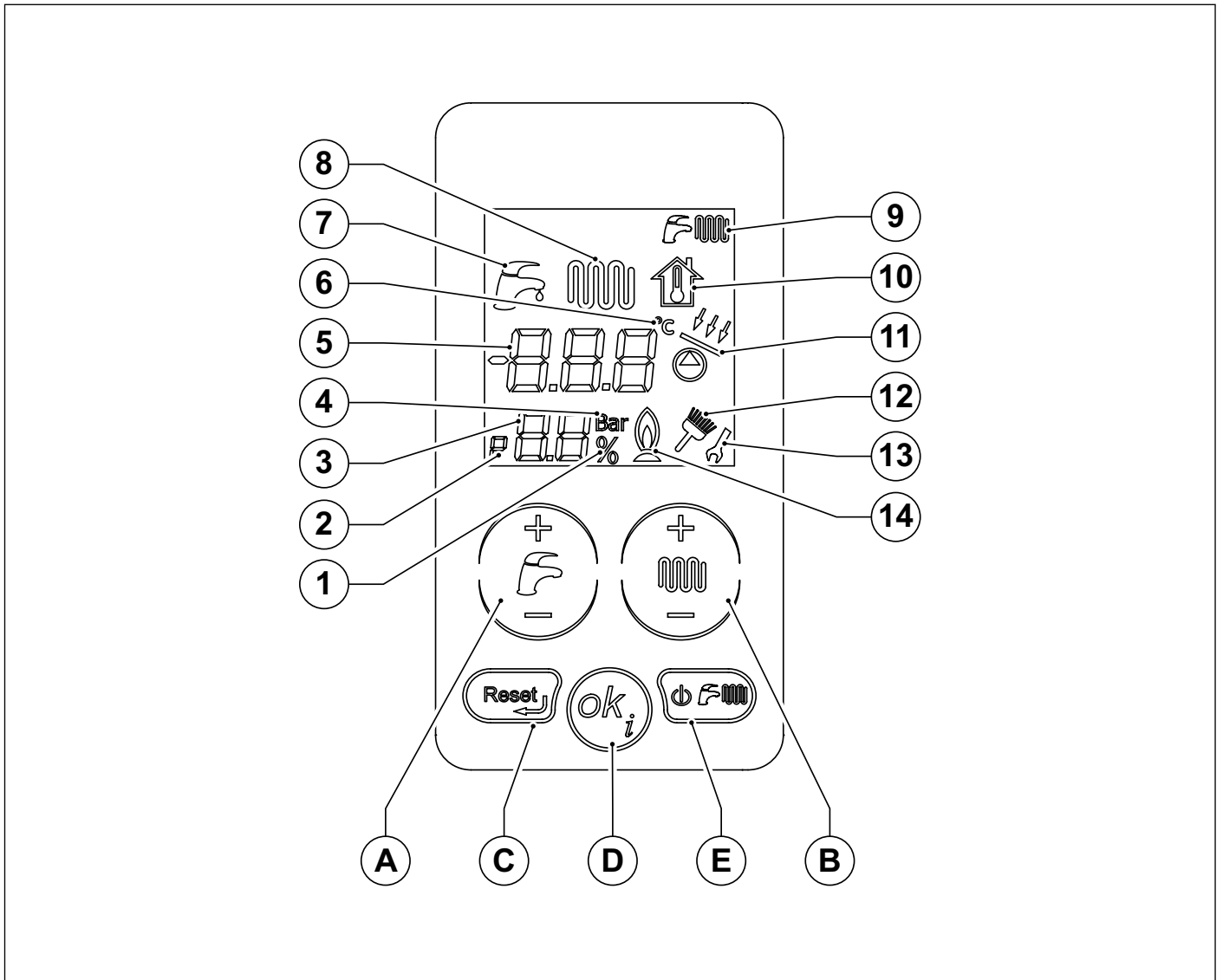















Fig. 1 Control panel

- A.** Domestic hot water settings (+/- HOT WATER).
- B.** Domestic heating settings and parameter settings (+/- HEATING).
- C.** Alarm reset and back to the starting page during parameter selection.
- D.** Parameter confirmation and information request.
- E.** Operating status selection.

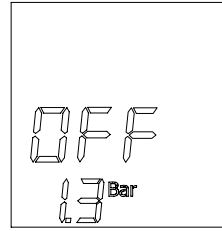
Touch the display in order to activate it. Unless an operation is performed, the display deactivates after 15 seconds.

Ref.	Symbol	Steady on	Flashing
1		Percentage indication	Not used
2		Indication of "parameter" inside the parameter menu	Not used
3		Displaying of the number of parameters, or of the system pressure, or of the burner power percentage	Not used
4	Bar	Indication of system pressure measurement unit	Not used
5		Displaying of temperature, parameter values and faults.	Not used
6		Indication of the centigrade degrees	Not used
7		A DHW request is present	Displaying of the DHW temperature set-point
8		A heating request is present	Displaying of the heating temperature set-point
9		CH and DHW functions enabled	Not used
10		Not used	Displaying of the calculated temperature set-point
11		Solar pump or solar valve active	Not used
12		Displaying of the flue cleaning function	Indicates that you are accessing the flue cleaning function.
13		During parameter setting, the 'wrench' symbol stays on until the value is confirmed.	Not used
14		Lit flame indication	Not used

1.2 Interpreting boiler status from display indications

1.2.1 Normal operation

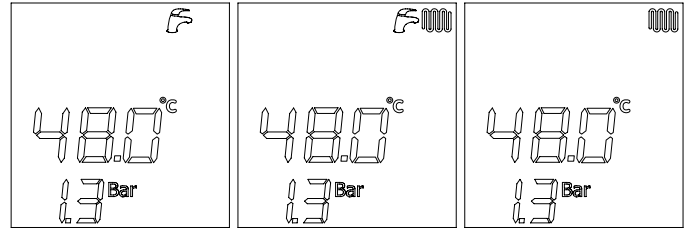
Boiler switch in OFF mode.



Boiler switch in SUMMER or WINTER mode or CH ONLY.

No active function.

The flow temperature and the heating system pressure are displayed.



SUMMER

WINTER

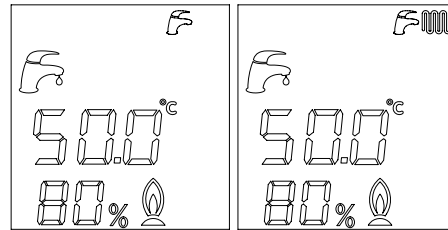
CENTRAL HEATING ONLY

Boiler switch in SUMMER or WINTER mode.

DHW function enabled.

DHW temperature is displayed.

(Only for models with DHW production).



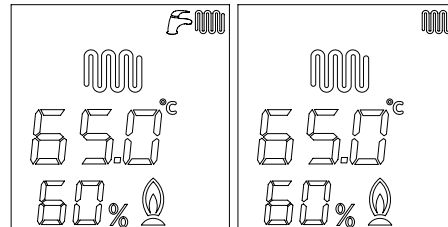
SUMMER

WINTER

Boiler switch in WINTER mode or CH ONLY.

CH function active.

The flow water temperature is displayed.



WINTER

CENTRAL HEATING ONLY

1.2.2 Malfunction

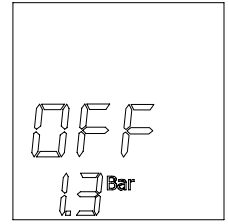
To identify any malfunctions, refer to paragraph *Troubleshooting* on page 87.

1.3 Selecting the operating mode

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

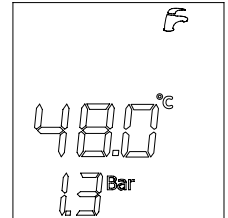
1. "OFF" operating status

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



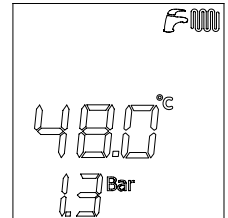
2. "SUMMER" operating status

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



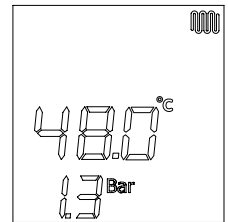
3. "WINTER" operating status

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



4. "CH ONLY" operating status

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



1.4 Adjusting heating and DHW temperature

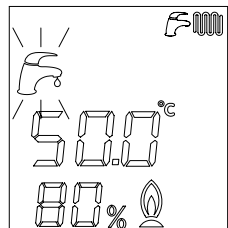
Press button **+/- DHW** to select the desired DHW temperature.

During selection,  icon will flash.

In the phase in which the icon is flashing, only the buttons to adjust the 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.



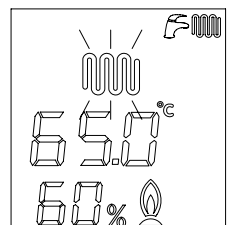
Press **CH +/-** button to select the desired flow water temperature.

During selection,  icon will flash.


In the phase in which the icon is flashing, only the buttons to adjust the temperature are enabled.


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

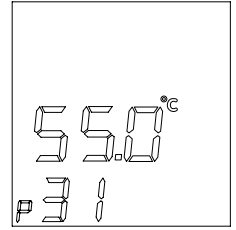
After this time, value is stored and display standard operation will be restored.



1.5 Parameter display


Press  to scroll the different parameter values.

You can quit this function at any time by simply pressing the  button.
To find the meaning of all parameters, see *TSP parameters* on page 58.



1.6 Failures that cannot be reset

The display shows the failure based on the corresponding error code (see *Troubleshooting* on page 87).

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

If failures cannot be reset but are of the self-resettable type, no key 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 interface is enabled and after 15 seconds is disabled, unless a button is pressed.




1.7 Resume boiler function

The display shows the failure based on the corresponding error code (see *Troubleshooting* on page 87).

Some failures can be reset through the  key, while some others are self-resettable.

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

The only active key you can press is the  key.

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

The interface is enabled and after 15 seconds is disabled, unless a button is pressed.




1.8 Boiler operation

1.8.1 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 shut-off cock.
- Turn the master switch installed ahead of the boiler to ON.
- The display turns on and indicates the function currently active (see *Interpreting boiler status from display indications* on page 11).
- Select boiler operating mode by pressing  button on the touch-screen: OFF, SUMMER, WINTER, CH ONLY (see *Selecting the operating mode* on page 12).
- Set desired CH temperature (see *CH function* on page 14).
- Set desired DHW temperature (see *DHW function* on page 14).
- Set the desired room temperature on the ambient thermostat inside the home (if installed).



WARNING


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


Beware that even by following this procedure, the boiler might still experience some starting difficulties and shut down once or twice. Press the RESET button to restore boiler operation.

1.8.2 CH function

To set the water temperature for central heating, press the **+/- HEATING** buttons.


The CH temperature setting range is from +35 °C to +78 °C.

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 waiting time between one switching on of the boiler and another, in order to avoid the boiler coming on and off when in central heating mode, is between 0 and 10 minutes (4 by default), which can be changed with parameter **P11**.

Should water temperature in the system fall below set minimum value, between 35°C and 78°C (default value 30°C) to be edited with the **P27** parameter, the waiting time is reset and the boiler re-ignites.


The burner ON symbol  shows while the burner is operating.

1.8.3 DHW function

The DHW production function is enabled on the CTFS/CTN models and on RTFS/RTN/RBTFS/RBTN models with external water heater (optional).

Boiler electronics always gives priority to DHW over CH supply.

To set the domestic hot water temperature, press **DHW +/-** buttons.

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.

CTFS/CTN models

For CTFS/CTN models, DHW temperature may be set within a range from +35 °C to +57 °C.



WARNING

A flow limiter is installed within the boiler, which limits DHW output flow rate.

This limit is: 10 litres per minute for model CTFS/CTN 24; 13 litres per minute for model CTFS/CTN 28 and 14 litres per minute for model CTFS 32.

Models RTFS/RTN/RBTFS/RBTN

On RTFS/RTN/RBTFS/RBTN models with external water heater (optional) and water heater temperature probe (optional, supplied by the manufacturer; included in the standard supply for RBTFS/RBTN model), temperature range is between 35 °C and 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/RTN/RBTFS/RBTN models with external water heater (optional) fitted with a temperature probe (optional, supplied by the manufacturer; included in the standard supply for RBTFS/RBTN model), 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.

1.8.4 Freeze protection function

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



DANGER

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

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



WARNING

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

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

1.8.4.1 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.

1.8.4.2 DHW plate exchanger freeze protection function

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 anti-freeze mode is still present and the flow temperature is below +60°C. The pump continues to operate even if the boiler shuts down.

1.8.4.3 Water heater freeze protection function (RTFS/RTN/RBTFS/RBTN)

In RTFS/RTN/RBTFS/RBTN models with external boiler (optional) and boiler sensor (optional, supplied by manufacturer; standard for RBTFS/RBTN) the anti-freeze function also protects the boiler.

When water heater 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.

During the water heater anti-freeze operation the temperature detected by the flow probe is constantly checked, and in case it reaches +60°C the burner is switched off.

The burner is switched on again if the operation request in anti-freeze mode is still present and the flow temperature is below +60°C. The pump continues to operate even if the boiler shuts down.

1.8.5 Anti-seize function

If the boiler remains inactive and connected to the power mains, the circulation pump and the deviating valve (if any) 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.

1.8.6 Timed post-circulation function

After each central heating, DHW or freeze protection request, the pump continues to be powered for 30 seconds.

If a new central heating, DHW or freeze protection request is received during this period, the post-circulation function is cancelled in order to fulfil the request.

1.8.7 Operation with external probe (optional)

Boiler can be connected to a probe measuring the external temperature (optional - not compulsory, supplied by the manufacturer)

Once the external temperature value is known, the boiler will automatically adjust the heating water temperature: increasing it as the external temperature decreases and decreasing it as the external temperature increases. This will both improve room comfort and reduce fuel consumption. 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.

With an external sensor, the +/- HEATING buttons no longer set the heating water temperature, and become buttons for changing the theoretical room temperature desired for the rooms to be heated.

During temperature setting, the fictitious ambient temperature  symbol flashes on the display and the value being set is shown.

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

For further details on "cruising temperature operation", refer to paragraph *Installation of the (optional) external probe and sliding temperature operation* on page 56.



WARNING

Only original external temperature probes supplied by the manufacturer must be used.

The use of non-original external probes, not supplied by the manufacturer, may affect the operation of the external probe itself and of the boiler.

1.8.8 Operation with (optional) remote control

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

- Boiler status selection.
- Ambient temperature selection.
- CH 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.

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



WARNING

Only use original Remote Control Units supplied by the manufacturer.

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

1.9 Boiler shut-down

The boiler shuts down automatically if a malfunction occurs.


To determine the possible causes of malfunction, see *Troubleshooting* on page 87.

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

1.9.1 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  button to restore burner operation: if, after two starting attempts, the boiler still fails to start and enters the shut-down mode again, contact a service centre or qualified personnel for maintenance.



WARNING

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

1.9.2 Shut-down due to overheating

Fault code **E02** is shown on the LCD display in the event of flow water temperature overheating. Contact a service centre or a qualified service engineer to carry out the maintenance.

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

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

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

1.9.4 Shut-down due to low water pressure

If "shutdown due to insufficient pressure in system" error **E04** starts flashing (indicating safety water pressure switch triggering), fill the system by opening the filler cock (see Fig. 2 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;
- Shut the filler cock and bleed any air out again, by opening the air bleeding valves on radiators.

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



DANGER

Make sure you close filler cock 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.

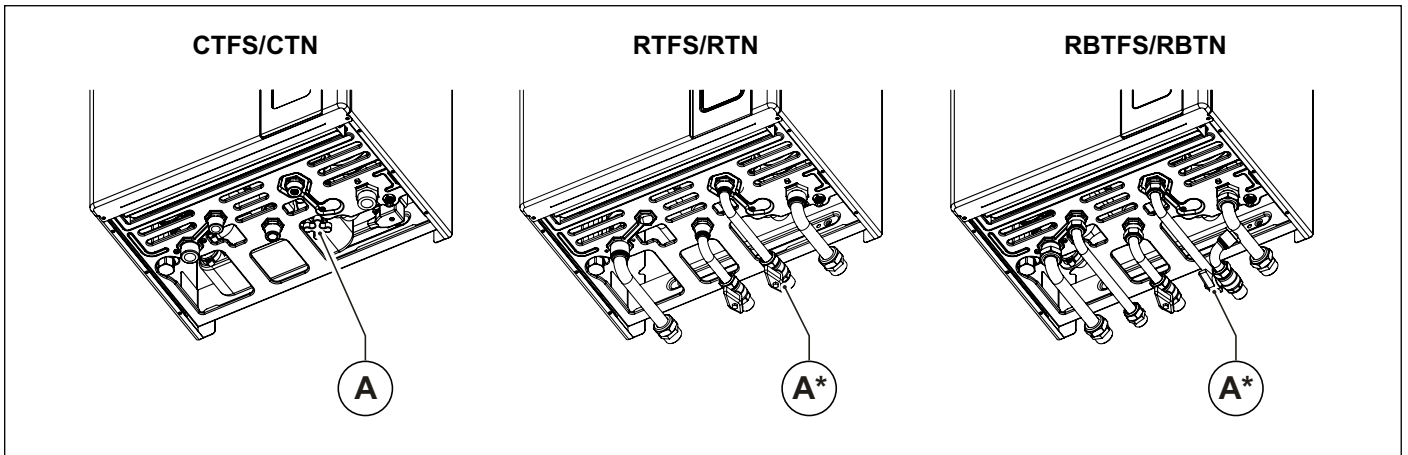


Fig. 2 Filler cock

(A*) optional

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

1.9.5 Alarm due to temperature probe malfunction

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

- **E05** for the CH probe: in this case the boiler does not work.
- **E06** for the DHW probe (CTFS/CTN models only); in this case the boiler works in heating mode only, whereas the DHW function is disabled.
- **E12** for the water heater probe (only models RTFS/RTN/RBTFS/RBTN); in this case, the boiler functions in central heating mode only, and the DHW function is disabled.



WARNING

In any case, contact a service centre or qualified personnel for maintenance.

1.9.6 Alarm due to (optional) Remote Control connection malfunction

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

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 and ignore the Remote Control settings.



WARNING

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

The remote control can indicate faults or shutdown conditions and can also restore boiler operation after shutdown 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 reconnect the boiler from the mains power.

1.9.7 Alarm due to (optional) external temperature probe malfunction

In case of external temperature probe failure, boiler will continue to operate, but the "sliding temperature" operation will be disabled. Heating water temperature is adjusted based on the value set with **CH +/-** buttons that, in this case, are no longer used to adjust calculated ambient temperature.

Contact a service centre or a qualified service engineer.

1.10 Maintenance



WARNING

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

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

Boilers must be maintained by qualified personnel only, under the requirements set forth by the prevailing rules.

1.11 Notes for the user



WARNING

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

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

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

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.
- **RBTF** forced draught, sealed chamber boiler with electronic ignition, CH only, with 3-way valve for connection to external water heater (optional).
- **CTN** open chamber, natural draught boiler with electronic ignition for heating and instantaneous DHW supply.
- **RTN** open chamber, natural draught boiler with electronic ignition for heating only.
- **RBTN** open chamber, natural draught boiler with electronic ignition, CH only, with 3-way valve for connection to external water heater (optional).

The following heat outputs are available:

- **CTFS 24, RTFS 24, RBTF 24:** with heat input of 25.5 kW
- **CTFS 28, RTFS 28, RBTF 28:** with heat input of 30.5 kW
- **CTFS 32, RTFS 32, RBTF 32:** with heat input of 33.0 kW
- **CTN 24, RTN 24, RBTN 24:** with heat input of 25.5 kW
- **CTN 28, RTN 28, RBTN 28:** with heat input of 30.5 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.
- Heating circuit pressure sensor.
- Air pressure switch (CTFS/RTFS/RBTF).
- Flue gas thermostat (CTN/RTN/RBTN).
- Integrated, automatic by-pass.
- 7 litre expansion vessel.
- System water discharge tap.
- CH flow temperature probe.

For CTFS/CTN/RBTF/RBTN models, only

- Motorised deviating valve.

For CTFS/CTN models, only

- Stainless steel plate heat exchanger for DHW production.
- DHW priority flow switch.
- DHW flow rate limiting device.
- Domestic hot water temperature probe.
- System filler cock.

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: 35-78 °C.
- DHW temperature regulator: 35-57 °C (CTFS/CTN) - 35-65 °C (RTFS/RTN/RBTF/RBTN with optional water heater probe).

2.1.3 Operating features

- Electronic flame modulation in CH mode, with timed rising ramp.
- 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.
- Circulation pump and deviating valve anti shut-down function: 30 seconds of operation after 24 hours of inactivity.
- Ready for connection to an (optional) 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).

For CTFS/CTN models, only

- DHW freeze protection function (CTFS): ON 5°C; OFF 10 °C or after 15 minutes of operation if DHW temperature > 5 °C.
- Anti-water hammer function: can be set from 0 to 3 seconds.

For CTFS/RTFS/RBTFS models, only

- Post-ventilation function after working: 10 seconds.
- Post-ventilation function for heating temperature > 95°C.

For CTFS/CTN models and RTFS/RTN/RBTFS/RBTN models with water heater probe

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

For RTFS/RTN/RBTFS/RBTN models with water heater probe

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

2.2 Dimensions

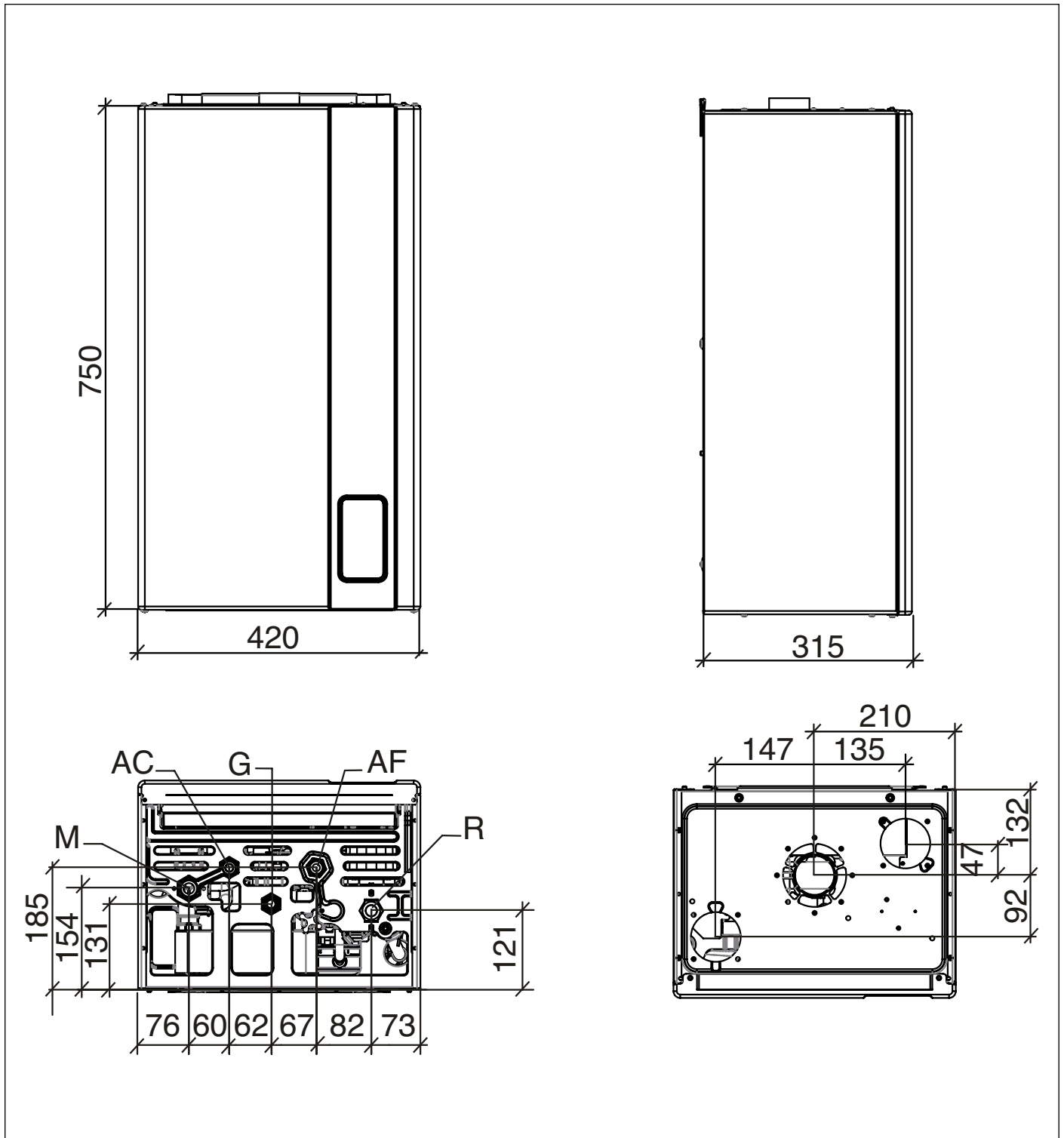


Fig. 3 CTFS model dimensions

- M CH system flow (3/4")
- AC DHW outlet (1/2")
- G Gas inlet (1/2")
- AF Cold water inlet (1/2")
- R CH system return (3/4")

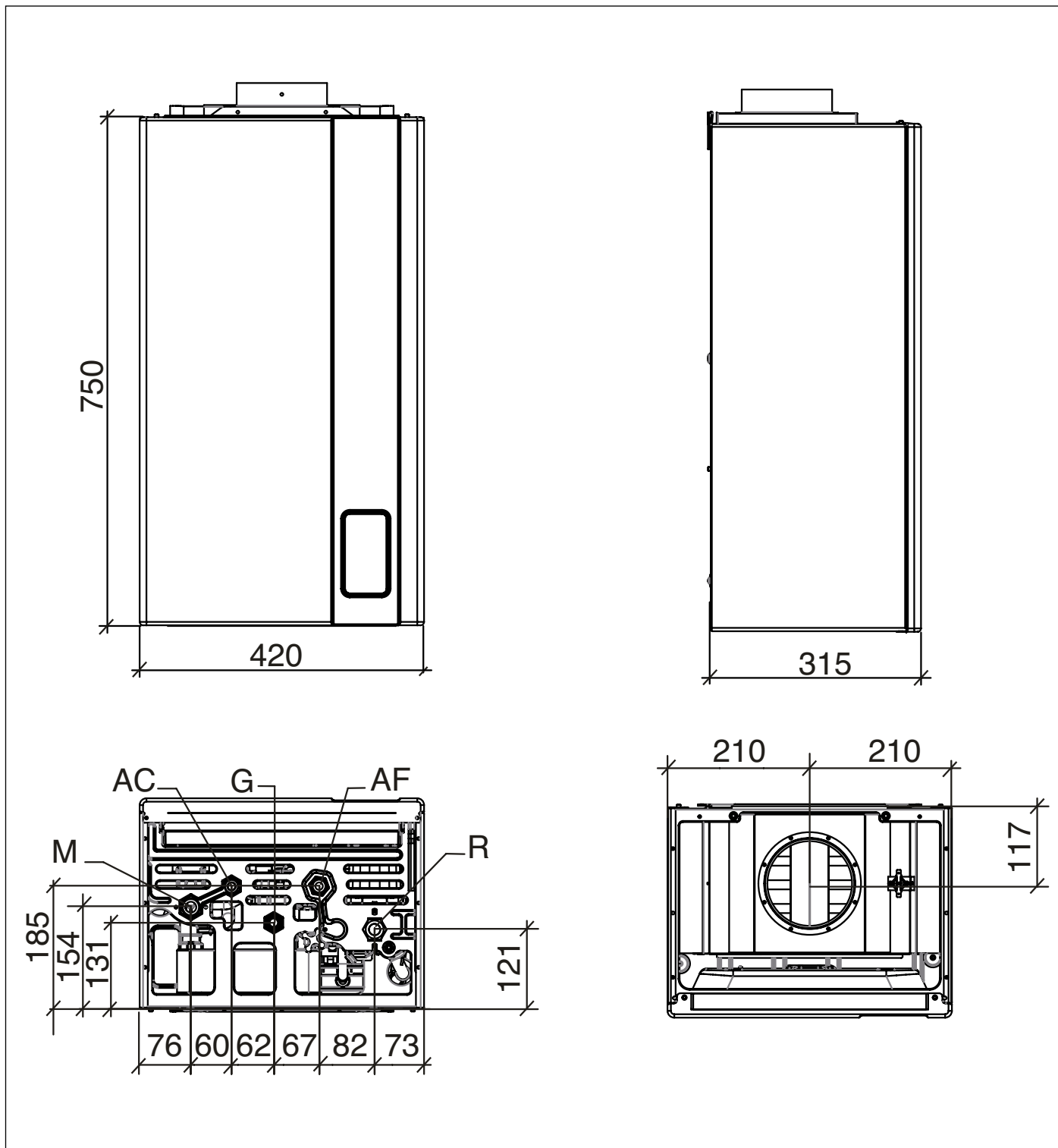


Fig. 4 Model CTN dimensions

- M CH system flow (3/4")
- AC DHW outlet (1/2")
- G Gas inlet (1/2")
- AF Cold water inlet (1/2")
- R CH system return (3/4")

