



# TAHITI CONDENSING

GB



## 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.

## 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 must be used for the purposes for which it has been intended.  
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 is to be performed according to the schedule indicated in the relevant section of this manual. Appropriate boiler maintenance ensures efficient operation, environment preservation, and safety for people, animals and objects.**

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.**

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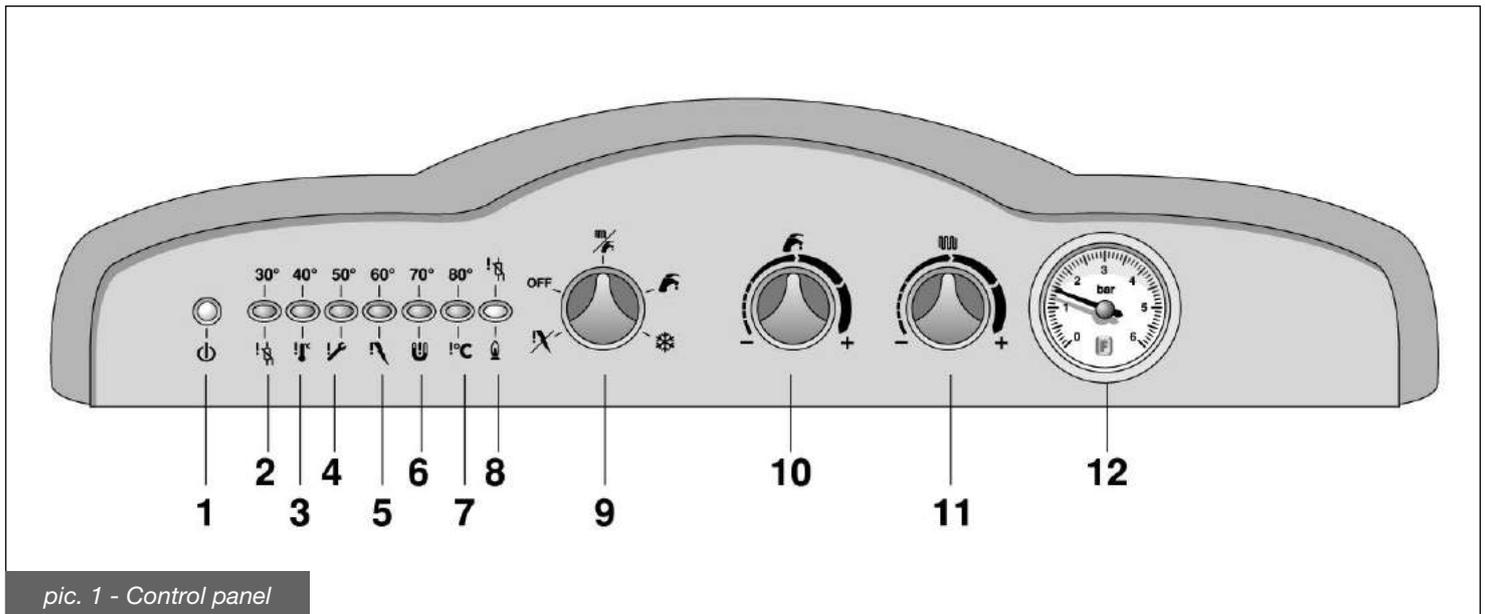
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## 1. Instructions for the user

### 1.1. Control panel



pic. 1 - Control panel

#### 1. Power LED (green)

The LED indicates that electric power is being supplied to the boiler.

#### 2. Signal LED (red)

When the LED is on and fixed, it signals central water temperature is in the range between 26°C and 35°C.

When the LED is on and blinking, it signals an operation malfunction (see no. 2 chart on page 7).

#### 3. Signal LED (red)

When the LED is on and fixed, it signals central water temperature is in the range between 36°C and 45°C.

When the LED is on and blinking, it signals an operation malfunction (see no. 2 chart on page 7).

#### 4. Signal LED (red)

When the LED is on and fixed, it signals central water temperature is in the range between 46°C and 55°C.

When the LED is on and blinking, it signals an operation malfunction (see no. 2 chart on page 7).

#### 5. Signal LED (red)

When the LED is on and fixed, it signals central water temperature is in the range between 56°C and 65°C.

When the LED is on and blinking, it signals an operation malfunction (see no. 2 chart on page 7).

#### 6. Signal LED (red)

When the LED is on and fixed, it signals central water temperature is in the range between 66°C and 75°C.

When the LED is on and blinking, it signals an operation malfunction (see no. 2 chart on page 7).

#### 7. Signal LED (red)

When the LED is on and fixed, it signals central water temperature is in the range between 76°C and 85°C.

When the LED is on and blinking, it signals an operation malfunction (see no. 2 chart on page 7).

#### 8. Signal LED (yellow)

When the LED is on and fixed, it signals flame presence on burner.

When the LED is on and blinking, it signals an operation malfunction (see no. 2 chart on page 7).

#### 9. Boiler operation mode selector

When the selector is set to OFF, the boiler is in stand-by.

When the selector is positioned to WINTER , the boiler is ready to operate both in central heating and domestic hot water supply modes (in KR models, domestic hot water supply mode is activated only when the boiler is connected to an external cylinder).

When the selector is positioned to SUMMER , the boiler is ready to operate in domestic hot water supply mode (in KR models, domestic hot water supply mode is activated only when the boiler is connected to an external cylinder).

When the selector is positioned to ANTI-FROST , only the anti-frost function is active.

When the selector is positioned to RESET , the boiler is re-activated after a shutdown.

#### 10. Domestic hot water temperature adjusting knob

The knob is adjusts domestic hot water temperature between a minimum of 35°C and a maximum of 57°C.

#### WARNING

**In KC model, a special adjusting device is installed, which limits domestic hot water flow rate to 13 liter per minute (KC 24), and to 16 liter per minute (KC 32). Domestic hot water temperature supplied, depends on no. 10 adjusting device, on the quantity requested by the user and on water mains supply temperature.**

#### 11. CH temperature adjustment

The knob is adjusts central heating water temperature between a minimum of 20°C and a maximum of 78°C.

#### 12. Water pressure gauge

Water pressure gauge indicates water pressure in the heating system.

## CORRELATION BETWEEN LED SIGNALLING – BOILER STATUS

Normal boiler operation	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7	LED 8
Boiler powered on	GREEN	n/a						
Flame presence	GREEN	n/a	n/a	n/a	n/a	n/a	n/a	YELLOW
CH water temp. ≤ 25°C	GREEN	OFF	OFF	OFF	OFF	OFF	OFF	n/a
26°C < CH water temp. ≤ 35°C	GREEN	RED	OFF	OFF	OFF	OFF	OFF	n/a
36°C < CH water temp. ≤ 45°C	GREEN	OFF	RED	OFF	OFF	OFF	OFF	n/a
46°C < CH water temp. ≤ 55°C	GREEN	OFF	OFF	RED	OFF	OFF	OFF	n/a
56°C < CH water temp. ≤ 65°C	GREEN	OFF	OFF	OFF	RED	OFF	OFF	n/a
66°C < CH water temp. ≤ 75°C	GREEN	OFF	OFF	OFF	OFF	RED	OFF	n/a
76°C < CH water temp. ≤ 85°C	GREEN	OFF	OFF	OFF	OFF	OFF	RED	n/a

No. 1 chart – Correlation between LED SIGNALLING – BOILER STATUS when boiler is operating

Malfunction	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7	LED 8
No electric power	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Safety thermostat shutdown	GREEN	OFF	RED L	OFF	OFF	OFF	OFF	OFF
Flue gas thermostat shutdown	GREEN	OFF	OFF	RED L	OFF	OFF	OFF	OFF
Flame absence shutdown	GREEN	OFF	OFF	OFF	RED L	OFF	OFF	OFF
Fluid circulation shutdown	GREEN	OFF	OFF	OFF	OFF	RED L	OFF	OFF
Fan shutdown	GREEN	OFF	RED L	OFF	OFF	OFF	OFF	YELLOW L
Flow alarm (>85°C)	GREEN	OFF	OFF	OFF	OFF	OFF	RED L	n/a
DHW probe alarm	GREEN	RED L	OFF	OFF	OFF	OFF	OFF	OFF
Flow probe alarm	GREEN	RED L	OFF	OFF	OFF	OFF	OFF	YELLOW L
Water tank probe alarm	GREEN	RED LA	OFF	OFF	OFF	OFF	OFF	YELLOW LA
Faulty remote control connection	GREEN	OFF	OFF	RED L	OFF	OFF	OFF	YELLOW L

No. 2 chart – Correlation between LED SIGNALLING – BOILER STATUS when boiler is malfunctioning

### Key chart to acronyms

OFF	LED off
RED	LED on and fixed (colored as indicated in the chart)
RED L	LED or LEDs blinking simultaneously (colored as indicated in the chart)
RED LA	LEDs blinking alternatively (colored as indicated in the chart)
n/a	LED status is not relevant

## 1.2. Operating the boiler

### 1.2.1. 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 (no. 1 LED turns on);
- select boiler operation mode via no. 9 selector (pic. 1);
- set desired CH temperature via no. 11 knob (pic. 1);
- In KC model, set desired domestic hot water temperature via no. 10 knob (pic. 1); In KR model equipped with external cylinder, set desired domestic hot water temperature directly on the external cylinder (see its instruction manual);
- Set desired room temperature by means of the room thermostat in the premises (when available).

When the flame on the burner turns on, no. 8 yellow LED turns on.

#### WARNING

**Should the boiler be left inactive for a long time, particularly when boiler is LPG 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. 9 knob to the reset position  for two seconds and back to the desired position.**

### 1.2.2. Operation

#### CENTRAL HEATING

Set desired CH water temperature via no. 11 knob (pic. 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).

Instantaneous central heating water temperature is displayed on the control board via no. 2 through no. 7 LED's (pic. 1).

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.

#### DOMESTIC HOT WATER

Domestic hot water supply is activated in KC model and KR model equipped with an external cylinder (optional equipment). Such function always has priority over CH water supply.

In KC model, set desired domestic hot water temperature via no. 10 knob (pic.1). It can be adjusted within a 35°C to 57°C range (from full counter-clockwise position to full clockwise position);

In KR model equipped with external cylinder (optional equipment), set desired domestic hot water temperature directly on the external cylinder (see its instruction manual); no. 10 knob is not functional in this model operation.

#### WARNING

**In KC model, a special adjusting device is installed, which limits domestic hot water flow rate to 13 liter per minute (KC 24), and to 16 liter per minute (KC 32). Domestic hot water temperature supplied depends on no. 10 adjusting device, on the quantity requested by the user and on water mains supply temperature.**

In KC model, DHW liter per minute flow depends on the boiler's thermal capacity and 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

- 507 in KC 32 model

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

E.g. in KC 24 model, when water mains supply temperature is 8°C and DHW is required to be 38°C, in order to have a shower, the value of  $\Delta t$  is:

$$\Delta t = 38\text{ °C} - 8\text{ °C} = 30\text{ °C}$$

and DHW liters (l per minute) available at the required temperature of 38°C are:

$$I = 401/30 = 13,4 \text{ [liter per minute] (mixed water at the tap)}$$

In contrast, in KR model equipped with an external cylinder (optional equipment), available DHW flow depends on the cylinder capacity. In KR model with external cylinder (optional equipment), every 15 days, the anti-Legionella function is activated; it consists in heating up the cylinder to 65°C for 30 minutes, regardless of boiler mode setting.

## ANTI-FROST

The boiler is equipped with anti-frost function, which is active in SUMMER/WINTER/ANTI-FROST modes.

When central heating water temperature sensor detects a water temperature of 5°C, the boiler is switched on and stays on at minimum heat output until central heating water temperature reaches 30°C or 15 minutes have elapsed. Should boiler shut down, pump operation is still granted.

In KC model, anti-frost function protects the domestic hot water system as well.

When domestic hot water probe detects a temperature of 5°C, the boiler ignites and stays on at minimum heat output until domestic hot water temperature reaches 10°C or 15 minutes have elapsed (the deviating valve is set to domestic hot water position). Should boiler shut down, pump operation is still granted.

