FORMENTERA

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INSTALLATION, USE AND MAINTENANCE

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Dear Sirs,

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

We inform users that:

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

General notes for installers, maintenance technicians, and users

This instruction manual is an integral and essential part of the product. It shall be supplied by the installer to the user who shall keep it carefully to consult it whenever necessary.
This document shall be supplied together with the equipment in case the latter is sold or transferred to others.

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

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 a wrong installation causing damages to persons, animals and/or property.

Damage and/or injury caused by incorrect installation or use and/or damage and/or injury due to non-observance of the manufacturer's instructions shall release the manufacturer from any and all contractual and extra-contractual liability.
Before installing the boiler, check that the technical data correspond to the requirements for its correct use in the system.

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

Do not obstruct the air intake openings.

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

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

The packages can be dangerous for children so keep them out of their reach.

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

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

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

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

In the event of long periods of inactivity of the boiler, disconnect it from power mains and close the gas cock.
Warning: Should power mains be disconnected, boiler electronic anti-freeze function will not be operative.

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

With gas fired boilers, take the following measures if you smell gas:
- do not turn on or off electric switches and do not turn on electric appliances;
- do not ignite flames and do not smoke;
- close the main gas cock;
- open doors and windows;
- contact a Service Centre, a qualified installer or the gas supply company.
Never use a flame to locate a gas leak.

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

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

RAPID OPERATING INSTRUCTIONS

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

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

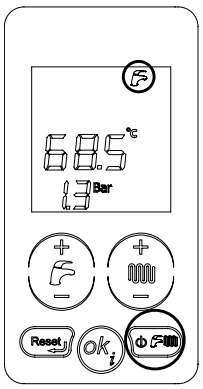
If any accessories have been fitted on the boiler, these instructions will not cover them. You will therefore have to refer to the full boiler instructions as well as to the specific instructions for the accessories.

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

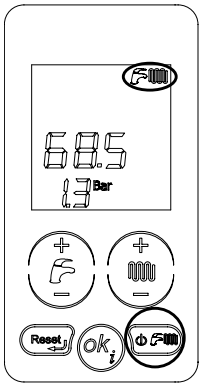
1. Open the gas cock installed ahead of the boiler.

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

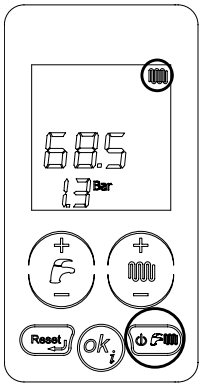
3. If you do not wish to activate the heating function, press the "operating mode selection" button until symbol is displayed: only the DHW function will be enabled.



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



5. If you do not wish to activate the DHW function, press the "operating mode selection" button a few times until symbol is displayed: this will activate the CH function only.



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

7. To set the heating water temperature, press heating water +/- buttons (**B,** fig. 1). Set temperature as required.

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

The boiler is now ready to operate.

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

CONTENTS

FIGURE INDEX

TABLE INDEX

1. INSTRUCTIONS FOR THE USER

1.1. Control panel

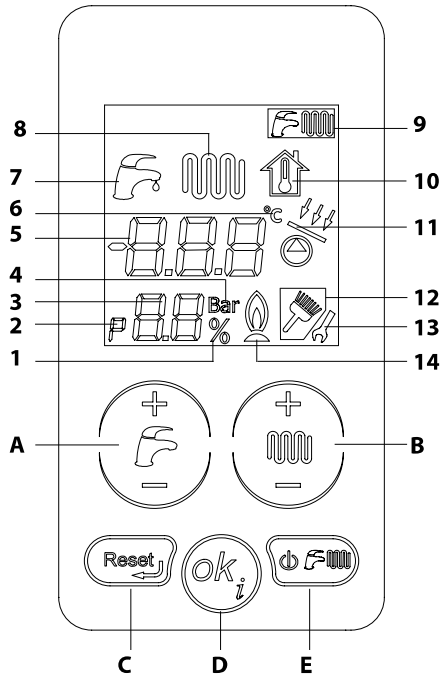


fig. 1

A. Domestic hot water set buttons.

B. Hot water for heating purposes and parameter set buttons.

C. Buttons for alarm reset and back to the starting page during parameter selection.

D. Parameter confirmation and information request button.

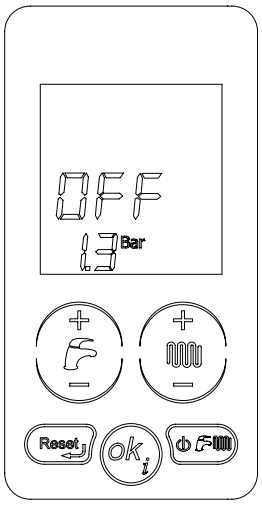
E. Operating status selection button.

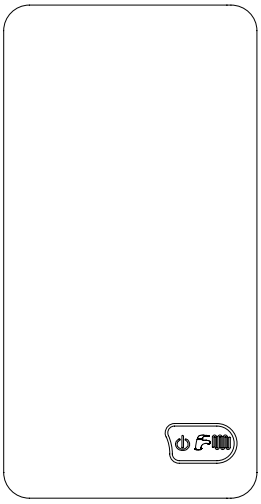
To gain access to the interface, touch the display area. Once active, the interface enables all the keys. 15 seconds after the last key has been touched, the interface disables all the keys.

	SYMBOL	STEADY	FLASHING
1	%	Percentage indication	
2	P	Indication of "parameter" inside the parameter menu	
3	88	Displaying of the number of parameters, or of the system pressure, or of the burner power percentage	
4	Bar	Indication of system pressure measurement unit	
5	888	Temperature, value, parameter and fault display.	
6	°C	Indication of the centigrade degrees.	
7		A DHW request is active.	Set DHW temperature display.
8		A CH request is active.	Display of set heating flow temperature.
9		Symbols for instantaneous DHW, heating. Symbol ON = function enabled, OFF = function disabled.	
10			Displaying of the calculated temperature setpoint
11		The solar pump or solar valve is active	
12		Display of the flue cleaning function.	It indicates that you are entering the flue cleaning function.
13		During parameter editing, the wrench symbol stays on until the set datum is confirmed.	
14		Flame ON indication	

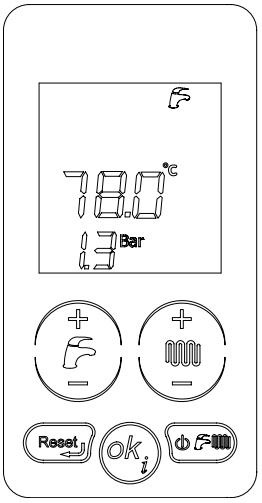
1.2. Selecting the operating mode

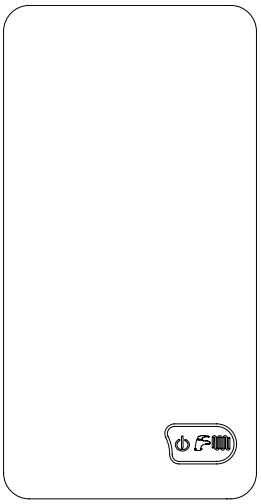
Every time the "operating status selection" button (**E,** fig.1) is pressed, the SUMMER , WINTER , CH ONLY and OFF modes are enabled in sequence.
At this stage, all buttons are enabled.
When the **SUMMER** mode is enabled, only the DHW production function is active.
When the **CH ONLY** mode is enabled, only the heating water production function is active.
When the **WINTER** mode is enabled, both functions are active: DHW production and heating water production.
When the **OFF** mode is enabled, no function is active.



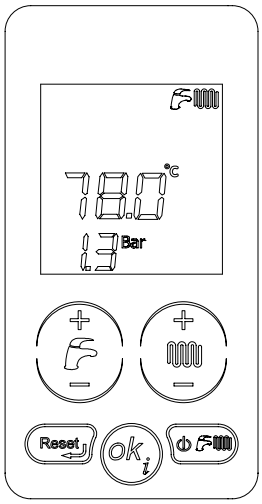


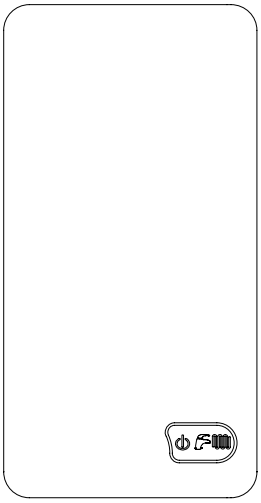
1. OPERATING STATUS OFF



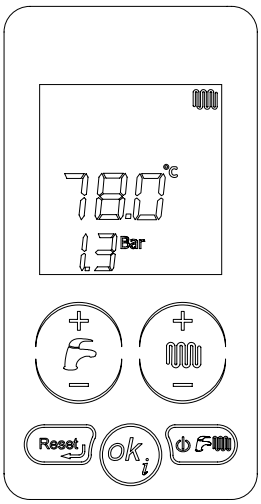


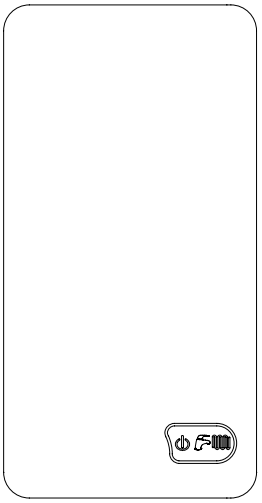
2. SUMMER OPERATING STATUS





3. OPERATING STATUS WINTER



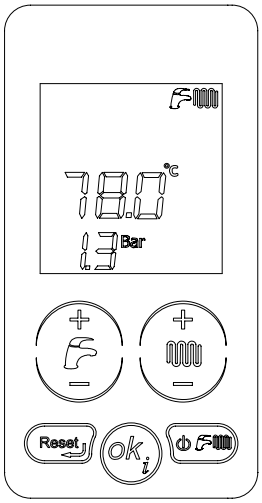


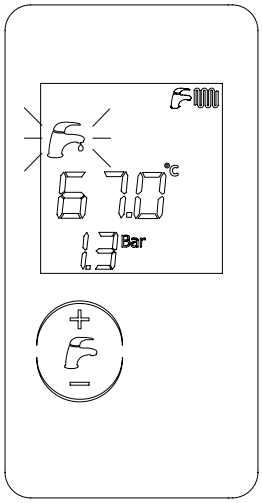
4. OPERATING STATUS CENTRAL HEATING ONLY

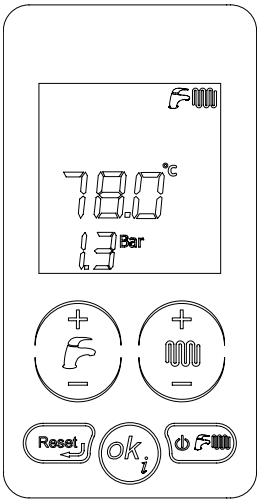
1.3. Adjusting heating and DHW temperature

Press the DHW +/- button (**A,** fig.1) to select the desired domestic hot water temperature. During selection, DHW icon (**7**, fig. 1) will flash. As soon as button is released, icon will continue flashing for approx. 3 seconds, and the DHW value will flash as well. After this time, value is stored and display standard operation will be restored.

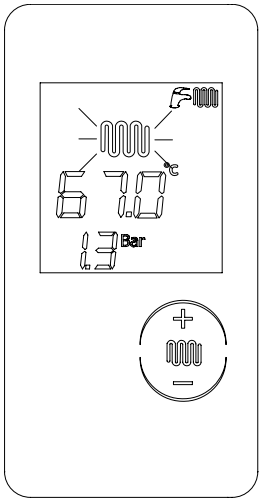
Press the CH +/- button (**B,** fig.1) to select the desired CH flow water temperature. During selection, CH icon (**8**, fig. 1) will flash. As soon as button is released, icon will continue flashing for approx. 3 seconds, and the CH water value will flash as well. After this time, value is stored and display standard operation will be restored. At this stage, all buttons are enabled.

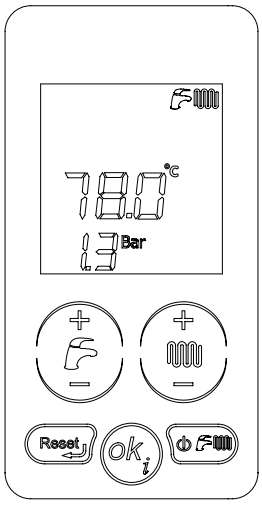






1. DHW TEMPERATURE SELECTION

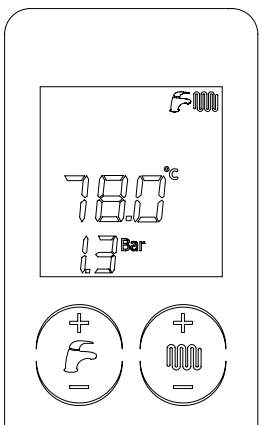


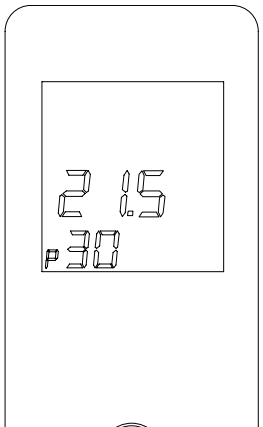


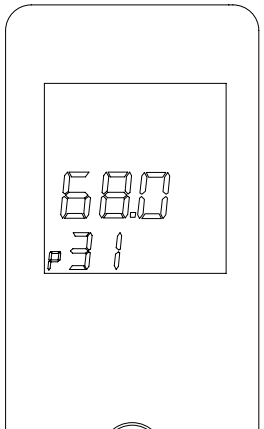
2. CH TEMPERATURE SELECTION

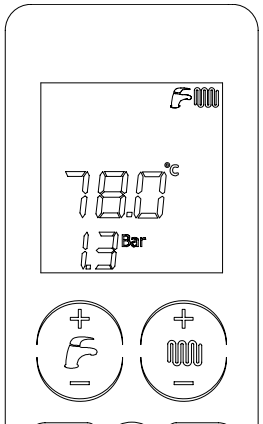
1.4. Parameter display

Press "Info" (**D,** fig.1) to scroll the different parameter values. You can quit this function at any time by simply pressing the "Reset" button (**C,** fig.1). Table 2 describes the meaning of all displayable parameters.







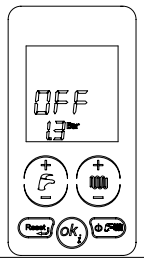
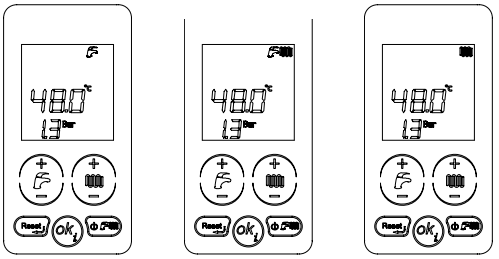
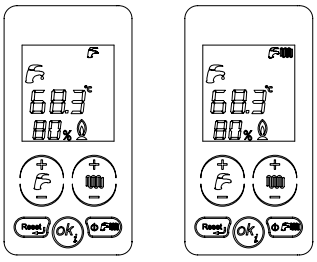
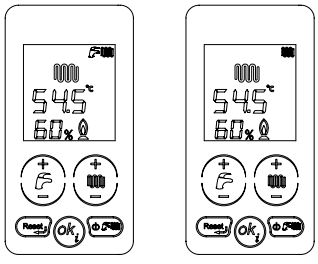
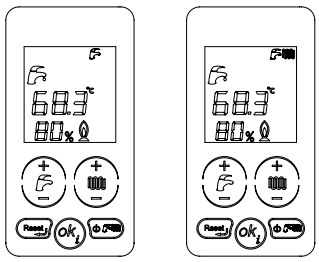


PARAMETERS	DESCRIPTION
P30 - TSP30	**External temperature** displaying (if an external probe is present).
P31	**Flow temperature** displaying.
P32	**Calculated nominal flow temperature** displaying. If no external probe is installed, the flow temperature manually set on boiler will be displayed. If an external probe is installed, the flow temperature boiler calculated through the curves on figure 18 will be displayed.
P42	**Domestic hot water temperature** displaying (for CTN and CTFS models).
P44	**Water cylinder temperature** displaying (if the water cylinder probe is installed).
P46	**Solar collector temperature** displaying (if the collector probe is installed).
P47	**Solar valve temperature** displaying (if the solar valve probe is installed).

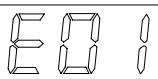
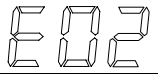
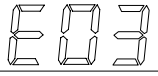
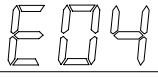
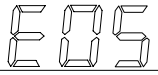
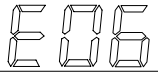
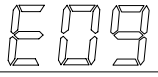
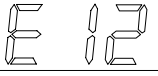
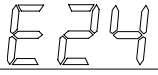
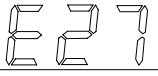
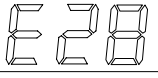
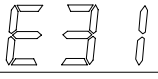
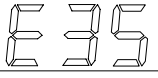
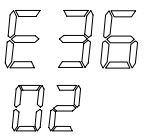
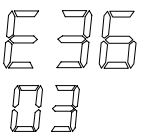
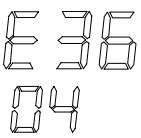
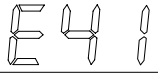
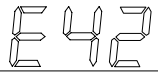
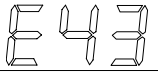
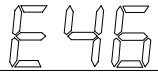
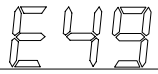
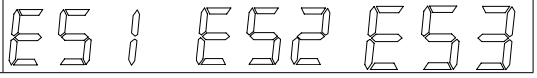
Table 2 - Displayable parameters with "info" button

1.5. Interpreting BOILER STATUS from LCD DISPLAY INDICATIONS

Normal operation

Boiler switch in OFF mode	
Boiler switch in SUMMER or WINTER mode or CH ONLY **No active function** **The flow water temperature is displayed**	 **SUMMER** **WINTER** **HEATING ONLY**
Boiler switch in SUMMER or WINTER mode **DHW function active** (for CTFS / CTN models, only) **The flow water temperature is displayed**	 **SUMMER** **WINTER**
Boiler switch in WINTER mode or CH ONLY **CH function active** **The flow water temperature is displayed**	 **WINTER** **HEATING ONLY**
Boiler switch in SUMMER or WINTER mode **External water cylinder enabled, DHW function active** **The flow water temperature is displayed** For RTN model with external water cylinder (optional), only	

Malfunction

No flame	
Triggering of double flow probe	
Triggering of flue gas thermostat (RTN / CTN) Triggering of air pressure switch (CTFS / RTFS)	
Insufficient system pressure	
Flow probe failure	
DHW probe failure (CTN / CTFS)	
Too high system pressure	
Boiler probe failure (RTN / RTFS with water cylinder, optional, equipped with NTC probe)	
SCS Solar collector probe failure (optional, if connected)	
SVS Solar valve probe failure (optional, if connected)	
SBS Solar water cylinder probe failure (optional, if connected)	
Remote Control connection failure (optional, if connected: this error appears only on the Remote Control display)	
Triggering of safety thermostat in mixed zone 2 (optional, if connected)	
Mixed zone flow probe 2 failure (optional, if connected)	
Mixed zone flow probe 3 failure (optional, if connected)	
Mixed zone flow probe 4 failure (optional, if connected)	
Communication failure with peripheral boards (optional, if connected: zone board and solar board)	
Hydraulic configuration not allowed	
Zone configuration error (optional, if connected: Remote Control and ambient thermostat)	
Pressure transducer fault	
Communication error between main board and touch screen	
Safety system hardware malfunction	

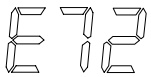
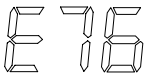
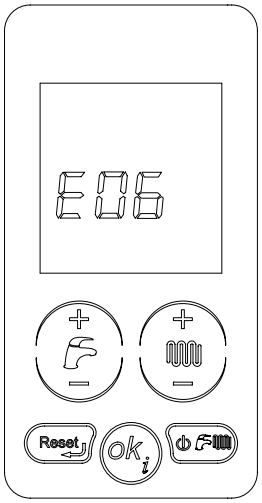
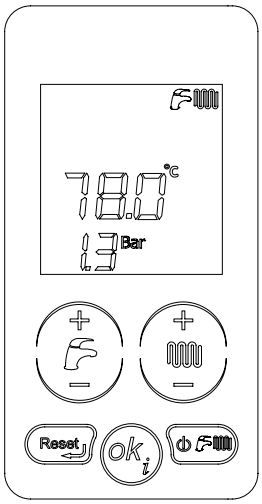
Boiler type recognition failure (TN or TFS)	
Gas valve modulation coil fault	
Max. number of reset attempts from touch screen reached	
Max. number of reset attempts from Remote Control reached (optional, if connected)	

Table 4 - BOILER STATUS - LCD INDICATIONS in the event of malfunction

1.6. Failures that cannot be reset

The display shows the failure based on the corresponding error code (table 4). Some failures can be reset through the "reset" button, while some others are self-resettable. Refer to the following paragraph ("Boiler reset").
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, this latter will be enabled and, 15 seconds after no key is touched, all the keys but the one around the LCD will be disabled.



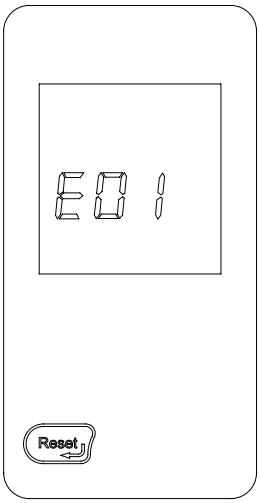


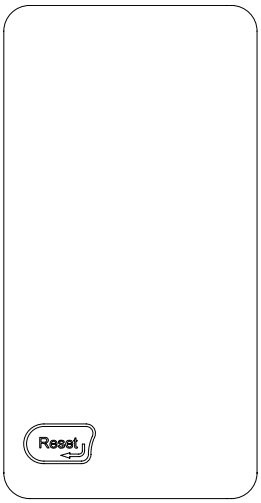
1.7. Boiler reset

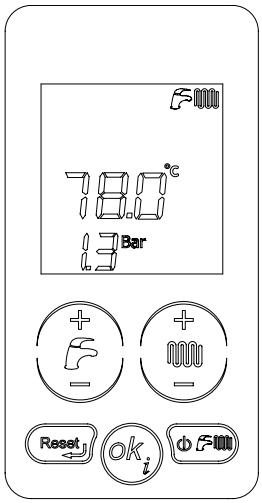
The display shows the failure based on the corresponding error code (table 4). Some failures can be reset through the reset key, while some others are self-resettable.

If shut-downs can be reset (E01, E02, E03) the reset key and the touch screen backlighting will always be on; the only active key that can be pressed is "reset".

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







1.8. Boiler operation

1.8.1. Switching on

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

- Open the gas stop cock;
- turn the master switch installed ahead of the boiler ON. The display turns on and indicates the function currently active (see tables 3 and 4);
- select boiler operation mode by pressing the "operating status selection" button on the touch-screen (**E**, fig. 1): OFF, SUMMER, WINTER, CH ONLY (par. 1.2).
- set desired CH temperature (see par. 1.8.2.);
- set desired DHW temperature (see par. 1.8.3.);
- set desired temperature on the (optional) ambient thermostat in the building.

WARNING
After a prolonged period with the boiler not in use, and with LPG fired boilers in particular, some starting difficulty may be encountered.
Before starting the boiler switch on another gas powered device (e.g. kitchen range).
Beware that even by following this procedure, the boiler might still experience some starting difficulties and shut down once or twice.
Reset boiler operation by pressing the "reset" button (C, fig. 1).

1.8.2. CH function

Set desired CH water temperature via heating +/- buttons (**B**, fig. 1).
CH temperature may be set within a range from 35°C to 78°C.

The waiting time between one boiler ignition and the following one, used to prevent boiler frequent turning on and off, ranges between 0 and 10 minutes (default value: 4 minutes), and can be edited with the **P11** parameter.
During temperature setting, the CH symbol (**8**, fig. 1) on the screen flashes and the CH current setting is displayed.
When the central heating system requests heat from the boiler, the LCD displays the CH symbol (steady on) (**8**, fig. 1) and the current heating flow water temperature. The burner on symbol (**14,** fig. 1) only shows while the burner is operating.
Should water temperature in the system fall below set minimum value, between 35°C and 78°C (default value 40°C) to be edited with the **P27** parameter, the waiting time is reset and the boiler re-ignites.

1.8.3. DHW function

Set desired DHW water temperature via "DHW +/-" buttons (**A**, fig. 1).
The DHW production function is enabled on CTFS / CTN models and on RTFS / RTN models with external water cylinder (optional).

Such function has always priority over CH water supply.

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

During temperature setting, the DHW symbol (**7**, fig. 1) on the display flashes and the DHW setting is displayed.

In RTN / RTFS models with external water cylinder (optional), water cylinder production of DHW can be enabled or disabled by pressing button "Operating mode selection" on the touch-screen (**E**, fig. 1).
Water cylinder is enabled when boiler is in one of the following operating modes: SUMMER, WINTER.

For RTN / RTFS models with external water cylinder (optional) with NTC probe (10 kQ @ ß=3435; refer to water cylinder technical specifications), temperature range is between 35 °C and 65 °C. When setting temperature, the DHW symbol (**7**, fig. 1) will flash on the display and the DHW value being set will be shown.

In RTN / RTFS models featuring an external water cylinder (optional) it is not possible to use a thermostat. A probe must be inserted in the boiler instead. This decision was made in order to reduce gas consumption.

In RTN / RTFS models featuring an external water cylinder (optional) fitted with a water cylinder probe (optional), once every 15 days the anti-legionnaires disease function is activated: this consists in heating the water of the external cylinder up to 65 °C for 30 minutes, regardless of all the other settings.

The burner on symbol (**14**, fig. 1) only shows while the burner is operating.

With CTFS and CTN models, available DHW litres per minute depend on boiler heat output and water mains supply temperature, according to the following formula:

$$l = \text{DHW litres per min.} = \frac{K}{\Delta T}$$

where K is:
- 336 for CTN 24 model
- 405 for CTN 28 model
- 348 for CTFS 24 model
- 426 for CTFS 28 model
- 453 for CTFS 32 model

ΔT = hot water temperature – cold water temperature

For instance, with model CTFS 24, if the cold water is at 8°C and you want hot water at 38°C for a shower, the value of ΔT is:

ΔT = 38°C - 8°C = 30°C

and the number of DHW litres per minute available at 38°C is:

$$l = \frac{348}{30} = 11.6 \text{ [litres per minute] (water mixed at cock)}$$

1.8.4. ANTI-FREEZE function

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

The anti-freeze 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.
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 anti-freeze functions are anyway enabled through the circulation pumps.

1.8.4.1. Flow anti-freeze 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. Plate DHW anti-freeze function

On the CTFS / CTN models, the anti-freeze function also protects the DHW plant.

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

1.8.4.3. Boiler antifreeze function

In RTN / RTFS models featuring an external water cylinder (optional) for the production of DHW with a NTC type temperature sensor (10 kQ @ ß=3435; refer to water cylinder technical specifications) the anti-freeze function also protects the water cylinder. When water cylinder temperature sensor detects a water temperature of 5°C, the boiler switches on and stays on at its minimum heating output until the temperature of the water cylinder water reaches 10°C or 15 minutes have elapsed. The pump continues to operate even if the boiler shuts down.

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

1.8.5. Anti-seize function

If the boiler remains inactive and connected to the power mains, the circulation pump and the deviating valve will be shortly enabled every 24 hours so as to avoid any shut-down. The same applies to the relay which can be freely programmed whenever this latter is used to power a recirculation pump or a deviating valve.

1.8.6. Operation with external probe (optional)

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

This boiler operating mode is called "*sliding temperaturae operation*".

