

# TAHITI CONDENSING



GB

Line  
tech



## INSTALLATION, USE AND MAINTENANCE



Dear Customer,

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.

The Manufacturer recommends that Customers contact authorized qualified personnel only for maintenance and repair operations.

## General information for fitters, maintenance technicians and users

This INSTRUCTION MANUAL, which is an integral and indispensable part of the product, must be handed over to the user by the installer and must be kept in a safe place for future reference. The manual must accompany the boiler should it be sold or its possession transferred. Following to the boiler installation, the fitter is to advise the user about boiler operation and its safety devices.



**This boiler is designed for connection to a central heating system and to a hot domestic water system. Any other use shall be considered incorrect and therefore dangerous.**

The boiler must be installed by qualified personnel, in compliance with applicable laws and standards and according to the manufacturer's instructions given in this manual. Incorrect installation may cause injury to persons and/or animals and damage to property. The manufacturer shall not be held liable for any such injury and/or damage.

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 relieve 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 damaged and/or faulty.

Do not obstruct the air suction openings.

Only manufacturer approved and supplied accessories or optional kits (including 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.

Keep the packaging out of the reach of children as it may represent a source hazard.

In the event of failure and/or faulty functioning, switch off the boiler. Do not attempt to make repairs: contact qualified technicians.

Manufacturer approved and supplied 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 property.

The manufacturer, in order to guarantee efficient and correct functioning of the equipment, recommends the boiler to be serviced and repaired by an authorized Service Centre which is best trained for the purpose.



**Routine boiler maintenance should be performed according to the schedule in the relevant section of this manual. Appropriate boiler maintenance ensures efficient operation, preservation of the environment, and safety for people, animals and property. Incorrect and irregular maintenance can be a source of danger for people, animals and property.**

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

**Warning! When power mains are disconnected, boiler electronic anti-frost function will not be operative.**

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



### IMPORTANT

**Should 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 tap;
- open doors and windows;
- contact a Service Centre, a qualified installer or the gas supply company.

**Never use flames to detect gas leaks.**



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

The Manufacturer cannot be held contractually or extra-contractually liable in the event of failure to comply with the 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 fitter, it has been used before 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.

2. Turn the master switch to **ON**: the display comes on and shows the function set via the boiler selector (**2**, fig. 1).

3. If you **do not wish** to activate the heating function, turn the boiler selector (**2**, fig. 1) to SUMMER. This will activate domestic hot water (DHW) only, and the display will show the flow water temperature.



*Boiler selector on SUMMER*

4. If **you wish** to activate the heating function, turn the boiler selector (**2**, fig. 1) to WINTER. This will activate both DHW and heating, and the display will show the flow water temperature.



*Boiler selector on WINTER*

5. To adjust the DHW temperature, first turn regulator (**3**, fig. 1) to an intermediate position (about 45 °C); then regulate it as required. While regulating, the LCD displays the temperature setting and the tap symbol flashes.



*DHW temperature regulator*



6. To regulate the CH water temperature, first set the regulator (**4**, fig. 1) to 3 o'clock (about 70°C), then regulate it as required. While the DHW temperature is being regulated, the LCD displays the temperature setting and the radiator symbol flashes.



*CH water temperature regulator*



7. Set the desired temperature on the (optional) room thermostat in the building.

The boiler is now ready to operate.

If the boiler shuts down, turn the boiler selector (**2** in fig. 1) to reset for a few seconds, then back to the desired position. If the boiler does not restart, contact an Authorised Service Centre.



*Boiler selector on RESET*

## CONTENTS

Warnings	page 3
General information for fitters, maintenance technician and user	page 4
1. User instructions	page 7
1.1. Control panel	page 7
1.2. LCD	page 8
1.3. Boiler status - LCD activation correspondence	page 9
1.4. Operating the boiler	page 10
1.4.1. Switching on	page 10
1.4.2. CH function	page 10
1.4.3. DHW function	page 10
1.4.4. ANTI-FREEZE function	page 11
1.4.5. PUMP AND VALVE ANTI-SHUTDOWN function	page 12
1.4.6. Operation with (optional) external probe	page 12
1.4.7. Operation with (optional) remote control	page 12
1.5. Boiler shutdown	page 13
1.5.1. Burner shutdown	page 13
1.5.2. Shutdown due to overheating	page 13
1.5.3. Shutdown due air/flue gas system malfunction	page 13
1.5.4. Shutdown due a water circulation malfunction	page 13
1.5.5. Shutdown for fan malfunction	page 14
1.5.6. Alarm due to temperature probe malfunction	page 14
1.5.7. Alarm due to (optional) remote control connection malfunction	page 14
1.5.8. Alarm due to (optional) external probe malfunction	page 14
1.6. Maintenance	page 14
1.7. Notes for the user	page 14
2. Technical features and dimensions	page 15
2.1. Technical features	page 15
2.2. Dimensions	page 16
2.3. Hydraulic layouts	page 17
2.4. Operating data	page 19
2.5. General characteristics	page 20
3. Instructions for the fitter	page 21
3.1. Installation standards	page 21
3.2. Installation	page 21
3.2.1. Packaging	page 21
3.2.2. Choosing where to install the boiler	page 21
3.2.3. Positioning the boiler	page 21
3.2.4. Installing the boiler	page 23
3.2.5. Boiler room ventilation	page 23
3.2.6. Air intake/flue gas discharge system	page 24
3.2.6.1. Air/flue gas system duct configuration	page 26
3.2.6.2. Ø 100/60 mm and 125/80 mm air/flue gas coaxial duct system	page 27
3.2.6.3. Ø 80 mm air/flue gas split duct system	page 28
3.2.7. Testing combustion efficiency	page 28
3.2.7.1. "Chimney sweep" function	page 28
3.2.7.2. Measurement procedure	page 29
3.2.8. Gas mains connection	page 29
3.2.9. Hydraulic connections	page 30
3.2.10. Power mains connection	page 30
3.2.11. Selecting central heating output range	page 31
3.2.12. Room thermostat installation (optional)	page 31
3.2.13. Installation of the Open Therm remote control (optional)	page 31
3.2.14. Installation of the (optional) external probe and "sliding temperature" operation	page 32
3.3. Filling the system	page 34
3.4. Starting the boiler	page 34
3.4.1. Preliminary checks	page 34
3.4.2. Switching on and off	page 34
3.5. Wiring diagram	page 35
3.6. Adapting to other gases and regulating the burner	page 36
3.6.1. Switching from Methane to Propane	page 38
3.6.2. Switching from Propane to Methane	page 38
3.6.3. Burner adjustment	page 38
4. Testing the boiler	page 38
4.1. Preliminary checks	page 39
4.2. Switching on and off	page 39
5. Maintenance	page 40
5.1. Maintenance schedule	page 40
5.2. Combustion analysis	page 40
6. Troubleshooting	page 41

## PICTURE INDEX

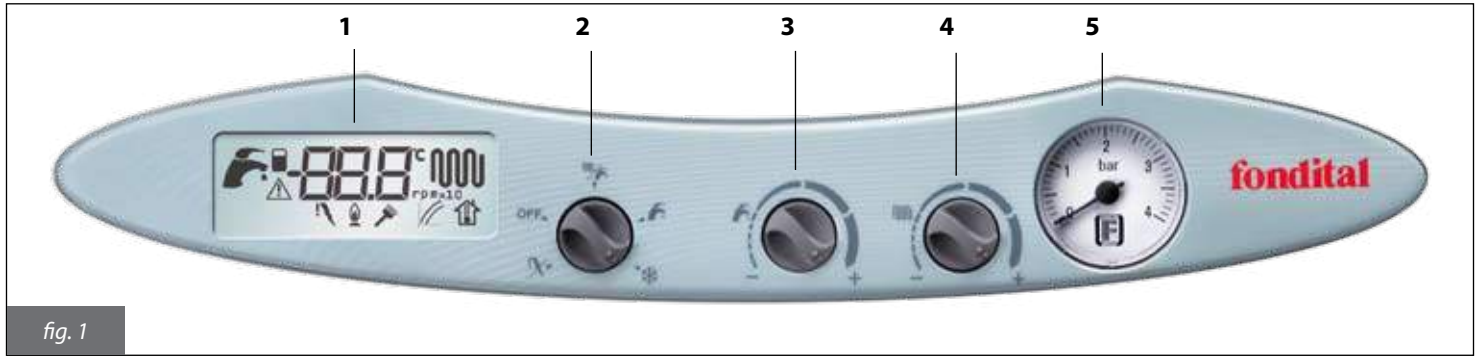
fig. 1 - Control panel	page 7
fig. 2 - LCD	page 8
fig. 3 - Fictitious room temperature regulation	page 12
fig. 4 - Filling tap for models KR and KC	page 13
fig. 5 - Filling tap for model KRB	page 13
fig. 6 - Dimensions	page 16
fig. 7 - KC model hydraulic layout	page 17
fig. 8 - KR model hydraulic layout	page 17
fig. 9 - KRB model hydraulic layout	page 18
fig. 10 - Installation template	page 22
fig. 11 - Filter installation	page 23
fig. 12 - Installation examples of air intake /flue gas discharge pipes	page 24
fig. 13 - Air intake and flue gas discharge coaxial pipe system	page 27
fig. 14 - Dimensions for connection to air intake and flue gas discharge coaxial pipe system	page 27
fig. 15 - Air intake and flue gas discharge split pipe system	page 28
fig. 16 - Dimensions for connection to air intake and flue gas discharge split pipe system	page 28
fig. 17 - Boiler casing opening	page 28
fig. 18 - Control panel	page 29
fig. 19 - Air intake and flue gas discharge tower	page 29
fig. 20 - Openings for combustion efficiency measurement	page 29
fig. 21 - Gas mains connection	page 29
fig. 22 - Thermoregulation trimmer	page 33
fig. 23 - Central heating curves with external probe operation	page 33
fig. 24 - System head curves	page 35
fig. 25 - Wiring diagram	page 36
fig. 26 - Adaptation to other gas types	page 38
fig. 27 - Gas valve adjustment	page 38

## TABLE INDEX

Table 1 - Correlation between LED SIGNALLING – BOILER STATUS when boiler is in operation	page 9
Table 2 - Correlation between LED SIGNALLING – BOILER STATUS when boiler is malfunctioning	page 9
Table 3 - KC 24 model adjustment rates	page 19
Table 4 - KC 28 model adjustment rates	page 19
Table 5 - KC 32 model adjustment rates	page 19
Table 6 - KR 24/KRB 24 model adjustment rates	page 19
Table 7 - KR 28/KRB 28 model adjustment rates	page 19
Table 8 - KR 32/KRB 32 model adjustment rates	page 19
Table 9 - KC/KB/KRB model general specifications	page 20
Table 10 - KC 24/KR 24/KRB 24 model combustion rates	page 20
Table 11 - KC 28/KR 28/KRB 28 model combustion rates	page 20
Table 12 - KC 32/KR 32/KRB 32 model combustion rates	page 20
Table 13 - Burner re-ignition temperatures	page 31
Table 14 - Limits to be set for TSP parameters and default values in relation to boiler type (TSP0)	page 32
Table 15 - TSP chart of parameters which can be displayed (they cannot be adjusted via remote control)	page 32
Table 16 - Correlation “temperature – nominal resistance” of temperature probes	page 37
Table 17 - CO <sub>2</sub> rates	page 38

# 1. USER INSTRUCTIONS


## 1.1. Control panel




### 1. Liquid crystal display (LCD)

The LCD displays the boiler status and operating data (see fig. 2).


### 2. Boiler function selector

With the selector on RESET , the boiler restarts after activation of the burner shutdown device.

With the selector on OFF, the boiler is in stand-by mode, with the heating and hot water functions disabled.

With the selector on SUMMER , the boiler is ready to produce domestic hot water only (KC model, KR + optional external water heater and KRB + optional external water heater).

With the selector on WINTER , the boiler is ready to heat and produce hot water.

With the selector on ANTI-FREEZE , only the anti-freeze function is enabled.

### 3. DHW temperature regulator

This is used to enable/disable water storage and to set the DHW temperature in the range 35-57°C.

For KR boiler with an external (optional) water heater, this regulator also activates/deactivates the heater.

For boilers model KR and KRB connected to an (optional) water heater this regulator also enables/disables the water heater.

### WARNING

**In KC model, a special adjusting device is installed, which limits domestic hot water flow rate to 13 liter per minute (KC 24), 14 liter per minute (KC 28) and to 16 liter per minute (KC 32).**

**Domestic hot water temperature supplied, depends on no. 3 adjusting device, on the quantity requested by the user and on water mains supply temperature.**

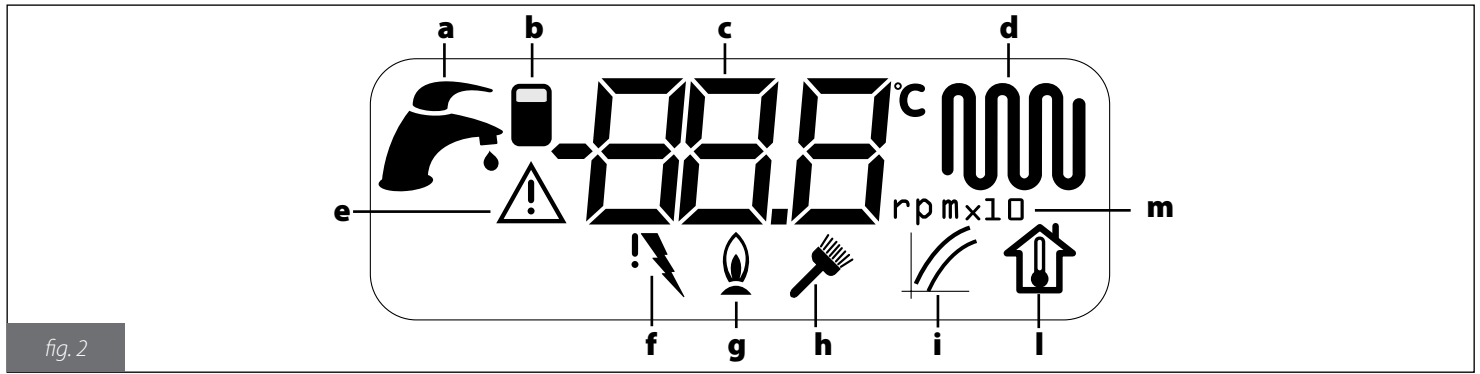
### 4. CH water temperature regulator

This is used to select the temperature of the water in the heating system in the range 20 °C to 45 or 78°C (depending on the selected temperature range).

### 5. Water pressure gauge

This shows the pressure of the water in the heating system.

## 1.2. LCD



### a. DHW indicator

This comes on when the boiler is in DHW mode.  
It flashes when the DHW temperature is being regulated via regulator **3** (fig. 1).

### b. Water heater on indicator

This indicator comes on when the water heater (optional) is activated via regulator **3** (fig. 1).

### c. Alphanumeric indicator

This shows the following:

- CH flow water temperature
- CH temperature setting
- DHW temperature setting
- boiler status
- boiler diagnostics


### d. Central heating indicator

This comes on when the boiler is in CH mode.  
It flashes when the CH temperature is being regulated via regulator **4** (fig. 1).

### e. Boiler shutdown indicator

This comes on when there is a malfunction that cannot be reset via the boiler function selector (**2**, fig. 1).  
The problem must be solved before the boiler can be restarted.

### f. Burner shutdown indicator

This comes on when the burner shutdown device activates due to a malfunction.  
To restart the boiler, turn the boiler selector (**2**, fig. 1) to the RESET position  for a few seconds and then back to the desired position.

### g. Flame indicator

This comes on when the burner flame is present.

### i. Chimney-sweep function indicator (for fitter only)

This flashes when the chimney-sweep function is activated.  
The flow water temperature and the number of fan rounds are shown alternatively (in this case, symbol **m** is also shown)

### i. Thermoregulation indicator (for fitter only)

This comes on when the thermoregulation curve is set.

### l. Fictitious room temperature indicator

When an external probe is installed, this indicator flashes when the fictitious room temperature is set via regulator **4**.

### m. Number of fan rounds (for fitter only)

When the chimney sweep function is activated, symbol **h** flashes and flow water temperature and number of fan rounds are shown alternatively (in this case, the correspondent symbol is also shown).