In CH only boilers equipped with a DHW supply external cylinder, anti-frost function protects the cylinder as well. The function is active only for cylinders equipped with  $\beta=3435$  type NTC probe (refer to cylinder technical data).

When cylinder water temperature probe detects a water temperature of 5°C, the boiler is switched on and stays on at minimum heat output until cylinder water temperature reaches 10°C or 15 minutes have elapsed (the deviating valve is set to domestic hot water position). Should the boiler shut down, pump operation is granted.



**Anti-frost function protects the boiler only and not the whole central heating system.**

**Central heating system is to be protected by means of an ambient thermostat, although this is disabled when the boiler is set to the anti-frost and OFF modes. Should anti-frost protection be necessary for the boiler and CH system, select winter position through no. 9 knob.**

CH system can be effectively protected from freezing by means of specific anti-freezing additives suitable in multi-metal systems. **Do not use automotive anti-frost products, and periodically check anti-frost product effectiveness.**

## PUMP AND DEVIATING VALVE ANTI-BLOCKING FUNCTION

Where the boiler is to remain inactive and:

- no. 9 selector is not set to the OFF position;

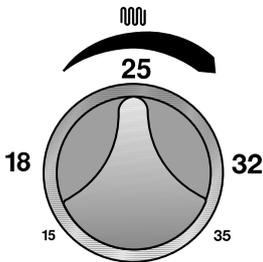
- boiler is not disconnected from electric main power supply;

the circulation pump (KC and KR) and three-way valve (KC), are operated for 3 minutes every 24 hours in order to prevent blockage.

### 1.2.3. External probe operation (optional equipment)

The boiler can be equipped with an external temperature probe (optional equipment), through which the boiler adjusts CH water temperature according to outdoor temperature, in other words, increasing CH water temperature when outdoor temperature decreases and vice-versa, providing increased energy saving operation (such boiler mode is called "sliding temperature operation").

Boiler microprocessor program determines CH water temperature variations.



When an external temperature probe is connected to the boiler, CH water temperature adjusting knob, no. 11 (pic. 1), loses its function and becomes a fictitious room temperature adjusting device.

When no. 11 knob is turned fully counter-clockwise, selected room temperature is 15°C; when set to 9:00 hours selected room temperature is 18°C; when set to 12:00 hours selected room temperature is 25°C; when set to 3:00 hours selected room temperature is 32°C; when is turned fully clockwise selected room temperature is 35°C;

For best curve setting, it is advisable a position close to 20°C.

Refer to 3.2.14. paragraph for detailed sliding temperature operation.

### 1.3. Boiler shut-down

Should any malfunction occur, boiler automatically shuts down.

Refer to no. 1 and no. 2 charts (on page 7) for boiler status detection.

In order to detect the probable malfunction causes, see, in addition to no. 2 chart, no. 7 "Troubleshooting" paragraph at the end of the manual, as well.

Follow the described procedure with respect to the type of shut-down.

#### 1.3.1. Burner shut-down

When the burner shuts down due to flame extinguishing, no. 5 LED (red) starts flashing. Should this happen proceed as follows:

- check the gas stopcock to be open, and gas network is actually providing service, by lighting a gas powered kitchen appliance such as a kitchen range or oven.

- once gas presence is verified, reset the burner by turning no. 9 knob (pic. 1) to the reset  position for 2 seconds, and then to the desired mode position: should the boiler not start shut down, and after performing three reset procedures, contact an authorized Service Centre or qualified personnel for service.

Should frequent burner shut down occur, a recurrent malfunction might be present: contact an authorized Service Centre or qualified personnel for service.

#### 1.3.2. Shut-down due to overheating

When CH flow water overheats the boiler is shut down, no. 3 LED (red) starts flashing.

Should the above happen contact an authorized Service centre or qualified personnel for service.

#### 1.3.3. Shut-down due to incorrect fluid circulation

Should CH water circulation not be adequate, the primary flow switch intervenes, the boiler is shut-down, and no. 6 LED (red) starts flashing.

The following 2 instances may have occurred:

a) no. 12 water pressure gauge (pic. 1) indicates a pressure value lower than 1 bar; in this instance follow the loading procedure as below described:

- turn the loading tap (pic. 2) counter-clockwise in order to allow water inlet;

- keep the loading tap open until the water pressure gauge reads 1-1.3 bar;

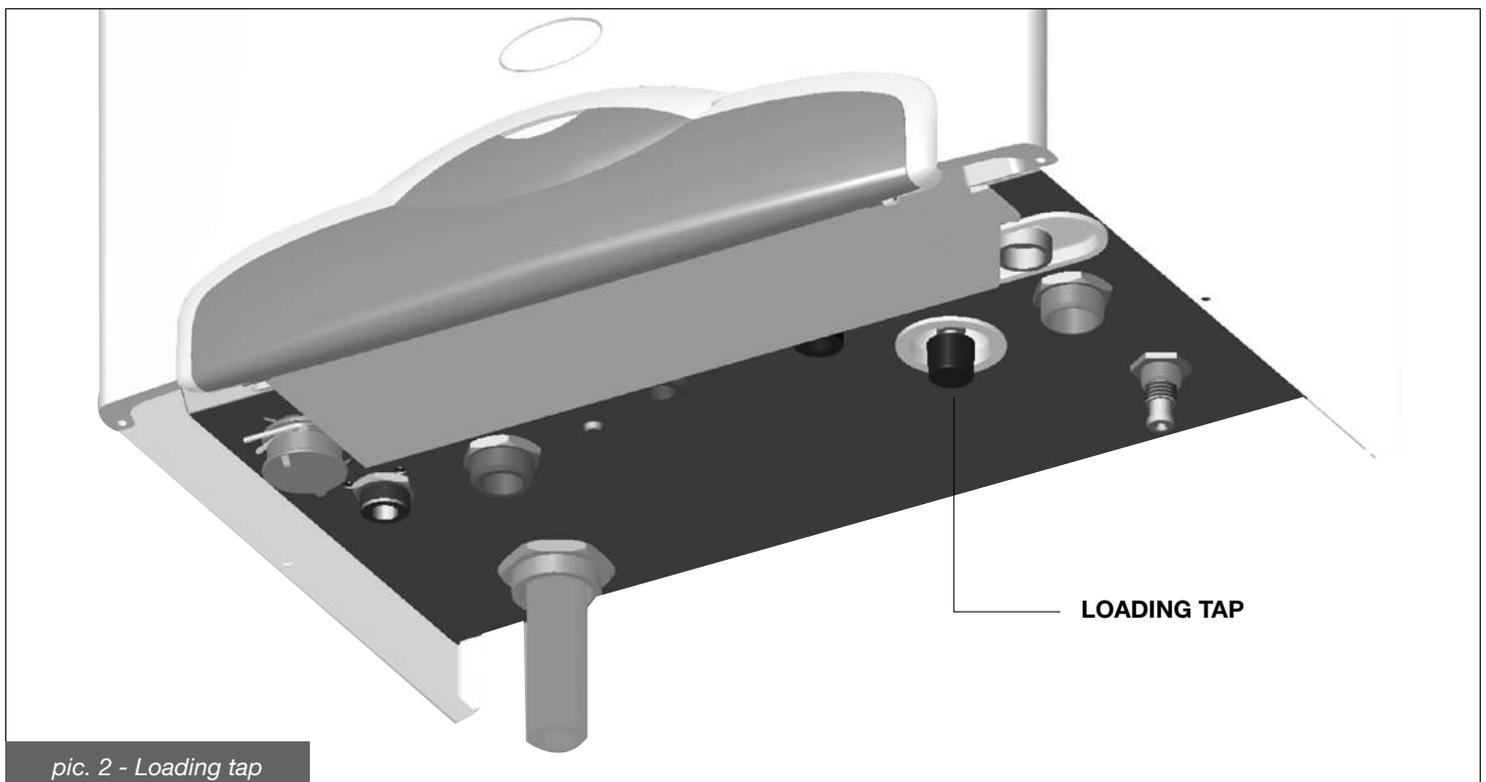
- close the loading tap by turning it clockwise;

- reset the burner by turning no. 9 knob to the reset  position for 2 seconds, and then to the desired mode position.

Should the boiler shut down again, contact an authorized Service Centre or qualified personnel for service.

 **Once the loading procedure is completed, properly close the loading tap. Should the tap not be appropriately closed, as pressure increases, CH system safety valve may open and water flow out.**

b) no. 12 water pressure gauge (pic. 1) indicates a correct pressure value (1-1.3 bar); in this instance contact an authorized Service Centre or qualified personnel for service.



#### **1.3.4. Shut-down due to inadequate air/flue gas draught**

Should the boiler shut down due to air intake and/or flue gas discharge ducts malfunction, no. 4 LED (pic. 1) starts flashing. Should that happen, contact an authorized Service Centre or qualified personnel for service.

#### **1.3.5. Shut-down due to fan malfunction**

Fan operation is constantly monitored and in case of malfunction the burner is turned off and no. 3 and no. 8 LEDs (pic. 1) start flashing simultaneously.

The above status continues until correct fan operation is restored.

Should the boiler not re-start and still remain in the above status, contact an authorized Service Centre or qualified personnel for service.

#### **1.3.6. Flow alarm**

Should flow temperature rise above 85°C, no. 7 LED (pic. 1) start flashing and the burner is turned off.

Normal boiler operation will be restored once flow temperature decreases below 85°C.

#### **1.3.7. Alarm due to failure of temperature probes**

Should the temperature probes malfunction, the following LEDs turn on:

- no. 2 and no. 8 LEDs start flashing simultaneously when flow probe malfunction occur;
- no. 2 LED start flashing when DHW probe malfunction occur (KC);
- no. 2 and no. 8 LEDs start alternatively flashing when external cylinder probe malfunction occur (KR equipped with external cylinder).

Contact an authorized Service Centre or qualified personnel for service.

#### **1.3.8. Alarm due to remote control malfunction**

Should the boiler receive incorrect information from the OpenTherm remote control (optional equipment), or should it not receive any (due to remote control malfunctioning, or incorrect connection between the boiler and the remote control), no. 2 and no. 8 LEDs start flashing simultaneously.

Contact an authorized Service Centre or qualified personnel for service.

### **1.4. Maintenance**

**Have the boiler routinely serviced, following the schedule described in the relevant section of this manual.**

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

**Qualified personnel only are to service the boiler.**

**Manufacturer recommends Customers to contact authorized Service Centre for maintenance and repairs; they are best qualified to implement such procedures.**

### **1.5. Notes for the user**

The user may only access boiler parts that can be reached without using technical equipment and/or tools: the user is not authorized to remove boiler casing and operate on any internal part.

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

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

Should the boiler be left inactive for a long time and power main supply disconnected, the pump might need to be un-blocked.

Such servicing includes boiler casing removal and access to boiler internal parts, therefore only qualified personnel may perform it.

Pump blockage may be avoided by adding filming additives suitable for multi-metal systems to water.

## 2. Technical characteristics and dimensions

### 2.1. Technical characteristics

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;

Both models are available in the following heat outputs:

KC 24 and KR 24 = 23.7 kW.

