



ITACA CH

KR 85

KR 120

KR 150

IST 03 C 1165 - 05

## INSTALLATION, USE AND MAINTENANCE



CE

EN

Translation of the  
original instructions  
(in Italian)



It is compulsory to read this manual before proceeding with the boiler installation, use and maintenance operations.

This boiler is intended for production of hot technical water only:

- For heating of residential, commercial and industrial rooms.
- For heating of industrial process water.
- For indirect production of domestic hot water.

Any other use is forbidden.

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



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**WARNING**

We inform users that:

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



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**WARNING**

According to European Directive 2012/19/EU on waste electrical and electronic equipment (WEEE) the crossed-out wheelie bin symbol indicated on the boiler and on the package means that the boiler, at the time of its decommissioning, must be collected and disposed of separately from other waste (see *Decommissioning, disassembly and disposal*).

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

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

The manufacturer reserves the right to modify the products and/or its components as deemed necessary, in any moment and without prior notice.

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

## General notes for installing and maintenance technicians, and users

This instruction manual is an integral and essential part of the product. It shall be supplied by the installer to the user who shall keep it carefully to consult it whenever necessary.

This document shall be supplied together with the equipment in case the latter is sold or transferred to others.



### WARNING

**This boiler is intended for production of hot technical water only:**

- For heating of residential, commercial and industrial rooms.
- For heating of industrial process water.
- For indirect production of domestic hot water.

**Any other use is forbidden.**



### DANGER

**This boiler must be installed by qualified personnel.**

**The installation by unqualified personnel is forbidden.**



### DANGER

**This boiler must be installed in compliance with the requirements of the technical standards and legislation in force relating to gas appliances, particularly with reference to ventilation of the premises.**

**Any installation that does not comply with the requirements of the technical standards and legislation in force is forbidden.**



### DANGER

**This boiler must be installed 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.**



### WARNING

**This boiler must be installed inside the building or in a partially sheltered place.**

**A partially sheltered place is a place which is not directly exposed to atmospheric agents.**

**Any installation in a place that is not partially sheltered is forbidden.**



### DANGER

**This boiler must be correctly and safely connected to an electrical system compliant with the existing technical standards.**

**Any incorrect and unsafe connection to the electrical system is forbidden.**

**It is forbidden to connect the boiler to an electrical system lacking a differential switch to protect the boiler power line.**

**Any connection to an electrical system lacking a proper grounding system is forbidden.**



### WARNING

**The boiler is supplied with a three-pole power cable, already connected to the electronic board and it is provided with a safety clamp.**

**This boiler must be connected to a 230V power supply network, as indicated on the label affixed to the power cable.**

**DANGER**

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Carefully read the instructions relating to air intake and flue gas venting systems in the specific section of this manual.

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**DANGER**

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**This boiler must be connected to a gas distribution system which complies with the existing technical standards.**

**Check the gas system state of conservation before installing the boiler.**

**Any connection to a gas system which does not comply with the existing technical standards is forbidden.**

**When connecting the boiler to gas supply network, it is compulsory to install an appropriately sized gasket made from suitable material.**

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

**After connecting the boiler, check the connection for tightness.**

**Once gas is in the pipes, leak test by a naked flame is forbidden; use specific products available on the market.**

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**DANGER**

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**With gas fired boilers, take the following measures if you smell gas:**

- **Do not turn on or off electric switches and do not turn on electric appliances.**
- **Do not ignite flames and do not smoke.**
- **Close the main gas cock.**
- **Open doors and windows.**
- **Contact a Service Centre, a qualified installer or the gas supply company.**

**Never use a flame to locate a gas leak.**

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

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

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Before installing the boiler, check that the technical data correspond to the requirements for its correct use in the system.

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

Damage and/or injury caused by incorrect installation or use and/or damage and/or injury due to non-observance of the manufacturer's instructions shall release the manufacturer from any and all contractual and extra-contractual liability.

Do not obstruct the air intake openings.

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

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

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

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

Original parts must be used for all repairs to the boiler.

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

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

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



**DANGER**

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**Before starting the boiler, and each time it is at a standstill for several days, make sure the trap is full of water. If the trap is empty, fill it by pouring water into the boiler through the flue gas venting duct.**

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**WARNING**

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**The boiler must be serviced periodically as indicated in the relevant section of this manual. Appropriate boiler maintenance ensures efficient operation, environment preservation, and safety for people, animals and objects. Incorrect and irregular maintenance can be a source of danger for people, animals and property.**

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

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

**WARNING**

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**With the electrical power disconnected and the gas cock closed, the device's electrical anti-freeze function does not work.**

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

**DANGER**

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

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# 1. Instructions for the user

## 1.1 Control panel

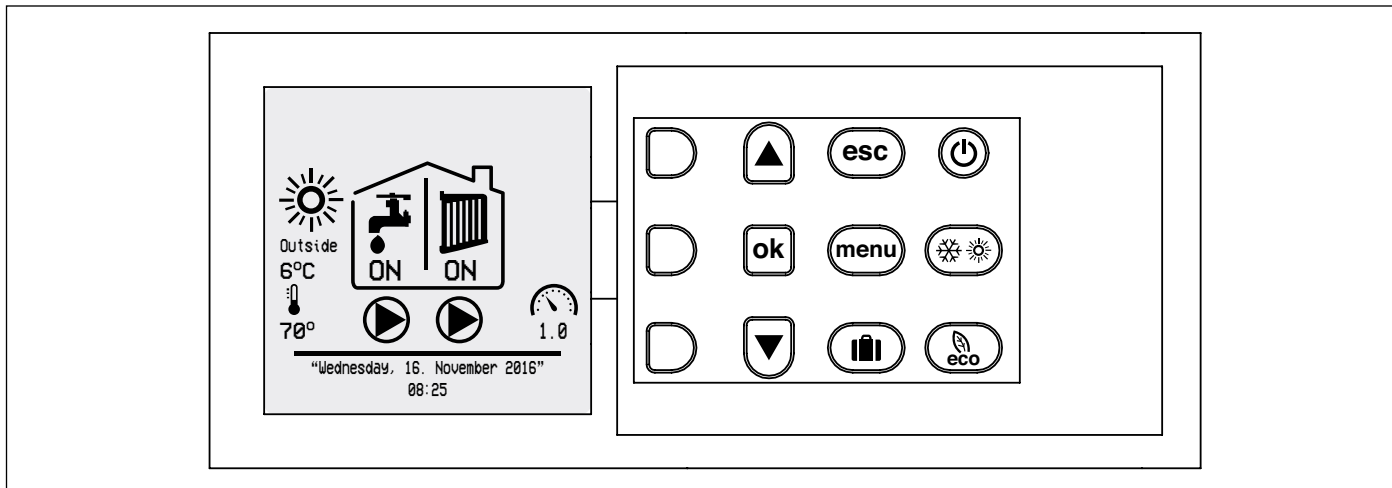


Fig. 1 Control panel

### 1.1.1 Display

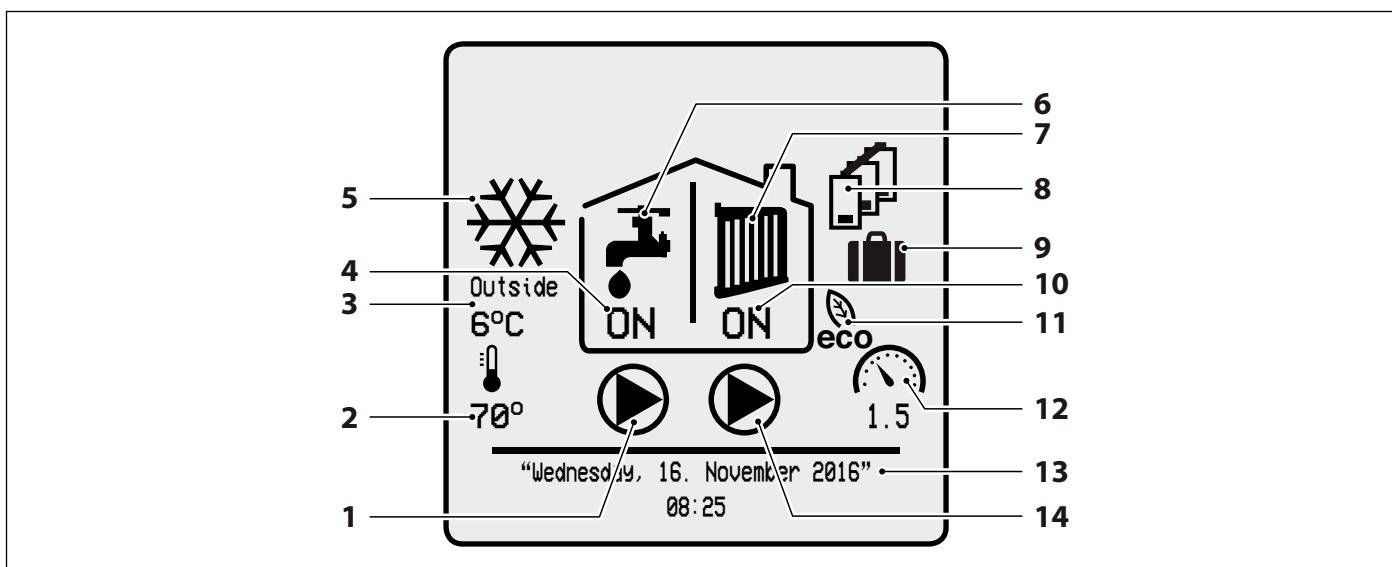


Fig. 2 Display

| Ref. | Description   |
|------|---|
| 1    | Request for domestic hot water enabled                          |
| 2    | Flow temperature  |
| 3    | External temperature (only if external probe is installed)      |
| 4    | Indication of DHW function enabling/disabling through timer     |
| 5    | Operating mode  |
| 6    | DHW operating status  |
| 7    | CH operating status   |
| 8    | Indication of cascade operation                                 |
| 9    | Indication of HOLIDAY mode enabling/disabling                   |
| 10   | Indication of heating function enabling/disabling through timer |
| 11   | Indication of ECO function enabling/disabling through key       |
| 12   | System water pressure   |
| 13   | Set date and time   |
| 14   | Heating request enabled   |

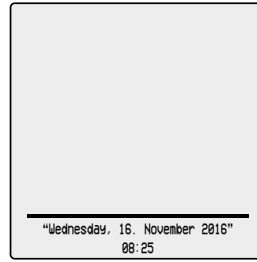
**1.1.2 Control panel keys and relevant functions**



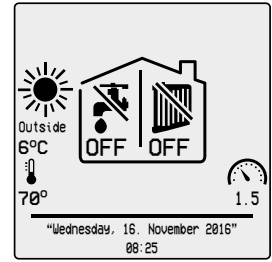
**SWITCHING ON**

**OFF:** stops the device, blocking the control panel keys.

**STAND-BY:** starts the device, unblocking the control panel keys.



**OFF**



**STAND-BY**



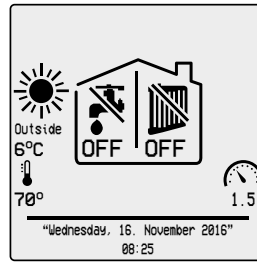
**OPERATING MODE**

**STAND-BY:** neither heating, nor DHW. "Pump anti-seize" function active.

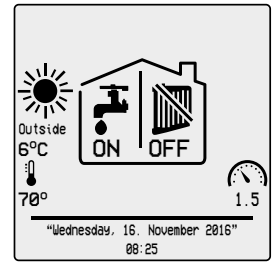
**SUMMER:** DHW production only (with external water heater, optional).

**CH ONLY:** production of heating water only.

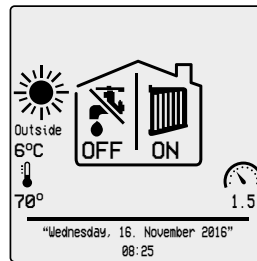
**WINTER:** water production for heating and DHW production (with external water heater, optional).



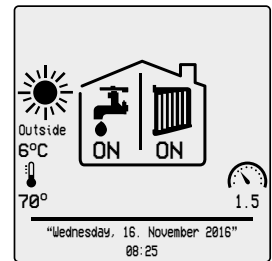
**STAND-BY**



**SUMMER**



**HEATING ONLY**

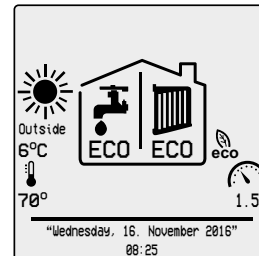


**WINTER**



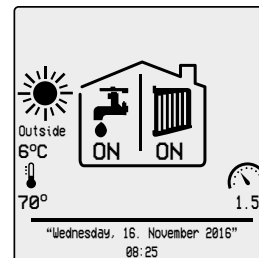
**ECO**

Reduces by a set value the CH and DHW water temperature (reduced operation).



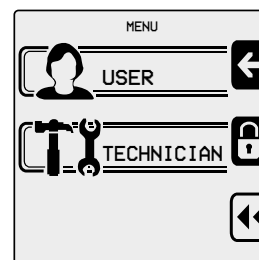
**ESC**

Allows interrupting the current displaying and go back to the main screen.



**MENU**

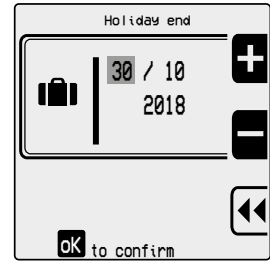
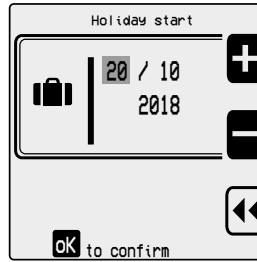
Displays the menu selection page (USER or TECHNICIAN).





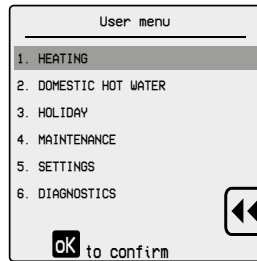
## HOLIDAY

Sets the holiday start and end dates and the CH and DHW water temperature values for this interval.



## UP and DOWN

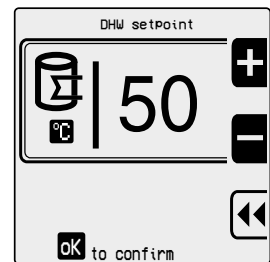
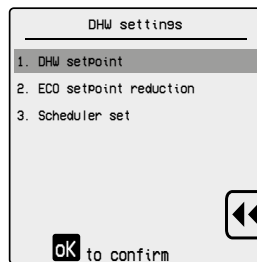
Scroll up and down the screen lines.



## OK

Allows:

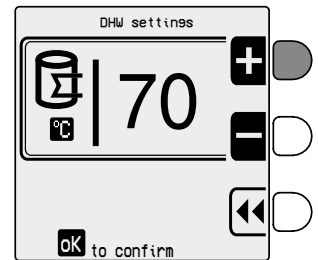
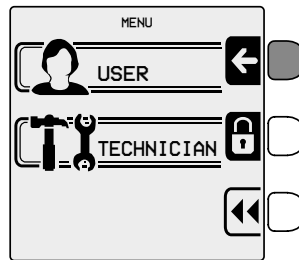
- accessing the selected menu line
- confirming the value changed



## SELECTION (high)

Allows:

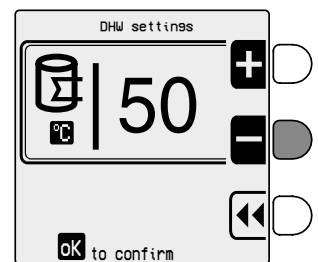
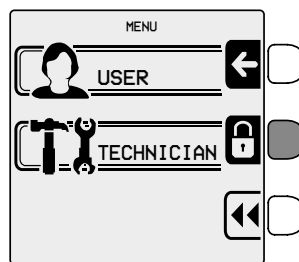
- accessing the USER menu
- increase the value to be changed (press and hold it for fast forwarding)



## SELECTION (intermediate)

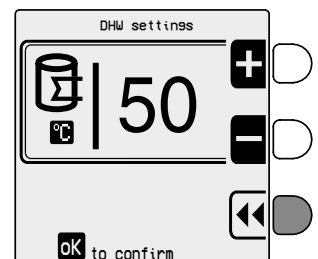
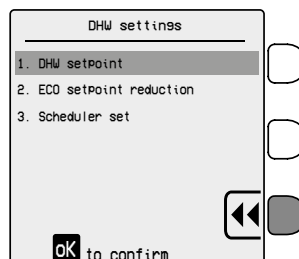
Allows:

- accessing the TECHNICIAN menu
- decrease the value to be changed (press and hold it for fast forwarding)



## SELECTION (low)

Allows going back to the previous screen without saving the edited value.






## 1.2 Boiler ignition

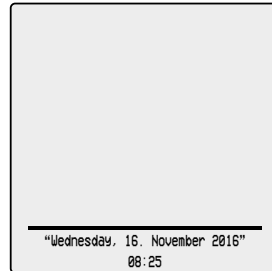


### DANGER

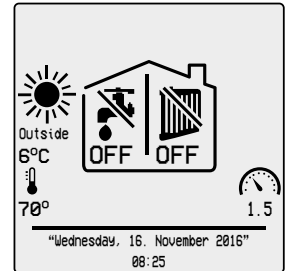
It is presumed that the boiler has been installed by a qualified installer, it has been commissioned and is ready to operate correctly.

For boiler ignition, proceed as follows:

- Open the gas cock installed ahead of the boiler.
- Turn the master switch installed ahead of the boiler **ON**. The boiler display turns on and sets to "OFF" status.
- Press  key to switch the boiler on. The display turns on and the boiler sets to the last selected status.
- Select the desired operating mode (see *Selecting the operating mode* on page 13).



OFF



STAND-BY




### WARNING


Upon the first ignition or after a prolonged period with the boiler not in use, particularly when boiler is propane-fired, ignition might be difficult and the boiler might shut-down several times (ERROR 1).

Reset boiler operation by pressing  key.

If, after several attempts, the boiler still fails to operate, contact a service centre or a qualified service engineer.


## 1.3 Selecting the operating mode


To select the operating mode check that the boiler display is ON - not in "OFF" mode. If this is not the case press  key to switch the boiler on.


Press  key and select the desired operating mode: "STAND-BY", "SUMMER", "CH ONLY", "WINTER" (see *Control panel keys and relevant functions* on page 11).

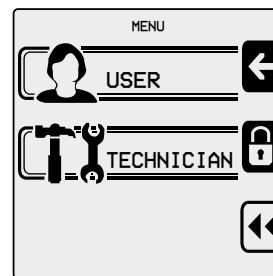
To change boiler operation user parameters, access the USER MENU (see *USER MENU* on page 14).



## 1.4 USER MENU


Check that the boiler display is ON - not in "OFF" mode. If this is not the case press  key to switch the boiler on.


Press  key to access the menu list.

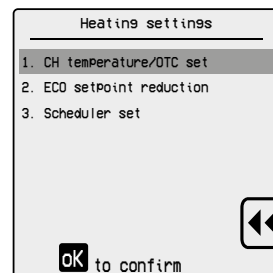
Press  (high) key to access the USER MENU.



Press   keys to scroll the menu.

Press  key to access sub-menus or access a parameter.

Press   key to go back to the previous screen.



For a detailed explanation of USER MENU items, see paragraphs *USER MENU navigation table* and *Description of USER MENU items* on pages [15](#) and [17](#).

### 1.4.1 USER MENU navigation table

| User menu             | Sub-menu 1                | Sub-menu 2   | Factory value | Settable values   |
|-----------------------|---------------------------|--|---------------|---|
| 1. HEATING            | 1. Temperature set        | 1. Temperature set   | 75°C          | 20 ÷ Absolute max temp. (*)   |
|                       |                           | 2. Outside temperature for CH off                                | OFF           | OFF<br>7 ÷ 30°C   |
|                       | 2. ECO setpoint reduction | -  | 50°C          | 0 ÷ 50°C  |
|                       | 3. Scheduler set          | 1. Enable/disable on board scheduler                             | Enabled       | Enabled<br>Disabled   |
|                       |                           | 2. Scheduler set   | Monday        | Monday<br>Tuesday<br>Wednesday<br>Thursday<br>Friday<br>Saturday<br>Sunday<br>Monday-Friday<br>Monday-Sunday<br>Saturday-Sunday |
| 2. DOMESTIC HOT WATER | 1. Temperature set        | -  | 80°C (**)     | 35 ÷ 85°C   |
|                       | 2. ECO setpoint reduction | -  | 20°C          | 0 ÷ 50°C  |
|                       | 3. Scheduler set          | 1. Enable/disable on board scheduler                             | Enabled       | Enabled<br>Disabled   |
|                       |                           | 2. Scheduler set   | Monday        | Monday<br>Tuesday<br>Wednesday<br>Thursday<br>Friday<br>Saturday<br>Sunday<br>Monday-Friday<br>Monday-Sunday<br>Saturday-Sunday |
| 3. HOLIDAY            | 1. CH holiday setpoint    | -  | 20°C          | 20 ÷ Absolute max temp. (*)   |
|                       | 2. DHW holiday setpoint   | -  | 80°C (**)     | 35 ÷ 85°C   |
| 4. MAINTENANCE        | 1. Service information    | Displaying of the service center telephone number (if set).      |               |   |
|                       | 2. Service due date       | Displaying the date of the following maintenance check (if set). |               |   |

(\*) The maximum value can be edited using parameter "1.2.1. Absolute maximum temperature" from TECHNICIAN MENU.