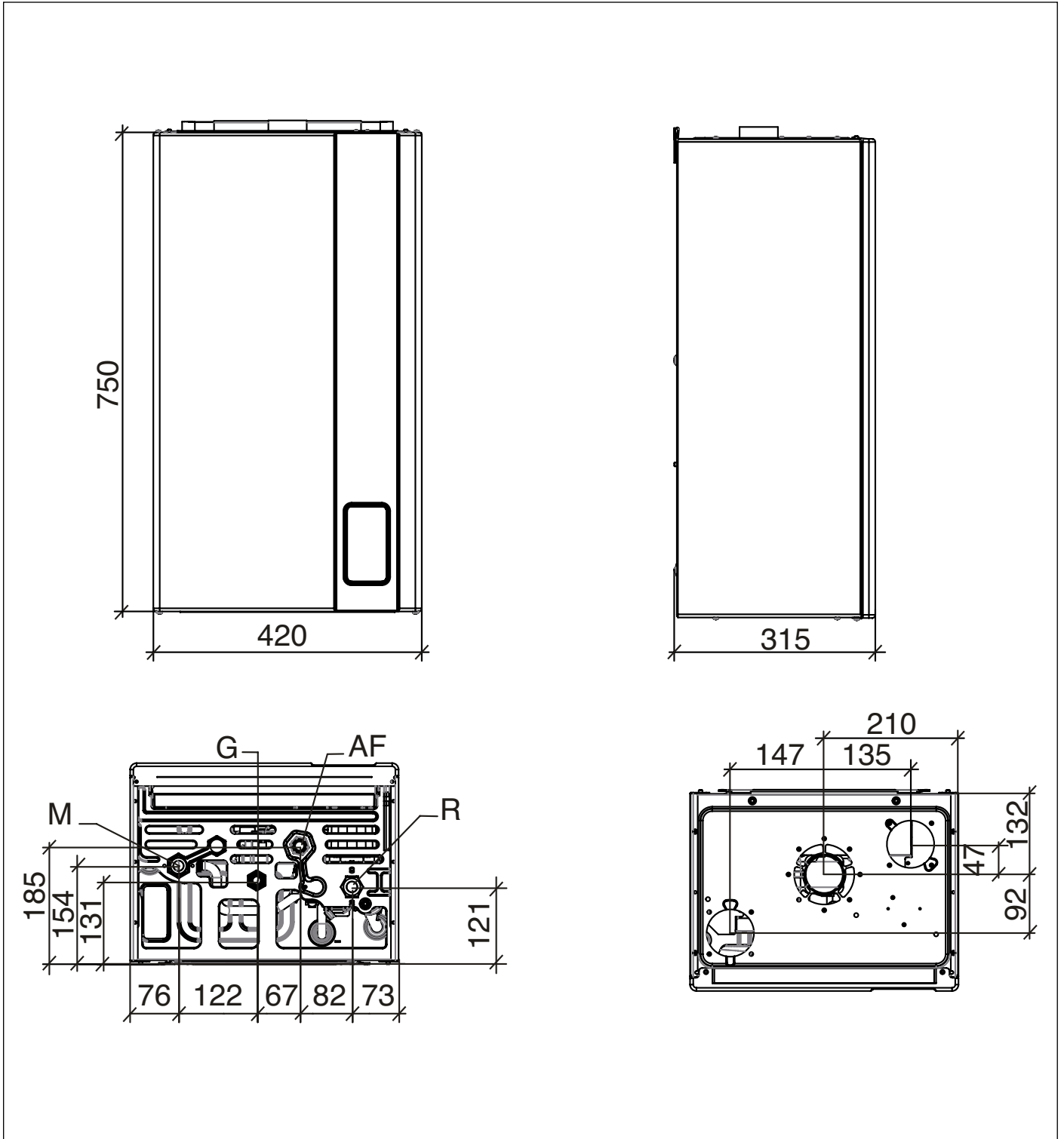


Fig. 5 RTFS sizes

- M CH system flow (3/4")
- G Gas inlet (1/2")
- AF Cold water inlet (1/2")
- R CH system return (3/4")

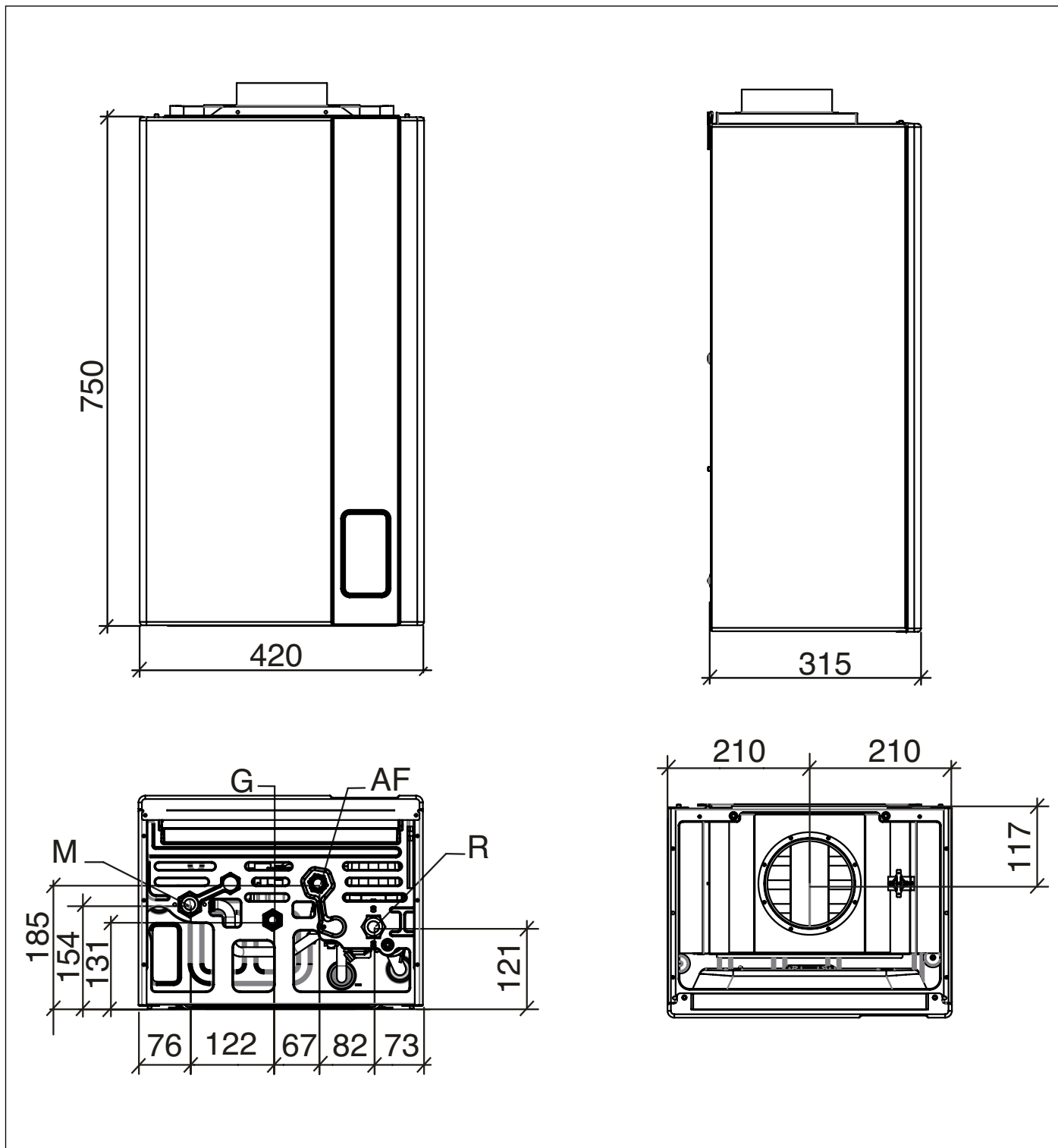


Fig. 6 RTN sizes

- M CH system flow (3/4")
- G Gas inlet (1/2")
- AF Cold water inlet (1/2")
- R CH system return (3/4")

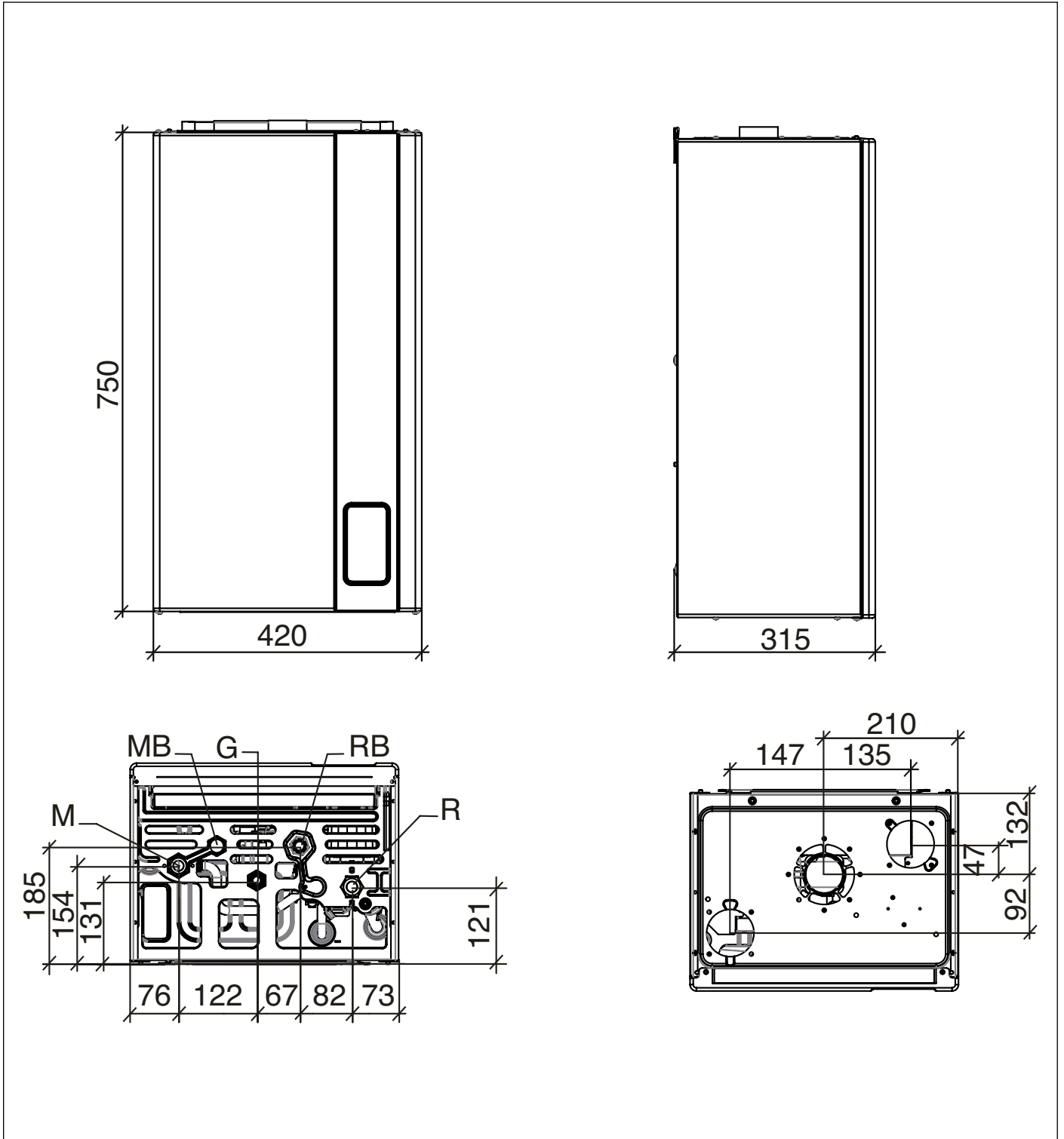


Fig. 7 RBTFS sizes

- M CH system flow (3/4")
- MB Water heater secondary flow (1/2")
- G Gas inlet (1/2")
- RB Water heater secondary return (1/2")
- R CH system return (3/4")

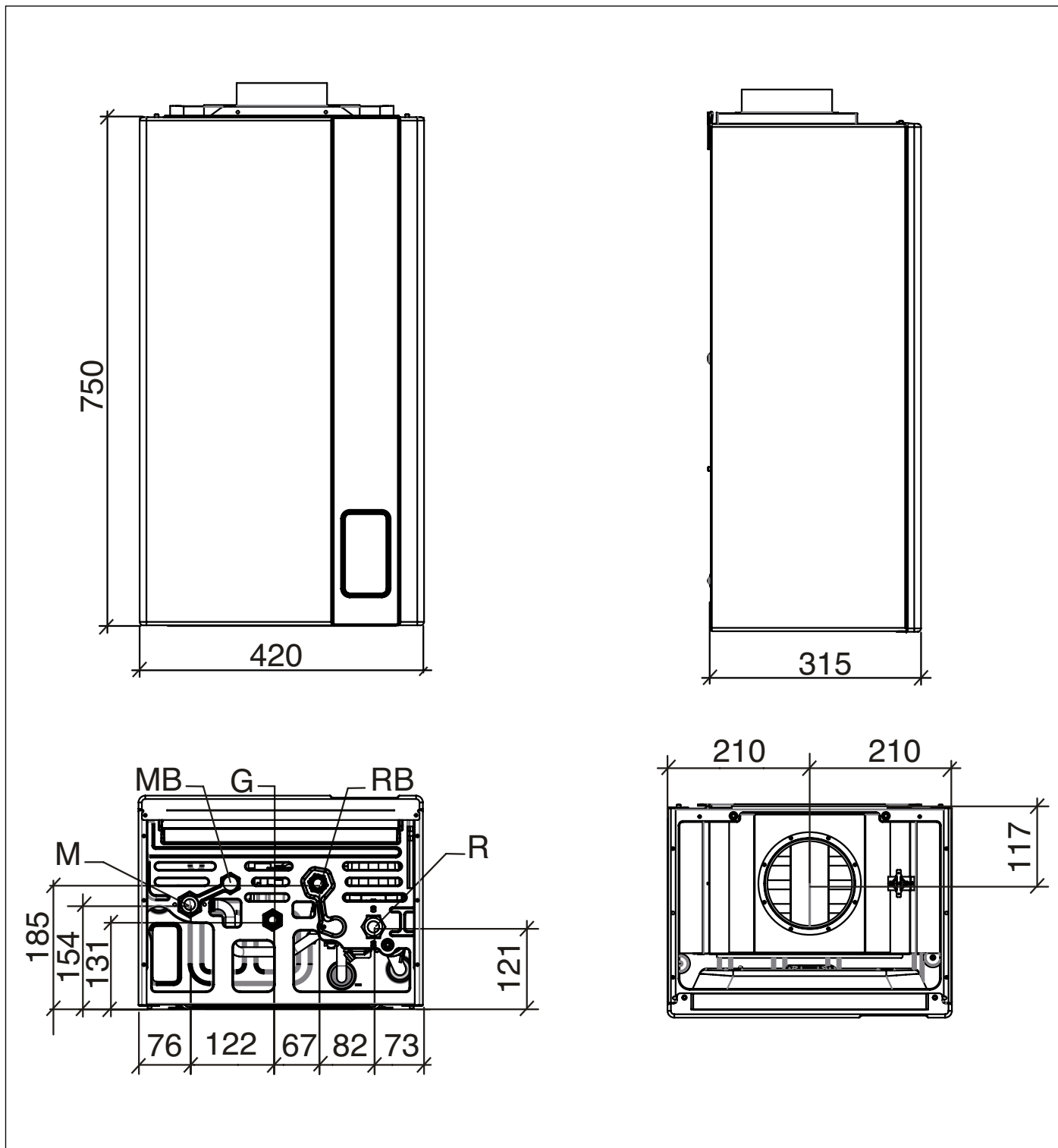


Fig. 8 RBTN sizes

- M CH system flow (3/4")
- MB Water heater secondary flow (1/2")
- G Gas inlet (1/2")
- RB Water heater secondary return (1/2")
- R CH system return (3/4")

2.3 Hydraulic diagram

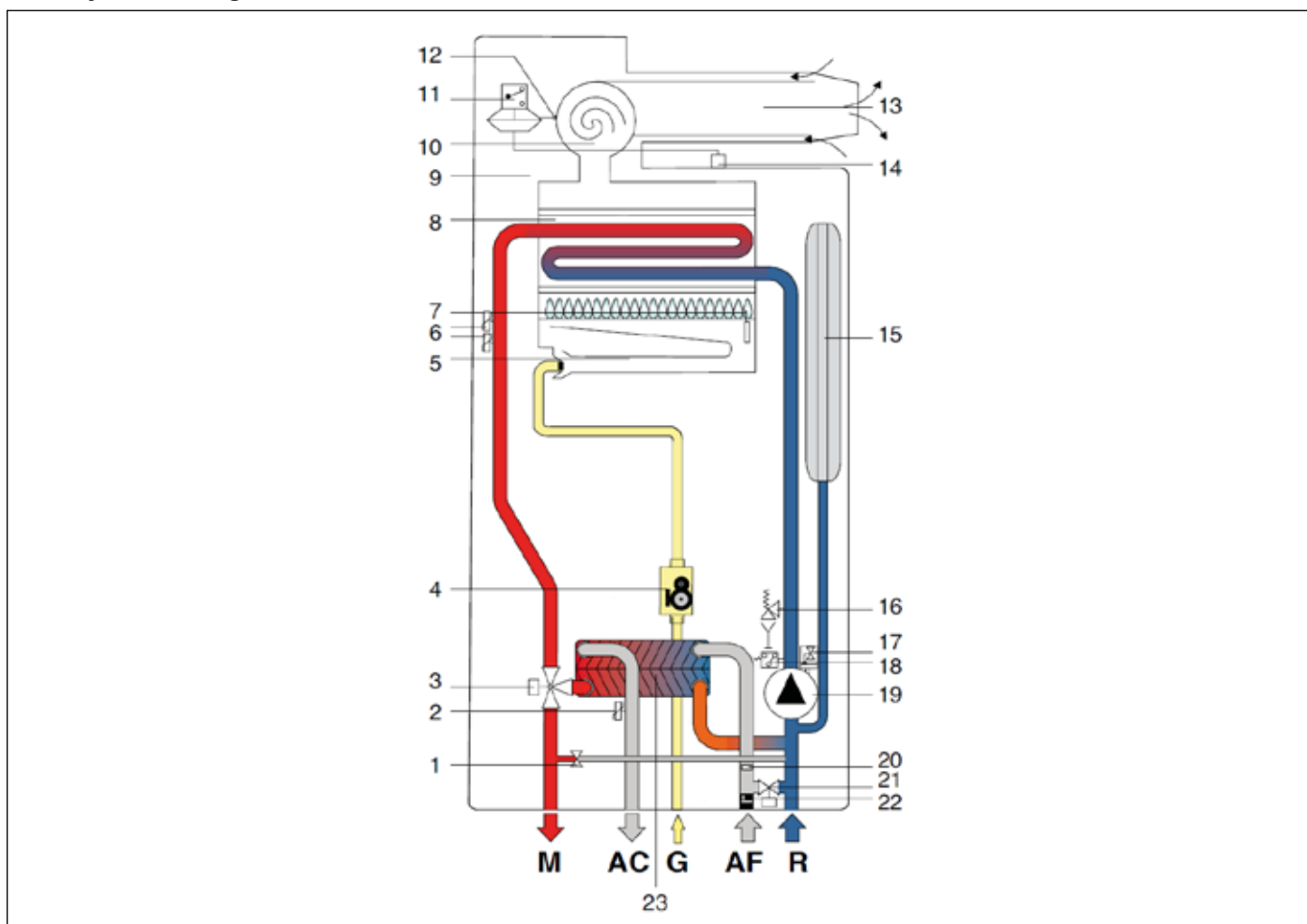


Fig. 9 Boiler layout CTFS

- | | |
|---|----------------------------|
| 1. Automatic by-pass | M CH system flow |
| 2. DHW temperature probe | AC DHW outlet |
| 3. Motorised 3-way valve | G Gas inlet |
| 4. Modulating gas valve | AF Cold water inlet |
| 5. Burner | R CH system return |
| 6. CH temperature double 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. Minimum pressure switch | |
| 19. Circulation pump | |
| 20. 10 l/min flow-limiting device | |
| 21. Filler cock | |
| 22. Cold water flow switch with filter | |
| 23. Secondary plate exchanger | |

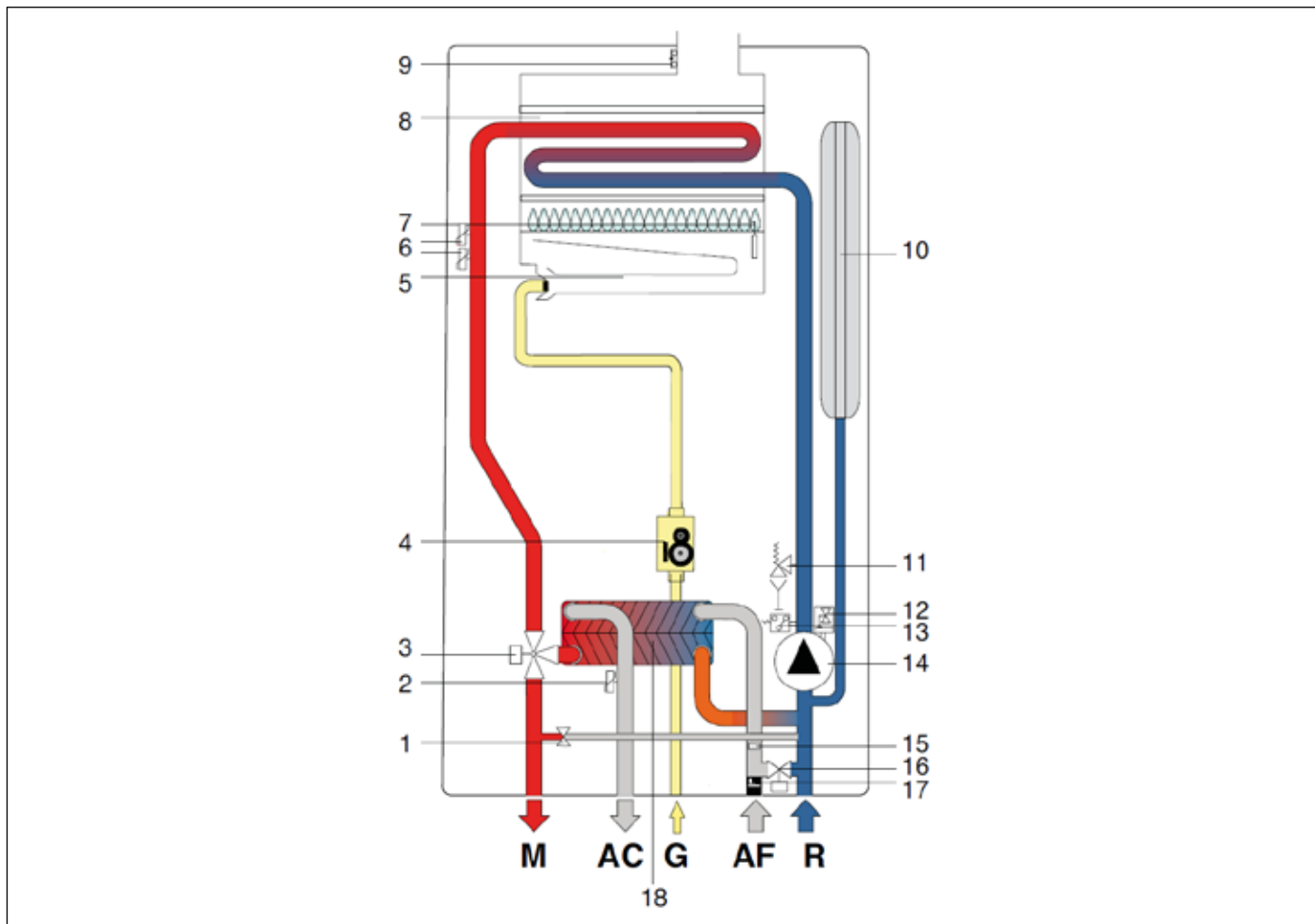


Fig. 10 Boiler layout CTN

- | | |
|--|---------------------|
| 1. Automatic by-pass | M CH system flow |
| 2. DHW temperature probe | AC DHW outlet |
| 3. Motorised 3-way valve | G Gas inlet |
| 4. Modulating gas valve | AF Cold water inlet |
| 5. Burner | R CH system return |
| 6. CH temperature double probe | |
| 7. Ignition/detection electrode | |
| 8. Mono-thermal heat exchanger | |
| 9. Flue gas thermostat | |
| 10. Expansion vessel | |
| 11. 3-bar safety valve | |
| 12. Air-purging device | |
| 13. Minimum pressure switch | |
| 14. Circulation pump | |
| 15. 10 l/min flow-limiting device | |
| 16. Filler cock | |
| 17. Cold water flow switch with filter | |
| 18. Secondary plate exchanger | |