### 1.3. BOILER STATUS – LCD ACTIVATION CORRESPONDENCE

#### Normal operation

Boiler selector on OFF	
Boiler selector on ANTI-FREEZE	
Boiler selector on SUMMER or WINTER No function active The flow water temperature is displayed	
Boiler selector on SUMMER or WINTER DHW system enabled (KC model only) The flow water temperature is displayed	
Boiler selector on WINTER CH function active The flow water temperature is displayed	
Boiler selector on SUMMER or WINTER External (optional) water heater enabled, no function active The flow water temperature is displayed (Only for KR and KRB models connected to an optional water heater)	

Table 1 - BOILER STATUS - LCD visualisation correspondence (normal operation)

#### Malfunction

Boiler not powered on	
Boiler shutdown due to flame absence	
Boiler shutdown due to safety thermostat activation	
Boiler shutdown due to flue gas thermostat activation	
CH probe failure	
DHW probe failure KC model only	
Water heater probe fault (Only for KR and KRB models connected to an optional water heater with NTC probe)	
Shutdown due to a water circulation malfunction in CH system or minimum pressure gauge (pump ON – main flow switch OPEN)	
Shutdown due to a water circulation malfunction in CH system (pump OFF – main flow switch CLOSE)	
Fan failure	
Remote control (optional) connection failure	
External probe (optional) failure	

Table 2 - BOILER STATUS - LCD visualisation correspondence (malfunction)

## 1.4. Operating the boiler

### 1.4.1. Switching on



The following procedure is to be implemented only after the boiler is installed and tested by a qualified fitter.

- Open the gas stop cock;
- turn ON the power switch external to the boiler; the LCD shows and indicates the active function (see tables 1 and 2);
- select boiler operation mode via no. **2** selector (fig. 1): OFF/SUMMER/WINTER/ANTI-FREEZE;
- set desired CH temperature (see par. 1.4.2.);
- Set desired DHW temperature (see par. 1.4.3.);
- Set desired room temperature by means of the room thermostat in the premises (when available).

#### WARNING

**Should the boiler be left inactive for a long time, particularly when boiler is propane-fired, ignition might be difficult.**

**Before starting the boiler switch on another gas powered device (e.g. kitchen range).**

**Beware that even by following this procedure, the boiler might still experience some starting difficulties and shut down once or twice. Resume boiler operation by turning no. 2 knob to the reset position  for two seconds and back to the desired position.**

### 1.4.2. CH function

Set desired CH water temperature via no. **4** knob (fig. 1);

CH water temperature adjusting range depends on selected operation range:

- **standard range:** from 20°C to 78°C (from full counter-clockwise position to full clockwise position);

- **reduced range:** from 20°C to 45°C (from full counter-clockwise position to full clockwise position).

Operation range choice is to be selected by the fitter or an authorized Service Centre (see 3.2.11. paragraph).

During temperature setting, the CH symbol on the LCD flashes and the CH setting is displayed.



When the CH system requests heat, the LCD shows the (fixed) CH symbol and the temperature of the CH water.

The burner symbol  only shows while the burner is operating.



To prevent frequent ignition and switching off in central heating mode, boiler is programmed to have a waiting time between subsequent ignitions which depends on the selected operating range.

- standard range: 4 minutes;

- reduced range: 2 minutes.

Should water temperature in the system fall below the default value (see 3.2.11. paragraph), waiting time procedure is aborted and boiler re-ignited.

### 1.4.3. DHW function

Set desired domestic hot water temperature via no. **3** knob (fig.1).

Domestic hot water supply is activated in KC model and KR, KRB model equipped with an external heater (optional equipment).

Such function always has priority over CH water supply.

In KC model, set desired domestic hot water temperature via no. **3** knob (fig.1). It can be adjusted within a 35°C to 57°C range (from full counter-clockwise position to full clockwise position).

During temperature setting, the DHW symbol on the LCD flashes and the DHW setting is displayed.



In KR and KRB model equipped with external heater (optional equipment), DHW production through the external heater may be activated/deactivated via no. **3** knob.

If you turn knob **3** fully anticlockwise, the water heater-active symbol is displayed. Now turn knob **3** until a temperature of at least 40°C is displayed. To switch off the water heater, turn knob **3** fully anticlockwise again until the symbol disappears and then back to a position showing a temperature of at least 40 °C.



For models KR and KRB with an (optional) external water heater with an NTC probe (10 kΩ @ β=3435; refer to the water heater specifications), the temperature setting range is 35-57°C (from the counter-clockwise limit position to full clockwise position of regulation knob **3**). During temperature setting, the DHW symbol on the LCD flashes and the DHW setting is displayed.

For models KR and KRB with an (optional) external water heater with thermostat probe, the desired HDW temperature must be set on the water heater (refer to the attached instructions). Regulation knob **3** has no effect on this configuration, except for water heater activation/deactivation as described above.



When the DHW system requests hot water, the LCD shows the (fixed) DHW symbol and the temperature of the DHW water.

The burner symbol  only shows while the burner is operating.



## WARNING

In KC model, a special adjusting device is installed, which limits domestic hot water flow rate to 13 liter per minute (KC 24), 14 liter per minute (for model KC 28) and 16 liter per minute (KC 32).

Domestic hot water temperature supplied depends on no. 3 adjusting device, on the quantity requested by the user and on water mains supply temperature, according to the following formula:

$$I = \text{DHW liter per min.} = \frac{K}{\Delta T}$$

K represents:

- 401 in KC 24 model

- 444 in KC 28 model

- 507 in KC 32 model

$\Delta t$  = DHW temperature – water mains supply temperature

For instance, with model KC 24, if the water supplied is 8°C and you want shower water at 38°C, the value of  $\Delta T$  is:

$$\Delta T = 38^\circ\text{C} - 8^\circ\text{C} = 30^\circ\text{C}$$

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

$$I = 401 / 30 = 13.4 \text{ [litres per minute - mixed water to the tap]}$$

In models KR and KRB with optional external heater, the quantity of DHW available depends on the heater.

In models KR and KRB with optional external heater, the anti-legionellose function is activated, which consists of heating the water inside the heater to a temperature of 65 °C for 30 minutes, without taking into account any of the other settings.

### 1.4.4. ANTI-FREEZE function

This boiler is fitted with an anti-freeze protection system, which works when the following functions are activated: SUMMER, WINTER and ANTI-FREEZE.



**The anti-freeze function only protects the boiler, not the whole heating system.**

**The heating system must be protected using a room thermostat, although this is disabled when the selector is set to the ANTI-FREEZE or OFF mode.**

**Therefore, if you want to protect both the boiler and the system, turn to WINTER  mode on selector 2.**

When the heating water temperature sensor detects a water temperature of 5°C, the boiler switches on and stays on at its minimum thermal power until the temperature reaches 30°C or 15 minutes have elapsed. The pump continues to operate even if the boiler shuts down.


In models KC, anti-freeze function also protects the DHW circuit.

When the DHW temperature sensor detects a temperature of 5°C, the boiler switches on and stays on at its minimum thermal power until the temperature reaches 10°C or 15 minutes have elapsed (the deviating valve is in the DHW position). The pump continues to operate even if the boiler shuts down.

In models KR and KRB with optional external heater for DHW production fitted with a NTC temperature sensor (10 k $\Omega$  @  $\beta=3435$ ; please refer to the heater technical characteristics), the anti-freeze function also protects the heater.

When the heater temperature sensor detects a temperature of 5°C, the boiler switches on and stays on at its minimum thermal power until the temperature reaches 10°C or 15 minutes have elapsed (the deviating valve is in the DHW position). The pump continues to operate even if the boiler shuts down.

In models KR and KRB with optional external heater for DHW production fitted with a thermostat-type temperature sensor, the anti-freeze function DOES NOT protect the water heater.

Water heater protection can be ensured by setting the boiler to SUMMER  or WINTER  (via no. 2 knob), activating the heater (via no. 3 knob), as described above, and setting a heater thermostat temperature higher than 0 °C.

The CH system can be protected effectively against freezing by means of specific anti-freeze additives suitable for use in multi-metal systems.

**Do not use car engine anti-freeze products, and periodically check the effectiveness of the anti-freeze product.**

#### 1.4.5. PUMP AND VALVE ANTI-SHUTDOWN function

If the boiler remains inactive and:

- selector **2** is not in the OFF position,

- the boiler is still connected to the mains supply,

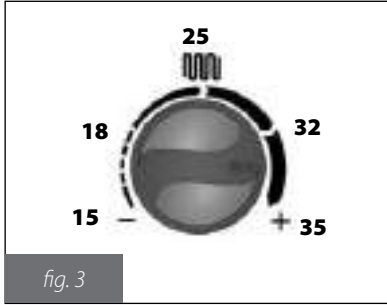
the pump and the switching valve activate briefly every 24 hours to keep them efficient.

#### 1.4.6. Operation with an (optional) external probe


The boiler can be connected to an (optional, can be supplied by the Producer) external temperature probe.

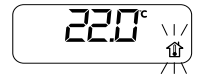
When the external temperature has been measured, the boiler automatically regulates the heating water temperature, increasing it when the outside temperature drops and decreasing it when it rises, which improves comfort and saves fuel (this is referred to as sliding temperature operation).

The heating water temperature varies according to a program in the boiler's microprocessor.



When an external probe is installed, regulator **4** (fig. 1) loses its heating water temperature function and becomes a fictitious room temperature regulator (fig. 3) for the temperature desired in the areas to be heated.

During temperature setting, the fictitious room temperature symbol  flashes and the temperature setting is displayed.



Regulator **4** in the fully anticlockwise position corresponds to a fictitious room temperature of 15°C, 9 o'clock corresponds to 18°C, 12 o'clock to 25°C, 3 o'clock to 32°C and the fully clockwise position to 35°C. To get an optimal curve, a setting of approximately 20°C is recommended.

For details on how to connect the external probe, refer to subsection 3.2.14.



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

**If non-original external probes are used, correct operation of the boiler, or of the probe, cannot be guaranteed.**

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

The boiler can be linked to an (optional, supplied by the Manufacturer) remote control, which can be used for setting numerous parameters:

- boiler status

- room temperature

- CH system water temperature

- DHW system water temperature

- CH system or external heater (optional) activation times

- boiler diagnostics display

- boiler reset

and others.

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.**

**If non-original remote controls are used, correct operation of the boiler, or of the remote control, cannot be guaranteed.**

## 1.5. Boiler shutdown


The boiler shuts down automatically if a malfunction occurs.

Refer to Tables 1 and 2 to identify the boiler operating mode.


Refer to Table 2 and section 6 to identify possible causes of the shutdown. The troubleshooting section is at the end of this manual.

Below is a list of kinds of shutdown and the procedure to follow in each.

### 1.5.1. Burner shutdown

If the burner shuts down as there is no flame, the burner shutdown symbol  is displayed and code E01 flashes.


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;
- if the gas supply is normal, turn selector **2** to the reset position  for a few seconds, then back to the desired position. If after three attempts the burner still fails to ignite, contact an Authorised Service Centre or a qualified service engineer.



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


### 1.5.2. Shutdown due to overheating

If the water temperature is too high, the boiler will shut down. The burner shutdown symbol  is displayed and code E02 flashes.



Contact an Authorised Service Centre or a qualified service engineer.


### 1.5.3. Shutdown due to air/flue gas system malfunction

If the air/flue gas system malfunctions, the boiler shuts down. The burner shutdown symbol  is displayed and code E03 (flue gas thermostat).



Contact an Authorised Service Centre or a qualified service engineer.


### 1.5.4. Shutdown due to a water circulation malfunction

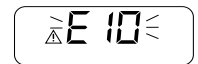
If there is a malfunction in water circulation in the heating system, the boiler shuts down. The boiler shutdown symbol  is displayed and code E10 or E26 flash, according to the malfunction.

1. With code E10 flashing there can be two different situations:

**a) the pressure gauge (5, fig. 1) shows a pressure lower than 1 bar**

Proceed as follows to restore the correct water pressure:

- Turn the filling tap (fig. 4) anticlockwise to allow water to enter the boiler.
- Keep the tap open until the pressure gauge shows a value of 1-1.3 bar.
- Turn the tap clockwise to close it.
- Turn selector **2** to the RESET position  for a few seconds, then back to the desired position.



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



**Make sure you close the tap carefully after filling.**

**If you do not, when the pressure increases, the safety valve may activate and discharge water.**

**b) the pressure gauge (5, pic 1) shows a pressure of 1-1.3 bar**

Contact an Authorised Service Centre or a qualified service engineer.

2. With flashing code E26, contact an Authorised Service Centre or a qualified service engineer.

#### KC and KR

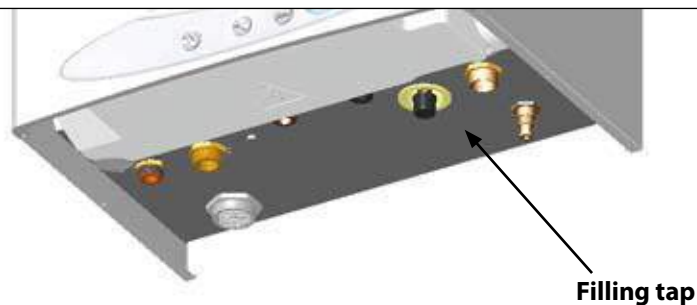


fig. 4

#### KRB

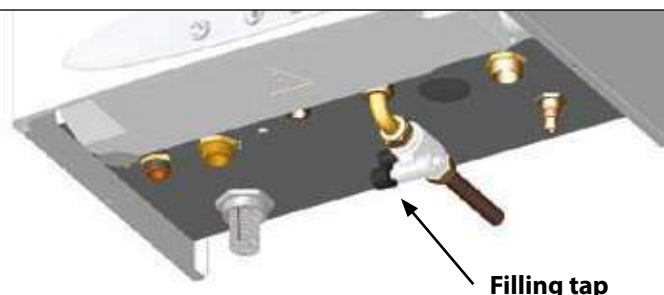



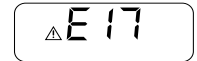
fig. 5

### 1.5.5. Shutdown for fan malfunction


The fan work is constantly monitored and in case of malfunction it goes off; the boiler shutdown symbol  is displayed and code E17 flashes.

This mode is maintained until the fan recovers normal working parameters.

If the boiler should not start and remain in this mode, contact an Authorised Service Centre or a qualified service engineer.




### 1.5.6. Alarm due to temperature probe malfunction

If the burner shuts down due to malfunction of the temperature probes, the boiler shutdown symbol  is displayed and the following codes may flash:

- E05, CH probe: the boiler does not work;
- E06, DHW probe (KC model only): the boiler only operates in CH mode, not DHW mode;
- E12, storage probe (KR/KRB model only with external optional water heater fitted with NTC 10 k $\Omega$  @ $\beta$ =3435 temperature probe); the boiler operates in CH while DHW mode is disabled.

Contact an Authorised Service Centre or a qualified service engineer.

### 1.5.7. Alarm due to (optional) remote control connection malfunction


The boiler recognises whether or not there is a remote control (optional). If the remote control is connected but the boiler does not receive instructions, the boiler shutdown symbol  is displayed and code E22 flashes.

The boiler will continue to operate according to the settings on the control panel (fig. 1) and ignore the remote control settings.

Contact an Authorised Service Centre or a qualified service engineer.



### 1.5.8. Alarm due to (optional) external probe malfunction

If the (optional) external temperature probe malfunctions, the boiler shutdown symbol  is displayed and code E23 flashes.

The boiler will continue to operate, but the sliding temperature function is deactivated. The temperature of the CH water is regulated according to the position of regulator **4** (fig. 1), which in this case loses its function as a fictitious room temperature regulator (see 1.4.6.).

Contact an Authorised Service Centre or a qualified service engineer.



## 1.6. Maintenance

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

**Correct maintenance of the boiler will allow it to work efficiently, without harming the environment, and in complete safety.**

**Maintenance and repairs must be performed by qualified personnel.**

**The user is strongly advised to have the boiler serviced and repaired by one of the Manufacturer's fully qualified and authorised Service Centres.**

### 1.7. 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 cannot be held liable for damage or injury due to tampering of the boiler or improper intervention.**

**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 done by suitably qualified personnel.**

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

## 2. Technical features and dimensions

### 2.1. Technical features

The boiler is equipped with a fully pre-mixed gas burner. The following models are available:

- KC:** condensing boiler with sealed chamber and forced draught, supplying CH water and instant DHW;
- KR:** condensing boiler with sealed chamber and forced draught, supplying CH water;
- KRB:** condensing boiler, forced draught and sealed chamber, with production of hot water for CH system; equipped with a deviation three-way valve allowing for connection to an (Optional) water heater.

Both models are available in the following heat outputs:

KC 24, KR 24 and KRB 24 = 23.7 kW

KC 28, KR 28 and KRB 28 = 26.2 kW

KC 32, KR 32 and KRB 32 = 31.4 kW

Both models are equipped with electronic ignition and ionization flame sensing device.

The boilers meet local applicable Directives enforced in the country of destination, which is stated on their data plate. Boiler installation in a different country from specified may endanger people, animals and objects.