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

When working with an external probe, the "heating +/-" buttons (B, fig. 1) are no longer used to set heating water temperature, but to edit calculated ambient temperature, namely the desired theoretical temperature.
During temperature setting, the calculated ambient temperature symbol flashes on the display (**10**, fig. 1) and the value being set is shown.
For curve optimal setting, a position close to 20° C is recommended. For further details on sliding temperature, refer to paragraph 3.2.14.

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

1.8.7. Operation with (optional) remote control

Boiler interface includes all the possible functions of a Fondital Remote Control, and can control up to two heating zones.
User can also connect the boiler to a Remote Control (optional - not compulsory, supplied by the manufacturer) so as to manage several boiler parameters, such as:
- boiler status;
- ambient temperature selection;
- CH system water temperature;
- DHW system water temperature;
- CH system or external heater (optional) activation times programming;
- boiler diagnostics display;
- boiler reset and other parameters.

For instructions on how to connect the Remote Control, refer to par. 3.2.13 and to its own instruction booklet.

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

1.9. Boiler shut-down

The boiler shuts down automatically if a malfunction occurs. Refer to Tables 3 and 4 to identify the boiler operating mode.
To determine the possible causes of malfunction, see also paragraph 6. *Troubleshooting* section is at the end of this manual.
Below is a list of kinds of shut-down and the procedure to follow in each.

1.9.1. 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 "reset" button to restore burner operation (**C**, fig. 1): if, after two starting attempts, the boiler still fails to start and enters the shut-down mode again, contact a Service Centre or qualified personnel for maintenance.

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

1.9.2. Shutdown due to overheating

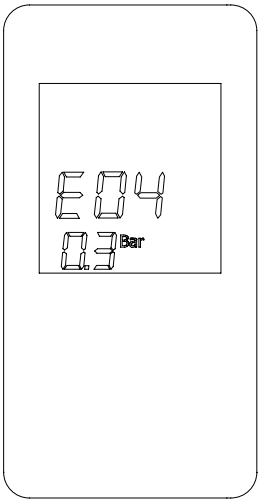
In case of flow water overheating, the boiler shuts down and the **E02** code will start flashing.
Contact a Service Centre or a qualified service engineer to carry out the maintenance.

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

In case of burner shut-down due to flue operation fault (CTN / RTN models) or intake/flue gas pipes (CTFS / RTFS models), flashing code **E03** is displayed (flue gas thermostat or air pressure switch tripped).

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

1.9.4. Shut-down due to low water pressure



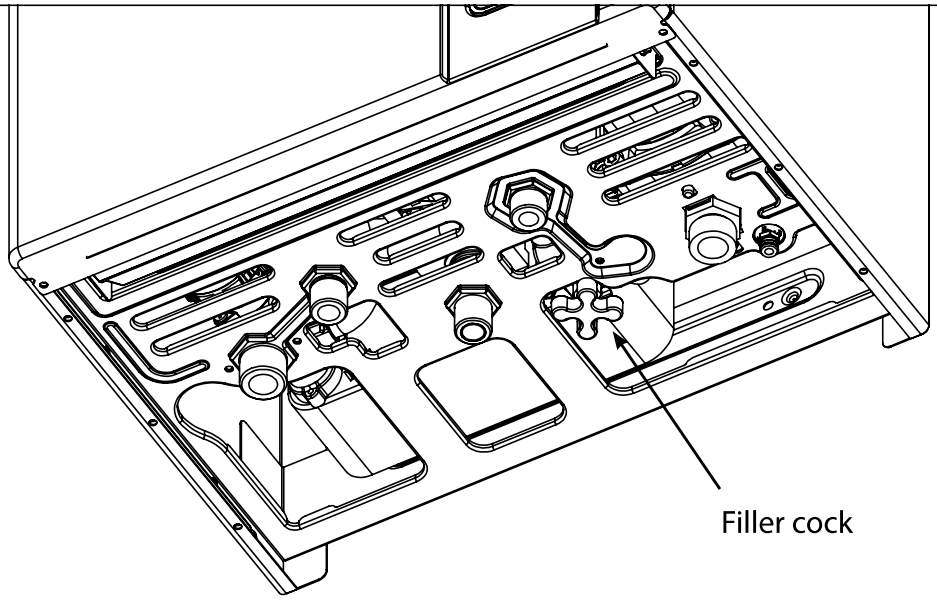
If "shut-down due to insufficient pressure in system" error **E04** starts flashing (indicating pressure transducer triggering), fill the system by opening the filler cock as shown in fig. 2 (models CTFS / CTN) or the cock on the cold water supply pipe (supplied with the boiler - model RTN / RTFS).
E04 error is displayed when system pressure drops below 0.4 bar and 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 the filling cock (fig. 2) anticlockwise to allow water to enter the boiler (models CTFS / CTN) or, for models RTN / RTFS, open the cock on the cold water supply pipe;
- keep the cock open until the control panel shows a value of 1÷1,3 bar;
- turn cock clockwise to close it (modela CTFS / CTN) or, for models RTN / RTFS, close the cock on the cold water supply pipe.

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

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

Models CTN - CTFS



Models RTN - RTFS

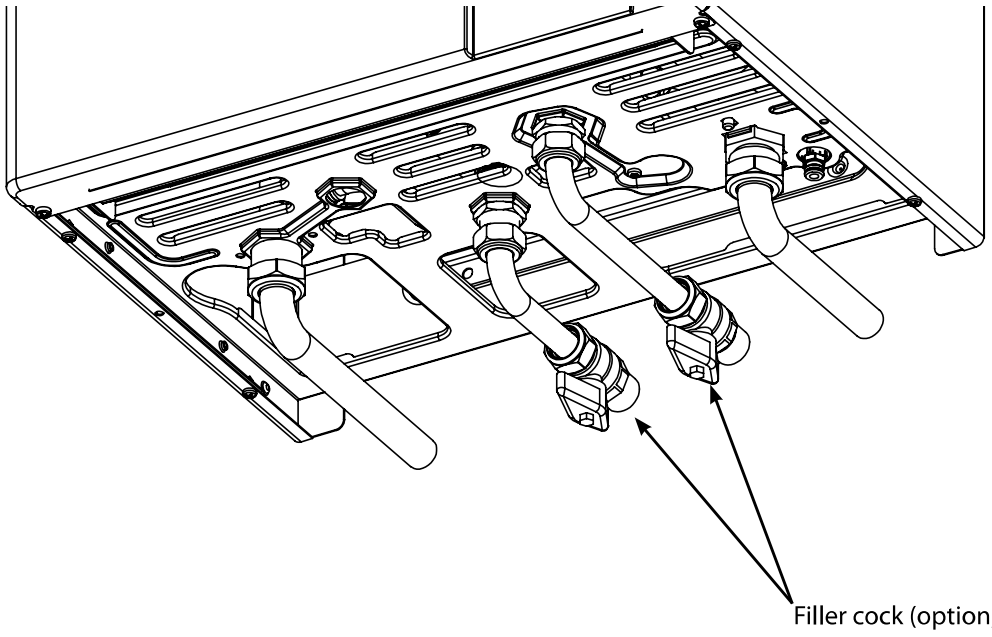


fig. 2

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 flow 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 central heating mode only, and the DHW function is disabled.
- **E12** for the water cylinder probe (RTN / RTFS model).
In this case, the boiler works in central heating mode only, and the DHW function is disabled.

In all cases, contact a Service Centre or a qualified engineer 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).
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.
Contact a Service Centre or a qualified service engineer to carry out the maintenance.

The remote control can indicate faults or shut-down conditions and can also restore boiler operation after shut-down up to a maximum of 5 times.
If the maximum number of attempts is reached, fault code **E99** is shown on the boiler display. To reset error **E99**, disconnect and re-connect again boiler from/to power mains.

1.10. Maintenance

The boiler must be serviced periodically as indicated in the relevant section of this manual.
Appropriate boiler maintenance ensures efficient operation, environment preservation, and safety for people, animals and objects.

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

The user is strongly advised to have the boiler serviced and repaired by a qualified Authorised Service Centre.
For maintenance operations see section 5. *Maintenance*.

The user may only clean the external casing of the boiler, employing common household products.
Do not use water!

1.11. Notes for the user

The user may only access parts of the boiler that can be reached without using special equipment or tools. The user is not authorised to remove the boiler casing or to operate on any internal parts.
No one, including qualified personnel, is authorised to modify the boiler.

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

If the boiler remains inactive and the power supply is switched off for a long time, it may be necessary to reset the 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.
All models are equipped with electronic ignition and ionisation flame sensing device.

The following models are available:
- **CTN 24, 28**: open chamber, natural draught boiler with electronic ignition for heating and instantaneous DHW supply (23.1-27.4 kW);
- **RTN 24, 28**: open chamber, natural draught boiler with electronic ignition for heating only (23.1-27.4 kW);
- **CTFS 24, 28 ,32**: sealed chamber, forced draught boiler with electronic ignition for heating and instantaneous DHW supply (23.7-28.6-30.8 kW);
- **RTFS 24, 28, 32**: sealed chamber, forced draught boiler with electronic ignition for heating only (23.7-28.6-30.8 kW);

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

The key technical features of the boilers are listed below.

Manufacturing characteristics

- IPX5D electrically protected control panel.
- Integrated, modulating electronic safety board.
- Electronic start-up with 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 circulation pump with built-in air purging device.
- Heating circuit pressure sensor.
- CH temperature probe (all models) and DHW temperature probe (CTFS / CTN).
- Flue gas thermostat (CTN / RTN).
- Air pressure switch (CTFS / RTFS).
- Integrated, automatic by-pass.
- 7 litre expansion vessel.
- Filler cock (CTN / CTFS) and drain cock (all models).
- Stainless steel plate DHW heat exchanger (CTFS / CTN).
- Motorised deviating valve (CTFS / CTN).
- DHW priority flow switch (CTN / CTFS).

User interface

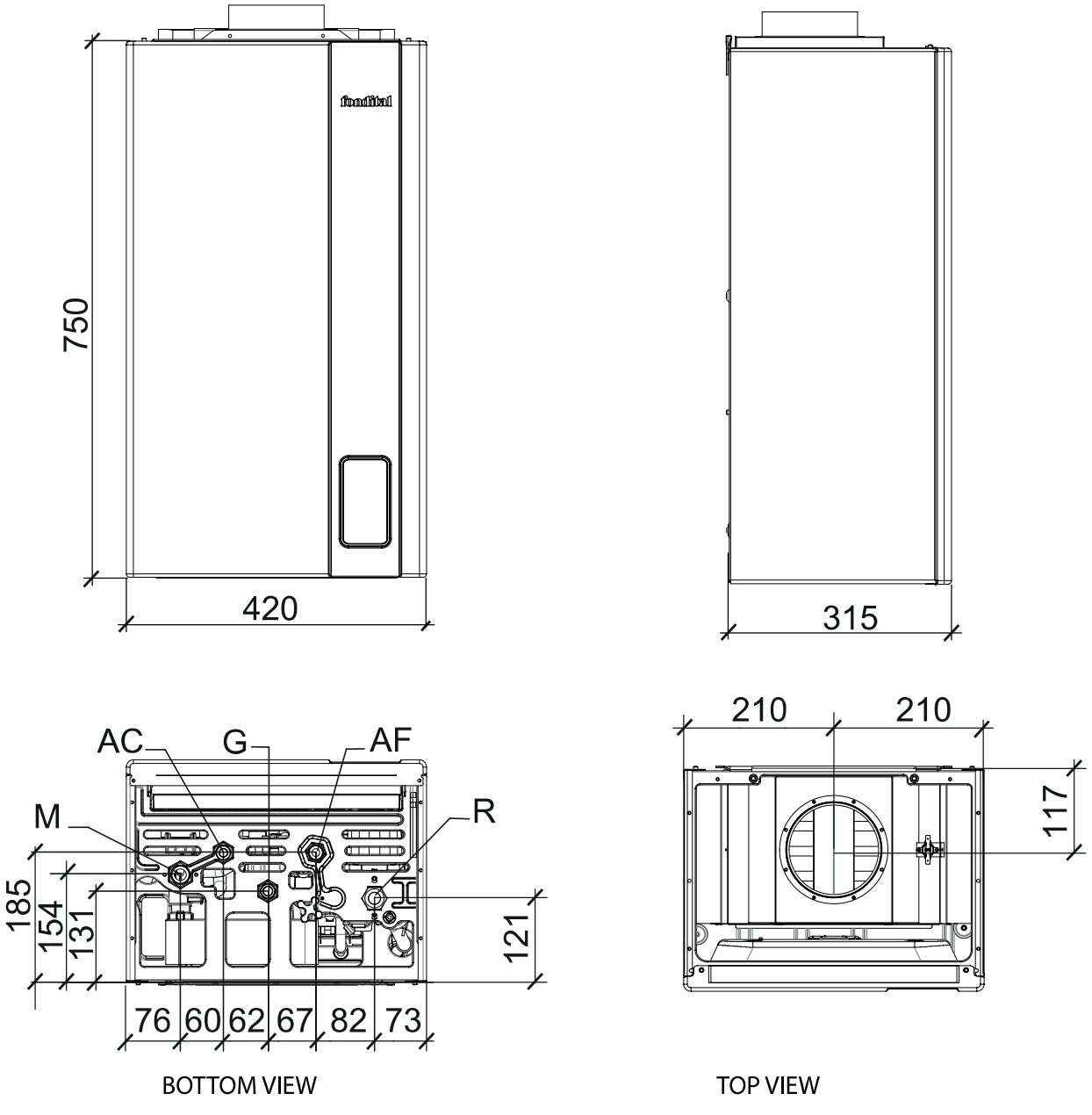
- Touch interface with built-in LCD to display and control boiler operating condition: OFF, RESET, WINTER, SUMMER and CH ONLY.
- CH water temperature regulator: 35-78°C.
- DHW water temperature regulator (CTN / CTFS): 35-57 °C.

Operating features

- CH electronic flame modulation with timer-controlled rising ramp (60 seconds, adjustable).
- Electronic flame modulation in DHW mode (CTFS / CTN; RTN / RTFS with external water cylinder - optional).
- DHW priority function (CTFS / CTN; RTN / RTFS with external water cylinder - optional).
- Flow anti-freeze function: ON 5°C; OFF 30°C or after 15 minutes of operation if CH temperature > 5 °C.
- DHW freeze protection function (CTFS / CTN): ON 5°C; OFF 10 °C or after 15 minutes of operation if DHW temperature > 5 °C.
- Water cylinder anti-freeze function (RTN / RTFS + optional external water cylinder with NTC probe): ON 5°C; OFF 10 °C or after 15 minutes of operation if water cylinder temperature > 5 °C.
- Timer-controlled flue cleaning function: 15 minutes.
- Anti-legionaries disease function (RTN / RTFS + external water cylinder - optional);
- 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, anti-freeze and flue cleaning modes: 30 seconds (adjustable).
- DHW post-circulation function (CTFS / CTN; RTN / RTFS with external water cylinder - optional): 30 seconds.
- Post-circulation function for heating temperature > 78 °C: 30 seconds.
- Post-ventilation function after working: 10 seconds.
- Post-ventilation function for CH temperature > 95°C.
- Circulation pump and deviating valve anti shut-down function: 30 seconds of operation after 24 hours of inactivity.
- Ready for connection to an ambient thermostat.
- Ready for operation with an external probe (optional, supplied by the manufacturer).
- Ready for operation with an OpenTherm remote control (optional, supplied by the manufacturer).
- Ready for operation with a module for different temperature zones.
- Ready for integration with solar panels.
- Anti- water hammer function: can be set from 0 to 3 seconds through parameter **P15**.

2.2. Dimensions

Model CTN



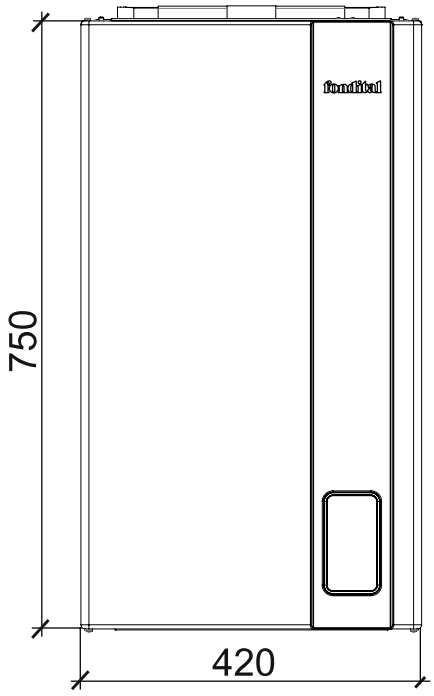
BOTTOM VIEW

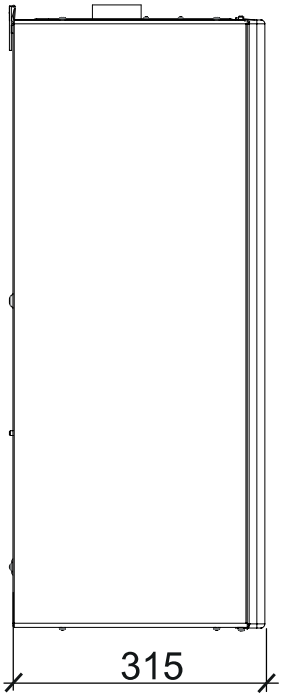
TOP VIEW

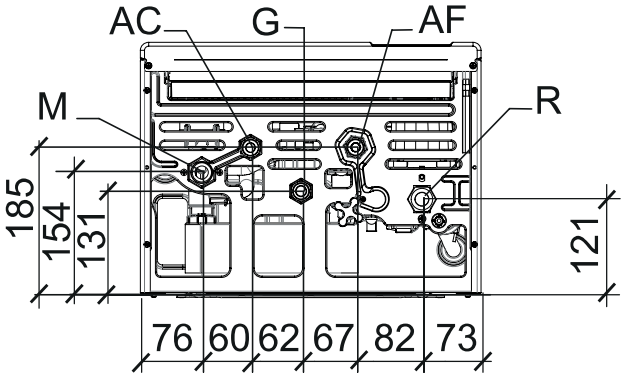
AF	Cold water inlet
G	Gas inlet
M	CH system flow
AC	Hot water outlet
R	CH system return

fig. 3

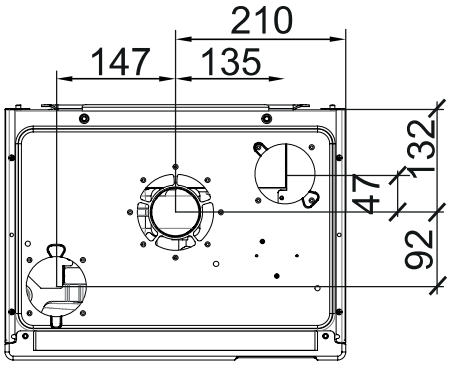
Model CTFS







BOTTOM VIEW

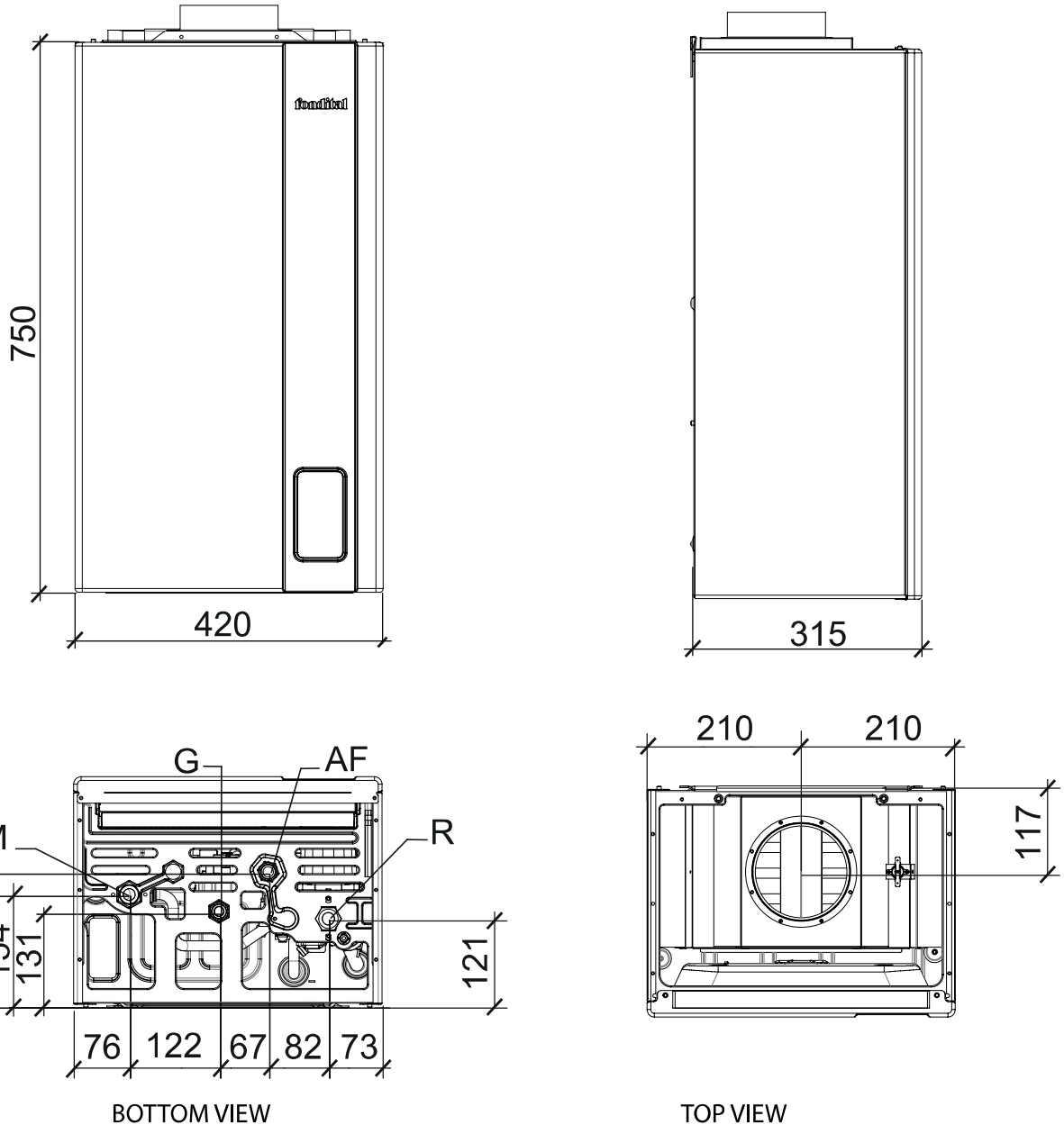


TOP VIEW

AF	Cold water inlet
G	Gas inlet
M	CH system flow
AC	Hot water outlet
R	CH system return

fig. 4

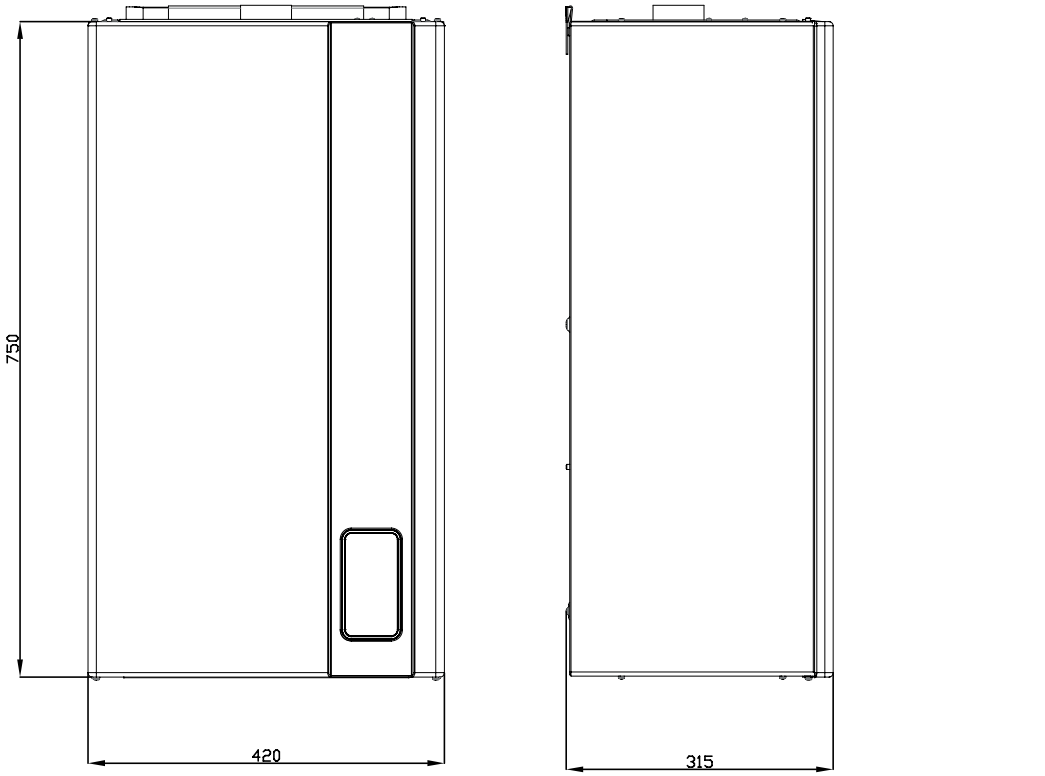
Model RTN



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

fig. 5

Model RTFS



BOTTOM VIEW

TOP VIEW

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

fig. 6

Model CTN

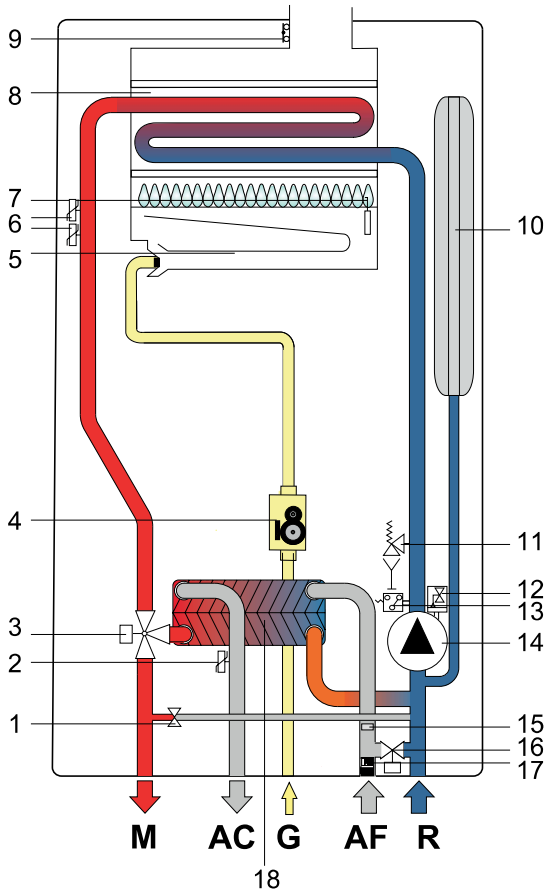
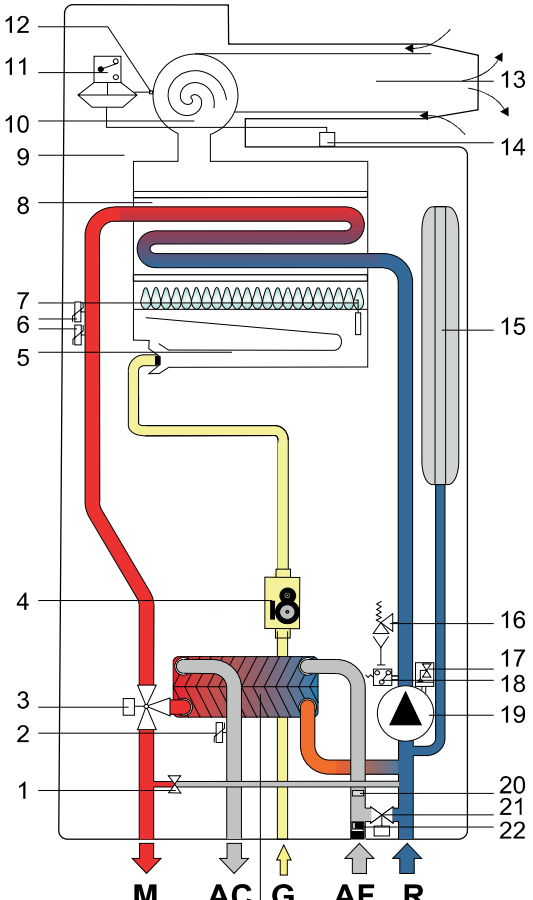


fig. 7

1. Automatic by-pass
2. Domestic hot water temperature sensor
3. Motorised 3-way valve
4. Modulation gas valve
5. Burner
6. Flow temperature twin sensor
7. Ignition/detection electrode
8. Mono-thermal exchanger
9. Flue gas thermostat
10. Expansion vessel
11. 3-bar safety valve
12. Air purging device
13. Pressure transducer
14. Manual 3-speed circulation pump
15. DHW flow rate limiter
16. Filler cock
17. Cold water flow switch with filter
18. Secondary plate exchanger