(\*\*) If parameter "2.5. Request type" from TECHNICIAN MENU = "Contact", then the value to be set is the water heater flow temperature.

Factory value = 80°C.

Settable values = 35÷85°C

In this case the set temperature must be at least 10°C greater than the water heater thermostat one.

If parameter "2.5. Request type" from TECHNICIAN MENU = "Sensor", then the value to be set is the DHW temperature.

Factory value = 60°C.

Settable values = 35÷65°C

| User menu      | Sub-menu 1              | Sub-menu 2   | Factory value | Settable values  |
|----------------|-------------------------|--|---------------|--|
| 5. SETTINGS    | 1. Select Language      | -  | English       | English<br>Italian<br>Polish<br>French<br>Spanish<br>Russian<br>Turkish<br>Romanian<br>Bulgarian<br>German |
|                | 2. Select Units         | -  | Celsius       | Fahrenheit<br>Celsius  |
|                | 3. Set date             | -  | -             | day / month<br>year  |
|                | 4. Set time             | 24 hours<br>12 hours   | -             | hours : minutes  |
|                | 5. Restore factory data | -  | -             | Press <input type="button" value="ok"/> to restore   |
| 6. DIAGNOSTICS | 1. Boiler information   | Displaying the main boiler parameters.<br>Where "*" symbol is present press <input type="button" value="ok"/> to display the parameter time chart. |               |  |
|                | 2. Lockout history      | Displaying the last boiler operation errors.<br>Press <input type="button" value="ok"/> to display the boiler status when the error occurred.      |               |  |

## 1.4.2 Description of USER MENU items

| Ref.                                     | Description   |
|--|---|
| <b>1. HEATING</b>                        |   |
| 1.1. Temperature set                     |   |
| 1.1.1. CH setpoint                       | Heating flow temperature setpoint setting.  |
| 1.1.2. Outside temperature for CH off    | External temperature setpoint setting for automatic switch to "SUMMER" mode.  |
| 1.2. ECO setpoint reduction              | Heating flow temperature reduction value setting in ECO mode.   |
| 1.3. Scheduler set                       |   |
| 1.3.1. Enable/disable on board scheduler | Heating hourly/weekly programming enabling or disabling.  |
| 1.3.2. Scheduler set                     | Heating hourly/weekly programming setting.  |
| <b>2. DOMESTIC HOT WATER</b>             |   |
| 2.1. DHW setpoint                        | If parameter "2.5. Request type "from TECHNICIAN MENU = "Contact", then the value to be set is the water heater flow temperature. (*)<br>If parameter "2.5. Request type "from TECHNICIAN MENU = "Sensor", then the value to be set is the DHW temperature. |
| 2.2. ECO setpoint reduction              | Domestic hot water temperature reduction value setting in ECO mode.   |
| 2.3. Scheduler set                       |   |
| 2.3.1. Enable/disable on board scheduler | Domestic hot water preparation hourly/weekly programming enabling or disabling.   |
| 2.3.2. Scheduler set                     | Domestic hot water preparation hourly/weekly programming setting.   |
| <b>3. HOLIDAY</b>                        |   |
| 3.1. CH holiday setpoint                 | Heating flow temperature setpoint setting in HOLIDAY mode.  |
| 3.2. Instant DHW setpoint                | Domestic hot water temperature setpoint setting in HOLIDAY mode.  |
| <b>4. MAINTENANCE</b>                    |   |
| 4.1 Service information                  | Displaying the Technical Service Centre telephone number (if set).  |
| 4.2. Service due date                    | Displaying the date of the following maintenance check (if set).  |
| <b>5. SETTINGS</b>                       |   |
| 5.1. Select Language                     | Selecting the display language.   |
| 5.2. Select Units                        | Selecting the unit of measurement for temperature (Celsius or Fahrenheit).  |
| 5.3. Set date                            | Current date setting (day/month/year).  |
| 5.4. Set time                            | Current time setting (12 or 24 hours / hours: minutes format).  |
| 5.5. Restore factory data                | Restoring factory settings.   |
| <b>6. DIAGNOSTICS</b>                    |   |
| 6.1. Boiler information                  | Displaying the main boiler parameters.<br>Where "*" symbol is present press <input type="button" value="ok"/> to display the parameter time chart.  |
| 6.2. Lockout history                     | Displaying the last boiler operation errors.<br>Press <input type="button" value="ok"/> to display the boiler status when the error occurred.   |

(\*) In this case the set temperature must be at least 10°C greater than the water heater thermostat one.

## 1.5 TIMER setting


It is possible to set the time slots during which the boiler must operate (in standard or ECO mode), if heat is requested, and those during which the boiler must remain OFF.


There is a maximum of 6 programmable time slots in the 24 hour time frame.

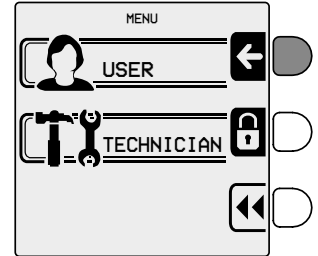
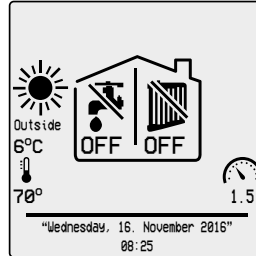
Each time slot has a start time (ON) and an end time (OFF).


The programming time range is 15 minutes.

Time slots can be set both for CH function and for DHW function.

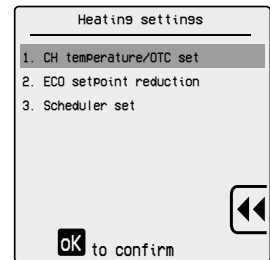
Press  key to access the menu list.

Press  (high) key to access the USER MENU.




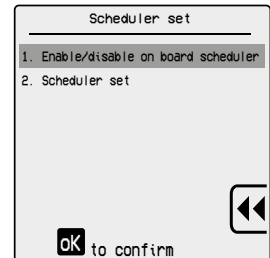
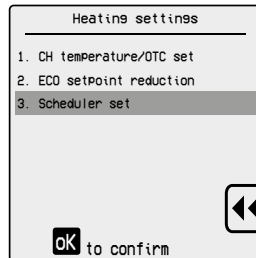
Select "1. HEATING" or "2. DOMESTIC HOT WATER" and press .


TIMER setting is the same for both functions.



Select "3. Timer setting" and press .

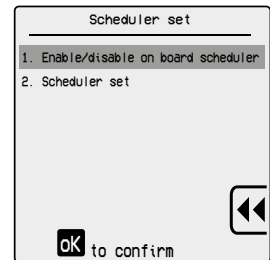
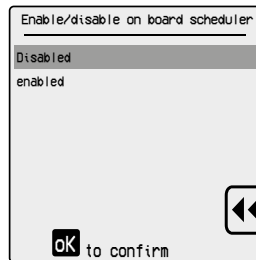
Select "1. Enable/Disable local timer" and press .



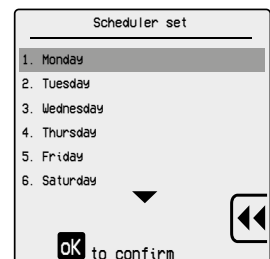
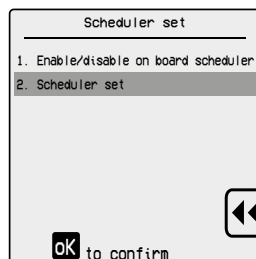
Select "Enabled" or "Disabled" and press  to confirm.

After pressing  the menu goes back to the previous screen.

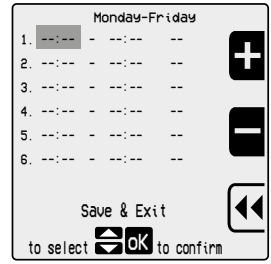
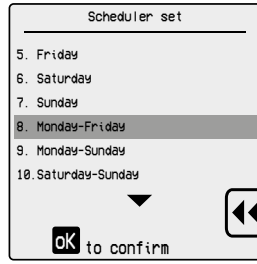
**If "Disabled" option is selected, TIMER programming is stored, but not respected.**



Select "2. Timer setting" and press .



Select the day or groups of days and press **OK**.



Press **+** or **-** to set the first slot start time.

Press **▼** to go to the first slot end time setting.

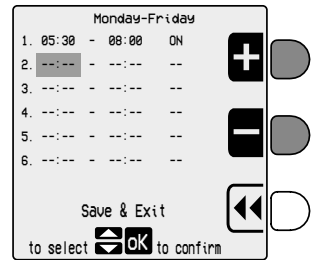
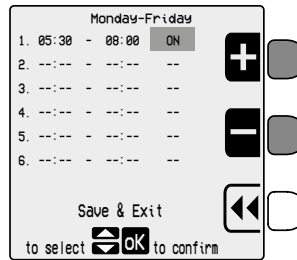
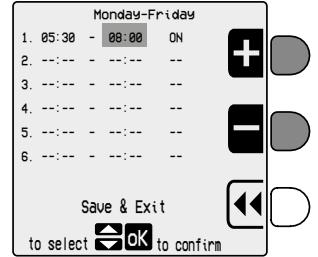
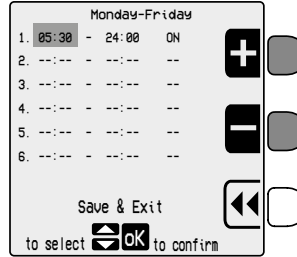
Press **+** or **-** to set the first slot end time.

Press **▼** to go to the operation mode setting.

Press **+** or **-** to set the operating mode: ON, ECO or -- (OFF).

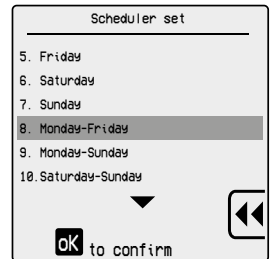
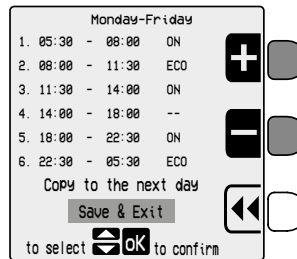
Press **▼** to go to the second slot setting.

Time setting is the same for all the time slots.



Press **▼** to select "Save and exit" or "Copy Day" to copy the setting in the next day.

Press **OK** to confirm and go back to the previous screen.



Repeat the previous operations to set the time slots of the other days or groups of days.

## 1.6 HOLIDAY function

The HOLIDAY function allows reducing the boiler operating temperatures, in heating and DHW modes, during a set time period (in days).


This function is useful in case of temporary absences (weekends, travels, etc.).




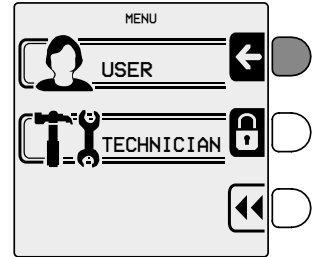
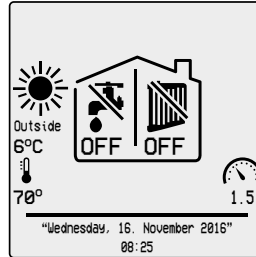
### WARNING

**During the period of absence the boiler must be electrically supplied, must remain in "WINTER" mode and the gas cock must remain open.**

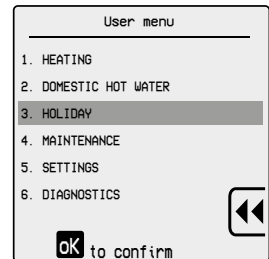
**If this is not the case the boiler cannot work.**

Press  key to access the menu list.



Press  (high) key to access the USER MENU.




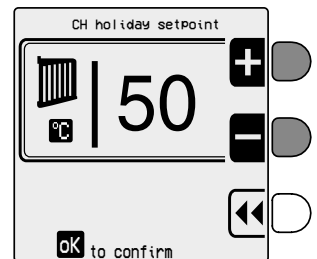
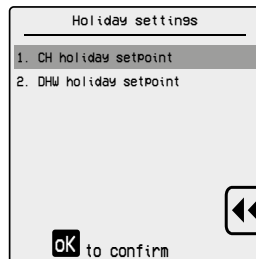
Select "3. HOLIDAY" and press .



Select "1. Heating temperature" and press .



Press  or  to set CH water temperature during HOLIDAY period.


Press  to confirm and go back to the previous screen.

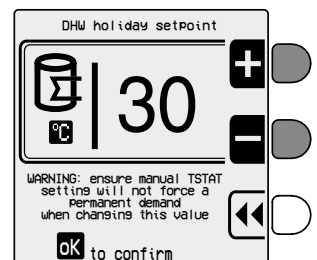
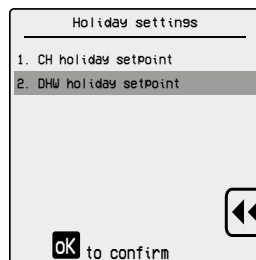


If a water heater with temperature probe is present (optional), it is possible to set the DHW operating temperature during the HOLIDAY period.

Select "2. DHW temperature" and press .

Press  or  to set DHW temperature during HOLIDAY period.

Press  to confirm and go back to the previous screen.



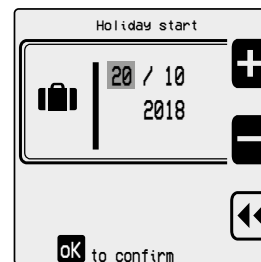
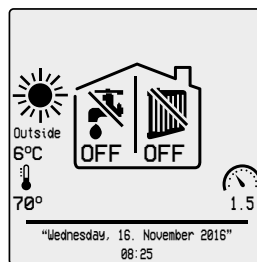
### WARNING

**If water heater is equipped with thermostat (optional), do not set a value lower than the thermostat one, as this would generate a continuous DHW request.**

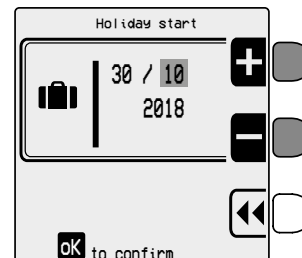
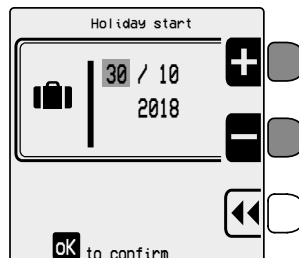
**In this case the set temperature must be at least 10°C greater than the water heater thermostat one.**



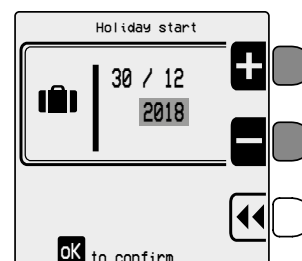
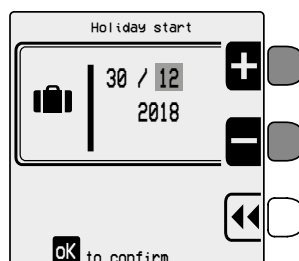
Press **esc** to go back to the starting page.  
 Press **🏠** to access the HOLIDAY period programming.



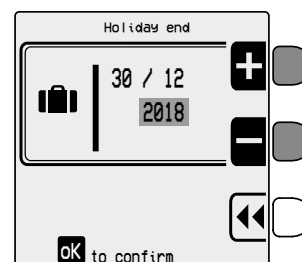
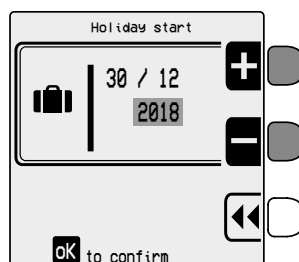
Press **+** or **-** to set HOLIDAY start day.  
 Press **↓** to go to the month setting.




Press **+** or **-** to set HOLIDAY start month.  
 Press **↓** to go to the year setting.




Press **+** or **-** to set HOLIDAY start year.  
 Press **ok** to confirm and go to the HOLIDAY end day setting.  
 Setting of HOLIDAY end day is equal to HOLIDAY start day.



## 1.7 ECO function

ECO operating mode can be activated both through TIMER setting (see *TIMER setting* on page 18) both through  key (see *Control panel keys and relevant functions* on page 11).

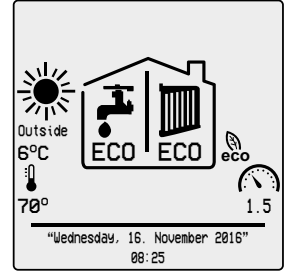
Activation through key has higher priority than activation TIMER setting.

When ECO operating mode is activated through key, the  icon is displayed, together with ECO under the cock and radiator symbols.

When ECO operating mode is activated through the TIMER setting, only ECO is displayed, together with the cock and/or radiator symbols, depending on whether the timer has been set for domestic hot water and/or heating.

If the activation of ECO operating mode is carried out through key, it is disabled by pressing the key again.

If the activation of ECO operating mode is carried out through the TIMER setting, it is automatically disabled according to the programming.



Every time the ECO mode is selected, the following functions are implemented:

### Heating mode

The boiler continues operating according to the current settings, but the flow temperature setpoint is reduced by a value equal to parameter "1.2. ECO setpoint reduction" (see *USER MENU navigation table* and *Description of USER MENU items* on pages 15 and 17).

The flow temperature setpoint is reduced also if an external probe is used or with 0-10V external signal.

If the resulting setpoint is lower than the minimum value set with parameter "1.2.3. Minimum set temperature" of TECHNICIAN MENU, the burner is turned off.

### Domestic hot water mode

If a water heater with temperature probe is present (optional), the boiler continues operating according to the current settings, but the domestic hot water temperature setpoint is reduced by a value equal to parameter "2.2. ECO setpoint reduction" (see *USER MENU navigation table* and *Description of USER MENU items* on pages 15 and 17).

## 1.8 Freeze protection function

The boiler is fitted with a freeze protection system, which works with all the operating modes: "OFF", "STAND-BY", "SUMMER", "WINTER" and "CH ONLY".



### DANGER

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

---

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



### WARNING

---

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

---



### WARNING

---

**To ensure the correct operation of pump anti-seize function the boiler must be electrically supplied and the gas cock must be open.**

---

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

### 1.8.1 CH anti-freeze function

When the heating water temperature sensor detects a temperature lower than 6°C, the boiler switches on and stays on until the temperature exceeds +15°C.

### 1.8.2 Water heater freeze protection function (with water heater probe only)

When the DHW temperature sensor detects a temperature lower than 6°C, the boiler switches on and stays on until the temperature exceeds +15°C.

## 1.9 Anti-legionella function

If the boiler is connected to an external water heater (optional, not mandatory), it is possible to activate the anti-legionella function through parameter "3.1.6. Antilegionella" from TECHNICIAN MENU (see *TECHNICIAN MENU* on page 60).

### Water heater with thermostat

The anti-legionella function activates once a week.

The boiler turns on in DHW function, the flow setpoint is brought to 80°C and the boiler remains ON for 15 minutes.

### Water heater with temperature probe

The anti-legionella function activates once a week.

The boiler turns on in DHW function, the flow setpoint is brought to 80°C and the boiler remains ON until the water heater probe reaches 60°C.

To avoid fuel waste, the anti-legionella function is performed after one week from the last execution only if in this period the water heater has never reached 60°C.

Instead, if the water heater reaches 60°C, the count is reset.

## 1.10 Operation with external probe (optional)

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

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

Standard and ECO max. operating temperatures will nevertheless be respected.

For a detailed explanation of operation with external probe, see *Installation of the (optional) external probe and sliding temperature operation* on page 57.

## 1.11 Operation with (optional) remote control

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

- Boiler status selection.
- Ambient temperature selection.
- CH system water temperature selection.
- DHW temperature selection.
- CH system and (optional) external water heater activation time programming.
- Boiler diagnostics display.
- Boiler reset and other parameters.

For a detailed description of Remote Control operation, refer to the Remote Control user manual.

To connect the Remote Control, see *Installation and operation with Open Therm Remote Control (optional)* on page 57.

## 1.12 Boiler shut-down

The boiler shuts down automatically if a malfunction occurs.


To determine the possible causes of malfunction, see *Malfunctions, possible causes and solutions* on page 96.

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

### 1.12.1 Burner shut-down

Fault code **ERROR 1** is displayed on the display in the event of burner shut-down due to missing flame.