The main technical characteristics of the boilers are listed below:

#### Manufacturing characteristics

- IPX4D electrically protected control panel
- Integrated, modulating electronic safety board
- Electronic ignition via separated igniter and ionization flame detection
- Stainless steel, fully pre-mixed burner
- Mono-thermal, high efficiency, composite and stainless steel heat exchanger with air purging device
- Twin shutter, modulating gas valve with constant air/gas ratio
- Modulating, electronically managed flue gas discharge fan
- Three-speed pump with air purging device
- Safety flow-switch, preventing operation with water circulation malfunction in the CH system
- CH temperature probe (KC, KR and KRB) and DHW (KC)
- Safety limit thermostat
- Flue gas thermostats
- Integrated, automatic by-pass
- 10 liter expansion vessel
- System loading and draining taps
- Stainless steel plate DHW heat exchanger (KC)
- Motorized deviating valve (KC and KRB)
- DHW priority flow switch (KC)
- DHW flow limiting device; 13 liter/min (KC 24), 14 liter/min (KC 28), 16 liter/min (KC 32)

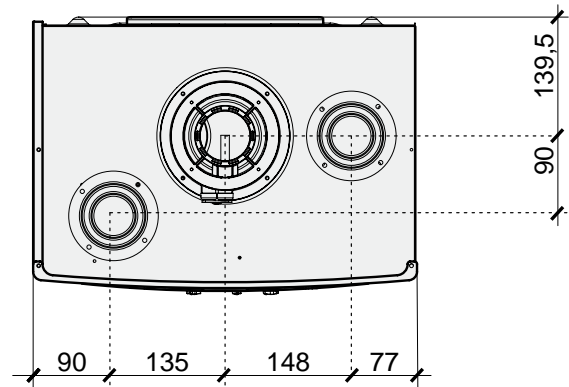
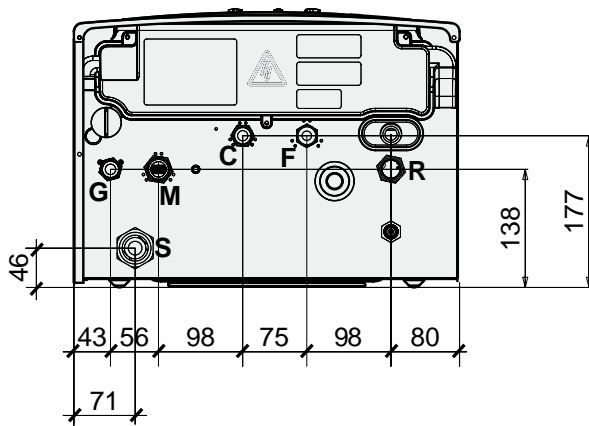
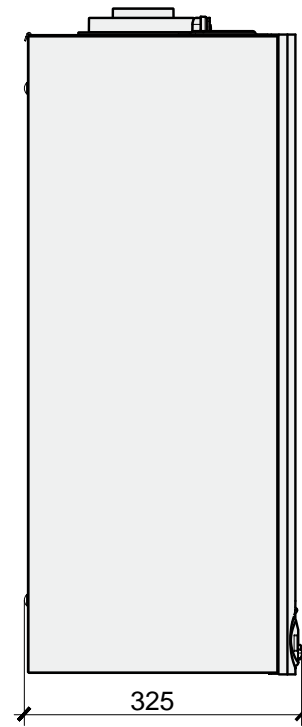
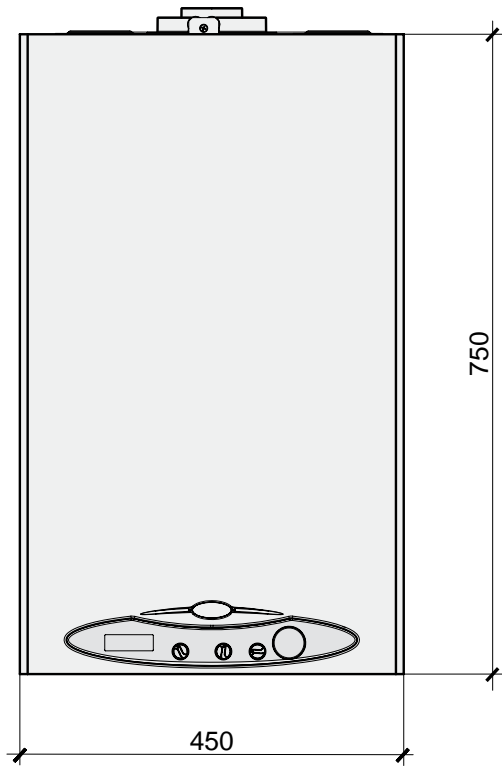
#### User interface

- Liquid crystal display showing the boiler operating status
- Mode selector: OFF, RESET, WINTER, SUMMER and ANTI-FREEZE
- CH water temperature regulator: 20-78°C (standard range) or 20-45 °C (reduced range)
- DHW water temperature regulator: 35-57°C
- Water pressure gauge

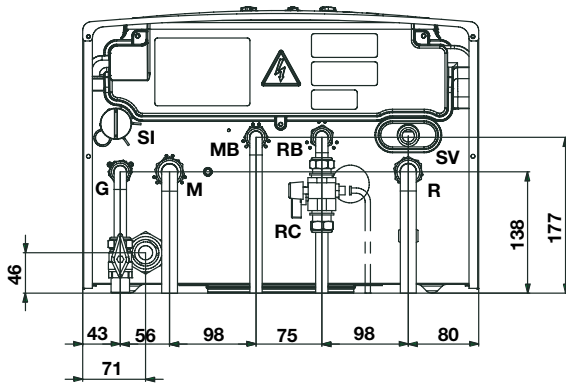
#### Operating features

- CH electronic flame modulation with timer-controlled rising ramp (50 seconds)
- DHW electronic flame modulation (KC, KR with optional external water heater and KRB with optional external water heater)
- DHW priority function (KC, KR with optional external water heater and KR with optional external water heater)
- CH anti-freeze function (ON 5°C; OFF 30°C or after 15 minutes of operation if CH temperature > 5 °C)
- DHW anti-freeze function (KC only), (ON 5°C; OFF 10°C or after 15 minutes of operation if DHW temperature > 5 °C)
- Water heater anti-freeze function (KR models + optional water heater with NTC probe and KRB models + optional water heater with NTC probe): ON 5°C; OFF 10°C or after 15 minutes of operation if water temperature in the heater > 5 °C)
- Timer-controlled chimney-sweep function (15 minutes)
- Anti-legionella function (KR +optional external water heater and KRB +optional external water heater)
- CH maximum heat input adjusting trimmer
- Ignition heat input adjusting trimmer
- Possibility to select the heating range: standard or reduced
- Ignition flame propagation function
- Timer-controlled room thermostat (240 seconds with standard range, 120 seconds with reduced range)
- Heating pump post-circulation function in CH, ANTI-FREEZE and CHIMNEY-SWEEP mode (180 seconds)
- Heating pump post-circulation function in DHW mode (KC, KR with optional external heater and KRB with optional external heater): 30 seconds
- Post-circulation function for heating temperature >85°C (30 seconds)
- Post-ventilation function after working: 10 seconds
- Post-ventilation safety function (ON 95°C;)
- Anti-blocking function (KC, KR and KRB) and switching valve (KC and KRB) : 180 seconds operation every 24 hours of boiler inactivity
- Ready for connection to a room thermostat (optional)
- 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

## 2.2. Dimensions



**View from the bottom of models KC and KR**



**View from the bottom of model KRB**

- S** Condensate drain
- F** Water mains intake (KC and KR)
- RB** Secondary return from the boiler (only KRB model)
- G** Gas intake
- SI** Inspection trap plug
- M** CH system flow
- C** DHW flow (KC model only)
- SV** 3-bar safety valve drain cock
- RC** Filling tap
- R** CH system return
- RS** Drain cock
- MB** Secondary flow to the boiler (only KRB model)

**In model KRB the connection to the cold water mains must be made through the 1/8" connection on the loading tap (shown with a broken line in the figure above).**



### 2.3. Hydraulic layouts

#### Model KC

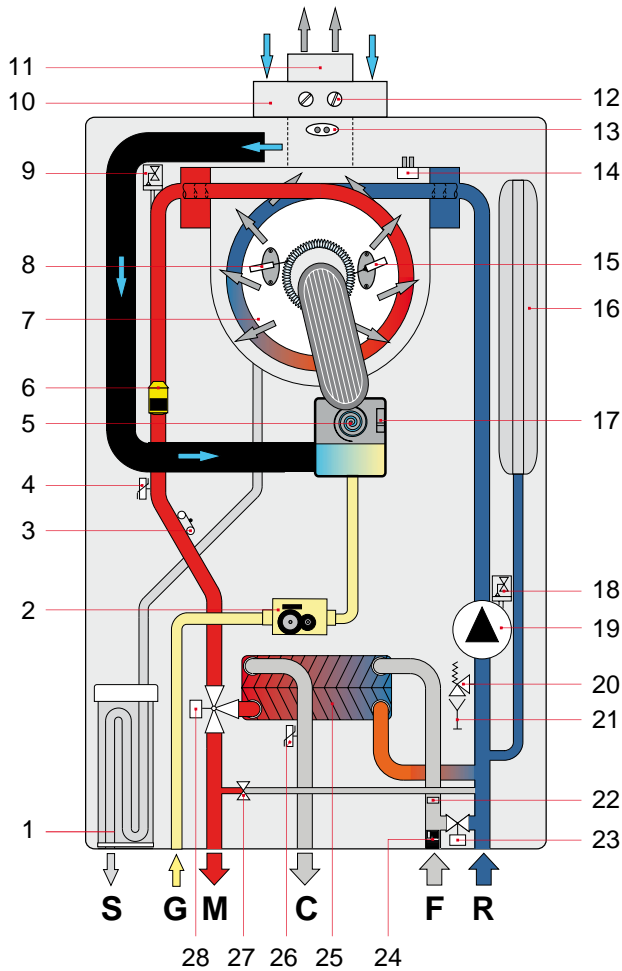


fig. 7

1. Condensate drain siphon
2. Modulating gas valve
3. Safety thermostat
4. CH temperature probe
5. Modulating fan
6. Primary fluid flow meter
7. Primary condensing exchanger
8. Ignition electrode
9. Air purging device
10. Combustion air intake system
11. Flue gas discharge system
12. Flue gas analysis ports
13. Flue gas thermostat on discharge duct
14. Flue gas thermostat on exchanger
15. Flame sensing electrode
16. Expansion vessel
17. Fan management probe
18. Air purging device
19. Pump
20. 3 bar safety valve
21. Unloading tap
22. Minimum pressure switch
23. Flow limiting device
24. Loading tap
25. Domestic cold water flow meter with filter
26. Secondary plate exchanger
27. DHW probe
28. Automatic by-pass
29. Motorized 3-way valve

- S** Condensate drain  
**G** Gas intake  
**M** CH system flow  
**C** DHW flow  
**F** Water mains intake  
**R** CH system return

#### Model KR

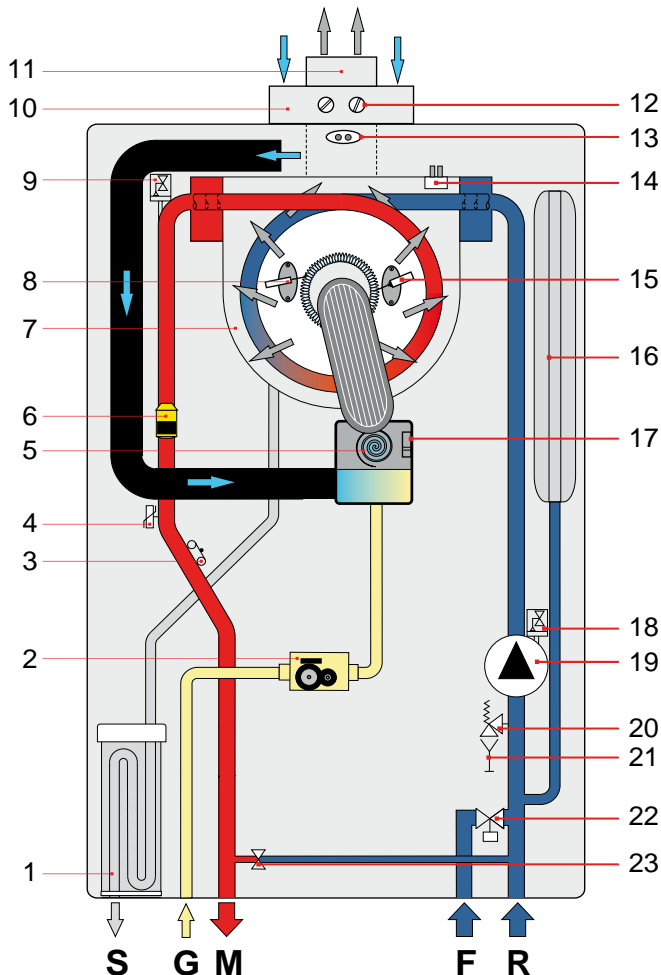
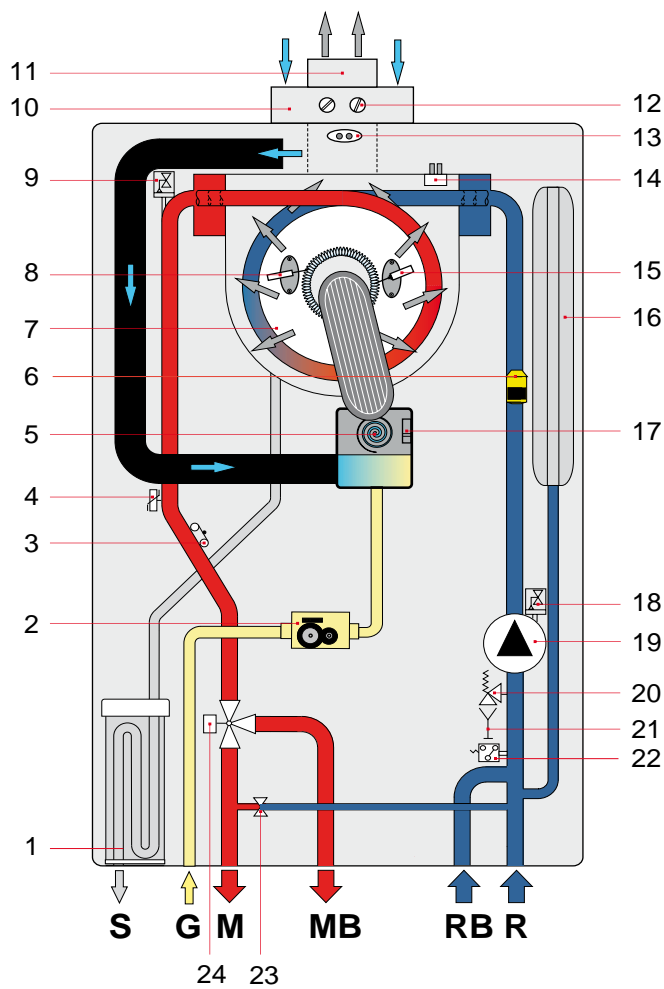


fig. 8

1. Condensate drain siphon
2. Modulating gas valve
3. Safety thermostat
4. CH temperature probe
5. Modulating fan
6. Primary fluid flow meter
7. Primary condensing exchanger
8. Ignition electrode
9. Air purging device
10. Combustion air intake system
11. Flue gas discharge system
12. Flue gas analysis ports
13. Flue gas thermostat on discharge duct
14. Flue gas thermostat on exchanger
15. Flame sensing electrode
16. Expansion vessel
17. Fan management probe
18. Air purging device
19. Pump
20. 3 bar safety valve
21. Unloading tap
22. Minimum pressure switch
23. Loading tap
24. Automatic by-pass

- S** Condensate drain  
**G** Gas intake  
**M** CH system flow  
**F** Water mains intake  
**R** CH system return



1. Condensate drain siphon
2. Modulating gas valve
3. Safety thermostat
4. CH temperature probe
5. Modulating fan
6. Primary fluid flow meter
7. Primary condensing exchanger
8. Ignition electrode
9. Air purging device
10. Combustion air intake system
11. Flue gas discharge system
12. Flue gas analysis ports
13. Flue gas thermostat on discharge duct
14. Flue gas thermostat on exchanger
15. Flame sensing electrode
16. Expansion vessel
17. Fan management probe
18. Air purging device
19. Pump
20. 3 bar safety valve
21. Unloading tap
22. Minimum pressure switch
23. Automatic by-pass
24. Motorized 3-way valve

- S** Condensate drain  
**G** Gas intake  
**M** CH system flow  
**MB** Secondary flow to the boiler  
**RB** Secondary return from the boiler  
**R** CH system return

fig. 9

## 2.4. Operating data

Burner pressures must be verified after a three minute boiler operation time

### KC 24

Function	Max. CH input (kW)	CH output (80-60°C) [kW]		CH output (50-30°C) [kW]		DHW output [kW]		Gas mains pressure [mbar]	Diaphragm diameter [mm]	Flue gas CO <sub>2</sub> [%]
		min	max	min	max	min	max			
Methane Gas G20	23.7	6.5	23.1	7.3	24.8	7.3	28.0	20	7.2	8.8 ÷ 9.1
Propane Gas G31	23.7	6.5	23.1	7.3	24.8	7.3	28.0	37	5.3	9.8 ÷ 10.1