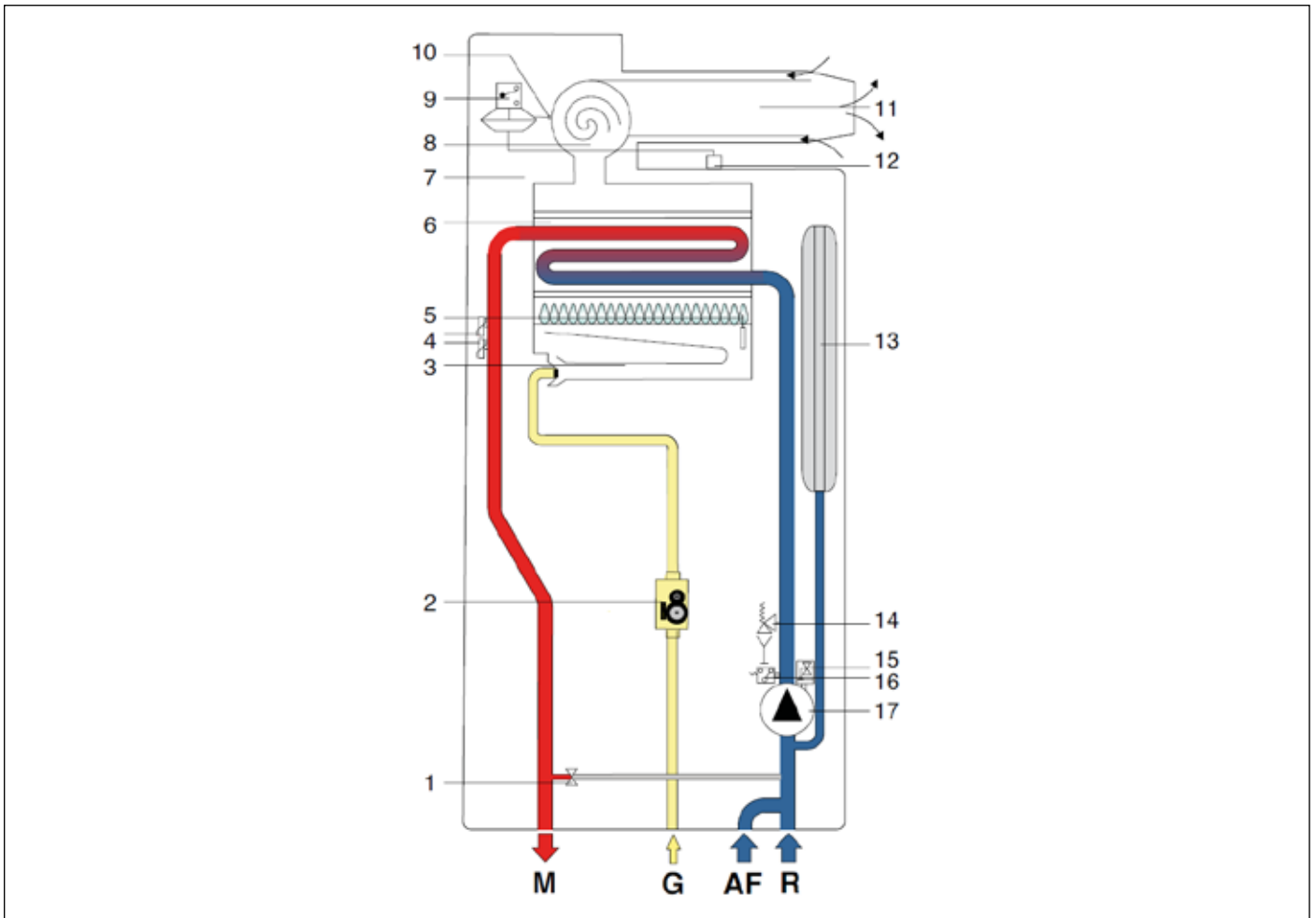


Fig. 11 Boiler layout (model RTFS)

1. Automatic by-pass
2. Modulating gas valve
3. Burner
4. CH temperature double 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. Minimum pressure switch
17. Circulation pump

- M** CH system flow
G Gas inlet
AF Cold water inlet
R CH system return

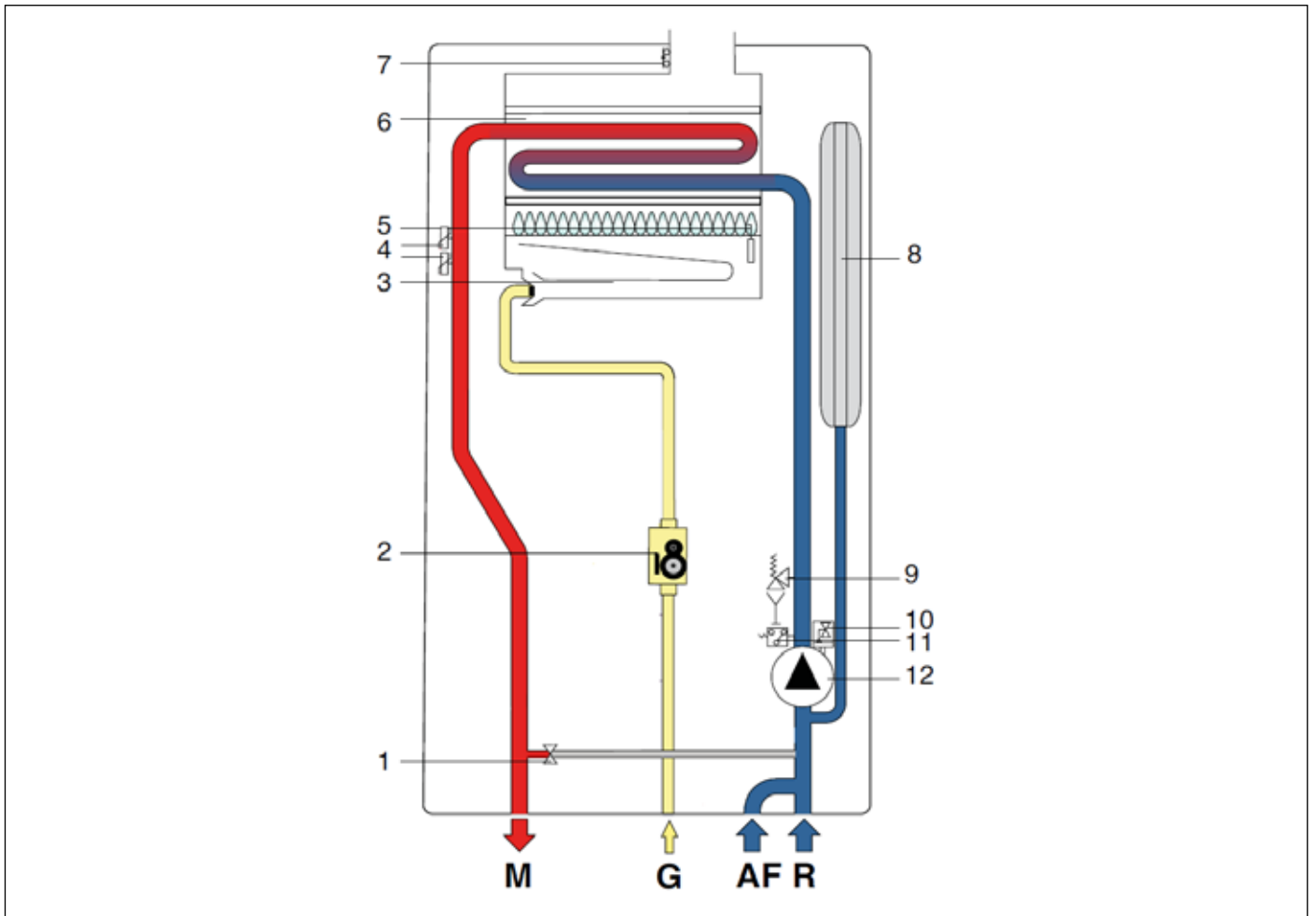


Fig. 12 Boiler layout (model RTN)

1. Automatic by-pass
2. Modulating gas valve
3. Burner
4. CH temperature double probe
5. Ignition/detection electrode
6. Mono-thermal heat exchanger
7. Flue gas thermostat
8. Expansion vessel
9. 3-bar safety valve
10. Air-purging device
11. Minimum pressure switch
12. Circulation pump

- M** CH system flow
G Gas inlet
AF Cold water inlet
R CH system return

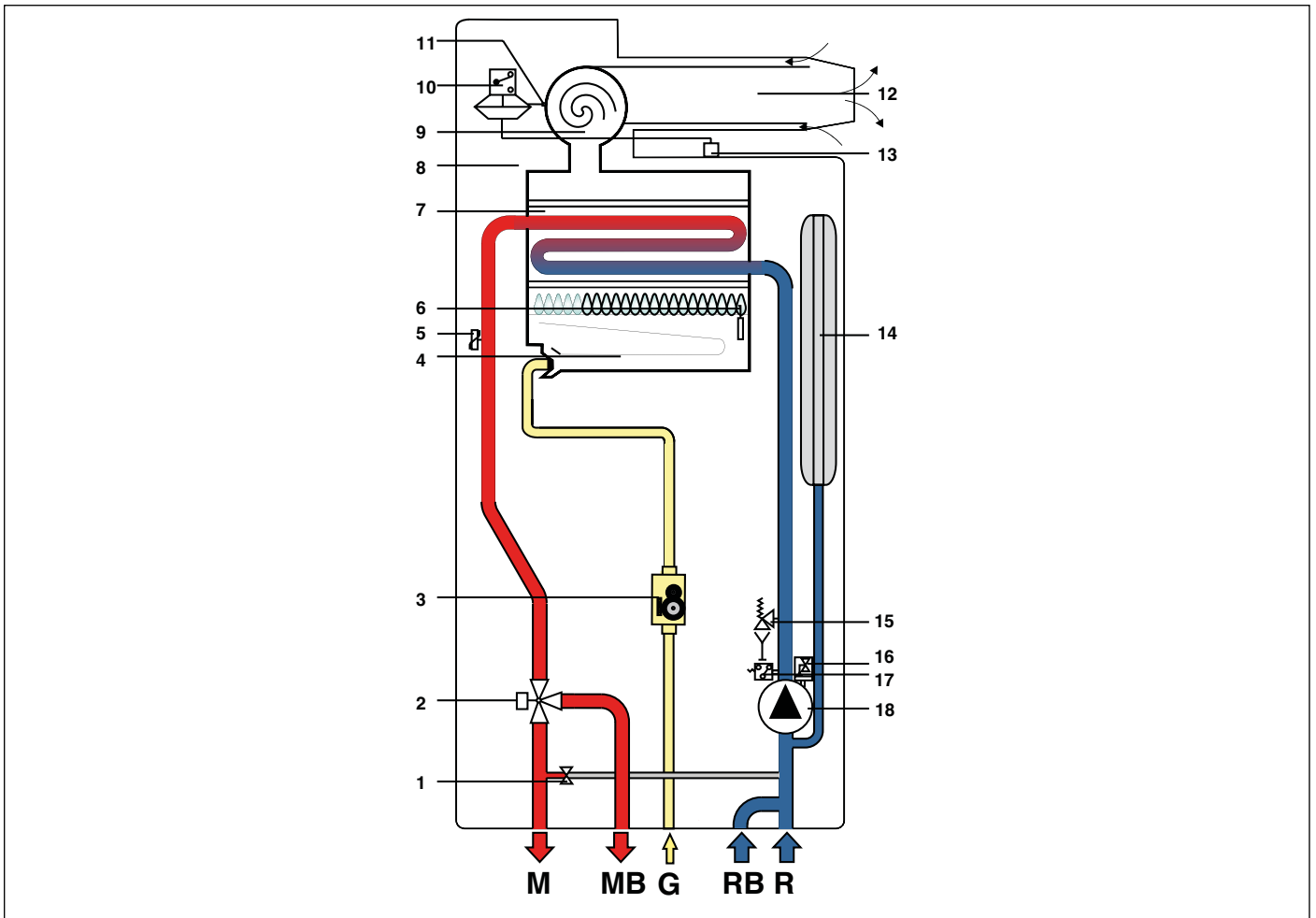


Fig. 13 Boiler layout RBTF

- | | |
|---|--|
| 1. Automatic by-pass | M CH system flow |
| 2. Motorised 3-way valve | MB Water heater secondary flow |
| 3. Modulating gas valve | G Gas inlet |
| 4. Burner | RB Secondary return from water heater |
| 5. CH temperature double probe | R CH system return |
| 6. Ignition/detection electrode | |
| 7. Mono-thermal heat exchanger | |
| 8. Sealed combustion chamber | |
| 9. Flue gas extraction fan | |
| 10. Flue gas circuit safety pressure switch | |
| 11. Pressure testing point on flue gas duct | |
| 12. Air intake and flue gas venting duct | |
| 13. Pressure testing point on flue gas duct | |
| 14. Expansion vessel | |
| 15. 3-bar safety valve | |
| 16. Air-purging device | |
| 17. Minimum pressure switch | |
| 18. Circulation pump | |

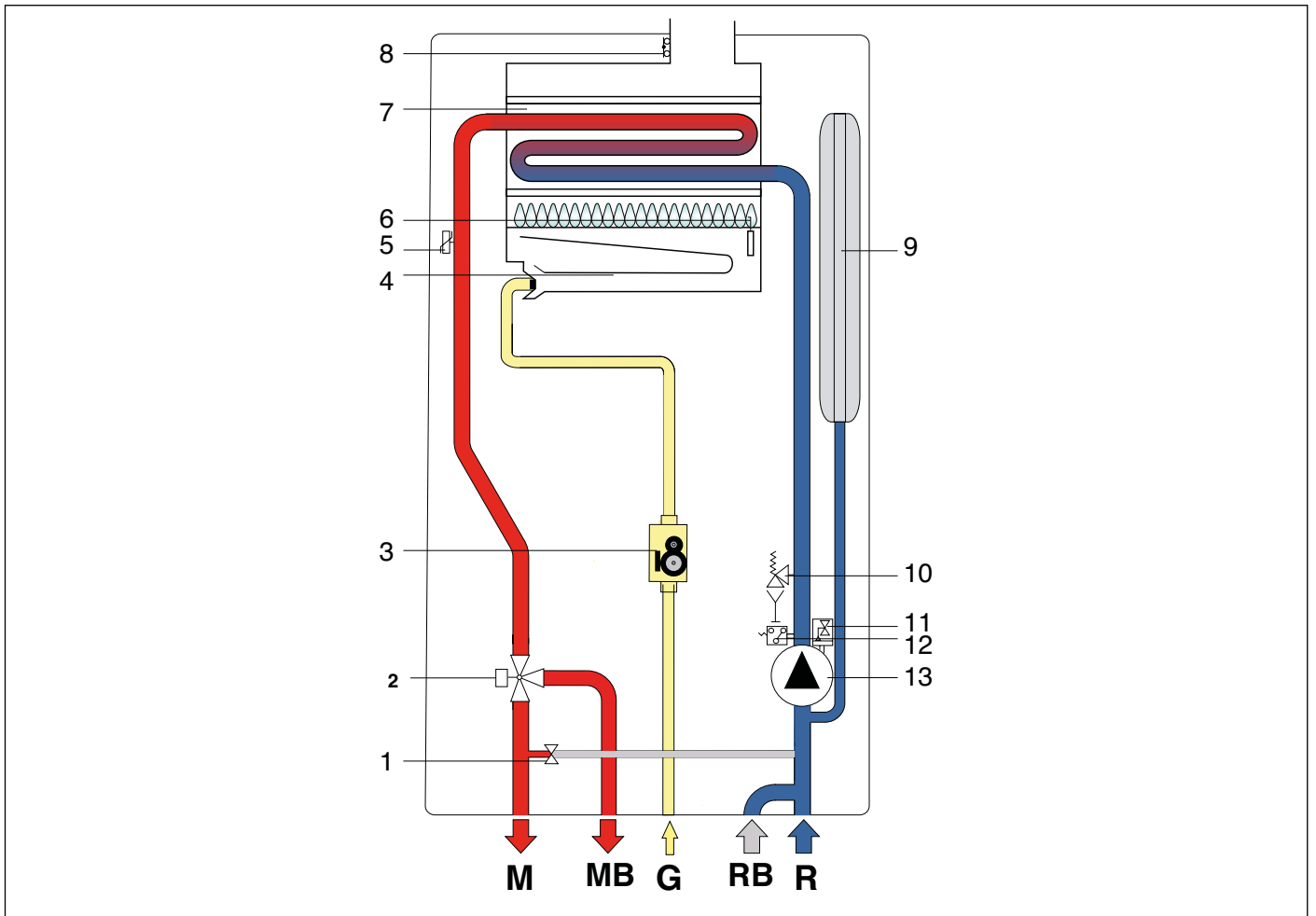


Fig. 14 Boiler layout RBTN

1. Automatic by-pass
2. Motorised 3-way valve
3. Modulating gas valve
4. Burner
5. CH temperature double probe
6. Ignition/detection electrode
7. Mono-thermal heat exchanger
8. Flue gas thermostat
9. Expansion vessel
10. 3-bar safety valve
11. Air-purging device
12. Minimum pressure switch
13. Circulation pump

- M** CH system flow
MB Water heater secondary flow
G Gas inlet
RB Secondary return from water heater
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.

Gas category: II2H3+

Fuel	Gas mains pressure [mbar]	Nozzle [mm]	Min pressure at the burner [mbar]	Max pressure at the burner [mbar]
Natural gas 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

Tab. 1 CTFS/RTFS/RBTFS 24 adjustment specifications

Fuel	Gas mains pressure [mbar]	Nozzle [mm]	Min pressure at the burner [mbar]	Max pressure at the burner [mbar]
Natural gas 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

Tab. 2 CTFS/RTFS/RBTFS 28 adjustment specifications

Fuel	Gas mains pressure [mbar]	Nozzle [mm]	Min pressure at the burner [mbar]	Max pressure at the burner [mbar]
Natural gas 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

Tab. 3 CTFS/RTFS/RBTFS 32 adjustment specifications

Fuel	Gas mains pressure [mbar]	Nozzle [mm]	Min pressure at the burner [mbar]	Max pressure at the burner [mbar]
Natural gas G20	20	1,35	2,0	12,0
Butane gas G30	29	0,78	4,5	28,0
Propane Gas G31	37	0,78	6,0	35,0

Tab. 4 CTN/RTN/RBTN 24 adjustment specifications

Fuel	Gas mains pressure [mbar]	Nozzle [mm]	Min pressure at the burner [mbar]	Max pressure at the burner [mbar]
Natural gas G20	20	1,35	2,3	12,1
Butane gas G30	29	0,78	5,1	27,5
Propane Gas G31	37	0,78	6,9	35,9

Tab. 5 CTN/RTN/RBTN 28 adjustment specifications

2.5 General characteristics

Description	um	CTFS 24	RTFS 24 RBTFS 24	CTFS 28	RTFS 28 RBTFS 28	CTFS 32	RTFS 32 RBTFS 32
Burner nozzles	no.	11		13		15	
Nominal heat input	kW	25,5		30,5		33,0	
Minimum heat input	kW	12,5		13,5		16,0	
Max heat output	kW	23,7		28,6		30,8	
Minimum heat output	kW	11,1		12,0		14,3	
Minimum CH system pressure	bar	0,5		0,5		0,5	
Maximum CH system pressure	bar	3,0		3,0		3,0	
DHW circuit min. pressure	bar	0,5	n.a.	0,5	n.a.	0,5	n.a.
DHW circuit max. pressure	bar	6,0	n.a.	6,0	n.a.	6,0	n.a.
DHW specific flow rate ($\Delta T=25K$)	l/min	13,9	n.a.	17,0	n.a.	18,1	n.a.
DHW specific flow rate ($\Delta t=30K$)	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	125		134		134	
Pump absorption	W	69		69		69	
Electric protection rating	IP	X5D		X5D		X5D	
Net weight	kg	34,0	31,5	34,5	32,5	35,0	33,0
Methane gas consumption at maximum CH output (Value referred to 15°C - 1013 mbar)	cu. m/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	

Tab. 6 General specifications CTFS/RTFS/RBTFS

(*) With water heater probe installed.

Description	um	CTN 24	RTN 24 RBTN 24	CTN 28	RTN 28 RBTN 28
Burner nozzles	no.	11		13	
Nominal heat input	kW	25,5		30,5	
Minimum heat input	kW	10,0		12,5	
Max heat output	kW	23,1		27,4	
Minimum heat output	kW	8,5		10,8	
Minimum CH system pressure	bar	0,5		0,5	
Maximum CH system pressure	bar	3,0		3,0	
DHW circuit min. pressure	bar	0,5	n.a.	0,5	n.a.
DHW circuit max. pressure	bar	6,0	n.a.	6,0	n.a.
DHW specific flow rate ($\Delta T=25K$)	l/min	13,4	n.a.	16,2	n.a.
DHW specific flow rate ($\Delta t=30K$)	l/min	11,2	n.a.	13,5	n.a.
Electric power supply – voltage / frequency	V - Hz	230 - 50		230 - 50	
Power mains supply fuse	A	3,15		3,15	
Maximum power consumption	W	86		86	
Pump absorption	W	69		69	
Electric protection rating	IP	X5D		X5D	
Net weight	kg	32,5	30,5	33,0	31,5
Methane gas consumption at maximum CH output (Value referred to 15°C - 1013 mbar)	cu. m/h	2,70		3,23	
Butane gas consumption at maximum CH output	kg/h	2,01		2,41	
Propane gas consumption at maximum CH output	kg/h	1,98		2,37	
Maximum CH working temperature	°C	83		83	
Maximum DHW working temperature	°C	62	65 (*)	62	65 (*)
Total capacity of expansion vessel	l	10		10	
Maximum recommended system capacity (Maximum water temperature 83°C, expansion vessel pressure 1 bar)	l	200		200	

Tab. 7 General specifications CTN/RTN/RBTN

(*) With water heater probe installed.

Description	um	Max. output	Min. output	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 (G20/G30/G31)	%	6.1/7.0/6.7	2.7/3.2/2.8	-
Maximum heat output efficiency rating	%	93,0	89,0	90,2
NOx emission class	-	3		

Tab. 8 CTFS/RTFS/RBTFS 24 combustion specifications

Description	um	Max. output	Min. output	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 (G20/G30/G31)	%	7.0/8.0/7.7	2.9/3.3/3.3	-
Maximum heat output efficiency rating	%	93,7	88,9	90,6
NOx emission class	-	3		

Tab. 9 CTFS/RTFS/RBTFS 28 combustion specifications

Description	um	Max. output	Min. output	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 (G20/G30/G31)	%	7.4/8.7/8.4	3.3/3.8/3.8	-
Maximum heat output efficiency rating	%	93,4	89,4	91,0
NOx emission class	-	3		

Tab. 10 CTFS/RTFS/RBTFS 32 combustion specifications

Description	um	Max. output	Min. output	30% load
Heat loss from the boiler casing	%	1,88	3,14	-
Flue system heat loss with burner on	%	7,52	11,46	-
Flue system mass capacity	g/s	20,73	18,9	-
Flue gas temperature - Air temperature	°C	86	63	-
CO2 value (G20/G30/G31)	%	4.9/5.8/5.6	2.0/2.5/2.4	-
Maximum heat output efficiency rating	%	90,6	85,4	89,4
NOx emission class	-	2		

Tab. 11 CTN/RTN/RBTN 24 combustion specifications

Description	um	Max. output	Min. output	30% load
Heat loss from the boiler casing	%	2,83	2,80	-
Flue system heat loss with burner on	%	7,17	10,7	-
Flue system mass capacity	g/s	21,7	8,89	-
Flue gas temperature - Air temperature	°C	96	67,7	-
CO2 value (G20/G30/G31)	%	5.5/6.5/6.5	2.4/2.9/2.9	-
Maximum heat output efficiency rating	%	90,0	86,5	87,8
NOx emission class	-	2		

Tab. 12 CTN/RTN/RBTN 28 combustion specifications

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.

To find out about the gas category and technical specifications, refer to operation data and general features specified in the 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 in case of damage to people, animals, or property due to failure to follow the above mentioned instructions.

Packaging includes:

- a wall bracket:
- one temperature probe for water heater (RBTFS/RBTN, only).
- a bag containing
 - » the present boiler installation, use and maintenance manual;
 - » the template for mounting the boiler on a wall (see Fig. 15 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 42 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.).
- do not install boilers in locations with a corrosive or very dusty atmosphere, such as hairdresser salons, laundries etc., as this may severely reduce the lifespan of the components of the boiler.
- avoid installing the air intake terminal in rooms or areas with corrosive or very dusty atmosphere to protect the heat exchanger.

3.3 Positioning the boiler

Each boiler is supplied with a paper template, found inside the packaging (see Fig. 15 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.

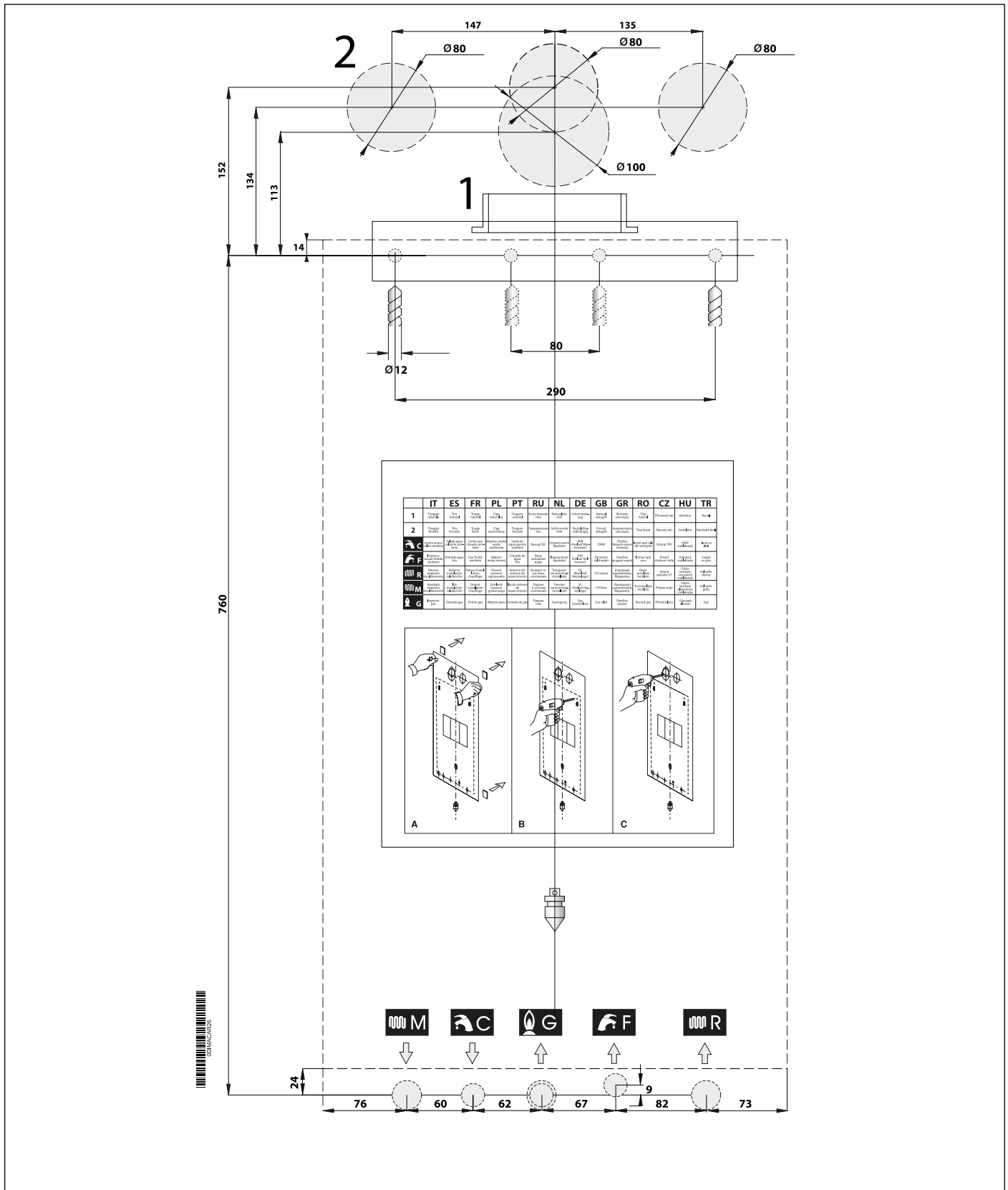


Fig. 15 Paper template

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

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

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.
- With reference to the lower part of the template, position the fittings for the connection of:
 - » gas supply pipe **G**;
 - » cold water supply pipe (CTFS/CTN/RTFS/RTN) or return from water heater (RBTFS/RBTN) **F**;
 - » DHW outlet (CTFS/CTN) or flow to water heater (RBTFS/RBTN) **C**;
 - » CH flow **M**;
 - » CH return **R**.
- Provide an outlet system for the 3-bar safety valve;
- Hook boiler to supporting bracket.
- Connect the boiler to the feed pipes (see *Hydraulic connections* on page 54).
- Connect the boiler to the outlet system of 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 42).
- Connect power supply, ambient thermostat (when available) and other available accessories (refer to the following paragraphs).