If this happens, proceed as follows:

- check that the gas cock is open and light a kitchen gas ring for example to check the gas supply;
- once having checked if the fuel is available, press the  button to restore burner operation: if, after two starting attempts, the boiler still fails to start and enters the shut-down mode again, contact a service centre or qualified personnel for maintenance.



#### **WARNING**

---

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

---

### 1.12.2 Shut-down due to overheating

In the event of excess supply water temperature, code **ERROR 3** appears on the LCD display.

In this case, contact a Service Centre or a qualified service engineer to carry out the maintenance.

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

The boiler is equipped with safety devices checking correct flue gas exhaustion.

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

- **ERROR 3**: for flue gas thermostat.
- **ERROR 7**: for the flue gas probe.

In this case, contact a Service Centre or a qualified service engineer to carry out the maintenance.

### 1.12.4 Shut-down for fan malfunction

The fan operation is constantly monitored and in case of malfunction the burner goes off and the code **ERROR 5** is displayed.

Press  button to reset.

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

### 1.12.5 Shut-down due to low water pressure

**ERROR 37** code is displayed on the LCD display in the event of shut-down triggered by the water pressure switch sensor.

Fill the system by working on system filler cock.

Shut-down occurs when the system pressure drops below 0.8 bar.

For error reset, pressure must be brought to min. 1.4 bar.



#### **DANGER**

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**Make sure you close filler cock carefully after filling procedure is completed.**

**If the cock is not shut completely off, the pressure increase may cause the safety valve to open, discharging water.**

---

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

### 1.12.6 Alarm due to temperature probe malfunction

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

- **ERROR 30 Flow probe in short circuit:** in this case, the boiler does not work.
- **ERROR 31 Flow probe open:** in this case, the boiler does not work.
- **ERROR 32 DHW probe in short circuit:** in this case, the boiler functions in central heating mode only, and the DHW function is disabled.
- **ERROR 33 DHW probe open:** in this case, the boiler functions in central heating mode only, and the DHW function is disabled.
- **ERROR 43 Return sensor in short circuit:** in this case, the boiler does not work.
- **ERROR 44 Return sensor open:** in this case, the boiler does not work.
- **ERROR 45 Flue gas sensor in short circuit:** in this case, the boiler does not work.
- **ERROR 46 Flue gas sensor open:** in this case, the boiler does not work.
- **ERROR 93 External probe in short circuit:** in this case the boiler will continue to operate, but the "sliding temperature" operation will be disabled.
- **ERROR 96 External probe open:** in this case the boiler will continue to operate, but the "sliding temperature" operation will be disabled.



#### WARNING

---

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

---

### 1.12.7 Alarm for fault number excess

If the boiler is reset 5 times in less than 15 minutes, then it will be set to shut-down mode and **ERROR 13** code is shown on the LCD display.

In this case it is necessary to switch the boiler power supply off and on again.

### 1.13 Maintenance



#### WARNING

---

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

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

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

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

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### 1.14 Notes for the user



#### WARNING

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**The user may only clean the external casing of the boiler, employing common household products.**

**Do not use water!**

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#### WARNING

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

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

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

---

## 2. Technical features and dimensions

### 2.1 Technical features

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

- **KR** condensing boiler with sealed chamber and forced draught, supplying CH water only.

The following power rates are available:

- **KR 85**: with heat input of 81.0 kW
- **KR 120**: with heat input of 115.0 kW
- **KR 150**: with heat input of 140.0 kW

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

The boilers meet local applicable Directives enforced in the country of destination, which are stated on their rating plate.

Installation in any other country may be a source of danger for people, animals and property.

The key technical features of the boilers are listed below.

#### 2.1.1 Manufacturing characteristics

- IPX4D electrically protected control panel.
- Integrated, modulating electronic safety board.
- Electronic start-up with built-in igniter and ionisation flame detection.
- Stainless steel, fully pre-mixed burner.
- Mono-thermal, high efficiency, stainless steel heat exchanger with air purging device.
- Twin shutter modulating gas valve with constant air/gas ratio.
- Modulating, electronically managed combustion fan.
- Heating circuit pressure sensor.
- System water pressure gauge.
- Flow sensor.
- Heating flow water temperature probe.
- Heating return water temperature probe.
- Flue gas thermostat on discharge tower
- Flue gas probe on primary heat exchanger.
- Safety valve.
- Air pressure switch (KR 150 only).

#### 2.1.2 Operating features

- Electronic flame modulation in CH mode, with timed rising ramp.
- Electronic flame modulation in DHW function (with external water heater, option).
- DHW priority function (with external water heater, option).
- "Flow anti-freeze" function: ON when  $< 6\text{ }^{\circ}\text{C}$ ; OFF when  $> 15\text{ }^{\circ}\text{C}$ .
- "Water heater anti-freeze" function (with optional external water heater and water heater probe): ON when  $< 6\text{ }^{\circ}\text{C}$ ; OFF when  $> 15\text{ }^{\circ}\text{C}$ .
- Timed "Manual test" function: 15 minutes.
- "Anti-legionella" function (with optional external water heater).
- CH Maximum heat input parameter adjustment.
- Ignition heat input adjustment parameter.
- Selecting the heating range: standard or ECO (with key or programming).
- Ignition flame propagation function.
- CH thermostat timer.
- Heating post-circulation function, anti-freeze and flue cleaning modes: max 30 minutes, adjustable.
- DHW post-circulation function (with external water heater - optional).
- Post-ventilation function after working.
- Circulation pump and deviating valve anti-seize function.
- Ready for connection to an external circulation pump (optional).
- Ready for connection to an external 3-way deviating valve (optional).
- Ready for connection to an (optional) ambient thermostat.
- Ready for operation with an external probe (optional, supplied by the manufacturer).
- Ready for operation with an OpenTherm remote control (optional, supplied by the manufacturer).
- Ready for cascade operation in Master-Slave mode.
- Ready for integration with solar collectors.

## 2.2 Dimensions

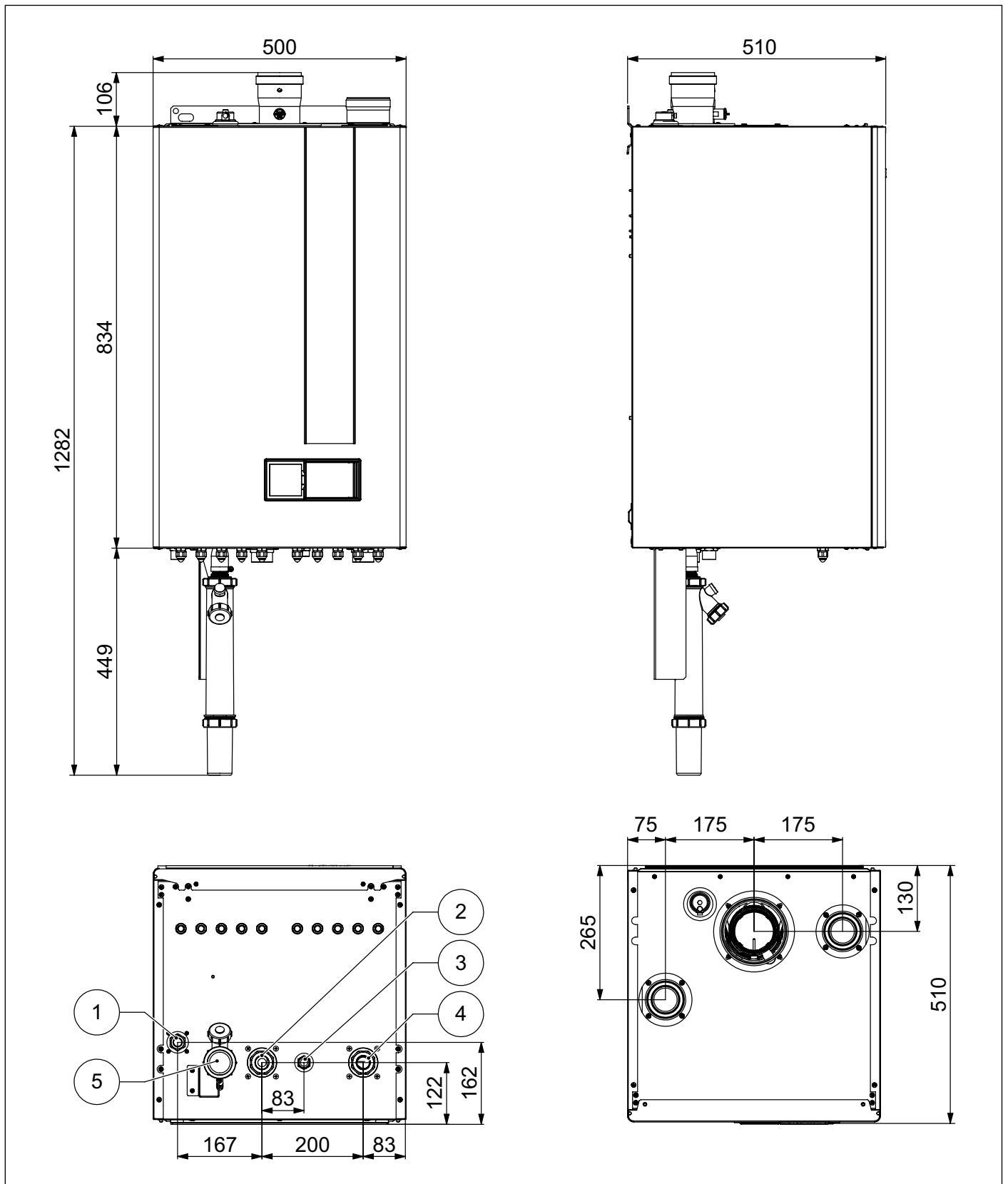


Fig. 3 Dimensions KR 85

1. Gas inlet ( $\frac{3}{4}$ "
2. CH system flow ( $1\frac{1}{4}$ "
3. Safety valve discharge outlet
4. CH system return ( $1\frac{1}{4}$ "
5. Condensate trap

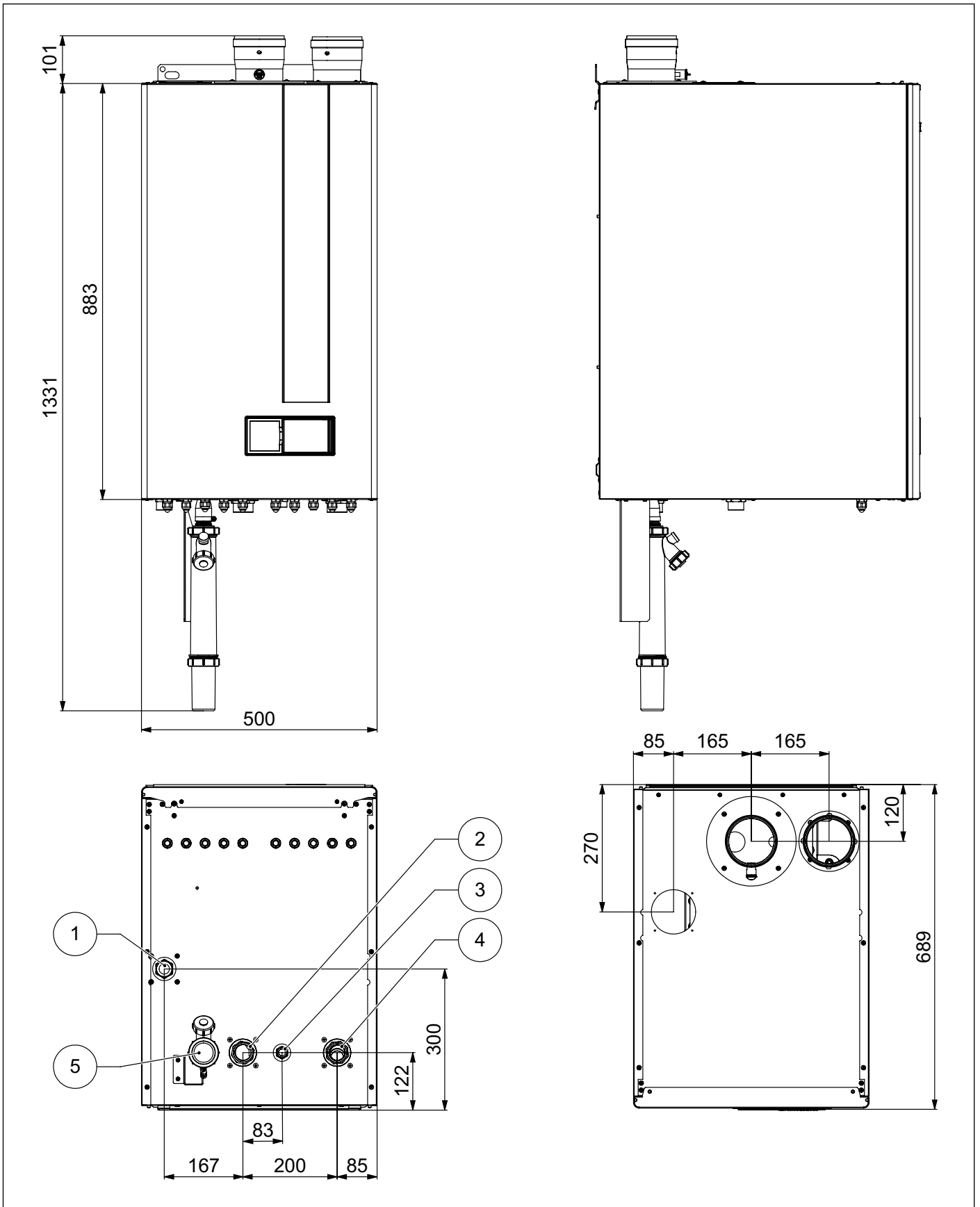


Fig. 4 Dimensions KR 120 - KR 150

1. Gas inlet (1")
2. CH system flow (1 1/4")
3. Safety valve discharge outlet
4. CH system return (1 1/4")
5. Condensate trap



## 2.3 Key components

KR 85

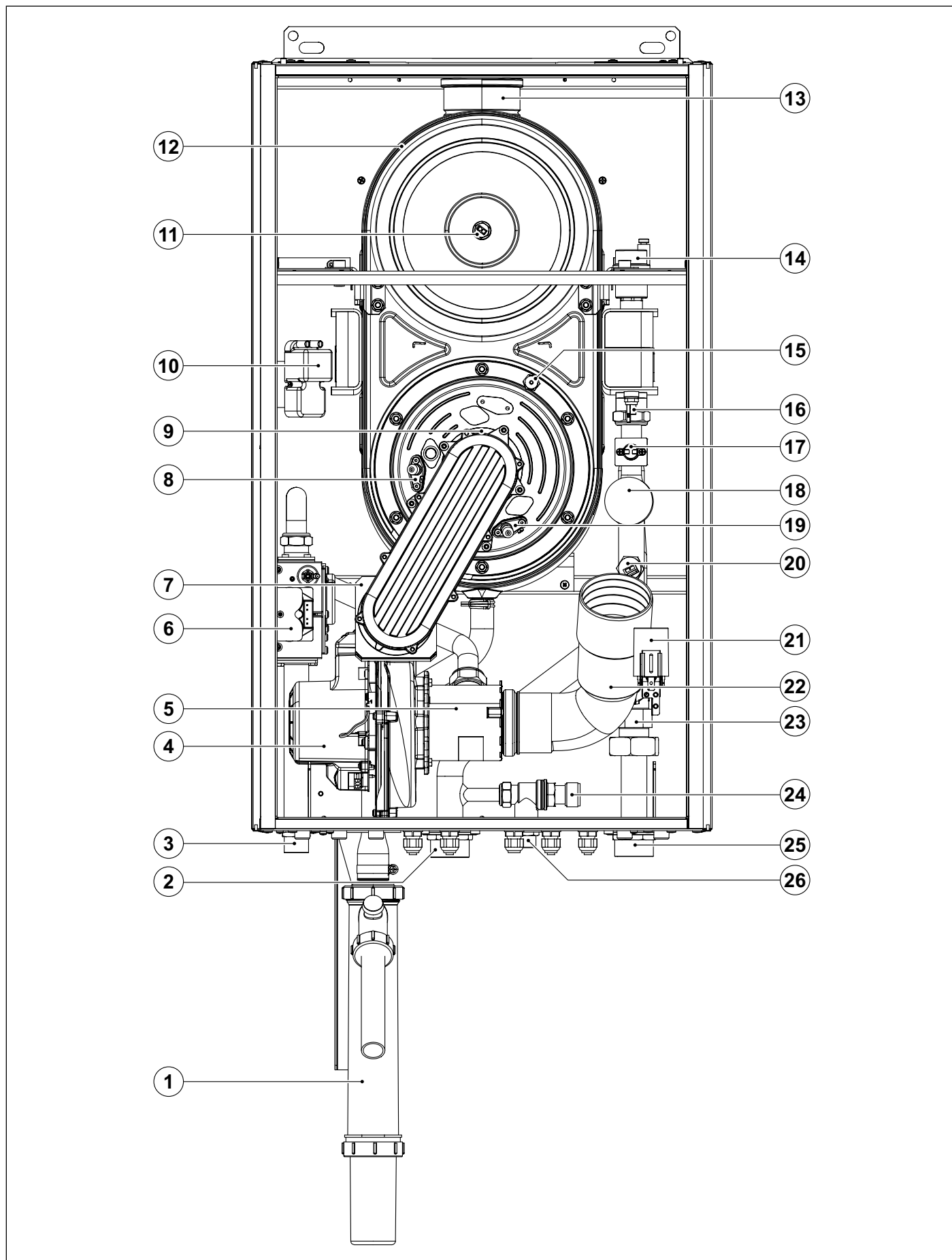


Fig. 5 Components KR 85 (I)

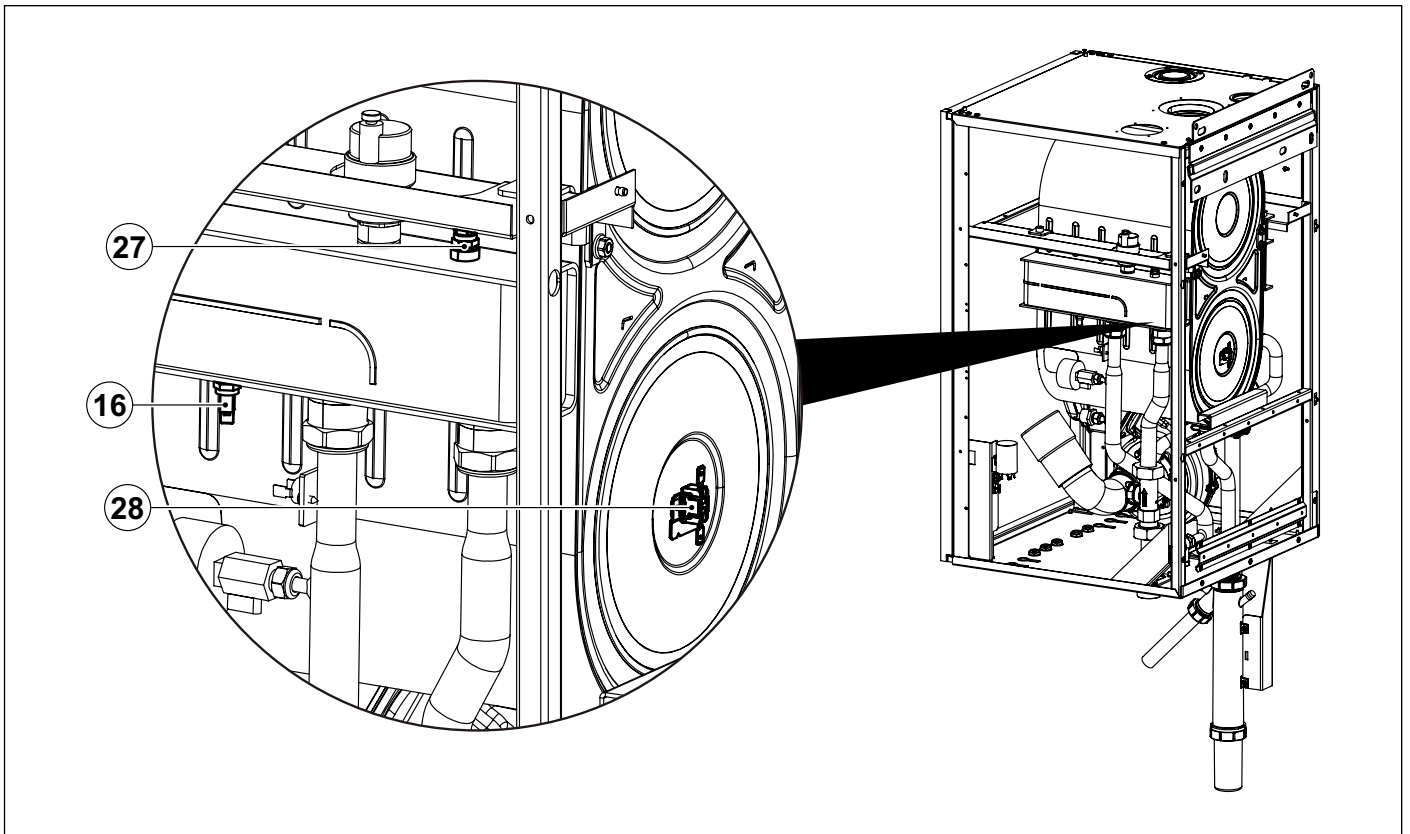


Fig. 6 Components KR 85 (II)