G Gas inlet
M CH flow
AC DHW outlet
AF Cold water inlet
R CH return

Model CTFS



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

G Gas inlet
M CH flow
AC DHW outlet
AF Cold water inlet
R CH return

Model RTN

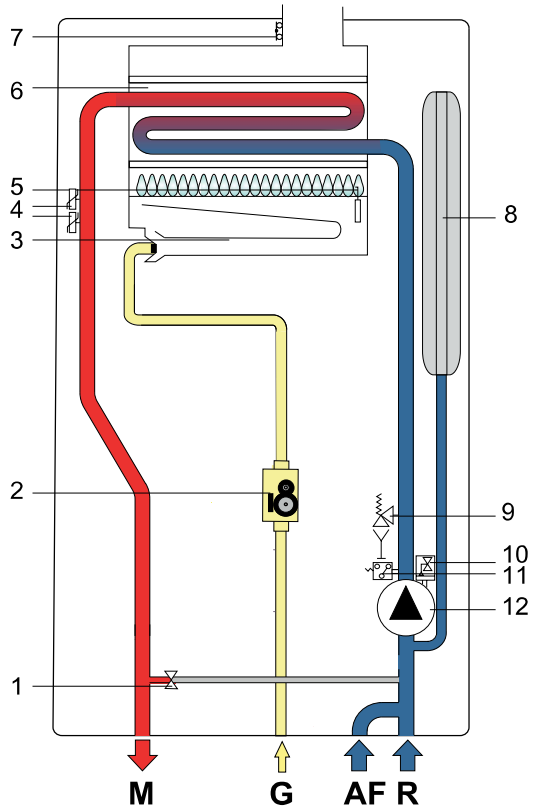
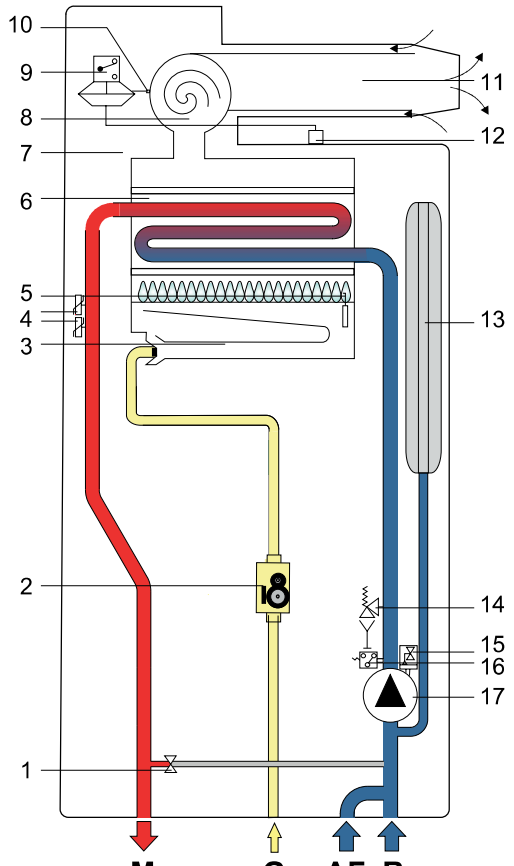


fig. 9

1. Automatic by-pass
2. Modulation gas valve
3. Burner
4. Flow temperature twin sensor
5. Ignition/detection electrode
6. Mono-thermal exchanger
7. Flue gas thermostat
8. Expansion tank
9. 3-bar safety valve
10. Air purging device
11. Pressure transducer
12. Manual 3-speed circulation pump

G Gas inlet
M CH flow
AF Cold water inlet
R CH return

Model RTFS



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

M CH flow
G Gas inlet
AF Cold water inlet
R CH return

2.4. Operating data

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

CTN-RTN 24

Gas type	Heat input [kW]	Max. heat output [kW]	Min. heat output [kW]	Gas mains pressure [mbar]	Nozzle diameter [mm/100]	Burner pressure [mbar]	
						min.	max.
Natural gas G20	25.5	23.1	8.5	20	1.35	2.0	12.0
Butane Gas G30	25.5	23.1	8.5	29	0.78	4.5	28.0
Propane Gas G31	25.5	23.1	8.5	37	0.78	6.0	35.0

Table 5 - CTN-RTN 24 adjustment rates

Domestic hot water supply ΔT 45°C = 7.5 l/min
Domestic hot water supply ΔT 40°C = 8.4 l/min
Domestic hot water supply ΔT 35°C = 9.6 l/min
Domestic hot water supply ΔT 30°C = 11.2 l/min *
Domestic hot water supply ΔT 25°C = 13.4 l/min *
***Note: water mixed at cock**

CTN-RTN 28

Gas type	Heat input [kW]	Max. heat output [kW]	Min. heat output [kW]	Gas mains pressure [mbar]	Nozzle diameter [mm/100]	Burner pressure [mbar]	
						min.	max.
Natural gas G20	30.5	28.6	12.0	20	1.35	2.7	12.4
Butane Gas G30	30.5	28.6	12.0	29	0.78	6.0	29.3
Propane Gas G31	30.5	28.6	12.0	37	0.78	8.1	36.3

Table 6 - CTN-RTN 28 adjustment rates

Domestic hot water supply ΔT 45°C = 9,0 l/min
Domestic hot water supply ΔT 40°C = 10.1 l/min
Domestic hot water supply ΔT 35°C = 11.6 l/min
Domestic hot water supply ΔT 30°C = 13.5 l/min *
Domestic hot water supply ΔT 25°C = 16.2 l/min *
***Note: water mixed at cock**

CTFS-RTFS 24

Gas type	Heat input [kW]	Max. heat output [kW]	Min. heat output [kW]	Gas mains pressure [mbar]	Nozzle diameter [mm/100]	Burner pressure [mbar]	
						min.	max.
Natural gas G20	25.5	23.7	11.1	20	1.35	3.2	12.2
Butane Gas G30	25.5	23.7	11.1	29	0.78	7.5	28.3
Propane Gas G31	25.5	23.7	11.1	37	0.78	7.6	34.2

Table 7 - CTFS-RTFS 24 adjustment rates

Domestic hot water supply ΔT 45°C = 7.7 l/min
Domestic hot water supply ΔT 40°C = 8.7 l/min
Domestic hot water supply ΔT 35°C = 9.9 l/min
Domestic hot water supply ΔT 30°C = 11.6 l/min *
Domestic hot water supply ΔT 25°C = 13.9 l/min *
***Note: water mixed at cock**

CTFS-RTFS 28

Gas type	Heat input [kW]	Max. heat output [kW]	Min. heat output [kW]	Gas mains pressure [mbar]	Nozzle diameter [mm/100]	Burner pressure [mbar]	
						min.	max.
Natural gas G20	30.5	28.6	12.0	20	1.35	2.7	12.4
Butane Gas G30	30.5	28.6	12.0	29	0.78	6.0	29.3
Propane Gas G31	30.5	28.6	12.0	37	0.78	8.1	36.3

Table 8 - CTFS-RTFS 28 adjustment rates

Domestic hot water supply ΔT 45°C = 9.5 l/min
Domestic hot water supply ΔT 40°C = 10.7 l/min
Domestic hot water supply ΔT 35°C = 12.2 l/min
Domestic hot water supply ΔT 30°C = 14.2 l/min *
Domestic hot water supply ΔT 25°C = 17.0 l/min *
***Note: water mixed at cock**

CTFS-RTFS 32

Gas type	Heat input [kW]	Max. heat output [kW]	Min. heat output [kW]	Gas mains pressure [mbar]	Nozzle diameter [mm/100]	Burner pressure [mbar]	
						min.	max.
Natural gas G20	33.0	30.8	14.3	20	1.35	2.8	11.1
Butane Gas G30	33.0	30.8	14.3	29	0.78	7.1	28.7
Propane Gas G31	33.0	30.8	14.3	37	0.78	9.5	25.3

Table 9 - CTFS-RTFS 32 adjustment rates

Domestic hot water supply ΔT 45°C = 10.1 l/min
Domestic hot water supply ΔT 40°C = 11.3 l/min
Domestic hot water supply ΔT 35°C = 12.9 l/min
Domestic hot water supply ΔT 30°C = 15.1 l/min *
Domestic hot water supply ΔT 25°C = 18.1 l/min *
***Note: water mixed at cock**

2.5. General characteristics

MODEL		CTN-RTN 24	CTN-RTN 28	CTFS-RTFS 24	CTFS-RTFS 28	CTFS-RTFS 32
Device category	-	II2H3+	II2H3+	II2H3+	II2H3+	II2H3+
Burner nozzles	no.	11	13	11	13	15
Minimum CH system pressure	bar	0.5	0.5	0.5	0.5	0.5
Maximum CH system pressure	bar	3.0	3.0	3.0	3.0	3.0
DHW circuit min. pressure	bar	0.5	0.5	0.5	0.5	0.5
DHW circuit max. pressure	bar	6	6	6.0	6.0	6.0
DHW specific flow rate (Δt 30K)	l/min	11.2	13.5	11.6	14.2	15.1
Electric power Supply - Voltage - Frequency	V - Hz	230 - 50	230 - 50	230 - 50	230 - 50	230 - 50
Power mains supply fuse	A	3.15	3.15	3.15	3.15	3.15
Maximum power consumption	W	86	86	125	134	134
Electric protection rating	IP	X5D	X5D	X5D	X5D	X5D
Net weight	kg	33.4	34.4	35.4	36.9	37.9
Natural gas consumption at maximum CH output (*)	m^3/h	2.69	3.23	2.70	3.23	3.49
Butane gas consumption at maximum CH output	kg/h	2.01	2.41	2.01	2.41	2.60
Propane gas consumption at maximum CH output	kg/h	1.98	2.37	1.98	2.37	2.56
Maximum CH working temperature	°C	83	83	83	83	83
Maximum DHW working temperature	°C	62 (models CTN-CTFS); 65 (RTN-RTFS with external optional cylinder)				
Total capacity of expansion vessel	l	7	7	7	7	7
Maximum recommended system capacity (**)	l	150	150	150	150	150

Table 10 - General specifications

(*) Value referred to 15°C - 1013 mbar
(**) Maximum water temperature 83°C, expansion vessel pressure 1 bar

CTN-RTN 24		Max. output	Min. output	30% load
Casing heat loss	%	1.88	3.14	-
Flue system heat loss with burner on	%	7.52	11.46	-
Flue system mass capacity	g/s	20.73	18.90	-
Flue gas temp. – air temp.	°C	86	63	-
CO_2 value	%	4.9	2.0	-
Boiler efficiency rating	%	90.6	85.4	89.4
Efficiency rating (according to 92/42/EC)	-	★★		
NO_x emission class	-	2		

Table 11 - Combustion specifications CTN-RTN 24

CTN-RTN 28		Max. output	Min. output	30% load
Casing heat loss	%	2.83	2.80	-
Flue system heat loss with burner on	%	7.17	10.7	-
Flue system mass capacity	g/s	21.7	8.9	
Flue gas temp. – air temp.	°C	96	68	
CO_2 value	%	2.4	5.5	
Boiler efficiency rating	%	90.0	86.5	87.8
Efficiency rating (according to 92/42/EC)	-	★★		
NO_x emission class	-	2		

Table 12 - Combustion specifications CTN-RTN 24

CTFS-RTFS 24		Max. output	Min. output	30% load
Casing heat loss	%	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 temp. – air temp.	°C	95	77	-
CO_2 value	%	6.1	2.7	-
Boiler efficiency rating	%	93.0	89.0	90.2
Efficiency rating (according to 92/42/EC)	-	★★★		
NO_x emission class	-	3		

Table 13 - Combustion specifications CTFS-RTFS 24

CTFS-RTFS 28		Max. output	Min. output	30% load
Casing heat loss	%	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 temp. – air temp.	°C	101	87	-
CO_2 value	%	7.0	2.9	-
Boiler efficiency rating	%	93.7	88.9	90.6
Efficiency rating (according to 92/42/EC)	-	★★★		
NO_x emission class	-	3		

Table 14 - Combustion specifications CTFS-RTFS 28

CTFS-RTFS 32		Max. output	Min. output	30% load
Casing heat loss	%	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 temp. – air temp.	°C	105	73	-
CO_2 value	%	7.4	3.3	-
Boiler efficiency rating	%	93.4	89.4	91.0
Efficiency rating (according to 92/42/EC)	-	★★★		
NO_x emission class	-	3		

Table 15- Combustion specifications CTFS-RTFS 32

3. INSTRUCTIONS FOR THE INSTALLER

3.1. Installation standards

This is an II2H3+ category boiler and must be installed in compliance with the laws and standards in force in the country of installation, which are herein considered as entirely transcribed.

3.2. Installation

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

3.2.1. Packaging

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 in following the above mentioned information.

Packaging includes:
- the hydraulic kit with copper pipes for boiler connection to gas mains, to the heating system and the DHW system (CTFS / CTN only);
- a wall bracket;
- a bag containing:
  a) boiler installation, use and maintenance manual;
  b) the template for mounting boiler on a wall (fig. 11);
  c) 2 screws and relevant wall blocks for fixing the boiler to the wall;
  d) for CTFS / RTFS 24 models, four diaphragms for flue gas vent (diameter 39.8; 42; 45; 49 mm);
  e) for CTFS / RTFS 28 models, four diaphragms for flue gas vent (diameter 39; 41; 45; 47 mm) and one air intake diaphragm (diameter 55.5 mm);
  f) for CTFS / RTFS 32 models, six diaphragms for flue gas vent (diameter da 39.8; 41; 44; 45; 47 and 49 mm) and one air intake diaphragm (diameter 55.5 mm);
  g) for model CTFS / RTFS, two blanking caps with gaskets.

3.2.2. Choosing where to install the boiler

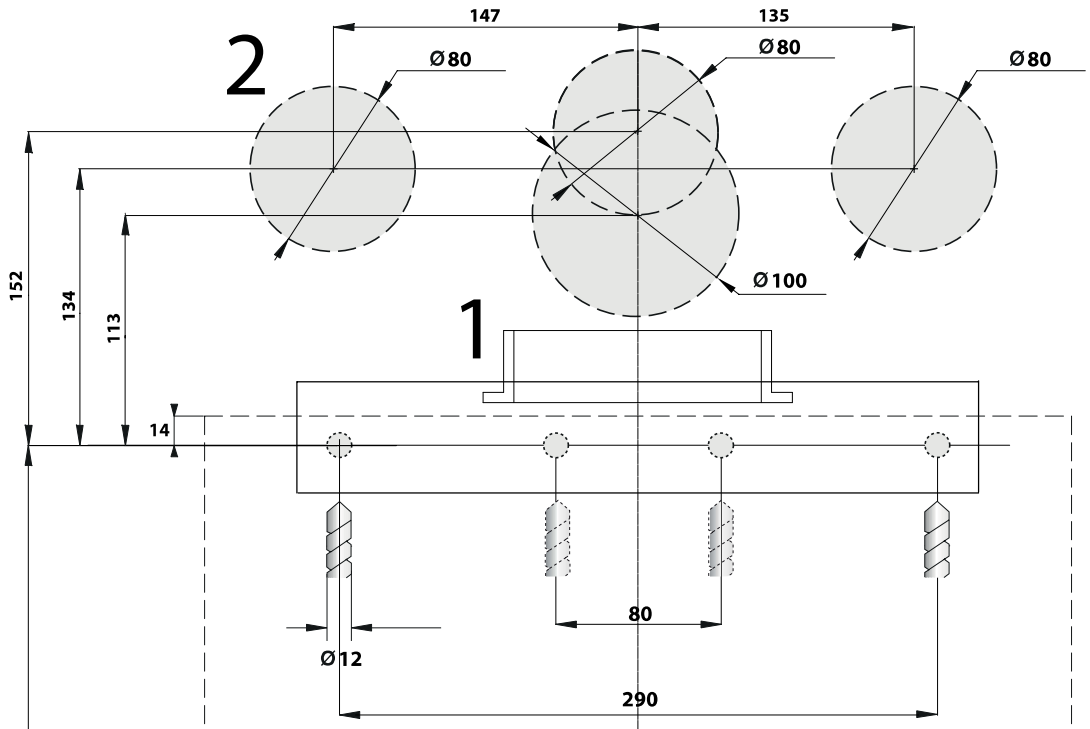
The following must be taken into account when choosing where to install the boiler:
- instructions from section 3.2.6. "*Air intake and flue gas venting system*" and relevant sub paragraphs;
- check the wall for sturdiness, avoiding weak areas;
- do not install the boiler over appliances which may affect boiler operation (e.g. cookers, which produce steam and grease, washing machines etc.);

3.2.3. Positioning the boiler

Each boiler is supplied with a paper template (fig. 11), found inside the packaging.
Said template ensures that the pipes connected to the central heating system, the domestic hot water system, the gas mains, and the air intake/flue gas venting pipes are all laid out correctly during the realisation of the water system and before installation of the boiler.
The template is made of heavy-duty paper, it is to be affixed to the wall where the boiler is to be mounted using a carpenter's level. It provides all the indications required to drill the boiler mounting holes to the wall, procedure which is done using two screws and wall blocks.
Template bottom allows marking the correct point where fittings must be for connecting the gas supply pipe, cold water supply pipe, hot water outflow pipe, heating flow and return pipes.

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

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 pipe.



	IT	ES	FR	PL	PT	RU	NL	DE	GB	GR	RO	CZ	HU
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2													
C													
F													
R													
M													
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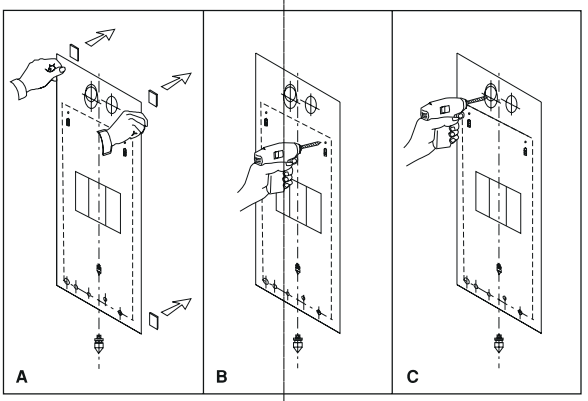
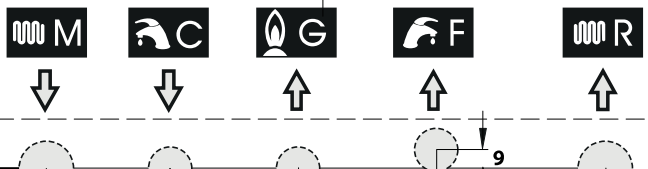




760

3.2.4. Installing the boiler

Before connecting the boiler to CH and DHW networks, clean the pipes carefully.
- Before commissioning a NEW system, clean it to remove any metal chips due to machining and welding, and any oil and grease that might negatively affect boiler operation or even damage it in case they get inside it.
- Before commissioning a RECONDITIONED system (where radiators have been added, the boiler has been replaced, etc.) thoroughly clean it to remove any sludge and residues.
Clean the system using standard non acid products, available on the market.
Do not use solvents as they could damage system components.
Furthermore, in the central heating system (either new or reconditioned), it is always advisable to add to water a suitable percentage of corrosion protectants for multi-metal systems that will create a protective film onto all internal surfaces.
The manufacturer shall not be held responsible in case of damage to people, animals, or property due to failure to follow the above mentioned instructions.

In order to install the boiler proceed as follows:
- secure the template (fig. 11) 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 pipes to pass through it;
- secure the supporting bracket to the wall using the blocks supplied with the boiler;
- position the connections for the gas mains pipe (**G**), the cold water inlet pipe (**F**), the hot water outlet pipe (**C**, CTFS and CTN models only), the heating flow pipe (**M**) and return pipe (**R**), as indicated at the bottom of the template;
- provide a system for relieving the 3-bar safety valve;
- hook boiler to supporting bracket;
- connect the boiler to mains pipes by means of the coupling kit supplied with the boiler (refer to paragraphs 3.2.9. and 3.2.10);
- provide a system for relieving the 3-bar safety valve;
- connect the boiler to the air intake and flue gas venting system (see paragraphs 3.2.6. and 3.2.7. and relevant sub-paragraphs);
- connect electric power supply, ambient thermostat (when available) and other available accessories (refer to the following paragraphs).

3.2.5. Boiler room ventilation

Natural draught boilers (models CTN and RTN) have an open combustion chamber and are designed for connection to a chimney: combustion air is drawn directly from the room where the boiler is installed.

Forced draught boilers (models CTFS and RTFS) have a sealed combustion chamber and do not draw combustion air from the room where the boiler is installed, so no specific indications are applicable regarding ventilation openings for combustion air and boiler room requirements.

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

3.2.6. Air intake/flue gas venting system for natural draught boilers (CTN and RTN)

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

The boiler is equipped with a manual reset safety device checking correct flue gas exhaustion (see paragraph 1.9.3).
Should an air/flue gas system malfunction occur, the safety device will shut-down the boiler and the LCD will display the E03 code flashing.
It is strictly forbidden to tamper with and/or prevent operation of such safety device.
Should the boiler repeatedly shut-down, it is necessary to have air/flue gas system ducts inspected, as they might be obstructed or inadequate to flue gas discharge into the atmosphere.

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

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

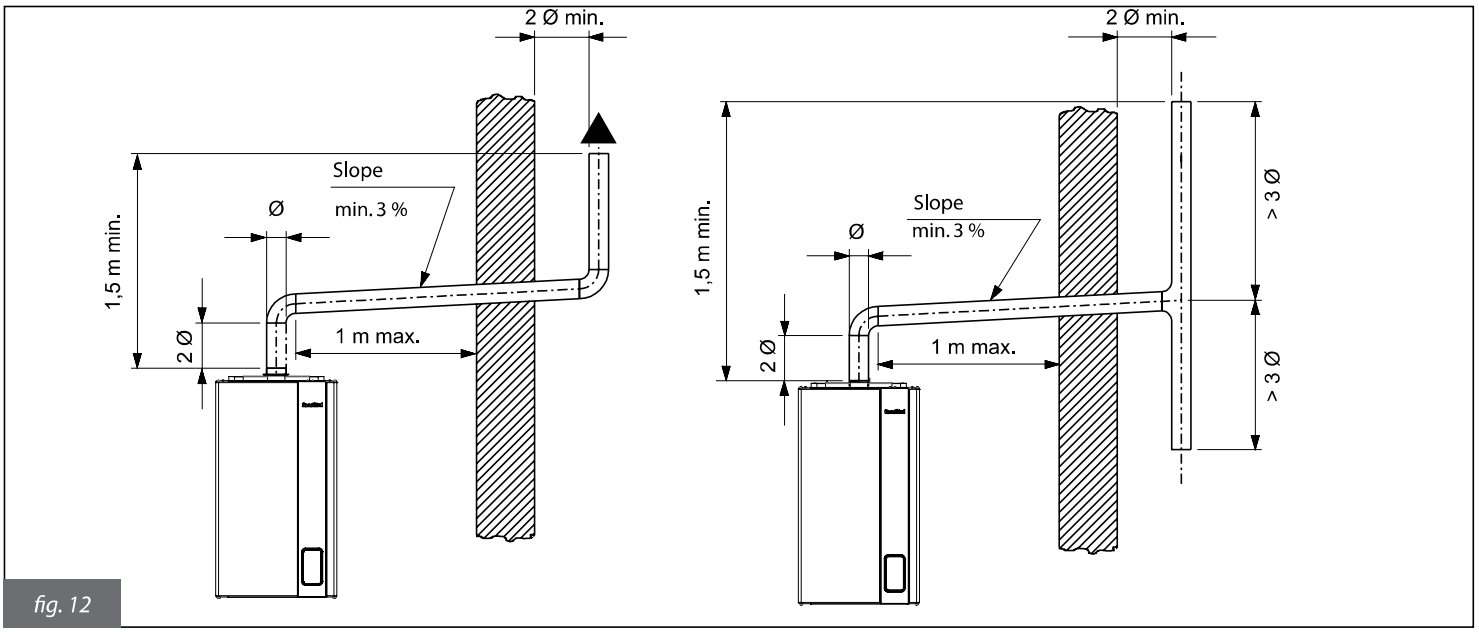


fig. 12

Connecting to the 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;
- the chimney diameter is not to 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.

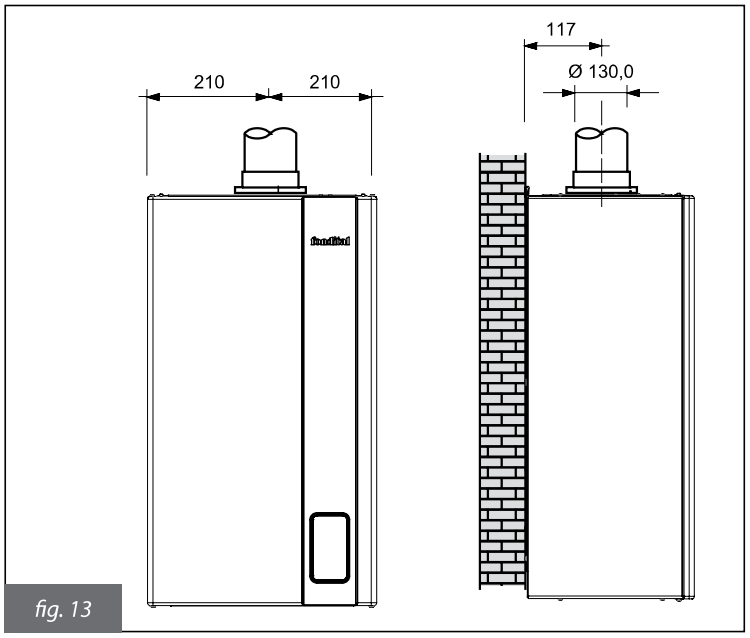


fig. 13

Direct emission into the atmosphere

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:

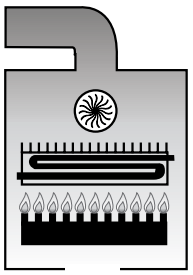
- its sub-horizontal part inside the building must be as short as possible (not longer than 1,000 mm);
- it is not to have more than 2 direction changes;
- it can host only one single boiler flue gas exhaust system;
- its section, which is passing through the wall is to be protected by a sheath duct; 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 terminal is to 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 (see fig. 12).