Table 3 – KC 24 model adjustment rates

Hot water supply  $\Delta T$  45°C = 8.9 l/min  
 Hot water supply  $\Delta T$  40°C = 10 l/min  
 Hot water supply  $\Delta T$  35°C = 11.5 l/min

Hot water supply  $\Delta T$  30°C = 13.4 l/min \*  
 Hot water supply  $\Delta T$  25°C = 16.1 l/min \*  
**\*Note: mixed water to the tap**

### KC 28

Function	Max. CH input (kW)	CH output (80-60°C) [kW]		CH output (50-30°C) [kW]		DHW output [kW]		Gas mains pressure [mbar]	Diaphragm diameter [mm]	Flue gas CO <sub>2</sub> [%]
		min	max	min	max	min	max			
Methane Gas G20	26.2	5.4	25.55	6.1	27.4	6.1	31.0	20	7.2	8.8 ÷ 9.1
Propane Gas G31	26.2	5.4	25.55	6.1	27.4	6.1	31.0	37	5.3	9.8 ÷ 10.1

Table 4 - KC 28 model adjustment rates

Hot water supply  $\Delta T$  45°C = 9.9 l/min  
 Hot water supply  $\Delta T$  40°C = 11.1 l/min  
 Hot water supply  $\Delta T$  35°C = 12.7 l/min

Hot water supply  $\Delta T$  30°C = 14.8 l/min \*  
 Hot water supply  $\Delta T$  25°C = 17.8 l/min \*  
**\*Note: mixed water to the tap**

### KC 32

Function	Max. CH input (kW)	CH output (80-60°C) [kW]		CH output (50-30°C) [kW]		DHW output [kW]		Gas mains pressure [mbar]	Diaphragm diameter [mm]	Flue gas CO <sub>2</sub> [%]
		min	max	min	max	min	max			
Methane Gas G20	31.4	8.7	30.63	9.6	33.2	9.6	35.4	20	8.4	8.8 ÷ 9.1
Propane Gas G31	31.4	8.7	30.63	9.6	33.2	9.6	35.4	37	6.0	9.8 ÷ 10.1

Table 5 - KC 32 model adjustment rates

Hot water supply  $\Delta T$  45°C = 11.3 l/min  
 Hot water supply  $\Delta T$  40°C = 12.7 l/min  
 Hot water supply  $\Delta T$  35°C = 14.5 l/min

Hot water supply  $\Delta T$  30°C = 16.9 l/min \*  
 Hot water supply  $\Delta T$  25°C = 20.3 l/min \*  
**\*Note: mixed water to the tap**

### KR 24/KRB 24

Function	Max. CH input (kW)	CH output (80-60°C) [kW]		CH output (50-30°C) [kW]		Gas mains pressure [mbar]	Diaphragm diameter [mm]	Flue gas CO <sub>2</sub> [%]
		min	max	min	max			
Methane Gas G20	23.7	6.5	23.1	7.3	24.8	20	7.2	8.8 ÷ 9.1
Propane Gas G31	23.7	6.5	23.1	7.3	24.8	37	5.3	9.8 ÷ 10.1

Table 6 - KR 24/KRB 24 model adjustment rates

### KR28/KRB 28

Function	Max. CH input (kW)	CH output (80-60°C) [kW]		CH output (50-30°C) [kW]		Gas mains pressure [mbar]	Diaphragm diameter [mm]	Flue gas CO <sub>2</sub> [%]
		min	max	min	max			
Methane Gas G20	26.2	5.4	25.5	6.1	27.4	20	7.2	8.8 ÷ 9.1
Propane Gas G31	26.2	5.4	25.5	6.1	27.4	37	5.3	9.8 ÷ 10.1

Table 7 - KR 28/KRB 32 model adjustment rates

### KR 32/KRB 32

Function	Max. CH input (kW)	CH output (80-60°C) [kW]		CH output (50-30°C) [kW]		Gas mains pressure [mbar]	Diaphragm diameter [mm]	Flue gas CO <sub>2</sub> [%]
		min	max	min	max			
Methane Gas G20	31.4	8.7	30.63	9.6	33.2	20	8.4	8.8 ÷ 9.1
Propane Gas G31	31.4	8.7	30.63	9.6	33.2	37	6.0	9.8 ÷ 10.1

Table 8 - KR 32/KRB 32 model adjustment rates

## 2.5. General characteristics

Models KC/KR/KRB		24	28	32
Equipment category	-	I12H3P	I12H3P	I12H3P
Minimum CH system pressure	bar	0.5	0.5	0.5
Maximum CH system pressure	bar	3	3	3
Minimum DHW system pressure	bar	0.5	0.5	0.5
Maximum DHW system pressure	bar	8	8	8
DHW specific flow rate ( $\Delta t$ 30 °C)	l/min	13.5	14.4	16.5
Electric power supply – voltage / frequency	V - Hz	230 - 50	230 - 50	230 - 50
Power mains supply fuse	A	2	2	2
Maximum power consumption	W	145	145	145
Electric protection rating	IP	X4D	X4D	X4D
Net weight	kg	38.5	39.2	40.0
Methane gas consumption at maximum CH input (*)	m <sup>3</sup> /h	2.51	2.77	3.32
Propane gas consumption at maximum CH input	kg/h	1.84	2.03	2.44
Maximum CH working temperature	°C	83	83	83
Maximum DHW working temperature	°C	62	62	62
Total capacity of expansion vessel	l	10	10	10
Maximum recommended CH system capacity (**)	l	200	200	200

Table 9 - KC/KR/KRB model general specifications

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

(\*\*) Maximum water temperature 83°C, expansion vessel pressure 1 bar

KC 24/KR 24/KRB 24		Max. heat output	Min. heat output	30% heat output
Casing heat loss with burner on	%	1.4	2.1	-
Casing heat loss with burner off	%		0.2	
Chimney heat loss with burner on	%	2.6	2.2	-
Flue gas system mass flow rate	g/s	12.4	3.1	-
Flue gas temp. – air temp	°C	67	49	-
Maximum heat output efficiency rating (60/80°C)	%	97.5	-	-
Maximum heat output efficiency rating (30/50°C)	%	104.8	-	-
Minimum heat output efficiency rating (60/80°C)	%	-	95.7	-
Minimum heat output efficiency rating (30/50°C)	%	-	106.9	-
30% heat output efficiency rating	%	-	-	109.1
Efficiency rating (according to 92/42/CEE)	-		★★★★	
NO <sub>x</sub> emission class	-		5	

Table 10 - KC 24/KR 24/KRB 24 model combustion rates

KC 28/KR 28/KRB 28		Max. heat output	Min. heat output	30% heat output
Casing heat loss with burner on	%	0.9	2.3	-
Casing heat loss with burner off	%		0.3	
Chimney heat loss with burner on	%	2.5	2.2	-
Flue gas system mass flow rate	g/s	13.9	3.1	-
Flue gas temp. – air temp	°C	51.2	45	-
Maximum heat output efficiency rating (60/80°C)	%	97.53	-	-
Maximum heat output efficiency rating (30/50°C)	%	105.4	-	-
Minimum heat output efficiency rating (60/80°C)	%	-	95.5	-
Minimum heat output efficiency rating (30/50°C)	%	-	106.7	-
30% heat output efficiency rating	%	-	-	108.9
Efficiency rating (according to 92/42/CEE)	-		★★★★	
NO <sub>x</sub> emission class	-		5	

Table 11 - KC 28/KR 28/KRB 28 model combustion rates

KC 32/KR 32/KRB 32		Max. heat output	Min. heat output	30% heat output
Casing heat loss with burner on	%	0.6	1.6	-
Casing heat loss with burner off	%		0.2	
Chimney heat loss with burner on	%	2.4	2.1	-
Flue gas system mass flow rate	g/s	15.7	4.1	-
Flue gas temp. – air temp	°C	54	51	-
Maximum heat output efficiency rating (60/80°C)	%	97.57	-	-
Maximum heat output efficiency rating (30/50°C)	%	105.4	-	-
Minimum heat output efficiency rating (60/80°C)	%	-	96.3	-
Minimum heat output efficiency rating (30/50°C)	%	-	106.3	-
30% heat output efficiency rating	%	-	-	108.7
Efficiency rating (according to 92/42/CEE)	-		★★★★	
NO <sub>x</sub> emission class	-		5	

Table 12 - KC 32/KR 32/KRB 32 model combustion rates

### 3. Instructions for the fitter

#### 3.1. Installation standards

This is an I12H3P category boiler and must be installed in compliance with laws and standards enforced 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 of must be managed via appropriate waste collection sites.

Keep packaging out of reach of children, as it may be dangerous.

Manufacturer shall not be held responsible for harm to people and/or animals, and/or damage to property due to failure in following the above mentioned instructions.

Packaging includes:

- for model KRB two interception valves: one for gas and one for connection to the water heater, the latter fitted with the system loading tap;
- copper pipe kit for boiler connection to the gas mains, to the CH system (KC and KR) and DHW system (KC);
- for model KRB two interception valves: one for gas and one for connection to the water heater, the latter fitted with the system loading tap;
- wall hanging bracket;
- a bag containing:
  - a) boiler installation, use and maintenance manual.
  - b) boiler wall mounting template (fig. 8).
  - c) two screws and wall plugs for fixing the metal plate to the wall.

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

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

- 3.2.6. "Air intake /flue gas discharge system" instructions and following paragraphs;
- check the wall for sturdiness, avoiding weak areas;
- do not hang the boiler above any equipment which may prejudice proper operation (steam and greasy vapor emitting kitchen appliances, washing machines, etc.).

##### 3.2.3. Positioning the boiler

Each boiler is supplied with a paper template (fig. 10), within its packaging, allowing arrangement of CH pipe system, DHW pipe system, gas supply pipe system and air intake/flue gas discharge system **before actually installing 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 fixing holes to the wall, procedure which is done using two screws and wall plugs.

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

The upper area of the template displays 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.**

**Boilers with split pipe flue system: in presence of flammable walls and flue gas ducts through such walls, ensure proper insulation between wall and flue gas ducts.**

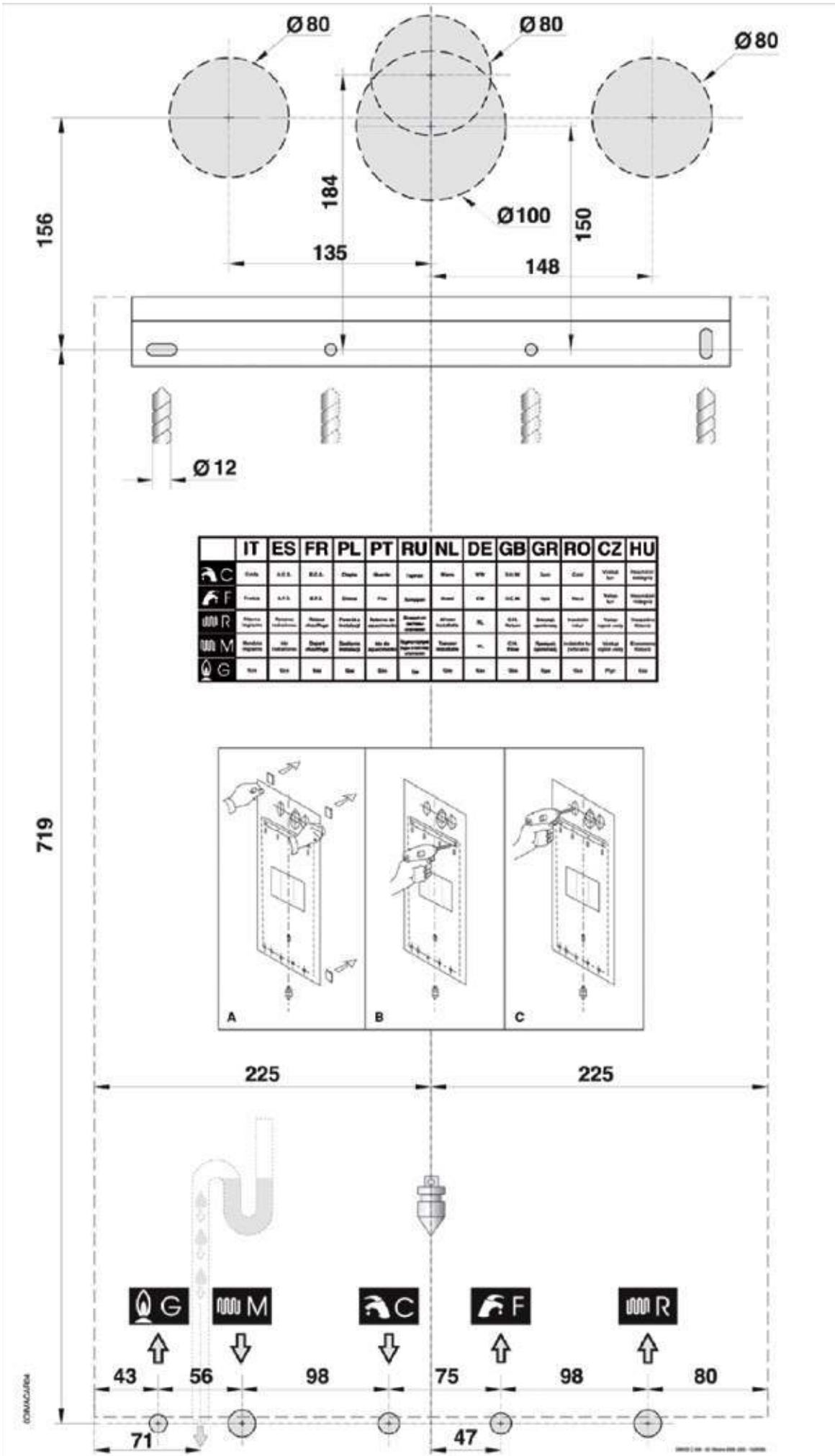


fig. 10

### 3.2.4. Installing the boiler



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

**Prior to operate a NEW system eliminate any metallic leftover during manufacturing and welding process, and any oil or grease deposits, which might reach the boiler and damage it or alter its operation.**

**Prior to operate a MODERNIZED system (addition of radiators, boiler replacement, etc.), clean it throughout so as to remove possible sludge and foreign particles.**

**In order to clean the system, employ non acid product available on the market. Do not use solvents as they could damage system components.**

**Furthermore, in the central heating system (either new or modernized), it is always advisable to add to water, with adequate concentration, suitable products inhibiting corrosion in multi-metal systems, which produce a protective film on internal metal surfaces.**

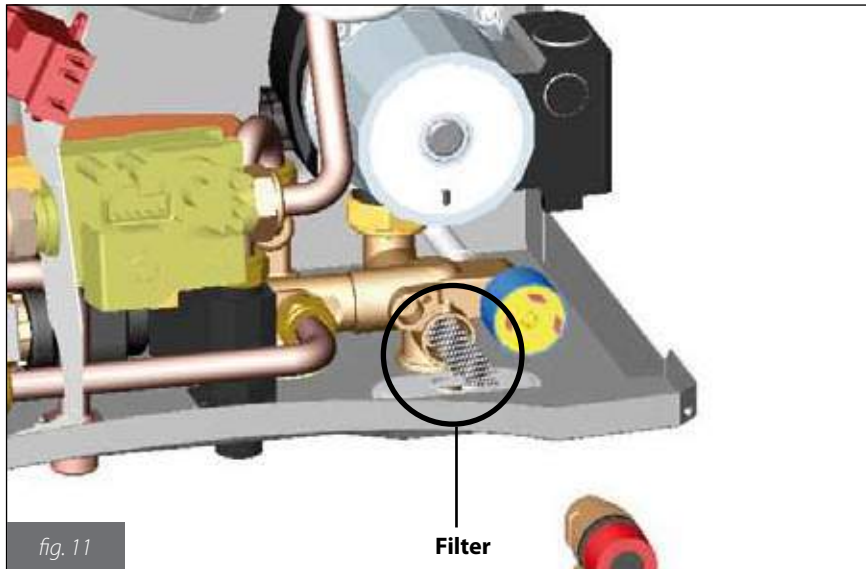
**Manufacturer shall not be held responsible in case of harm to people and/or animals, or property damage due to failure in adhering to the above stated instructions.**

The boiler is fitted with a filter (fig. 11) whose function is to prevent the main heat exchanger pipes from obstructing, due to deposits that may form in the heating system.