KC 32 and KR 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 low water pressure in the CH system
- CH temperature probe (KC and KR) 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)
- DHW priority flow switch (KC)
- DHW flow limiting device; 13 liter/min (KC 24), 16 liter/min (KC 32)

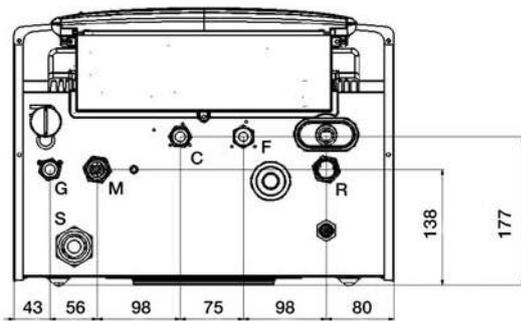
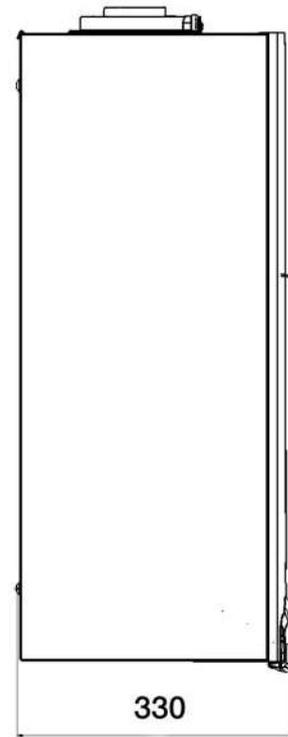
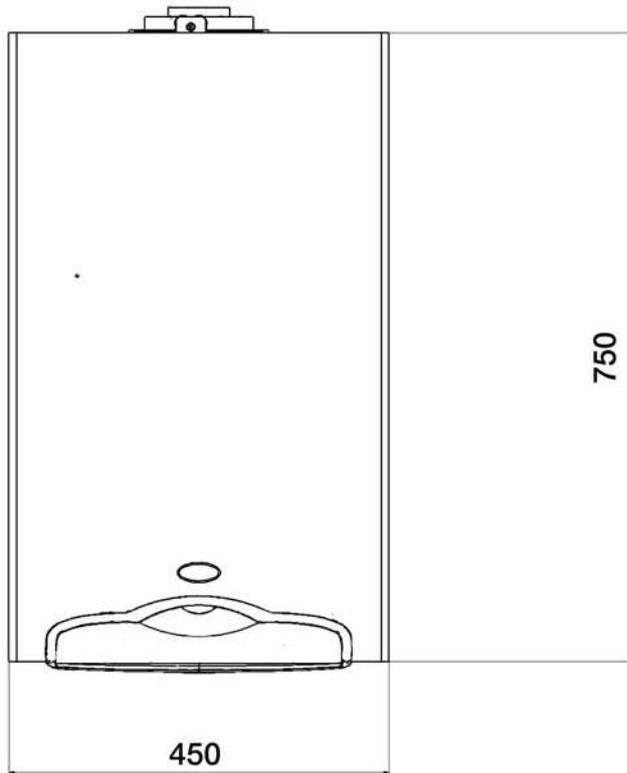
#### User interface

- Boiler mode selector: OFF, RESET, WINTER, SUMMER, ANTI-FROST
- CH temperature adjusting switch: 20/78°C (standard range), or 20/45°C (reduced range)
- DHW temperature adjusting switch (KC): 35/57°C.
- Led displayed CH water temperature
- CH water pressure gauge
- Light emitting diodes indicating:
  - power main supply connection;
  - flame detection;
  - burner shut-down due to flame extinguishing;
  - burner shut-down due to overheating;
  - burner shut-down due to flue gas pressure switch intervention;
  - burner shut-down due to inadequate CH water circulation;
  - burner shut-down due to fan malfunction;
  - malfunction of temperature probes;
  - remote control faulty connection.

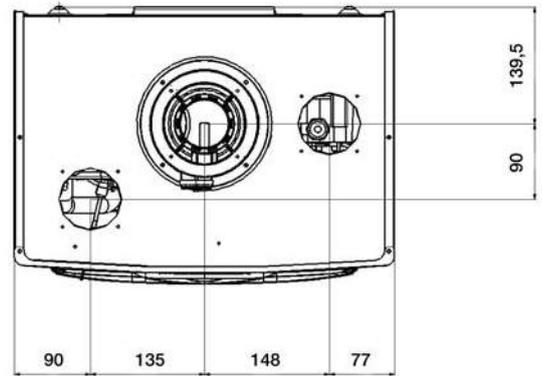
## Operating characteristics

- CH mode electronic flame modulation, timer controlled flame rising ramp (50 seconds)
- DHW mode electronic flame modulation (KC and KR with external cylinder)
- DHW priority function (KC and KR with external cylinder)
- Flow anti-frost function: ON at 5°C; OFF at 30°C or after 15 minutes operation when CH water > 5°C
- DHW anti-frost function (KC): ON at 5°C; OFF at 10°C or after 15 minutes operation when DHW temperature > 5°C
- External cylinder anti-frost function (KR + external cylinder equipped with NTC probe): ON at 5°C; OFF at 10°C or after 15 minutes operation when external cylinder water temperature > 5°C
- Timer controlled "chimney sweep" function: 15 minutes
- Anti-Legionella function (KR equipped with optional external cylinder)
- Maximum CH input adjusting trimmer
- Ignition heat input adjusting trimmer
- CH water temperature range adjusting device: standard or reduced
- Ignition flame spread function
- Timer controlled CH thermostat: 240 seconds standard range, 120 seconds reduced range
- Post-circulation function in CH mode, anti-frost and chimney sweep mode: 180 seconds
- Post-circulation function in DHW supply mode (KC and KR with external cylinder): 30 seconds
- Post-circulation function for CH temperature > 85°C: 30 seconds
- Post ventilation function following operation: 10 seconds
- Post ventilation function for CH temperature > 95°C
- Pump (KC and KR) and deviating valve (KC) anti-blocking function: 180 seconds operation after 24 hours of non operation
- Ready for connection to a room thermostat
- Ready for connection to an external probe (manufacturer delivered optional equipment)
- Ready for connection to an OpenTherm remote control (manufacturer delivered equipment)
- Ready for serving different zones

## 2.2. Dimensions



Bottom view

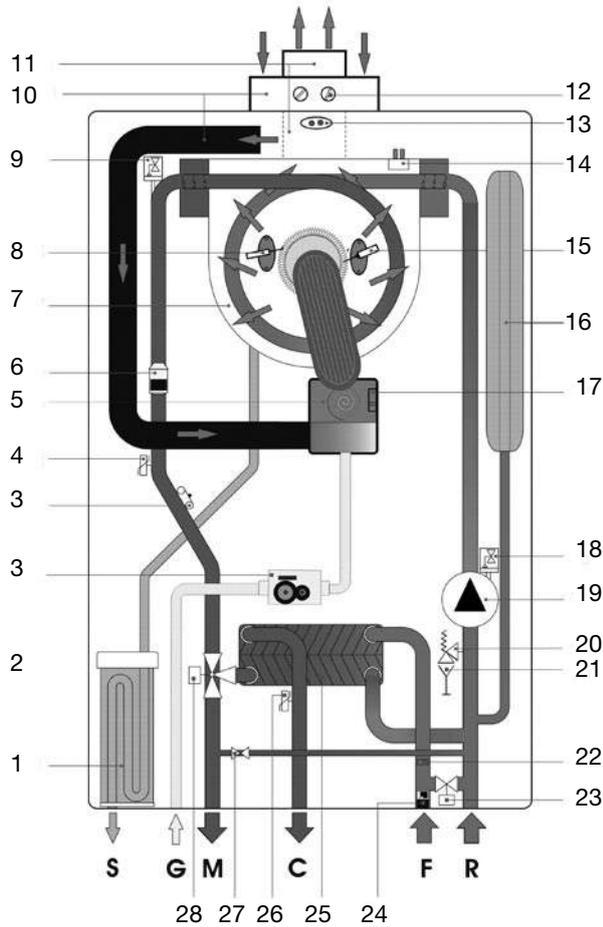


Top view

- S Condensate drain
- F Water mains intake
- 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

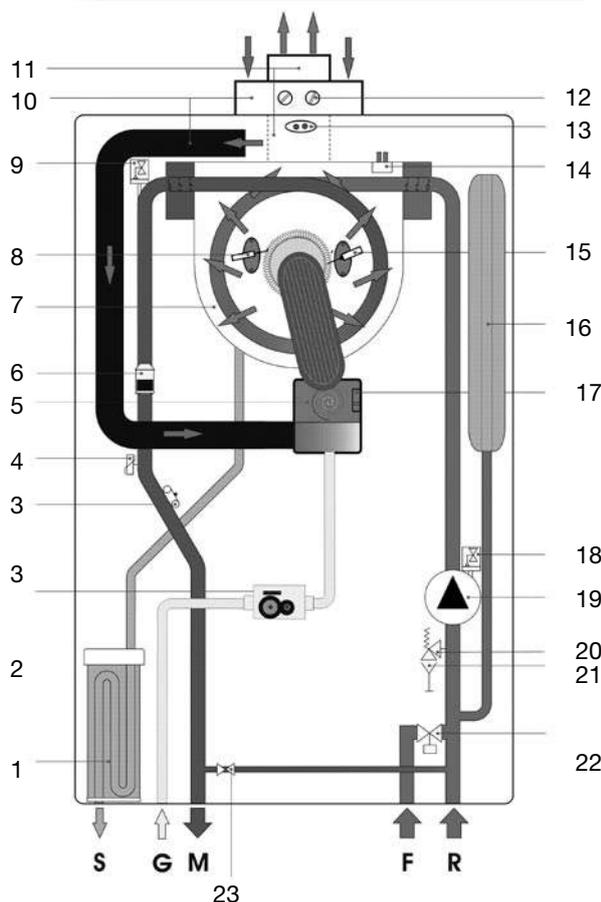
pic. 3 - Dimensions

## 2.3. Hydraulic layouts



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. Flow limiting device
  23. Loading tap
  24. Domestic cold water flow meter with filter
  25. Secondary plate exchanger
  26. DHW probe
  27. Automatic by-pass
  28. 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

pic. 4 - KC model hydraulic layout



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. Loading tap
  23. Automatic by-pass
- S Condensate drain  
G Gas intake  
M CH system flow  
F Water mains intake  
R CH system return

pic. 5 - KR model hydraulic layout

## 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)	Flue gas CO <sub>2</sub> [%]
		min	max	min	max	min	max		
Methane Gas G20	23.7	6.5	22.7	7.3	24.8	7.3	28.0	20	8.8 ÷ 9.1
Propane Gas G31	23.7	6.5	22.7	7.3	24.8	7.3	28.0	37	9.8 ÷ 10.1

No. 3 chart – 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 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)	Flue gas CO <sub>2</sub> [%]
		min	max	min	max	min	max		
Methane Gas G20	31.4	8.7	30.5	9.6	33.2	9.6	35.4	20	8.8 ÷ 9.1
Propane Gas G31	31.4	8.7	30.5	9.6	33.2	9.6	35.4	37	9.8 ÷ 10.1

No. 4 chart – 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

Function	Max. CH input (kW)	CH output (80-60°C) [kW]		CH output (50-30°C) [kW]		Gas mains pressure (mbar)	Flue gas CO <sub>2</sub> [%]
		min	max	min	max		
Methane Gas G20	23.7	6.5	22.7	7.3	24.8	20	8.8 ÷ 9.1
Propane Gas G31	23.7	6.5	22.7	7.3	24.8	37	9.8 ÷ 10.1

No. 5 chart – KR 24 model adjustment rates

### KR 32

Function	Max. CH input (kW)	CH output (80-60°C) [kW]		CH output (50-30°C) [kW]		Gas mains pressure (mbar)	Flue gas CO <sub>2</sub> [%]
		min	max	min	max		
Methane Gas G20	31.4	8.7	30.5	9.6	33.2	20	8.8 ÷ 9.1
Propane Gas G31	31.4	8.7	30.5	9.6	33.2	37	9.8 ÷ 10.1

No. 6 chart – KR 32 model adjustment rates

## 2.5. General characteristics

KC MODEL		KC 24	KC 32
Equipment category	-	II2H3P	II2H3P
Minimum CH system pressure	bar	0.5	0.5
Maximum CH system pressure	bar	3	3
Minimum DHW system pressure	bar	0.5	0.5
Maximum DHW system pressure	bar	8	8
DHW specific flow rate ( $\Delta t$ 30 °C)	l/min	13.4	16.9
Electric power supply – voltage / frequency	V - Hz	230 - 50	230 - 50
Power mains supply fuse	A	2	2
Maximum power consumption	W	145	145
Electric protection rating	IP	X4D	X4D
Net weight	kg	38.5	40.0
Methane gas consumption at maximum CH input (*)	m <sup>3</sup> /h	2.51	3.32
Propane gas consumption at maximum CH input	kg/h	1.84	2.44
Maximum CH working temperature	°C	83	83
Maximum DHW working temperature	°C	62	62
Total capacity of expansion vessel	l	10	10
Maximum recommended CH system capacity (**)	l	200	200

No. 7 chart – KC model general specifications

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

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

KC 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	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)	%	96.0	-	-
Maximum heat output efficiency rating (30/50°C)	%	104.8	-	-
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		