DANGER

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.

3.5 Boiler room ventilation

The open combustion chamber boiler is designed to be connected to a chimney. Combustion air is drawn directly from the room where the boiler is installed.

If in the destination Country no installation standard is in force a ventilation grille with a net dimension of 6 cm²/kW installed in the room with a minimum of 100 cm² must be provided.

For boilers with a sealed combustion chamber no specific recommendations must be applied involving air intake ventilation openings, or concerning boiler room requirements.



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 a safety device for flue gas exhaustion check.

It is strictly forbidden to tamper with and/or prevent operation of such safety device.

Should an air/flue gas system malfunction occur, the device will shut-down the boiler by interrupting the gas supply to the boiler and the LCD will display the E03 code.

In this case it is necessary to have safety device, boiler and the air intake/flue gas venting ducts promptly checked by a service centre or a qualified service engineer.

In case of repeated stops, it is necessary to have safety device, boiler and the air intake/flue gas venting ducts checked by a service centre or a qualified service engineer.

After each operation on the safety device or the air suction/flue gas exhaust system, it is necessary to perform a functional test of the boiler.

In case it is necessary to replace the safety device use only original spare parts supplied by the Manufacturer.

On the open chamber model, the actual waiting time for the automatic reset of the combustion gas exhaust control device is equal to 10 minutes. To reset the device before this time it is necessary to press "Reset".

On the sealed chamber model, to reset the combustion gas exhaust control device operation it is necessary to press "Reset".

3.6.1 Natural draught boiler

Connecting to the exhaust chimney

The chimney is indispensable for correct boiler operation; it must therefore comply with the following requirements:

- it must be made of waterproof material and be resistant to flue gas temperature and related condensate;
- it must have appropriate mechanical characteristics and low thermal conductivity;
- it must be perfectly sealed;
- it must be as vertical as possible and the roof terminal is to have a cap ensuring efficient and constant flue gas exhaustion;
- it must not be less wide than the boiler flue gas outlet diameter; squared or rectangular section chimneys must bear an internal section, 10% larger than the section connected to the boiler draught excluder device;
- starting from the boiler, the duct connecting to the chimney is to follow a vertical direction and must be long not less than twice its diameter before joining the chimney.
- the connection pipe must be fixed to the boiler hood by means of a screw in the specific **A** hole (see Fig. 17 Dimensions for connection to the flue gas system of the open chamber models).

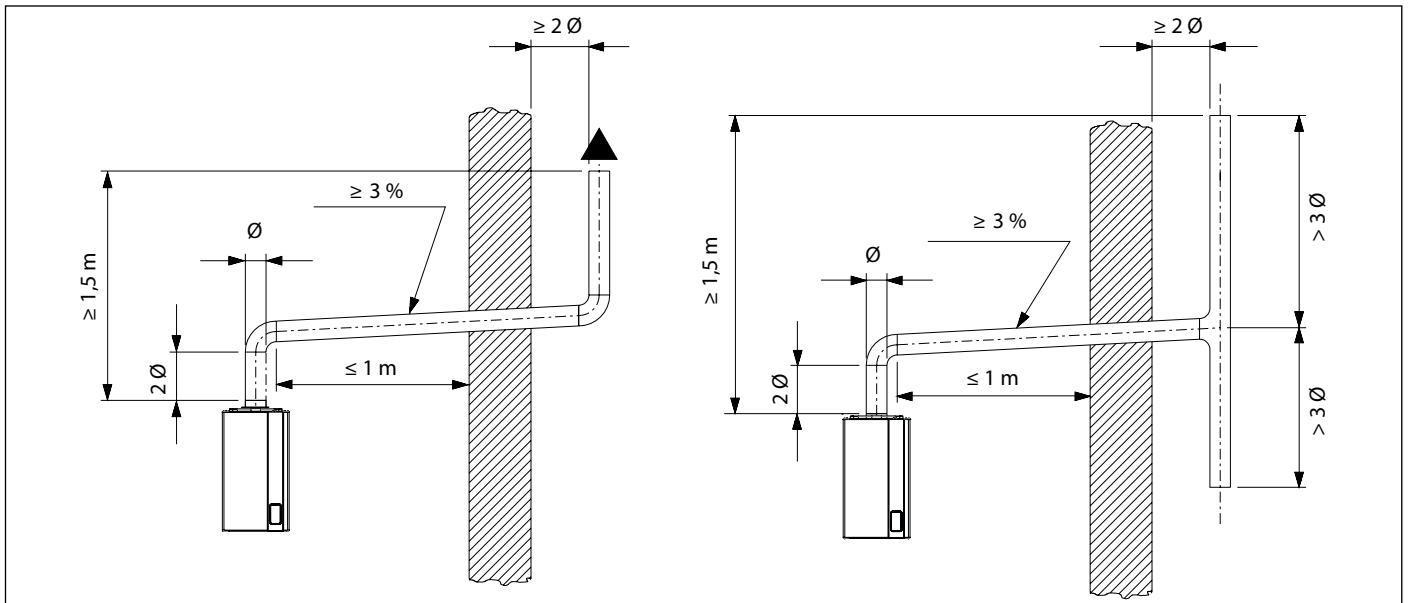


Fig. 16 Connections to the chimney of open chamber models

Direct outside discharge

Natural draught boilers can vent flue gas directly into the atmosphere via a duct which goes through the outside walls of the building and ends with an anti-wind gust device terminal.

The flue gas exhaust duct is to comply with the following requirements:

- its sub-horizontal part inside the building must be as short as possible (not longer than 1,000 mm);
- it is not to have more than 2 direction changes;
- it can host only one single boiler flue gas exhaust system;
- its section, which is passing through the wall is to be protected by a sheath duct; the part of the sheath duct facing the inside of the building is to be sealed, while the part facing outwards is to be left open;
- its end section, on which the draught terminal is to be installed, is to protrude from the wall of the building for a length of a least twice the diameter of the duct;
- the terminal must be no less than 1.5 meters above the connection for the flue gas venting duct on the boiler.
- the connection pipe must be fixed to the boiler hood by means of a screw in the specific **A** hole (see Fig. 17 Dimensions for connection to the flue gas system of the open chamber models).

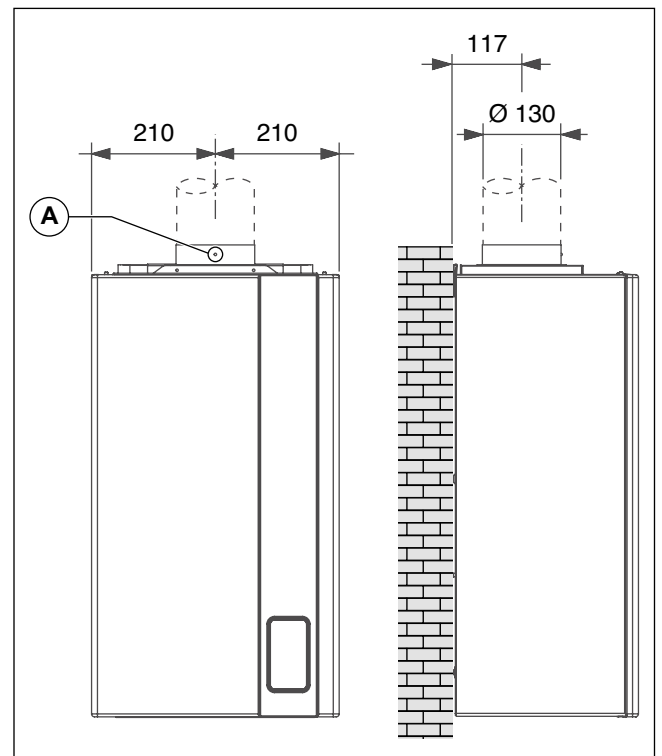


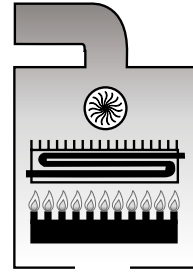
Fig. 17 Dimensions for connection to the flue gas system of the open chamber models

3.6.2 Forced draught boiler

3.6.3 Possible configuration of air intake and flue gas venting ducts

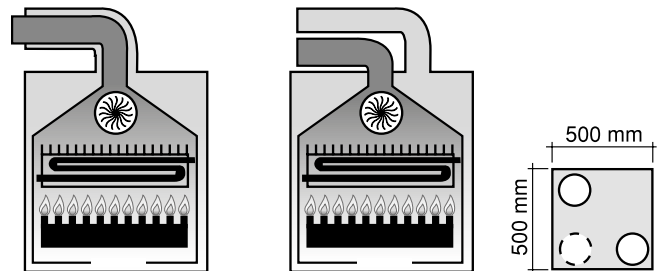
Type B22

- 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.



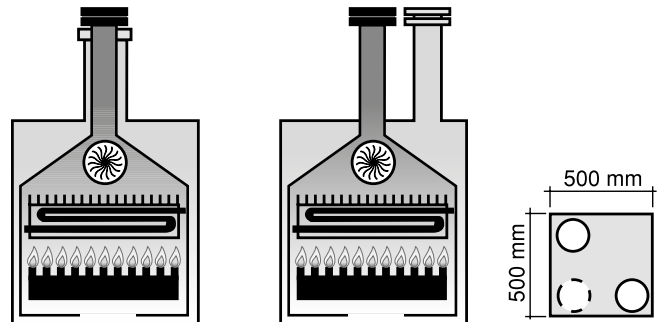
Type C12

- Boiler intended for connection to horizontal outlet and intake ducts connected to the outside by means of coaxial or split ducts.
- The minimum distance between the air intake duct and the flue gas venting duct must be at least 250 mm (see figure opposite), whereas both terminals must be contained within a square measuring 500 x 500mm.



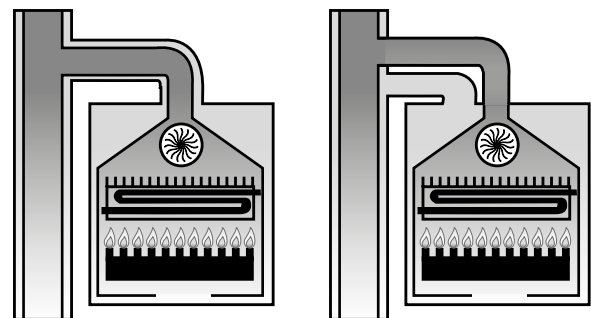
Type C32

- Boiler intended for connection to vertical outlet and intake ducts connected to the outside by means of coaxial or split ducts.
- The minimum distance between the air intake duct and the flue gas venting duct must be at least 250 mm (see figure opposite), whereas both terminals must be contained within a square measuring 500 x 500mm.



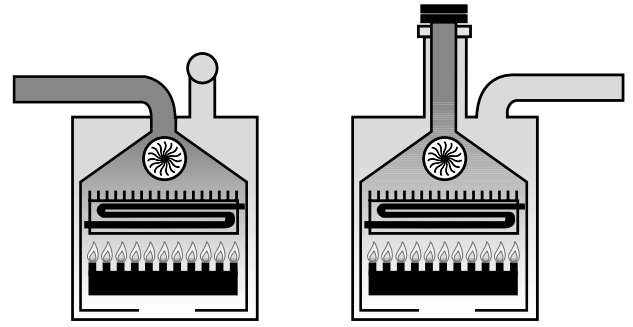
Type C42

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



Type C52

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

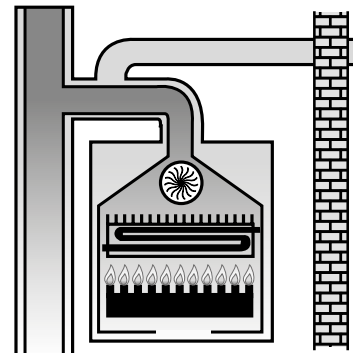


Type C62

- 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 (always refer to standards and laws in force in the country of installation).

Type C82

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



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

3.6.4.1 Installation types: C12, C12X and C32

Provisions for models CTFS/RTFS/RBTFS 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 chimney.
- The maximum allowed length of **vertical coaxial** ducts is 6 metres, including the chimney.
- 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
$0,5 \leq L \leq 2^*$	Ø 39.8
$2 < L \leq 3^*$	Ø 42
$3 < L \leq 4^*$	Ø 45
$4 < L \leq 5^*$	Ø 49
$5 < L \leq 6^*$	-

Tab. 13 Flue gas venting duct length and diaphragm diameter 100/60 (CTFS/RTFS/RBTFS 24)

(*) for C12/C12X types, measurement includes the first elbow.

Provisions for models CTFS/RTFS/RBTFS 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 chimney.
- The maximum allowed length of **vertical coaxial** ducts is 7 metres, including the chimney.
- 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
$0,5 \leq L \leq 2^*$	Ø 39
$2 < L \leq 4^*$	Ø 41
$4 < L \leq 6^*$	Ø 47
$6 < L \leq 7^*$	-

Tab. 14 Flue gas venting duct length and diaphragm diameter 100/60 (CTFS/RTFS/RBTFS 28)

(*) for C12/C12X types, measurement includes the first elbow.

Provisions for models CTFS/RTFS/RBTFS 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 chimney.
- The maximum allowed length of **vertical coaxial** ducts is 5 metres, including the chimney.
- 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
$0,5 \leq L \leq 2^*$	Ø 39.8
$2 < L \leq 3^*$	Ø 41
$3 < L \leq 4^*$	Ø 44
$4 < L \leq 5^*$	Ø 47

Tab. 15 Flue gas venting duct length and diaphragm diameter 100/60 (CTFS/RTFS/RBTFS 32)

(*) for C12/C12X types, measurement includes the first elbow.

coaxial duct kit 0KITCONC00

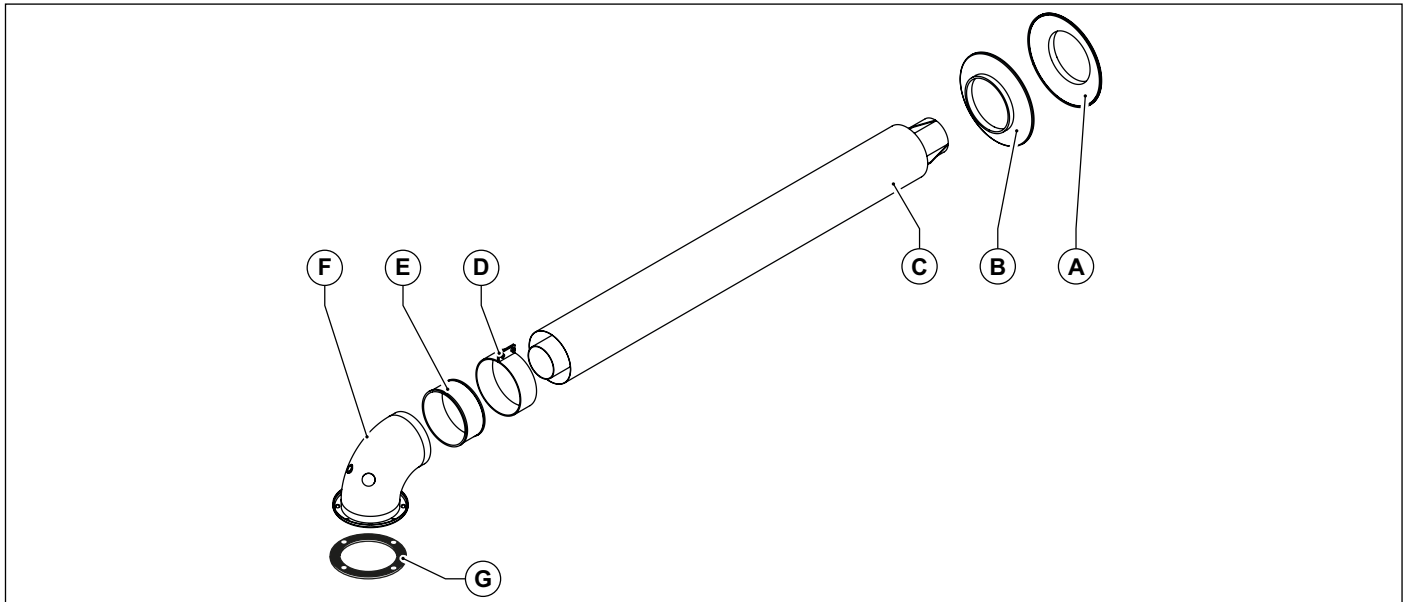


Fig. 18 coaxial duct kit 0KITCONC00

- 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

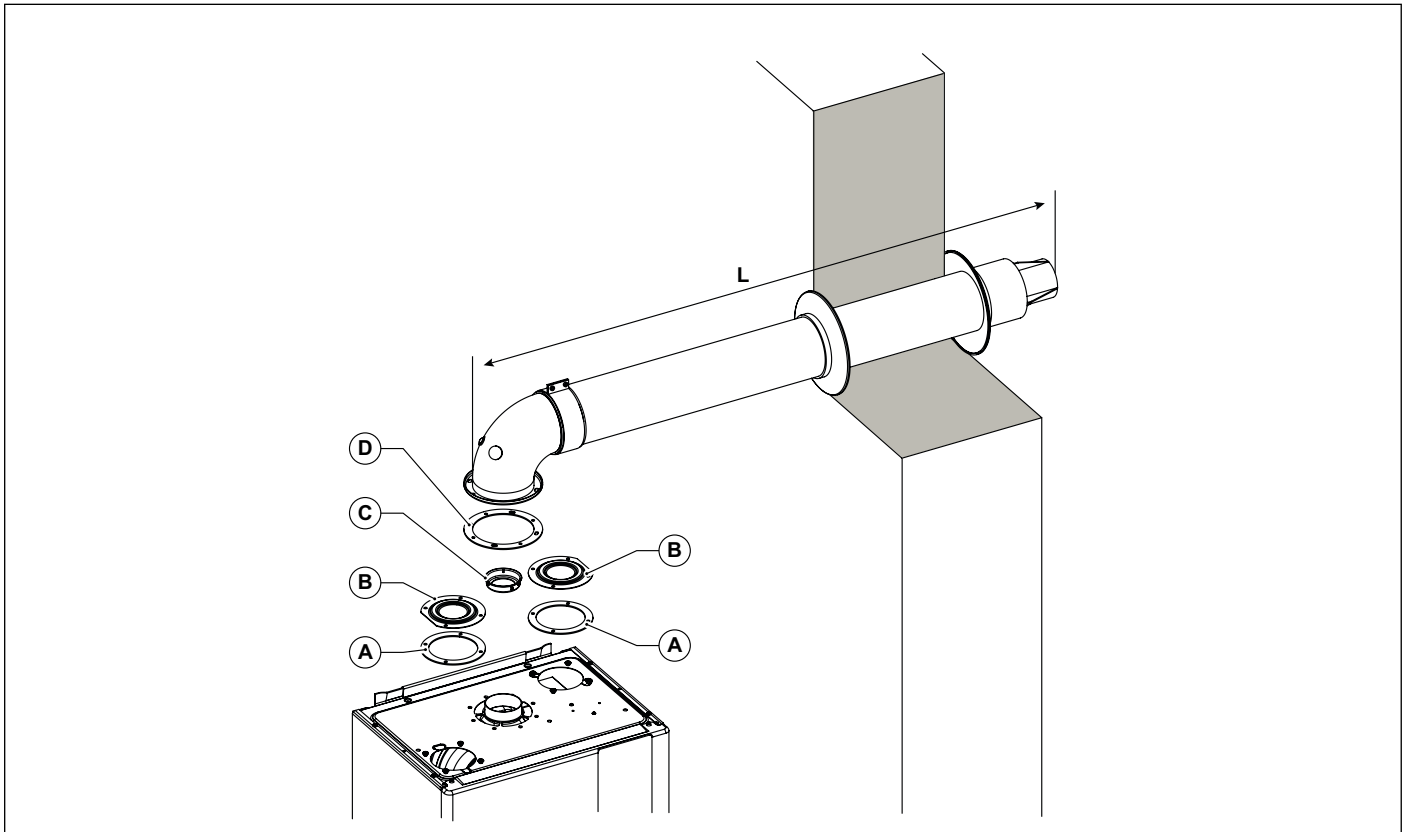


Fig. 19 Air intake and flue gas venting via coaxial ducts

- 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

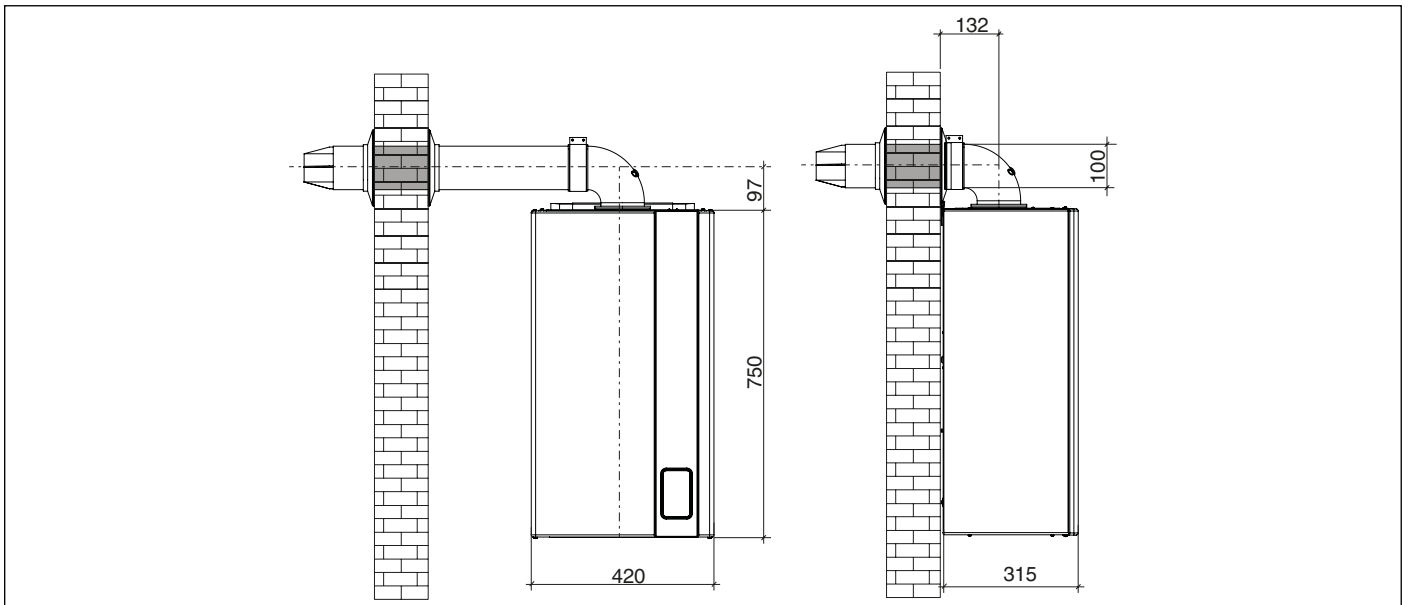


Fig. 20 Dimensions for connection to coaxial air intake/flue gas venting duct

3.6.5 Air intake and flue gas venting via 125/80 mm coaxial ducts

3.6.5.1 Installation types: C12, C12X and C32

Provisions for models CTFS/RTFS/RBTFS 24

- The minimum permissible length of **horizontal coaxial** ducts is 1.0 metre, including the first elbow connected to the boiler.
- The maximum permissible length of **horizontal coaxial** ducts is 9.0 metre, including the first elbow connected to the boiler.
- For each additional 90° elbow, maximum permissible length is to be reduced by 3 meters.
- For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 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 chimney.
- The maximum allowed length of **vertical coaxial** ducts is 9.0 metres, including the chimney.
- For each additional 90° elbow, maximum permissible length is to be reduced by 3 meters.
- For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.
- With "ceiling-mounted terminal", maximum permissible length is to be reduced by 1 metre.
- **Use the diaphragms supplied with the kit 125/80 (optional).**

Pipe length (m)	Flue gas venting diaphragm diameter
1 ≤ L ≤ 4*	Ø 39
4 < L ≤ 5*	Ø 39.8
5 < L ≤ 6*	Ø 42
6 < L ≤ 7*	Ø 44
7 < L ≤ 8*	Ø 45
8 < L ≤ 9*	Ø 47

Tab. 16 Flue gas venting duct length and diaphragm diameter 125/80 (CTFS/RTFS/RBTFS 24)

(*) for C12/C12X types, measurement includes the first elbow.

Provisions for models CTFS/RTFS/RBTFS 28

- The minimum permissible length of **horizontal coaxial** ducts is 1.0 metre, including the first elbow connected to the boiler.
- The maximum permissible length of **horizontal coaxial** ducts is 11.0 metre, including the first elbow connected to the boiler.
- For each additional 90° elbow, maximum permissible length is to be reduced by 3 meters.
- For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 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 chimney.
- The maximum allowed length of **vertical coaxial** ducts is 11.0 metres, including the chimney.
- For each additional 90° elbow, maximum permissible length is to be reduced by 3 meters.
- For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.
- With "ceiling-mounted terminal", maximum permissible length is to be reduced by 1 metre.
- **Use the diaphragms supplied with the kit 125/80 (optional).**

Pipe length (m)	Flue gas venting diaphragm diameter
1 ≤ L ≤ 4*	Ø 39
4 < L ≤ 6*	Ø 42
6 < L ≤ 7*	Ø 44
7 < L ≤ 9*	Ø 47
9 < L ≤ 11*	Ø 49

Tab. 17 Flue gas venting duct length and diaphragm diameter 125/80 (CTFS/RTFS/RBTFS 28)

(*) for C12/C12X types, measurement includes the first elbow.