Such filter is not sufficient to prevent deposits of such materials to form inside the boiler. To this purpose, please note that:



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



In order to install the boiler proceed as follows:

- affix the template (fig. 10) to the wall;
- drill two 12 mm Ø holes in the wall to accommodate the boiler support bracket wall plugs;
- arrange air intake/flue gas system path in the wall as needed;
- secure boiler support bracket to the wall by means of the wall plugs supplied with the boiler;
- position gas supply network coupling **G**, water mains supply coupling **F** (KC and KR models), **RB** secondary return from the boiler (only KRB model), DHW flow coupling **C** (only in KC model), **MB** secondary flow to the boiler (only KRB model), CH flow coupling **M**, and CH return coupling **R**, as shown on the template (refer to its lower area);
- provide a system for relieving condensates (S in fig. 10) and an outlet for the 3-bar safety valve (SV in fig. 6);
- position the boiler to the supporting bracket on the wall;
- connect the boiler to network pipes by means of the coupling kit supplied with the boiler (refer to 3.2.9. paragraph);
- connect the boiler to pipe for condensate discharge (refer to 3.2.9. paragraph);
- provide a system for relieving the 3-bar safety valves;
- connect the boiler to the air intake and flue gas exhaust system (refer to 3.2.6. paragraph and following);
- connect electric power supply, room thermostat (when available) and other available accessories (refer to the following paragraphs).

### 3.2.5. Boiler room ventilation



The boiler has sealed combustion chamber. Combustion air is not drawn from boiler room, therefore specific recommendations need not to be applied concerning the boiler room or openings and ventilation provided to the boiler room.




**It is mandatory to install the boiler in an adequate room following laws and standards applicable in the country of installation, which are considered as fully transcribed in this manual.**

### 3.2.6. Air intake / flue gas discharge system

Flue gas discharge into the atmosphere must comply with applicable laws and standards in the country of installation.

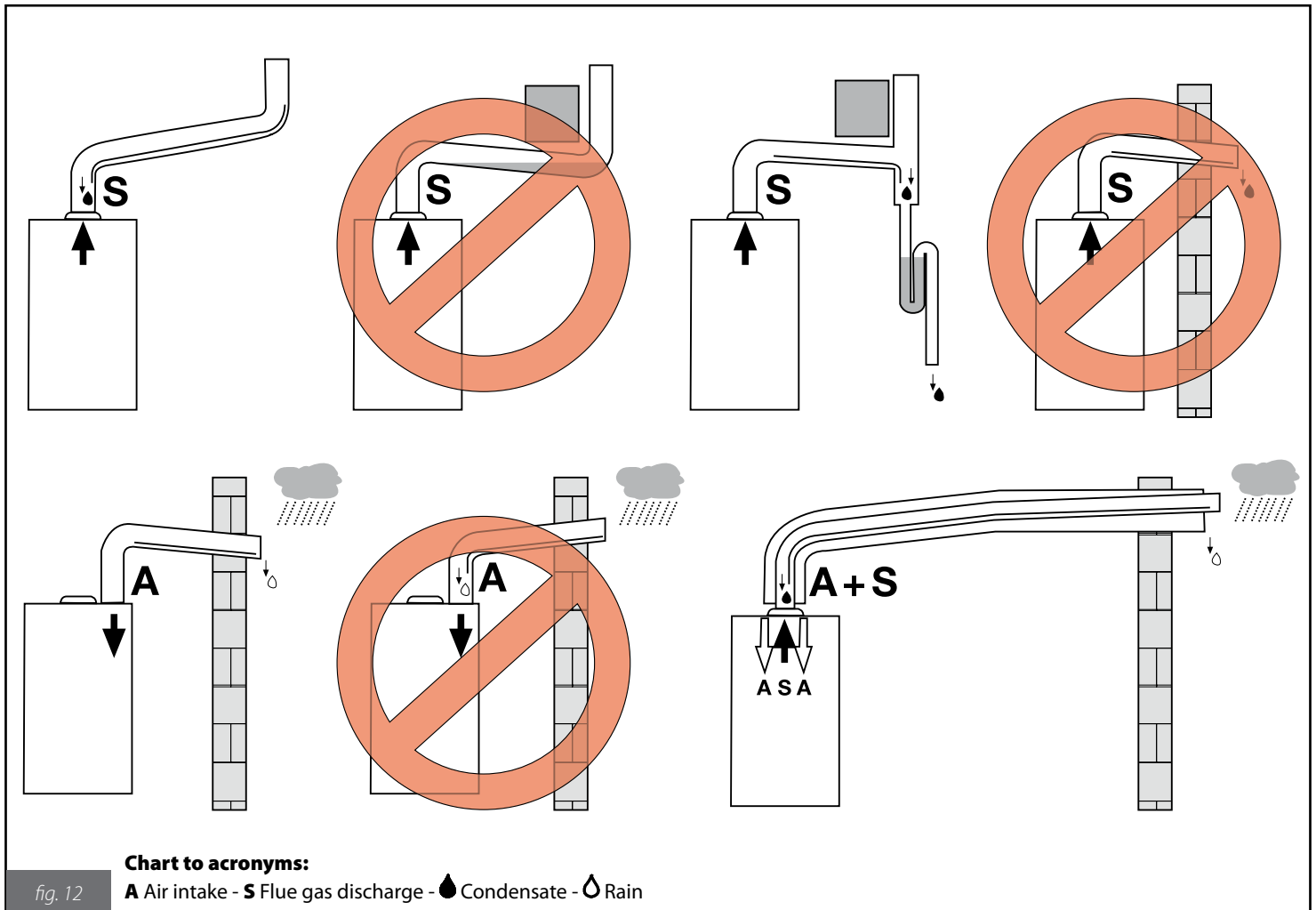
 **The boiler is equipped with safety devices checking correct flue gas exhaustion. Should an air/flue gas system malfunction occur, the safety devices shut down the boiler and the LCD will display the burner shutdown symbol  and flashing E03 code. It is strictly forbidden to tamper with and/or prevent operation of such safety devices. Should the boiler repeatedly shut down, it is necessary to have air/flue gas system ducts inspected, as they might be obstructed or inadequate to flue gas discharge into the atmosphere.**

 **In air intake/flue gas discharge systems, specific, manufacturer approved, condensate acid-resistant systems for condensing boiler are to be used.**

 **Flue gas discharge pipes are to be installed tilted toward the boiler so that condensate runs in the direction of the combustion chamber, which is designed for condensate collection and drainage. Should the above procedure not be possible to be implemented, it is necessary to install, in condensate stagnation areas, devices designed for condensate collection and conveying to the condensate drain system. It is necessary to avoid formation of condensate stagnation areas in the flue gas discharge system, with the exception of the condensate drain siphon eventually connected to the discharge system itself.**

**The manufacture shall not be held liable for damage resulting in incorrect installation, use, modification of the equipment or non-observance of instructions provided by the manufacturer or applicable installation standards involving the product.**

#### Installation examples





### **3.2.6.1. Air/flue gas system duct configuration**

#### **Type B23**

Boiler intended for connection to an existing flue system external to the boiler room.

Combustion air is taken directly from the boiler room itself while flue gas is conveyed to the outside.

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

#### **Type B53**

Boiler intended for connection, via an independent duct, to the flue gas discharge terminal.

Air intake combustion air is taken directly from the boiler room itself while flue gas is conveyed to the outside.

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

#### **Type C13**

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

The distance between the air intake duct and the flue gas outlet duct is to be a minimum of 250 mm, and both terminals are to be positioned within a squared area having 500 mm sides.

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

#### **Type C33**

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

The distance between air intake duct and flue gas flue duct is to be a minimum of 250 mm, and both ends are to be positioned within a squared area having 500 mm sides.

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

#### **Type C43**

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 flue gas chimney system must comply with current standards.

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

#### **Type C53**

Boiler with separate pipes for air intake and flue gas.

Air and flue gas may have different exhaustion pressure. Air and flue gas terminals may not face each other from opposite walls.

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


#### **Type C83**

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

Flue gas chimney must comply with current standards.

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

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

 The above data are referred to air intake/flue gas exhaust systems which are implemented by means of smooth, rigid manufacturer approved and supplied pipes.

#### Type C13

##### KC 24, KR 24 and KRB 24

Minimum permissible length of horizontal coaxial pipes is 1 meter, without accounting for the first elbow connected to the boiler.  
Maximum permissible length of Ø 100/60 mm horizontal coaxial pipes is 9.5 meter not including the first elbow connected to the boiler.  
Maximum permissible length of Ø 125/80 mm horizontal coaxial pipes is 14.5 meter not including the first elbow connected to the boiler.  
For each additional 1 meter straight pipe maximum permissible length is to be reduced by 1 meter.  
For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.  
For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.  
The wall terminal reduces maximum permissible length by 1.5 meters.  
The air intake duct is to be tilted by 1% toward its exit, in order to avoid rain water to enter it.

##### KC 28, KR 28 and KR 28

Minimum permissible length of horizontal coaxial pipes is 1 meter, without accounting for the first elbow connected to the boiler.  
Maximum permissible length of Ø 100/60 mm horizontal coaxial pipes is 7.5 meter not including the first elbow connected to the boiler.  
Maximum permissible length of Ø 125/80 mm horizontal coaxial pipes is 11 meter not including the first elbow connected to the boiler.  
For each additional 1 meter straight pipe maximum permissible length is to be reduced by 1 meter.  
For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.  
For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.  
The wall terminal reduces maximum permissible length by 1.5 meters.  
The air intake duct is to be tilted by 1% toward its exit, in order to avoid rain water to enter it.

##### KC 32, KR 32 and KRB 32

Minimum permissible length of horizontal coaxial pipes is 1 meter, without accounting for the first elbow connected to the boiler.  
Maximum permissible length of Ø 100/60 mm horizontal coaxial pipes is 6.5 meter not including the first elbow connected to the boiler.  
Maximum permissible length of Ø 125/80 mm horizontal coaxial pipes is 11.5 meter not including the first elbow connected to the boiler.  
For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.  
For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.  
For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.  
The wall terminal reduces maximum permissible length by 1.5 meters.  
The air intake duct is to be tilted by 1% toward its exit, in order to avoid rain water to enter it.

#### Type C33

##### KC 24, KR 24 and KRB 24

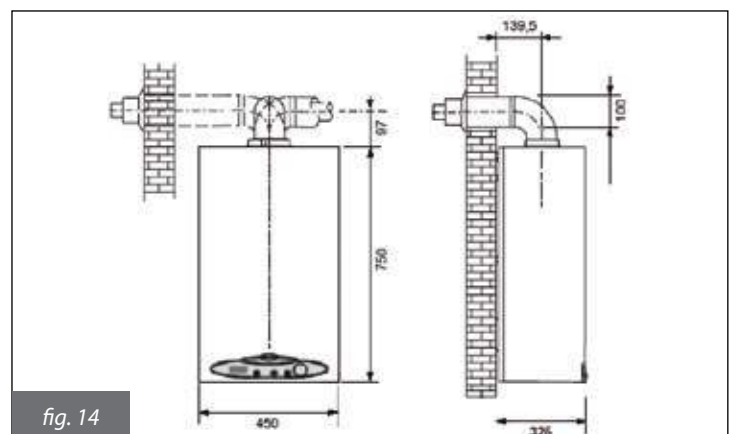
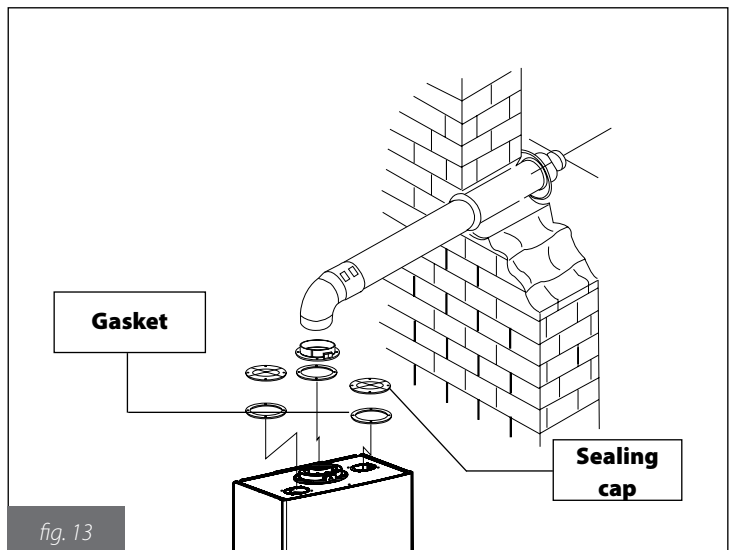
Minimum permissible length of vertical coaxial pipes is 1 meter.  
Maximum permissible length of Ø 100/60 mm vertical coaxial pipes is 9.5 meters.  
Maximum permissible length of Ø 125/80 mm vertical coaxial pipes is 14.5 meters.  
For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.  
For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.  
For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.  
The roof terminal reduces maximum permissible length by 1.5 meters.

##### KC 28, KR 28 and KRB 28

Minimum permissible length of vertical coaxial pipes is 1 meter.  
Maximum permissible length of Ø 100/60 mm vertical coaxial pipes is 7.5 meters.  
Maximum permissible length of Ø 125/80 mm vertical coaxial pipes is 11 meters.  
For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.  
For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.  
For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.  
The roof terminal reduces maximum permissible length by 1.5 meters.

##### KC 32, KR 32 and KRB 32

Minimum permissible length of vertical coaxial pipes is 1 meter.  
Maximum permissible length of Ø 100/60 mm vertical coaxial pipes is 6.5 meters.  
Maximum permissible length of Ø 125/80 mm vertical coaxial pipes is 11.5 meters.  
For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.  
For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.  
For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.  
The roof terminal reduces maximum permissible length by 1.5 meters.



### 3.2.6.3. Ø 80 mm air/flue gas split duct system

 The above data are referred to air intake/flue gas exhaust systems which are implemented by means of smooth, rigid manufacturer approved and supplied pipes.

#### Installation types C43 - C53 - C83

##### KC 24, KR 24 and KRB 24 - KC 28, KR 28 and KRB 28 - KC 32, KR 32 and KRB 32

Minimum permissible length of air intake pipe is 1 meter.

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

Maximum permissible length of air intake/flue gas discharge pipes is 120 meters (combined length of air intake and flue gas discharge pipe length).

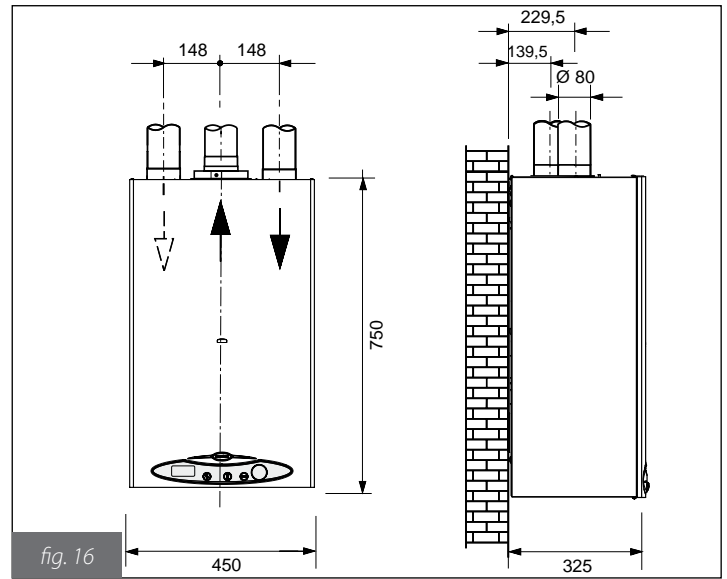
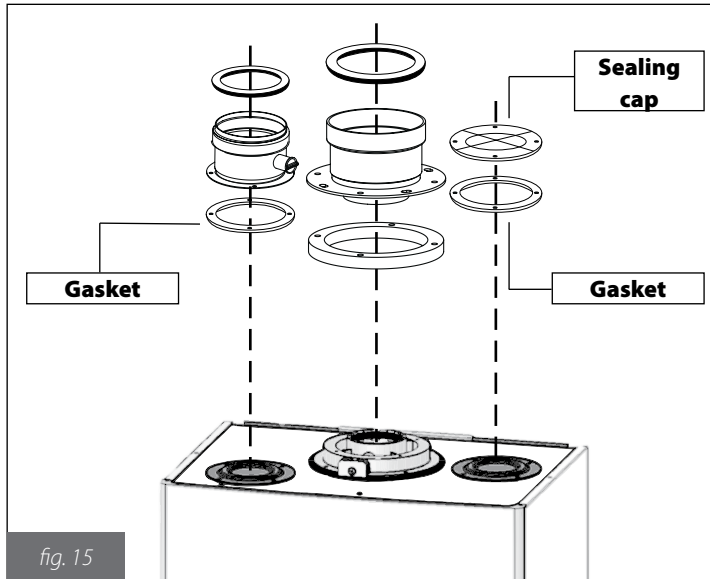
For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

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

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

The roof terminal reduces maximum permissible length by 1.5 meters.

The wall terminal reduces maximum permissible length by 1 meter.