1. Condensate trap
2. CH system flow (1 ¼")
3. Gas inlet (¾")
4. Combustion fan
5. Air/gas mixer
6. Modulating gas valve
7. Flue gas check valve
8. Ignition electrode
9. Stainless steel, fully pre-mixed burner
10. Igniter
11. Thermofuse
12. Heat exchanger
13. Flue gas venting duct
14. Deaerator on exchanger
15. Limit thermostat (260 °C)
16. CH flow probe
17. Safety thermostat on CH flow
18. Heating system water pressure gauge
19. Detection electrode
20. Heating circuit pressure sensor
21. EMC filter
22. Intake pipe
23. Flow meter
24. Safety valve. 5 bar
25. CH system return (1 ¼")
26. Safety valve discharge outlet
27. CH return probe
28. Thermofuse

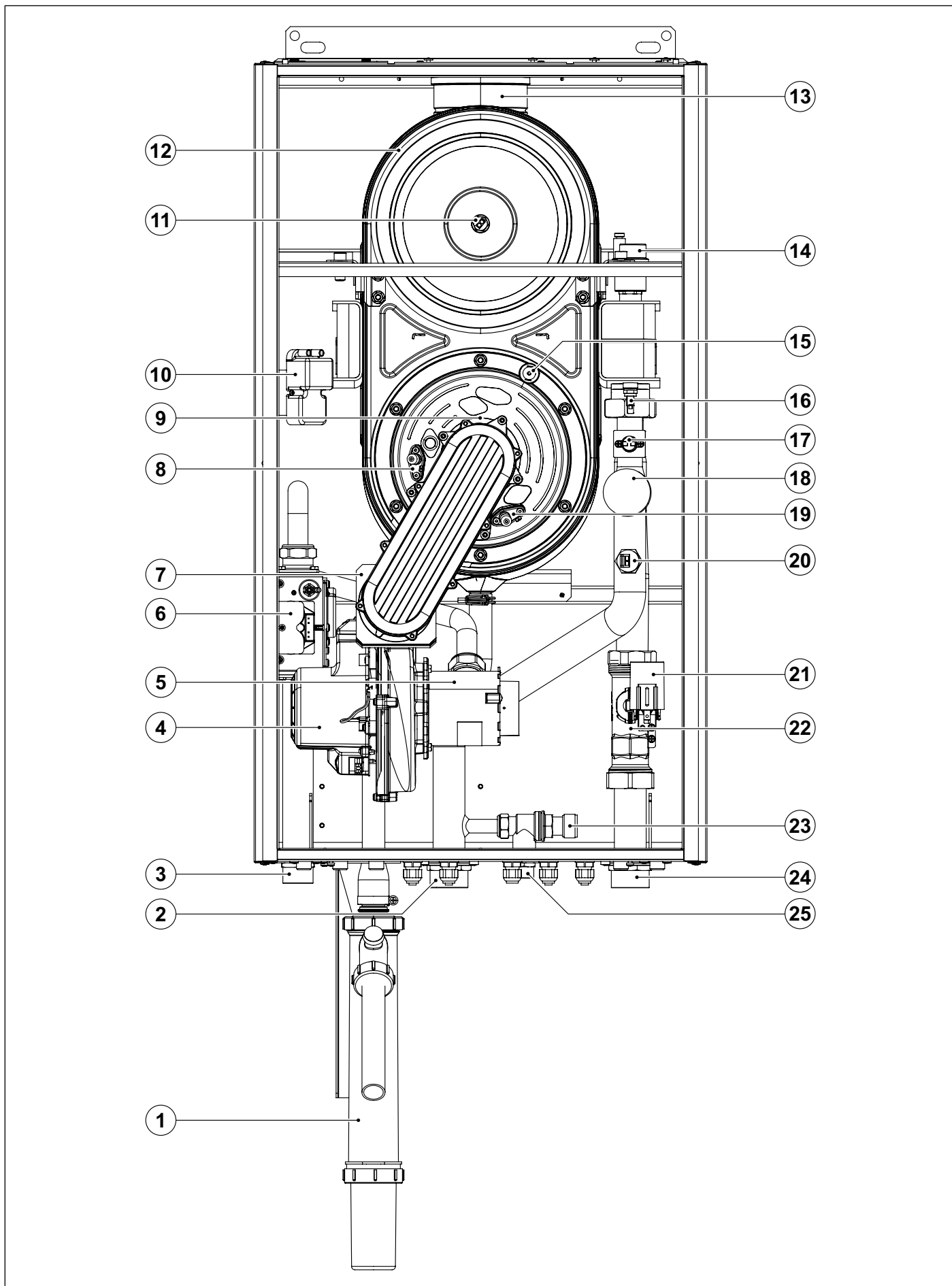


Fig. 7 Components KR 120 (I)

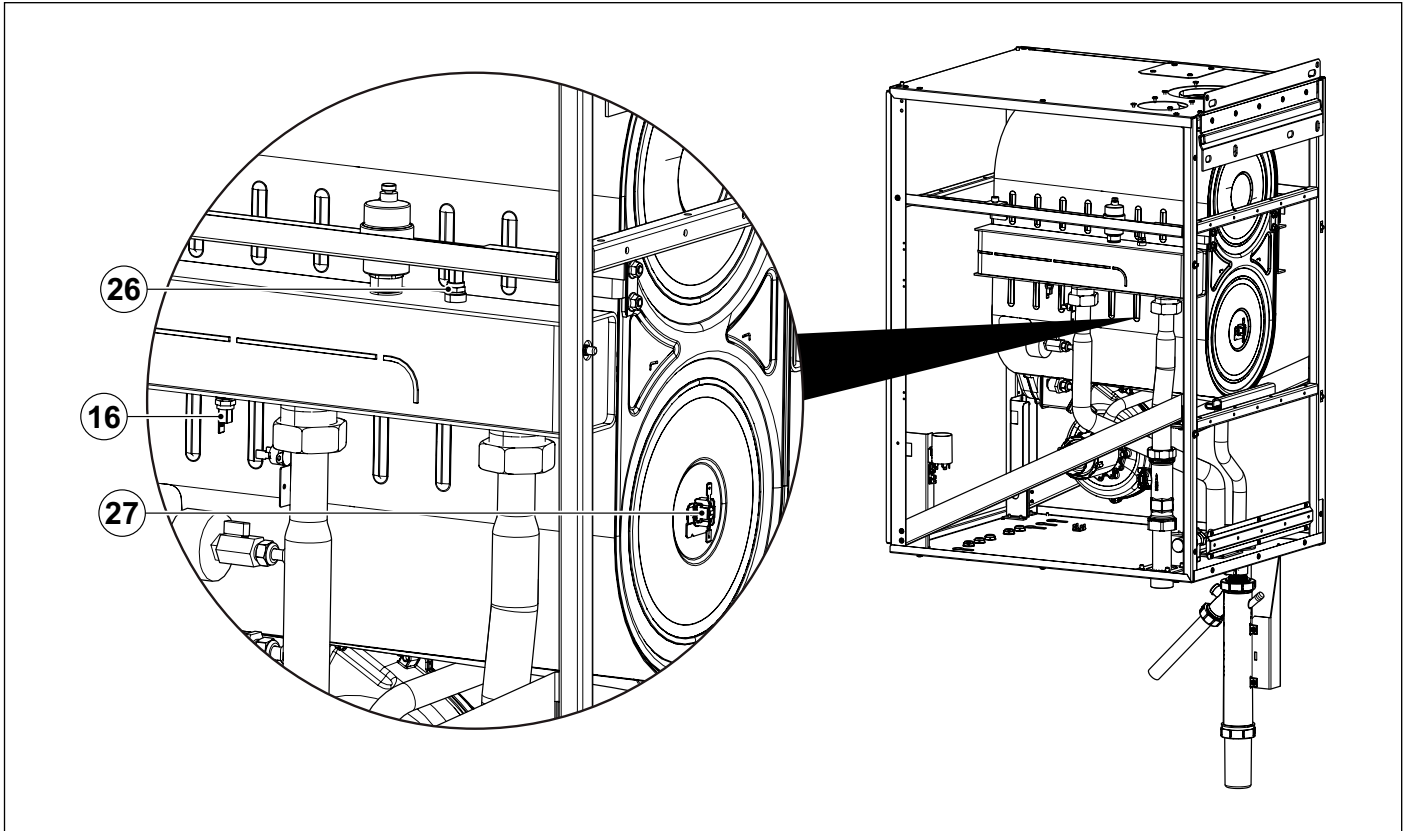


Fig. 8 Components KR 120 (II)

1. Condensate trap
2. CH system flow (1 ¼")
3. Gas inlet (1")
4. Combustion fan
5. Air/gas mixer
6. Modulating gas valve
7. Flue gas check valve
8. Ignition electrode
9. Stainless steel, fully pre-mixed burner
10. Igniter
11. Thermofuse
12. Heat exchanger
13. Flue gas venting duct
14. Deaerator on exchanger
15. Limit thermostat (260 °C)
16. CH flow probe
17. Safety thermostat on CH flow
18. Heating system water pressure gauge
19. Detection electrode
20. Heating circuit pressure sensor
21. EMC filter
22. Flow meter
23. Safety valve. 5 bar
24. CH system return (1 ¼")
25. Safety valve discharge outlet
26. CH return probe
27. Thermofuse

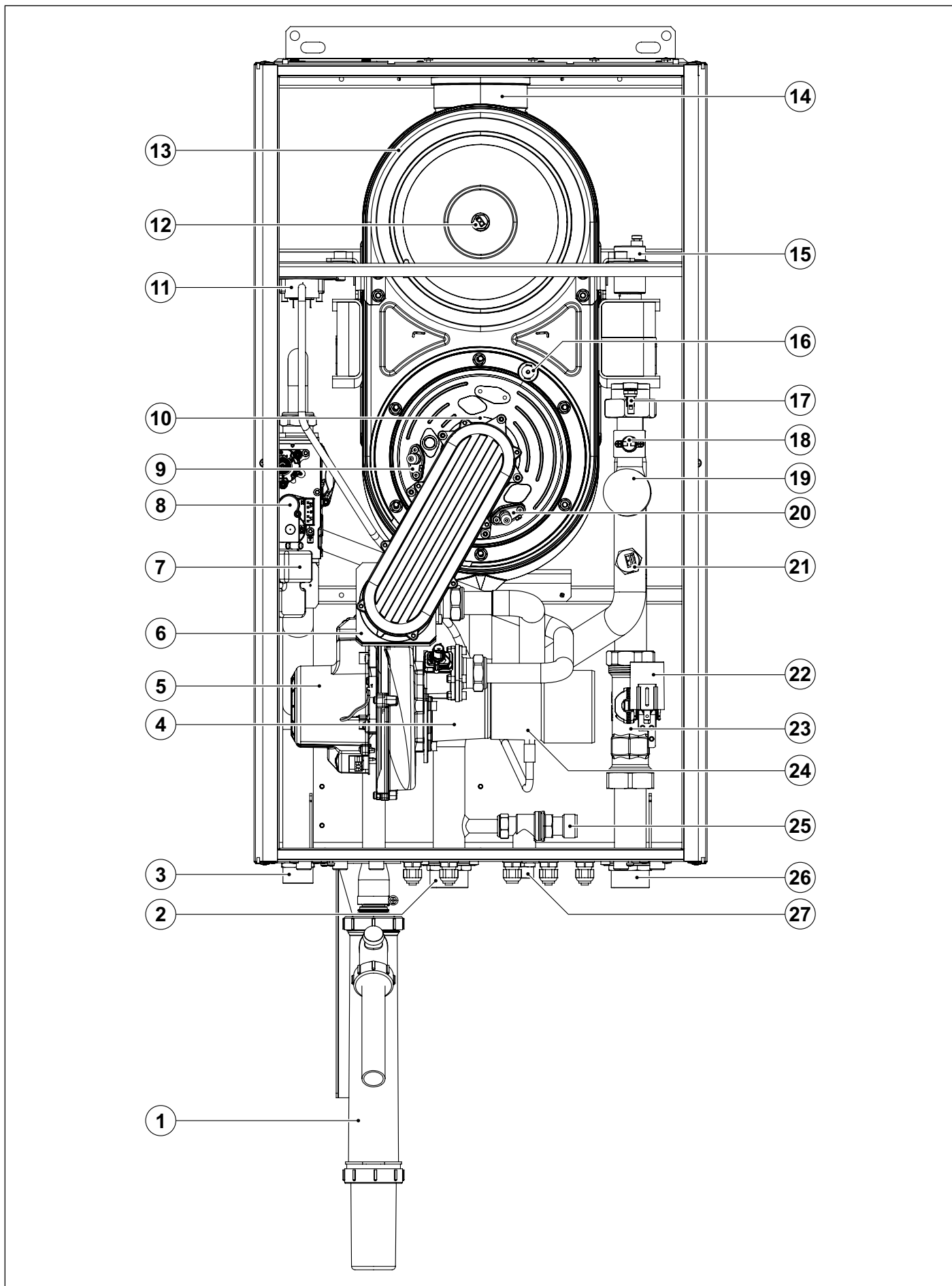


Fig. 9 Components KR 150 (I)

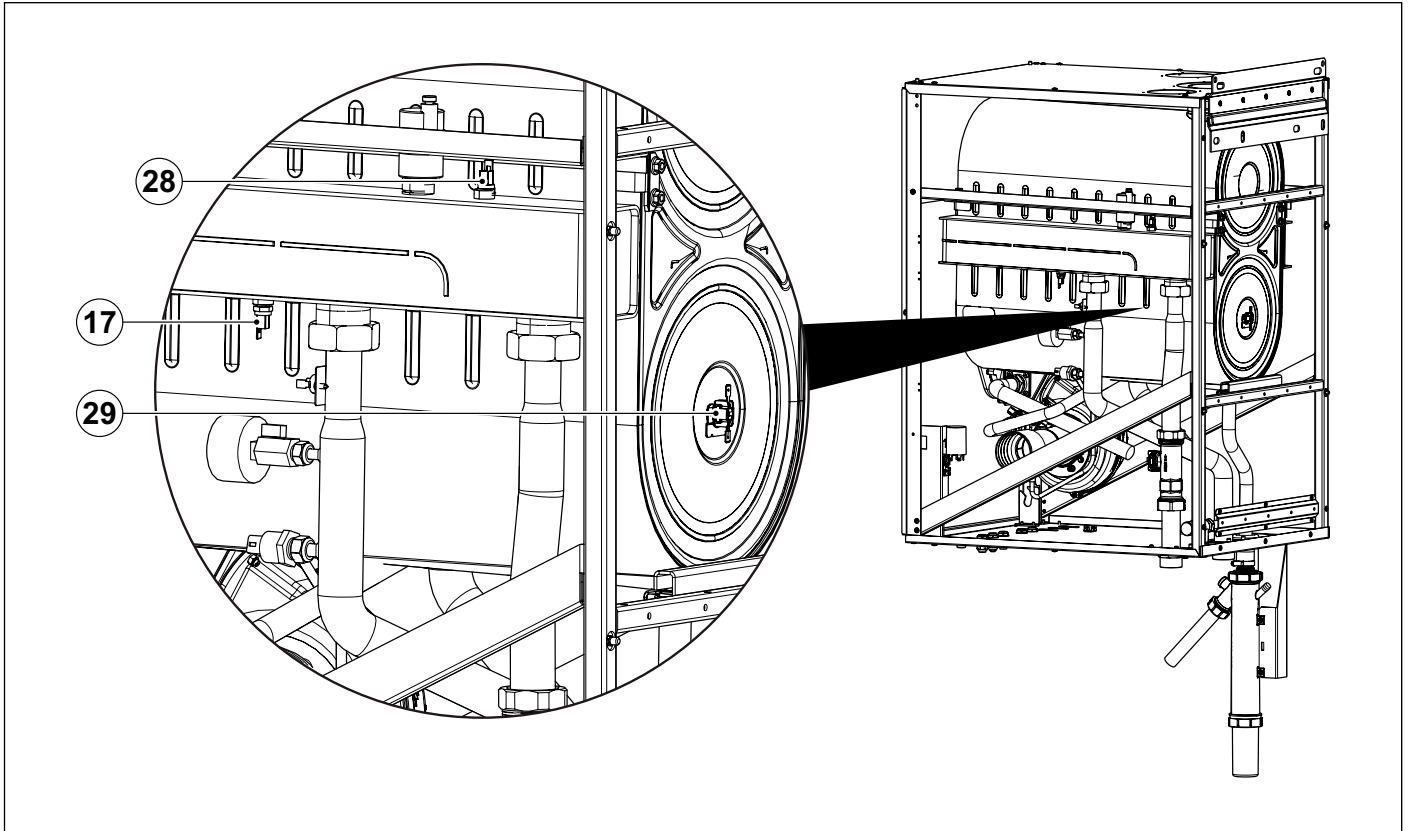


Fig. 10 Components KR 150 (II)

1. Condensate trap
2. CH system flow (1 ¼")
3. Gas inlet (1")
4. Air/gas mixer
5. Combustion fan
6. Flue gas check valve
7. Igniter
8. Modulating gas valve
9. Ignition electrode
10. Stainless steel, fully pre-mixed burner
11. Air pressure switch
12. Thermofuse
13. Heat exchanger
14. Flue gas venting duct
15. Deaerator on exchanger
16. Limit thermostat (260 °C)
17. CH flow probe
18. Safety thermostat on CH flow
19. Heating system water pressure gauge
20. Detection electrode
21. Heating circuit pressure sensor
22. EMC filter
23. Flow meter
24. Intake pipe
25. Safety valve. 5 bar
26. CH system return (1 ¼")
27. Safety valve discharge outlet
28. CH return probe
29. Thermofuse

## 2.4 Hydraulic diagrams

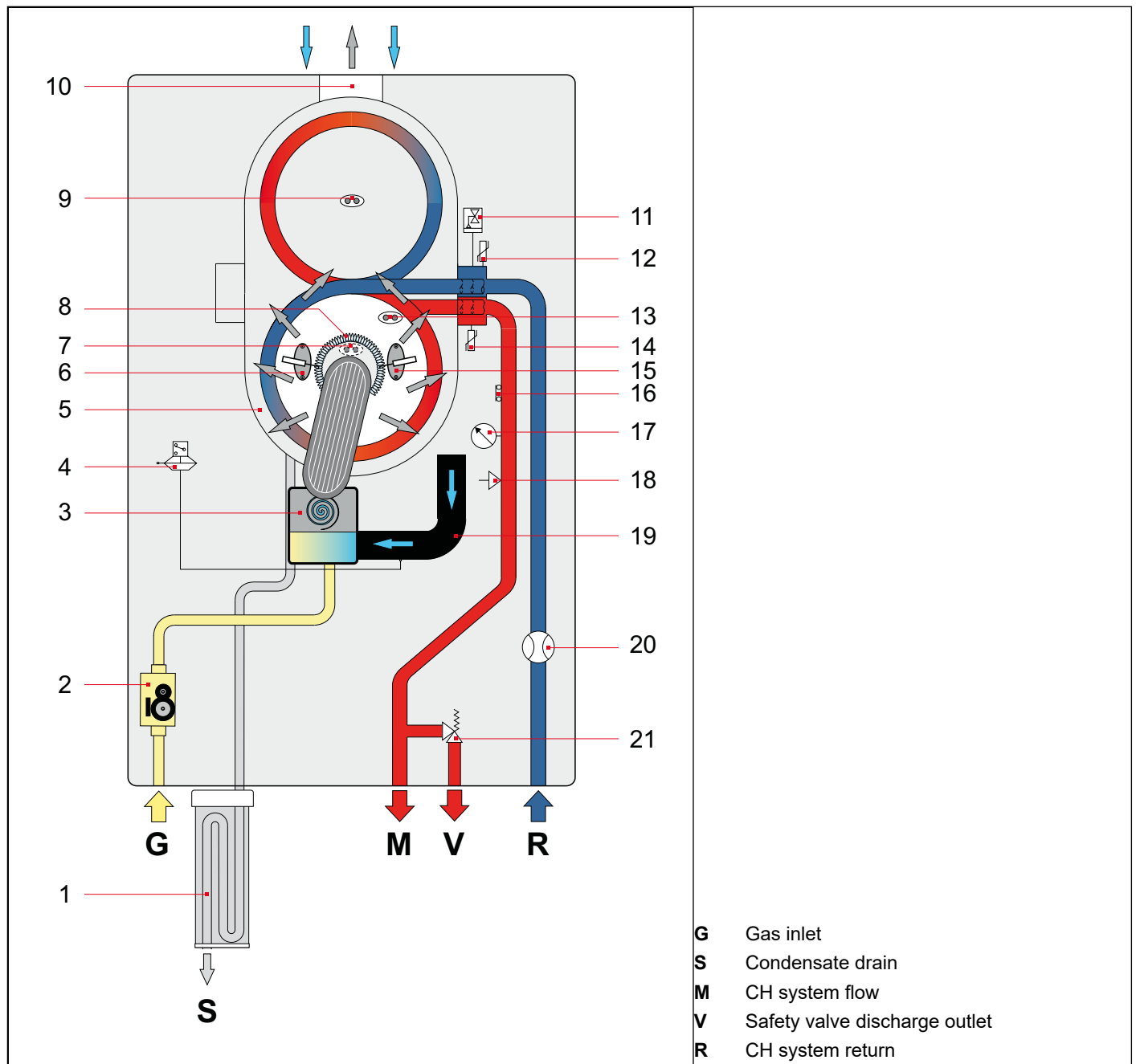


Fig. 11 Hydraulic diagram

- |  |   |
|--|---|
| 1. Condensate trap                         | 12. CH return probe                     |
| 2. Modulating gas valve                    | 13. Limit thermostat                    |
| 3. Combustion fan                          | 14. CH flow probe                       |
| 4. Air pressure switch (KR 150 only)       | 15. Detection electrode                 |
| 5. Heat exchanger                          | 16. Safety thermostat on CH flow        |
| 6. Ignition electrode                      | 17. Heating system water pressure gauge |
| 7. Thermofuse                              | 18. Heating circuit pressure sensor     |
| 8. Stainless steel, fully pre-mixed burner | 19. Intake pipe (KR 85 - KR 150 only)   |
| 9. Thermofuse                              | 20. Flow meter                          |
| 10. Flue gas venting duct                  | 21. Safety valve.                       |
| 11. Deaerator on exchanger                 |   |