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

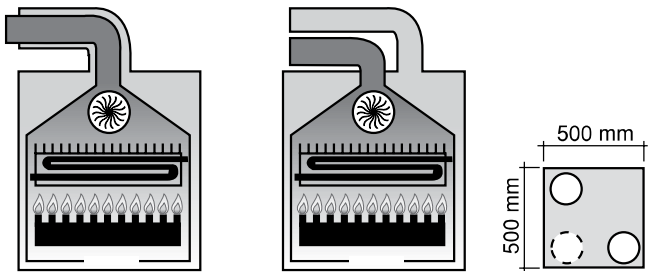
3.2.7. Air intake/flue gas venting system for forced draught boilers (CTFS and RTFS)

When positioning the boiler flue gas venting pipe terminals onto the wall, comply with the distances specified in the applicable standards and regulations in force in the Country of installation.

type
B22



type
C12

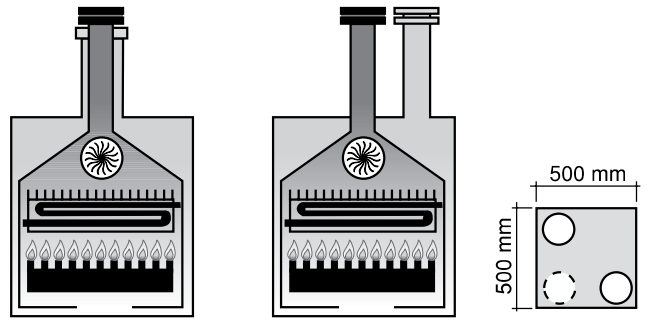


3.2.7.1. Configuration of air intake and flue gas venting ducts

Type B22
The flue must not be fitted with draught excluder devices, while a ventilator device must be installed downstream of the combustion chamber/heat exchanger.

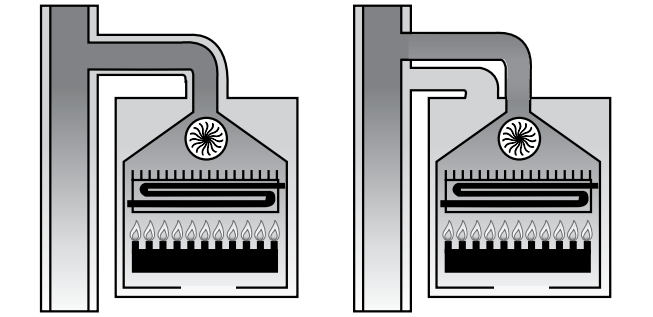
Type C12
Boiler intended for connection to horizontal outlet and intake ducts connected to the outside by means of coaxial or split ducts.
The minimum distance between the air intake duct and the flue gas venting duct must be at least 250 mm (see figure opposite), whereas both terminals must be contained within a square measuring 500 x 500mm.

type
C32



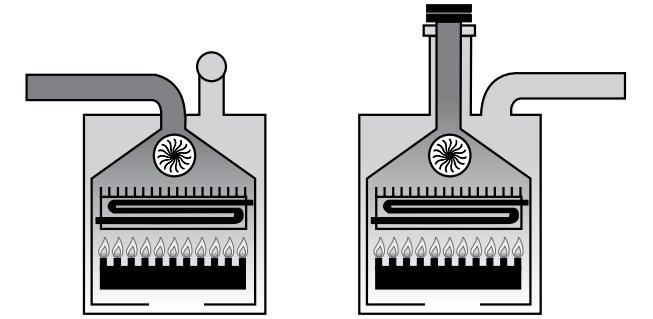
Type C32
Boiler intended for connection to vertical outlet and intake ducts connected to the outside by means of coaxial or split ducts.
The minimum distance between the air intake duct and the flue gas venting duct must be at least 250 mm (see figure opposite), whereas both terminals must be contained within a square measuring 500 x 500mm.

type
C42



Type C42
Boiler intended for connection to collective chimney pipe system that includes two ducts, air intake and flue gas exhaustion. These ducts may be coaxial or split.
The chimney must be compliant with applicable legislation and standards.

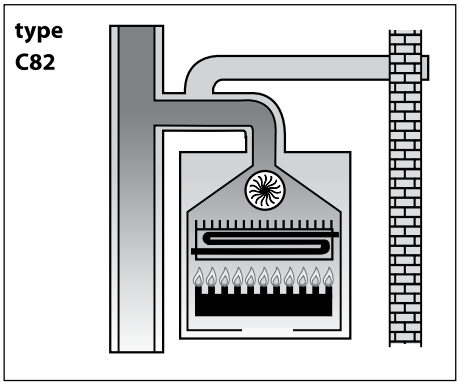
type
C52



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 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.

type
C82



3.2.7.2. Air intake and flue gas venting via 100/60 mm coaxial pipes

Type C12 - Type C32

CTFS / RTFS 24
The minimum permissible length of **horizontal coaxial** pipes is 0.5 metres, including the first elbow connected to the boiler. The maximum permissible length of horizontal coaxial pipes 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.
Minimum permissible length for **vertical coaxial** pipes is 1 metre, equal to the length of the chimney. Maximum permissible length for vertical coaxial pipes is 6 metres, including the chimney. For each additional elbow the maximum permissible length must be reduced by 1 meter. With "roof terminal", maximum permissible length is to be reduced by 1.5 meters.

Using the diaphragms supplied with the boiler (fig. 15)

Pipe length (m)	Diameter of flue gas vent diaphragm
0.5 < L < 2*	Ø 39.8
2 < L < 3*	Ø 42
3 < L < 4*	Ø 45
4 < L < 5*	Ø 49
5 < L < 6*	-

* including the first elbow for Type C12

CTFS / RTFS 28
The minimum permissible length of **horizontal coaxial** pipes is 0.5 metres, including the first elbow connected to the boiler. The maximum permissible length of horizontal coaxial pipes 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.
Minimum permissible length for **vertical coaxial** pipes is 1 metre, equal to the length of the chimney. Maximum permissible length for vertical coaxial pipes is 7 metres, including the chimney. For each additional elbow the maximum permissible length must be reduced by 1 meter. With "roof terminal", maximum permissible length is to be reduced by 1.5 meters.

Using the diaphragms supplied with the boiler (fig. 15)

Pipe length (m)	Diameter of flue gas vent diaphragm
0.5 < L < 2*	Ø 39
2 < L < 4*	Ø 41
4 < L < 6*	Ø 47
6 < L < 7*	-

* including the first elbow for Type C12

CTFS / RTFS 32
The minimum permissible length of **horizontal coaxial** pipes is 0.5 metres, including the first elbow connected to the boiler. The maximum permissible length of horizontal coaxial pipes 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.
Minimum permissible length for **vertical coaxial** pipes is 1 metre, equal to the length of the chimney. Maximum permissible length for vertical coaxial pipes is 5 metres, including the chimney. For each additional elbow the maximum permissible length must be reduced by 1 meter. With "roof terminal", maximum permissible length is to be reduced by 1.5 meters.

Using the diaphragms supplied with the boiler (fig. 15)

Pipe length (m)	Diameter of flue gas vent diaphragm
0,5 < L < 2*	Ø 39,8
2 < L < 3*	Ø 41
3 < L < 4*	Ø 44
4 < L < 5*	Ø 47

* including the first elbow for Type C12

The boiler is equipped with a device which controls flue gas venting. In the event of a fault in the air intake and/or flue gas venting system, this device shuts down the boiler in safety conditions (refer to paragraph 1.9.3)

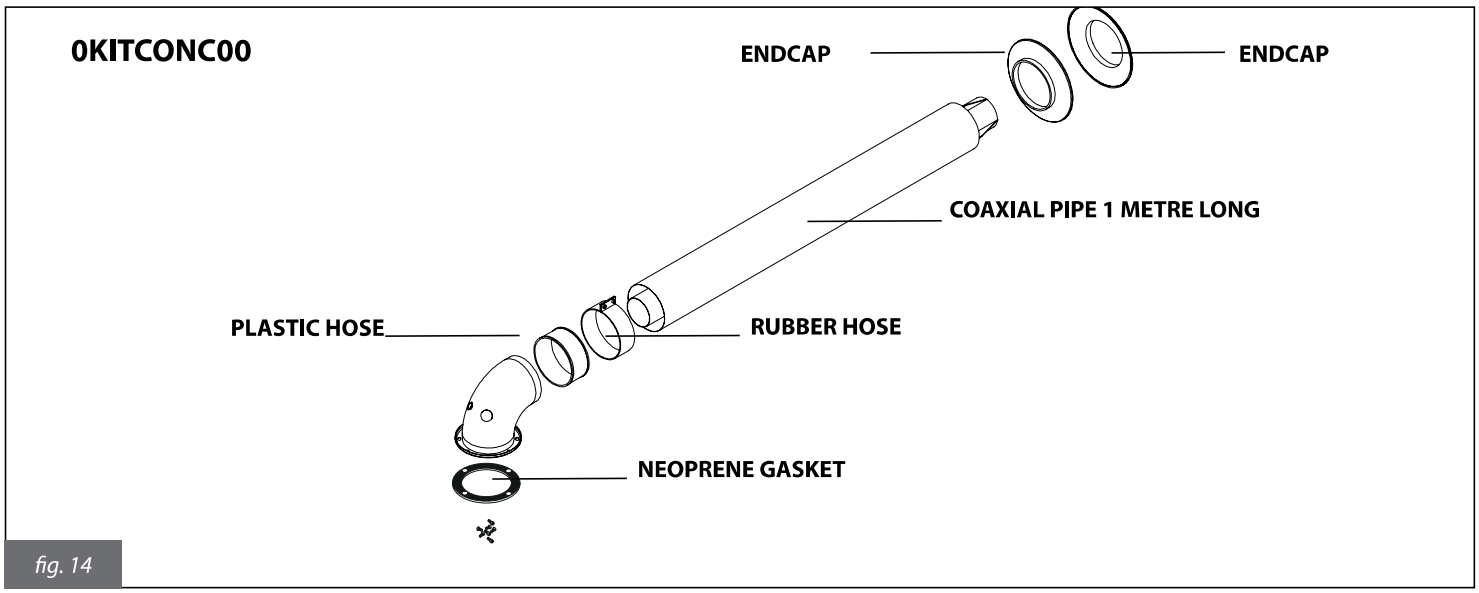


fig. 14

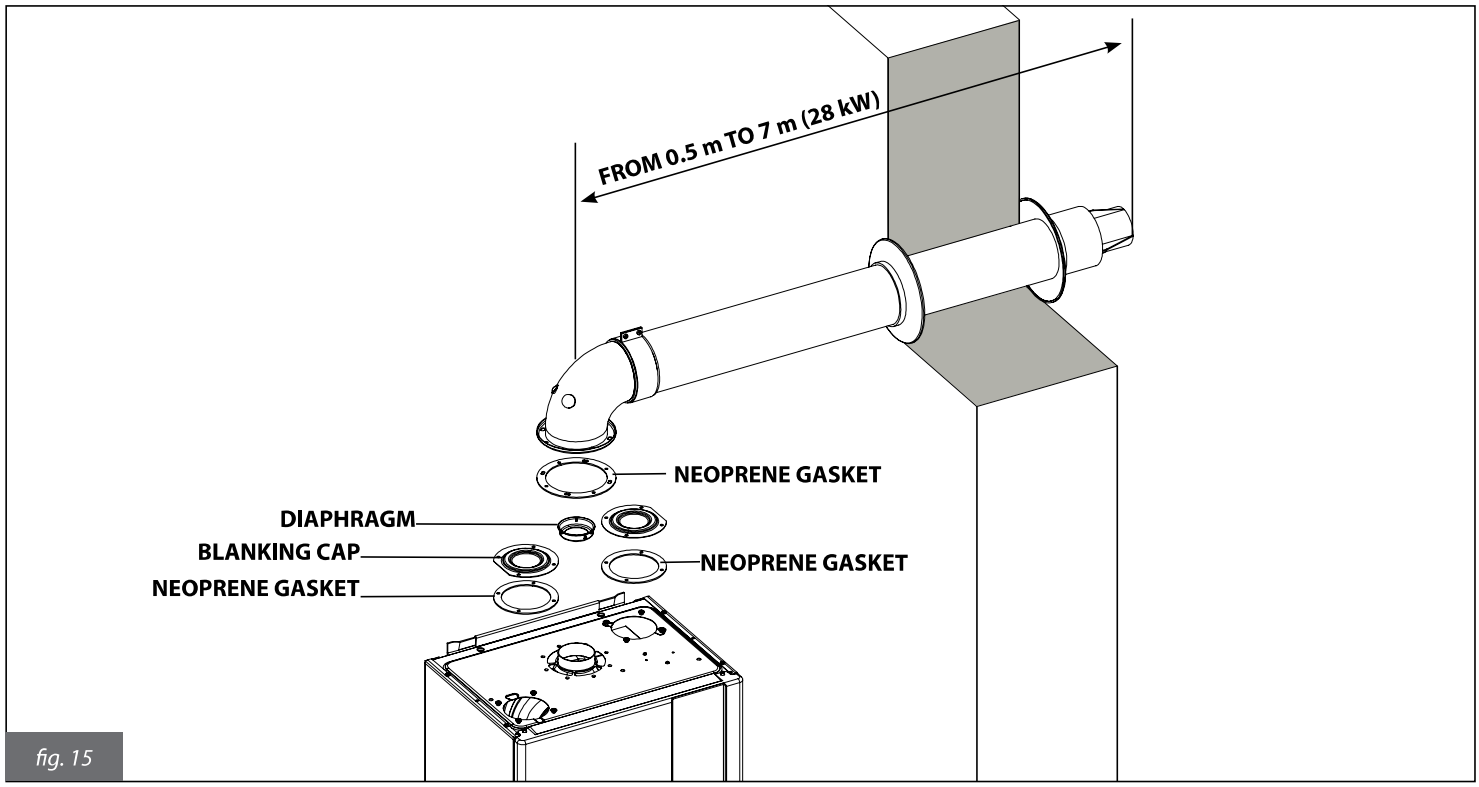


fig. 15

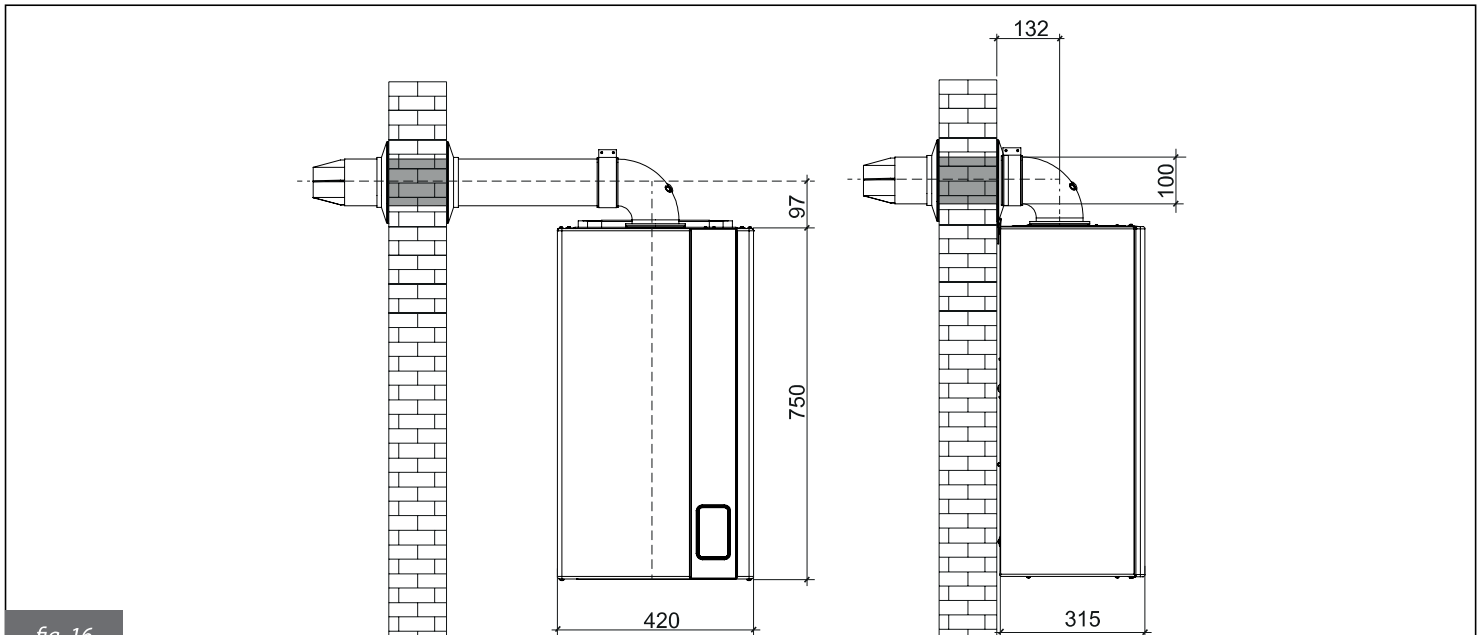


fig. 16

3.2.7.3. Air intake and flue gas venting via 80 mm split pipes

C42 - C52- C82 installation category

For all systems with separate air intake and flue gas vent pipes, the suitable standard split pipe kit (0SDOPPIA11) must be used, it includes the following parts (fig. 17):
- a female flanged stub pipe Ø 80 mm for connecting flue gas vent pipe;
- a female flanged stub pipe Ø 80 mm for connecting air intake pipe;
- a standard deflector;
- retaining screws and seals/gaskets.

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

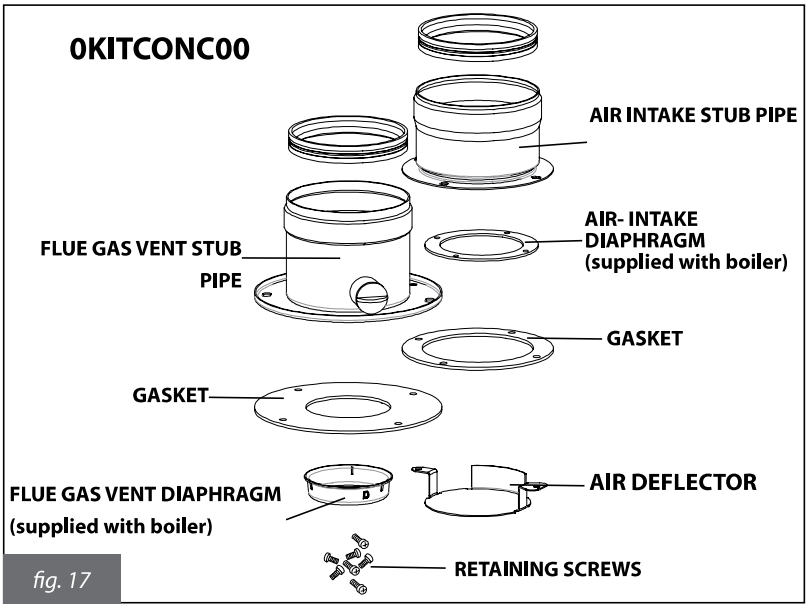


fig. 17

Air intake CTFS / RTFS 24
Minimum permissible length of air intake pipe is 1 meter.
Each wide radius 90° air-intake elbow (R=D) is equivalent to a 0.8 metre long straight pipe section.
Each narrow radius 90° air-intake elbow (R=D) is equivalent to a 1.7 metre long straight pipe section.
Every air intake pipe length of one metre is equivalent to a 0.6 metre long straight pipe section.
Every split pipe chimney at intake is equivalent to a 4.2 metre long straight pipe section.
Air intake pipe flow resistance shall not be considered.
Install the standard deflector.

Pipe length (m)	Diameter of flue gas vent diaphragm
1 < L < 3	Ø 39.8
3 < L < 14	Ø 42
14 < L < 26	Ø 45
26 < L < 34	Ø 49
34 < L < 42	-

Flue gas vent CTFS / RTFS 24
Each wide radius 90° elbow (R=D) in flue gas vent equals a 1.4 m long straight pipe section.
Each narrow radius 90° elbow (R<D) in flue gas vent equals a 2.8 m long straight pipe section.
Every flue gas vent pipe length of one metre is equivalent to a 1.0 metre long straight pipe section.
Every split pipe chimney at glue gas vent is equivalent to a 5.7 metre long straight pipe section.

Air intake CTFS / RTFS 28
Minimum permissible length of air intake pipe is 1 meter.
Each wide radius 90° air-intake elbow (R=D) is equivalent to a 0.8 metre long straight pipe section.
Each narrow radius 90° air-intake elbow (R=D) is equivalent to a 1.7 metre long straight pipe section.
Every air intake pipe length of one metre is equivalent to a 0.6 metre long straight pipe section.
Every split pipe chimney at intake is equivalent to a 4.3 metre long straight pipe section.
Air intake pipe flow resistance shall not be considered.
Install the standard deflector.

Pipe length (m)	Diameter of flue gas vent diaphragm	Diameter of intake diaphragm
1 < L < 18	Ø 45	Ø 55.5
18 < L < 23	Ø 47	Ø 55.5

Flue gas vent CTFS / RTFS 28
Each wide radius 90° elbow (R=D) in flue gas vent equals a 1.4 m long straight pipe section.
Each narrow radius 90° elbow (R<D) in flue gas vent equals a 2.8 m long straight pipe section.
Every flue gas vent pipe length of one metre is equivalent to a 1.0 metre long straight pipe section.
Every split pipe chimney at glue gas vent is equivalent to a 5.9 metre long straight pipe section.

Air intake CTFS / RTFS 32
Minimum permissible length of air intake pipe is 1 meter.
Each wide radius 90° air-intake elbow (R=D) is equivalent to a 0.8 metre long straight pipe section.
Each narrow radius 90° air-intake elbow (R=D) is equivalent to a 1.7 metre long straight pipe section.
Every air intake pipe length of one metre is equivalent to a 0.6 metre long straight pipe section.
Every split pipe chimney at intake is equivalent to a 4.2 metre long straight pipe section.
Air intake pipe flow resistance shall not be considered.
Install the standard deflector.

Pipe length (m)	Diameter of flue gas vent diaphragm	Diameter of intake diaphragm
1 < L < 5	Ø 44	Ø 55.5
5 < L < 12	Ø 45	Ø 55.5
12 < L < 19	Ø 47	Ø 55.5
19 < L < 25	Ø 49	Ø 55.5

Flue gas vent CTFS / RTFS 32
Each wide radius 90° elbow (R=D) in flue gas vent equals a 1.4 m long straight pipe section.
Each narrow radius 90° elbow (R<D) in flue gas vent equals a 2.8 m long straight pipe section.
Every flue gas vent pipe length of one metre is equivalent to a 1.0 metre long straight pipe section.
Every split pipe chimney at glue gas vent is equivalent to a 5.9 metre long straight pipe section.

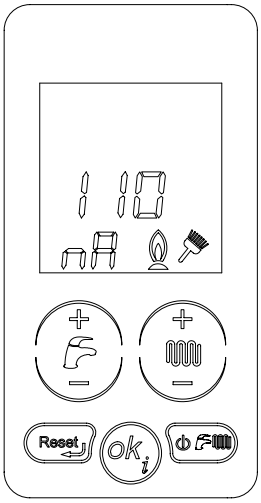
3.2.8. Checking combustion efficiency

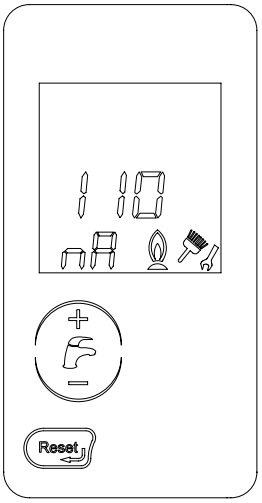
3.2.8.1. Flue cleaning function

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

To enable the flue cleaning function, press the "reset" key (**C**, fig. 1) and keep it pressed for 5 seconds.
When the flue cleaning function is activated with the boiler in WINTER mode, and ambient thermostat ON (if installed), the boiler performs the ignition sequence and then operates at a fixed power output which corresponds to the one set through parameter **P95**.
The flue cleaning symbol steady on (**12**, fig. 1), the flame symbol on (**14**, fig. 1) - if burner is on - and gas valve modulation coil input current value indicate that the flue cleaning function is active.
The keys active in this function are: "reset" (**C**, fig. 1) and "DHW +/-" (**A**, fig. 1).

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





Use "DHW +/-" buttons (**A**, fig. 1) to change current input to gas valve modulation coil through the available range, from a minimum value (parameter **P96**) to a maximum value (parameter **P95**) automatically set according to boiler type. The display shows the "wrench" symbol (**13**, fig. 1) to warn user that parameter is being modified, the "flue cleaning" symbol (**12**, fig. 1), the gas valve modulation coil input current value and the flame on symbol (**14**, fig. 1) if burner is on.

3.2.8.2. Measurement procedure

Coaxial pipe system

In order to verify combustion efficiency the following measurements must be implemented:
- assess combustion air from opening 2 (fig. 18 A).
- assess flue gas temperature and CO_2 from opening 1 (fig. 18 A).

Allow boiler to reach working temperature before taking any measurement.

Split pipe system

In order to verify combustion efficiency the following measurements must be implemented:
- assess combustion air from opening 2 (fig. 18 B).
- assess flue gas temperature and CO_2 from opening 1 (fig. 18 B).

Allow boiler to reach working temperature before taking any measurement.

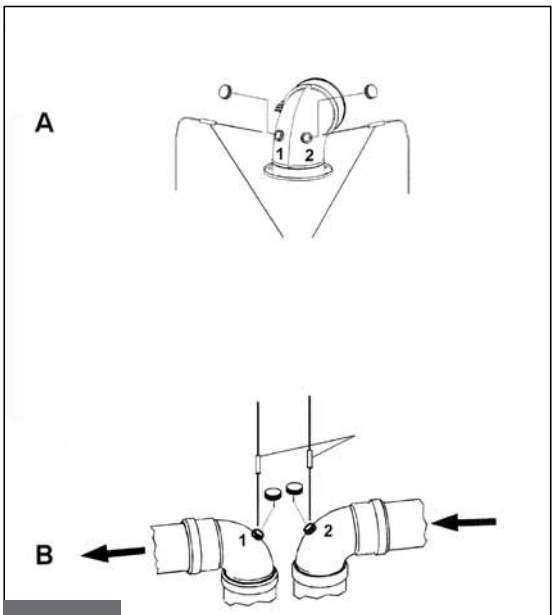


fig. 18

3.2.9. Connection to gas mains

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

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

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

When connecting the boiler to gas supply network, it is COMPULSORY to install an appropriately sized gasket made from suitable material (fig. 19).
The boiler gas inlet coupling is NOT suitable for hemp, Teflon tape or similarly made gaskets.

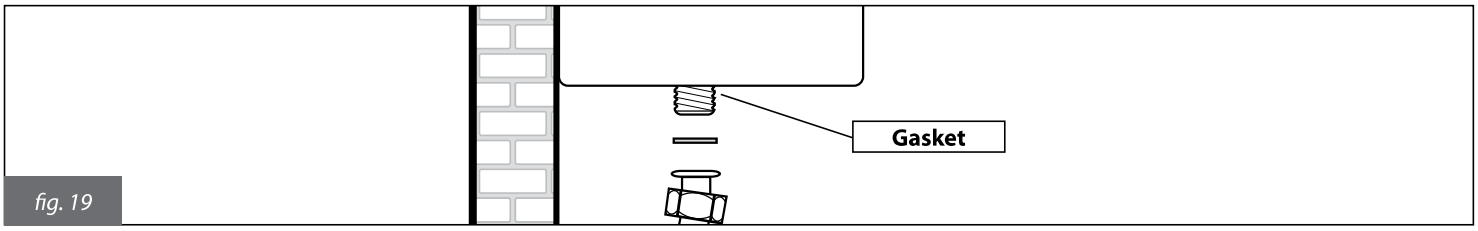


fig. 19

3.2.10. Hydraulic connections

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.