### 3.2.7. Testing combustion efficiency

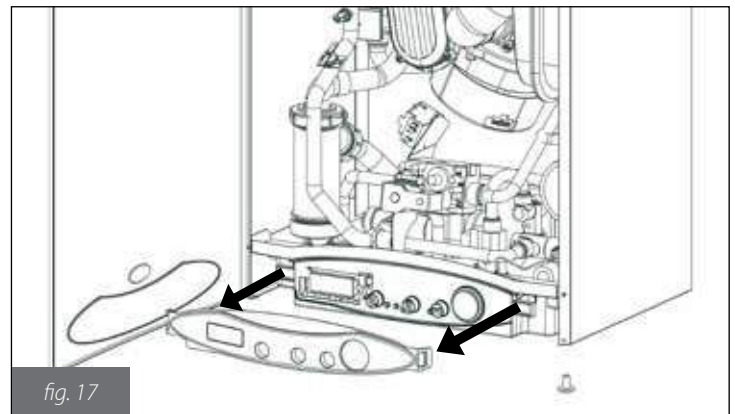
#### 3.2.7.1. "Chimney sweep" function



The boiler is equipped with "chimney sweep" function, to be used when testing combustion efficiency, and in order to adjust the burner.

To activate this function, it is necessary to open the front section of the casing for access to the controls. Proceed as follows:

- Unscrew two of the four screws securing the casing – either those on the left or those on the right.
- Open the casing.
- Remove the control panel mask by pulling the hooks on either side outwards and pulling the mask towards you (fig. 17).

The control panel is represented in fig. 18.



When no. 2 selector (fig. 1) is positioned to WINTER, and room thermostat (if available) to ON, while the boiler is operating, press "chimney sweep" button  (fig. 18) for some seconds; the boiler turns off and resumes the ignition sequence again to the fixed heat output corresponding to setting of max heating output adjuster  max (fig. 18), which allows for adjustment of maximum CH output. "Chimney sweep" function operates for 15 minutes.

In order to exit the "chimney sweep" function, set no. 2 selector to any position other than WINTER.

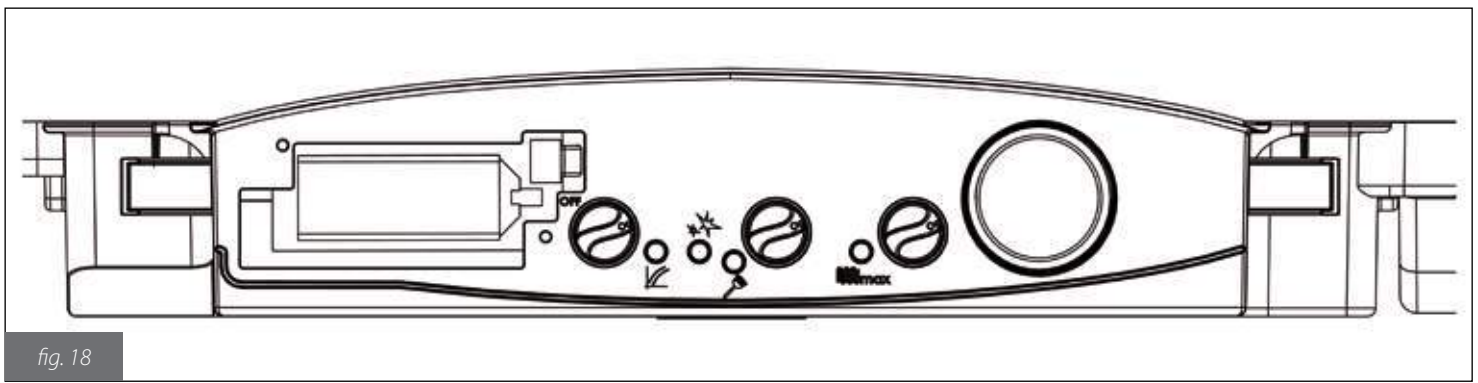


fig. 18

### 3.2.7.2. Measurement procedure

The boiler is equipped with a tower allowing for air intake/flue gas discharge duct connection (fig. 19 and 20). The tower is designed with two pre-arranged openings directly accessing air and flue gas ducts (fig. 20).

Remove cap A from the pre-arranged openings on the tower, before starting combustion checking procedure (fig. 19).

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

- assess combustion air from no. 1 opening (fig. 20).
- assess flue gas temperature and CO<sub>2</sub> from no. 2 opening (fig. 20).

Allow boiler to reach working temperature before performing any measurement.

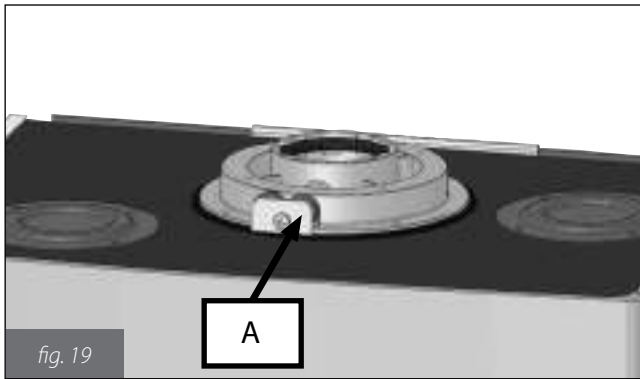


fig. 19

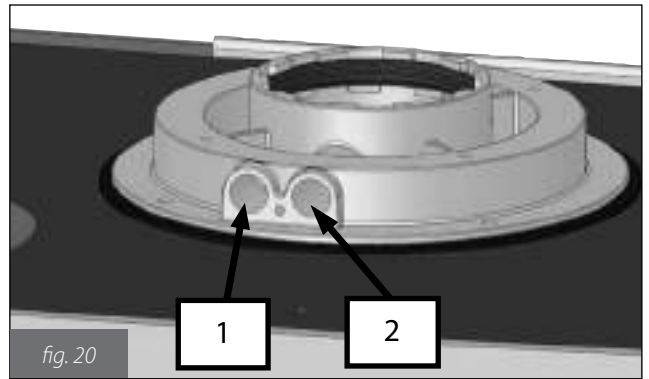


fig. 20

### 3.2.8. Gas mains connection

Gas supply pipe cross-section must be equal or greater than boiler gas pipe.

Cross-section gas pipe size calculation depends on its length, layout pattern, gas flow rate. Gas pipe size is to be dimensioned accordingly.

**Comply with installation standards enforced in the installation country 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.**

**Adhere to the following leak test instructions:**

- leak test is to be carried out before pipes are covered;
- leak test is NOT to be carried out employing flammable gas: use air or nitrogen for this purpose;
- when gas is already in the pipes supplying the boiler, leak testing by 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 and made gasket (fig. 21). The boiler gas inlet thread configuration is NOT appropriate for hemp, plastic tape or similarly made gaskets.**

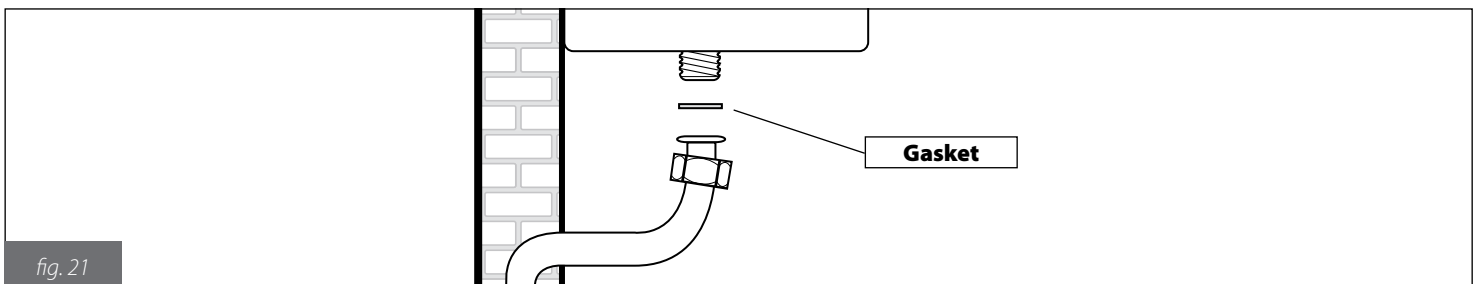


fig. 21

### 3.2.9. 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.

#### CENTRAL HEATING

CH flow and CH return pipes must be connected to the relevant 3/4" **M** and **R** couplings on the boiler (fig. 6 and 10).

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 (only KC model)

DHW flow and water mains inlet pipes are to be connected to the relevant 1/2" **C** and **F** couplings on the boiler (fig. 6 and 10).

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



**Depending on hardness level of the water supplied, it might be necessary to install a suitable water treatment device for domestic use and in compliance with applicable laws and standards. Water treatment is always advisable when water supplied to the boiler is more than 20°F hard. Water treated by commonly marketed water softeners, due to PH level induced in water, may not be compatible with some components of the system.**

#### WATER HEATER (Model KRB)

In model KRB the secondary flow to the water heater and the secondary return from the water heater must be connected to 1/2" **MB** and **RB** connections (fig. 6) which are indicated with letters C and F in picture 10.



**With model KRB do not convey water from connection MB (fig.6) to the DHW system.**

#### CONDENSATE DRAIN

Comply with condensate drain laws and standards applicable in the country of installation, which are considered herein integrally transcribed. When the law is not stating differently, the condensate produced by combustion is to be routed (via the condensate drain **S** in fig. 6) through a discharge system connected to the domestic sewer, which due to its basicity, counteracts flue gas condensate acidity.

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

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

Manufacturer shall not be held responsible for any damage to people, animals or objects, resulting as failure in observing the above mentioned technical precaution.

### 3.2.10. Power mains connection

The boiler is supplied with a three-poled power cable, already connected to the electronic board and it is provided with an anti-rupture firming 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 are which are considered herein integrally transcribed.

An easy accessible two-poled switch is to be installed externally to the boiler, in an easy-to-reach position. The switch minimum distance between contacts is to be 3 mm. The switch is necessary to allow power supply interruption in order to safely perform maintenance and service procedures.

Power supply to the boiler is to be fitted with a differential magnetic-thermal automatic switch of appropriate shut-down capacity.

Electrical power supply is to be appropriately earthed. The above mentioned safety measure is to be verified. When in doubt, ask a qualified technician to thoroughly check the power network.



**The manufacturer shall not be held responsible for any damage due to failure in grounding the system: gas, hydraulic, or CH system pipes are NOT suitable for grounding power networks.**

### 3.2.11. Selecting central heating output range

CH water temperature adjusting choice depends on selected operation range:

- standard range: from 20°C to 78°C (from full counter-clockwise position to full clockwise position);
- reduced range: from 20°C to 45°C (from full counter-clockwise position to full clockwise position).

Act on thermoregulation trimmer (↻ in fig. 18) in order to choose the operation range, as per the following instruction:

- standard range: turn trimmer ↻ fully clockwise;
- reduced range: turn trimmer ↻ fully counter-clockwise.

When the external probe is installed, trimmer ↻ is used to select the thermoregulation curve as well (see paragraph 3.2.14).

Central heating output range selection also alters the waiting time between ignition sequences (thus preventing frequent ignition and switching off of the boiler), when in CH mode.

- standard range: 4 minutes;
- reduced range: 2 minutes.

Selected range		Re-ignition temperature
Standard range	Set-point > 55°C Set-point ≤ 55°C	< 40°C Tset-point - Tflow > 15°C
Reduced range	Regardless of set-point	< 20°C

Table 13 - Burner re-ignition temperatures

Should water temperature in the system fall below a determined value (table 17), waiting time procedure is aborted and the boiler re-ignited. Operation range selection is to be implemented by a fitter or an authorized Service Centre.

### 3.2.12. Room thermostat installation (optional)

The boiler can be connected to a room thermostat (optional).

The contacts must be properly sized in relation to a 5 mA 24 VDC load.

The wires must be connected to terminal M9 on the circuit board (fig. 23), after removing the jumper supplied standard with the boiler.

**Room thermostat wires must NOT be grouped together with the power supply cables.**

### 3.2.13. Installation of the OpenTherm remote control (optional)

The boiler can be connected to an OpenTherm remote control, an optional supplied by the manufacturer.

**The remote control must be installed by a suitably qualified person.**



**Only original remote controls supplied by the manufacturer must be used.  
If non-original remote controls are used, correct operation of the boiler cannot be guaranteed.**

For installation instructions, refer to the booklet accompanying the remote control.

Precautions to take when installing the remote control:

- **The remote control cables must NOT be routed together with power cables:** otherwise the disturbance would cause the remote control to malfunction.
- Position the remote control on a wall inside the building, about 1.5 metres from the floor, in a suitable position for measuring the environmental temperature.
- Do not install in alcoves, behind doors or curtains, near sources of heat, or exposed to sunlight, draughts or spray.

The remote control connection is protected against false polarity, which means the connections can be switched.

Once the remote control has been installed, position the boiler selector (2 in fig. 1) in WINTER position.

The activation and deactivation of the heating and domestic hot water functions are operated directly by the remote control.

**If the boiler selector is kept in a position other than WINTER, the correct functioning of the boiler and of the remote control are not guaranteed.**



Boiler selector on WINTER

**The remote control must not be connected to a 230 V ~ 50 Hz mains supply.**

Refer to the manual included in the remote control Open Therm kit, in order to program it.

A series of parameters, called TSP, reserved to qualified personnel (tables 14 and 15), can be read and set through the remote control. TSP0 parameter sets default data table and restores all original values, cancelling all preceding modifications on single parameters. When the value of a single parameter is detected to be wrong, its value is restored from the default data table. When a parameter is tried to be set to a value out of the allowed range, the new value is rejected and the existing one is kept.

Parameter	Range of values	default values by TSP0 = 1 KC/KR/KRB 24	default values by TSP0 = 2 KC/KR/KRB 28	default values by TSP0 = 3 KC/KR/KRB 32
<b>TSP0</b> Equipment type and default data chart	1 - 3	1	2	3
<b>TSP1</b> Fan speed at burner max. output (DHW)	120 ÷ 250 Hz (3600 ÷ 7500 rpm)	181 Hz (5430 rpm)	195 Hz (5430 rpm)	193 Hz (5790 rpm)
<b>TSP2</b> Fan speed at burner min. output (DHW and CH)	30 ÷ 120 Hz (900 ÷ 3600 rpm)	53 Hz (1590 rpm)	45 Hz (1590 rpm)	56 Hz (1680 rpm)
<b>TSP3</b> Fan speed at burner ignition and spread	30 ÷ 160 Hz (900 ÷ 4800 rpm)	67 Hz (2010 rpm)	67 Hz (2010 rpm)	67 Hz (2010 rpm)
<b>TSP4</b> CH max. output upper limit, adjustable via P4 trimmer	10 ÷ 100 %	84%	83%	90%


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

Parameter	Minimum limit	Maximum limit
<b>TSP5</b> P6 trimmer position	0 (thermoregulation curve = 0,0)	255 (thermoregulation curve = 3,0)
<b>TSP6</b> Fictitious temperature set via adjuster 4 (only when external probe is installed)	15°C	35°C

Table 15 - TSP chart of parameters which can be displayed (these parameters cannot be adjusted via 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 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 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 probe must be connected to terminal M8 on the boiler's printed circuit board (fig. 25).


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

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


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

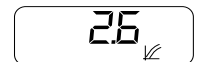
- the outdoor temperature measured
- the thermoregulation curve selected
- the fictitious room temperature selected.

The thermoregulation curve is selected via trimmer  (fig. 22).

During regulation, the LCD displays the thermoregulation symbol  and the set temperature is shown. Such value can also be read as parameter TSP5 on the Remote Control (when installed).

Relation between TSP5 value and thermoregulation curves coefficients: coefficient = TSP5 read value/84.67

In addition, trimmer position  in fig. 22), selects CH operation temperature range in relation to the following values:



TSP5 parameter values which select the reduced range	0 ÷ 75
Coefficients corresponding to thermoregulation curves	0.0 ÷ 0.8
TSP5 parameter values which select the standard range	76 ÷ 255
Coefficients corresponding to thermoregulation curves	1.0 ÷ 3.0

The fictitious room temperature is set via regulator 4 (fig. 1), which loses its CH temperature control function (see subsection 1.4.6.) when the probe is installed and which value can be read as TSP6 parameter on the remote control (when such is installed).

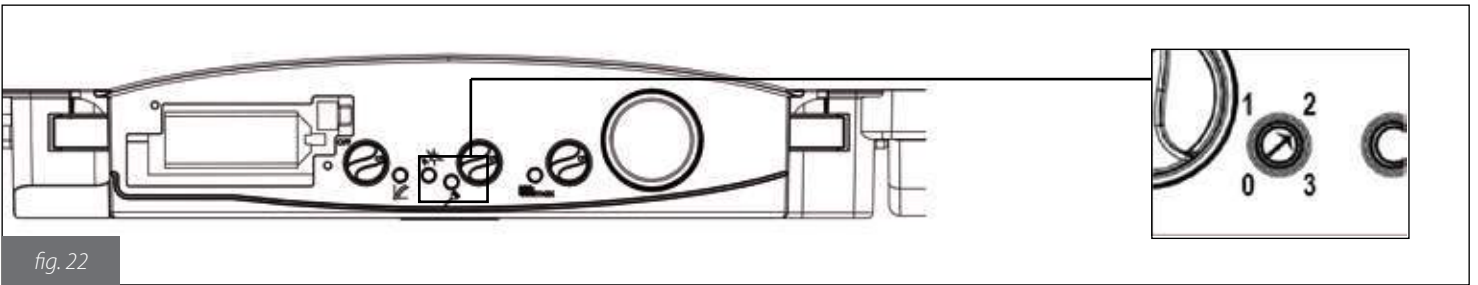


fig. 22

Fig. 23 shows the curves for a fictitious temperature of 20°C.  
 When this value is increased or decreased via regulator **4**, the curves move up or down, respectively.