## 2.5 Operating data

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

Gas category: II2H3P

| Gas             | Supply pressure [mbar] | Upper nozzle [mm] | Lower nozzle [mm] | Flue CO <sub>2</sub> value Max. output [%] | Flue CO <sub>2</sub> value Min. output [%] |
|-----------------|------------------------|-------------------|-------------------|--|--|
| Natural gas G20 | 20                     | 5,9               | 5,6               | 9.0 ± 0.3                                  | 9.0 ± 0.3                                  |
| Propane Gas G31 | 37                     | 4,9               | 4,6               | 10.0 ± 0.3                                 | 9.4 ± 0.3                                  |

Tab. 1 Adjustment specifications KR 85

| Gas             | Supply pressure [mbar] | Upper nozzle [mm] | Lower nozzle [mm] | Flue CO <sub>2</sub> value Max. output [%] | Flue CO <sub>2</sub> value Min. output [%] |
|-----------------|------------------------|-------------------|-------------------|--|--|
| Natural gas G20 | 20                     | 6,6               | 6,2               | 9.0 ± 0.3                                  | 9.0 ± 0.3                                  |
| Propane Gas G31 | 37                     | 5,3               | 5,1               | 10.2 ± 0.3                                 | 10.2 ± 0.3                                 |

Tab. 2 Adjustment specifications KR 120

| Gas             | Supply pressure [mbar] | Diaphragm [mm] | Flue CO <sub>2</sub> value Max. output [%] | Flue CO <sub>2</sub> value Min. output [%] |
|-----------------|------------------------|----------------|--|--|
| Natural gas G20 | 20                     | 12,1           | 9.0 ± 0.3                                  | 9.0 ± 0.3                                  |
| Propane Gas G31 | 37                     | 9,0            | 10.2 ± 0.3                                 | 10.2 ± 0.3                                 |

Tab. 3 Adjustment specifications KR 150

## 2.6 General characteristics

| Description   | um                | KR 85   | KR 120   | KR 150   |
|---|-------------------|---|----------|----------|
| Type  | -                 | B23-B23P-C13-C13X-C33-C33X-C43-C43X-C53-C63-C63X-C83-C93-C93X |          |          |
| CH nominal heat input                                   | kW                | 81,0  | 115,0    | 140,0    |
| CH minimum heat input                                   | kW                | 9,0   | 11,5     | 22,5     |
| Maximum heat output (80-60°C) - CH                      | kW                | 78,5  | 112,0    | 136,3    |
| Minimum heat output (80-60°C) - CH                      | kW                | 8,5   | 11,1     | 21,6     |
| Maximum heat output (50-30°C) - CH                      | kW                | 84,8  | 122,0    | 148,7    |
| Minimum heat output (50-30°C) - CH                      | kW                | 9,7   | 12,4     | 23,9     |
| Minimum CH system pressure                              | bar               | 0,8   | 0,8      | 0,8      |
| Maximum CH system pressure (PMS)                        | bar               | 6,0   | 6,0      | 6,0      |
| Safety valve calibration pressure                       | bar               | 5,0   | 5,0      | 5,0      |
| Maximum heat exchanger temperature (TMS)                | °C                | 110   | 110      | 110      |
| Electric power supply – voltage / frequency             | V - Hz            | 230 - 50  | 230 - 50 | 230 - 50 |
| Power mains supply fuse                                 | A                 | 4,0   | 4,0      | 4,0      |
| Maximum power consumption                               | W                 | 156   | 251      | 310      |
| Pump absorption - Stratos Para 25/1-8 (optional)        | W                 | 130   | -        | -        |
| Pump absorption - Stratos Para 25/1-11 (optional)       | W                 | 140   | -        | -        |
| Pump absorption - Yonos Para HF 25/12 (optional)        | W                 | 240   | 260      | 260      |
| Pump absorption - UPML 25 - 105 - 180 PWM (optional)    | W                 | 140   | -        | -        |
| Pump absorption - UPMXL 25 - 125 - 180 PWM (optional)   | W                 | -   | 180      | 180      |
| Pump absorption - UPMXXL 25 - 120 - 180 AUTO (optional) | W                 | -   | 182      | 182      |
| Electric protection rating                              | IP                | X4D   | X4D      | X4D      |
| Natural gas consumption at maximum CH output (*)        | m <sup>3</sup> /h | 8,57  | 12,17    | 14,81    |
| Propane gas consumption at maximum CH output            | kg/h              | 6,29  | 8,93     | 10,88    |
| Water content   | l                 | 4,30  | 6,74     | 9,24     |
| Net weight  | kg                | 74,5  | 84,5     | 106,0    |

Tab. 4 General specifications

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



| Description  | um  | Max. output | Min. output | 30% load |
|--|-----|-------------|-------------|----------|
| Casing heat loss with burner on                    | %   | 0,33        | 3,31        | -        |
| Casing heat loss with burner off                   | %   |             | 0,14        |          |
| Flue system heat loss with burner on               | %   | 2,80        | 1,87        | -        |
| Flue system mass capacity                          | g/s | 37,2        | 4,1         | -        |
| Residual head available                            | Pa  | 194         | 5           | -        |
| Flue gas temperature - Air temperature             | °C  | 45,3        | 31,2        | -        |
| Heat output efficiency rating (80-60°C)            | %   | 96,9        | 94,8        | -        |
| Heat output efficiency rating (50-30°C)            | %   | 104,8       | 107,6       | -        |
| Heat output efficiency rating with 30% of the load | %   | -           | -           | 108,3    |
| NOx emission class                                 | -   |             | 6           |          |

Tab. 5 Combustion specifications KR 85

| Description  | um  | Max. output | Min. output | 30% load |
|--|-----|-------------|-------------|----------|
| Casing heat loss with burner on                    | %   | 0,00        | 2,06        | -        |
| Casing heat loss with burner off                   | %   |             | 0,08        |          |
| Flue system heat loss with burner on               | %   | 2,59        | 1,70        | -        |
| Flue system mass capacity                          | g/s | 52,7        | 5,3         | -        |
| Residual head available                            | Pa  | 275         | 5           | -        |
| Flue gas temperature - Air temperature             | °C  | 54,0        | 35,4        | -        |
| Heat output efficiency rating (80-60°C)            | %   | 97,4        | 96,2        | -        |
| Heat output efficiency rating (50-30°C)            | %   | 106,1       | 108,2       | -        |
| Heat output efficiency rating with 30% of the load | %   | -           | -           | 108,6    |
| NOx emission class                                 | -   |             | 6           |          |

Tab. 6 Combustion specifications KR 120

| Description  | um  | Max. output | Min. output | 30% load |
|--|-----|-------------|-------------|----------|
| Casing heat loss with burner on                    | %   | 0,38        | 2,17        | -        |
| Casing heat loss with burner off                   | %   |             | 0,09        |          |
| Flue system heat loss with burner on               | %   | 2,27        | 1,83        | -        |
| Flue system mass capacity                          | g/s | 64,2        | 10,3        | -        |
| Residual head available                            | Pa  | 290         | 10          | -        |
| Flue gas temperature - Air temperature             | °C  | 52,6        | 35,4        | -        |
| Heat output efficiency rating (80-60°C)            | %   | 97,3        | 96,0        | -        |
| Heat output efficiency rating (50-30°C)            | %   | 106,2       | 106,3       | -        |
| Heat output efficiency rating with 30% of the load | %   | -           | -           | 108,4    |
| NOx emission class                                 | -   |             | 6           |          |

Tab. 7 Combustion specifications KR 150

| Additional specifications (EN 15502-1)                                  | um  | Value |
|---|-----|-------|
| Maximum operating temperature of the combustion products                | °C  | 80    |
| Overheating temperature of the combustion products                      | %   | 100   |
| Installation type: C63 - Maximum air temperature on intake              | %   | 40    |
| Installation type: C63 - Maximum flue gas recirculation at the terminal | g/s | 10    |

Tab. 8 Additional specifications

## 2.7 ERP and Labelling data

| Model(s): ITACA CH   |                    |        | KR 85    | KR 120   | KR 150   |
|--|--------------------|--------|----------|----------|----------|
| Condensing boiler  |                    |        | yes      | yes      | yes      |
| Low-temperature (**) boiler  |                    |        | yes      | yes      | yes      |
| B <sub>1</sub> boiler  |                    |        | no       | no       | no       |
| Cogeneration space heater  |                    |        | no       | no       | no       |
| Combination heater   |                    |        | no       | no       | no       |
| <b>Seasonal space heating energy efficiency class</b>  |                    |        | <b>A</b> | <b>A</b> | <b>A</b> |
| Item   | Symbol             | Value  | Unit     |          |          |
| <b>Rated heat output</b>   | P <sub>rated</sub> | kW     | 79       | 112      | 136      |
| Useful heat output: At rated heat output and high-temperature regime (*)   | P <sub>4</sub>     | kW     | 78,5     | 112,0    | 136,3    |
| Useful heat output: At 30 % of rated heat output and low-temperature regime (**)   | P <sub>1</sub>     | kW     | 26,3     | 37,7     | 45,5     |
| <b>Seasonal space heating energy efficiency</b>  | η <sub>s</sub>     | %      | 93       | 93       | 93       |
| Useful efficiency: At rated heat output and high-temperature regime (*)  | η <sub>4</sub>     | %      | 87,3     | 87,0     | 87,3     |
| Useful efficiency: At 30 % of rated heat output and low-temperature regime (**)  | η <sub>1</sub>     | %      | 97,7     | 98,3     | 97,6     |
| Auxiliary electricity consumption: At full load  | e <sub>l,max</sub> | kW     | 0,142    | 0,264    | 0,316    |
| Auxiliary electricity consumption: At part load  | e <sub>l,min</sub> | kW     | 0,051    | 0,082    | 0,092    |
| Auxiliary electricity consumption: In standby mode   | P <sub>SB</sub>    | kW     | 0,004    | 0,004    | 0,004    |
| Standby heat loss  | P <sub>stby</sub>  | kW     | 0,114    | 0,097    | 0,127    |
| Ignition burner power consumption  | P <sub>ign</sub>   | kW     | 0,000    | 0,000    | 0,000    |
| Annual energy consumption  | Q <sub>HE</sub>    | GJ     | 135      | 190      | 246      |
| Emissions of nitrogen oxides   | NO <sub>x</sub>    | mg/kWh | 36       | 30       | 40       |
| Sound power level, indoors   | L <sub>WA</sub>    | dBA    | 65       | 63       | 61       |
| Contact details: FONDITAL S.p.A. - Via Cerreto, 40 I-25079 VOBARNO (Brescia) Italia - Italy  |                    |        |          |          |          |
| (*) High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.                                      |                    |        |          |          |          |
| (**) Low temperature means for condensing boilers 30 °C, for low-temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet). |                    |        |          |          |          |

Tab. 9 ERP and Labelling data

## 3. Instructions for the installer

### 3.1 Installation standards

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

To find out about the gas category and technical specifications, refer to operation data and general features specified in the previous pages.



#### **DANGER**

---

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

---

#### 3.1.1 Packaging

The boiler is shipped in a wooden cage and secured to a wooden pallet with 2 screws.

Packaging includes:

- The present boiler installation, use and maintenance manual.
- An adhesive label with energy data.
- the template for mounting the boiler on a wall (see Fig. 12 Paper template).
- A wall bracket.
- 2 screws and relevant wall blocks for fixing the boiler to the wall.
- The condensate trap.
- A bracket for trap support.
- A clamp for trap fastening.
- A female flange connection for flue gas venting system is already installed in the boiler.
- A female flanged stub pipe for connecting air intake duct.
- Two flue gas closing caps.
- Two gaskets.
- A corrugated pipe for condensate drain.
- 5 cable retainer U-bolts.
- Various screws.

### 3.2 Choosing where to install the boiler

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

- indications contained in paragraph *Air intake and flue gas venting system* on page 43 and its sub-paragraphs.
- check the wall for sturdiness, avoiding weak areas.
- do not install the boiler over appliances which may affect boiler operation (e.g. cookers, which produce steam and grease, washing machines etc.).
- do not install boilers in locations with a corrosive or very dusty atmosphere, such as hairdresser salons, laundries etc., as this may severely reduce the lifespan of the components of the boiler.
- avoid installing the air intake terminal in rooms or areas with corrosive or very dusty atmosphere to protect the heat exchanger.



#### **WARNING**

---

**The boiler is supplied without circulation pump.  
When selecting the boiler location, consider the circulation pump installation space.**

---



### 3.4 Installing the boiler

For the treatment of heating system water, refer to paragraph *Filling the system*.



#### DANGER

---

Before connecting the boiler to CH and DHW system pipes, clean the latter carefully.

Before commissioning a NEW system, clean it to remove any metal chips due to machining and welding, and any oil and grease that might negatively affect boiler operation or even damage it in case they get inside it.

Before commissioning a RECONDITIONED system (where radiators have been added, the boiler has been replaced, etc.) thoroughly clean it to remove any sludge and residues.

Clean the system using standard non-acid products, available on the market.

Do not use solvents as they could damage system components.

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

---



#### DANGER

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Based on the state of conservation of the system to which the boiler is connected, the installer must evaluate if the system return line needs the installation of a Y filter or of a dirt separator or of a plate exchanger, which serves as hydraulic separator, of a size suitable for the heating system water flow rate.

This taking also into account the cleaning and remedial treatment of the system which, in compliance with the existing standards, is carried out when the boiler is installed.

---



#### WARNING

---

The boiler is supplied with 2 dowels and 2 screws with 10 mm diameter, suitable for boiler installation on walls of:

- Concrete
- Solid bricks
- Vertically drilled bricks
- Lightweight aggregate concrete block
- Natural stone with solid structure

Check that the wall on which the boiler will be installed is suitable for installation. If this is not the case select a different installation location.

Check that screws and dowels are suitable for the type of wall on which the boiler will be installed. If this is not the case replace them with a suitable type.

---



#### WARNING

---

The boiler is not fitted with a heating system loading and unloading system.

Prepare a loading and unloading system for boiler external heating system.

---

In order to install the boiler proceed as follows:

- Affix the template to the wall.
- Drill two Ø 14 mm holes in the wall to accommodate the boiler bracket wall blocks.
- If necessary, provide holes in the wall to allow air intake and/or flue gas venting ducts to pass through it.
- Secure the supporting bracket to the wall using the blocks supplied with the boiler.
- With reference to the lower part of the template, position the fittings for the connection of:
  - » gas supply pipe **G**;
  - » CH flow pipe **M**;
  - » CH return pipe **R**.
- Provide an outlet for the safety valve **S**.
- Prepare a condensate drain connection.
- Hook boiler to supporting bracket.
- Fasten the condensate drain trap to the boiler (see *Fastening the condensate drain trap*).
- Connect the trap to the condensate drain system with the corrugated pipe supplied.
- Connect the boiler to the feed pipes (see *Hydraulic connections* on page 56).
- Connect the boiler to the gas supply system (refer to par. *Connection to gas mains* on page 55).
- Provide an outlet for the safety valve.
- Connect the boiler to the air intake and flue gas venting system (see *Air intake and flue gas venting system* on page 43).
- Connect power supply, ambient thermostat (when available) and other available accessories (refer to the following paragraphs).

### 3.4.1 Fastening the condensate drain trap

For trap fastening, follow the instructions below:

- Fasten the trap to the trap support bracket with the 2 screws 3.9 x 8 mm.
- Insert the metal clamp over the boiler condensate drain pipe.
- Insert the trap in the boiler condensate drain pipe.
- Fasten the trap support bracket to the boiler with the 2 screws 4 x 7 mm.
- Tighten the metal clamp between boiler condensate drain pipe and trap.



#### WARNING

The condensate trap is provided with an already installed internal tube and an O-ring (A).

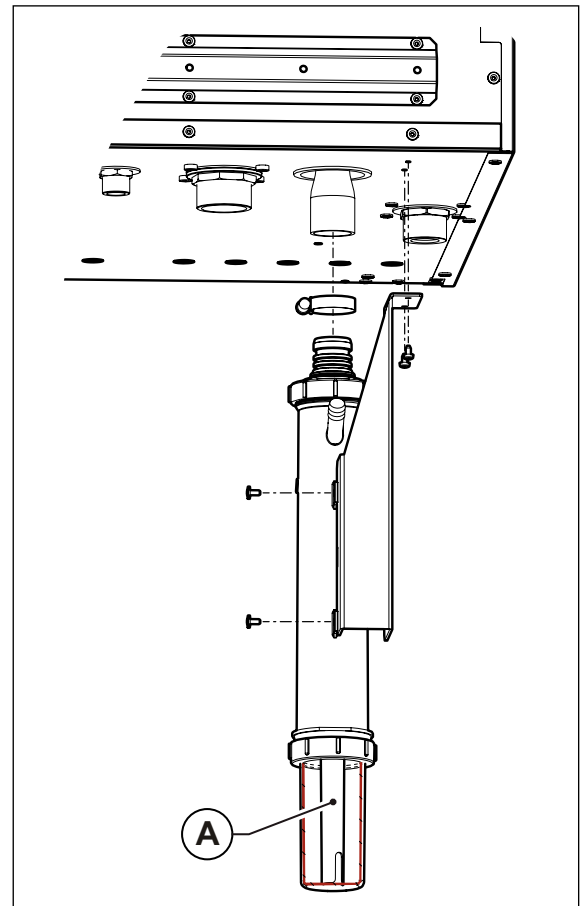


Fig. 13 Fastening the trap

### 3.5 Boiler room ventilation

The boiler has sealed combustion chamber. Combustion air is not drawn from boiler room, therefore no specific recommendations need to be applied concerning the boiler room or openings and ventilation provided to the boiler room.

In the case of type B23 installation in a closed room, air vents must be provided for in compliance with the standards in force in the country of installation.



#### **DANGER**

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

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### 3.6 Air intake and flue gas venting system

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



#### **DANGER**

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**For the air intake/flue gas venting systems, specific, manufacturer-approved, condensate acid-resistant pipes and systems must be used, suitable for condensing boilers.**

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#### **DANGER**

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**In the case of passages through walls with split or coaxial air intake and gas venting ducts, always seal any space between pipes and walls.**

**If the wall is made of flammable material, apply fireproof insulating material around the flue gas venting pipe.**

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#### **DANGER**

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**For boilers with split air intake and flue gas venting ducts, in the case of passages through flammable walls, apply fireproof insulating material around the flue gas venting pipe.**

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#### **DANGER**

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**The boiler is equipped with safety devices checking correct flue gas exhaustion.**

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

**Should an air/flue gas system malfunction occur, the devices will shut-down the boiler by interrupting the gas supply to the boiler and the LCD will display ERROR 3, ERROR 7, ERROR 45 or ERROR 46.**

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

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

**In case of replacement of safety devices, replace them using original spare parts supplied by the manufacturer.**

---

### 3.6.1 Starter kit installation

Refer to Fig. 14 Split kit installation and to Fig. 15 Coaxial kit installation.