HEATING
The CH outlet and return pipes must be connected to the respective 3/4" connectors **M** and **R** on the boiler (fig. 11).
When calculating the cross section of CH system pipes, bear in mind load losses induced by radiators, thermostatic valves, radiator gate valves, and the configuration of the system itself.

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

DOMESTIC HOT WATER
Cold water inlet and DHW outlet shall be connected to the boiler through the special 1/2" **C** and **F** fittings (fig. 11).
Hardness of water supplied to the boiler may increase the plate heat exchanger cleaning/replacement intervals.

Depending on the hardness of the mains water supply, ascertain whether or not to install appropriate domestic water treatment systems using water treatment products suitable for drinking water and compliant with the standards in force in the country of installation.
Water treatment is always advisable when water supplied to the boiler is more than 20°F hard.

3.2.11. 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 the boiler to power mains, follow correct phase / neutral polarity sequence.
Installation standards must be complied with and they are herein considered as entirely transcribed.

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

Power supply to the boiler must be fitted with a residual-current circuit breaker having suitable disconnection capacity. Electric power supply must be properly earthed.
The above mentioned safety measure must be verified. If in doubt, ask a qualified technician to thoroughly check the power network.

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

3.2.12. Connection to ambient thermostat (optional)

The boiler is designed to be connected to an ambient thermostat (optional, not compulsory).
Ambient thermostat contacts must be properly sized in compliance with a load of 5 mA at 24 Vdc.
Ambient thermostat cables shall be connected to electronic board pins **1** and **2** (fig. 23, 24 and 29), after having eliminated the jumper supplied as a standard with the boiler.
The ambient thermostat cables are not to be grouped together in the same sheath as power mains supply cables.

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

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

The Remote Control must only be installed by qualified personnel.

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

To install the Remote Control, refer to the instructions provided with the Remote Control itself.
Please note the following precautions when installing the Remote Control:
- the remote control wiring must not be grouped together in the same sheath as the power cables: if the cables are sheathed together, electrical interference from the power cables may compromise the functions of the Remote Control;
- the Remote Control must be installed on an indoor wall at a height of approximately 1.5 m from the floor and in a suitable location for measuring ambient temperature: do not install in recess or corners, behind doors or curtains, and install away from heat sources, direct sunlight, air draughts and water sprays.

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

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

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

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

3.2.14. 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.

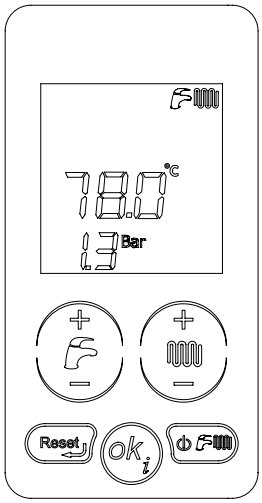
Only original external temperature probes supplied by the manufacturer must be used.
If non-original external temperature probes are used, correct operation of the boiler and external probe cannot be guaranteed.

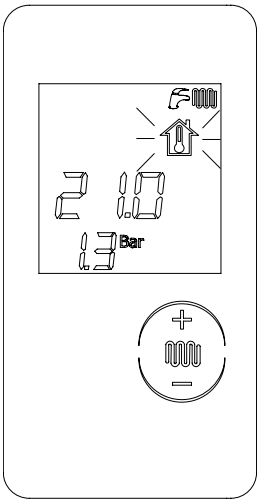
The external temperature probe must be connected by means of a double insulated wire, minimum cross-section 0.35 sq.mm.
The external probe must be connected to pins **5-6** of boiler electronic board (fig. 23, 24 and 29).
The temperature probe cables must NOT be routed together with power cables.

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

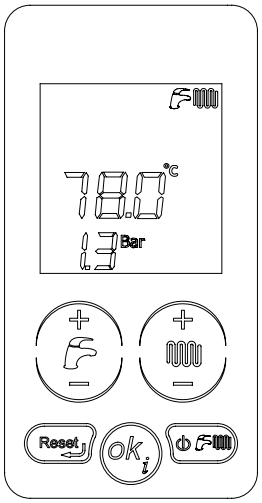
The external temperature probe automatically modifies the CH flow temperature in relation to:
- the external temperature measured;
- the thermoregulation curve selected;
- the calculated ambient temperature selected.

The calculated ambient temperature is set using "CH + and -" keys (**B**, fig. 1) that, with the external temperature probe installed, no longer work to set the CH water temperature (see paragraph 1.8.6.) and the set value can be read on the boiler display. The external temperature value detected by the external probe can be displayed through boiler **P30** parameter.



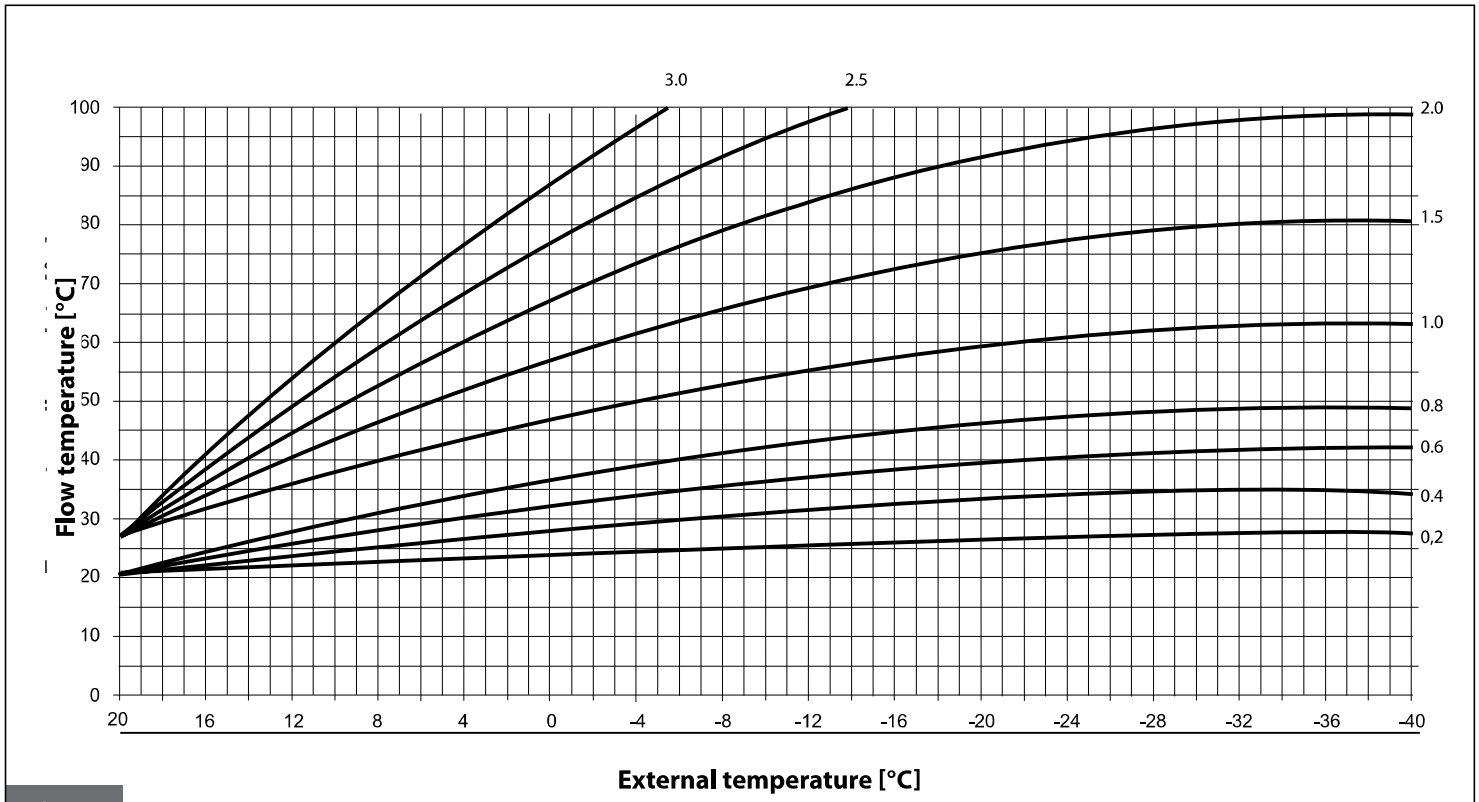


1- With installed external probe, press "CH +/-" buttons (**B,** fig. 1) to set calculated ambient temperature. As soon as "CH +/-" buttons are released, "ambient temperature" icon will continue flashing for approx. 3 seconds, and the calculated ambient temperature value will flash as well.



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

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



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

	Parameter	Settable values	Default values	Notes
	P0 - TSP0 Boiler power selection	0 ÷ 5	1	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	1	1 = combined instantaneous; 2 = heating only; 3 = with water heater
	P6 - TSP6 Ignition power setting	0 ÷ 100 % (min-max)	0 %	With P6=0 ignition with ramp With P6≠0 ignition at the set power (P6=1 minimum power ÷ P6=100 maximum power)
	P7 - TSP7 Heating power maximum setting	10 ÷ 100%	100%	
	P10 - TSP10 Heating output curves	0 ÷ 3	1,5	resolution 0.05
	P11 - TSP11 Heating thermostat timing	0 ÷ 10 min.	4	
	P12 - TSP12 CH power rising ramp timer	0 ÷ 10 min.	1	
	P13 - TSP13 Timing of post-circulation, heating, anti-freeze, flue cleaning	30 ÷ 180 sec.	30	
	P14 - TSP14 Setting of "solar" DHW thermostats	0 ÷ 1	0	0 = normal 1 = solar
	P15 - TSP15 Anti water hammer delay	0 ÷ 3 sec.	0	
	P16 - TSP16 Ambient thermostat reading delay / Remote Control	0 ÷ 199 sec.	0	
	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 = request by the ambient thermostat 2
Solar par. (with P17=2 or with supplementary board)	**P18 - TSP18** Solar system selection	0 ÷ 1	0	0 = solar valve; 1 = solar pump
	P19 - TSP19 Water heater set-point setting	10 ÷ 90 °C	60 °C	only with P18 = 1
	P20 - TSP20 ΔT ON (diff. solar pump ignition)	1 ÷ 30 °C	6 °C	
	P21 - TSP21 ΔT OFF (diff. solar pump shut-down)	1 ÷ 30 °C	3 °C	
	P22 - TSP22 Maximum collector temperature	80 ÷ 140 °C	120 °C	
	P23 - TSP23 Minimum collector temperature	0 ÷ 95 °C	25 °C	
	P24 - TSP24 Solar collector anti-freeze	0 ÷ 1	0	0 = anti-freeze not enabled; 1 = anti-freeze enabled (only with P18 = 1)
	P25 - TSP25 Solar load forcing	0 ÷ 1	0	0 = automatic operation; 1 = always enabled
	P26 - TSP26 Enabling of water heater cooling	0 ÷ 1	0	0 = disabled; 1 = enabled (only with P18 = 1)
	P27 - TSP27 Heating timer reset temperature	35 ÷ 78 °C	40 °C	
	P28 - TSP28 Hydraulic selection for deviating valve relay control	0 ÷ 1	0	0 = recirculating pump + deviating valve; 1 = double pump.
	P29 - TSP29 Default parameter setting (except P00, P01, P02, P17, P28)	0 ÷ 1	0	0 = user's parameters 1 = default parameters
Display only	**P30** External temperature			only with external probe connected
	P31 Flow temperature			
	P32 Nominal calculated flow temperature			only with external probe connected
	P33 Set point of zone 2 flow temperature			only with at least one zone board connected
	P34 Current zone 2 flow temperature			only with at least one zone board connected

	Parameter	Settable values	Default values	Notes
Display only	**P36** Set point of zone 3 flow temperature			only with at least two zone boards connected
	P37 Current zone 3 flow temperature			only with at least two zone boards connected
	P39 Set point of zone 4 flow temperature			only with three zone boards connected
	P40 Current zone 4 flow temperature			only with three zone boards connected
	P42 Plate DHW temperature			
	P44 Water cylinder temperature (RTFS/RTN - with water cylinder probe)			only with water cylinder probe connected
	P46 Solar collector temperature (if solar collector probe is connected to the boiler)			only with solar collector probe connected
	P47 Temperature of water heater or solar valve from boiler			only with water heater probe or solar valve connected
	P48 Temperature of water heater or solar valve from solar board			as above, but only with solar board connected
	P49 Ambient probe 1 (SA1) temperature			only with connected ambient probe
	P50 Ambient probe 2 (SA2) temperature			only with connected ambient probe
P51 SA1 ambient probe triggering differential OFF		0.0 ÷ 1.0 °C	0.0 °C	only with connected ambient probe
P52 SA1 ambient probe triggering differential ON		-1.0 ÷ -0.1 °C	-0.5 °C	only with connected ambient probe
P53 Ambient probe SA1 correction range		-5.0 ÷ 5.0 °C	0.0 °C	only with connected ambient probe
P54 SA2 ambient probe triggering differential OFF		0.0 ÷ 1.0 °C	0.0 °C	only with connected ambient probe
P55 SA2 ambient probe triggering differential ON		-1.0 ÷ -0.1 °C	-0.5 °C	only with connected ambient probe
P56 Ambient probe SA2 correction range		-5.0 ÷ 5.0 °C	0.0 °C	only with connected ambient probe
P57 Type of modulation with connected ambient probes (only with P61 set between 03 and 07)		0 ÷ 4	4	0 = on/off; 1 = ambient probe modulation; 2 = external probe modulation; 3 = ambient probe and external probe modulation; 4 = no ambient probe connected.
P58 Ambient probe weight during modulation		0 ÷ 20 °C	8 °C	used for thermoregulation with P57=3
P59 Type of temperature visualization on display		0 ÷ 7	0	0 = flow temp.; 1 = SA1 probe temp.; 2 = SA2 probe temp.; 3 = external temp.; 4 = water heater temp.; 5 = solar coll. temp.; 6 = solar valve temp.; 7 = solar valve temp. from solar board
P60 Number of additional boards connected		0 ÷ 4	0	Maximum 4 boards (3 zone + 1 solar)
P61 Association between remote and ambient thermostats		00 ÷ 07	00	00 = remote zone 2 / TA2 zone 1; 01 = TA1 zone 2 / TA2 zone 1; 02 = TA2 zone 2 / remote zone 1; 03 = SA1 zone 1 / TA2 zone 2; 04 = SA1 zone1 / SA2 zone 2; 05 = remote zone 1 / SA2 zone 2; 06 = zone 1 not managed / SA2 zone 2; 07 = TA1 zone 1 / SA2 zone 2.
P62 Selection of zone 2 curve		0 ÷ 3	0.6	only with zone board connected
P63 Zone 2 set-point		15 ÷ 35 °C	20 °C	only with zone board connected
P66 Selection of zone 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

	Parameter	Settable values	Default values	Notes
	P71 Zone 4 set-point	15 ÷ 35 °C	20 °C	only with three zone boards connected
	P74 Low temperature zone mixer valve opening time	0 ÷ 300 sec.	140 sec.	only with zone boards connected
	P75 Rise in nominal boiler temperature with zone board	0 ÷ 35 °C	5 °C	only with zone boards connected
	P76 Thermal discharge enabling with solar board	0 ÷ 1	0	0 = disabled; 1 = enabled
	P78 Interface back-lighting switching on	0 ÷ 2	0	0 = standard; 1 = LCD always on; 2 = LCD and keys always on
System check	**P80** Multifunction relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay excited
System check	**P81** Zone 2 pump relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay excited
System check	**P82** Zone 2 mixing valve forcing	0 ÷ 2	0	0 = standard function; 1 = force in opening; 2 = force in closing
System check	**P84** Zone 3 pump relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay excited
System check	**P85** Zone 3 mixing valve forcing	0 ÷ 2	0	0 = standard function; 1 = force in opening; 2 = force in closing
System check	**P87** Zone 4 pump relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay excited
System check	**P88** Zone 4 mixing valve forcing	0 ÷ 2	0	0 = standard function; 1 = force in opening; 2 = force in closing
System check	**P91** Solar board relay forcing	0 ÷ 1	0	0 = standard function; 1 = relay excited
System check	**P92** Solar board valve relay forcing	0 ÷ 2	0	0 = standard function; 1 = force in opening; 2 = force in closing
	P95 Modulator maximum current	0÷170mA	depending on P0 value	resolution 1%
	P96 Modulator minimum current	0÷170mA	depending on P0 value	resolution 1%

Table 16 - General table of TSP parameters

3.3. 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 air purging valves on all radiators and verify the boiler automatic valve operation;
- gradually open the relevant filler cock (fig. 2 for models CTN and CTFS, or the cock on the cold water supply pipe for models RTN and RTFS), checking any automatic bleeding valves installed in the system properly work;
- close all radiator air purging valves as soon as water starts coming out;
- check boiler water pressure gauge not to exceed 1÷1.3 bars reading;
- shut the filler cock (for models CTN and CTFS, or the cock on the cold water supply pipe for models RTN and RTFS) 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
As for water treating in the domestic heating systems in order to optimise efficiency and safety, ensure a long life, trouble-free operation of auxiliary equipment, minimise power consumption, thereby integrating the standards and rules in force in the country of installation, it is recommended to use specific products suitable for multi-metal heating systems.

WARNING
Pressure transducer will not electrically enable the burner ignition when water pressure is below 0.4 bar (this parameter can be edited by qualified professional staff).
CH water pressure must not to be less than 1 bar. Restore proper value as needed, via the filler cock of the boiler (fig. 2 for models CTN and CTFS, or the cock on the cold water supply pipe for models RTN and RTFS)**.**
The procedure is to be followed while the system is cold. Digital pressure gauge is used to read pressure inside the heating circuit.

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:
- unscrew the protective cap at the centre of the pump motor;
- put a screwdriver into the hole and manually rotate the circulation pump shaft clockwise;
- once the unblocking operation is completed, screw the protective cap back on and check for water leaks.
When the protection cap is removed, some water may flow out. Before refitting the boiler casing ensure that all surfaces are properly dried.

3.4. Starting up the boiler

3.4.1. Preliminary checks

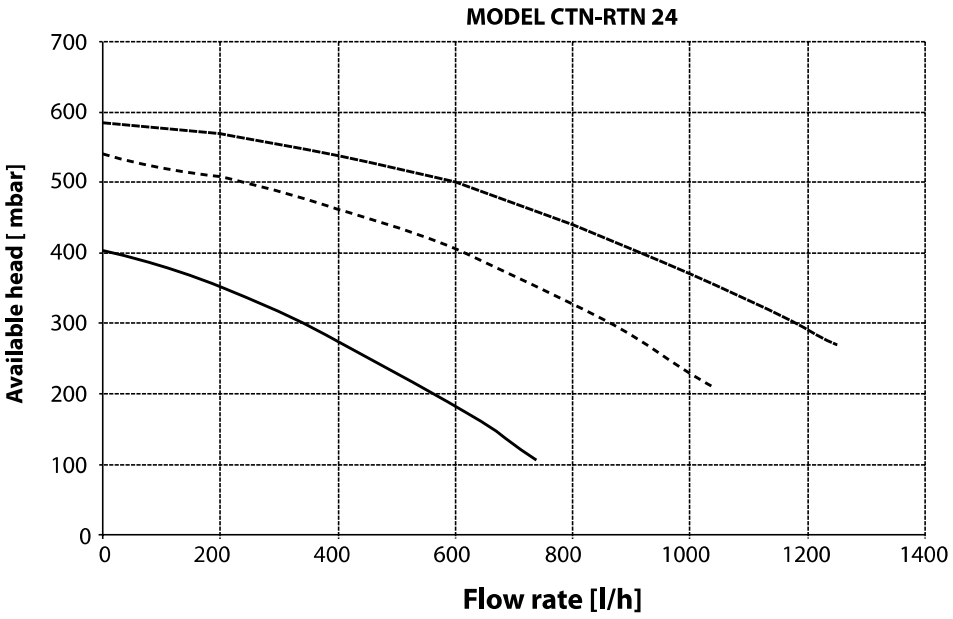
Before starting the boiler, check that:
- the flue gas venting duct and the relevant terminal are installed in conformity with the instructions: **with the boiler operating, there must be no leakage of combustion by-products from any of the gaskets**;
- the supply power to the boiler must be 230 V – 50 Hz;
- the system is correctly filled with water (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 if necessary (see section 3.7. *Adaptation to other gas types*): have this operation carried out 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.

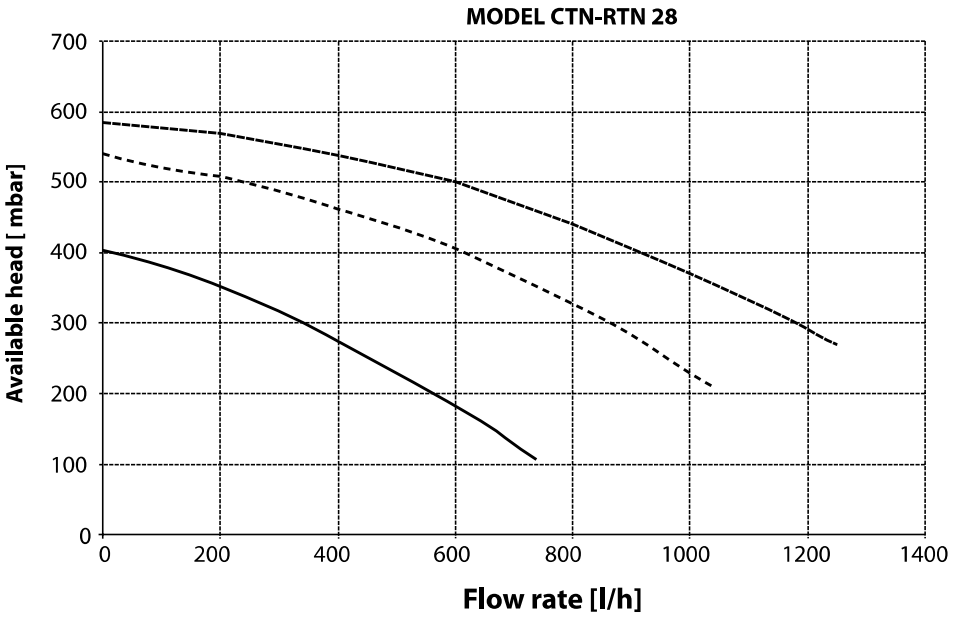
WARNING
If you wish to set a different pump speed, taking into account the water circulation requirements in the boiler and the resistance properties of the system, check operation of the boiler in all the conditions dictated by the features of the system (e.g. closure of one or more heating zones or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