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

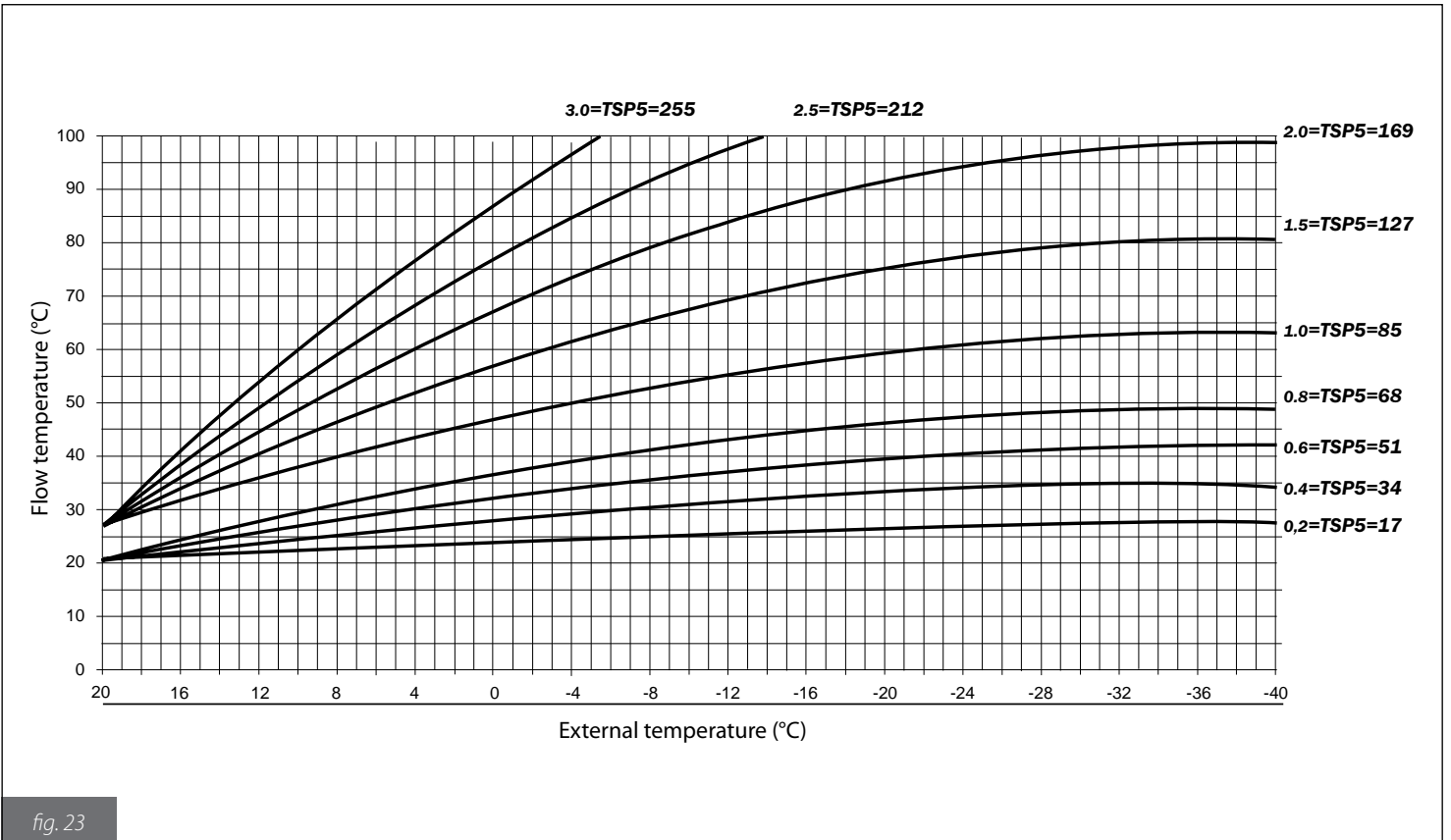


fig. 23



### 3.3. Filling the system

When all the boiler connections have been completed, the CH system can be filled with water.

This must be done with caution, following these steps in sequence.

- Open the air purging valve on all the radiators and check the efficiency of the automatic boiler valve.
- Gradually open the boiler filling tap (fig. 4 and 5) and check that all the automatic air valves work efficiently.
- Close all the radiator valves as soon as water starts to come out.
- Check on the water pressure gauge that the reading is 1-1.3 bar.
- Close the filling tap and open all the valves on the radiators to remove any residual air.
- Start the boiler and as soon as the system reaches the working temperature, stop the pump and repeat the air bleeding procedure.
- Allow the system to cool down, then restore water pressure to 1-1.3 bar.

#### WARNING

**As regards treating water in domestic heating systems, it is advisable to use specific products that are suitable for multi-metal plants, in order to optimize performance and safety, preserve these conditions over time, ensure regular operation of auxiliary equipment as well, and minimize energy consumption, in compliance with the applicable laws and standards.**

#### WARNING

**The low water pressure safety switch will prevent the burner from being started when the water pressure is below 0.4÷0.6 bar.**

**The water pressure in the CH system must not be below 1÷1.3 bar. Restore the correct value as needed and while the water in the system is cold.**

**The boiler pressure gauge shows the water pressure in the system.**

#### WARNING

**If the boiler is not used for a long time, the pump may not work.**

**BEFORE STARTING UP THE BOILER, PERFORM THE FOLLOWING PROCEDURE TO MAKE SURE THAT THE PUMP WORKS.**

- **Unscrew the protection bolt in the centre front section of the pump motor.**
  - **Insert the tip of a screwdriver in the hole and rotate the circulation unit shaft clockwise.**
  - **Once the unblocking operation has been completed, screw the protection bolt back on and check for water leaks.**
- When the protection bolt is removed, some water may flow out. Before re-installing the external housing of the boiler, check that all internal surfaces are dry.**

### 3.4. Starting the boiler

#### 3.4.1. Preliminary checks

Before starting the boiler, perform the following checks:

- The flue gas exhaust pipe and terminal must be installed as instructed. **When the boiler is running, no combustion products must leak from any of the gaskets.**
- Supply power to the boiler must be 230 V – 50 Hz.
- The system must be filled with water (pressure reading on water gauge 1÷1.3 bar).
- All the stopcocks on the pipes must be open.
- The gas supplied to the boiler must be of the type for which the boiler is designed. If necessary, convert the boiler following the instructions in subsection 3.7 - ADAPTATION TO OTHER GASES AND BURNER ADJUSTMENT. This operation must be carried out by a qualified service engineer.
- The gas supply stopcock must be open.
- **There must be no gas leaks.**
- The main power switch must be on.
- The boiler 3-bar safety valve must not be blocked.
- There must be no water leaks.
- The pump must not be blocked.
- The condensate trap installed on the boiler is discharging condensate correctly and is not stuck.



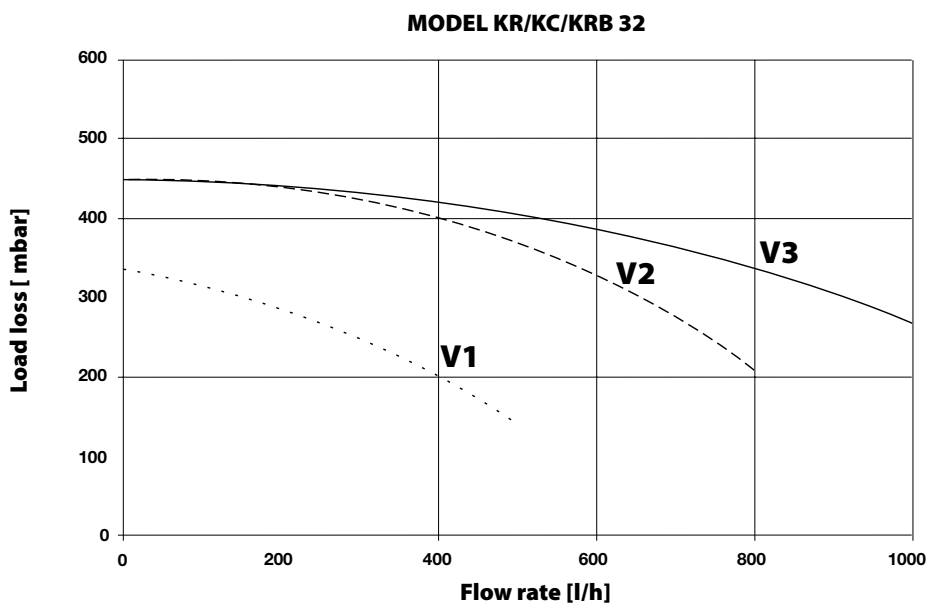
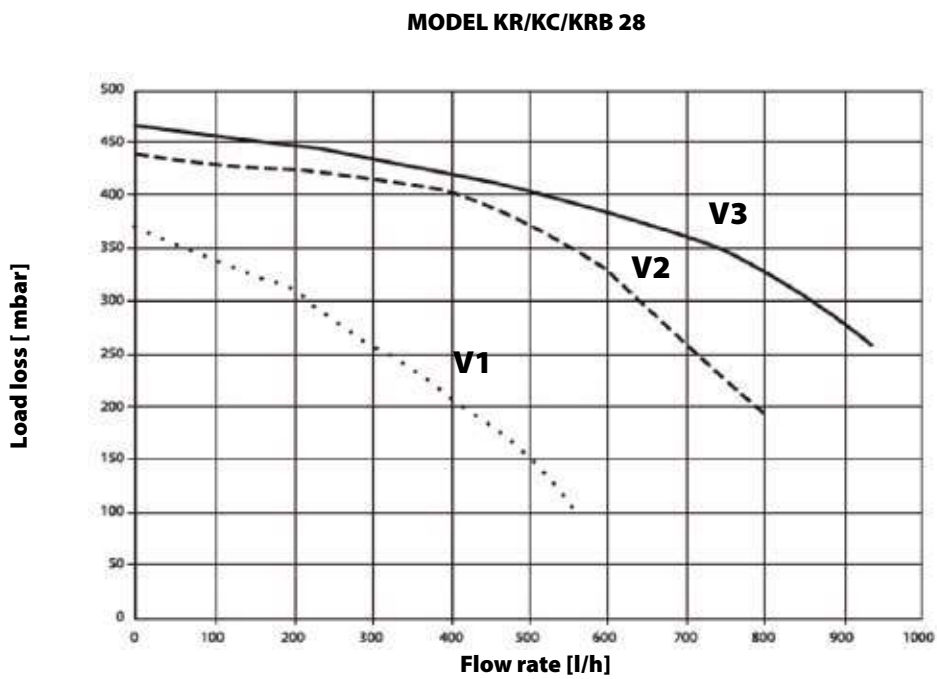
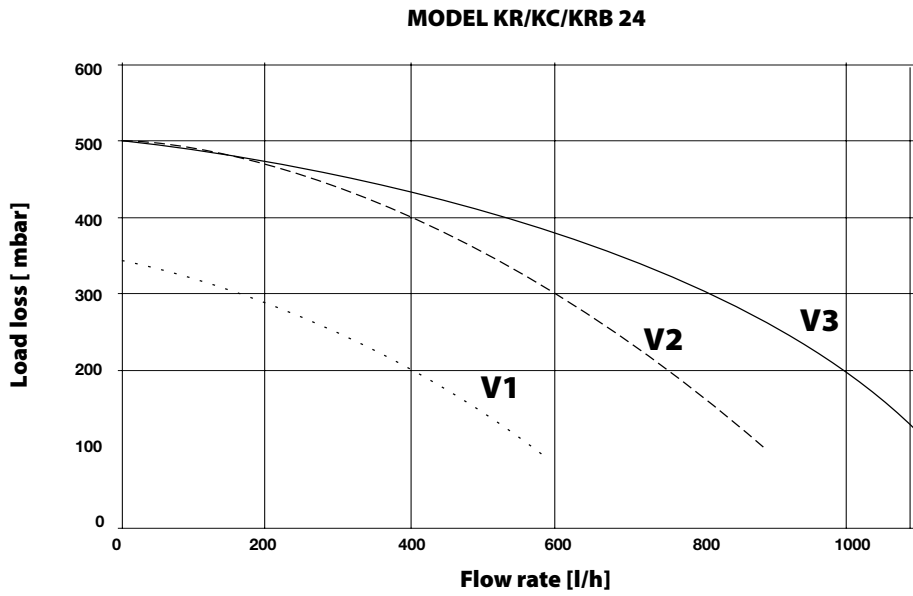
**The boiler is equipped with a three-speed circulation pump corresponding to three different residual heads. It is delivered with the circulation pump on the third speed setting.**

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

#### 3.4.2. Switching on and off

To switch the boiler on and off, refer to the Instructions for the User, in section 1.

### 3.5 Load loss



**Chart to acronyms**

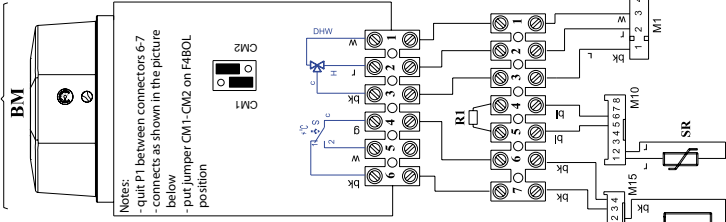
**V1** Pump I speed (min)

**V2** Pump II speed

**V3** Pump III speed (max)

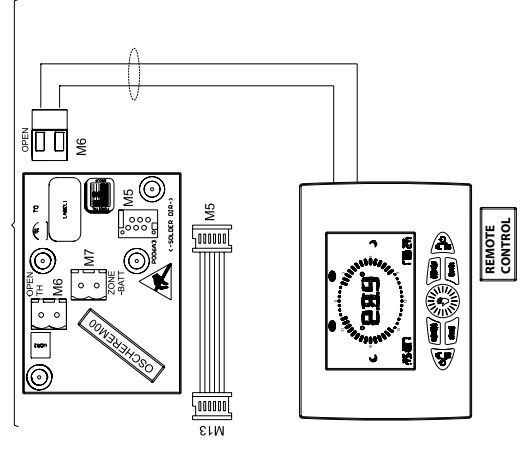
### 3.6. Wiring diagram

Only in KR equipped by external heater with bulb thermostat and 3-way

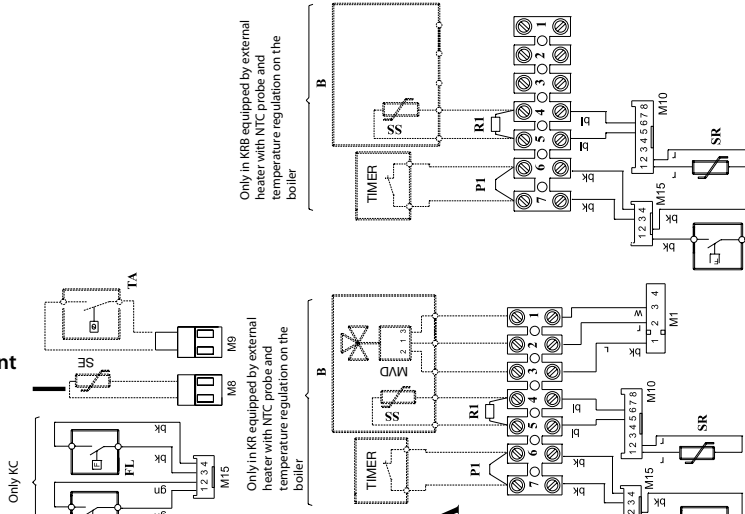


Notes:  
 - cut P1 between connectors 6-7  
 - connects as shown in the picture below  
 - put Jumper CM1-CM2 on F4BOL position