#### DANGER

**There must be no leakage of combustion by-products from any of the gaskets.**

#### *Split kit (supplied with the boiler)*

The flange connection for flue gas venting system (A) is already installed in the boiler.

Clean the boiler roof from dust and other debris due to any masonry works.

Fix the adhesive gasket under the flange connection for air intake system (B). The gasket must adhere completely to the whole surface.

Fix the flange connection for air intake system (B) on the boiler roof at one of the suitable holes, using the screws supplied. The gasket must adhere completely to the roof surface.

Fix the adhesive gasket under the flue gas closing plug (C). The gasket must adhere completely to the whole surface.

Fix the flue gas closing plug (C) on the boiler roof at the free hole, using the screws supplied. The gasket must adhere completely to the roof surface.

The second flue gas closing plug is not to be used.

#### *Coaxial kit (optional)*

Clean the boiler roof from dust and other debris due to any masonry works.

Remove the flange connection for flue gas venting system (A) fitted as a standard on the boiler by loosening the 4 screws fixing it to the boiler roof. Remove any seal residues.

Fix the adhesive gasket under the flange coaxial connection (D). The gasket must adhere completely to the whole surface.

Fix the flange coaxial connection (D) at the suitable hole on the boiler roof, using the screws supplied. The gasket must adhere completely to the roof surface.

Fix the adhesive gaskets under the two flue gas closing plugs (C) supplied with the boiler. Gaskets must adhere completely to the whole surface.

Fix the flue gas closing plugs on the boiler roof at the two suitable holes, using the screws supplied. Gaskets must adhere completely to the roof surface.

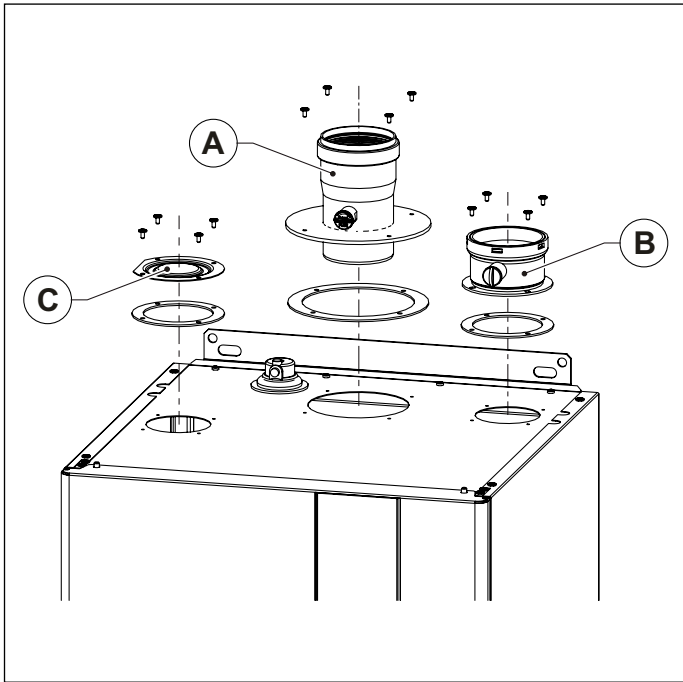


Fig. 14 Split kit installation

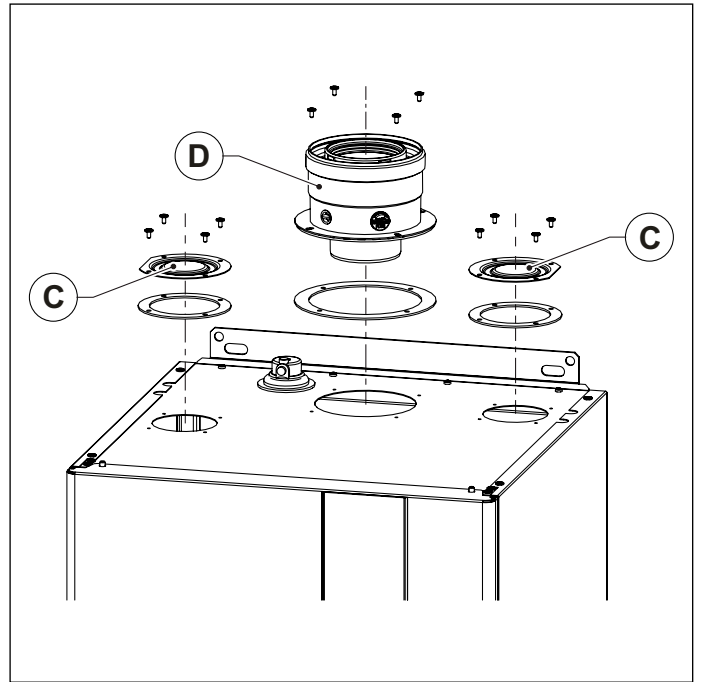


Fig. 15 Coaxial kit installation



3.6.2 Pipe and terminal installation



**DANGER**

Flue gas venting pipes are to be installed tilted toward the boiler so that condensate runs toward the combustion chamber, which is designed for condensate collection and drainage.

Should the above procedure not be possible, it is necessary to install, in condensate stagnation areas, devices designed for condensate collection and conveying to the condensate drain system.

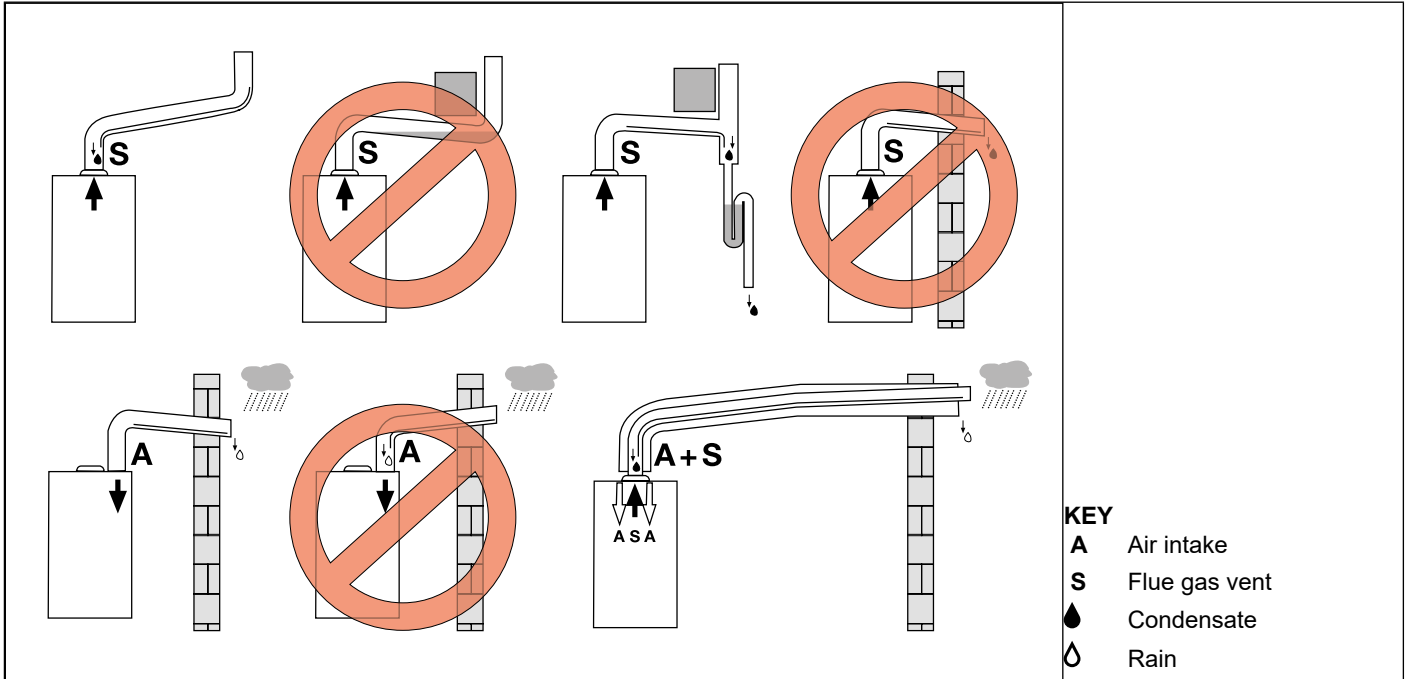


Fig. 16 Installation examples

To install pipes, elbows, terminals and other accessories for air intake and flue gas venting, proceed as follows (see Fig. 17 Pipe installation):

- Clean surfaces and gaskets of the components, removing any dust and debris.
- Apply a thin layer of lubricant on the gasket.
- Insert the components with a slight rotation, pushing until the spigot end stops.



**DANGER**

There must be no leakage of combustion by-products from any of the gaskets.

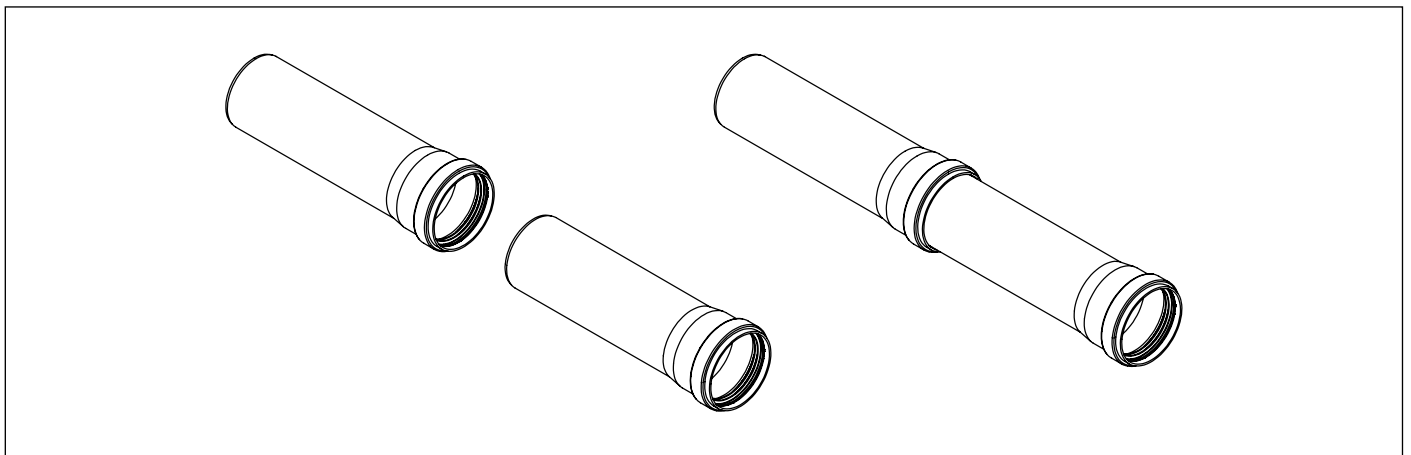


Fig. 17 Pipe installation

### Wall-mounted terminals

The final parts of air intake and flue gas venting terminals, both split and coaxial, feature a groove (A) to fix the external collar (see Fig. 18 Wall-mounted terminal installation).

Insert the external collar into the terminal until reaching the groove.

Insert the terminal, from outside, making the external collar adhere to the wall. The terminal projection beyond the wall must be that imposed by the collar forced position.

Insert the internal collar, from inside, until it adheres to the wall.

Any pipes, elbows or other components must not be inserted at the passage through the wall.

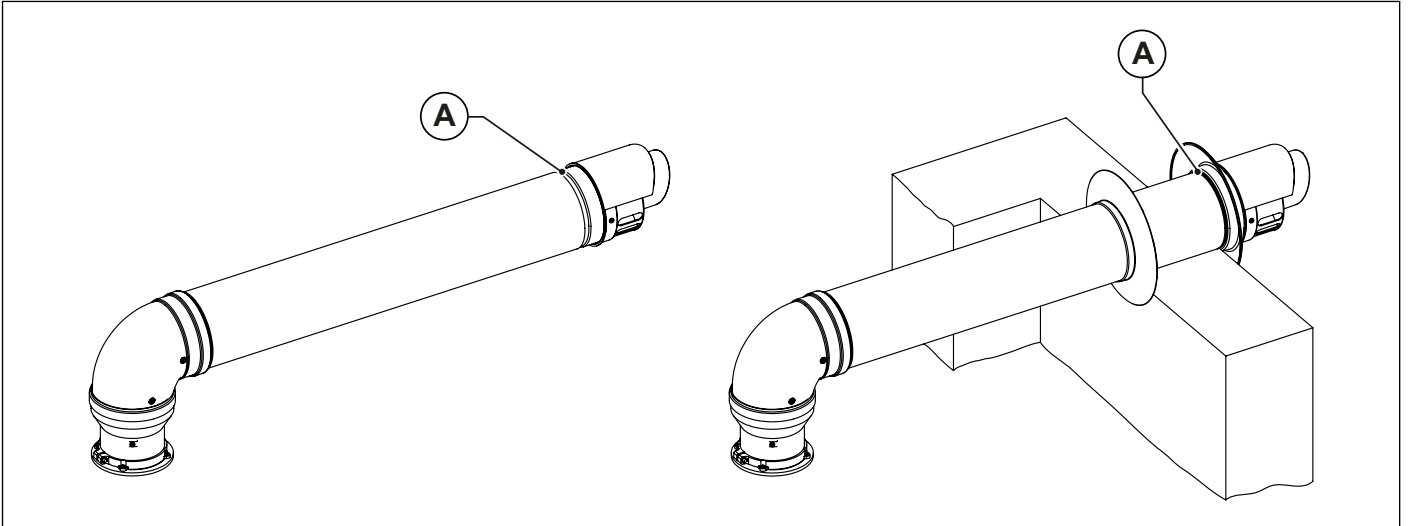


Fig. 18 Wall-mounted terminal installation

### Tile for pitched roofs

The tile for pitched roofs can be used on roofs with an inclination between  $18^\circ$  and  $44^\circ$  (see Fig. 19 Tile for pitched roofs).

Remove the roofing elements (tiles, pantiles,...) from the roof area where the tile for pitched roofs will be installed.

Position the tile on the roof.

Position the roofing elements (tiles, pantiles,...) in such a way that rainwater drains over them.

Fit the cap (A) on the tile. The cap can be fitted in 2 positions, according to the roof inclination.

Insert the flue from above through the tile.

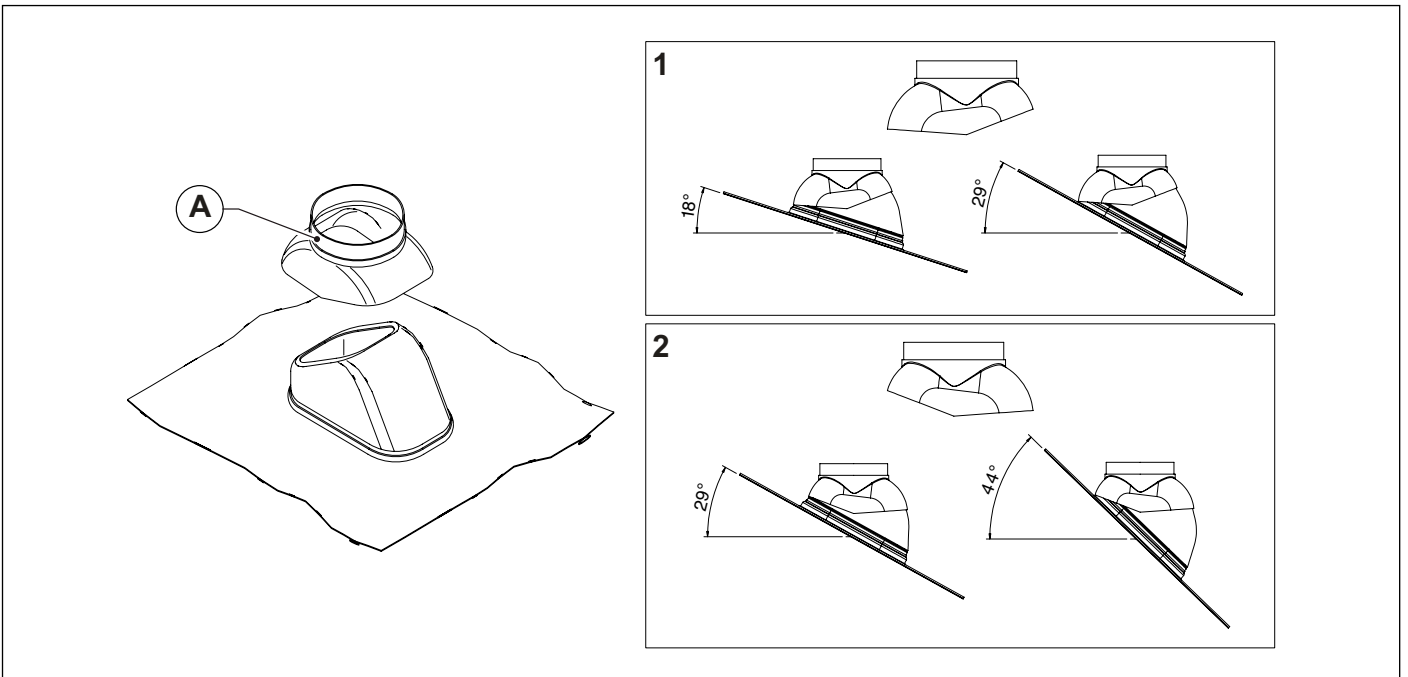


Fig. 19 Tile for pitched roofs

### Roof flues

Insert the air intake and/or flue gas venting flue from above through the tile.

Position the rainproof collar (A) until it bottoms on the cap of the tile for roofs (B) and fix it with the screw supplied.

Keep the distance indicated in the figure between the rainproof collar and the terminal.

Check that the flue is in a vertical position and fix it to the structure with collars or other fixing systems.

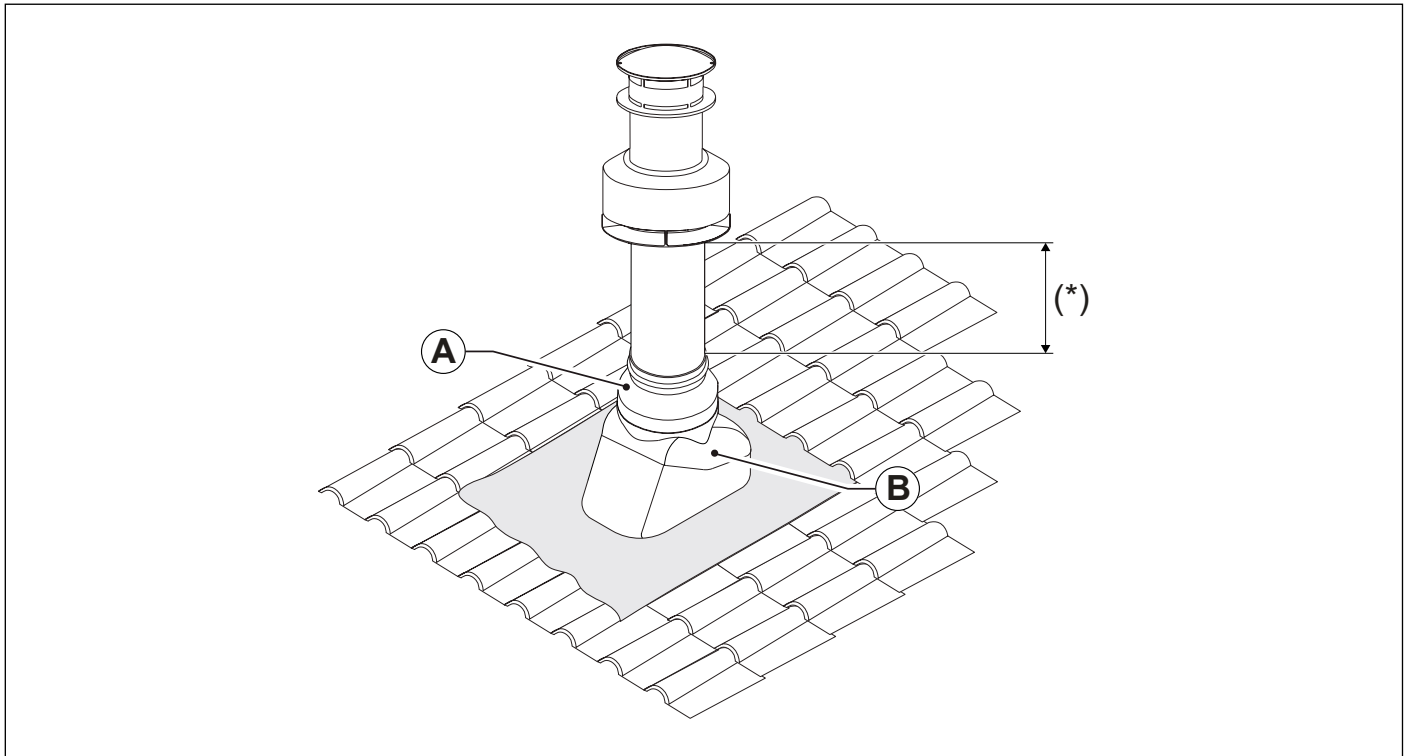


Fig. 20 Roof flue installation

- (\*)  $\geq 370$  mm for 0CAMISCA00 and 0CAMIASP00 accessories.
- = 270 mm for 0KCAMASP00 accessory.