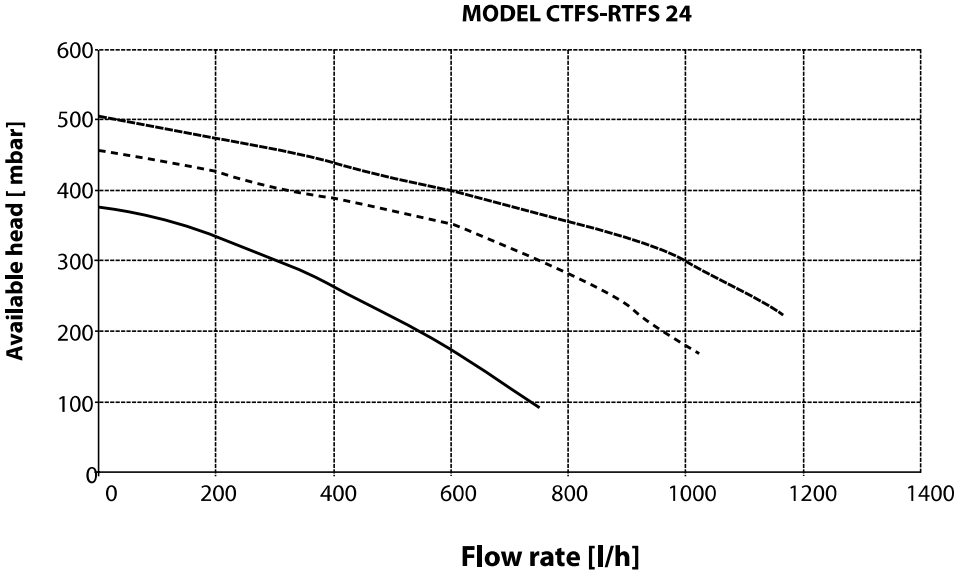
3.4.2. Switching on and switching off

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

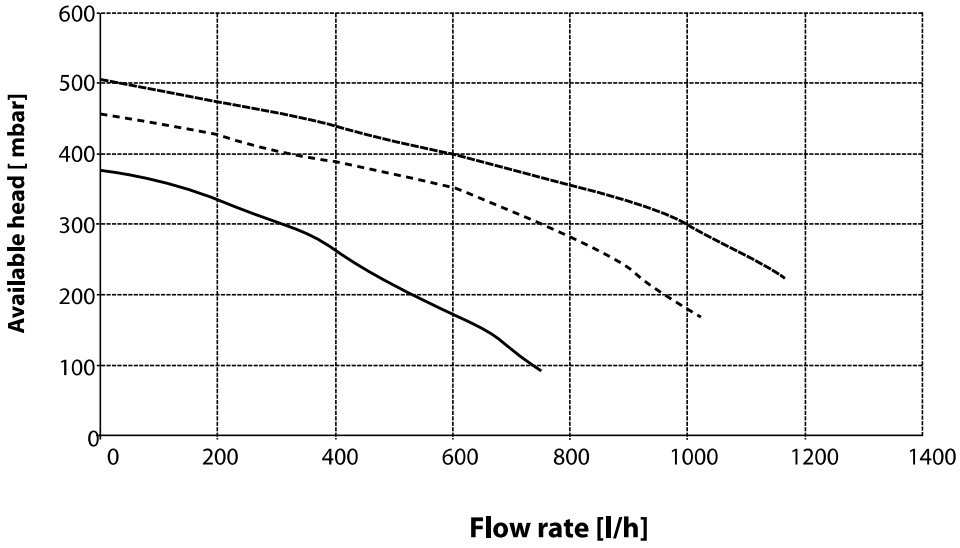
3.5. Circulation pump flow resistance



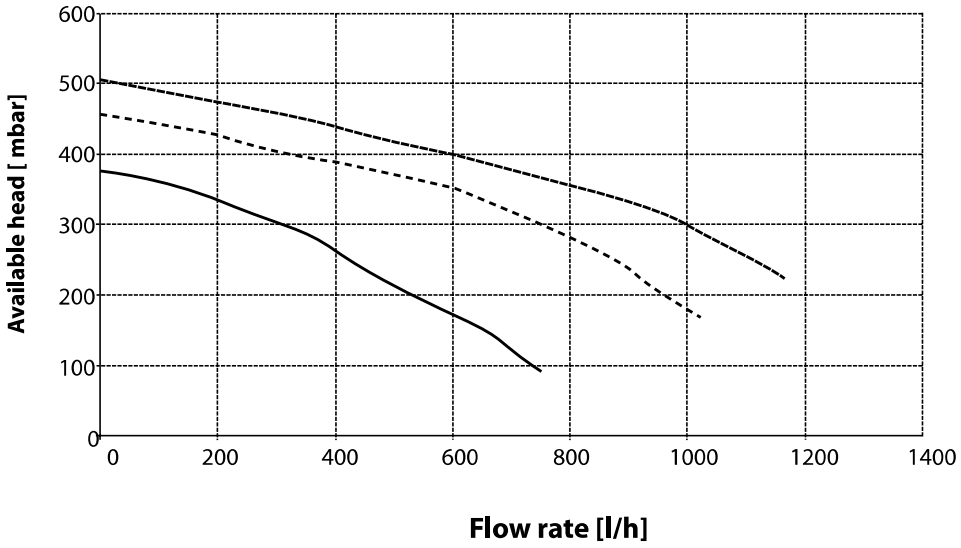




MODEL CTFS-RTFS 28



MODEL CTFS-RTFS 32



3.6. Wiring diagrams

3.6.1. Model CTFS

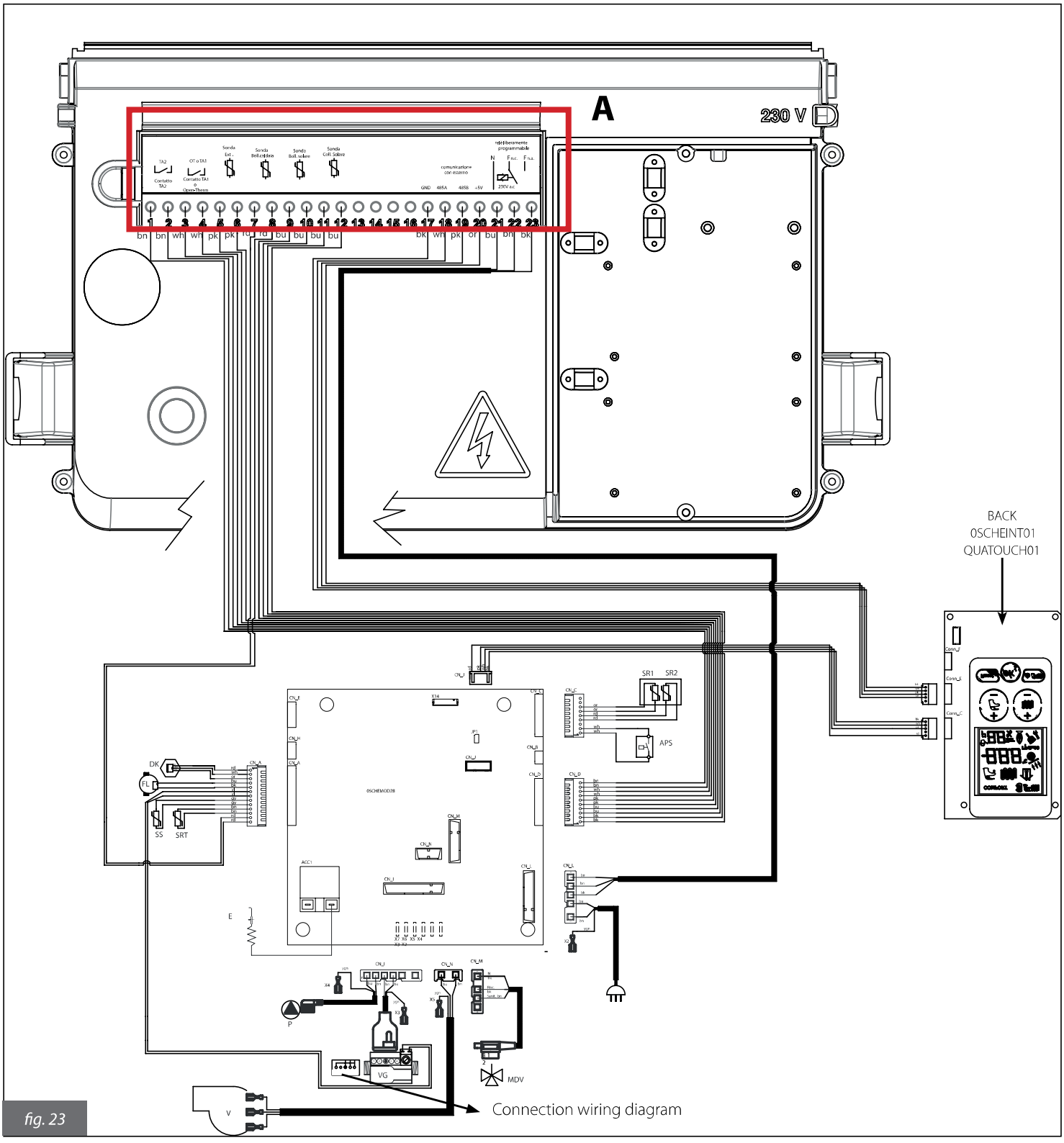
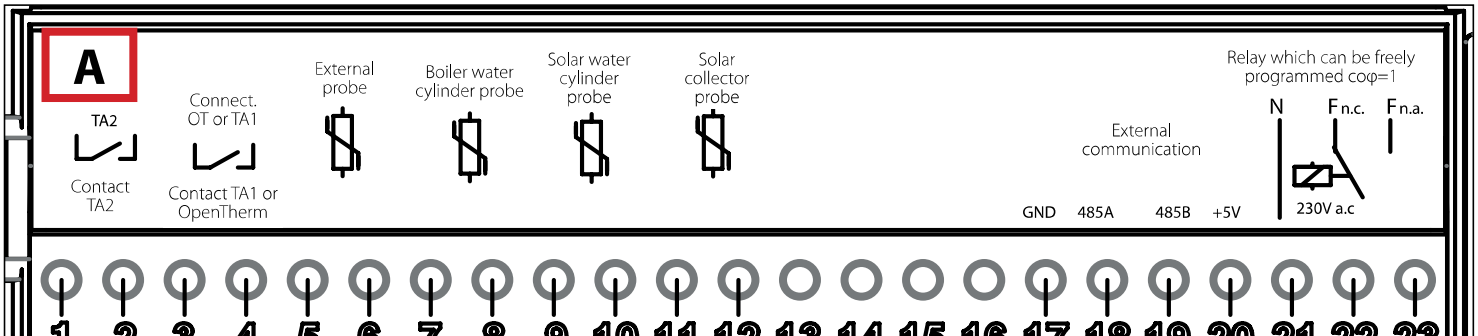


fig. 23



INTERNAL CONNECTIONS

DK	: PRESSURE TRANSDUCER
FL	: FLOW SWITCH
SS	: DHW OUT NTC PROBE 10k Ohm at 25°C B=3435
SRT	: RETURN NTC PROBE 10k Ohm at 25°C B=3435
SR1-SR2	: CH NTC PROBE 10k Ohm at 25°C B=3435 (DOUBLE)
APS	: AIR PRESSURE SWITCH
VG	: GAS VALVE WITH MODULATION COIL
P	**:** BOILER CIRCULATION PUMP
MDV	: ELECTRIC DEVIATING VALVE
E	: IGNITION/FLAME DETECTION ELECTRODE
V	: FAN
0SCHEMOD28	: ELECTRONIC BOARD
QUATOUCH01	: TOUCH SCREEN INTERFACE
CN_A-CN_M	: LOAD/SIGNAL CONNECTORS
X2-X7	: GROUND CONNECTORS

CODES OF WIRING

0CABESTO19: signal wiring 0SCHEMOD27 - rest of boiler (probes, fan, pump signal) and first part of terminal box
0CABCOMP16: 230V load wiring
0CABESTO02: power cable + prog. relay wiring
0CABESTO04: 24V power wiring between 0SCHEMOD27 and 0SCHEINT00
0CABESTO08: RS485 wiring with terminals for communication with external units

KEY TO CABLE COLOURS:

rd: red
wh: white
bu: blue
bk: black
gy: grey
pk: pink
bn: brown
vl: violet
or: orange
ygn: yellow/green

3.6.2. Model CTN

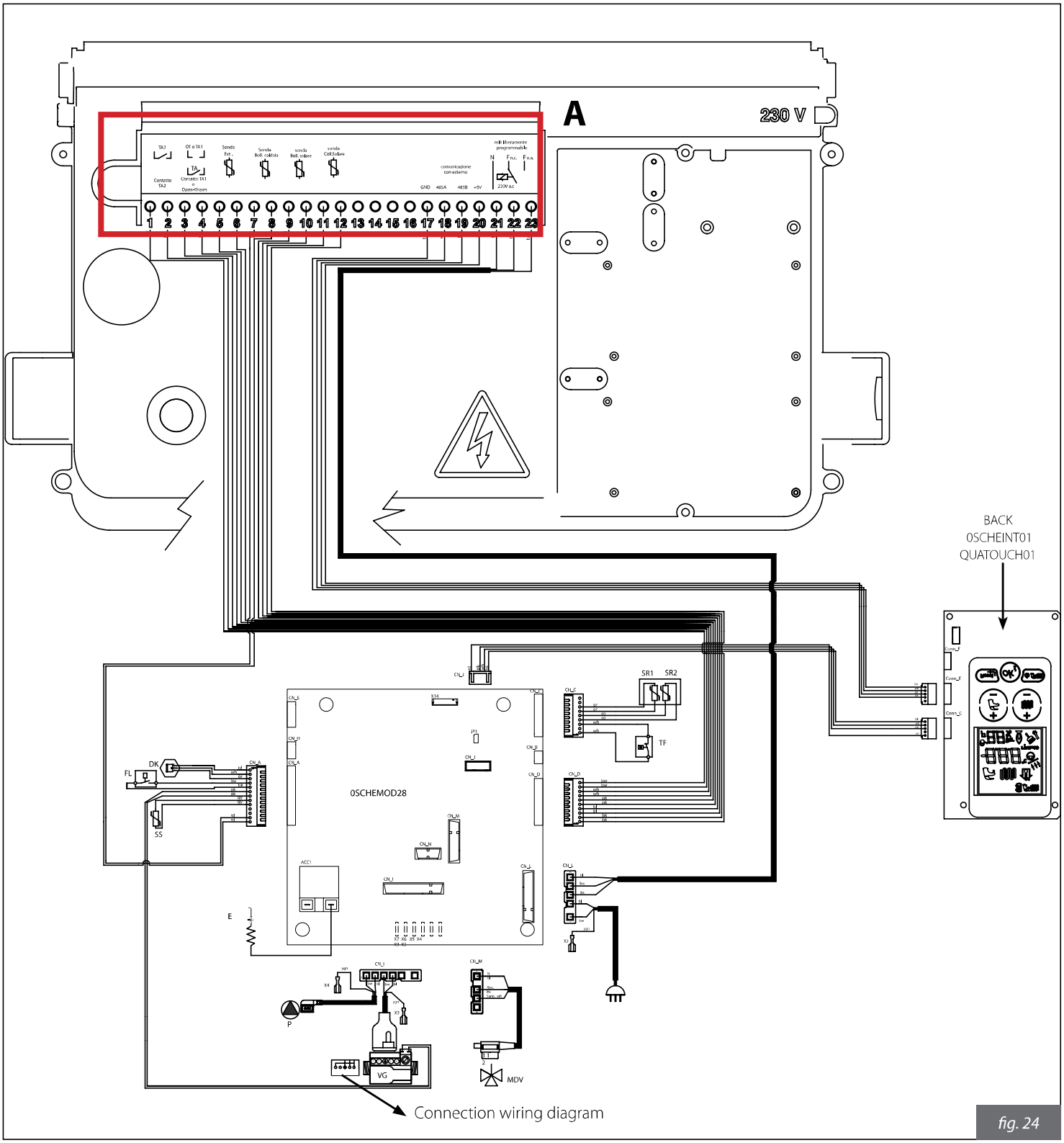
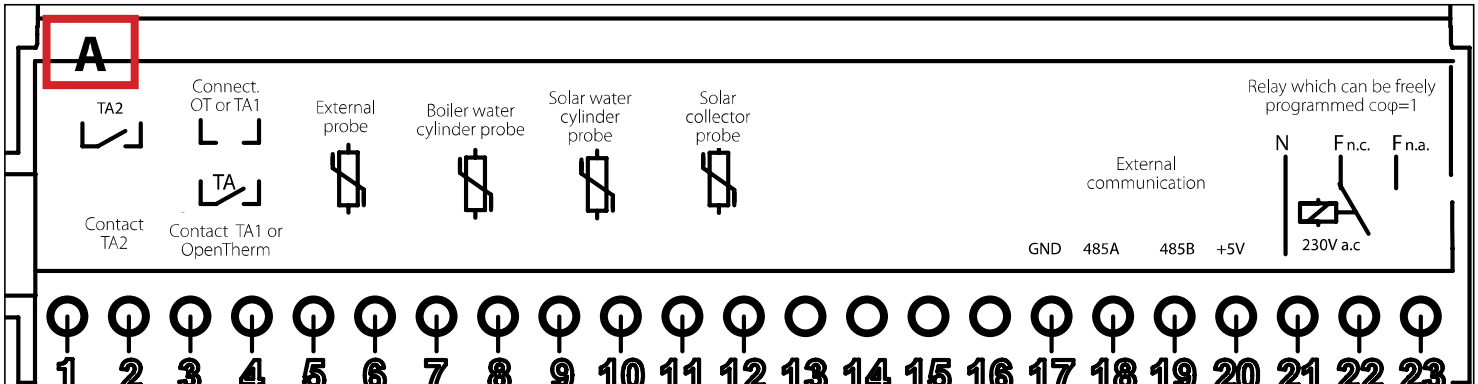


fig. 24



INTERNAL CONNECTIONS

DK	: PRESSURE TRANSDUCER
FL	: FLOW SWITCH
SS	: DHW OUT NTC PROBE 10k Ohm at 25°C B=3435
SRT	: RETURN NTC PROBE 10k Ohm at 25°C B=3435
SR1-SR2	: CH NTC PROBE 10k Ohm at 25°C B=3435 (DOUBLE)
TF	: FLUE GAS THERMOSTAT
VG	: GAS VALVE WITH MODULATION COIL
P	**:** BOILER CIRCULATION PUMP
MDV	: ELECTRIC DEVIATING VALVE
E	: IGNITION/FLAME DETECTION ELECTRODE
0SCHEMOD28	: ELECTRONIC BOARD
QUATOUCH01	: TOUCH SCREEN INTERFACE
CN_A-CN_M	: LOAD/SIGNAL CONNECTORS
X2-X7	: GROUND CONNECTORS

KEY TO CABLE COLOURS:

rd: red
wh: white
bl: blue
bk: black
gy: grey
pk: pink
bw: brown
vl: violet
or: orange
ygn: yellow/green

3.6.3. Wiring diagram for forced circulation solar system with combi boiler

Parameter setting		
P03	**P17**	**P18**
1	2	0

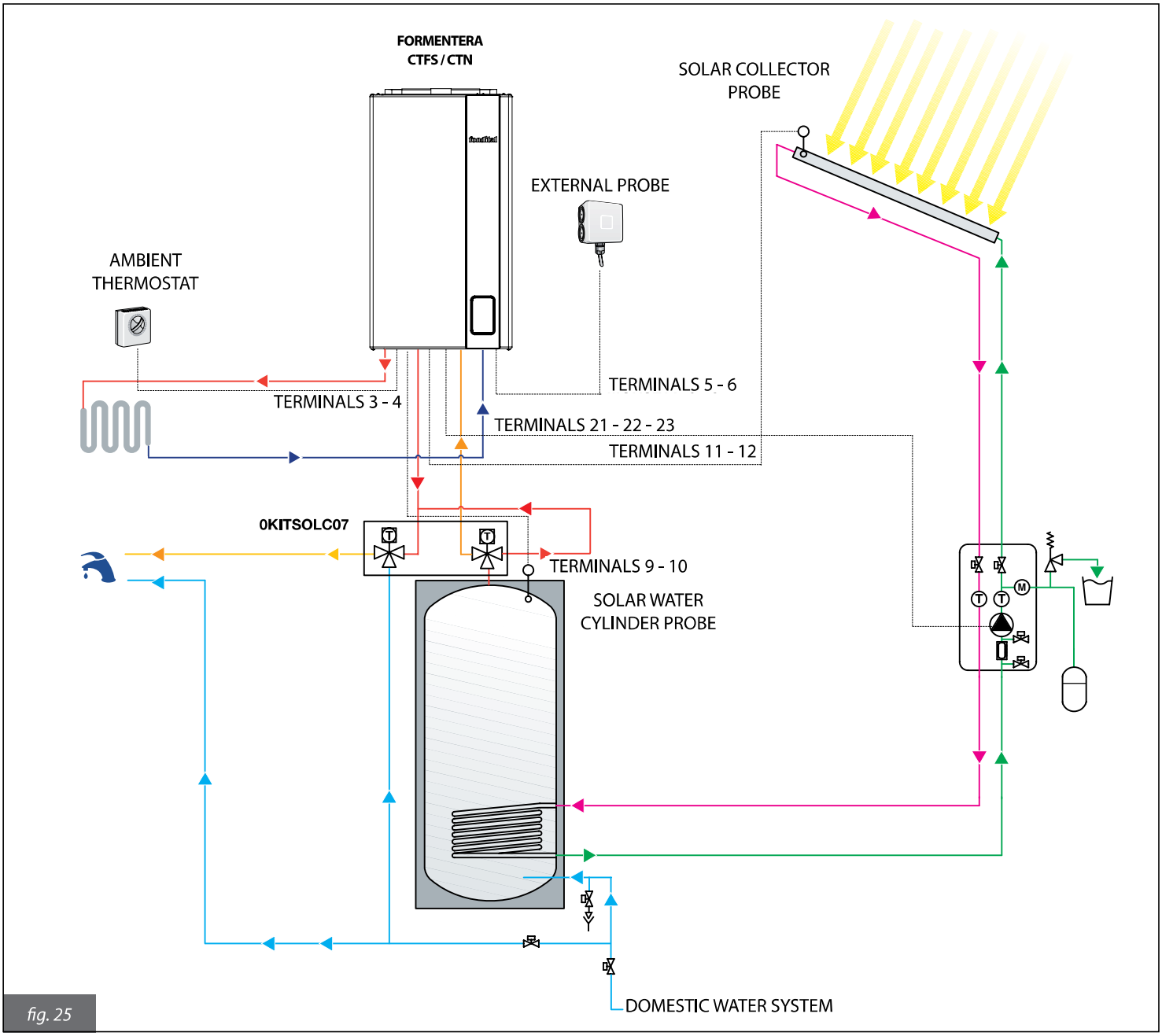


fig. 25

Multifunction relay connecting diagram

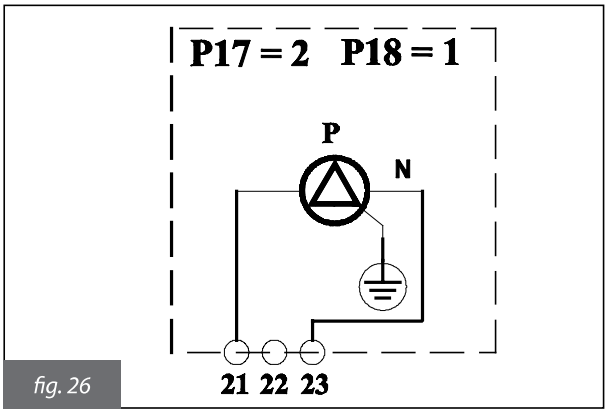


fig. 26

3.6.4. Solar collector anti-freeze function

Solar collector anti-freeze 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.

3.6.5. 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 cylinder probe is below 93 °C, solar pump is enabled to fill water cylinder. Solar pump operation is disabled as soon as solar collector temperature goes below 108 °C or solar water cylinder probe detects a temperature above 95°C.

3.6.6. Water cylinder cooling function

This function consists in cooling water cylinder down to the temperature value set by the user by transferring excess heat from the water cylinder to the solar collector.
With the boiler in SUMMER, WINTER or CH ONLY mode, if water cylinder temperature is 2°C higher than set-point temperature and collector probe temperature is 6°C lower than solar water cylinder probe temperature (editable with parameter **P20**), solar pump is enabled to cool water cylinder. Function is interrupted as soon as water cylinder temperature reaches the set-point value set by the user, or when solar collector probe temperature is 3°C lower than solar water cylinder probe temperature (editable with parameter **P21**). Function can be disabled with parameter **P26** (P26 = 1 enabled; P26 = 0 disabled).

3.6.7. Solar mode operation and failure signal

When solar pump is active, symbol (**11,** fig.1) appears on the display. If solar collector probe or solar water cylinder probe are faulty, error codes **E24** and **E28** will be displayed, respectively. Solar pump will be turned off.

3.6.8. Wiring diagram for natural circulation solar system with combi boiler

Parameter setting		
P03	**P17**	**P18**
1	2	0

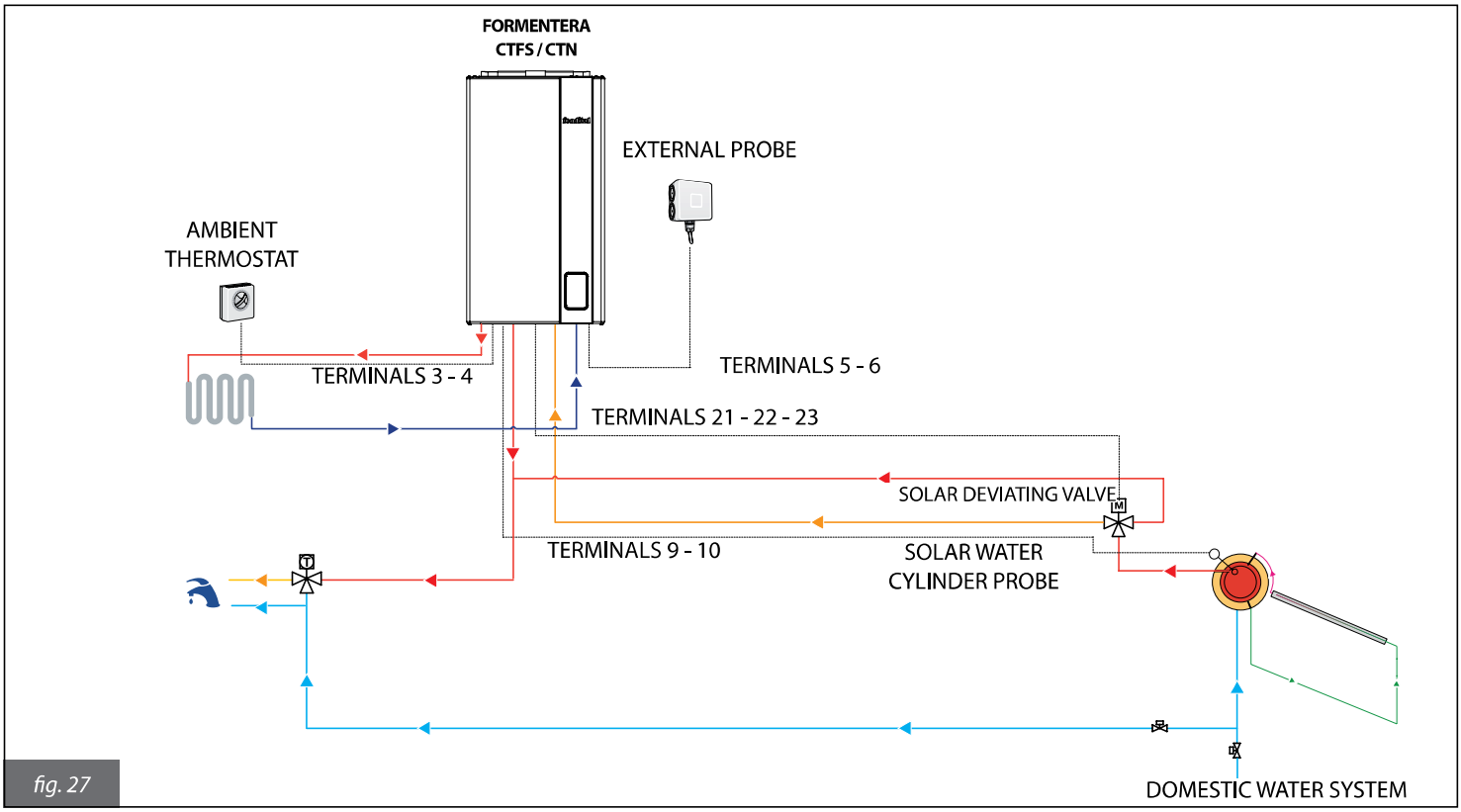


fig. 27

Multifunction relay connecting diagram

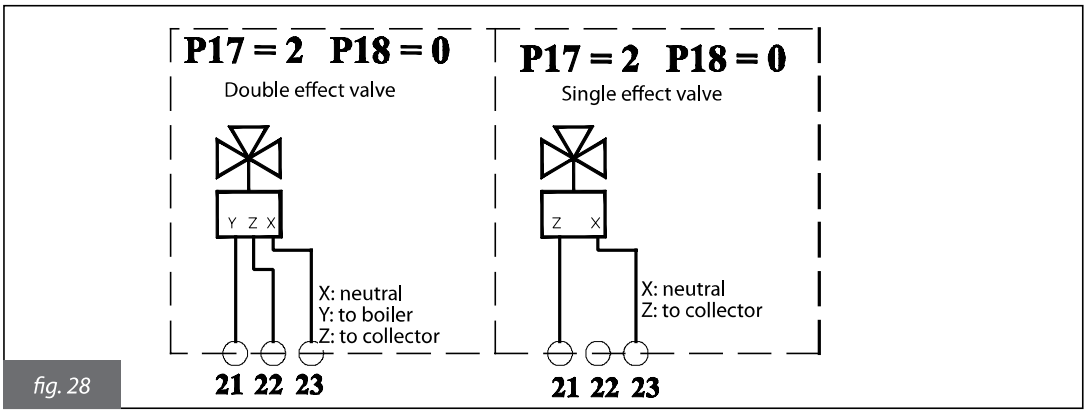


fig. 28

3.6.9. Model RTN

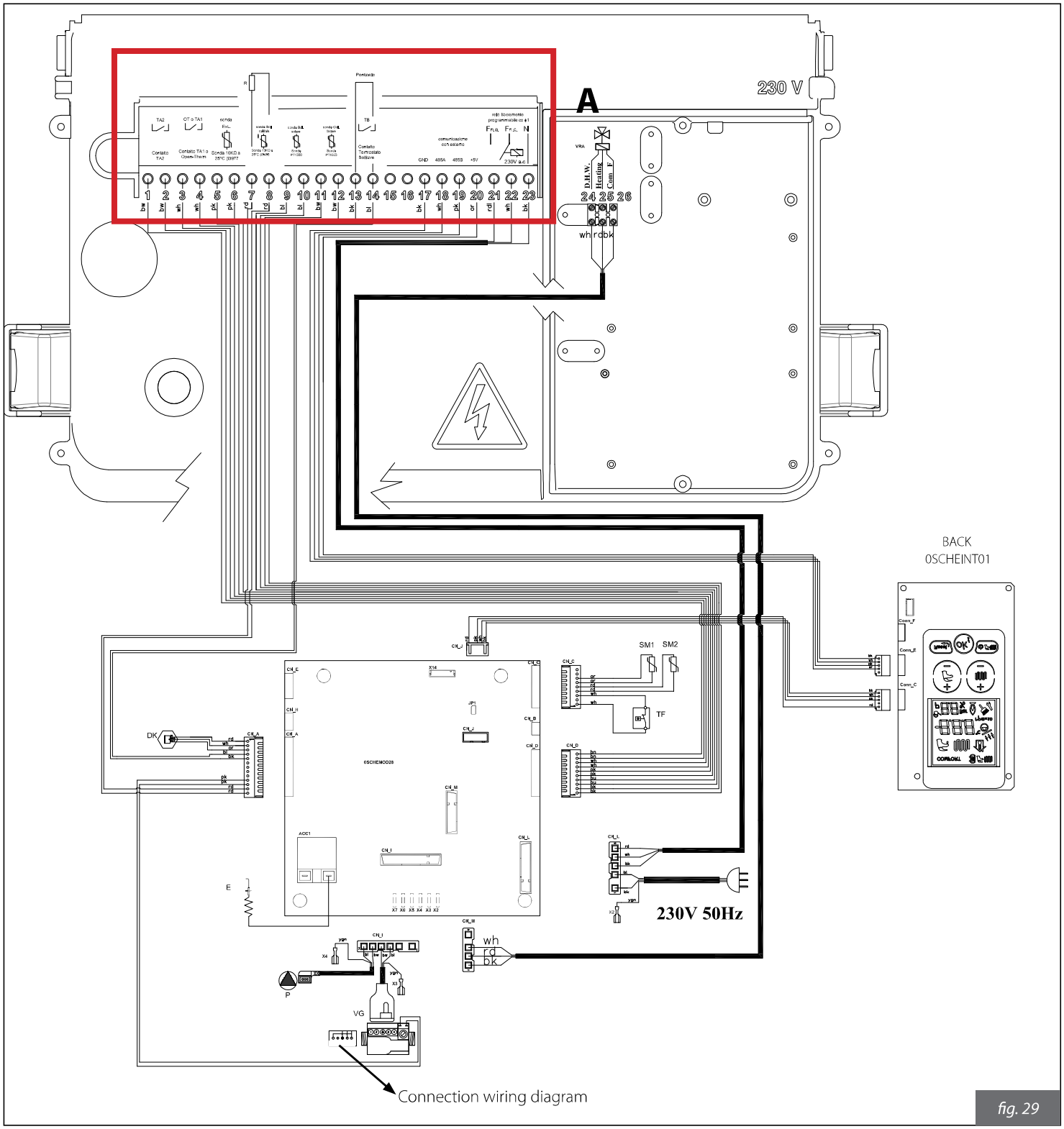
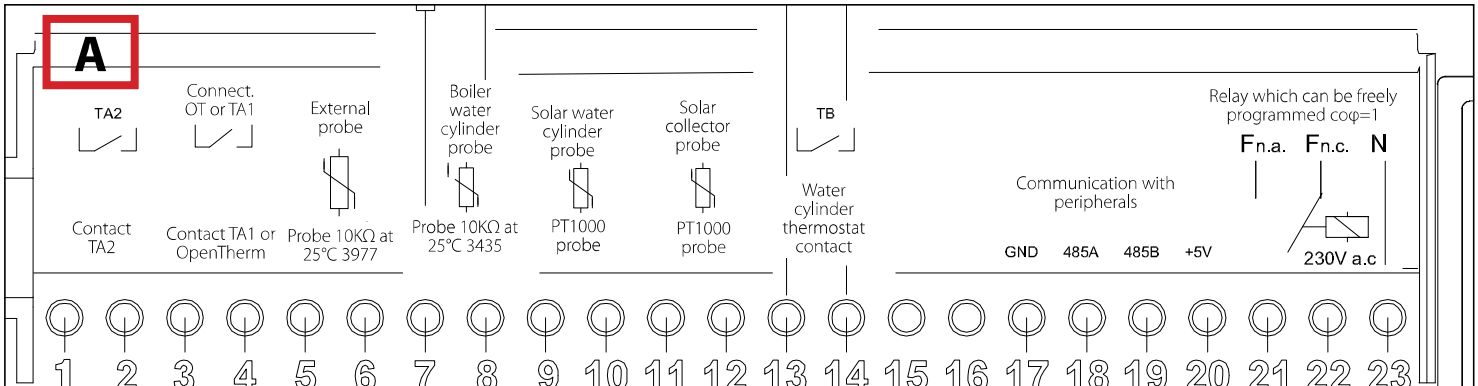


fig. 29



INTERNAL CONNECTIONS

DK	: PRESSURE TRANSDUCER
SR1-SR2	: CH NTC PROBE 10k Ohm at 25°C B=3435 (DOUBLE)
TF	: FLUE GAS THERMOSTAT
TB	: WATER CYLINDER THERMOSTAT
VG	: GAS VALVE WITH MODULATION COIL
P	**:** BOILER CIRCULATION PUMP
R	: 10 KOhm 1/4 Watt RESISTOR
VRA	: THREE-WAY VALVE
E	: IGNITION/FLAME DETECTION ELECTRODE
0SCHEMOD28	: ELECTRONIC BOARD
CN_A-CN_M	: LOAD/SIGNAL CONNECTORS
X2-X7	: GROUND CONNECTORS