Provisions for models CTFS/RTFS/RBTFS 32

- The minimum permissible length of **horizontal coaxial** ducts is 1.0 metre, including the first elbow connected to the boiler.
- The maximum permissible length of **horizontal coaxial** ducts is 9.0 metre, including the first elbow connected to the boiler.
- For each additional 90° elbow, maximum permissible length is to be reduced by 3 meters.
- For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 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 chimney.
- The maximum allowed length of **vertical coaxial** ducts is 9.0 metres, including the chimney.
- For each additional 90° elbow, maximum permissible length is to be reduced by 3 meters.
- For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.
- With "ceiling-mounted terminal", maximum permissible length is to be reduced by 1 metre.
- **Use the diaphragms supplied with the kit 125/80 (optional).**

Pipe length (m)	Flue gas venting diaphragm diameter
$1 \leq L \leq 5^*$	Ø 39.8
$5 < L \leq 6^*$	Ø 42
$6 < L \leq 8^*$	Ø 44
$8 < L \leq 9^*$	Ø 47

Tab. 18 Flue gas venting duct length and diaphragm diameter 125/80 (CTFS/RTFS/RBTFS 32)

(*) for C12/C12X types, measurement includes the first elbow.

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

3.6.6.1 Installation types: C42, C52 and C82

Provisions for models CTFS/RTFS/RBTFS 24

For all systems with separate air intake and flue gas vent pipes, the suitable standard split pipe kit (OSDOPPIA13) 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 pipe kit is not used, correct boiler operation is not guaranteed.

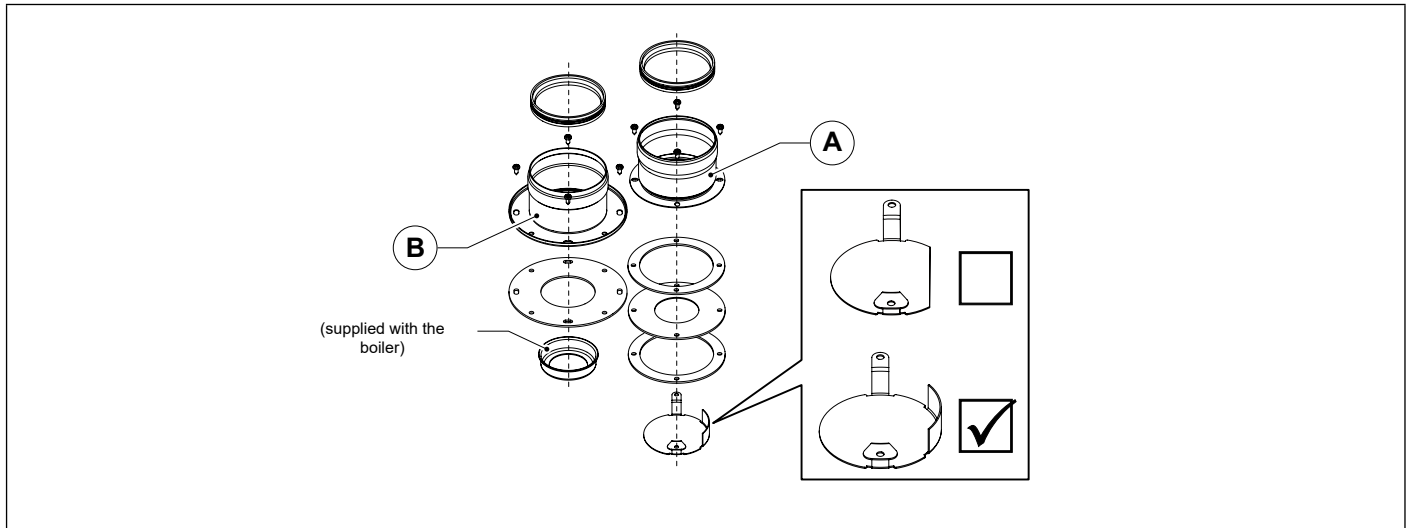


Fig. 21 OSDOPPIA13

Air intake

- Minimum permissible length of air intake pipe 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.
- Each 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.
- Install the specific air deflector (see Fig. 21 OSDOPPIA13).

Flue gas vent

- Each wide radius 90° elbow (R=D) in flue gas venting equals a 1.4 m long straight pipe section.
- Each narrow radius 90° elbow (R<D) in air intake is equivalent to a 2.8 metre long straight pipe section.
- Each air intake duct length of one metre is equivalent to a 1 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
1 ≤ L ≤ 3*	Ø 39.8
3 < L ≤ 14*	Ø 42
14 < L ≤ 26*	Ø 45
26 < L ≤ 34*	Ø 49
34 < L ≤ 42*	-

Tab. 19 Flue gas venting duct length and diaphragm diameter 80+80 (CTFS/RTFS/RBTFS 24)

(*) measurement includes the first elbow.

Provisions for models CTFS/RTFS/RBTF 28

Air intake

- Minimum permissible length of air intake pipe 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.
- Each 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.
- Install the specific air deflector (see Fig. 21 OSDOPPIA13).

Flue gas vent

- Each wide radius 90° elbow (R=D) in flue gas venting equals a 1.4 m long straight pipe section.
- Each narrow radius 90° elbow (R<D) in air intake is equivalent to a 2.8 metre long straight pipe section.
- Each air intake duct length of one metre is equivalent to a 1 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
$1 \leq L \leq 18^*$	Ø 45	Ø 55,5
$18 < L \leq 23^*$	Ø 47	Ø 55,5

Tab. 20 Flue gas venting/air intake duct length and diaphragm diameter 80+80 (CTFS/RTFS/RBTF 28)

(*) measurement includes the first elbow.

Provisions for models CTFS 32 and RTFS 32

Air intake

- Minimum permissible length of air intake pipe 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.
- Each 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.
- Install the specific air deflector (see Fig. 21 OSDOPPIA13).

Flue gas vent

- Each wide radius 90° elbow (R=D) in flue gas venting equals a 1.4 m long straight pipe section.
- Each narrow radius 90° elbow (R<D) in air intake is equivalent to a 2.8 metre long straight pipe section.
- Each air intake duct length of one metre is equivalent to a 1 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
$1 \leq L \leq 5^*$	Ø 44	Ø 55,5
$5 < L \leq 12^*$	Ø 45	Ø 55,5
$12 < L \leq 19^*$	Ø 47	Ø 55,5
$19 < L \leq 24^*$	Ø 49	Ø 55,5

Tab. 21 Flue gas venting/air intake duct length and diaphragm diameter 80+80 (CTFS/RTFS/RBTF 32)

(*) measurement includes the first elbow.

3.6.6.2 Installation type: C62

Maximum chimney residual head (intake-venting): 105 Pa (CTFS/RTFS/RBTF 24); 70 Pa (CTFS/RTFS/RBTF 28); 78 Pa (CTFS/RTFS/RBTF 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  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 **B** and the gas valve modulation coil input current value **A**.

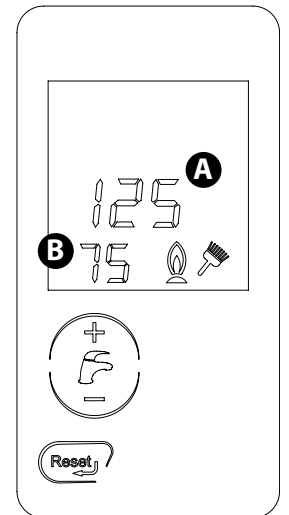
The keys active in this function are:  and **DHW +/-**.

The flue cleaning function lasts 15 minutes.

To quit the flue cleaning function, press  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 Measurement procedure

Coaxial duct system

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

- assess combustion air from opening 2 (see ref. **A** Fig. 22 Examples of flue gas testing points).
- assess flue gas temperature and CO₂ from no. 1 opening (see **B** ref. **A** Fig. 22 Examples of flue gas testing points).

Allow boiler to reach working temperature before taking any measurement.

Split ducts system

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

- assess combustion air from opening 2 (see ref. **B** Fig. 22 Examples of flue gas testing points).
- assess flue gas temperature and CO₂ from no. 1 opening (see **B** ref. **B** Fig. 22 Examples of flue gas testing points).
- Allow boiler to reach working temperature before taking any measurement.

Allow boiler to reach working temperature before taking any measurement.

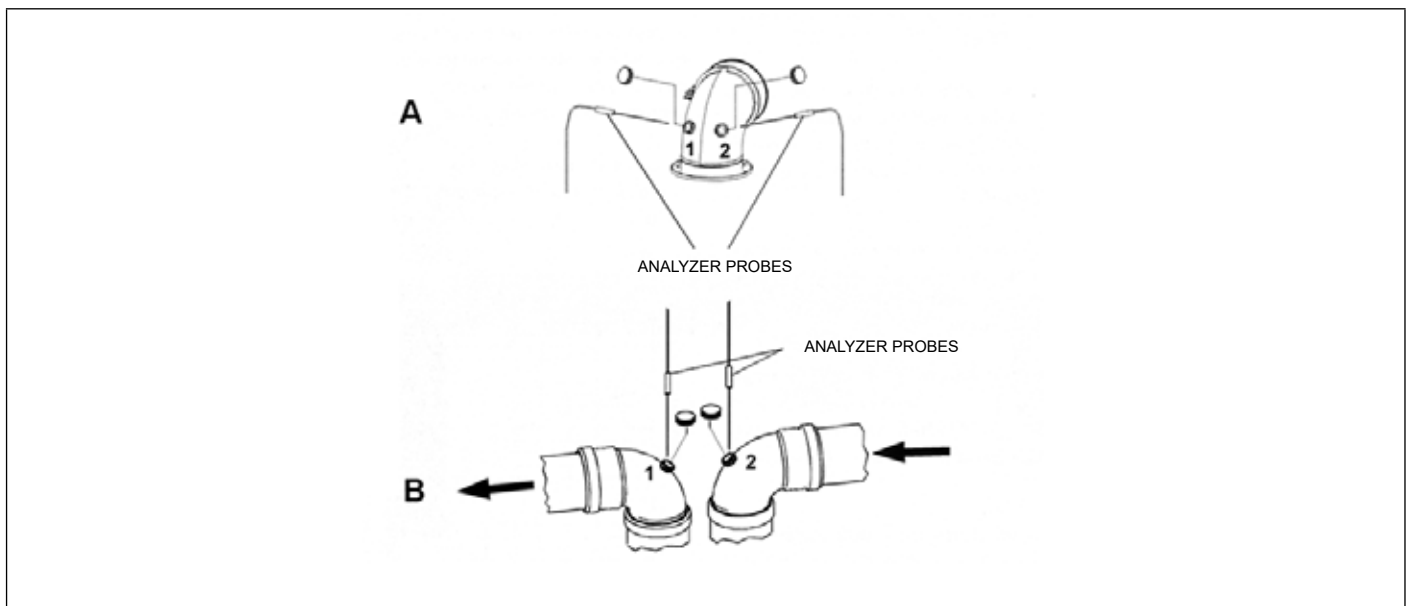


Fig. 22 Examples of flue gas testing points

3.8 Connection to gas mains

Cross-section gas pipe size must be chosen depending on its length, layout pattern, 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. 23 Connection to gas mains).

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

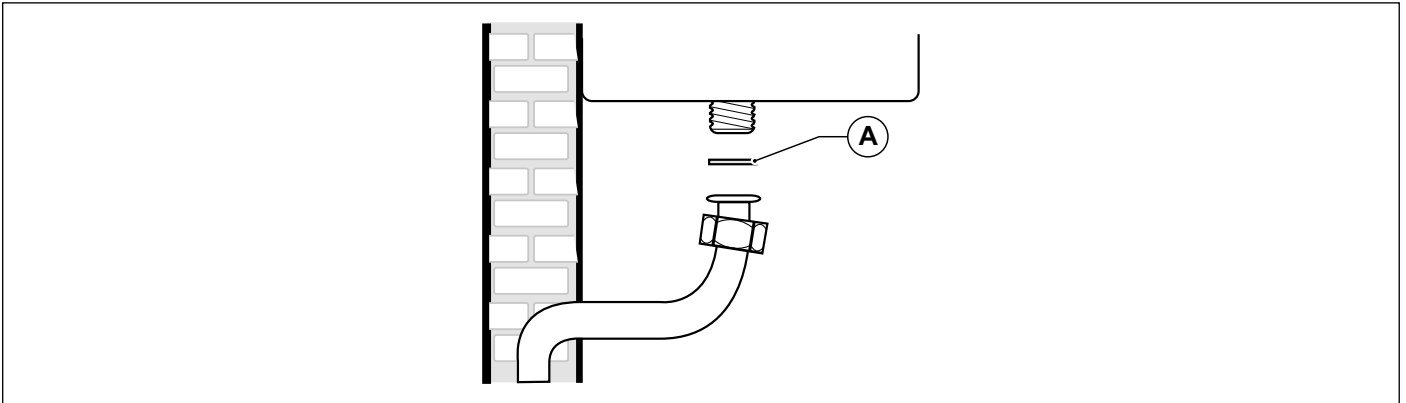


Fig. 23 Connection to gas mains

3.9 Hydraulic connections

3.9.1 Central heating

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 outlet and return pipes must be connected to the respective 3/4" connectors **M** and **R** on the boiler (see Fig. 15 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.



WARNING

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 in case of damage to people, animals, or property due to failure to follow the above mentioned instructions.

3.9.2 DHW

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 heat exchanger.

CTFS/CTN models

The cold water inlet and the DHW outlet must be connected to the respective 1/2" connectors **C** and **F** on the boiler.

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

RTFS/RTN models

Cold water inlet shall be connected to the boiler through the special 1/2" fitting **F**.

RBTFS/RBTN models

Return from the water heater (RB) and flow to water heater (MB) must be connected to the respective 1/2" connectors **F** and **C** on the boiler



WARNING

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 regulations and standards in force in the country of installation.

Water treatment is always advisable when water supplied to the boiler has a hardness that is more than 15°F.

Water supplied by commonly marketed water softeners could, due to the chemical and physical characteristics that it takes, not be compatible with some heating system components as the loading of the system is done with DHW system water.

For this reason it is better to use polyphosphate feeders.

3.10 Connection to electrical mains

The boiler is supplied with a three-poled power cable, already connected to the electronic board and it is provided with a safety clamp. The boiler is to be connected to a 230V-50Hz electrical power supply.

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

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

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

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

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



WARNING

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.

The ambient thermostat cables must be connected to terminals 1 and 2 of the electronic board (see par. *Wiring diagrams* on page 65) after having eliminated the jumper supplied as a standard with the boiler.

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

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



WARNING

Only use original Remote Control Units supplied by the manufacturer.

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

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.

The Remote Control cables must be connected to terminals 3 and 4 of the electronic board (see *Wiring diagrams*).

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



WARNING

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.

Boiler display layout corresponds to the setting made from the Remote Control, as for the operating mode.

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

Setting the **TSP0** parameter sets the default data table and reloads all original data, cancelling any modifications previously made to individual 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.

3.13 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.



WARNING

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.



WARNING

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:

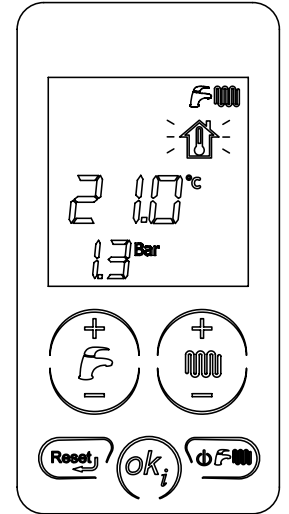
- Measured external temperature.
- Selected thermoregulation curve.
- Selected fictitious ambient temperature.

The fictitious ambient temperature is set using **CH +/-** buttons that, with external probe installed, no longer work to set the heating water temperature (see *Operation with external probe (optional)* on page 16).

Through boiler parameter **P30** it is possible to display the value of the outside temperature detected by the external probe.

With installed external probe, press **+/- CH** buttons to set calculated ambient temperature. As soon as the 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.



The figure shows the curves for a fictitious ambient temperature of 20°C. Parameter **P10** allows selecting the curve value shown (see Fig. 24 Thermoregulation curves).

If fictitious ambient temperature value is edited on boiler display, the curves shift up or down, respectively, by the same amount.

With a fictitious ambient temperature setting of 20°C, for example, if you select the curve corresponding to parameter 1 and the outdoor temperature is -4°C, the CH flow temperature will be 50°C.

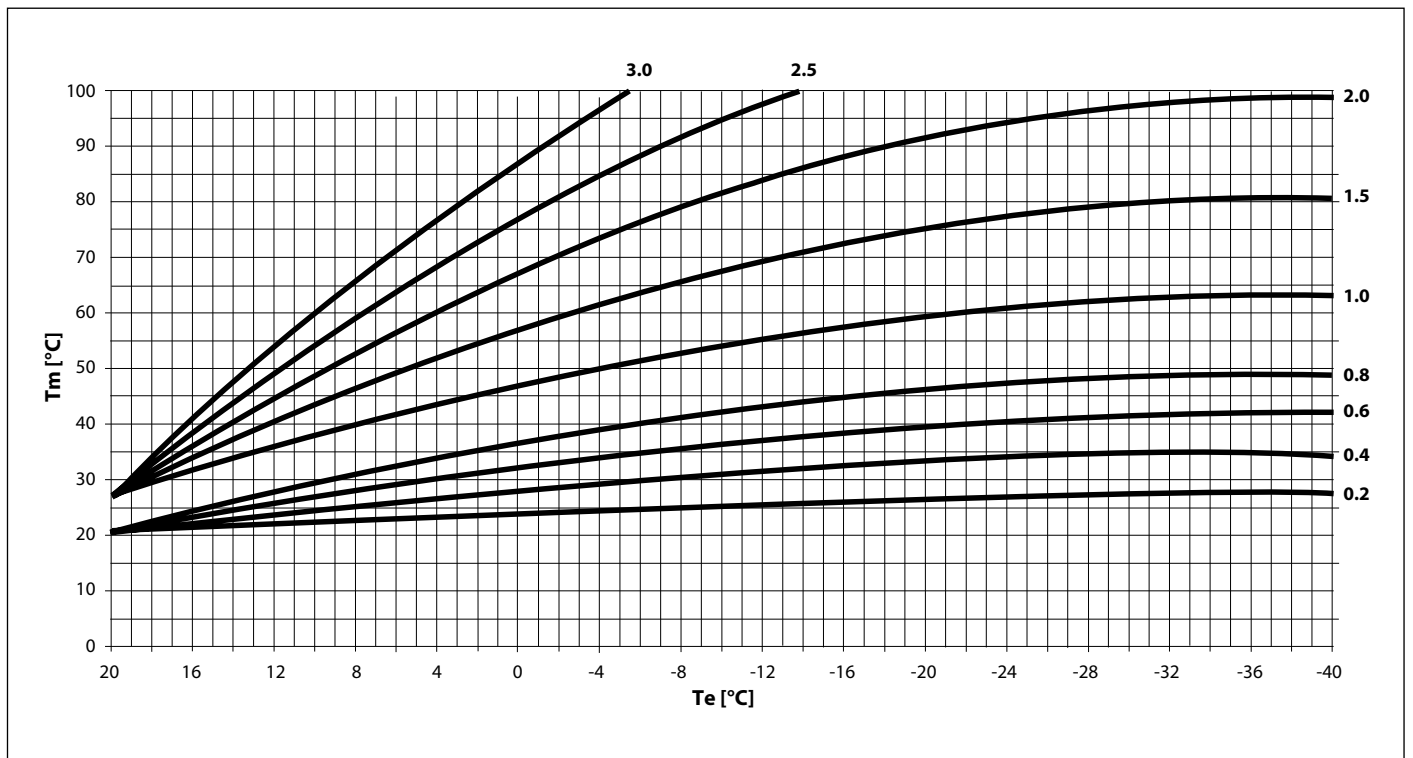




Fig. 24 Thermoregulation curves


Tm indicates flow water temperature in °C


Te indicates external temperature in °C

3.14 TSP parameters

The boiler operation is controlled by several parameters.


To change the parameters, press  and  at the same time for 3 seconds. Scroll through the parameters by pressing **CH +/-** buttons.

Set onto the required one and press .

The  symbol turns on to indicate that you can edit the parameter value.

The parameter value can be changed with the **+/- HEATING** buttons.

To confirm modification press .

To quit the parameter editing mode press .

Parameter	Settable values	Default values	Notes
P0 - TSP0 Boiler power selection	0 ÷ 5	According to the model	0 = 24 kW LPG 1 = 24 kW Natural gas 2 = 28 kW LPG 3 = 28 kW Natural gas 4, 5 = not used
P0 - TSP0 Boiler power selection	0 ÷ 5	According to the model	0 = 24 kW LPG 1 = 24 kW Natural gas 2 = 28 kW LPG 3 = 28 kW Natural gas 4 = 32 kW LPG 5 = 32 kW Natural gas
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 CH max heat output 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 Water hammer protection delay	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 fault 1 = requested by the ambient thermostat 1/ Remote Control 2 = solar 3 = ambient thermostat 2 request
P18 - TSP18 Solar plant type choice	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

Tab. 22 Limits to be set for TSP parameters and default values in relation to boiler type (TSP0) - I

Parameter	Settable values	Default values	Notes
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)
P27 - TSP27 Heating timer reset temperature	35 ÷ 78 °C	30 °C	n.a.
P28 - TSP28 Hydraulic setting for management of deviating valve relay	0 ÷ 1	0	0 = recirculation pump + deviator 1 = double pump
P29 - TSP29 Default parameter setting (except P0, P1, P2, P17, P28)	0 ÷ 1	0	0 = user's 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 DHW plate exchanger temperature	n.a.	n.a.	only CTFS
P42 DHW plate exchanger temperature	n.a.	n.a.	n.a.
P44 Water heater temperature	n.a.	n.a.	only RTFS/RBTFS with water heater probe

Tab. 23 Limits to be set for TSP parameters and default values in relation to boiler type (TSP0) - II

Parameter	Settable values	Default values	Notes
P46 Solar collector boiler temperature	n.a.	n.a.	only with solar collector probe connected
P47 Water heater or boiler solar valve temperature	n.a.	n.a.	only with water heater probe or solar valve connected
P48 Water heater or solar PCB valve temperature	n.a.	n.a.	As above, but only with solar board connected
P59 Type of temperature visualization on display	0 ÷ 7	0	0 = flow temp. 1 = not used 2 = not used 3 = external temp. 4 = water heater temp. 5 = solar collector temp. 6 = solar valve temp. 7 = solar valve temp from solar board
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 3 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 Selection of zone 4 curve	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 = LCD always ON 2 = LCD and keys always ON

Tab. 24 Limits to be set for TSP parameters and default values in relation to boiler type (TSP0) - III

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 PCB forcing	0 ÷ 1	0	0 = standard function 1 = relay energised
P92 Solar PCB valve relay forcing	0 ÷ 2	0	0 = standard function 1 = force opening 2 = force closing
P94 Automatic filling procedure activation	0 ÷ 1	1	0 = disabled 1 = enabled

Tab. 25 Limits to be set for TSP parameters and default values in relation to boiler type (TSP0) - IV

3.15 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 relevant filler cock, checking any automatic bleeding valves installed in the system properly work (see Fig. 2 Filler cock).
- Close all radiator bleeding valves as soon as water starts coming out.
- Check on boiler display that water pressure reaches the 1÷1.3 bar reading.
- Shut the filler cock and bleed any air out again, by opening the air bleeding valves on radiators.
- Start the boiler and bring the system to working temperature, stop the pump, and repeat air bleeding procedure.
- Allow the system to cool and restore water pressure to 1÷1.3 bars.



WARNING

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.**
 - **Before refitting the boiler casing ensure that all surfaces are properly dried.**
 - **Once the unblocking operation is completed, screw the protective cap back on and check for water leaks.**
-



WARNING

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

The CH system water pressure must not be lower than 1 bar. Otherwise, fill the heating system.

The procedure is to be followed while the system is cold.

Digital pressure gauge is used to read pressure inside the heating circuit.



WARNING

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

3.16 Starting up the boiler

3.16.1 Preliminary checks

Before starting the boiler, check that:

- The flue gas venting duct and the relevant terminal are installed in conformity with the instructions: with the boiler operating, there must be no leakage of combustion by-products from any of the gaskets.
- The supply power to the boiler must be 230 V ~ 50 Hz.
- The heating system is correctly filled with water (pressure gauge reading 1±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 if necessary (see *Adaptation to other gas types and burner adjustment* on page 80). 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 adjacent to the boiler is turned on.
- The safety valve is not blocked.
- There are no water leaks.
- The pump has not seized.



WARNING

The boiler is equipped with a 3-speed circulation pump, set by the manufacturer on speed III.

In paragraph *Available head* shows the system residual heads for the various speeds.

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).

3.16.2 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).