No. 8 chart – KC 24 model combustion rates

KC 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	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)	%	96.6	-	-
Maximum heat output efficiency rating (30/50°C)	%	105.4	-	-
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		

No. 9 chart – KC 32 model combustion rates

KR MODEL		KR 24	KR 32
Equipment category	-	II2H3P	II2H3P
Minimum CH system pressure	bar	0.5	0.5
Maximum CH system pressure	bar	3	3
Electric power supply – voltage / frequency	V - Hz	230 - 50	230 - 50
Fuse	A	2	2
Maximum power consumption	W	145	145
Electric protection rating	IP	X4D	X4D
Net weight	kg	37.5	39.0
Methane gas consumption at maximum CH input (*)	m <sup>3</sup> /h	2.51	3.32
Propane gas consumption at maximum CH input	kg/h	1.84	2.44
Maximum CH working temperature	°C	83	83
Total capacity of expansion vessel	l	10	10
Maximum recommended CH system capacity (**)	l	200	200

No. 10 chart – KR model general specifications

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

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

KR 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	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)	%	96.0	-	-
Maximum heat output efficiency rating (30/50°C)	%	104.8	-	-
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		

No. 11 chart – KR 24 model combustion rates

KR 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	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)	%	96.6	-	-
Maximum heat output efficiency rating (30/50°C)	%	105.4	-	-
Minimum heat output efficiency rating (30/50°C)	%	-	106.3	-
30% heat output efficiency rating	%	-	-	108.7
Efficiency rating (according to 92/42/GEE)	-	★★★★		
NO <sub>x</sub> emission class	-	5		

No. 12 chart – KR 32 model combustion rates

### 3. Instructions for the fitter

#### 3.1. Installation standards

This is an II2H3P 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:

- copper pipe kit for boiler connection to the gas mains, to the CH system (KC and KR) and DHW system (KC);
- wall hanging bracket;
- a bag containing:
  - a) boiler installation, use and maintenance manual.
  - b) boiler wall mounting template (pic. 6).
  - c) metal plate for fixing the boiler to the wall.
  - d) 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" paragraph instructions;
- 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 (pic. 6), 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**

### 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.**

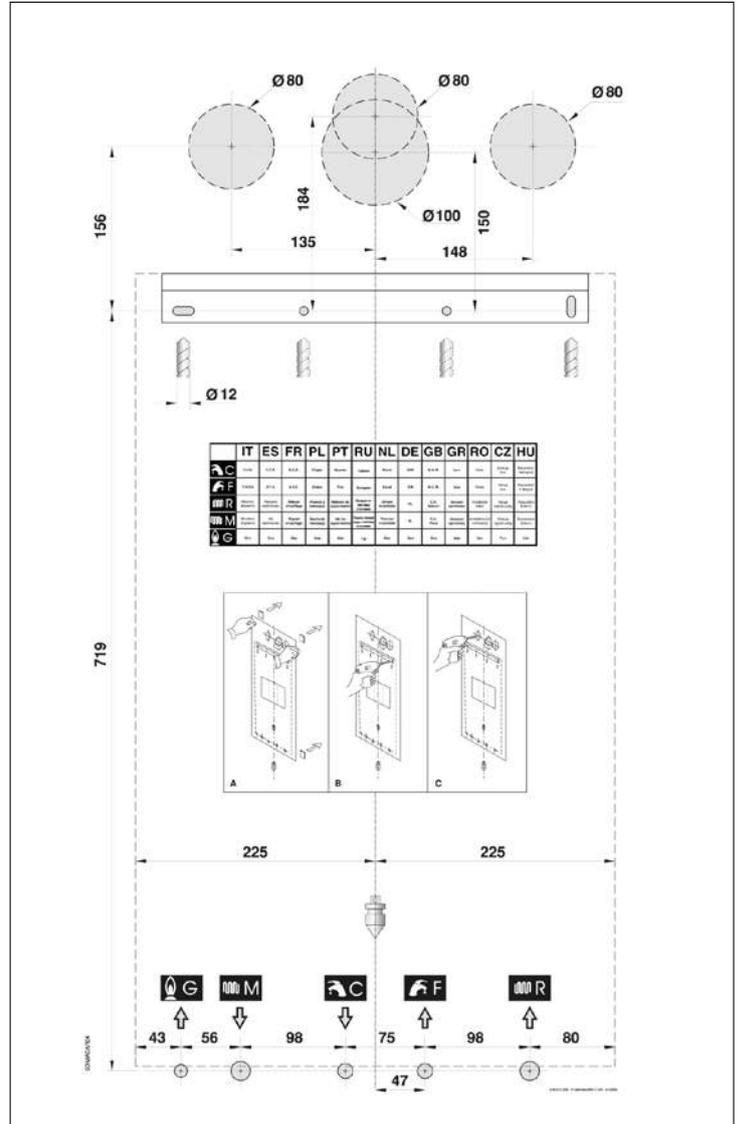
**For all kinds of heating plants, it is necessary to install the seal with filter (supplied with the boiler) on the return duct, as shown in pic. 7.**

**Should boiler be mounted in an existing system, install a filter which can be inspected (Y-shaped type) with Ø 0.4mm-mesh span, on return pipe before the boiler.**

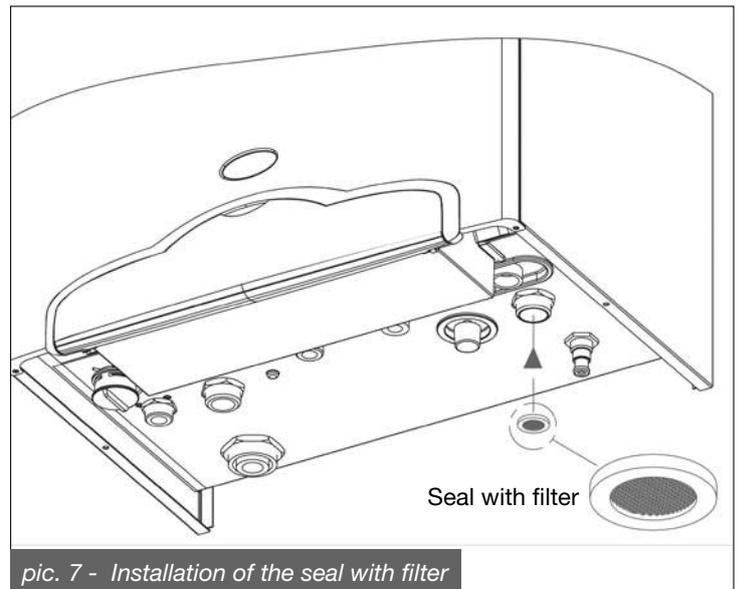


In order to install the boiler proceed as follows:

- affix the template (pic. 6) 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), DHW flow coupling (C, only in KC model), CH flow coupling (M), and CH return coupling (R), and condensate drain coupling (S), as shown on the template (refer to its lower area);
- 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);
- connect the boiler to the air intake and flue gas exhaust system (refer to 3.2.6. paragraph);
- connect electric power supply, ambient thermostat (when available) and other available accessories (refer to the following paragraphs).



pic. 6 - Installation template



pic. 7 - Installation of the seal with filter

### 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

As far as flue gas discharge into the atmosphere and air intake / flue gas discharge systems are concerned, comply with laws enforced in the country of installation, which are considered as fully transcribed in this manual.

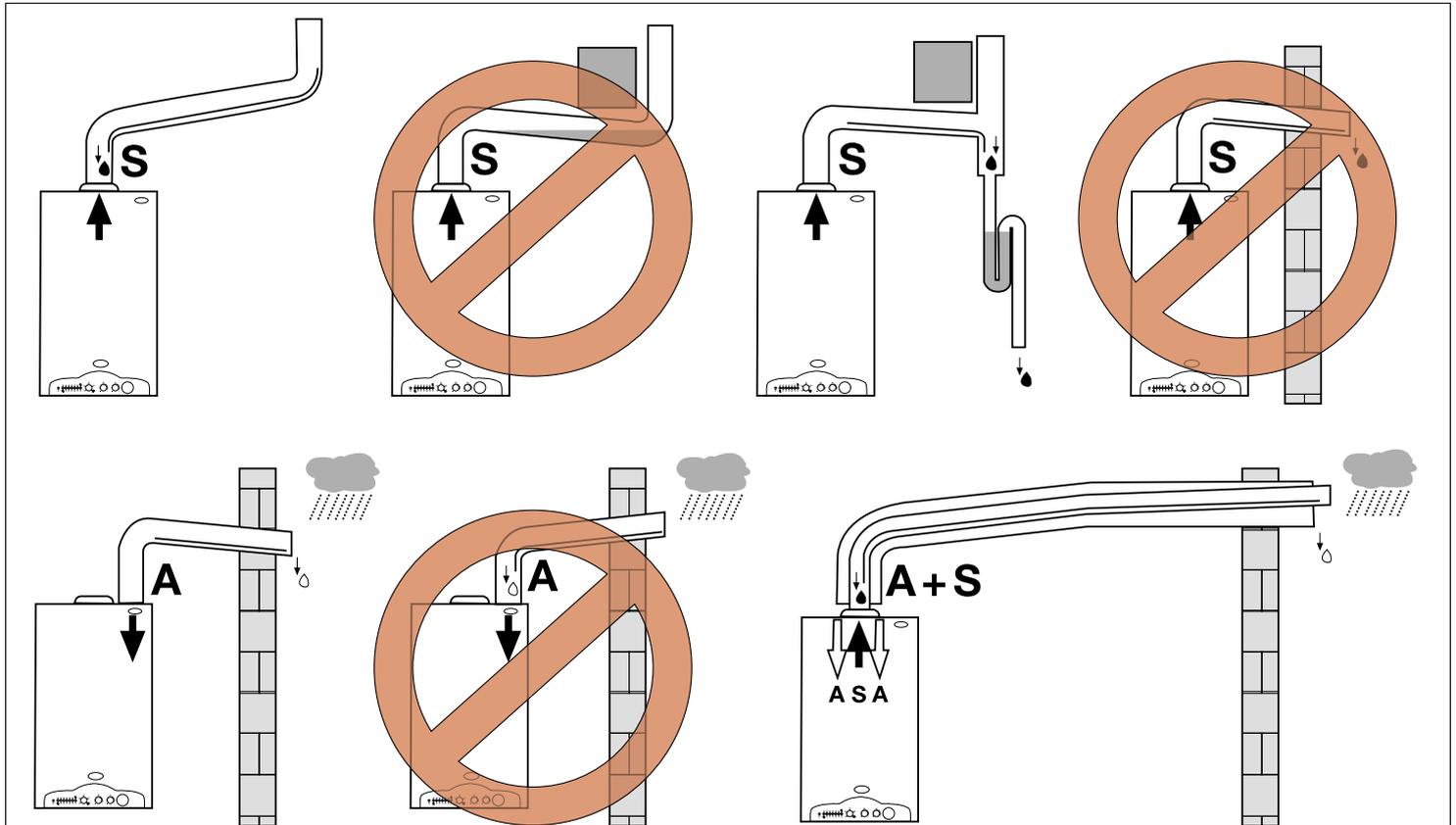
 The boiler is equipped with safety devices checking correct flue gas exhaustion. Should an air/flue gas system malfunction occur, the safety devices shut down the boiler and no. 4 or no. 3 and no. 8 LEDs start flashing (see no. 2 chart). It is strictly forbidden to tamper with and/or prevent operation 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



#### Chart to acronyms:

A Air intake - S Flue gas discharge - d Condensate - r Rain

pic. 8 – Installation examples of air intake/flue gas discharge pipes

### 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 be 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

#### Type C13

##### KC 24 and KR 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 32 and KR 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