### 3.6.3 Possible configuration of air intake and flue gas venting ducts

#### **Type B23/B23P**

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 with anti-wind gust device; it has to be equipped with a fan mounted before the combustion chamber/heat exchanger.

#### **Type C13/C13X**

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

The minimum distance between the air intake duct and the flue gas venting duct must be at least 250 mm, whereas both terminals must be contained within a square measuring 500 x 500 mm.

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

#### **Type C33/C33X**

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

The minimum distance between the air intake duct and the flue gas venting duct must be at least 250 mm, whereas both terminals must be contained within a square measuring 500 x 500 mm.

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

#### **Type C43/C43X**

Boiler intended for connection to collective chimney pipe system that includes two ducts, one for air intake and the other for flue gas exhaustion. These ducts may be coaxial or split.

The chimney must be compliant with applicable legislation and standards.

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

#### **Type C53**

Boiler with separate pipes for combustion air intake and flue gas evacuation.

These pipes may discharge in areas at a different pressure.

The terminals may not face each other from opposed walls.

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

#### **Type C63/C63X**

Boiler designed to be sold without air intake or flue gas venting ducts.

Flue gas venting and air intake to be ensured by using commercially available pipes, which are to be certified separately.

The boiler is to be equipped with 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.

The chimney must be compliant with applicable legislation and standards.

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

#### **Type C93/C93X**

Boiler designed to be connected to a vertical terminal through a ducted vent duct.

The technical compartment where the venting system is housed is also used as combustion air intake duct, through the air gap which is created.

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

### 3.6.4 Length of air intake and flue gas venting ducts

Lengths are expressed in equivalent metres on flue gas vent ( $m_{sef}$ ).

To calculate the actual length of the air intake/flue gas vent system, flow resistances of the accessories must be used (see *Flow resistance tables* on page 51).



#### WARNING

The information given above is with reference to air intake/flue gas venting ducts made from smooth, rigid pipes approved and supplied by the manufacturer.

#### KR 85

| Type of installation | Pipe diameters [mm]                        | Max intake length $L_A$ [ $m_{sef}$ ] | Max venting length $L_S$ [ $m_{sef}$ ] | Max total length $L_A + L_S$ [ $m_{sef}$ ] | Maximum straight development without terminals (1) [m] |
|----------------------|--|---------------------------------------|--|--|--|
| B23/B23P             | Ø 80                                       | -                                     | 20                                     | 20   | 6  |
|                      | Ø 100                                      | -                                     | 62                                     | 62   | 41   |
| C13/C13X - C33/C33X  | Ø 80/125                                   | -                                     | -                                      | 13   | 5  |
|                      | Ø 100/150                                  | -                                     | -                                      | 32   | 20   |
| C43/C43X - C53 - C83 | Ø 80 + Ø 80                                | 20                                    | 20                                     | 20   | 6  |
|                      | Ø 100 + Ø 100                              | 62                                    | 62                                     | 62   | 41   |
| C63/C63X             | Residual flue head (Pmin-Pmax): 5 - 194 Pa |                                       |  |  |  |
| C93/C93X             | Ø 80<br>133x133 (2)                        | -                                     | 18                                     | 18   | 7  |
|                      | Ø 100<br>165x165 (3)                       | -                                     | 54                                     | 54   | 33   |

Tab. 10 Pipe length KR 85

#### KR 120

| Type of installation | Pipe diameters [mm]                        | Max intake length $L_A$ [ $m_{sef}$ ] | Max venting length $L_S$ [ $m_{sef}$ ] | Max total length $L_A + L_S$ [ $m_{sef}$ ] | Maximum straight development without terminals (1) [m] |
|----------------------|--|---------------------------------------|--|--|--|
| B23/B23P             | Ø 100                                      | -                                     | 43                                     | 43   | 22   |
| C13/C13X             | Ø 100/150                                  | -                                     | -                                      | 22   | 11   |
| C33/C33X             | Ø 100/150                                  | -                                     | -                                      | 22   | 6  |
| C43/C43X - C53 - C83 | Ø 100 + Ø 100                              | 43                                    | 43                                     | 43   | 22   |
| C63/C63X             | Residual flue head (Pmin-Pmax): 5 - 275 Pa |                                       |  |  |  |
| C93/C93X             | Ø 100<br>165x165 (3)                       | -                                     | 37                                     | 37   | 17   |

Tab. 11 Pipe length KR 120

(1) The maximum straight development can change depending of the intake and venting terminal flow resistance. In case of C9 ducts, the value indicated is the maximum vertical length of the duct inside the lightwell.

(2) Maximum length that can be developed in a lightwell with 133x133 mm minimum size, including terminal C9. The fitting with the boiler is composed of a 90° elbow with 80/125 mm diameter and a one-metre extension with 80/125 mm diameter.

(3) Maximum length that can be developed in a lightwell with 165x165 mm minimum size, including terminal C9. The fitting with the boiler is composed of a 80/125-100/150 mm adapter, a 90° elbow with 100/150 mm diameter and a one-metre extension with 100/150 mm diameter.

**KR 150**

| Type of installation | Pipe diameters [mm]                         | Max intake length<br>$L_A$<br>[m <sub>sef</sub> ] | Max venting length<br>$L_S$<br>[m <sub>sef</sub> ] | Max total length<br>$L_A + L_S$<br>[m <sub>sef</sub> ] | Maximum straight development without terminals (1)<br>[m] |
|----------------------|---|---|--|--|---|
| B23/B23P             | Ø 100                                       | -   | 34   | 34   | 12  |
| C13/C13X             | Ø 100/150                                   | -   | -  | 17   | 11  |
| C33/C33X             | Ø 100/150                                   | -   | -  | 17   | 1   |
| C43/C43X - C53 - C83 | Ø 100 + Ø 100                               | 34  | 34   | 34   | 12  |
| C63/C63X             | Residual flue head (Pmin-Pmax): 10 - 290 Pa |   |  |  |   |
| C93/C93X             | Ø 100<br>165x165 (3)                        | -   | 30   | 30   | 9   |

Tab. 12 Pipe length KR 150

(1) The maximum straight development can change depending of the intake and venting terminal flow resistance. In case of C9 ducts, the value indicated is the maximum vertical length of the duct inside the lightwell.

(3) Maximum length that can be developed in a lightwell with 165x165 mm minimum size, including terminal C9. The fitting with the boiler is composed of a 80/125-100/150 mm adapter, a 90° elbow with 100/150 mm diameter and a one-metre extension with 100/150 mm diameter.

### 3.6.5 Flow resistance tables

**Flow resistance of separate ducts Ø 80 mm (in equivalent metres on flue gas vent ( $m_{set}$ ))**

| Component   | Code       | KR 85 |      |
|---|------------|-------|------|
|   |            | A     | S    |
| M/F extension L=1000 mm   | 0PROLUNG00 | 0,5   | 1,0  |
| M/F extension L=500 mm  | 0PROLUNG01 | 0,5   | 0,5  |
| 90° M/F elbow   | 0CURVAXX02 | 1,0   | 1,5  |
| 45° M/F elbow   | 0CURVAXX01 | 1,0   | 1,5  |
| T-shaped fitting for visual inspection and condensate collection tank | 0KITRACT00 | 1,0   | 1,0  |
| M/M/F T-shaped fitting  | 0RACCORT00 | 1,0   | 1,0  |
| M/F telescopic extension L=340...450 mm                               | 0PROLTELO1 | 0,5   | 0,5  |
| Flue gas vent flue L=1380 mm  | 0CAMISCA00 | -     | 6,5  |
| M/F flexible hose L=20,000 mm   | 0TUBOFLE01 | 13,0  | 20,0 |
| Suction opening   | 0GRIGASP01 | 7,0   | -    |
| Wall flue gas vent terminal L=1000 mm                                 | 0TERMSCA00 | -     | 6,0  |
| Flue gas vent flange connection                                       | 0PARTFUM01 | -     | 0,0  |
| Air intake flange connection  | 0TRONASP00 | 0,0   | -    |
| Intake/vent flue L=1380 mm (80+80 mm)                                 | 0CAMIASP00 | 5,0   | 6,5  |

Tab. 13 Flow resistance of separate ducts Ø 80 mm

**Flow resistance of separate ducts Ø 100 mm (in equivalent metres on flue gas vent ( $m_{set}$ ))**

| Component                                    | Code       | KR 85 |      | KR 120 |      | KR 150 |      |
|--|------------|-------|------|--------|------|--------|------|
|  |            | A     | S    | A      | S    | A      | S    |
| Flue gas vent flange connection (Ø 80 mm)    | 0PARTFUM01 | -     | 0,5  | -      | -    | -      | -    |
| Air intake flange connection (Ø 80 mm)       | 0TRONASP00 | 0,0   | -    | -      | -    | -      | -    |
| 90° M/F elbow (Ø 80 mm)                      | 0CURVAXX02 | 3,0   | 5,0  | -      | -    | -      | -    |
| Suction opening (Ø 80 mm)                    | 0GRIGASP01 | 21,5  | -    | -      | -    | -      | -    |
| M/F extension L=500 mm (Ø 80 mm)             | 0PROLUNG01 | 1,0   | 1,5  | -      | -    | -      | -    |
| Adapter M/F Ø 80-100 mm                      | 0RIDUZIO13 | 0,0   | 2,0  | -      | -    | -      | -    |
| M/F extension L=500 mm                       | 0PROLUNG07 | 0,5   | 0,5  | 0,5    | 0,5  | 0,5    | 0,5  |
| M/F extension L=1000 mm                      | 0PROLUNG08 | 0,5   | 1,0  | 0,5    | 1,0  | 0,5    | 1,0  |
| M/F extension L=2000 mm                      | 0PROLUNG09 | 1,5   | 2,0  | 1,5    | 2,0  | 1,5    | 2,0  |
| 90° M/F elbow with inspection                | 0CURVAXX08 | 2,5   | 3,5  | 2,5    | 3,5  | 2,5    | 4,0  |
| 90° M/F elbow                                | 0CURVAXX10 | 2,5   | 3,5  | 2,5    | 3,5  | 2,5    | 4,0  |
| 45° M/F elbow                                | 0CURVAXX11 | 2,0   | 3,0  | 2,0    | 3,0  | 2,0    | 3,0  |
| M/M/F T-shaped fitting                       | 0RACCORT01 | 3,0   | 5,0  | 3,5    | 5,0  | 3,5    | 5,5  |
| M/M/F T-shaped fitting for visual inspection | 0RACCORT03 | 1,5   | 2,5  | 2,0    | 2,5  | 2,0    | 3,0  |
| Stainless steel roof terminal                | 0TERCOIN01 | -     | 6,5  | -      | 7,0  | -      | 7,5  |
| M/F flexible hose L=20,000 mm                | 0TUBOFLE04 | 13,0  | 20,0 | 13,5   | 20,0 | 13,5   | 20,0 |
| Wall flue gas vent terminal L=1000 mm        | 0TERMSCA03 | -     | 7,5  | -      | 8,0  | -      | 8,5  |
| Wall intake terminal L=1000 mm               | 0TERMASP00 | 9,0   | -    | 10,0   | -    | -      | 10,5 |
| Flue gas vent flange connection              | 0PARTFUM00 | -     | -    | -      | 0,0  | -      | 0,0  |
| Air intake flange connection                 | 0TRONFLA05 | -     | -    | 0,0    | -    | 0,0    | -    |
| Suction opening                              | 0GRIGASP02 | -     | -    | 9,5    | -    | 9,5    | -    |

Tab. 14 Flow resistance of separate ducts Ø 100 mm

A = air intake

S = flue gas vent

**Flow resistance of concentric ducts Ø 80/125 mm (in equivalent metres on flue gas vent ( $m_{set}$ ))**

| Component   | Code       | KR 85 |
|---|------------|-------|
|   |            | A+S   |
| M/F extension L=1000 mm   | 0PROLUNG04 | 1,0   |
| M/F extension L=500 mm  | 0PROLUNG05 | 0,5   |
| 90° M/F elbow   | 0CURVAXX07 | 1,5   |
| 45° M/F elbow   | 0CURVAXX06 | 1,0   |
| Wall intake/vent terminal L=900 mm  | 0KITASCA01 | 7,0   |
| Wall vent kit:<br>Wall intake/vent terminal L=900 mm<br>90° M/F elbow<br>Adapter M/F Ø 60/100-80/125 mm | 0KITASCA00 | 9,5   |
| Intake/vent flue L=1200 mm  | 0KITCACO01 | 7,5   |
| Adapter M/F Ø 60/100-80/125 mm  | 0KITADCO00 | 1,0   |
| Roof vent kit:<br>Intake/vent flue L=1180 mm<br>Adapter M/F Ø 60/100-80/125 mm                          | 0KITCACO00 | 8,5   |
| Intake/vent flange connection   | 0ATTCOFL01 | 0,0   |

Tab. 15 Flow resistance of concentric ducts Ø 80/125 mm

**Flow resistance of concentric ducts Ø 100/150 mm (in equivalent metres on flue gas vent ( $m_{set}$ ))**

| Component   | Code       | KR 85 | KR 120 | KR 150 |
|---|------------|-------|--------|--------|
|   |            | A+S   | A+S    | A+S    |
| Intake/vent flange connection (Ø 80/125 mm)           | 0ATTCOFL01 | 0,5   | -      | -      |
| Adapter M/F Ø 80/125-100/150 mm                       | 0RIDUZIO22 | 1,5   | -      | -      |
| M/F extension L=250 mm                                | 0PROLUNG20 | 0,5   | 0,5    | 0,5    |
| M/F extension L=500 mm                                | 0PROLUNG21 | 0,5   | 0,5    | 0,5    |
| M/F extension L=1000 mm                               | 0PROLUNG22 | 1,0   | 1,0    | 1,0    |
| M/F extension L=2000 mm                               | 0PROLUNG23 | 2,0   | 2,0    | 2,0    |
| 90° M/F elbow   | 0CURVAXX18 | 3,0   | 3,0    | 3,0    |
| 45° M/F elbow   | 0CURVAXX19 | 1,0   | 1,0    | 1,0    |
| M/M/F T-shaped fitting with cap (closed straight way) | 0RACTTAP00 | 3,5   | 3,5    | 4,0    |
| M/M/F T-shaped fitting with cap (closed 90° way)      | 0RACTTAP01 | 0,5   | 0,5    | 0,5    |
| 15° M/F elbow   | 0CURVAXX20 | 0,5   | 0,5    | 0,5    |
| 30° M/F elbow   | 0CURVAXX21 | 1,0   | 1,0    | 1,0    |
| M/F connection with analysis ports                    | 0ATTCOVE07 | 0,0   | 0,0    | 0,0    |
| M/F connection with condensate collection tank        | 0ATTCOVE08 | 0,0   | 0,0    | 0,0    |
| Wall intake/vent terminal L=900 mm                    | 0TERMPAR00 | 7,5   | 8,0    | 8,5    |
| Intake/vent flange connection                         | 0ATTCOFL00 | 0,0   | 0,0    | 0,0    |
| Intake/vent flue L=1200 mm (Ø 80/125 mm)              |            |       |        |        |
| Adapter M/F Ø 100/150-80/125 mm                       | 0TERMTET00 | 15,0  | 14,0   | 16,5   |

Tab. 16 Flow resistance of concentric ducts Ø 100/150 mm

A + S = air intake + flue gas venting



**Flow resistance of ducts Ø 80 mm for type C9 in 133x133 mm lightwell (in equivalent metres on flue gas vent ( $m_{set}$ ))**

| Component  | Code       | KR 85 |
|--|------------|-------|
|  |            | A+S   |
| Intake/vent flange connection (Ø 80/125 mm)                      | 0ATTCOFL01 | 0,0   |
| M/F extension L=1000 mm (Ø 80/125 mm)                            | 0PROLUNG04 | 1,5   |
| M/F extension L=500 mm (Ø 80/125 mm)                             | 0PROLUNG05 | 0,5   |
| 90° M/F elbow (Ø 80/125 mm)                                      | 0CURVAXX07 | 1,5   |
| 45° M/F elbow (Ø 80/125 mm)                                      | 0CURVAXX06 | 1,5   |
| M/F extension L=1000 mm (Ø 80 mm) in 133x133 mm lightwell        | 0PROLUNG00 | 1,0   |
| M/F extension L=500 mm (Ø 80 mm) in 133x133 mm lightwell         | 0PROLUNG01 | 0,5   |
| M/F flexible hose L=20,000 mm (Ø 80 mm) in 133x133 mm lightwell  | 0TUBOFLE01 | 20,0  |
| Plastic roof terminal for flue (Ø 80 mm) in 133x133 mm lightwell | 0COPECAF00 | 7,0   |
| 90° M/F elbow (Ø 80 mm) in 133x133 mm lightwell                  | 0CURVAXX02 | 1,5   |

Tab. 17 Flow resistance of ducts Ø 80 mm for type C9 in 133x133 mm lightwell

**Flow resistance of ducts Ø 100 mm for type C9 in 165x165 mm lightwell (in equivalent metres on flue gas vent ( $m_{sef}$ ))**

| Component  | Code       | KR 85 | KR 120 | KR 150 |
|--|------------|-------|--------|--------|
|  |            | A+S   | A+S    | A+S    |
| Intake/vent flange connection (Ø 80/125 mm)                      | 0ATTCOFL01 | 0,5   | -      | -      |
| Adapter M/F Ø 80/125-100/150 mm                                  | 0RIDUZIO22 | 3,0   | -      | -      |
| Intake/vent flange connection (Ø 100/150 mm)                     | 0ATTCOFL00 | -     | 0,0    | 0,0    |
| 90° M/F elbow (Ø 100/150 mm)                                     | 0CURVAXX18 | 5,0   | 5,0    | 5,0    |
| M/F extension L=1000 mm (Ø 100/150 mm)                           | 0PROLUNG22 | 1,5   | 1,5    | 1,5    |
| M/F extension L=500 mm (Ø 100 mm) in 165x165 mm lightwell        | 0PROLUNG07 | 0,5   | 0,5    | 0,5    |
| M/F extension L=1000 mm (Ø 100 mm) in 165x165 mm lightwell       | 0PROLUNG08 | 1,0   | 1,0    | 1,0    |
| M/F extension L=2000 mm (Ø 100 mm) in 165x165 mm lightwell       | 0PROLUNG09 | 2,0   | 2,0    | 2,0    |
| M/F flexible hose L=20,000 mm (Ø 100 mm) in 165x165 mm lightwell | 0TUBOFLE04 | 20,0  | 20,0   | 20,0   |
| 90° M/F elbow (Ø 100 mm) in 165x165 mm lightwell                 | 0CURVAXX10 | 3,0   | 3,0    | 3,0    |

Tab. 18 Flow resistance of ducts Ø 100 mm for type C9 in 165x165 mm lightwell

A + S = air intake + flue gas venting

### 3.7 Measuring combustion efficiency during operation

#### 3.7.1 MANUAL TEST function

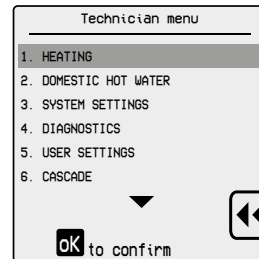
The boiler features a MANUAL TEST function which must be used to measure combustion efficiency during operation and to adjust the burner.

The MANUAL TEST function allows using the boiler with a settable fixed power.

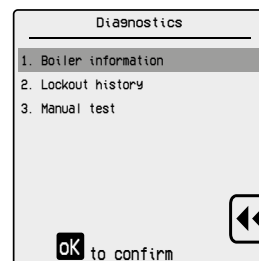
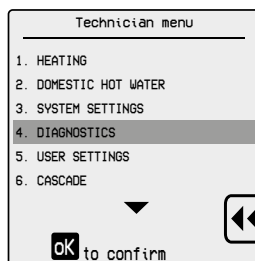
Maximum duration of the MANUAL TEST is 15 minutes.


To enable MANUAL TEST function follow the instructions below.

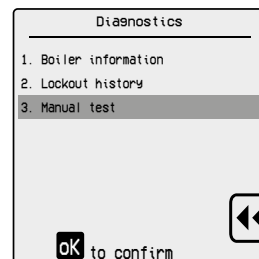
Accessing the TECHNICIAN MENU (see *TECHNICIAN MENU* on page 60).





Select "4. DIAGNOSTICS" and press .



Select "3. Manual test" and press .