KEY TO CABLE COLOURS:

rd: red
wh: white
bl: blue
bk: black
gy: grey
pk: pink
bw: brown
vl: violet
or: orange
ygn: yellow/green

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

Parameter setting		
P03	**P17**	**P18**
3	2	1

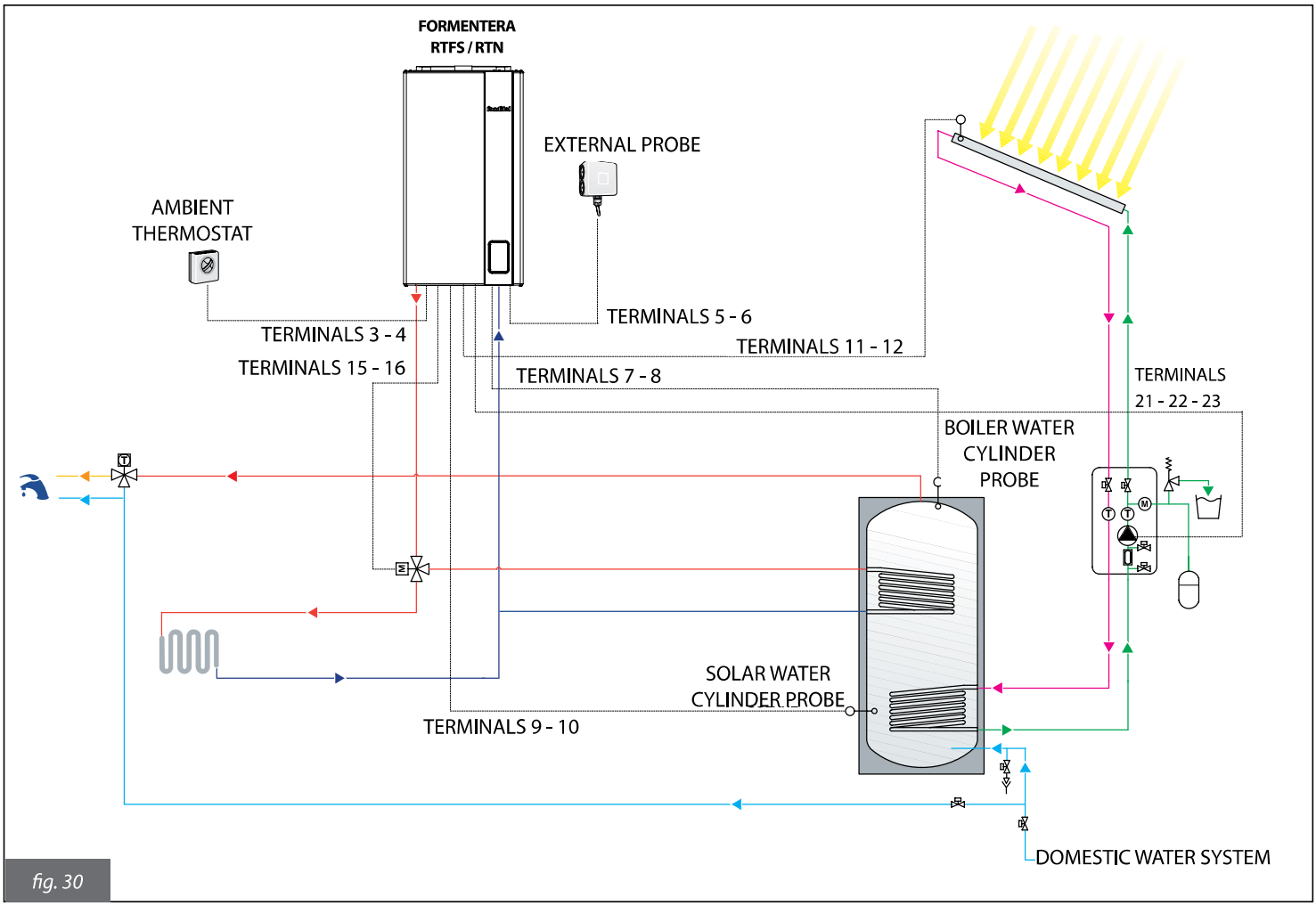
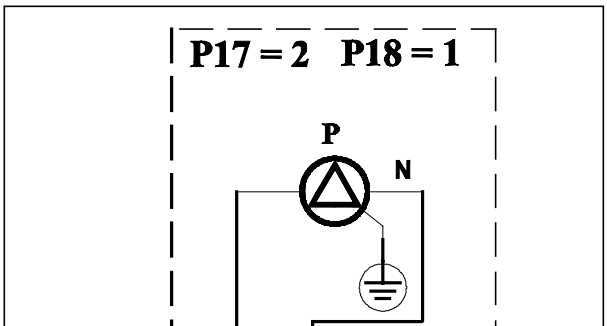


fig. 30

Multifunction relay connecting diagram



3.6.11. Model RTFS

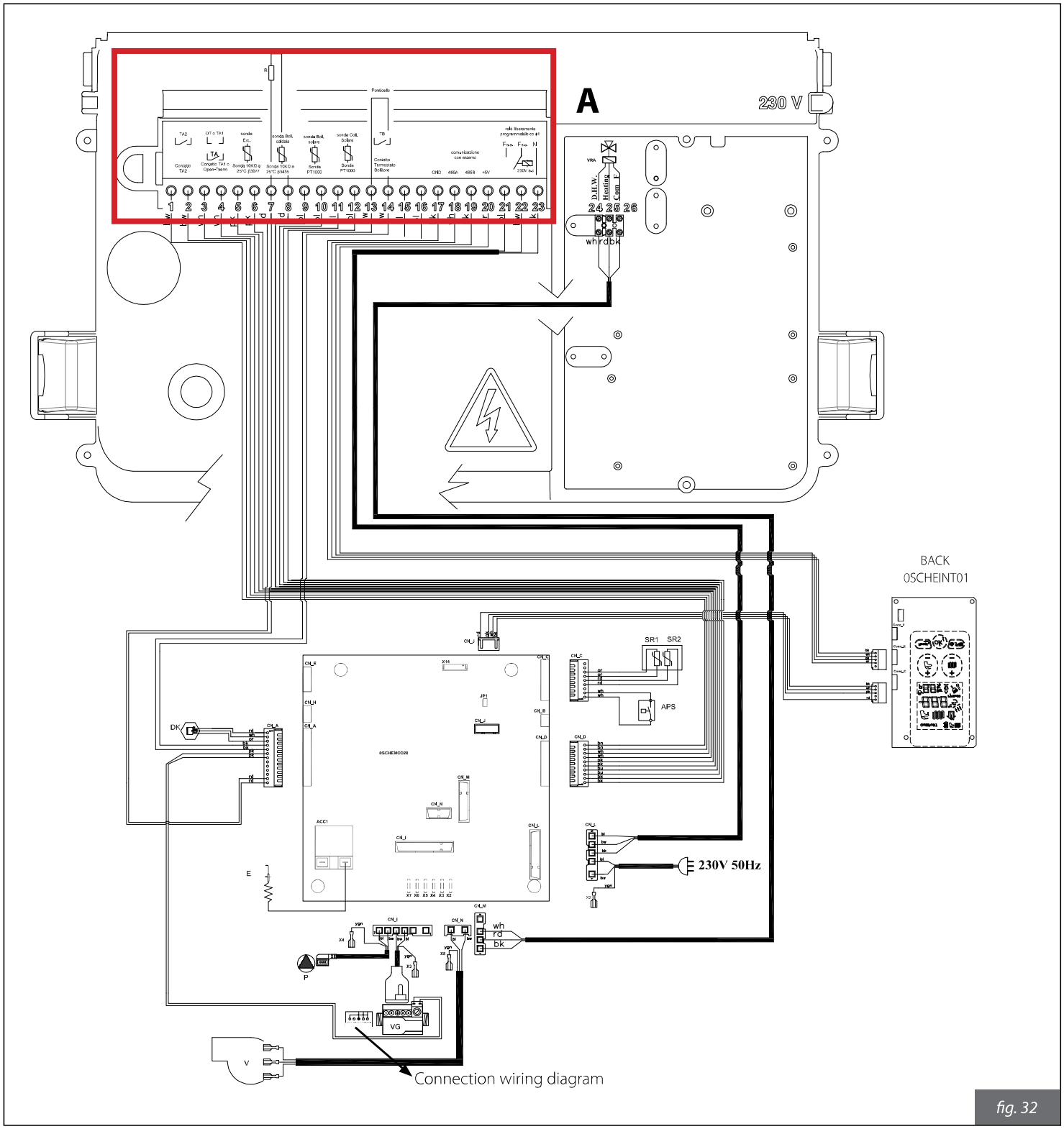
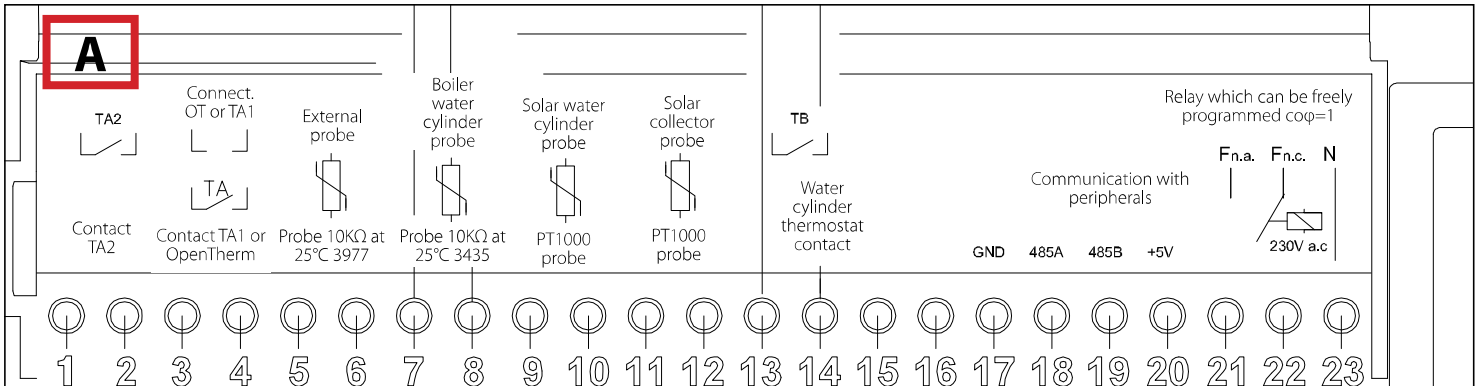


fig. 32



INTERNAL CONNECTIONS

DK	: PRESSURE TRANSDUCER
SM1-SM2	: CH PROBE 10k Ohm at 25°C B=3435
PV	**:** FLUE GAS PRESSURE SWITCH
VG	: GAS VALVE WITH MODULATION COIL
P	**:** BOILER CIRCULATION PUMP
R	: RESISTOR KΩ 1/4 WATT
VRA	: THREE-WAY VALVE
E	: IGNITION/FLAME DETECTION ELECTRODE
0SCHEMOD28	: ELECTRONIC BOARD
CN_A-CN_M	: LOAD/SIGNAL CONNECTORS
X2-X7	: GROUND CONNECTORS
ER	: REMOTE CONTROL SOLENOID VALVE
PSOL	: SOLAR PUMP
ALARM	: ALARM-SIGNALLING LIGHT

KEY TO CABLE COLOURS:

rd: red
wh: white
bu: blue
bk: black
gy: grey
pk: pink
bn: brown
vl: violet
or: orange
ygn: yellow/green

3.6.12. Multifunction relay setting diagrams

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

Relay with remote control and TA2

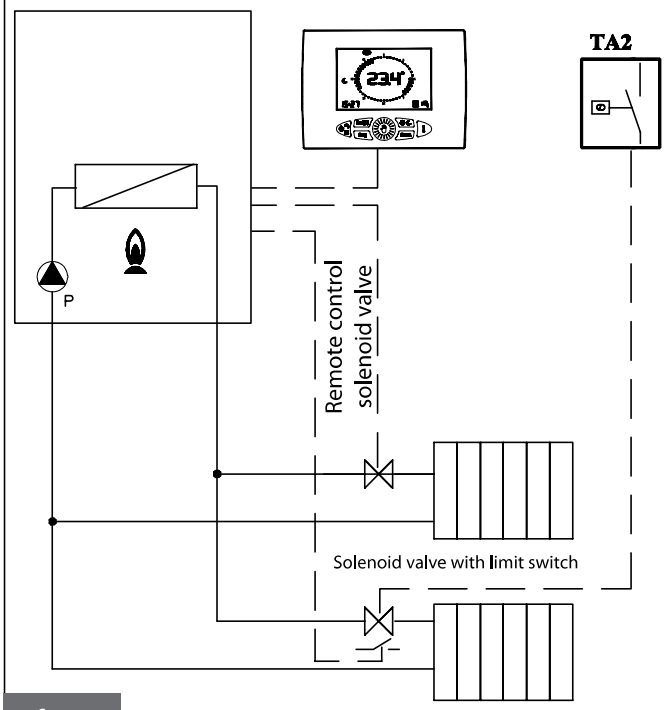


fig. 33

Relay with interface programming and TA2

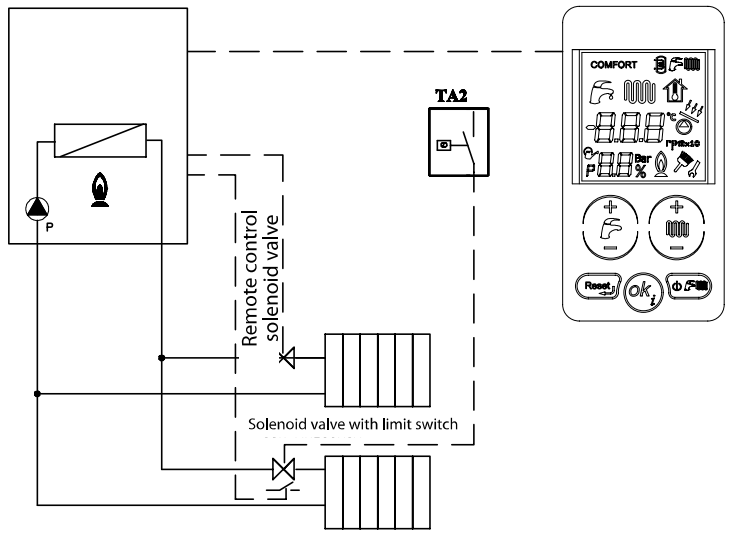


fig. 34

Relay with remote request (P17=1)

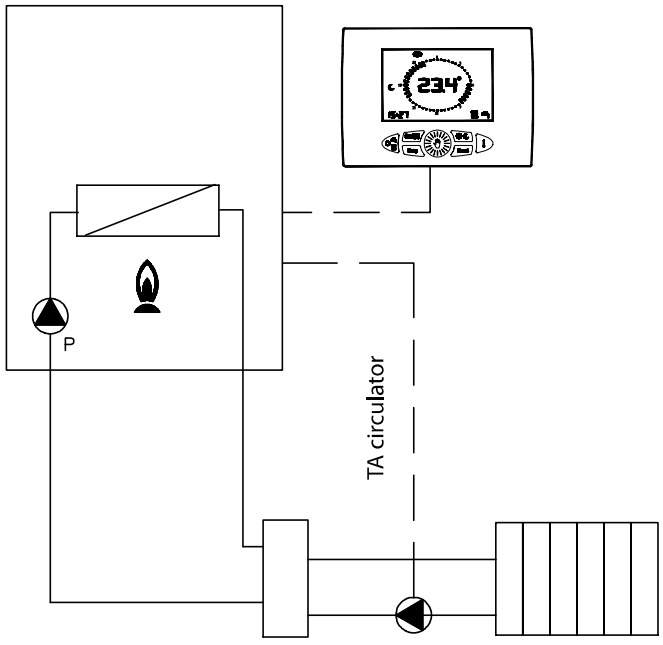


fig. 35

Relay with request (P17=3)

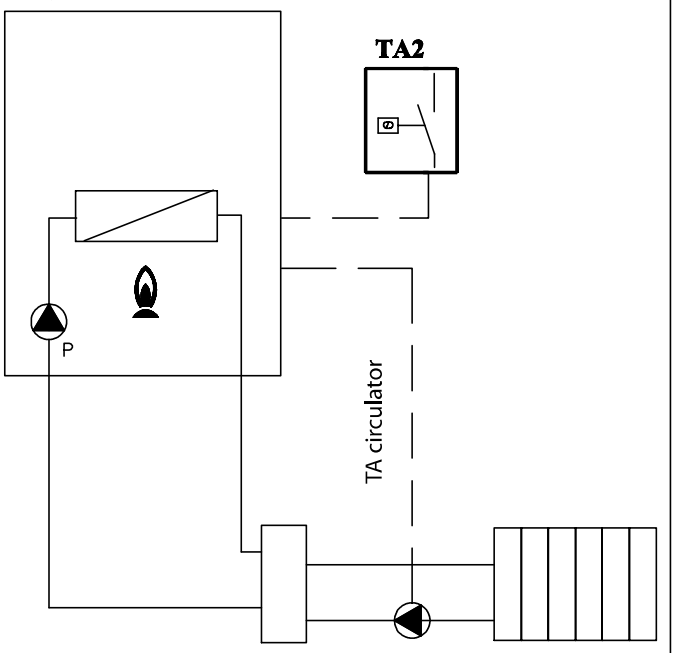
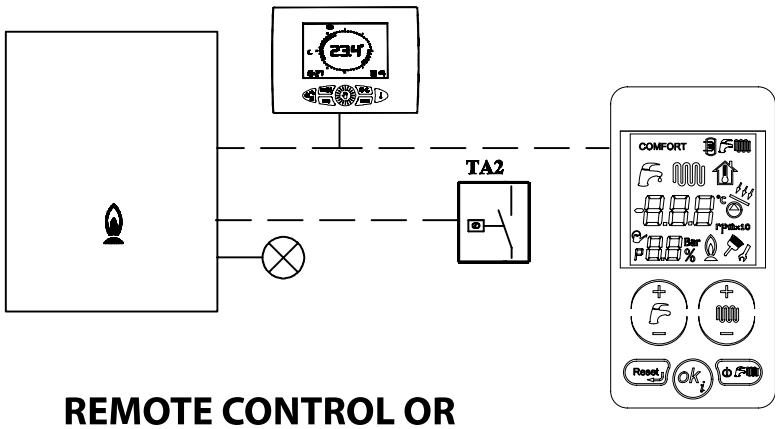


fig. 36

Relay with alarm alert (P17=0)



REMOTE CONTROL OR BOILER INTERFACE (NOT BOTH)

fig. 37

DIAGRAM PARAMETER SETTING (SOLAR 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

Relationship between temperature (°C) and nominal resistance (Ohm) of the central heating probe (SR), of the DHW probe (SS).

T (°C)	0	2	4	6	8
0	27203	24979	22959	21122	19451
10	17928	16539	15271	14113	13054
20	12084	11196	10382	9634	8948
30	8317	7736	7202	6709	6254
40	5835	5448	5090	4758	4452
50	4168	3904	3660	3433	3222
60	3026	2844	2674	2516	2369
70	2232	2104	1984	1872	1767
80	1670	1578	1492	1412	1336
90	1266	1199	1137	1079	1023

Table 17 - Relationship between "Temperature and Nominal resistance" for temperature probes

3.7. Adaptation to other gas types and burner adjustment

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

3.7.1. Switching from NATURAL GAS to LPG

- Disconnect the boiler from the electric power supply.
- Remove boiler outer front panel, as described in fig. 38.

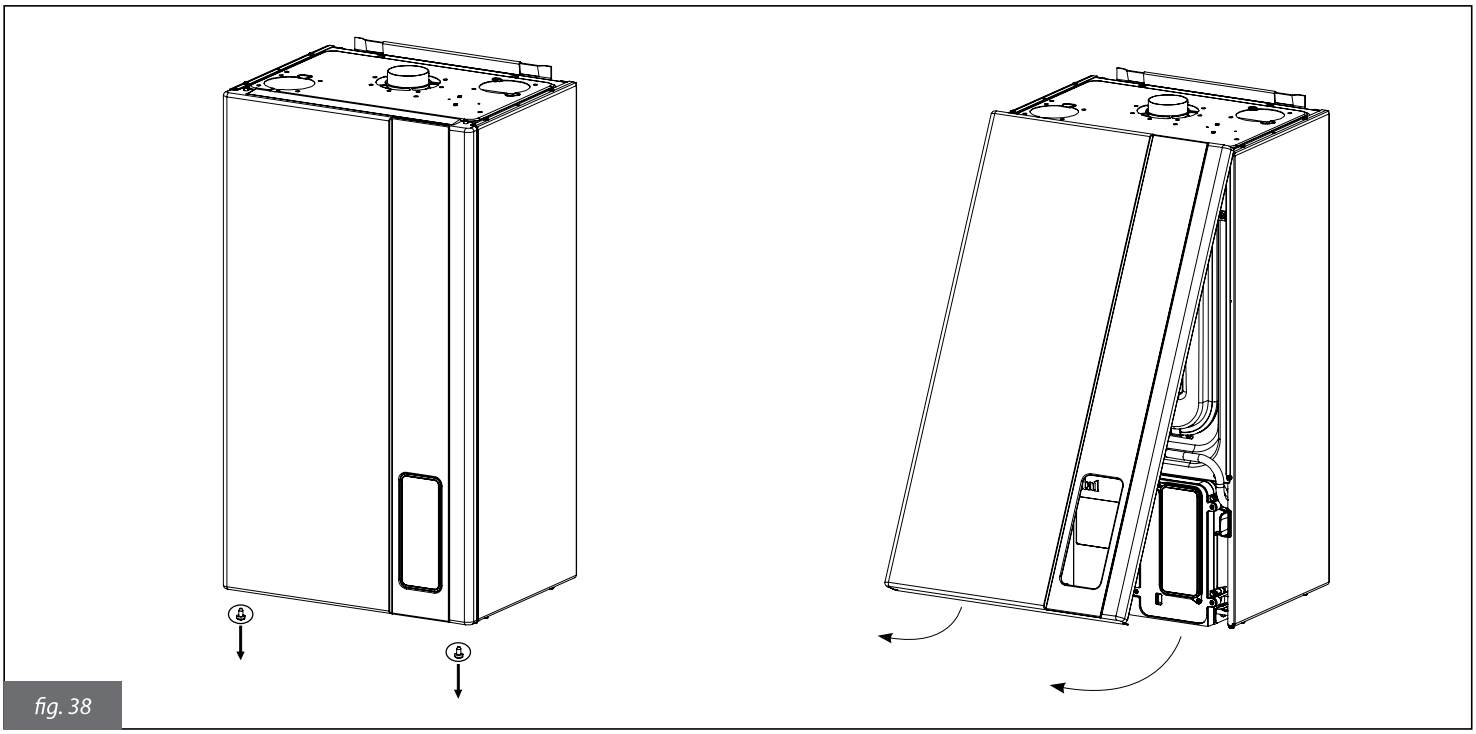


fig. 38

- Remove the front panel of the combustion chamber, and remove expansion tank as shown in fig. 39 and 40;