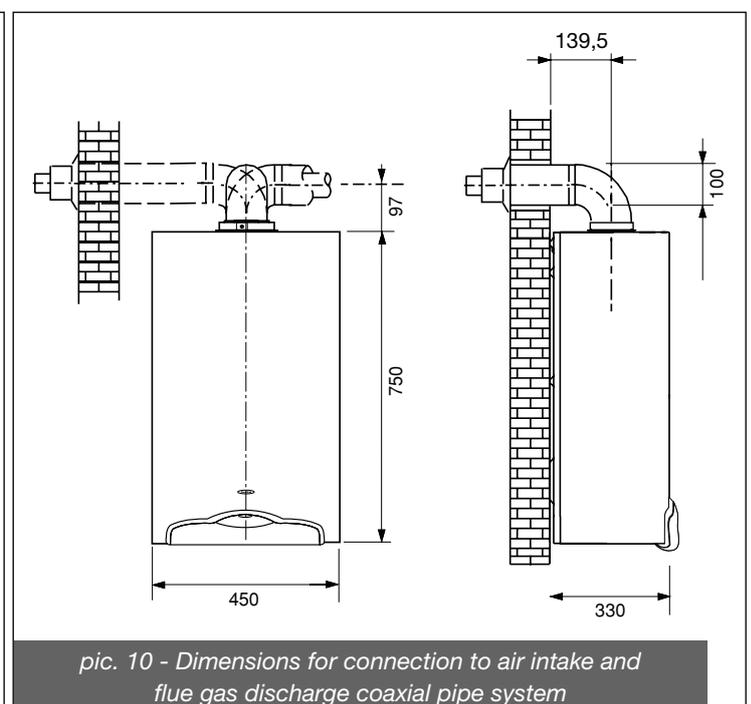
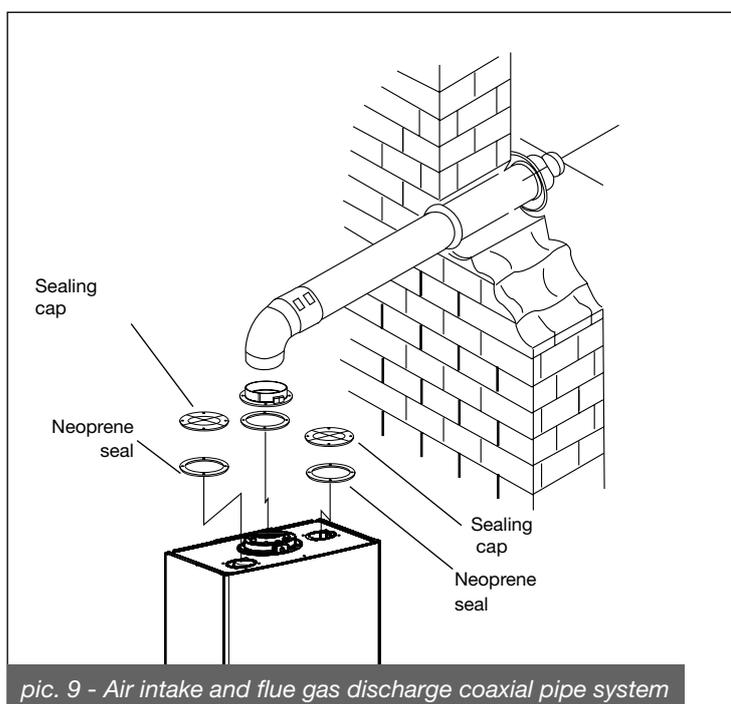
##### KC 24 and KR 24

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 32 and KR 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.

 The above data are referred to air intake/flue gas discharge system, implemented with original, rigid and smooth ducts, delivered by the manufacturer.





### 3.2.7.2. Measurements

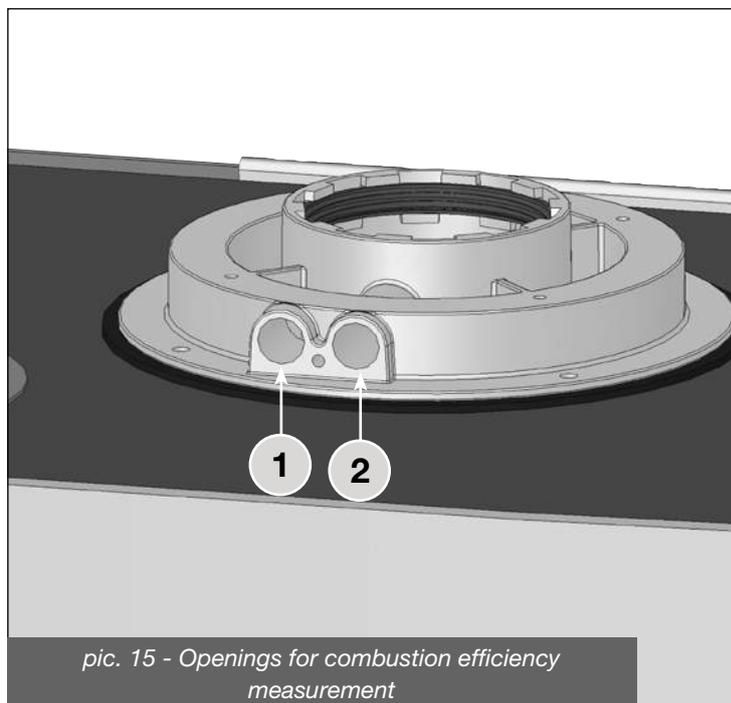
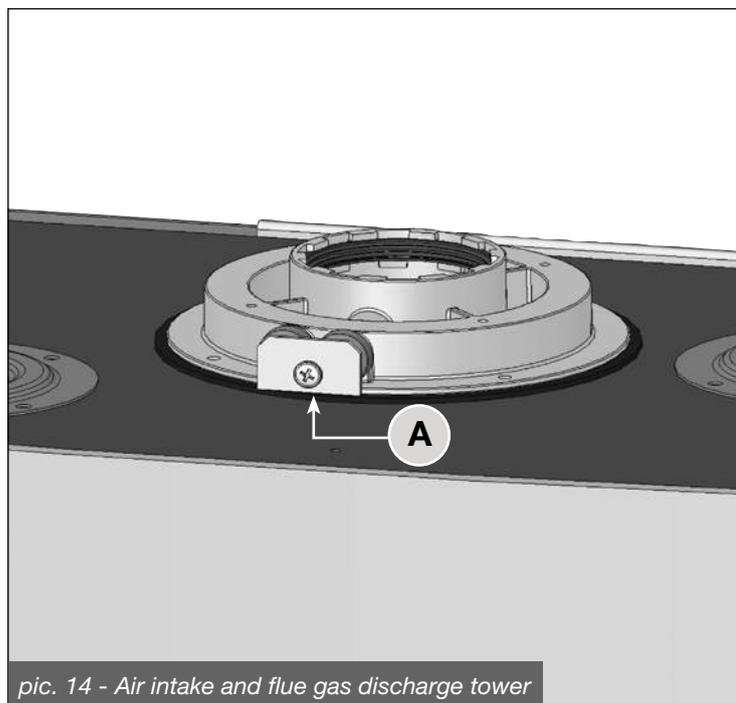
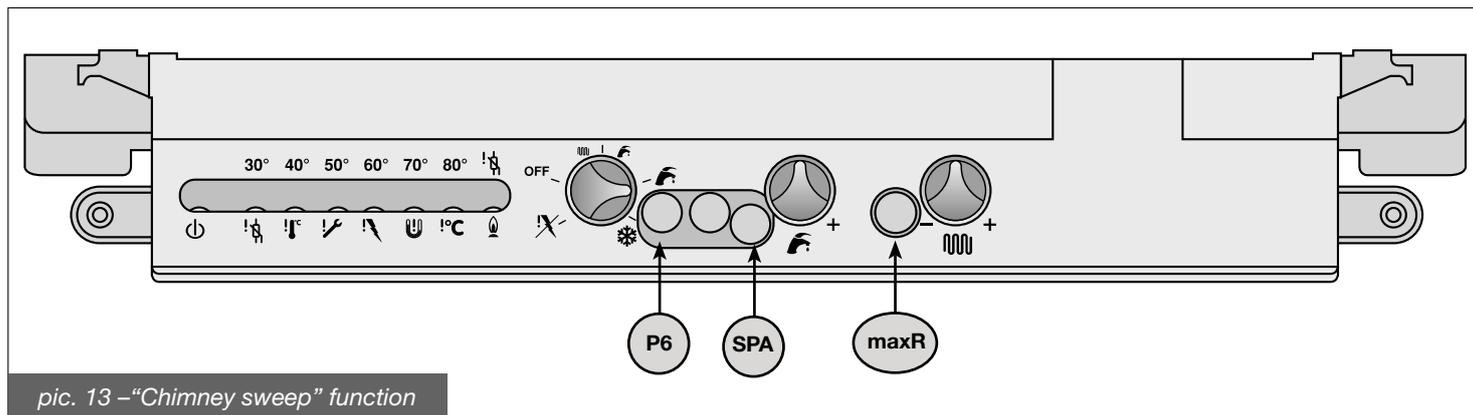
The boiler is equipped with a tower allowing for air intake/flue gas discharge duct connection (pic. 14 and pic. 15). The tower is designed with two pre-arranged openings directly accessing air and flue gas ducts (pic. 15).

Remove cap A from the pre-arranged openings on the tower, before starting combustion checking procedure (pic. 14).

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

- assess combustion air from no. 1 opening (pic. 15).
- assess flue gas temperature and CO<sub>2</sub> from no. 2 opening (pic. 15).

Allow boiler to reach working temperature before performing any measurement.

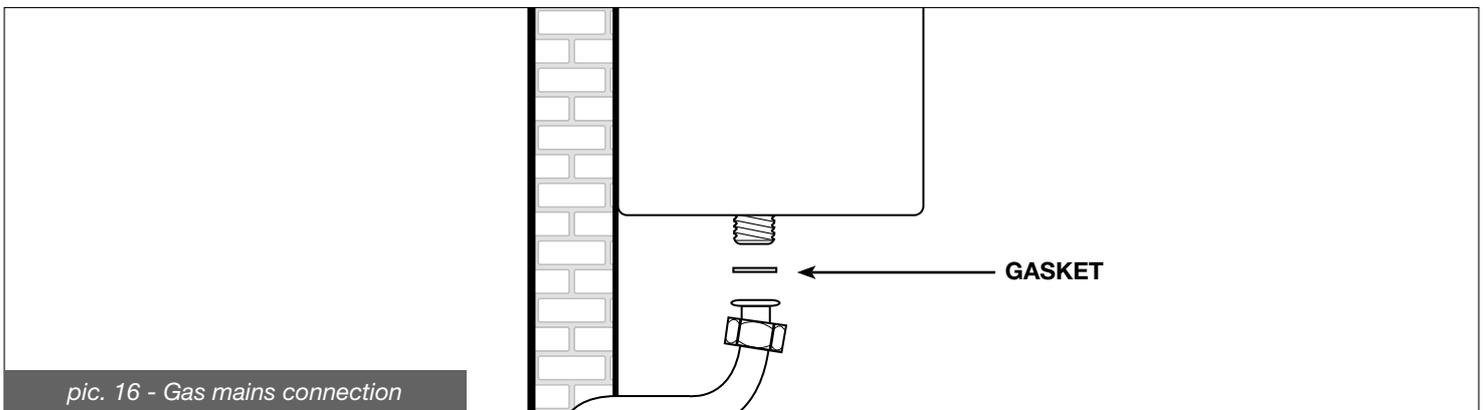


### 3.2.8. Gas main connection

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, install an appropriately sized and made gasket (pic. 16). The boiler gas inlet thread configuration is not appropriate for hemp, plastic tape or similarly made gaskets.



pic. 16 - Gas mains connection

### 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 (pic. 6).

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

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

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 installing 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 in system.

## CONDENSATE DRAIN

Comply with condensate drain laws and standards applicable in the country of installation and 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 pic. 3) 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 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 main 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 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 P6 trimmer (pic. 13) in order to choose the operation range, as per the following instruction:

- **standard range:** turn P6 trimmer fully clockwise;
- **reduced range:** turn P6 trimmer fully counter-clockwise.

When the external probe is installed, P6 trimmer function varies (see paragraph 3.2.14).

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

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

Should water temperature in the system fall below a determined value (no. 13 chart), waiting time procedure is aborted and the boiler re-ignited.