3.17 Available head

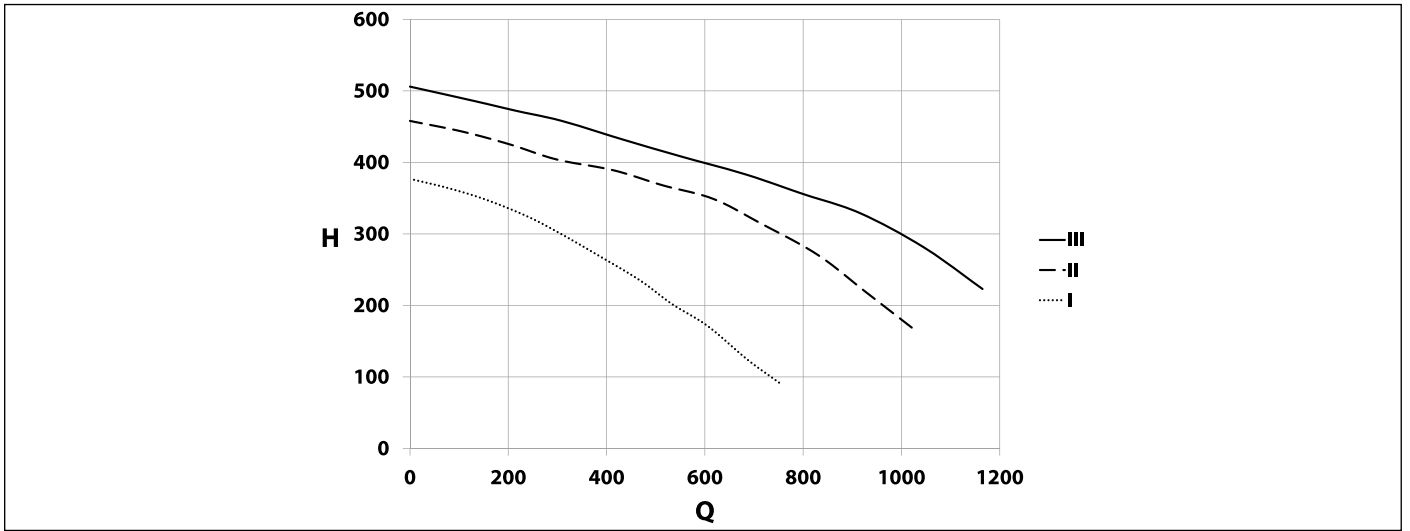


Fig. 25 Available head CTFS/CTN/RTFS/RTN/RBTFS/RBTN 24

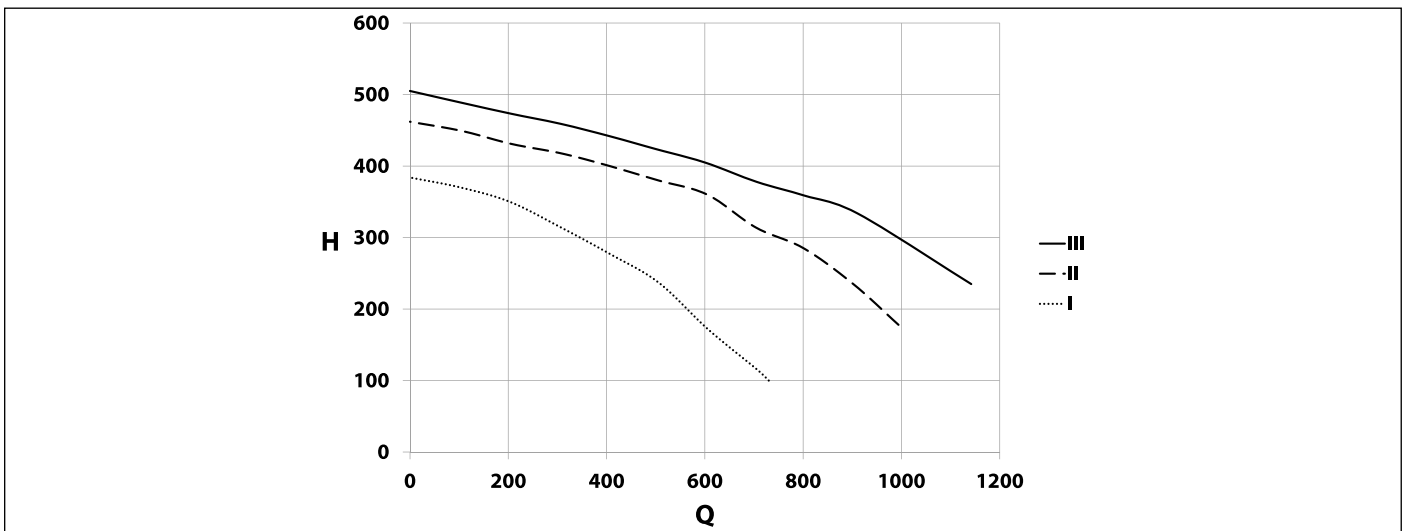


Fig. 26 Available head values CTFS/CTN/RTFS/RTN/RBTFS/RBTN 28

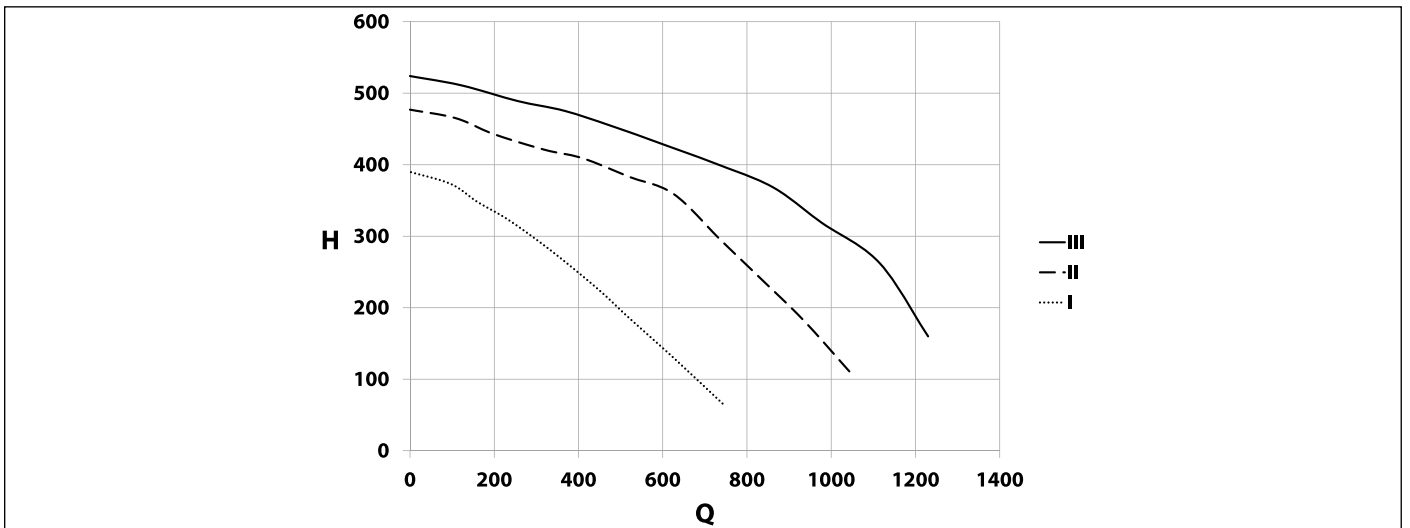


Fig. 27 Available head values CTFS/RTFS/RBTFS 32

Q Flow rate (l/h)
H Available head (mbar)

3.18 Wiring diagrams

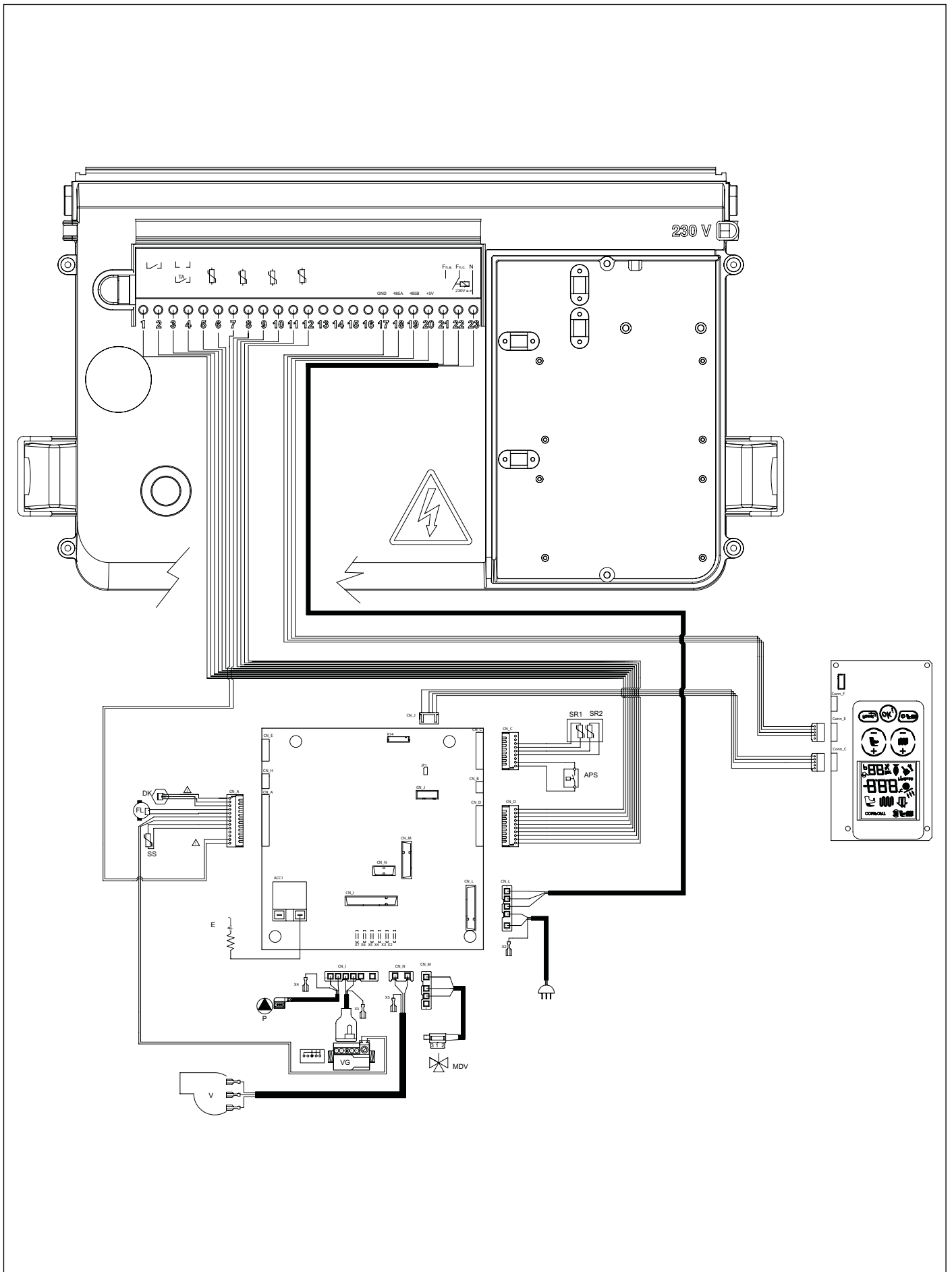


Fig. 28 Wiring diagram CTFS

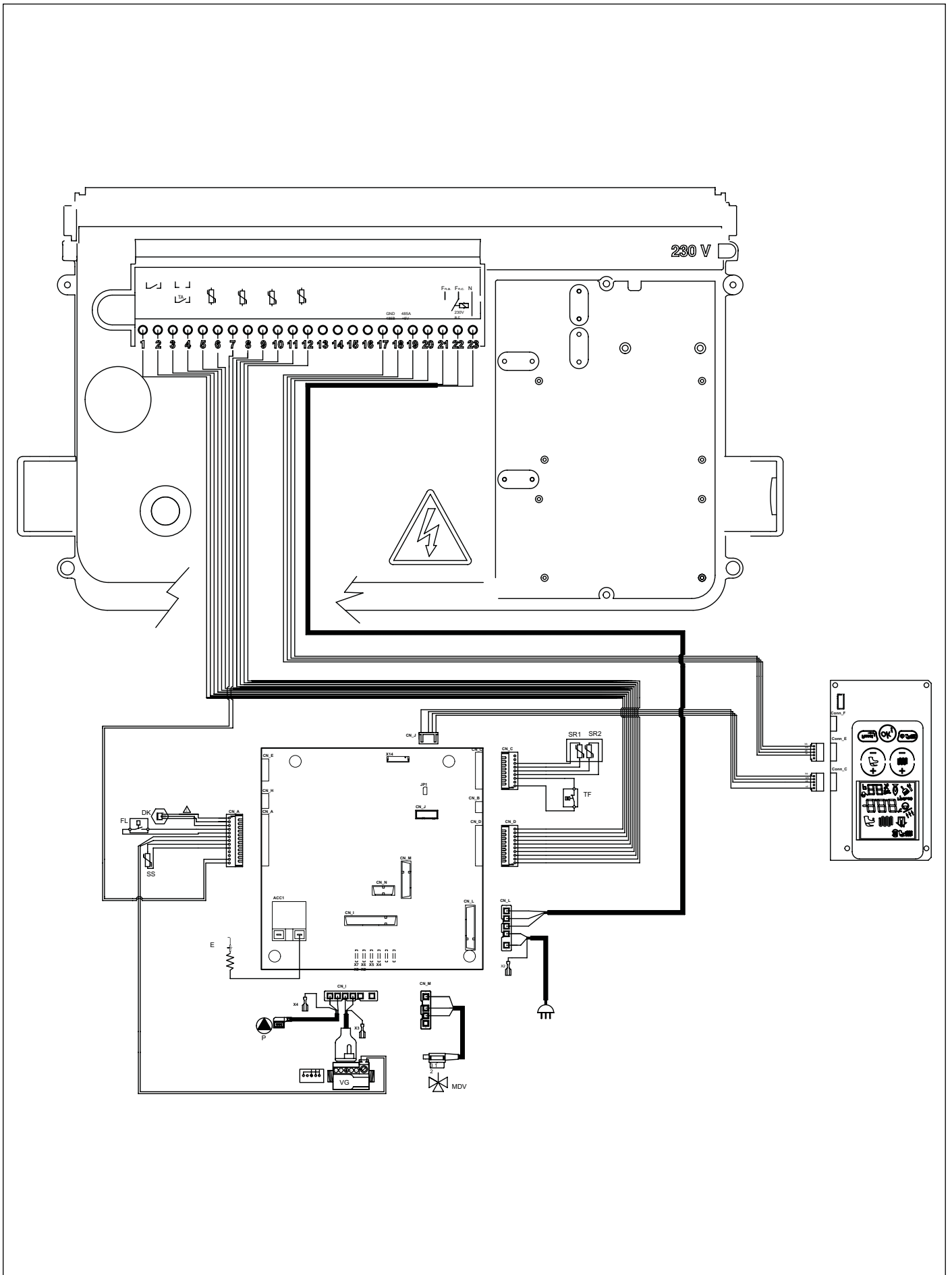


Fig. 29 Wiring diagram CTN

Internal connections

- DK : pressure transducer
- FL : Flow meter
- SS : DHW NTC 'OUT' probe 0k Ohm a 25°C B=3435
- SR1-SR2 : CH NTC probe 10k Ohm at 25°C B=3435 (double)
- ASP : air pressure switch (CTFS)
- TF : flue gas thermostat (CTN)
- VG : Valve gas with modulation coil
- P : boiler pump
- MDV : electric deviating valve
- E : Ignition/detection electrode
- V : Fan (CTFS)
- 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: outdoor temperature probe (10K Ohm B=3977 at 25° C)
- 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)
- 13-14-15-16: ... not used
- 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: phase (NO)
 - 22: phase (NC)
 - 23: neutral (COMMON)

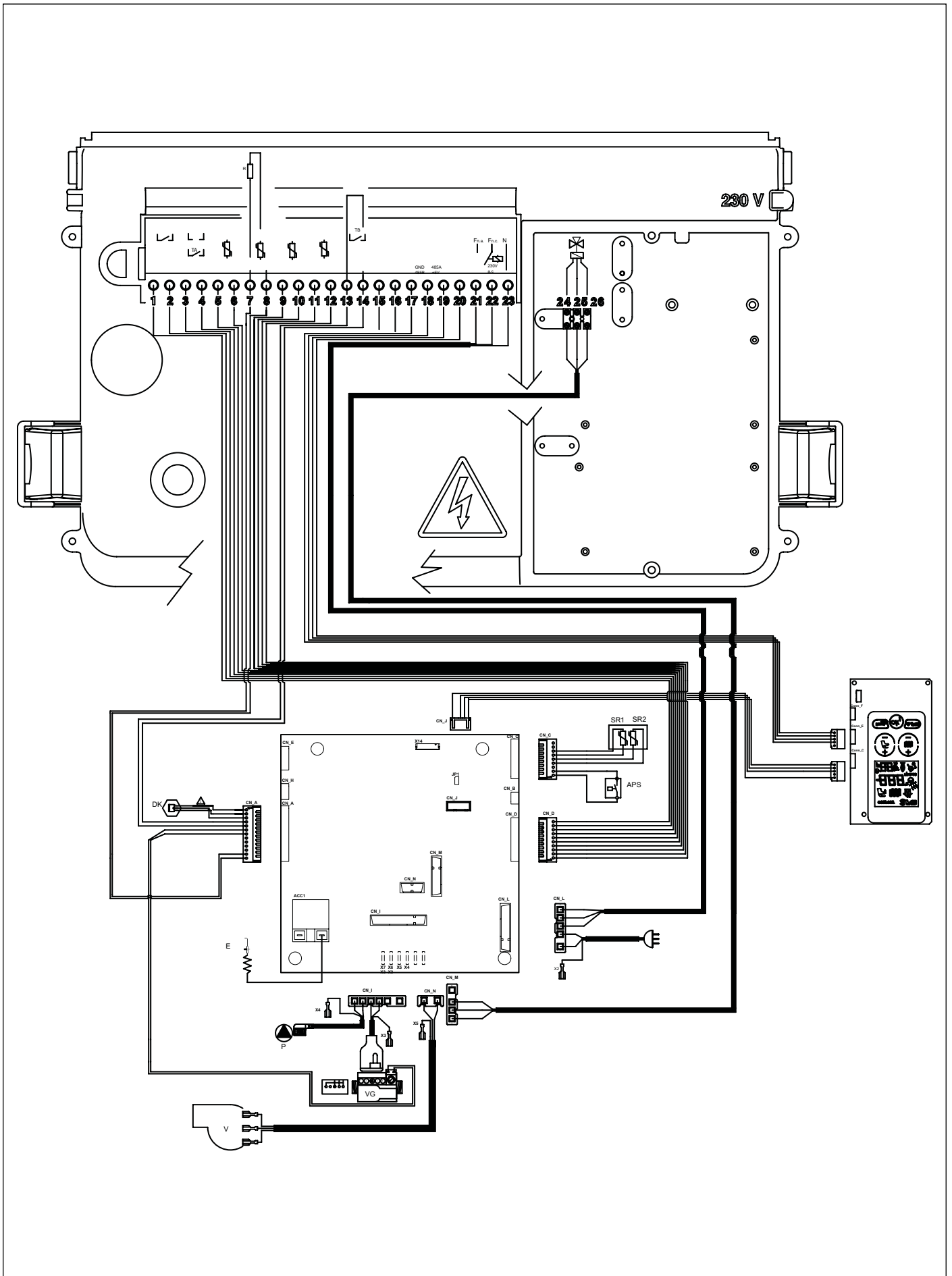


Fig. 30 Wiring diagram RTFS

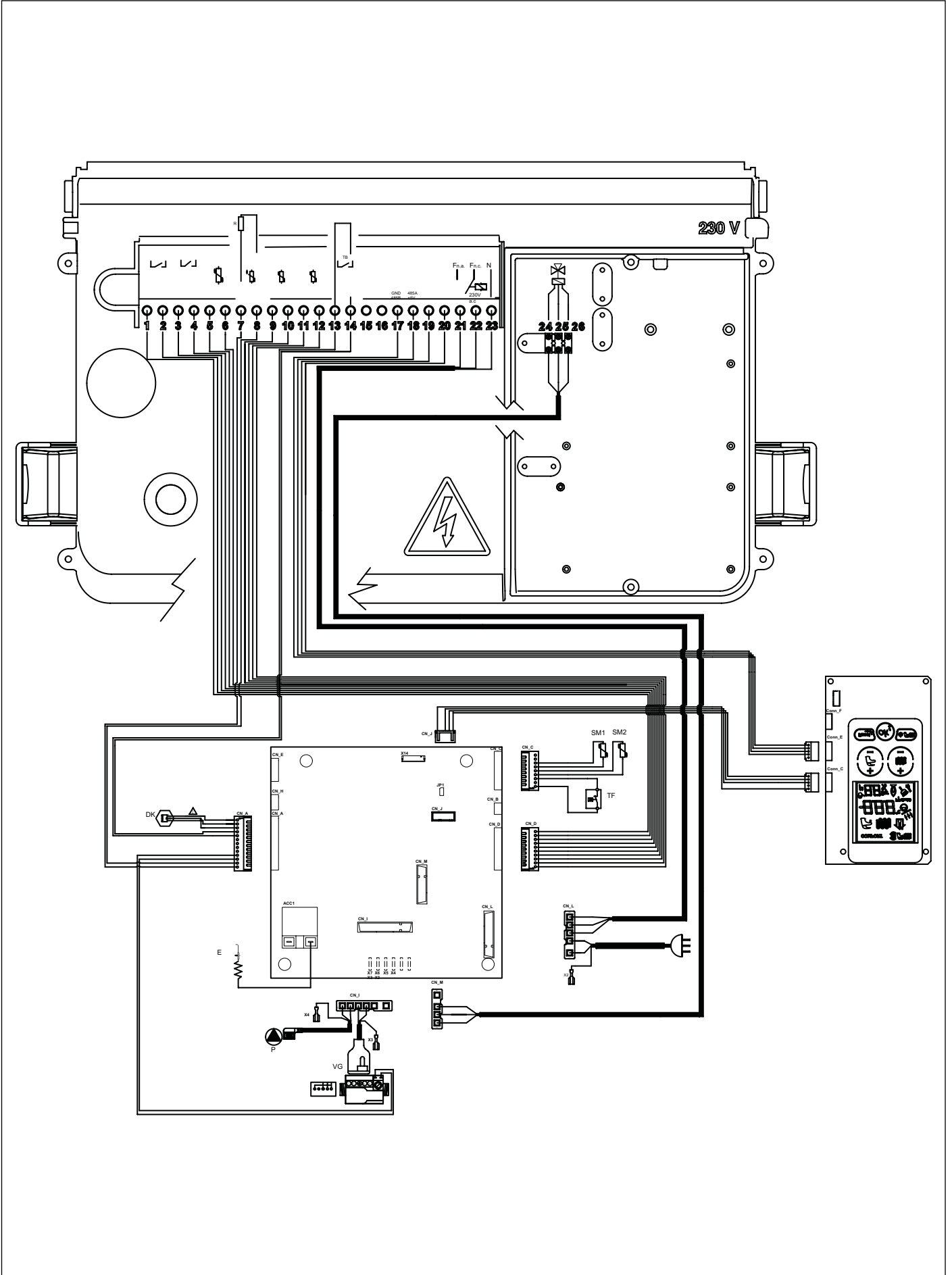


Fig. 31 Wiring diagram RTN

Internal connections

- DK** : pressure transducer
- SR1-SR2** : CH NTC probe 10k Ohm at 25°C B=3435 (double)
- ASP** : air pressure switch (RTFS)
- TF** : flue gas thermostat (RTN)
- VG** : Valve gas with modulation coil
- P** : boiler pump
- E** : Ignition/detection electrode
- V** : Fan (RTFS)
- 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**: outdoor temperature probe (10K Ohm B=3977 at 25° C)
- 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**: Water heater thermostat
- 15-16**: not used
- 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**: phase (NO)
 - 22**: phase (NC)
 - 23**: neutral (COMMON)
- 24-25-26**: 3-way deviating valve (RTFS/RTN)
 - 24**: DHW (neutral, NC)
 - 25**: heating (neutral, NO)
 - 26**: phase (COMMON)

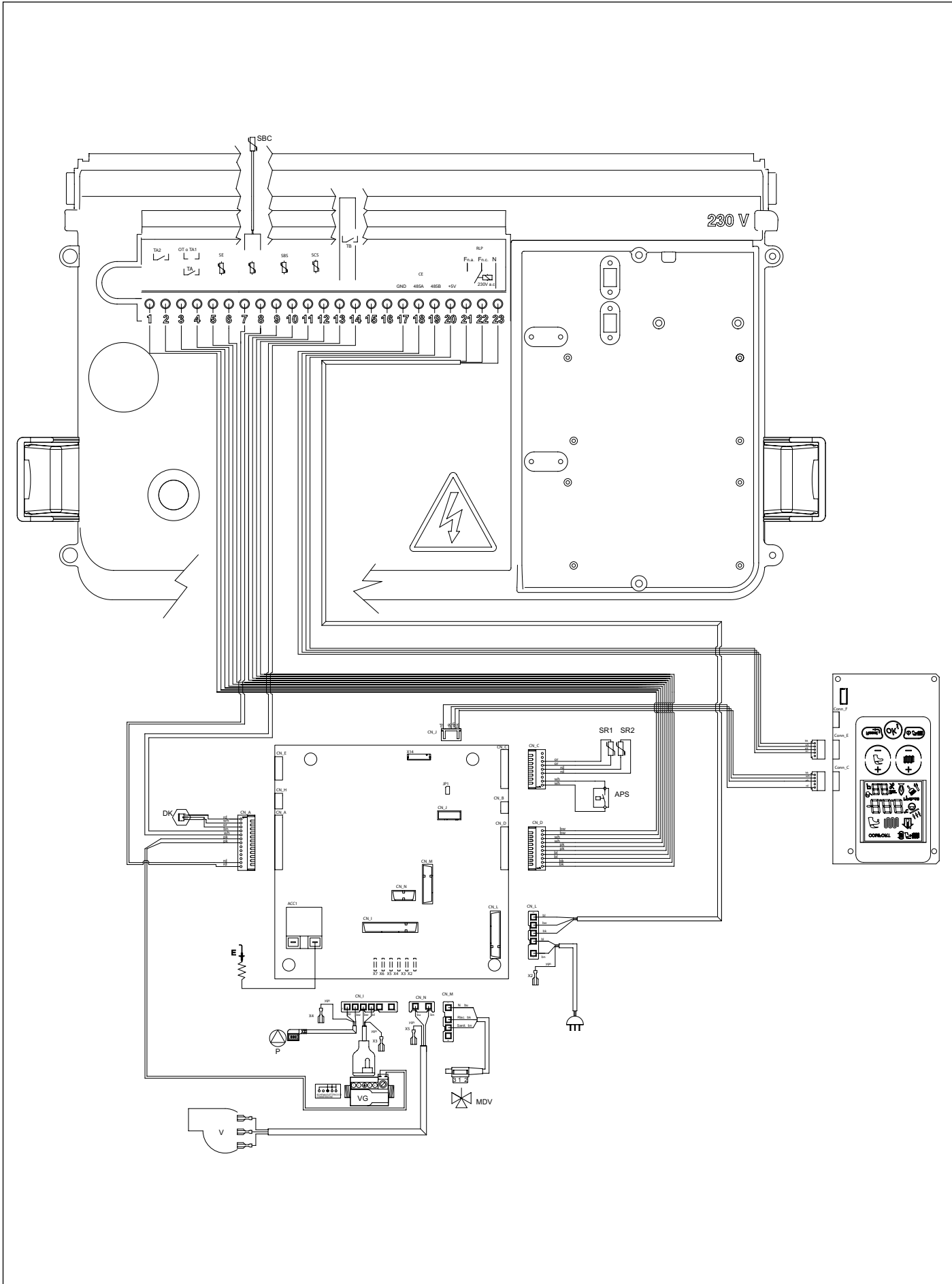


Fig. 32 Wiring diagram RBTFS

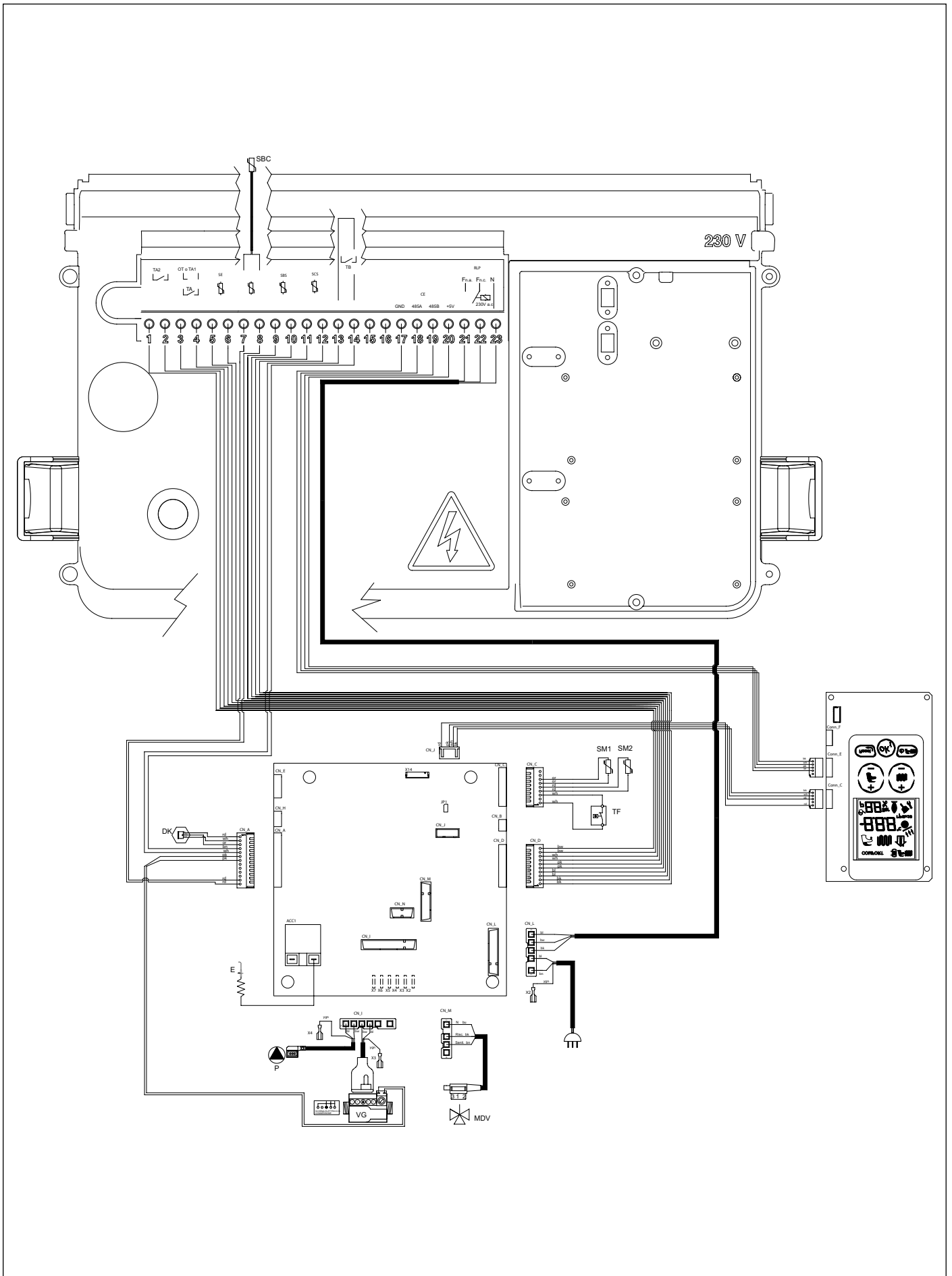


Fig. 33 Wiring diagram RBTN

Internal connections

- DK** : pressure transducer
- SR1-SR2** : CH NTC probe 10k Ohm at 25°C B=3435 (double)
- ASP** : air pressure switch (RBTFS)
- TF** : flue gas thermostat (RBTN)
- VG** : Valve gas with modulation coil
- P** : boiler pump
- MDV** : electric deviating valve
- E** : Ignition/detection electrode
- V** : Fan (RBTFS)
- 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**: outdoor temperature probe (10K Ohm B=3977 at 25° C)
- 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**: Water heater thermostat
- 15-16**: not used
- 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**: phase (NO)
 - 22**: phase (NC)
 - 23**: neutral (COMMON)