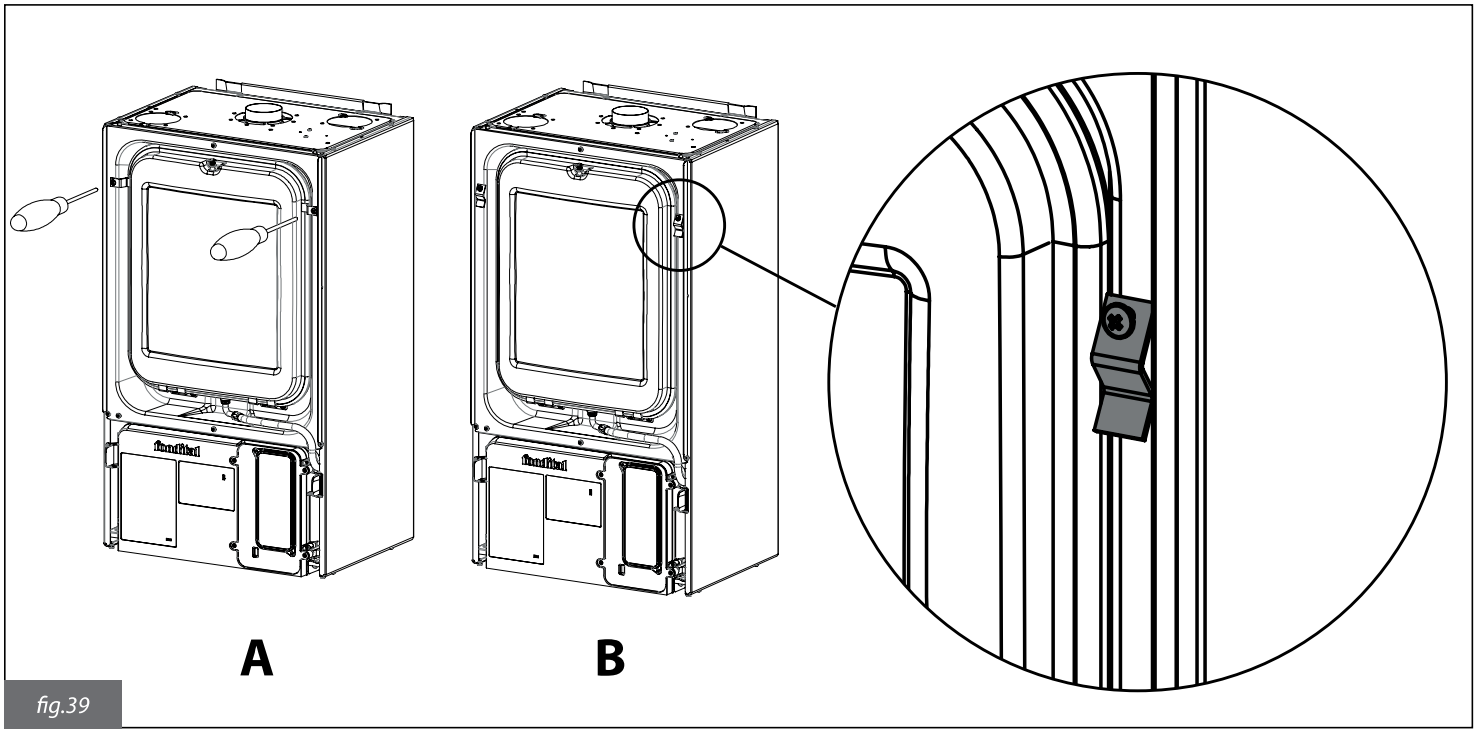
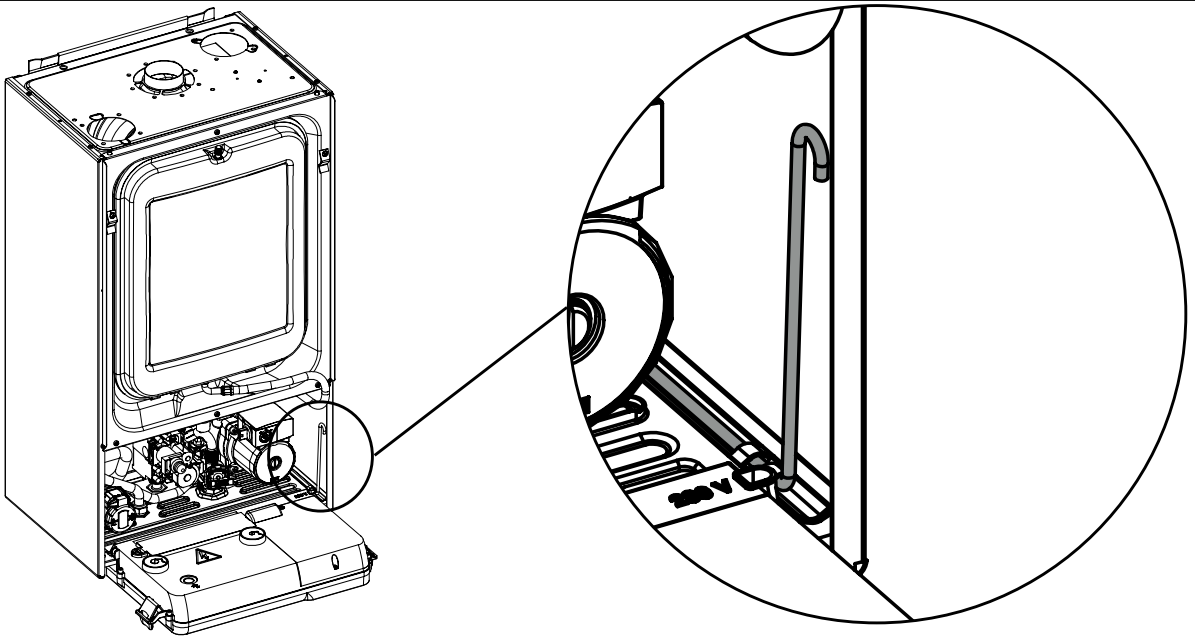
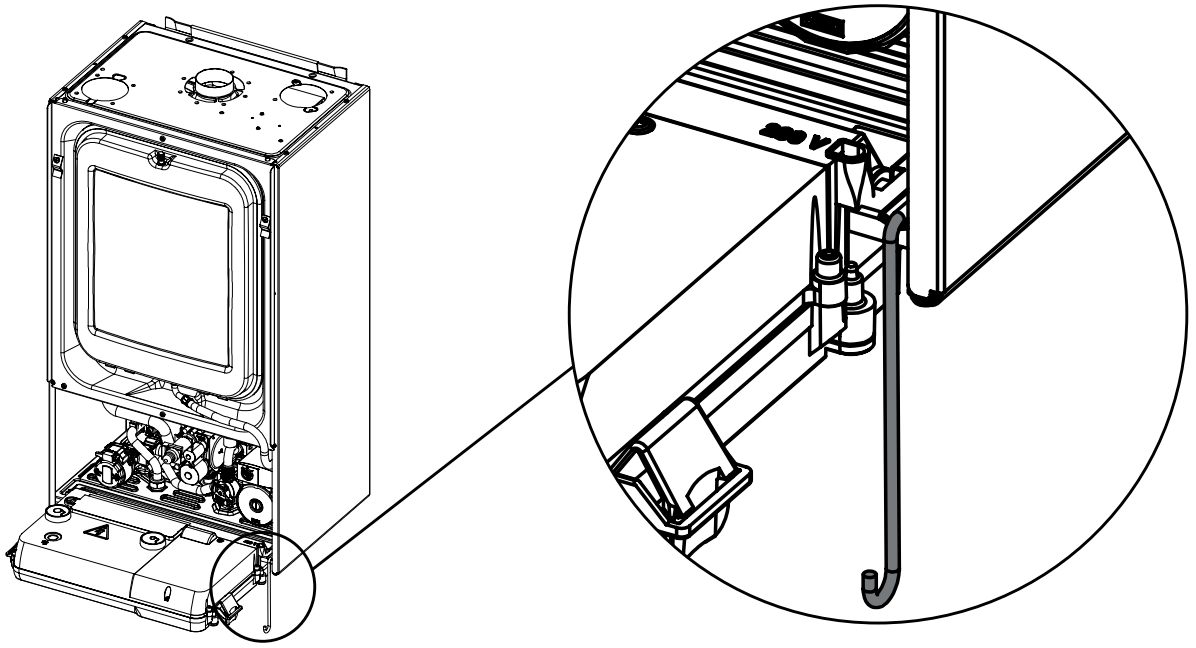


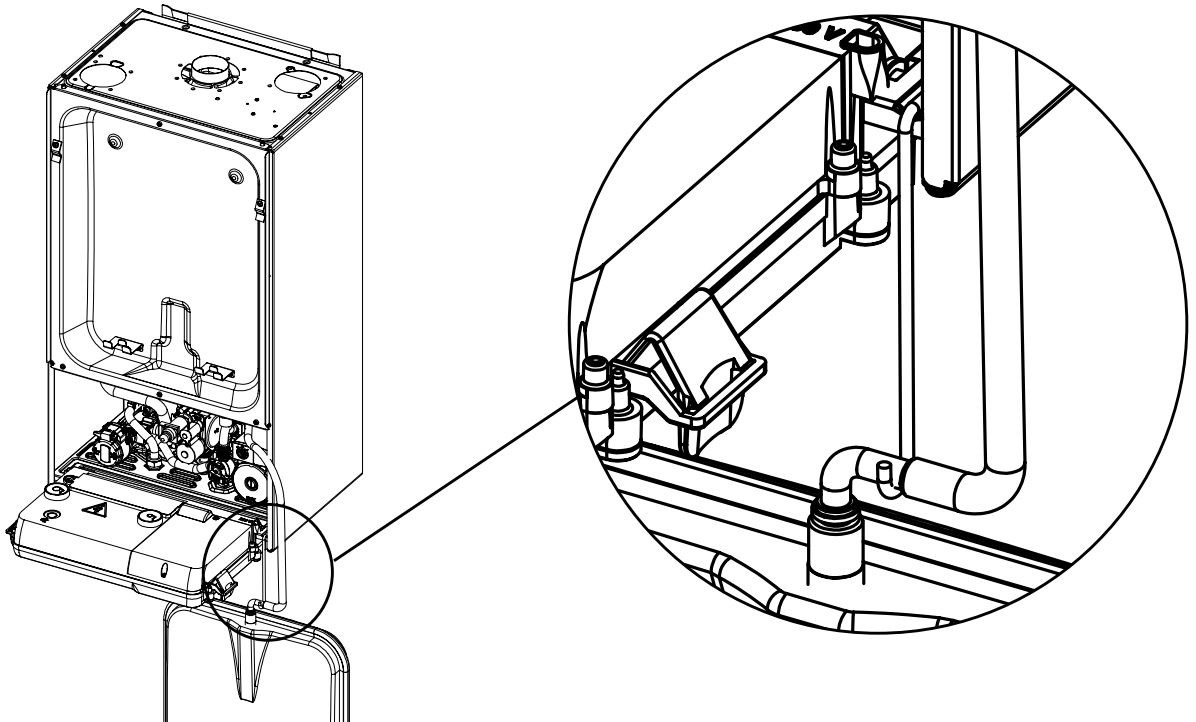
fig.39



C



D



E

- Remove the front part of combustion chamber as shown in fig. 41;

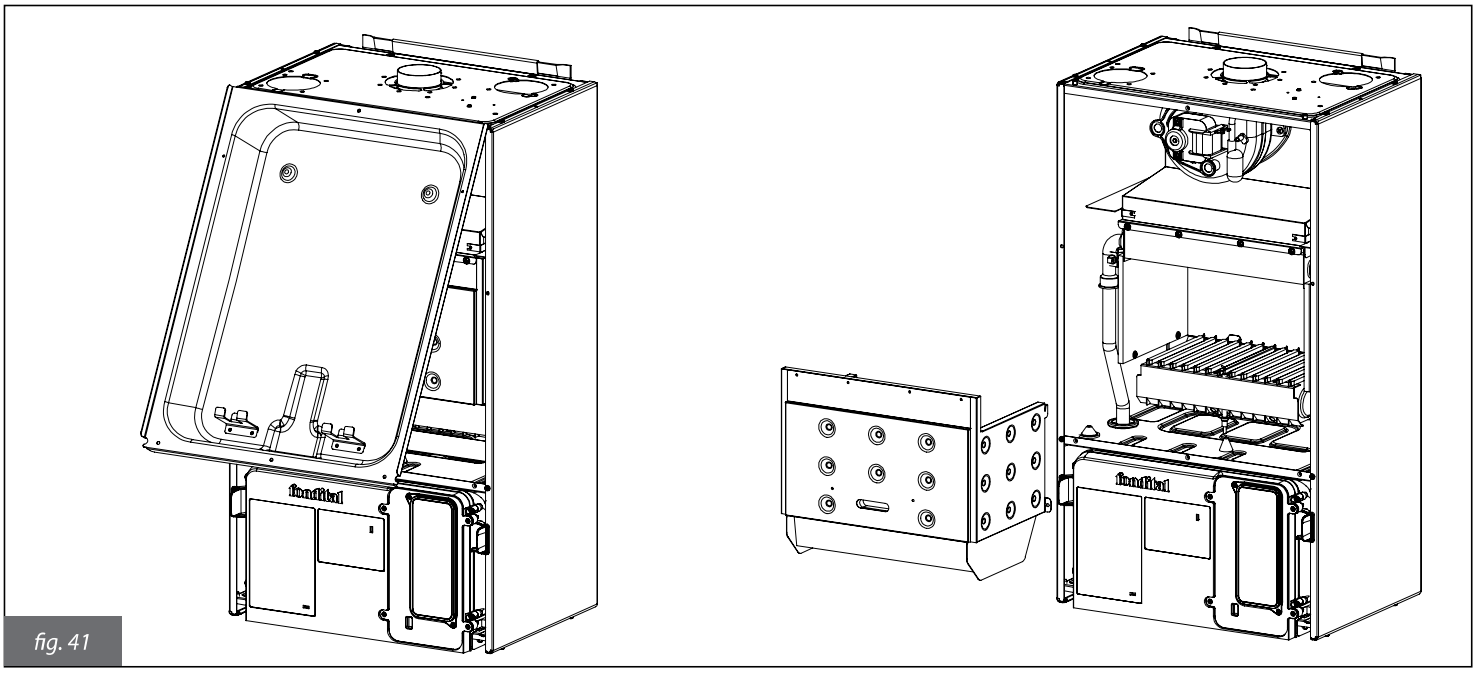
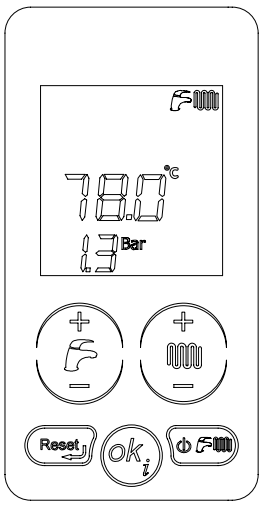
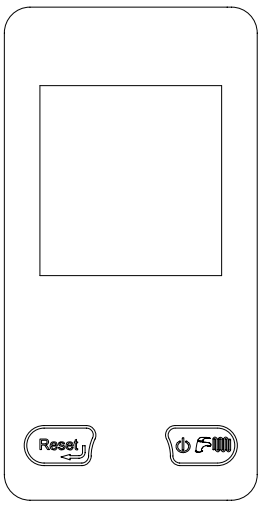


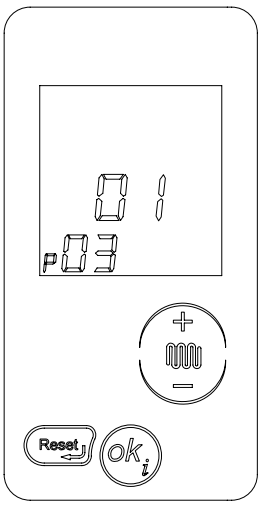
fig. 41

- Remove the main burner;
- Remove nozzles from main burner replacing them by new gas type correct diameter ones. **WARNING! the copper gaskets must be installed;**
- Reinstall the main burner;
- Modify parameter **P00** value according to boiler power, following table 18.

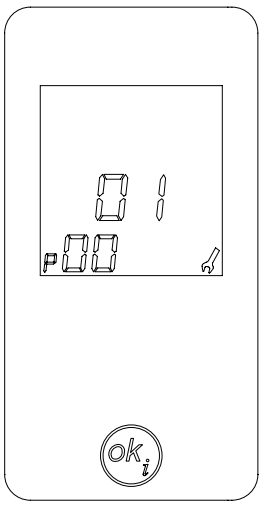




1- To modify parameter **P00** it is necessary to press "reset" and "operating mode" keys at the same time, for three seconds.



2- Parameters can be scrolled by pressing "CH +/-" buttons. As soon as you reach the one to be modified, press "ok". The wrench symbol turns on and indicates you can edit the parameter value.



3 - The parameter value can be edited using "CH + and -" buttons. If you quit using the "reset" button, the parameter will not save changes and remain set to previous value. To confirm modification you must press "ok".

	Default
Parameter	**P00**
24 kW LPG	0
24 kW Natural gas	1
28 kW LPG	2
28 kW Natural gas	3

tab. 18 - P00 parameter setting

3.7.2. Switching from LPG to NATURAL GAS

- Disconnect the boiler from the electric power supply.
- Remove boiler outer front panel, as described in fig. 38;
- Remove the front panel of the combustion chamber, and remove expansion tank as shown in fig. 39 and 40;
- Remove the front part of combustion chamber as shown in fig. 41;
- Remove the main burner;
- Remove nozzles from main burner replacing them by new gas type correct diameter ones. **WARNING! the copper gaskets must be installed;**
- Reinstall the main burner;
- Modify parameter **P00** value according to boiler power, following table 18.
- Adjust the gas valve (see next paragraph, 3.7.3.).

3.7.3. Gas valve setting

3.7.3.1. Maximum heating output adjustment

- check flow pressure value (see tables 5, 6, 7 and 8 "Adjustment rates");
- remove the plastic cover **C** (fig. 39) at the top of the modulation coil, protecting the pressure regulator adjuster screws;
- connect a pressure gauge to pressure measurement point **V** as in figure 43;
- select the "WINTER" mode on the control panel pressing key n times until symbol is displayed;
- start the 'flue cleaning' function by keeping key Reset pressed until symbol stops flashing. Boiler switches to max. output operation;
- turn nut **K** (external, fig. 41) CLOCKWISE to increase the pressure at nozzles, turn COUNTER CLOCKWISE to decrease it;
- for LPG operation, turn brass nut **K** fully CLOCKWISE.

3.7.3.2. Minimum heating output adjustment

- disconnect modulation coil from electric wiring (**M**, fig. 43);
- switch on the burner and check that the "MINIMUM" pressure value matches the value indicated in tables 5, 6, 7 and 8 "Adjustment rates";
- 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 (fig. 44);
- reconnect electric wiring to modulation coil.

3.7.3.3. Final settings

- After quitting flue cleaning function (see par. 3.2.8.1), make sure that burner ignites correctly and without noise;
- measure the minimum and maximum gas valve pressures again;
- adjust as necessary;
- refit plastic cover **C**;
- close gas pressure measurement points;
- check for gas leaks.

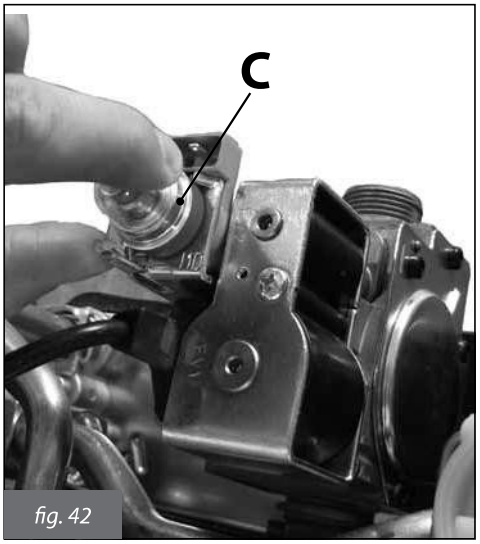


fig. 42

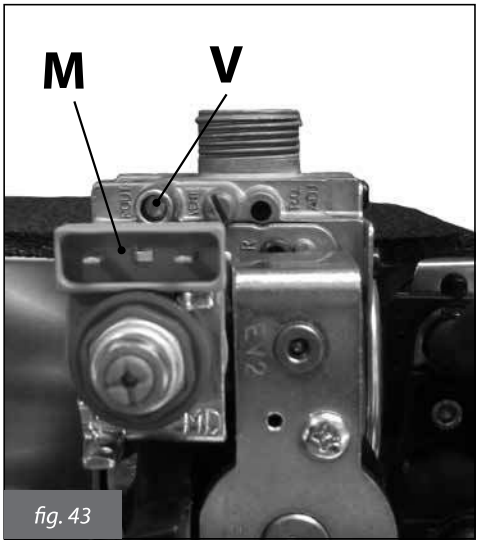


fig. 43

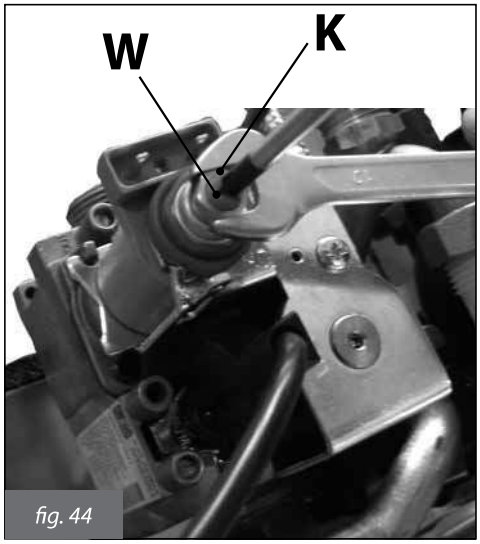


fig. 44

4. TESTING THE BOILER

4.1. Preliminary checks

Before testing the boiler, it is recommended to check the following:
- the boiler has been installed in compliance with laws and standards in force in the country of installation;
- the flue gas venting duct and the relative terminal are installed in conformity with the instructions given in the present document: **there must be no leakage of combustion by-products from any of the gaskets;**
- the boiler is powered by a 230 V - 50 Hz mains supply;
- the system is correctly filled with water (pressure gauge reading 1 to 1.3 bar);
- any shut-off cocks in the system pipes are open;
- the mains gas type is correct for the boiler calibration: convert the boiler to the available gas when necessary (see section no. 3.7.); 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.

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

4.2. Switching on and switching off

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

5. MAINTENANCE

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

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

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

5.1. Maintenance schedule

The boiler must be serviced at least once every year.

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

Maintenance operations include check and cleaning procedures. In particular.

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 pipes;
- check the condition of the draught excluder (RTN / CTN);
- check that there is no flue gas return into the room and that the flue gases are vented correctly (RTN / CTN);
- check operation of safety thermostat installed on the draught excluder (RTN / CTN);
- check air intake pressure switch operation (CTFS / RTFS);
- 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 (CTFS / RTFS);
- clean the draught excluder (RTN / CTN);
- clean the ventilation grille in the room in which the boiler is installed (RTN and CTN);
- clean the flue gas side of the heat exchanger.

When checking the boiler for the very first time, also verify:
- boiler room suitability;
- the ventilation openings in the room (RTN / CTN);
- diameter and length of flue gas system ducts;
- boiler installation in accordance to this "Installation use and maintenance" manual instructions.

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

5.2. Combustion analysis

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

6. TROUBLESHOOTING

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	SOLUTION
E01*	Burner does not ignite	Gas supply failure.	Check gas supply. Check gas supply cock or gas network safety valve intervention.
		Gas valve is disconnected.	Reconnect it.
		Gas valve is faulty.	Replace it.
		The board is faulty.	Replace it.
	Burner does not ignite: there is no spark.	Ignition electrode is faulty.	Replace the electrode.
		Ignition transformer is faulty	Replace the ignition transformer.
		Electronic board does not ignite. It is faulty.	Replace electronic board.
	Burner ignites for a few seconds and goes off.	Electronic board does not detect flame: inverted phase and neutral.	Check the correct phase-neutral connection to the power supply.
		Detection electrode cable is interrupted.	Reconnect or replace wire.
		Detection electrode is faulty.	Replace the electrode.
		Electronic board does not detect flame: it is faulty.	Replace electronic board.
		Ignition heat input setting is too low.	Increase it
		Minimum heat input is not set correctly.	Check setting of burner.
E02*	Flow temperature has exceeded maximum value allowed.	Circulation pump is faulty.	Replace it.
		Circulation pump is seized.	Check pump electrical connection.
E03*	Air pressure switch triggering (CTFS).	Flue gas exhaust pressure switch is faulty.	Check pressure switch: replace it if faulty.
		The silicone pipes are disconnected or damaged.	Connect or replace silicone pipes.
		Air intake or flue gas vent flow is not correct.	Check air intake and flue gas vent pipes: clean or replace.
		Fan is faulty	Replace it.
		The board is faulty.	Replace it.
	Flue gas thermostat triggering. (CTN and RTN).	Poor flue draught.	Check air intake or flue gas venting system and vent grilles in the boiler room
		Flue gas thermostat is faulty.	Replace it.
E04**	CH system water pressure is low.	The system is leaking.	Check system.
		Pressure transducer is disconnected.	Reconnect it.
		Pressure transducer is faulty.	Replace it.
E05**	CH probe failure	Flow probe is electrically disconnected.	Reconnect it.
		Flow probe faulty.	Replace it.
E06**	DHW probe failure (CTN and CTFS)	DHW probe is disconnected from electric system.	Reconnect it.
		DHW probe is faulty.	Replace it.
E09	System pressure is too close to the max. limit.	During manual filling, a system pressure too close to the safety valve drain value has been restored.	Progressively drain the system until the error symbol disappears.
E12**	Water cylinder probe failure (RTN with external water cylinder, optional, and NTC probe)	Probe is disconnected.	Reconnect it.
		Probe is faulty.	Replace it.

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	SOLUTION
E24**	Solar collector failure.	Probe is disconnected.	Reconnect it.
		Probe is faulty.	Replace it.
E27**	Solar valve failure.	Probe is disconnected.	Reconnect it.
		Probe is faulty.	Replace it.
E28**	Solar water cylinder failure.	Probe is disconnected.	Reconnect it.
		Probe is faulty.	Replace it.
E31**	Remote Control connection failure (shown on the Remote Control display).	The Remote Control is not connected to boiler board.	Reconnect it.
		Remote control faulty	Replace it.
		Boiler board is faulty.	Replace it.
E35**	Safety pressure switch protecting the mixed 'zone 2' triggering (with zone kit "0KITZONE05" installed, only)	Mixer valve is faulty.	Replace it.
		Thermostat is disconnected.	Reconnect it.
		Thermostat is faulty	Replace it.
E36**	Flow probe failure on one of the installed zones (with zone kit "0KITZONE05" installed, only)	Probe is disconnected.	Reconnect it.
		Probe is faulty.	Replace it.
E41	Communication failure between peripheral devices (zone boards, solar board).	Peripheral device electric connections are not correct.	Check electrical connections.
		P60 parameter value is not entered correctly.	Enter correct value for parameter P60.
E42	Hydraulic system configuration error.	Setting parameters for boiler board or solar board are not correct.	Check that the P17 and P18 parameter set values match with those specified on the reference tables.
E43	Configuration error of ambient probe, Remote Control, zone.	Setting parameters for boiler board are not correct.	Check that the P61 parameter set value matches with that specified on the reference tables.
E46	Pressure transducer failure.	Pressure transducer is disconnected.	Reconnect it.
		Pressure transducer is faulty.	Replace it.
E49	Communication error between boiler board and touch screen.	The interface is faulty.	Replace it.
E72	Failed acknowledgement of boiler combustion chamber.	Air pressure switch is disconnected.	Reconnect it.
		Air pressure switch is faulty.	Replace it.
E76	Gas valve modulation coil is not working	PCB and gas valve link is disconnected or faulty	Check connection to the gas valve
		Gas valve modulation coil is faulty	Replace gas valve modulation coil
E98	The max. number of resets from the boiler interface has been reached.	User reached the maximum number of errors that can be reset from the boiler.	Reset the interface by disconnecting the boiler from the power supply.
E99	The max. number of resets from the remote control has been reached.	User reached the maximum number of errors that can be reset from Remote Control.	Reset the interface by disconnecting the boiler from the power supply.

* errors that can be reset by the user by keeping the 'Reset' button pressed
** self-resettable errors, they automatically reset as soon as the failure is corrected
*** errors that can be reset only by the Technical Service personnel

In case when errors **E51, E52** and **E53** are displayed, please contact a qualified Service Centre.

0LIBMCEN26

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