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

*No. 13 chart – Burner re-ignition temperatures*

**Operation range selection is to be implemented by a fitter or an authorized Service Centre.**

### 3.2.12. Room thermostat connection (optional equipment)

The boiler can be connected to a room thermostat (not supplied with the boiler). Room thermostat contacts are to be connected to M9 position of the boiler printed circuit board (pic. 21), after removal of the jumper which is delivered as standard fitting to the boiler.

**Room thermostat wiring must not be grouped together with power mains supply cables.**

### 3.2.13. Open Therm remote control installation and operation procedure (optional equipment)

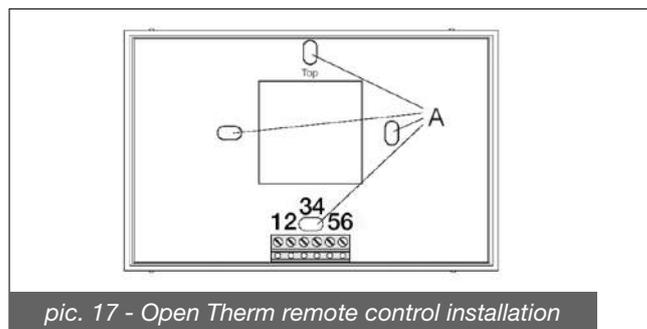
The boiler can be connected to an Open Therm remote control (optional equipment).

Installation is to adhere to the following procedure:

- install 0SCHEREM00 printed circuit board, included in the Remote Control Kit (which is necessary for connection of the remote control to the boiler), following the instructions described in the kit itself;
- position the remote control on a wall inside the premises, far from heat sources or draughts;
- separate, by means of a screwdriver, the rear part of the housing (grey) from the front one (white) and secure, by means of openings A (pic. 17) the rear part to the wall;
- hook up the remote control to the boiler, connecting no. 1 and no. 2 positions of the remote control (pic. 17) to the terminal board OPENTH M6 of code 0SCHEREM00 printed circuit board (see pic. 20 electric layout). The connection of BUS is protected against false polarity, that means the connections can be switched;
- employ two wired electric line for the connection, and with the following characteristics:
  - maximum length: 40 meters;
  - maximum impedance:  $2 \times 4\Omega/m$ ;
  - interlaced or sheathed wires can be installed in order to avoid disturbances;
  - **remote control wires are not to be routed together with electric supply cables;**
- now, should the external probe or the phone operation device not be in need to be installed, close the remote control housing, otherwise, follow the instructions described in the following paragraphs.



**The remote control is not to be connected to a 230V electrical power supply.**



pic. 17 - Open Therm remote control installation

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 (no. 14 and no. 15 charts), can be read and set through the remote control.

TSP0 parameter sets default data chart 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 chart.

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

No. 14 chart – 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 11 (only when external probe is installed)	15°C	35°C

No. 15 chart – TSP chart of parameters which can be displayed (these parameters cannot be adjusted via remote control)

### 3.2.14. External temperature probe installation (optional equipment) and “sliding temperature” operation

The boiler can be connected to an external temperature probe (optional equipment), which adjusts CH flow temperature for sliding temperature operation.

The manufacturer supplies two probe models:

- 0KSONEST00: external probe for connection to the remote control;
- 0SONDAES01: external probe for direct connection to the boiler;

**When the Open Therm remote control is employed, it is advisable to install the external probe for connection to the remote control, code 0KSONEST00.**

**For boiler trouble-free operation of the boiler use external probes supplied by the Manufacturer only.**

External temperature probe connection is to be performed by means of a double insulated wire, its minimum cross-section is to be 0.35 sq.mm.

External temperature probe code 0KSONEST00 is to be connected to no. 5 and no. 6 positions on the remote control (pic. 17).

External temperature probe code 0SONDAES01 is to be connected to M8 position of the boiler printed circuit board (pic. 21).

**External temperature probe wiring is NOT to be grouped together with power mains supply cables.**

External temperature probe is to be installed on an outside wall facing north/north-east.

Do not install in window area, next to ventilation openings, or heat sources.

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

- sensed outdoor temperature;
- selected thermoregulation curve;
- selected fictitious room temperature.

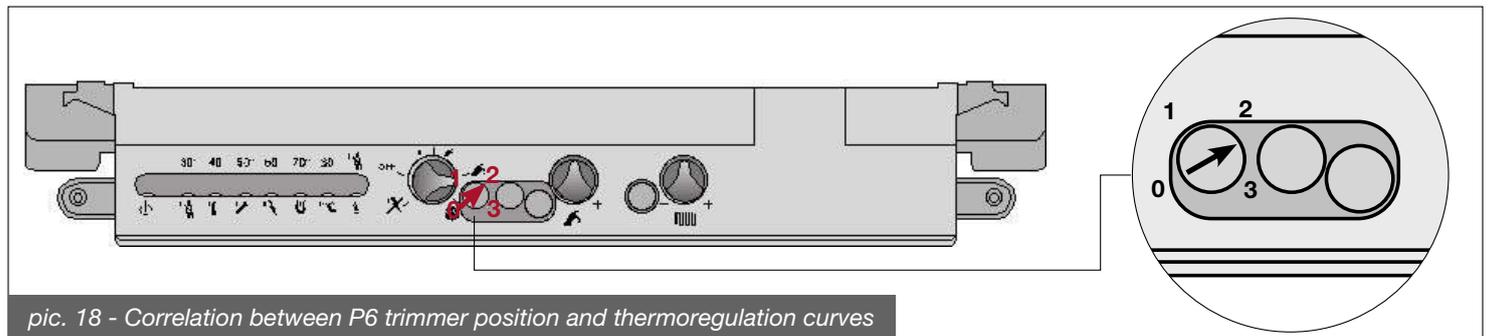
The thermoregulation curve is selected via P6 trimmer (pics. no. 18 and no. 19), which value can be read as TSP5 parameter in the TECHNICAL menu on the remote control (when installed):

Relation between read value and thermoregulation curves coefficients:  $\text{coefficient} = \text{read value}/84.67$

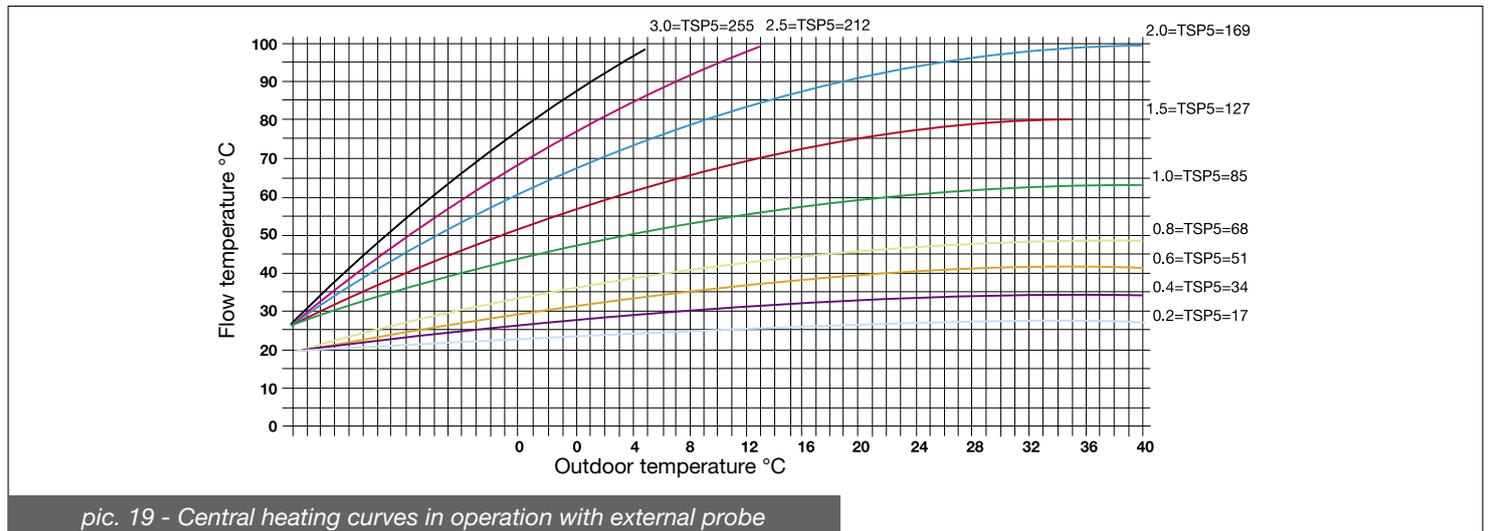
In addition, P6 trimmer position selects CH operation temperature range in relation to the following values:

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

The fictitious room temperature is set via adjuster 11 (pic. 1), which, when the external temperature probe is installed, loses its capability to set CH flow temperature (see 1.2.3. paragraph) and which value can be read as TSP6 parameter in the TECHNICAL menu on the remote control (when installed).



pic. 18 - Correlation between P6 trimmer position and thermoregulation curves



pic. 19 - Central heating curves in operation with external probe

Above shown curves, relative to a 20°C desired room temperature, are always limited between minimum and maximum value of Ch operation temperature range. When 20°C fictitious room temperature is changed (via adjuster 11), all curves move correspondingly.

### **3.2.15. Phone operation device installation (optional equipment)**

The boiler can be connected to a phone operation device (not provided with the boiler), allowing for CH mode activation via phone. The phone operation device is to be connected to no. 3 and no. 4 positions on the remote control (pic. 17). Phone operation device specifications are enclosed in the manual enclosed in its packaging.

### **3.3. Loading the system**

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

This procedure is to be cautiously carried out, following each below indicated step:

- open the air purging valves on all radiators and verify the boiler automatic valve operation;
- gradually open the relevant loading tap to fill the system up (pic. 2), checking that all automatic air purging valves installed in the system properly work;
- close all radiator air purging valves as soon as water starts coming out;
- check boiler water pressure gauge for pressure to reach 1-1.3 bars reading;
- shut the boiler loading tap and bleed any air out again by opening all air purging valves on radiators;
- start the boiler, and as soon as the system reaches working temperature, stop the pump and repeat the air purging procedures;
- allow the system to cool and restore water pressure to 1-1.3 bars.

#### **WARNING**

**As far as domestic heating systems treatment of water is concerned, in order to optimize performance and safety, to preserve these conditions over time, to ensure long-lasting regular operation of auxiliary equipment as well, and to minimize energy consumption, thereby integrating current local laws and standards it is advisable to use specific products that are suitable for multi-metal plants.**

#### **WARNING**

**Safety low water pressure switch will not allow the burner to be started when water flow is below 200 liter/minute.**

**CH system water pressure is not to be below 1 bar; restore proper value as needed via the provided loading tap (pic. 2).**

**The procedure is to be carried out while water in the system is cold. Boiler pressure gauge displays water pressure in the CH system.**

#### **WARNING**

**After long boiler inactivity, its pump may be blocked. Before operating the boiler, follow the below indicated pump unblocking procedure:**

- unscrew the protective bolt, located in the center front section of pump motor;
- put a screwdriver into the opening and manually rotate the circulation unit shaft clockwise;
- once the unblocking operation is completed, screw back on the protection bolt and check for water leaks;

**When the pump protective bolt is removed, some water may flow out. Before re-installing the boiler external housing, verify all internal surfaces to be dry.**