3.18.1 Wiring diagram for forced circulation solar system with combi boiler

Parameter setting

P03 : 1

P17 : 2

P18 : 1

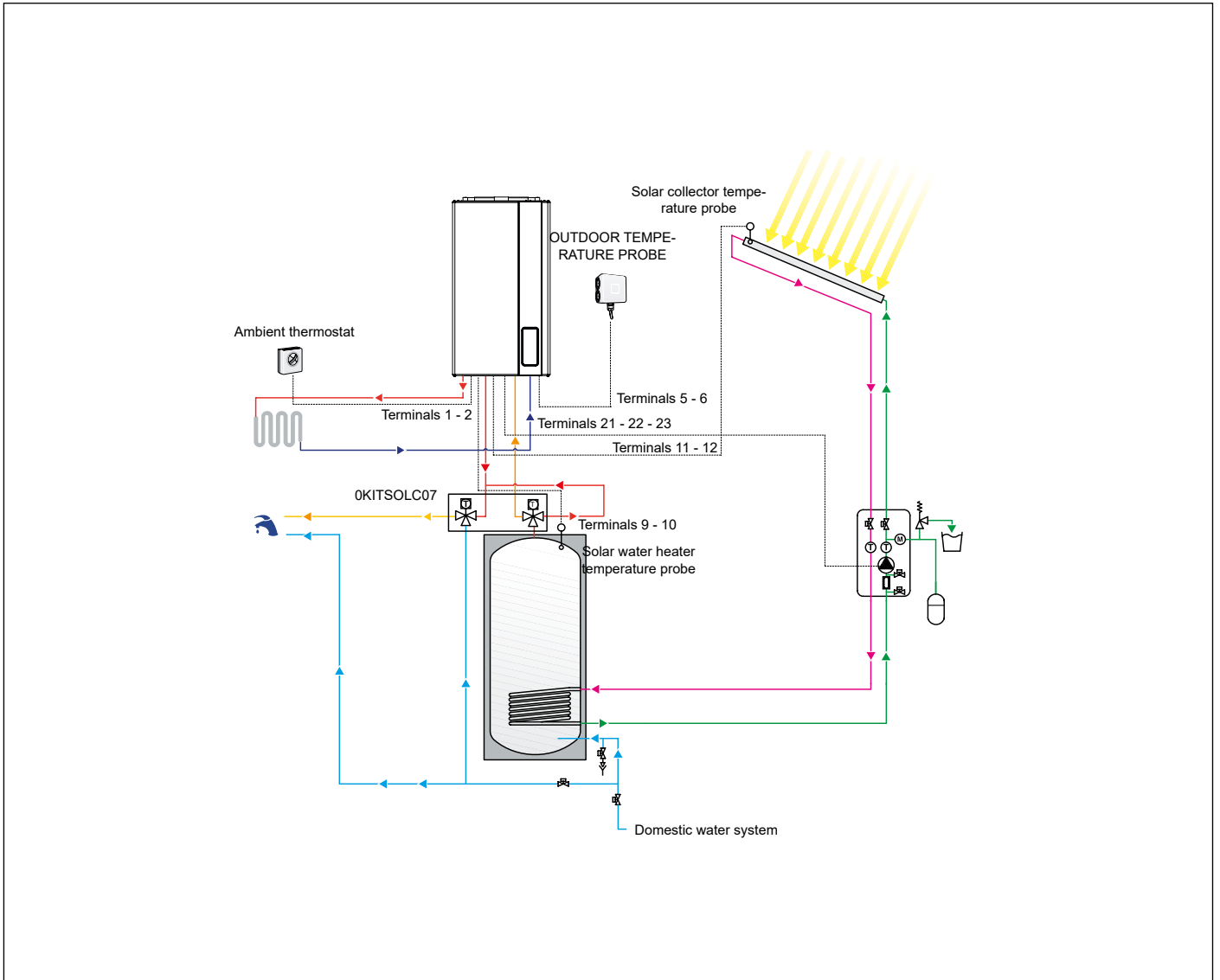


Fig. 34 Wiring diagram for forced circulation solar system with combi boiler

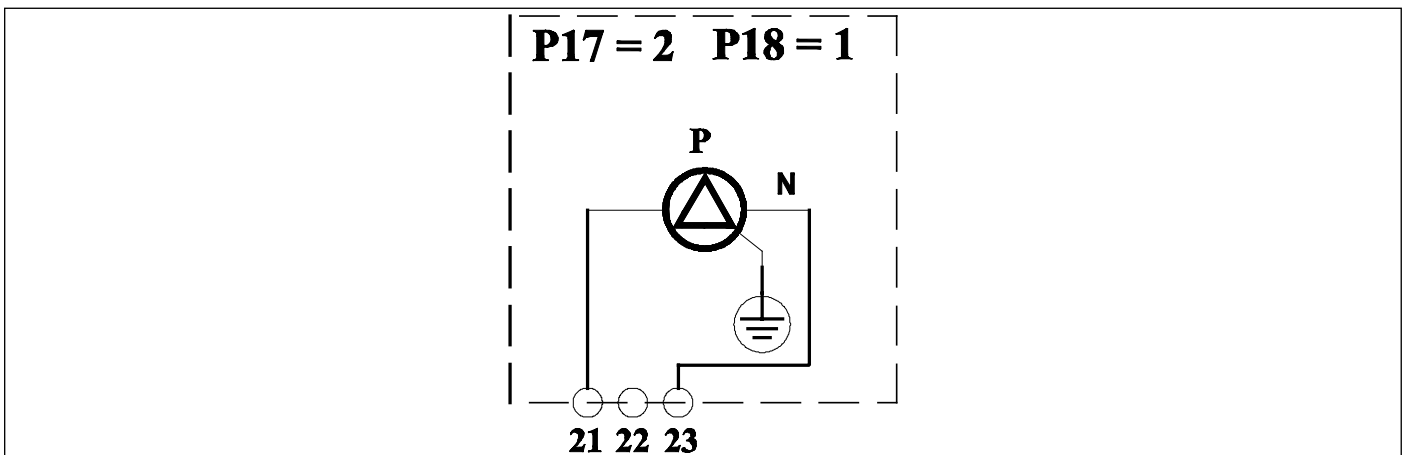


Fig. 35 Multifunction relay connection diagram

3.18.2 Wiring diagram for natural circulation solar system with combi boiler

Parameter setting

P03 : 1

P17 : 2

P18 : 0

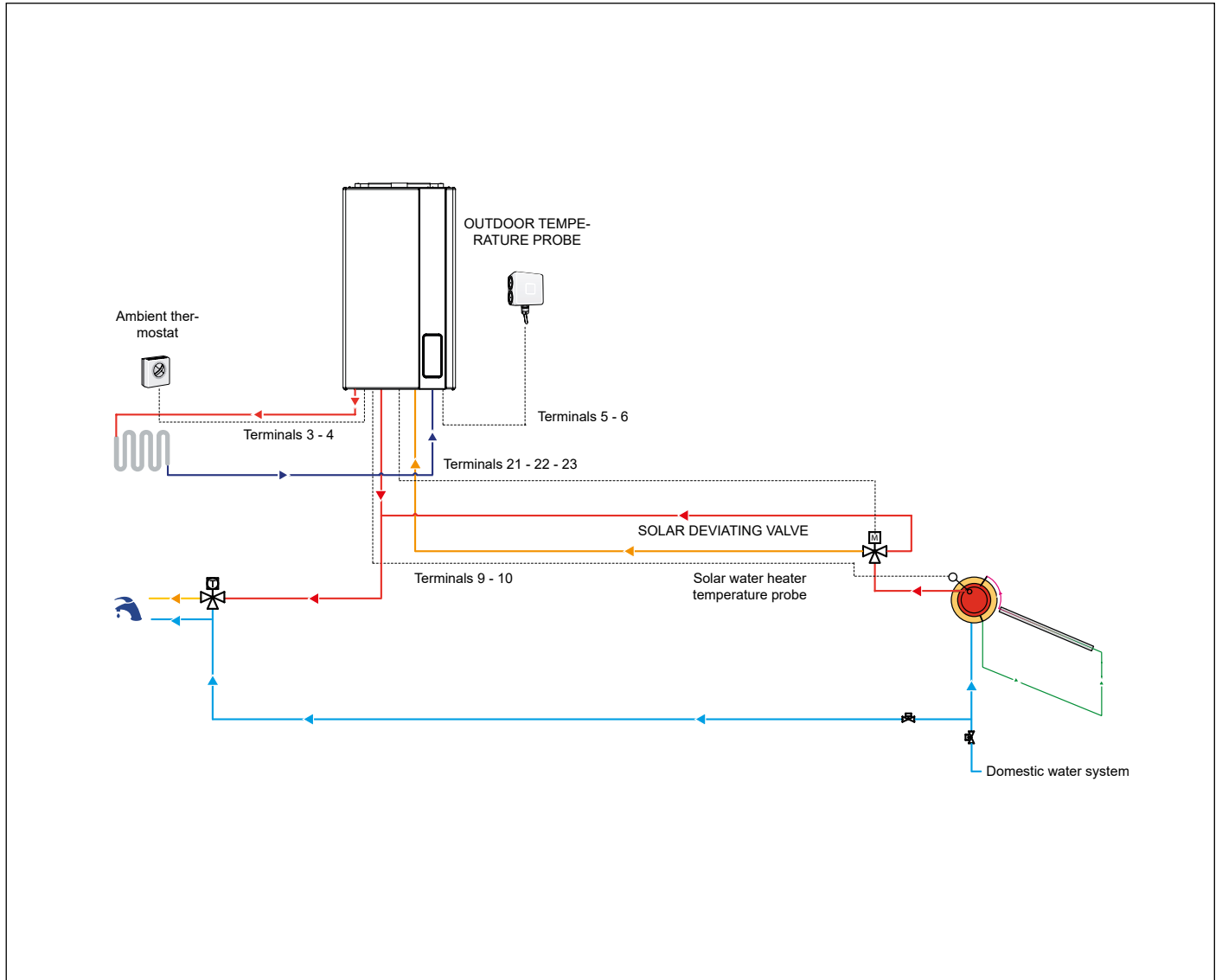


Fig. 36 Wiring diagram for natural circulation solar system with combi boiler

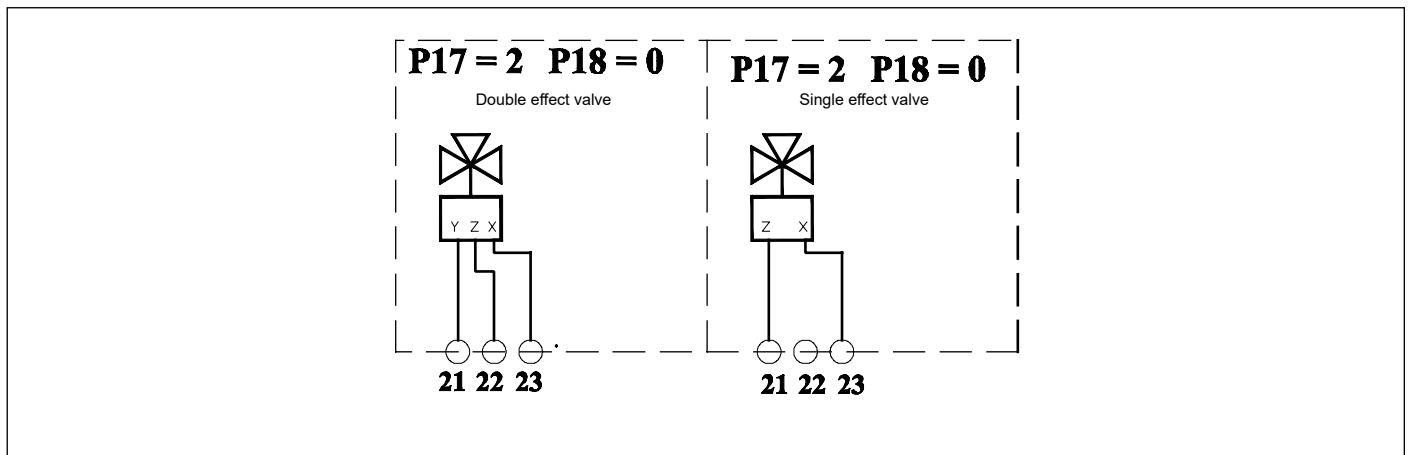


Fig. 37 Multifunction relay connecting diagram (X = neutral; Y = to boiler; Z = to collector)

3.18.3 Forced circulation solar system with CH only boiler wiring diagram

Parameter setting

P03 : 3

P17 : 2

P18 : 1

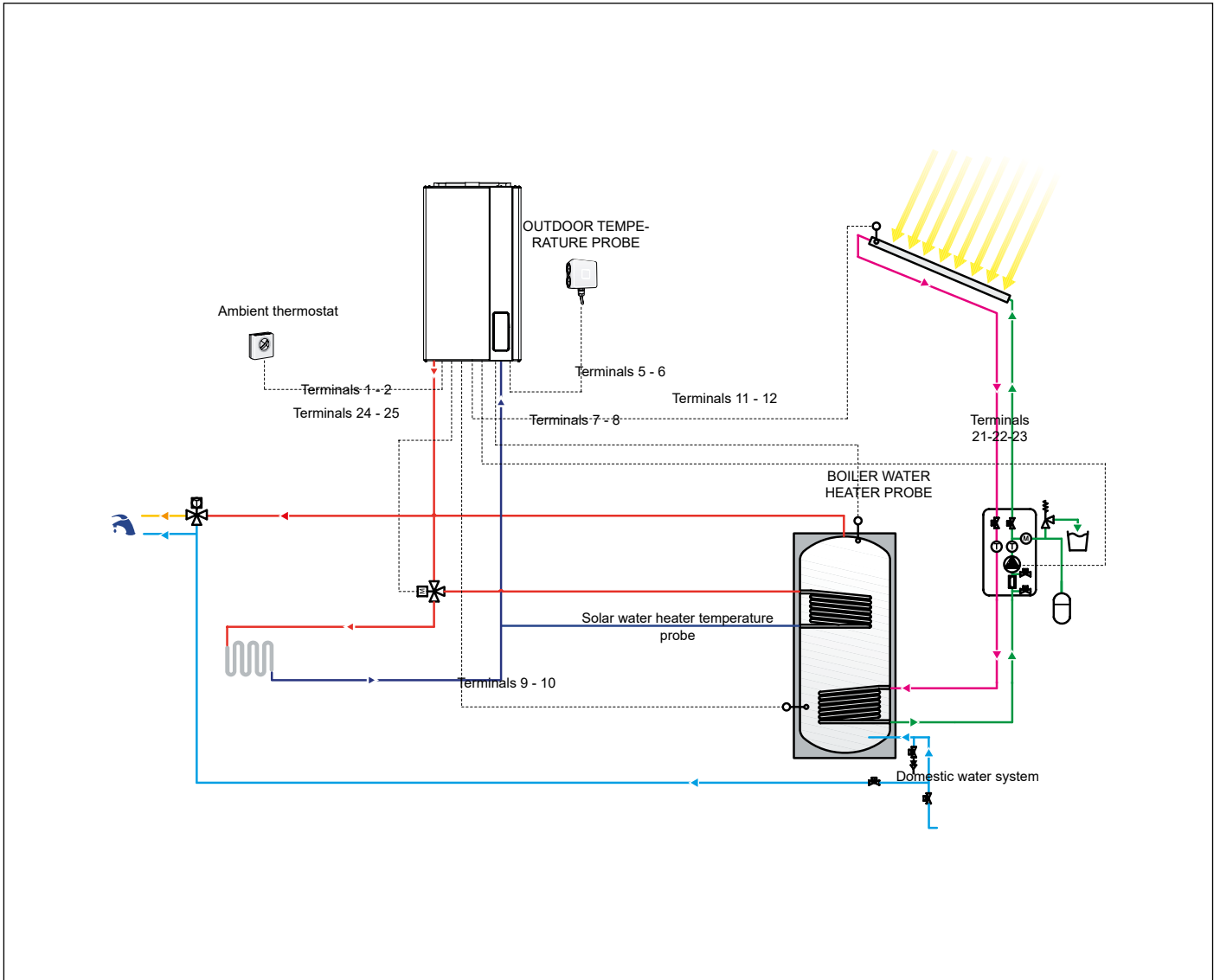


Fig. 38 Forced circulation solar system with CH only boiler wiring diagram

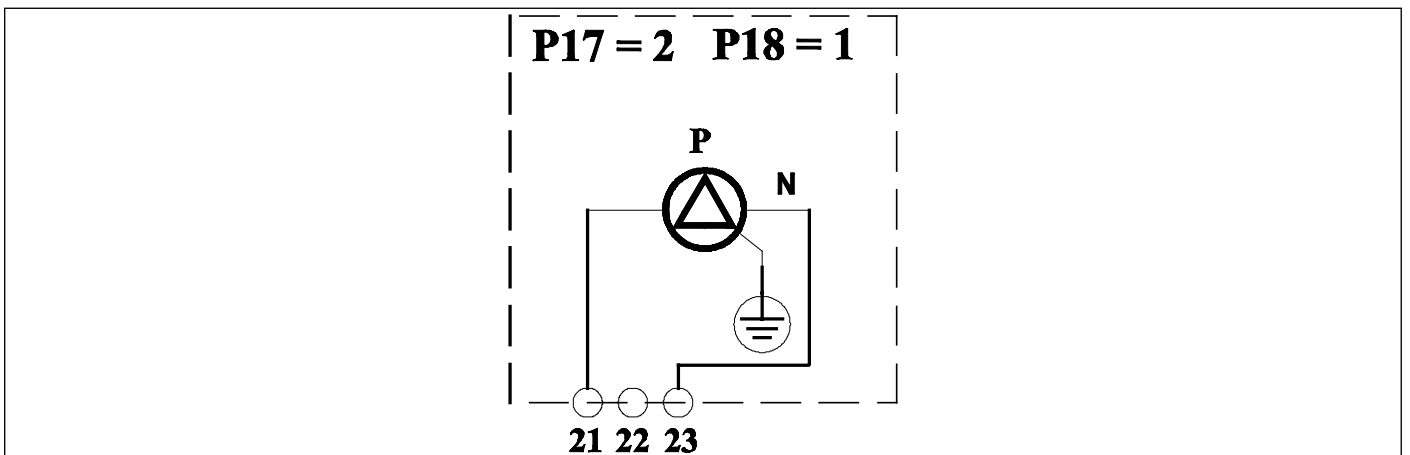


Fig. 39 Multifunction relay connection diagram

3.18.4 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.

3.18.5 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.

3.18.6 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).

3.18.7 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.

3.18.8 Multifunction relay setting diagrams

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

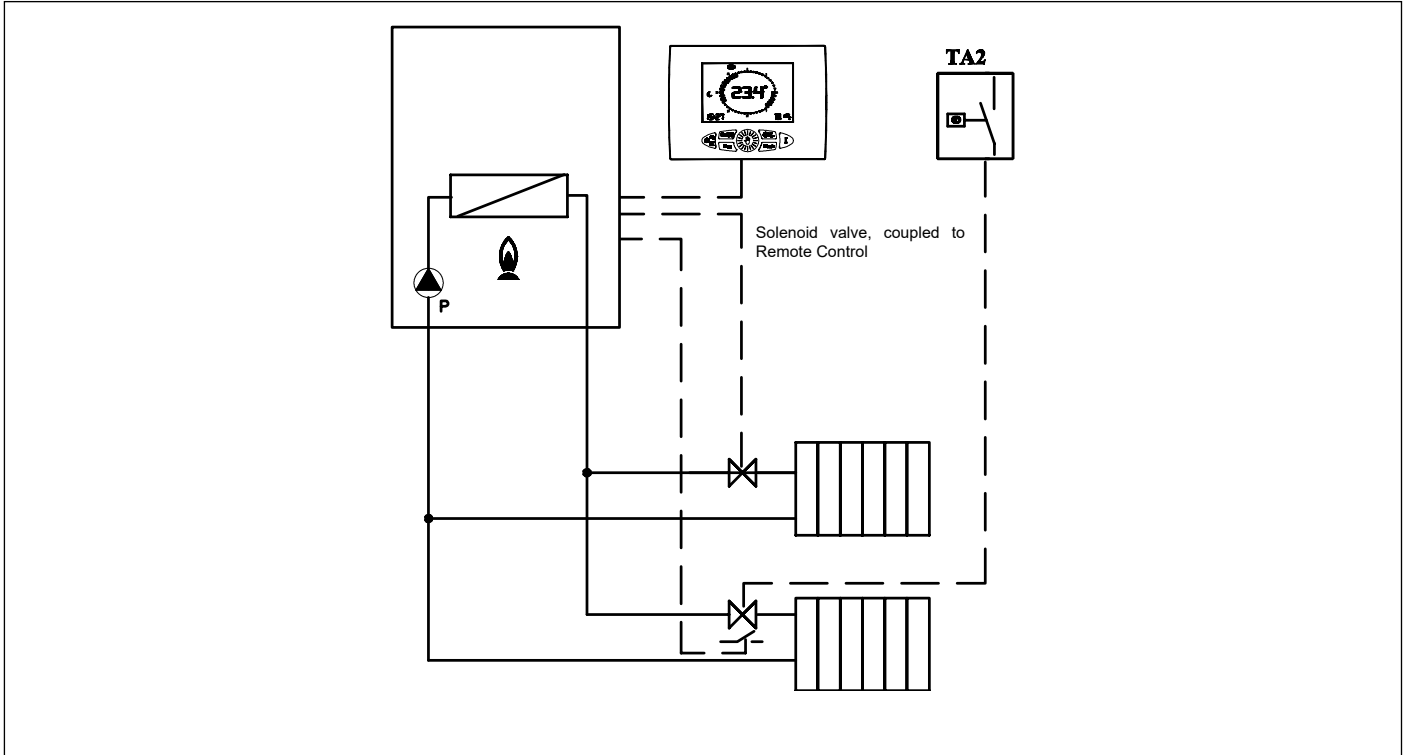


Fig. 40 Relay with remote control and TA2

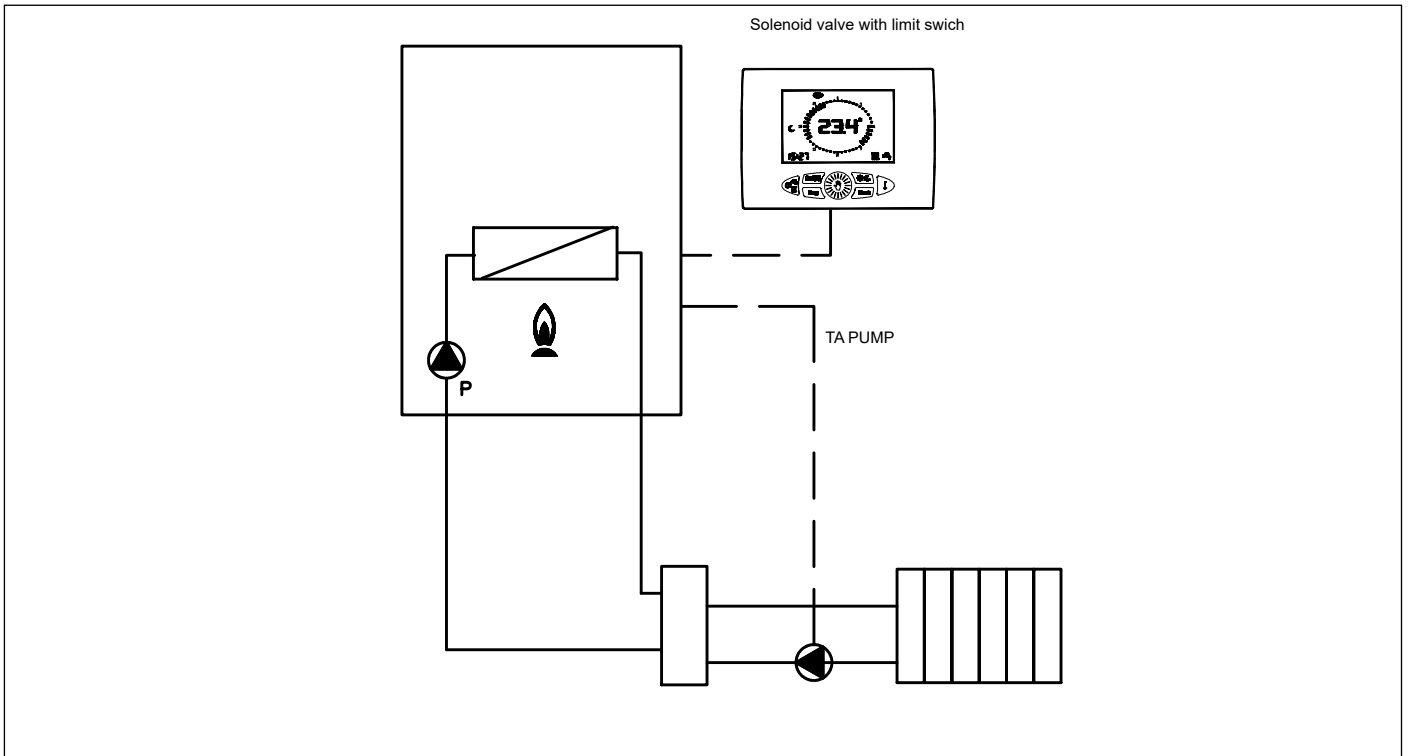


Fig. 41 Relay with remote request (P17=1)

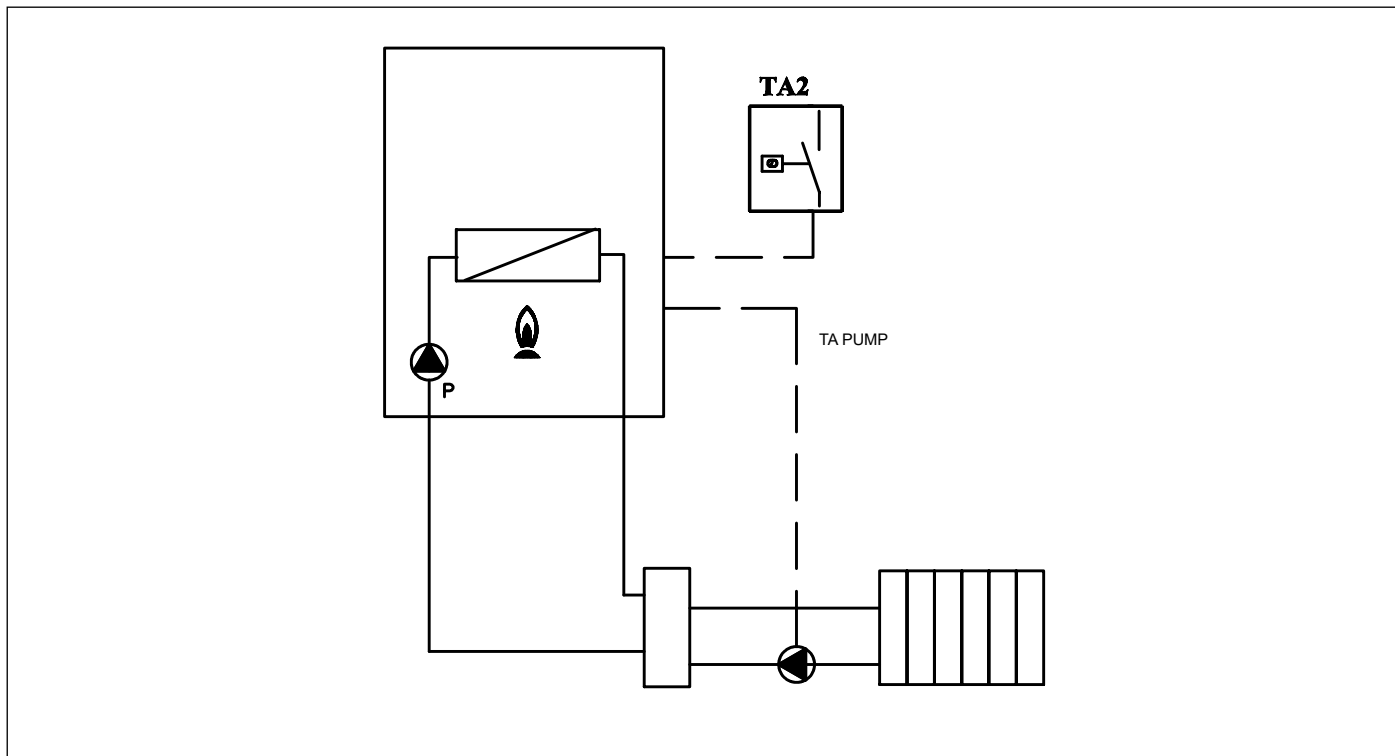


Fig. 42 Relay with TA2 request (P17 = 3)

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

Tab. 26 Parameter setting

3.18.9 Relationship between temperature and nominal resistance of all NTC probes (B=3435)

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

Tab. 27 Relationship between "Temperature and Nominal resistance" for temperature probes

3.19 Adaptation to other gas types and burner adjustment



WARNING

This boiler is built to run on the type of gas specified 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.