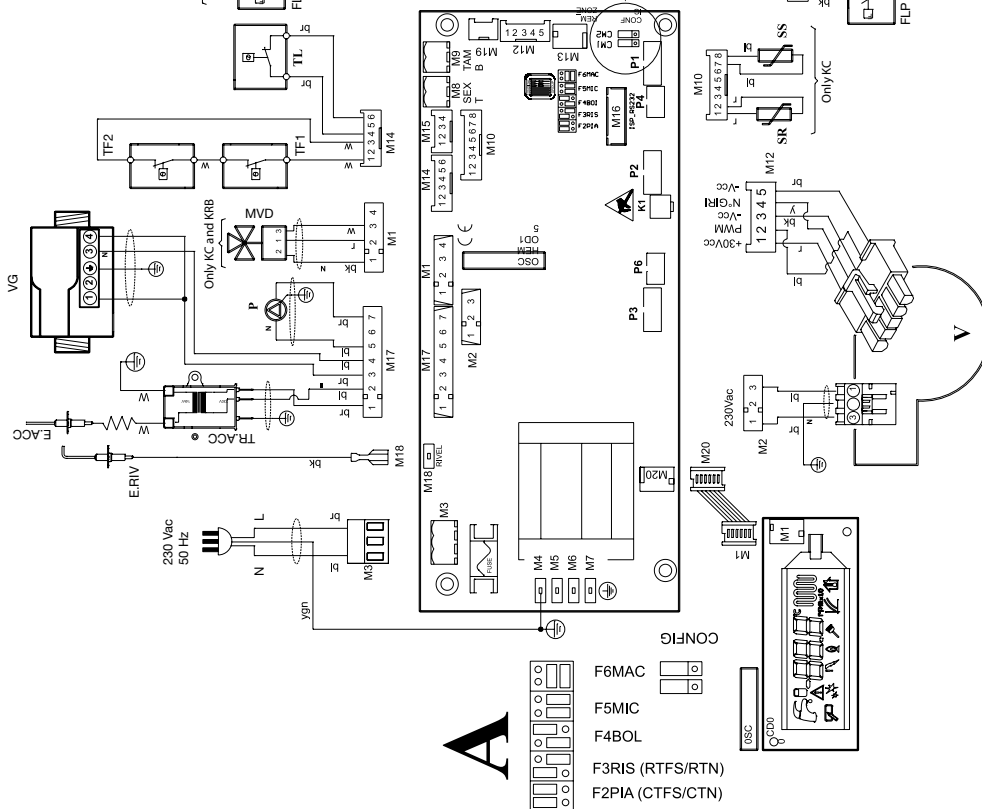
### OPTIONAL: OPENTHERM REMOTE CONTROL



### SE: 0SONDAES01 (for remote controls different from 0CREMOTO02-03)



- IMPORTANT:**
1. It is necessary to cut the TA jumper (connector M9)
  2. In case of thermoregulation with external temperature probe + remote control (0CREMOTO02-03), the external probe must be used (0SONDAES02 and it has to be connected to the external probe terminal M8)
  3. In case of thermoregulation with external temperature probe + remote control different from the 0CREMOTO02-03 the external temp. probe to be used is 0SONDAES01 and it has to be connected to connector M8 on the plate.



**A**

- CONFIG
- F6MAC
  - F5MIC
  - F4BOL
  - F3RIS (RTFS/RTN)
  - F2PIA (CTFS/CTN)

fig. 25

**CHART TO FIG. 21 ACRONYMS**

F2 PIA: mono-thermal heat exchanger boiler  
 F3 RIS: CH only boiler  
 F4 BOL: system boiler  
 F5 MIC: micro-reservoir boiler  
 F6 MAC: encased, "AQUA PREMIUM" boiler  
 M3-M8-M9: power Supply connector, outdoor probe, TA  
 M16: connector for tele-msetting  
 M2-M15: service connectors  
 E.RIV: detection electrode  
 E.ACC: ignition electrode  
 P: pump  
 V: brushless fan  
 MVD: three-way valve motor  
 TF1 – TF2: flue gas thermostat protecting discharge system and exchanger  
 TR.ACC: ignition transformer  
 SR: CH probe 10k Ohm B = 3435

SE: external temperature probe 0SONDAES01 10k Ohm B = 3977 (Option) boiler probe to be connected to the boiler electronic board  
 SS: DHW probe 10k Ohm B = 3435 three meter max length  
 TA: room thermostats (option)  
 CM1-CM2: boiler type selection jumpers  
 FL: DHW flow switch  
 FLP: flow switch preventing low water pressure operation (CH)  
 VG: gas valve  
 TL: limit thermostat  
 P1: CH flow temperature potentiometer  
 P2: DHW temperature potentiometer  
 P3: boiler selector  
 P4: maximum CH output adjusting potentiometer  
 P6: thermoregulation curve adjuster

K1: "chimney sweep" function key  
 B: probe-equipped external water heater (remove R1)  
 BM120: external water heater equipped with bulb probe thermostat (remove P1)  
 TIMER: DHW programmer (remove P1 when timer is installed)  
 P1: TIMER jumper – DHW priority  
 R1: 10k Ohm resistance  
 REMOTE CONTROL (option)

**Relation between temperature (°C) and nominal resistance (Ohm) of CH probe SR and 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 16 - Relation between the temperature (°C) and nominal resistance (Ohm) of SR heating, SS hot water and SB storage tank probes.

### 3.7. Adapting to other gases and regulating the burner



**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.**

**If you wish to switch to another type of gas, this must be done by a qualified technician using the accessories supplied by the manufacturer. He will make the necessary modifications and adjustments to ensure efficient operation of the boiler.**

#### 3.7.1. Switching from METHANE to PROPANE

- Open the boiler front panel, as described in par. 3.2.7.1.
- unscrew the outlet connection to the gas valve (**A** in fig. 26);
- replace the diaphragm in the relevant seating, with the one for PROPANE (see tables 3, 4, 5, 6, 7 and 8).
- re-connect the outlet connection to the gas valve (**A** in fig. 26);
- see par. 3.7.3.

#### 3.7.2. Switching from PROPANE to METHANE

- Open the boiler front panel, as described in par. 3.2.7.1.
- unscrew the outlet connection to the gas valve (**A** in fig. 26);
- replace the diaphragm in the relevant seating, with the one for METHANE (see tables 3, 4, 5, 6, 7 and 8).
- re-connect the outlet connection to the gas valve (**A** in fig. 26);
- see par. 3.7.3.

#### 3.7.3. Burner adjustment

##### Maximum heating output adjustment

- set max heating output adjuster **max** (fig. 18) to MAXIMUM (turn it fully clockwise); the LCD will display the desired maximum heating output, in percentage with respect to the boiler available max heating output.
- position selector **2** (fig. 1) to WINTER;
- verify the optional room thermostat (when available) to be set to ON;
- start "chimney sweep" boiler mode (see paragraph 3.2.7.1);
- adjust CO<sub>2</sub> in flue gas by turning ratio adjuster **B** (fig. 27) and verify CO<sub>2</sub> value to be within the range stated in table 17;
- allow boiler to keep operating in chimney sweep mode and go to the following point;

##### Minimum heating output adjustment

- set max heating output adjuster **max** (fig. 18) to MINIMUM (turn it fully counter-clockwise); the LCD will display the desired maximum heating output, in percentage with respect to the boiler available max heating output.
- adjust CO<sub>2</sub> in flue gas by turning offset adjuster **C** (fig. 27) and verify CO<sub>2</sub> value to be within the range stated in table 17;
- to end the chimney-sweep function, set selector **2** on a position other than WINTER and then to the desired position.

#### CO<sub>2</sub>

Fuel	CO <sub>2</sub>
Methane	8.8 ÷ 9.1
Propane	9.8 ÷ 10.1

Table 17 – CO<sub>2</sub> rates

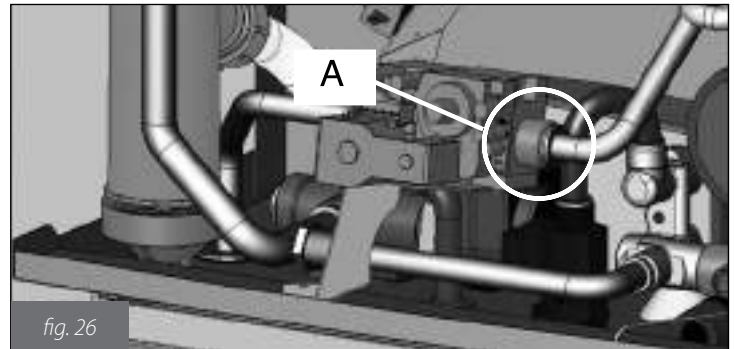


fig. 26

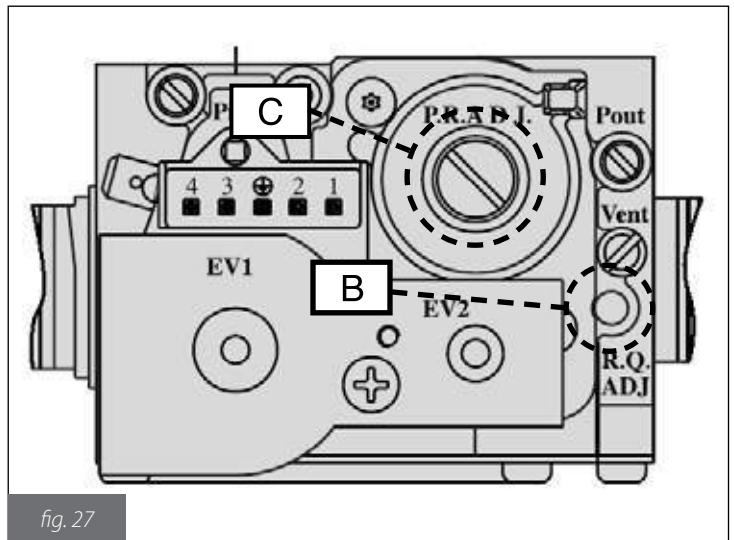


fig. 27

## 4. TESTING THE BOILER

### 4.1. Preliminary checks

Before testing the boiler, it is advisable to check that:

- the installation complies with the current regulations.
- The flue gas exhaust pipe and terminal must be installed as instructed. **When the boiler is running, no combustion products must leak from any of the gaskets.**
- Supply power to the boiler must be 230 V – 50 Hz.
- The system must be filled with water (pressure reading on water gauge 1÷1.3 bar).
- All the stopcocks on the pipes must be open.
- The gas supplied to the boiler must be of the type for which the boiler is designed. If necessary, convert the boiler following the instructions in subsection 3.7 - ADAPTATION TO OTHER GASES AND BURNER ADJUSTMENT. This operation must be carried out by a qualified service engineer.
- The gas supply stopcock must be open.
- **There must be no gas leaks.**
- The main power switch must be on.
- The boiler 3-bar safety valve must not be blocked.
- There must be no water leaks.
- The pump must not be blocked.
- The condensate trap installed on the boiler is discharging condensate correctly and is not stuck.



**If the boiler is not installed in accordance with the applicable laws and regulations, inform the system supervisor and do not test the boiler.**

### 4.2. Switching on and off

Refer to the User Instructions for details of how to switch the boiler on and off.

## 5. MAINTENANCE

**Maintenance and repairs must be carried out by a fully qualified technician.**

**The user is strongly advised to have the boiler serviced and repaired by one of the Manufacturer's fully qualified and authorised Service Centres**

**Correct maintenance of the boiler will allow it to work efficiently, without harming the environment, and in complete safety.**

### 5.1. Maintenance schedule

Routine maintenance must be performed once a year.

 **Before carrying out any maintenance work involving the replacement of components or internal cleaning of the boiler, disconnect the boiler from the mains.**

Routine maintenance must include a series of checks and cleaning operations.

#### Checks:

- General integrity of the boiler
- Boiler and gas supply leaks
- Boiler gas supply pressure
- Boiler ignition
- Boiler combustion parameters by flue gas analysis
- Flue system integrity, good state of preservation, and leak test
- State of combustion fan
- General integrity of the boiler safety devices
- Integrity, state of preservation and seal of the flue gas discharge pipes
- Water leaks and oxidation of the boiler fittings
- Boiler safety valve efficiency
- Expansion vessel pressure
- Water switch checking circulation malfunctions
- Correct discharge of condensates

#### Cleaning operations:

- Inside of the boiler
- Gas nozzles
- Air intake and flue gas discharge circuit
- Heat exchanger
- Drain siphon and condensate discharge ducts
- Drain siphon for discharge of condensate installed in the boiler

Checks to perform when using the boiler for the first time.








- User manual
- Suitability of the boiler room
- Flue gas discharge pipes – diameters and lengths
- Boiler installation in accordance with the instructions in this manual

**If the boiler does not work properly or if it poses a danger to people, animals or property, inform the system supervisor and compile a report.**




### 5.2. Combustion analysis

The boiler combustion parameter check to assess efficiency and polluting emissions must be performed in accordance with the applicable laws and regulations.

## 6. TROUBLESHOOTING

BOILER STATUS	PROBLEM	POSSIBLE CAUSE	SOLUTION
The boiler has shut down. The symbol  is displayed and code E01 flashes. Turn selector 2 to RESET to resume boiler operation.	Burner does not ignite.	Gas supply failure.	Check gas pressure. Check that the gas valve opens or whether any system safety valves have cut in.
		Gas valve disconnected.	Reconnect it.
		Gas valve faulty.	Replace it.
		PCB faulty.	Replace it.
	Burner does not ignite: spark not generated.	Spark electrode faulty.	Replace the spark electrode.
		Ignition transformer faulty.	Replace the ignition transformer.
		PCB faulty.	Replace PCB.
	Burner ignites for a few seconds and then goes off.	PCB does not detect flame: phase and neutral connections are inverted.	Verify correct neutral and phase connections to the power mains.
		Flame detection electrode wire faulty.	Reconnect or replace wire.
		Flame detection electrode faulty.	Replace electrode.
PCB board does not detect flame.		Replace PCB.	
Ignition value setpoint too low.		Increase value setpoint.	
Min. heat input not set correctly.		Check burner setting.	
The boiler has shut down. The symbol  is displayed and code E03 flashes. Turn selector 2 to RESET to resume boiler operation.	One of the boiler safety thermostats has cut in.	Difficult draught at chimney.	Check the chimney and ambient air suction grilles.
		Flue gas thermostat faulty.	Replace it.
The boiler has shut down. The symbol  is displayed and code E02 flashes. Operation can be resumed by resetting the pressure in the system.	Boiler safety thermostat has cut in.	CH water does not flow: pipes might be clogged, thermostatic valves might be shut, system stopcocks might be closed.	Check CH system.
		Pump blocked or faulty.	Check the pump.
The boiler has shut down. The symbol  is displayed and code E10 flashes. Operation can be resumed by resetting the pressure in the system.	Insufficient water circulation in the system.	Possible water leaks.	Check system for leaks.
		Main water pressure switch disconnected.	Reconnect it.
		Main water pressure switch faulty.	Replace it
		The minimum pressure gauge is disconnected.	Reconnect it.
		The minimum pressure gauge does not intervene.	It's faulty.
The boiler has shut down. The symbol  is displayed and code E05 flashes. Operation is resumed automatically when the cause of shutdown has been removed.	CH probe not working.	CH probe disconnected.	Reconnect it.
		CH probe faulty.	Replace it.
The boiler does not work in DHW mode. The symbol  is displayed and code E06 flashes. Operation is resumed automatically when the cause of shutdown has been removed.	DHW probe not working (KC model only).	DHW probe disconnected.	Reconnect it.
		DHW probe faulty.	Replace it.
The boiler does not work in DHW mode. The symbol  is displayed and code E12 flashes. Operation is resumed automatically when the cause of shutdown has been removed.	Storage tank probe not working. KR model with external optional boiler and NTC probe.	Water heater probe disconnected.	Reconnect it.
		Water heater probe faulty.	Replace it.



<b>BOILER STATUS</b>	<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
The boiler does not work in DHW mode.	DHW flow switch does not cut in (KC model only).	System pressure or flow rate too low.	Check DHW system.
			Check flow meter filter.
		Flow switch sensors disconnected or faulty.	Replace or reconnect it.
		Flow switch stuck.	Replace it.
The boiler does not work properly. The symbol  is displayed and code E17 flashes. Operation is resumed automatically when the cause of shutdown has been removed.	Combustion fan not working.	Fan disconnected.	Reconnect it.
		Fan faulty.	Replace it.
The (optional) remote control is switched off. The symbol  is displayed and code E22 flashes. Operation is resumed automatically when the cause of shutdown has been removed.	No communication with remote control.	Cable between boiler and remote control disconnected.	Reconnect it
		Remote control faulty.	Replace it.
The symbol  is displayed and code E23 flashes. Operation is resumed automatically when the cause of shutdown has been removed.	External probe not working.	External probe disconnected.	Reconnect it.
		External probe faulty.	Replace it.







0LIBMUEN18

# fondital

**Fondital S.p.A.**

25079 VOBARNO (Brescia) Italia - Via Cerreto, 40

Tel. 0365/878.31 - Fax 0365/878.576

e mail: [fondital@fondital.it](mailto:fondital@fondital.it) - [www.fondital.it](http://www.fondital.it)

Il produttore si riserva il diritto di apportare ai propri prodotti quelle modifiche che riterrà necessarie o utili, senza pregiudicarne le caratteristiche essenziali.