### 3.4. Starting the boiler

#### 3.4.1. Preliminary checks

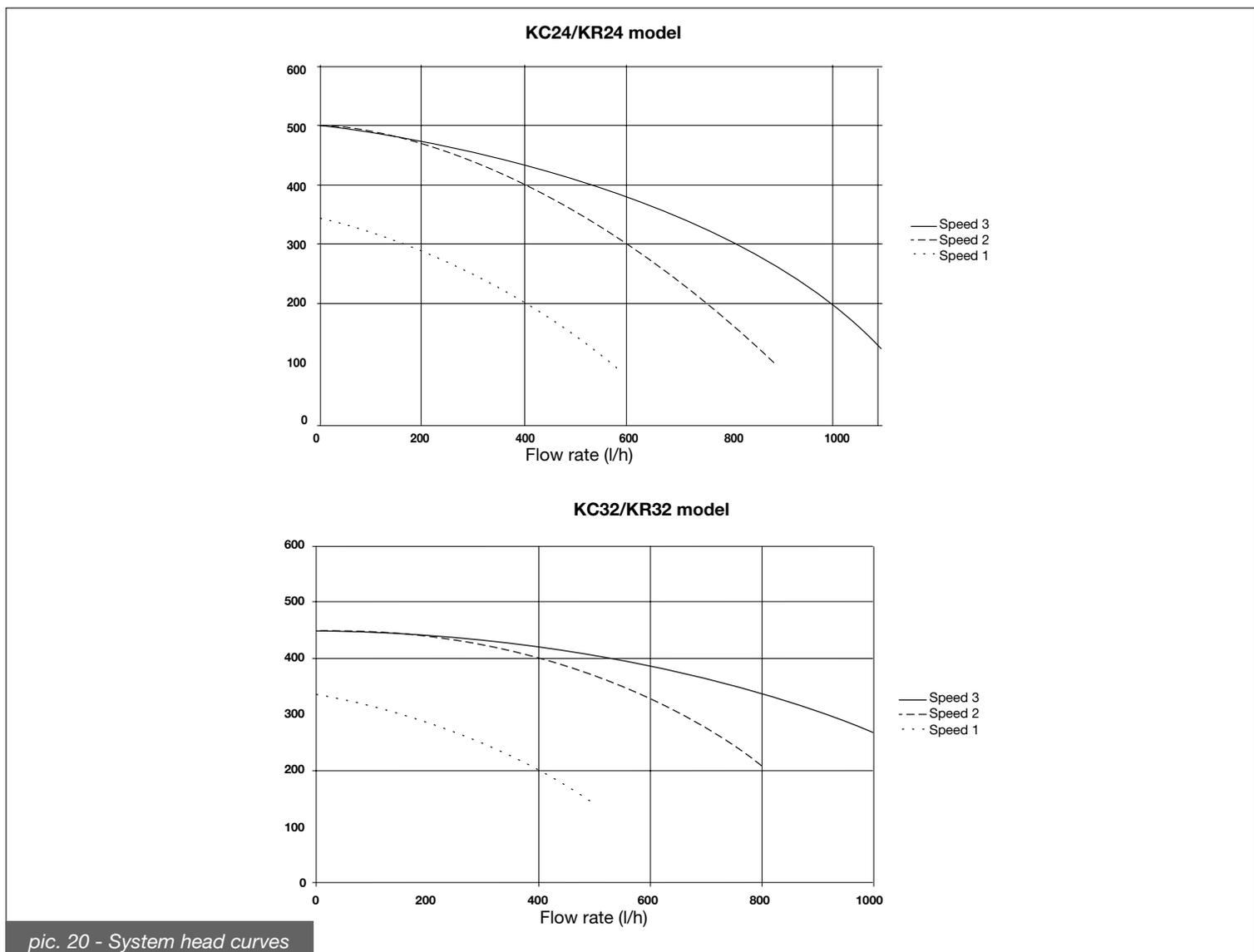
Before starting the boiler it is necessary to perform the following checks:

- flue gas exhaust pipe and terminal are installed as instructed: **when the boiler is running no products generated by combustion are to leak from any gasket;**
- electric power supplied to the boiler is to be 230 V – 50 Hz;
- the system is properly filled with water (pressure reading on water pressure gauge is to be 1 – 1.3 bar);
- all system pipes stopcocks are open.
- the gas type supplied to the boiler corresponds to that for which the boiler is set: convert the boiler to the available gas type (see 3.6. section Adaptation to other gases and burner adjustment); the procedure is to be performed by technically qualified personnel;
- the gas supply stopcock is open;
- **there are no gas leaks;**
- the power main switch external to the boiler is on;
- the boiler 3 bar safety valve is not blocked;
- there are no water leaks;
- the pump is not blocked.

 **WARNING**  
The boiler is equipped with a pump with three speeds corresponding to the residual head to the system according to the curves in pic. 20.

The boiler is delivered with the pump set to third speed.

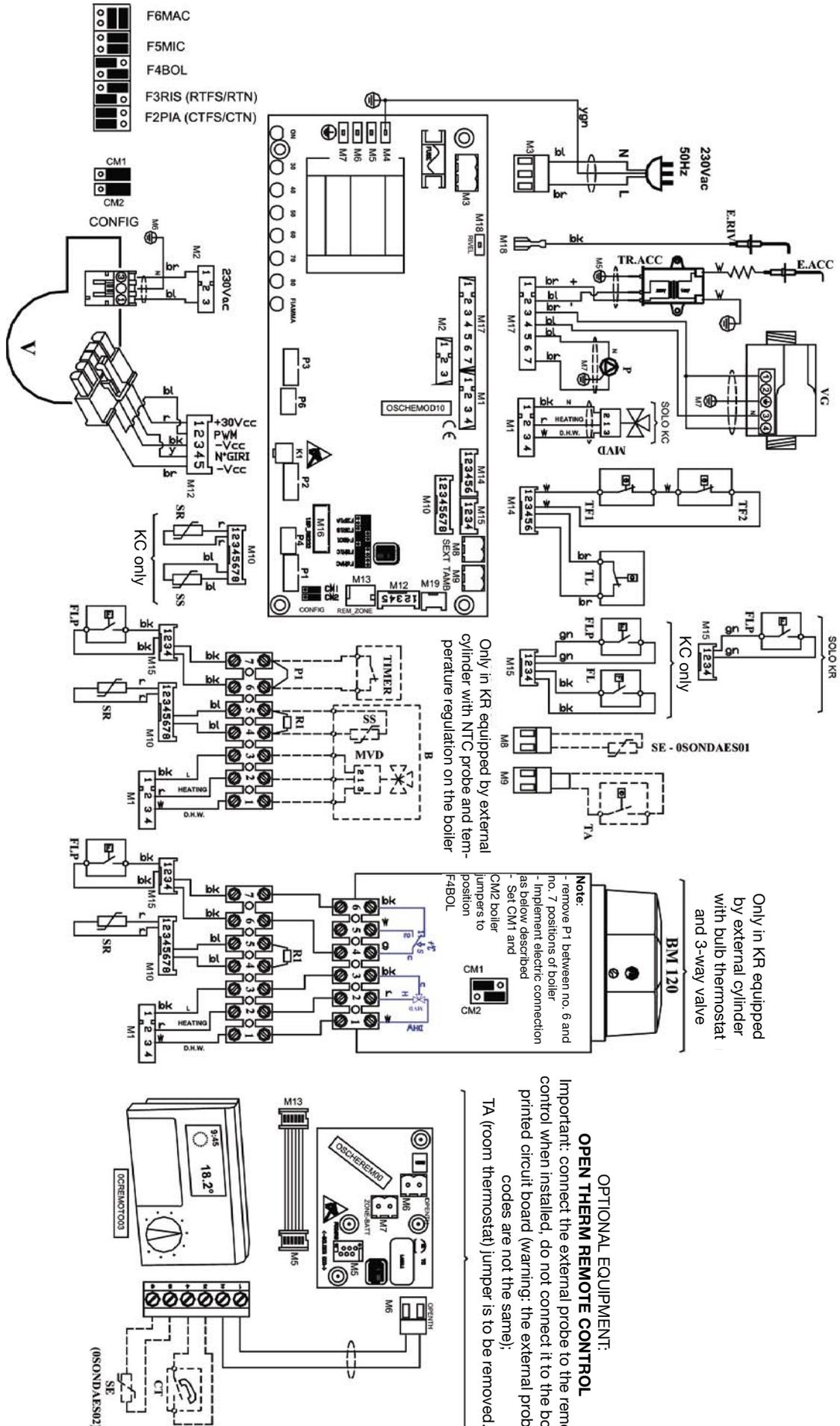
When changing speed to the pump, in accordance with the flow rate required by the boiler (ensured by the primary flow switch) and the system characteristics, verify that all the conditions relative to the system itself (such as closing of one or more zones in the CH system or closing of thermostatic valves) are respected.



#### 3.4.2. Switching on and switching off

For boiler switching on and switching off procedure follow § 1. "Instructions for the User".

### 3.5. Wiring diagram



pic. 21 - Electric layout

**CHART TO PIC. 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: "AQUA PREMIUM" boiler  
 M3-M8-M9: power Supply connector, outdoor probe TA  
 M16: connector for tele-metering  
 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  
 TA: ambient thermostat (option)  
 CM1-CM2: boiler type selection jumpers  
 FL: DHW flow switch

SE: external temperature probe 0SONDAES01 10k Ohm B = 3977 (Option) boiler probe to be connected to the boiler electronic board when no remote control is installed  
 SE: external temperature probe 0SONDAES02 type KYT (Option): to be connected to the remote control when remote control (option) is installed  
 SS: DHW probe 10k Ohm B = 3435 three meter max length  
 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 tank (remove R1)  
 BM120: external water tank 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  
 S: bulb probe thermostat  
 COMANDO REMOTO: REMOTE CONTROL (option)  
 0CREMOTO03: Open therm remote control  
 0SCHEREM00: interface board for remote control  
 0SONDAES02: outdoor probe to be installed with remote control (option)  
 CT (option): phone operation device

**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

*No. 16 chart - Correlation "temperature - nominal resistance" of temperature probes***3.6. Adaptation to other gases and burner adjustment**

The boilers are manufactured for the gas type specified upon order.

**WARNING**

**Adaptations after delivery are to be strictly implemented by qualified personnel, employing manufactured supplied accessories and implementing the modifications and adjustments for the necessary boiler setting up.**

**Adapting the boiler from METHANE to PROPANE**

- unscrew the outlet connection to the gas valve (A in pic. 22);
- replace the diaphragm in the relevant seating, with the one for PROPANE;
- re-connect the outlet connection to the gas valve (A in pic. 22);
- see A) and B) points.

**Adapting the boiler from PROPANE to METHANE**

- unscrew the outlet connection to the gas valve (A in pic. 22);
- replace the diaphragm in the relevant seating, with the one for METHANE;
- re-connect the outlet connection to the gas valve (A in pic. 22);
- see A) and B) points.

**A) Maximum heating output adjustment**

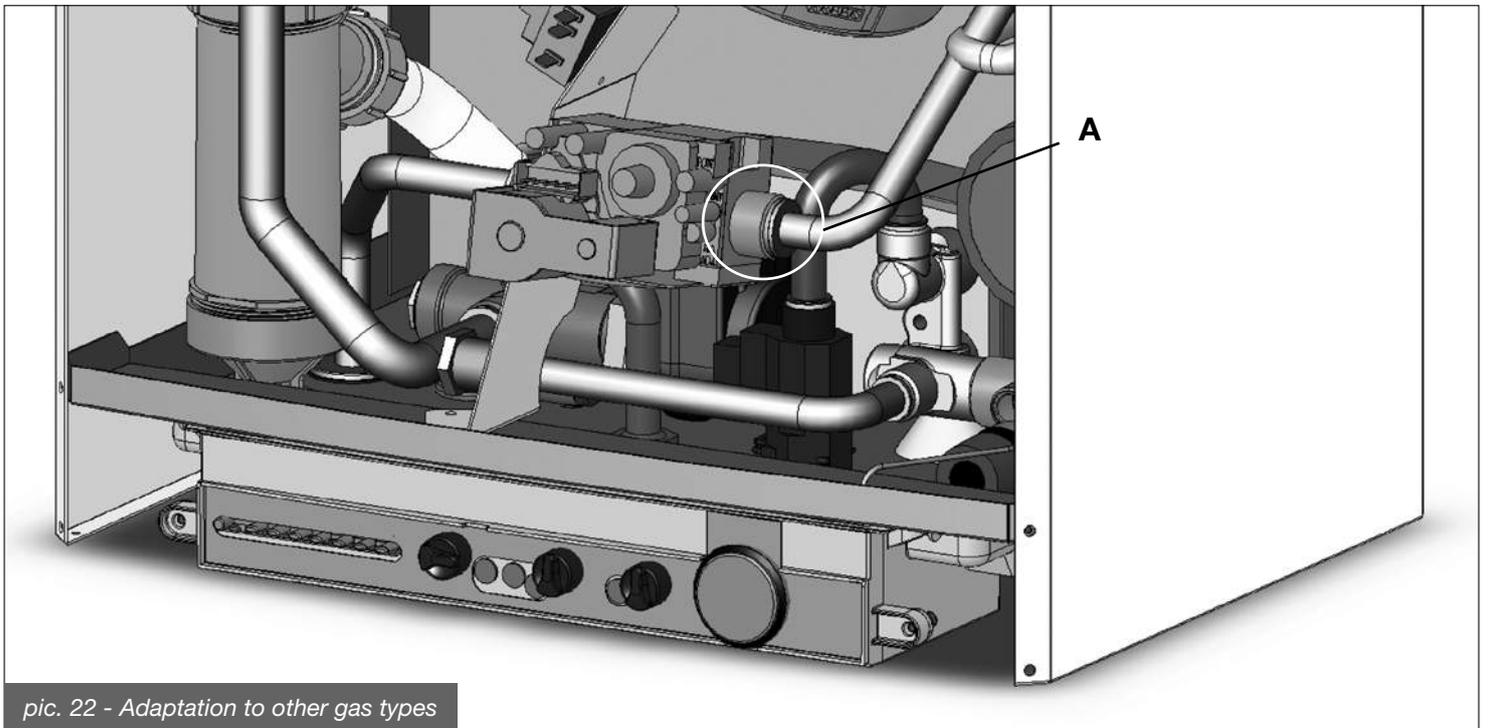
- set heating output adjuster maxR (pic. 13) to maximum (turn it fully clockwise after removing the protective cap);
- position selector 9 (pic. 1) to WINTER;
- verify the room thermostat (when available) to be set to ON;
- start "chimney sweep" boiler mode (see paragraph 3.2.7.1);
- adjust CO<sub>2</sub> in flue gas by turning ratio adjuster B (pic. 23) and verify CO<sub>2</sub> value to be within the range stated in no. 17 chart;
- allow boiler to keep operating in chimney sweep mode and go to point B;