3.19.1 Replacing the nozzles

- Disconnect the boiler from the electric power supply.
- Remove boiler outer front panel (see Fig. 43 Front casing opening).

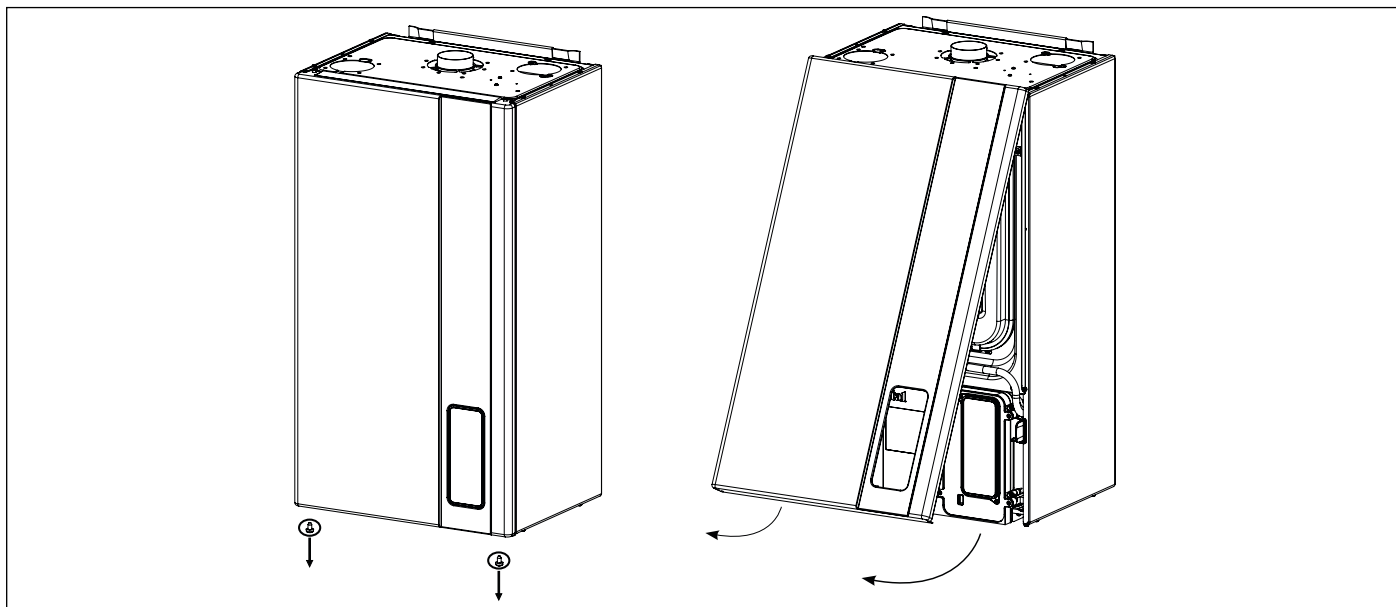


Fig. 43 Front casing opening

- Remove the front panel of the combustion chamber, and remove expansion vessel (see Fig. 44 Expansion vessel mounting bracket removal and Fig. 45 Expansion vessel bracket).

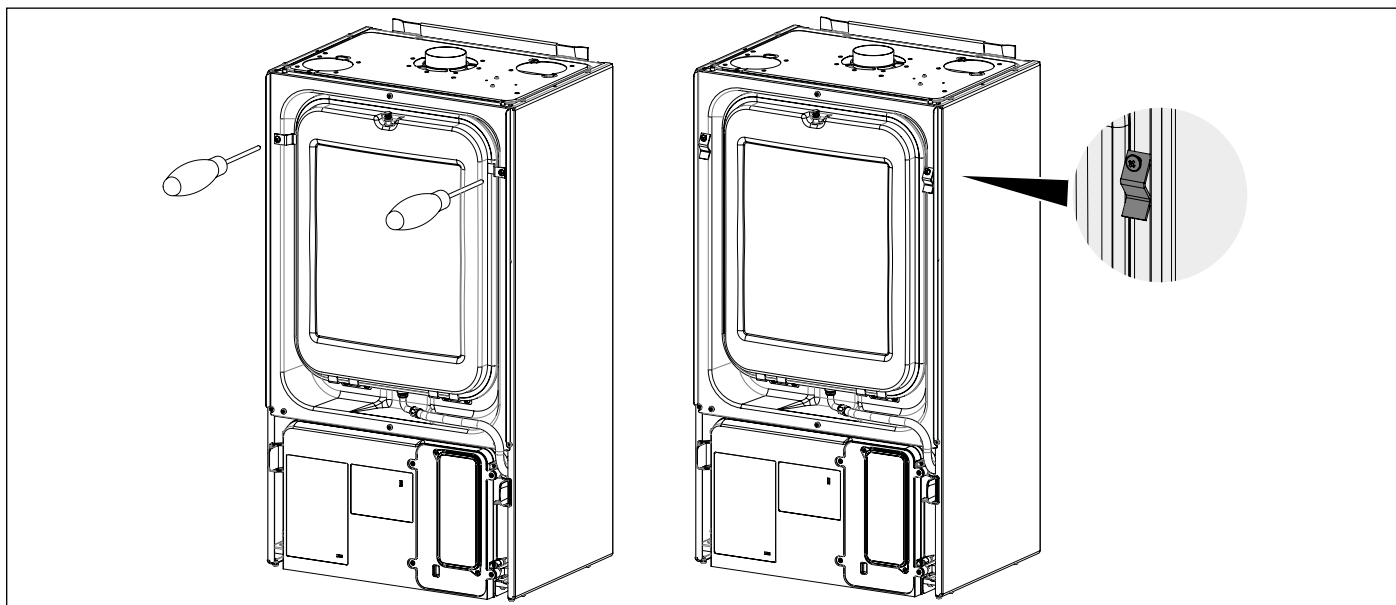


Fig. 44 Expansion vessel mounting bracket removal

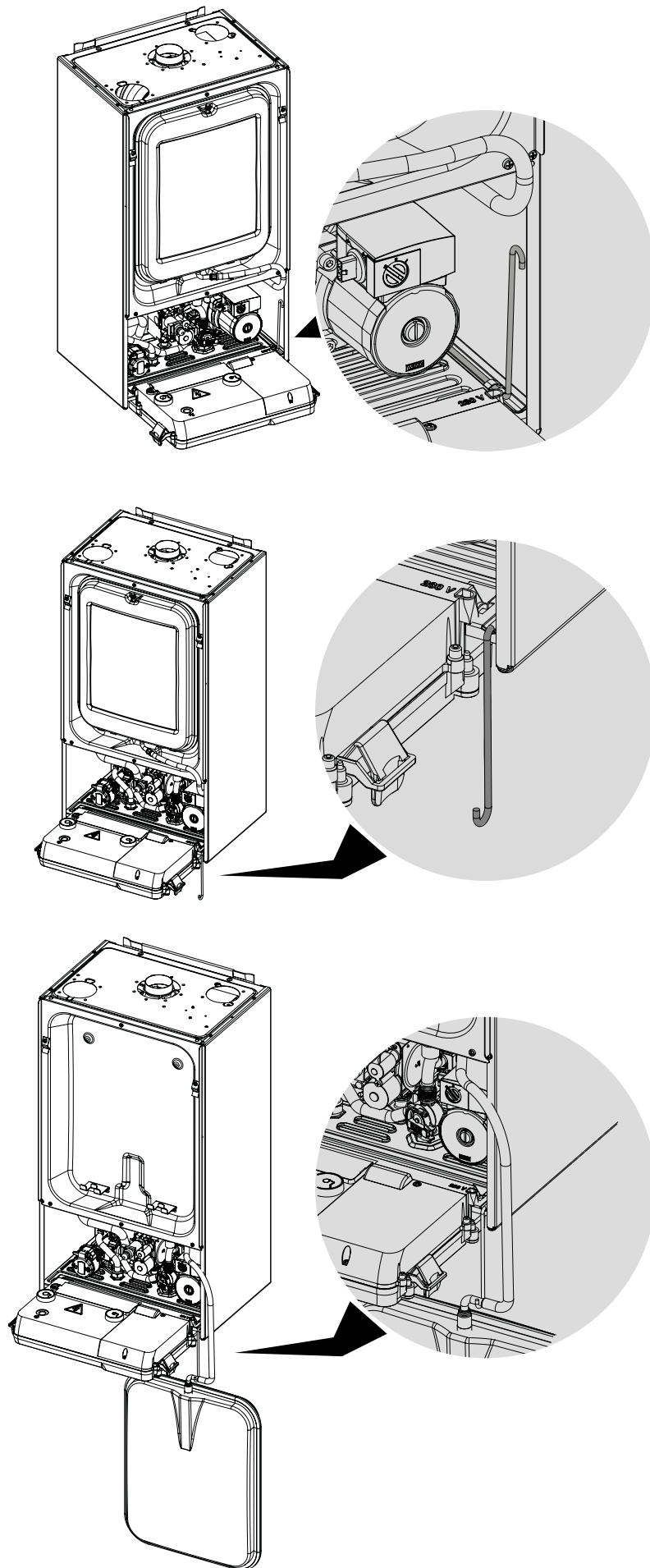


Fig. 45 Expansion vessel bracket

- Remove the front panel of the combustion chamber (see Fig. 46 Combustion chamber removal).

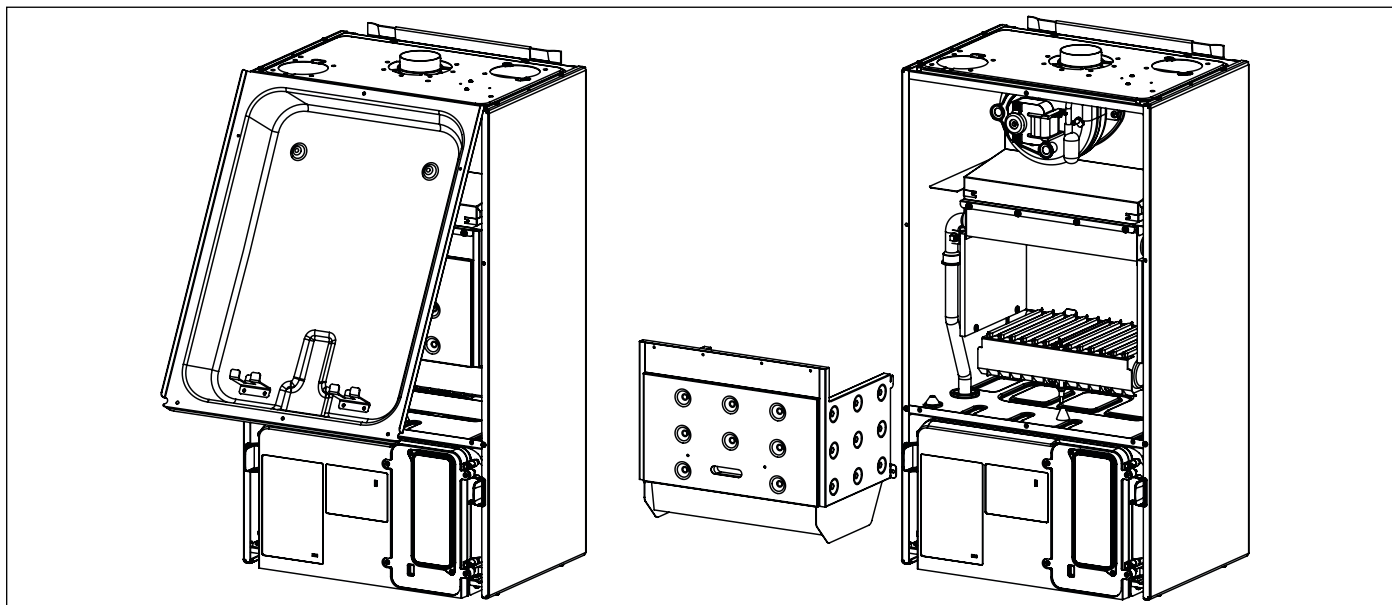


Fig. 46 Combustion chamber removal

- Remove the main burner.
- Remove nozzles from main burner replacing them by new gas type correct diameter ones (see *Operating data* on page 34).





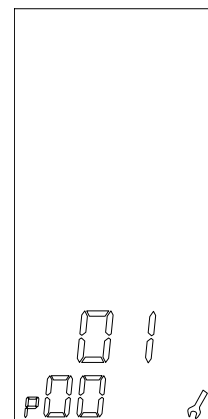
WARNING

The copper gaskets must be installed.

- Reinstall the main burner.
- Change **P0-TSP0** parameter value according to the boiler heat output and gas type (see Tab. 28 P0-TSP0 parameter setting).

Edit parameter P0-TSP0

1. Press  and **ON** at the same time for three seconds.
2. Scroll through the parameters by pressing **CH +/-** buttons. 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 value can be changed with the **+/- HEATING** buttons.
5. To confirm modification press **OK**.
6. To quit editing mode without changing the parameter press .







Boiler settings	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

Tab. 28 P0-TSP0 parameter setting

- Adjust the gas valve (see *Gas valve setting* on page 83).

3.19.2 Gas valve setting

Maximum heating output adjustment

- Check the flow pressure value (see *Operating data* on page 34).
- Remove plastic cap **C** (see Fig. 47 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. 48 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  until symbol  stops flashing. The boiler starts operating at maximum heat output.
- turn nut **K**CLOCKWISE (see Fig. 49 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 heating 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 34).
- 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. 49 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.

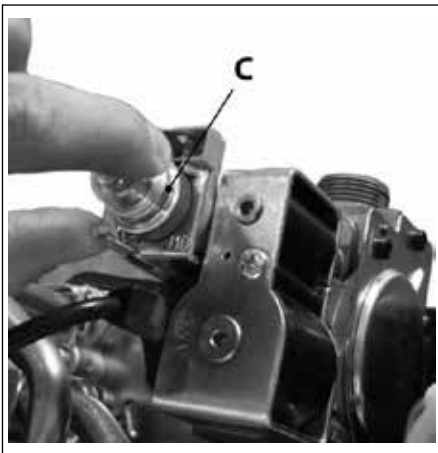


Fig. 47 Gas valve modulation coil

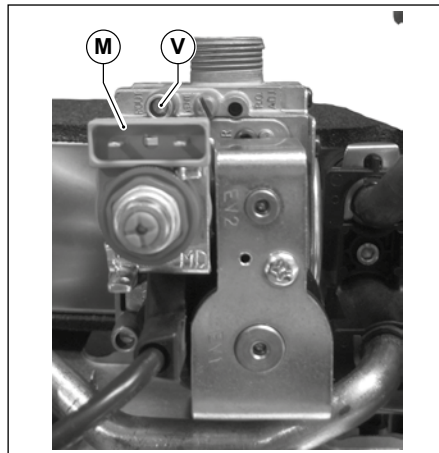


Fig. 48 Pressure testing point

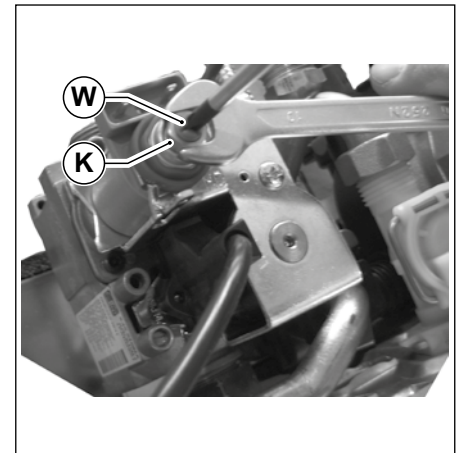


Fig. 49 Gas valve setting

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 must be 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 water leaks;
- the pump has not seized.



WARNING

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



WARNING

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

The user is strongly advised to have the product serviced and repaired by a service centre or qualified personnel. Appropriate boiler maintenance ensures efficient operation, environment preservation, and safety for people, animals and objects. **Maintenance operations must be carried out at least once a year.**



WARNING

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 intake pressure switch operation (TFS).
- Check operation of safety thermostat installed on the draught excluder (TN).
- Check the condition of the draught excluder (TN).
- Check that there is no flue gas return into the room and that the flue gases are vented correctly (TN).
- 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.

The following cleaning is to be done

- Clean the general interior of the boiler.
- Clean the gas nozzles.
- Clean the air intake and flue gas venting circuits (TFS).
- Clean the draught excluder (TN).
- Clean the ventilation grille in the room in which the boiler is installed (TN).
- Clean the heat exchanger.

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

- Boiler room suitability.
- The ventilation apertures in the room in which the boiler is installed (TN).
- Diameter and length of flue gas system ducts.
- Boiler installation in accordance to this "Installation use and maintenance" manual instructions.



WARNING

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. Malfunctions, possible causes and solutions

6.1 Troubleshooting

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	USER'S TASKS	QUALIFIED PERSONNEL'S TASKS	
E01*	Burner does not ignite.	Gas supply failure.	Check gas supply. Check gas supply cock or gas network safety valve intervention.		
		Gas valve is disconnected.	Contact qualified personnel	Reconnect it.	
		Gas valve is faulty.	Contact qualified personnel	Replace it.	
		The board is faulty.	Contact qualified personnel	Replace it.	
	Burner does not ignite: no spark.	Ignition relay is faulty.	Contact qualified personnel	Replace the electrode.	
		Ignition transformer is faulty	Contact qualified personnel	Replace the ignition transformer.	
		Electronic board does not ignite. It is faulty.	Contact qualified personnel	Replace electronic board.	
	Burner ignites for a few seconds and goes off.	Electronic board does not detect flame: inverted phase and neutral.	Contact qualified personnel	Verify correct neutral and phase connection.	
		Detection electrode cable is interrupted.	Contact qualified personnel	Reconnect or replace wire.	
		Detection electrode is faulty.	Contact qualified personnel	Replace the electrode.	
		Electronic board does not detect flame: it is faulty.	Contact qualified personnel	Replace electronic board.	
		Ignition heat input setting is too low.	Contact qualified personnel	Increase it.	
		Minimum heat input is not set correctly.	Contact qualified personnel	Check burner setting.	
E02*	Flow temperature exceeded the max. allowed value.	Circulation pump is faulty.	Contact qualified personnel	Replace it.	
		Circulation pump is seized.	Contact qualified personnel	Check pump electrical connection.	

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	USER'S TASKS	QUALIFIED PERSONNEL'S TASKS
E03*	Air pressure switch triggering (CTFS/RTFS/RBTFS).	Flue gas exhaust pressure switch is faulty	Contact qualified personnel	Check pressure switch: replace it if faulty.
		The silicone pipes are disconnected or damaged.	Contact qualified personnel	Connect or replace silicone pipes
		Air intake or flue gas vent flow is not correct.	Contact qualified personnel	Check air intake/flue gas venting ducts: clean or replace if necessary.
		Fan disconnected.	Contact qualified personnel	Reconnect it.
		Fan faulty.	Contact qualified personnel	Replace it.
		The board is faulty.	Contact qualified personnel	Replace it.
	Flue thermostat triggering (CTN/RTN/RBTN).	Poor flue draught.	Contact qualified personnel	Check air intake or flue gas venting system and vent grilles in the boiler room.
		Flue gas thermostat is disconnected.	Contact qualified personnel	Reconnect it.
		Flue gas thermostat is faulty.	Contact qualified personnel	Replace it.
E04**	CH system water pressure is low.	The system has been recently bled.	Fill the system (see section Boiler block). If the error occurs again several times, contact a qualified Service Centre or qualified personnel.	
		The system is leaking.	Check system.	
		Pressure transducer is disconnected.	Contact qualified personnel	Reconnect it.
		Pressure transducer is faulty.	Contact qualified personnel	Replace it.
E05**	Flow probe failure.	Flow probe is electrically disconnected.	Contact qualified personnel	Reconnect it.
		Flow probe faulty.	Contact qualified personnel	Replace it.
E06**	DHW probe failure (CTFS/CTN).	DHW probe is electrically disconnected.	Contact qualified personnel	Reconnect it.
		DHW probe faulty.	Contact qualified personnel	Replace it.

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	USER'S TASKS	QUALIFIED PERSONNEL'S TASKS
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 (RTFS/RTN/RBTFS/RBTN with optional water heater and NTC probe).	Probe is disconnected.	Contact qualified personnel	Reconnect it.
		Probe is faulty.	Contact qualified personnel	Replace it.
E23**	External probe failure	Probe is disconnected.	Contact qualified personnel	Reconnect it.
		Probe is faulty.	Contact qualified personnel	Replace it.
E24**	Solar collector failure.	Probe is disconnected.	Contact qualified personnel	Reconnect it.
		Probe is faulty.	Contact qualified personnel	Replace it.
E27**	Solar valve probe failure.	Probe is disconnected.	Contact qualified personnel	Reconnect it.
		Probe is faulty.	Contact qualified personnel	Replace it.
E28**	Solar water heater probe failure.	Probe is disconnected.	Contact qualified personnel	Reconnect it.
		Probe is faulty.	Contact qualified personnel	Replace it.
E31**	Remote Control connection failure (only shown on Remote Control display).	The Remote Control is not connected to boiler board.	Contact qualified personnel	Reconnect it.
		Remote control faulty.	Contact qualified personnel	Replace it.
		Boiler board is faulty.	Contact qualified personnel	Replace it.
E35**	Safety Thermostat triggering to protect the mixed "zone 2" (with zone kit "OKITZONE05" installed, only).	Mixer valve is faulty.	Contact qualified personnel	Replace it.
		Thermostat is disconnected.	Contact qualified personnel	Reconnect it.
		Thermostat is faulty	Contact qualified personnel	Replace it.

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	USER'S TASKS	QUALIFIED PERSONNEL'S TASKS
E36**	Flow probe failure on one of the installed zones (with zone kit "0KITZONE05" installed, only).	Probe is disconnected.	Contact qualified personnel	Reconnect it.
		Probe is faulty.	Contact qualified personnel	Replace it.
E41**	No communication between board and peripheral devices (panel interface and/or zone/solar boards).	Interface display is disconnected.	Contact qualified personnel	Reconnect it.
		Zone/solar boards are disconnected.	Contact qualified personnel	Reconnect them.
		Interface display and/or zone/solar boards are faulty.	Contact qualified personnel	Replace them.
E42	Hydraulic system setting error.	Wrong boiler board or solar board setting parameters.	Contact qualified personnel	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 qualified personnel	Check that the P61 parameter set values match with those specified on the reference tables.
E46	Pressure transducer failure.	Pressure transducer is disconnected.	Contact qualified personnel	Reconnect it.
		Pressure transducer is faulty.	Contact qualified personnel	Replace it.
E49	Communication error between boiler board and touch screen.	The interface is faulty.	Contact qualified personnel	Replace interface.
E51	Shut-down due to safety circuit hardware fault	Boiler electronic board is faulty.	Contact qualified personnel	Check boiler electronic board.
E52				
E53				
E72	Air pressure switch recognition failure (CTFS/RTFS/RBTFS).	Air pressure switch is electrically disconnected.	Contact qualified personnel	Reconnect it.
		Air pressure switch is faulty.	Contact qualified personnel	Replace it.
E76	Gas valve modulation coil is not working.	Electronic board and gas valve link is electrically disconnected or faulty.	Contact qualified personnel	Check connection to the gas valve.
		Gas valve modulation coil is faulty.	Contact qualified personnel	Replace gas valve modulation coil.

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	USER'S TASKS	QUALIFIED PERSONNEL'S TASKS
E98	The max. number of resets from the boiler interface has been reached.	Max. number of reset attempts from boiler reached.	To reset the interface, disconnect boiler from power mains.	
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.	To reset the interface, disconnect boiler from power mains.	

* errors that can be reset by the user by keeping the **RESET** button pressed

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

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



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

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