### B) Minimum heating output adjustment

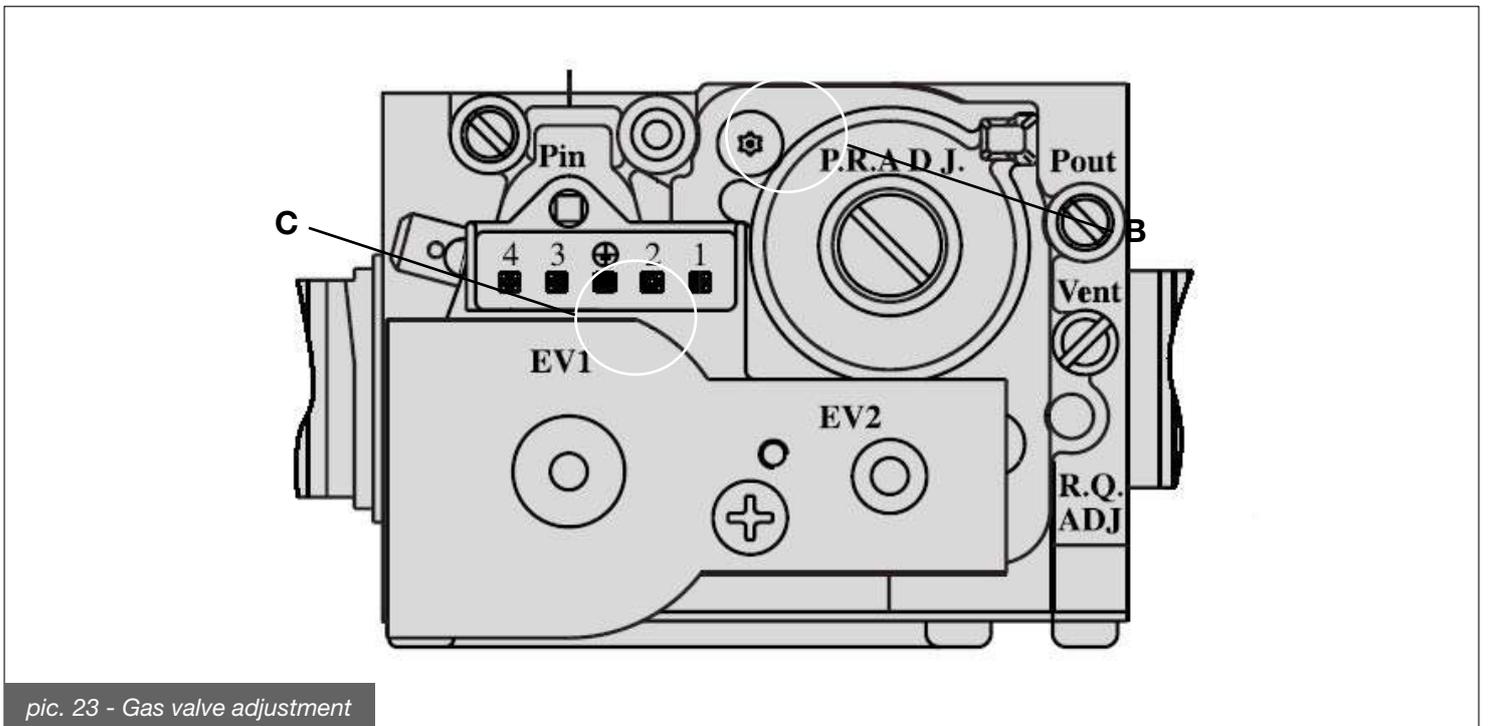
- set heating output adjuster maxR (pic. 13) to minimum (turn it fully counter-clockwise after removing the protective cap);
- adjust CO<sub>2</sub> in flue gas by turning offset adjuster C (pic. 23) and verify CO<sub>2</sub> to be within the range stated in no. 17 chart;
- exit chimney sweep mode by setting selector 9 (pic. 1) to any position other than WINTER;

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

No. 17 chart – CO<sub>2</sub> rates



pic. 22 - Adaptation to other gas types



pic. 23 - Gas valve adjustment

## 4. Testing the boiler

### 4.1. Preliminary checks

Before testing the boiler, it is recommended to carry out the following checks:

- compliance of flue gas discharge ducts and terminal installation according to instructions: **when the boiler is operating no products generated by combustion are to leak from any gasket;**
- power mains supply to boiler is 230 V – 50 Hz;
- the system is correctly loaded (water pressure gauge is to display 1 / 1.3 bar);
- all stopcocks in the system piping are to be open;
- gas type is to be in accordance to boiler specifications: convert the boiler to the available gas type (see 3.6. section “**Adaptation to other gases and burner adjustment**”); the procedure is to be performed by technically qualified personnel;
- gas supply stopcock is to be open;
- no gas leaks are to be detected;
- electric power switch, external to the boiler is to be on;
- boiler 3 bar safety valve is not to be blocked;
- water leaks are not to be detected;
- pump is not to be blocked.



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

### 4.2. Switching on and switching off

For boiler switching on and switching off procedure follow § 1. “**Instructions for the User**”.

## 5. Maintenance

**Have the boiler periodically serviced in compliance with standards applicable in the country of installation.**

**Appropriate heating unit maintenance ensures efficient operation, environment preservation, and safety for people, animals and objects.**

**Maintenance and repair procedures are strictly to be carried out by qualified personnel.**

The manufacturer recommends Customers to contact an authorized Service Centre for all maintenance and repairs, which are best trained for the purpose.



**Before implementing any maintenance involving replacement of components and/or cleaning of internal boiler parts, disconnect electrical power supply to the boiler.**

### Maintenance schedule

Routine maintenance schedule must include:

#### the following checks:

- general integrity of the boiler;
- boiler and network gas supply leakage;
- gas supply pressure to boiler;
- boiler ignition sequence;
- boiler combustion parameters by analysis of flue gas;
- flue gas system integrity, good state of preservation, and absence of leaks;
- combustion fan correct operation,;
- general integrity of boiler safety devices;
- absence of water leaks and oxidized areas on boiler couplings;
- efficiency of the system safety valve;
- expansion vessel loading pressure;
- safety flow switch efficiency preventing low water pressure operation.

#### the following cleaning is to be performed:

- general boiler internal areas;
- gas nozzles;
- air intake and flue gas exhaust system;
- heat exchanger;
- siphon and condensate discharge pipes.

When operating for the very first time to the boiler, also check:

- boiler room suitability;
- duct diameter and length in the flue gas system;
- boiler installation in accordance to this “**Installation use and maintenance**” manual instructions.

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

## 6. Troubleshooting

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	SOLUTION
The boiler has shut down, and no. 5 led (red) is flashing. Turn selector 9 to reset position in order to resume boiler operation	Burner does not ignite	Gas supply failure	Check gas pressure. Check gas stopcocks to be open and gas network safety valve intervention.
		Gas valve is disconnected	Reconnect it
		Gas valve is faulty	Replace it
		PCB is faulty	Replace it
	Burner does not ignite: no spark	Spark electrode is faulty	Replace the electrode
		Ignition transformer is faulty	Replace ignition transformer
		PCB does not ignite: it is faulty	Replace PCB
	Burner ignites for a few seconds and goes off	PCB does not detect flame: inverted phase and neutral	Verify correct neutral and phase connections
		Flame detection electrode wire is disconnected or faulty	Connect flame detection electrode wire or replace it
		Detection electrode is faulty	Replace electrode
		PCB does not detect flame: it is faulty	Replace PCB
		Ignition heat output value set point is too low	Increase it
Minimum heat input is not set correctly		Check burner adjustment	
The boiler has shut down and no. 4 LED (red) is flashing. Turn selector 9 to reset position in order to resume boiler operation	Flue gas thermostats are not consenting to operation	Flue gas thermostats are faulty	Check flue gas thermostats: replace them if faulty
		Inadequate air intake or flue gas discharge flow	Check air intake/flue gas discharge ducts: clean or replace
		Fan is not correctly operating	Check fan
		PCB is faulty	Replace it
The boiler is not operating, no. 3 LED (red) is flashing. Boiler will resume operation when selector 9 is brought to reset position and CH water temperature goes back to normal parameters	Boiler safety thermostat has intervened	CH water does not flow: pipes might be clogged, thermostatic valves might be shut, system stopcocks might be closed	Check CH system
		Pump is stuck or faulty	Check the pump
		Flow probe sends faulty signals	Check flow probe
The boiler is not operating, no. 7 LED (red) is flashing. Boiler will automatically resume operation as soon as malfunction ends	Flow water temperature has exceeded 85°C	Inadequate water flow in the system	Check the pump Check CH system
The boiler is not operating, no. 6 LED (red) is flashing. Boiler will resume operation as soon as CH water flow is restored	CH water does not flows	Insufficient water in CH system	Load CH system
		CH system is leaking	Check CH system
		Primary flow switch is disconnected	Reconnect it
		Primary flow switch does not intervene: it is faulty	Replace it
The boiler is not operating, no. 3 (red) and no. 8 (yellow) LEDs are simultaneously flashing. Boiler will automatically resume operation as soon as malfunction ends	Fan is not correctly operating	Fan is not correctly connected	Check the fan
		Fan is faulty	Replace it
The boiler is not operating, no. 2 (red) and no. 8 (yellow) LED are simultaneously flashing. Boiler will automatically resume operation as soon as malfunction ends	Flow probe is not operating	Flow probe is disconnected	Reconnect it
		Flow probe is faulty	Replace it
No. 2 LED (red) is flashing. Boiler will automatically resume operation as soon as malfunction ends	DHW probe is not operating	DHW probe is disconnected	Reconnect it
		DHW probe is faulty	Replace it

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	SOLUTION
No. 2 (red) and no. 8 (yellow) LEDs are alternatively flashing (in KR boilers with external cylinder equipped by NTC probe). Boiler will automatically resume operation as soon as malfunction ends	Cylinder probe is not operating	Flow probe is disconnected	Reconnect it
		Flow probe is faulty	Replace it
No. 4 (red) and no. 8 (yellow) LEDs are simultaneously flashing. Boiler will automatically resume operation as soon as malfunction ends	The boiler is not receiving data from remote control	Remote control connection is interrupted	Check connections of remote control
		Remote control is faulty	Replace remote control
Boiler is not operating in DHW mode (KC)	DHW flow switch is not operating	The system has inadequate pressure or flow rate	Check DHW system Check flow switch filter
		Flow switch sensor is faulty or disconnected	Replace it or reconnect it
		Flow switch is blocked	Replace it





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