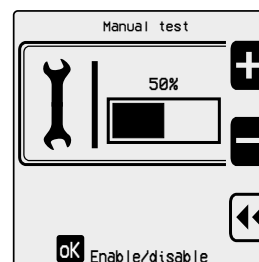
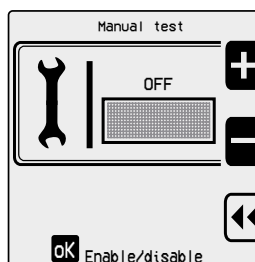
Press  to start the MANUAL TEST function.

Press  and  to increase or decrease power (from 0% to 100%).

Carry out checks and measurements.

Maximum duration of the MANUAL TEST is 15 minutes.

To interrupt the MANUAL TEST function, press .



### 3.7.2 Measurement procedure

The boiler is supplied with two initial fittings: one for connection of the air intake duct **A** and one for connection of the flue gas vent duct **B** (see Fig. 21 Combustion analysis ports).

Fittings are provided with ports for combustion analysis.

If the starting fittings supplied are not used, provide for ports for combustion analysis.

Remove caps from the pre-arranged openings on the fittings, before starting combustion checking procedure.

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

- Measurement of combustion air from the air intake fitting.
- Measurement of flue gas temperature and CO<sub>2</sub> from the flue gas vent fitting.

**Carry out specific measurements when the boiler has stabilised.**



**DANGER**

---

**When the combustion analysis is over, refit the caps on fitting openings.**

---

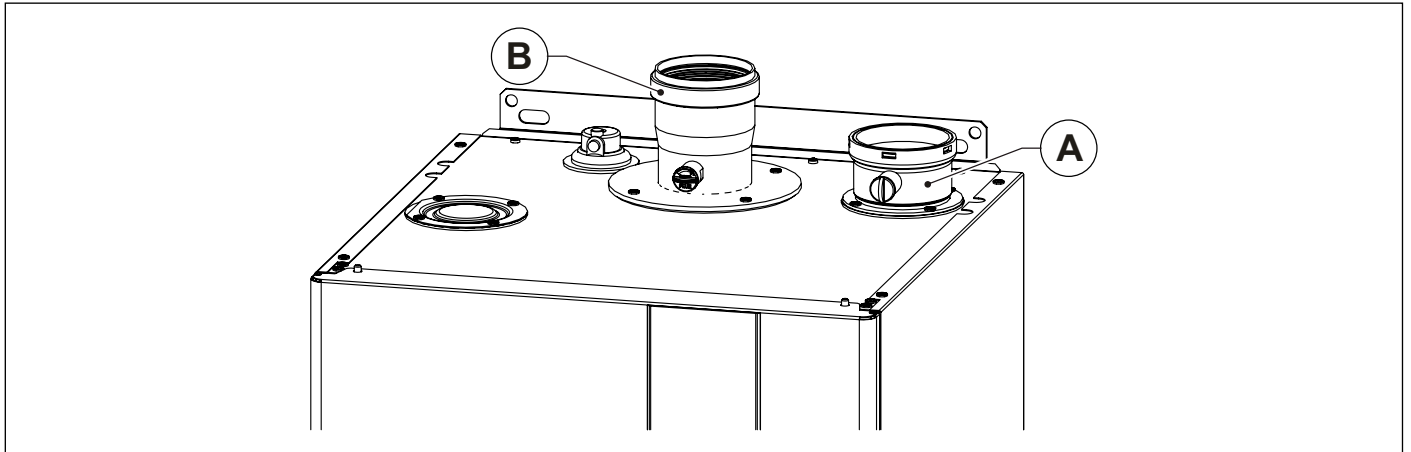


Fig. 21 Combustion analysis ports

### 3.8 Connection to gas mains

Gas pipe cross-section must be chosen depending on its length, layout pattern, gas flow rate.

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



**DANGER**

---

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

**Remember that before operating an indoor gas distribution system and before connecting it to a meter, it must be checked for leaks.**

**If some system parts are not visible, the leak test is to be carried out before the pipes are covered.**

**Leak test is NOT to be carried out employing flammable gas: use air or nitrogen for this purpose.**

**Once gas is in the pipes, leak test by a naked flame is forbidden; use specific products available on the market.**

**When connecting the boiler to gas supply network, it is compulsory to install an appropriately sized gasket made from suitable material.**

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

---

## 3.9 Hydraulic connections

### 3.9.1 Central heating

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

The CH outlet and return pipes must be connected to the respective 1¼" connectors **M** and **R** on the boiler (see Fig. 12 Paper template).

The safety valve exhaust system must be connected to the boiler to fitting **S** (see Fig. 12 Paper template).



#### WARNING

---

**It is advisable to convey the discharge flow of boiler safety valve to the sewer system. Should the above precaution not be implemented and the safety valve be activated, boiler room flooding may occur.**

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

---

### 3.9.2 Condensate drain

Comply with condensate drain laws and standards applicable in the country of installation, which are considered herein integrally transcribed.

Unless forbidden, the condensate produced by combustion is to be routed via the condensate drain 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 odour 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.



#### WARNING

---

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

---

## 3.10 Connection to electrical mains

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

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

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

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

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

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



#### WARNING

---

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

---

### 3.11 Connection to ambient thermostat (optional)

The boiler is designed to be connected to an ambient thermostat (optional, not compulsory).

Room thermostat contacts must be potential-free and able to withstand a load of 5 mA at 24 Vdc.

The ambient thermostat cables must be connected to terminals (23) and (24) of the electronic board (see *Wiring diagram* on page 78) after eliminating the jumper supplied as a standard with the boiler.

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

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



#### WARNING

---

**Only use original Remote Controls supplied by the manufacturer.**

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

---

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

The Remote Control must only be installed by qualified personnel.

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

The Remote Control must be installed on an indoor wall at a height of approximately 1.5 m from the floor and in a suitable location for measuring ambient temperature: do not install in recess or corners, behind doors or curtains, and install away from heat sources, direct sunlight, air draughts and water sprays.

The Remote Control cables must be connected to terminals (27) and (28) of the electronic board (see *Wiring diagram* on page 78).

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



#### WARNING

---

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

**The remote control cables must not be grouped together in the same sheath as the power cables: if the cables are sheathed together, electrical interference from the power cables may compromise the functions of the Remote Control.**

---

Once the Remote Control has been installed, initialise it:

- Move the Remote Control to OFF.
- Press “Prog” and “Reset” keys at the same time and hold them until the display shows “PAR”.
- Release the keys, then press them again at the same time until flashing “P13” and its value “0” are displayed.
- Release “Prog” and “Reset” keys and press the central key: “0” will flash.
- Rotate the central key until value “1” is displayed.
- Press “Reset” key to quit the programming mode.

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

Board and Remote Control communicate in each operating mode: STAND-BY, SUMMER, WINTER, CH ONLY.

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

### 3.13 Installation of the (optional) external probe and sliding temperature operation

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

Once the external temperature value is known, the boiler will automatically adjust the heating water temperature according to a climate curve.



#### WARNING

---

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

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

---

The external temperature probe must be connected by means of a double insulated wire, minimum cross-section 0.35 sq.mm.

The external probe must be connected to terminals (21) and (22) of the electronic board (see *Wiring diagram* on page 78).

The external probe must be connected to a double conductor shielded coaxial cable with grounded braid and maximum length of 50 metres.

Conductors must have a minimum cross-section of 1 mm<sup>2</sup>.



## WARNING

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

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

Once the external probe has been installed, it is necessary to enable its operation by changing parameter "1.6. CH Request type" from TECHNICIAN MENU.

- Accessing the TECHNICIAN MENU (see *TECHNICIAN MENU* on page 60).
- Select "1.6. CH Request type" and press .
- Select "External probe" and press .

The climate curve is automatically calculated by the boiler board according to the value of 4 parameters in the TECHNICIAN MENU:

- "1.2.2. CH maximum setpoint" (**Tm\_max** in the image)
- "1.2.3. CH minimum setpoint" (**Tm\_min** in the image)
- "1.3.1. Outside temp for max CH" (**Te\_max** in the image)
- "1.3.2. Outside temp for min CH" (**Te\_min** in the image)

To change the climate curve, it is necessary to change these 4 parameters.

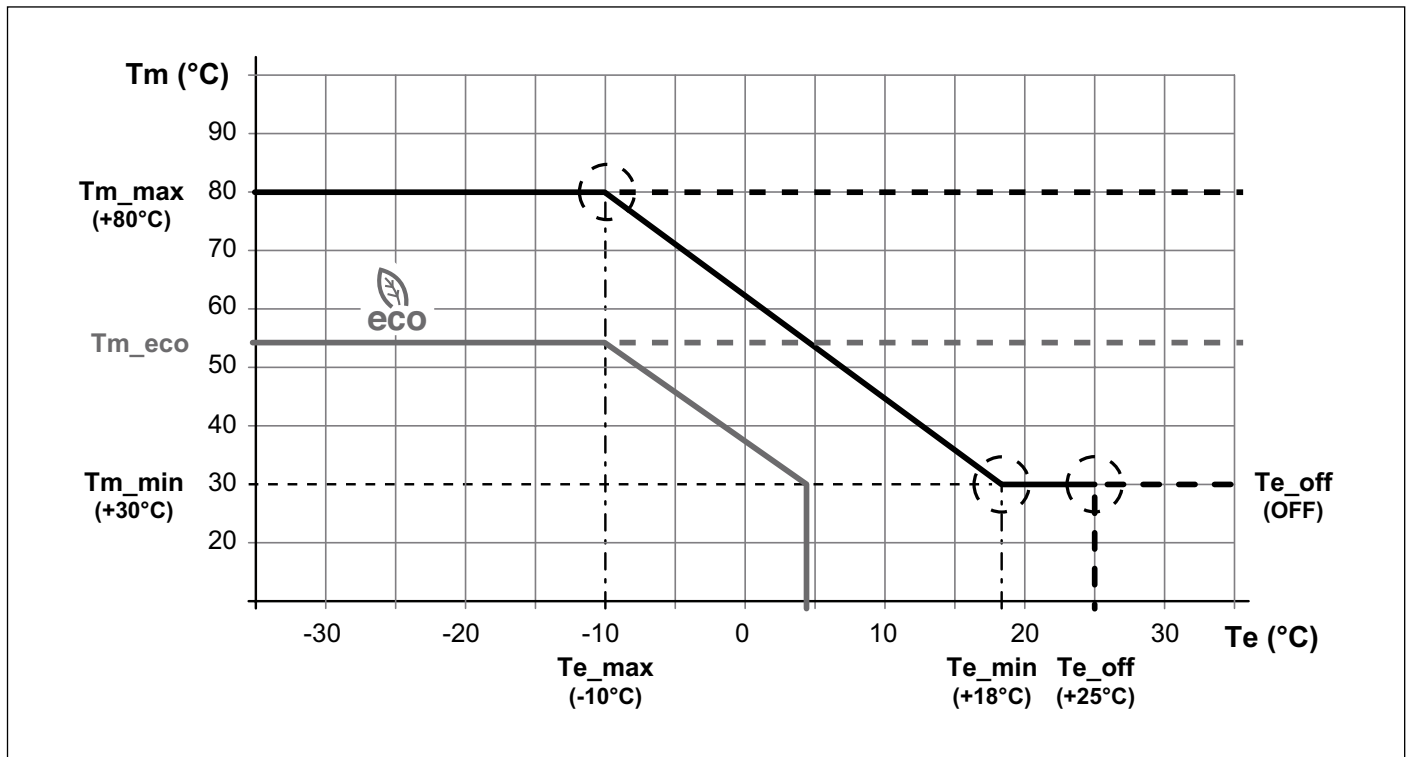


Fig. 22 Climate curve

**Tm** indicates flow water temperature in °C

**Te** indicates external temperature in °C

In case of operation in ECO mode (set through timer or  key) the climate curve is reduced by the value set with parameter "1.2. ECO setpoint reduction" of USER MENU).

In this case, if the flow temperature drops below the minimum set value (parameter "1.2.3. CH minimum setpoint" of TECHNICIAN MENU), the boiler turns off.

It is possible to set the boiler switching off when the external temperature exceeds a given value.

To enable this operation it is necessary to set parameter "1.3.3. Outside temp for CH off" to the desired value (**Te\_off** in the image).

If this is not the case this value must be set to "OFF".

### 3.14 Operation with external 0-10V signal

The boiler can be controlled by an external 0-10VDC signal.  
Control can be performed in terms of power or temperature.



#### WARNING

**If the control from external 0-10VDC power signal is set, it is necessary to install a temperature probe on the boiler flow, to be connected to the 0-10VDC external controller.**

**The probe must be installed near the boiler, before any hydraulic separators or plate exchangers.**

**The probe must avoid that the flow temperature exceeds the maximum temperature settable in the boiler (85°C).**

To enable control from 0-10VDC external signal, it is necessary to carry out the following settings:

- Set parameter "1.6. CH request type" of TECHNICIAN MENU on:
  - » 0-10V Signal [%] for power control.
  - » 0-10V Signal [SP] for temperature control.
- Set the boiler in WINTER or CH ONLY mode.
- Short-circuit TA input of the electronic board (inputs 23 and 24).

**Boiler operation time slots are programmed by the 0-10VDC external controller.**

For this reason the boiler timer must be disabled (parameter "1.3.1. Enable/disable on board scheduler" in the USER MENU must be set to "Disabled" (see *TIMER setting*)).

The heating power/temperature of the boiler is controlled by the 0-10VDC signal as follows:

| Increasing 0-10VDC Signal | Boiler operation                                     |
|---------------------------|--|
| signal < 2V               | Boiler OFF   |
| 2V ≤ signal ≤ 10V         | Boiler ON with linear variation of power/temperature |
| Decreasing 0-10VDC Signal | Boiler operation                                     |
| 2V ≤ signal ≤ 10V         | Boiler ON with linear variation of power/temperature |
| 1V ≤ signal ≤ 2V          | Boiler ON at minimum power/temperature               |
| signal < 1V               | Boiler OFF   |

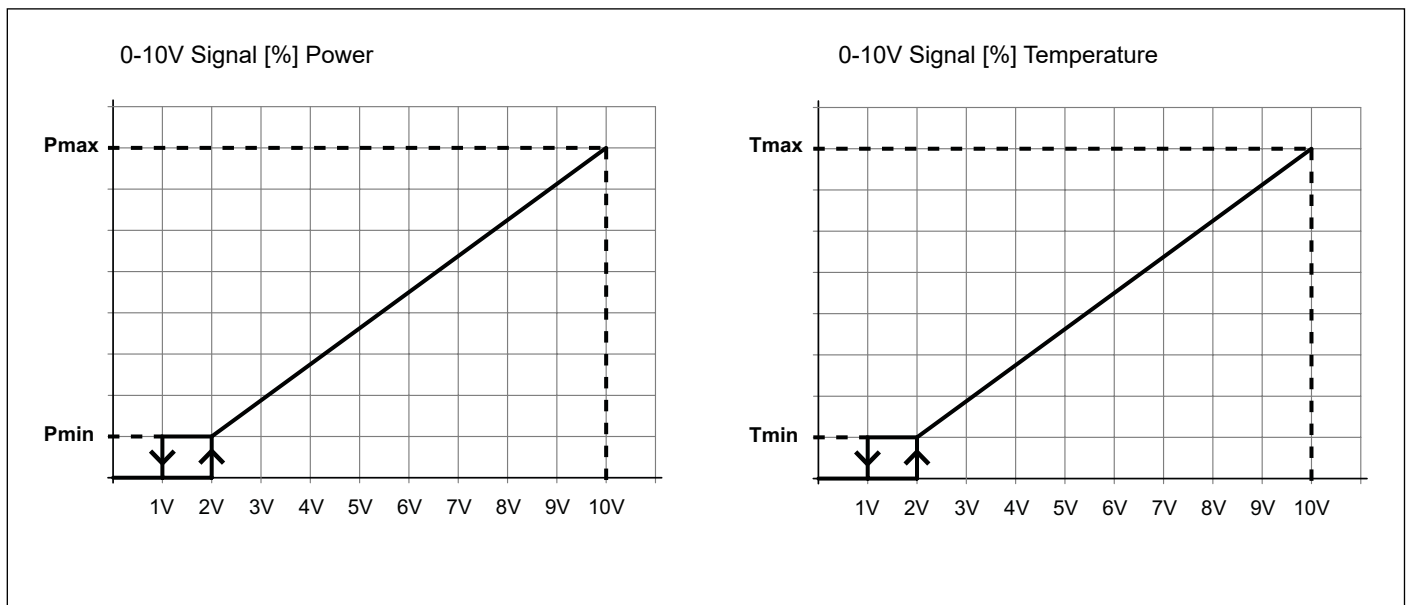



Fig. 23 0-10VDC Signal


### 3.15 TECHNICIAN MENU




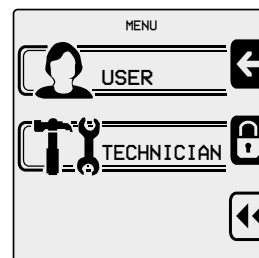
#### WARNING

**Parameter change in the TECHNICIAN MENU is reserved to service centres or qualified service engineers.**

Check that the boiler display is ON - not in "OFF" mode. If this is not the case press  key to switch the boiler on.

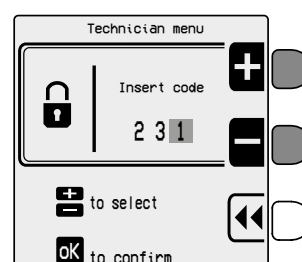
Press  key to access the menu list.



Press  (intermediate) key to access the TECHNICIAN MENU.




Access to TECHNICIAN MENU is protected by password "2 3 1".

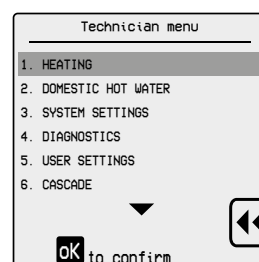
To enter the password, use  and  keys and press .



Press   keys to scroll the menu.

Press  key to access sub-menus or access a parameter.

Press  key to go back to the previous screen.



For a detailed explanation of TECHNICIAN MENU items, see paragraphs *TECHNICIAN MENU navigation table* and *Description of TECHNICIAN MENU lines* on pages [61](#) and [66](#).



### 3.15.1 TECHNICIAN MENU navigation table

| Technician menu       | Sub-menu 1           | Sub-menu 2                 | Factory value   | Settable values     |
|-----------------------|----------------------|----------------------------|---|---------------------|
| 1. HEATING            | 1. CH power set      | 1. Maximum power           | 100%  | 0 ÷ 100%            |
|                       |                      | 2. Minimum power           | 0%  | 0 ÷ 100%            |
|                       | 2. CH temperatures   | 1. ABS max temperature     | 80°C  | 20 ÷ 85°C           |
|                       |                      | 2. CH maximum setpoint     | 75°C  | 20 ÷ 80°C           |
|                       |                      | 3. CH minimum setpoint     | 40°C  | 20 ÷ 70°C           |
|                       |                      | 4. CH setpoint hysteresis  | 3°C   | 2 ÷ 10°C            |
|                       | 3. OTC parameters    | 1. Outside temp for max CH | -10°C   | -34 ÷ 10°C          |
|                       |                      | 2. Outside temp for min CH | 18°C  | 15 ÷ 25°C           |
|                       |                      | 3. Outside temp for CH off | OFF   | OFF<br>7 ÷ 30°C     |
|                       |                      | 4. OTC setpoint table      | Displaying table  |                     |
|                       |                      | 5. Heating curve           | Displaying curve  |                     |
| 4. CH pump settings   | 1. Post pump time    | 5 min                      | 1÷30 min  |                     |
| 5. Ignition timer     | -                    | 1 min                      | 0÷15 min  |                     |
| 6. CH request type    | -                    | Ambient thermostat         | External probe<br>Ambient thermostat<br>0-10V Signal [%]<br>0-10V Signal [SP] |                     |
| 2. DOMESTIC HOT WATER | 1. DHW power         | 1. Maximum power           | 100%  | 0 ÷ 100%            |
|                       |                      | 2. Minimum power           | 0%  | 0 ÷ 100%            |
|                       | 2. DHW temperatures  | 1. DHW storage temp        | 80°C (*)  | 35 ÷ 85°C           |
|                       |                      | 2. Instant DHW setpoint    | 60°C  | 35 ÷ 65°C           |
|                       |                      | 3. DHW setpoint hysteresis | 3°C   | 2 ÷ 10°C            |
|                       | 3. DHW pump settings | 1. Post pump time          | 30 sec  | OFF<br>1 ÷ 180 sec  |
|                       | 4. DHW priority      | 1. DHW status              | Enabled   | Enabled<br>Disabled |
|                       |                      | 2. DHW priority timeout    | OFF   | OFF<br>1÷60 min     |
| 5. Request type       | -                    | Contact                    | Contact<br>Sensor (*)   |                     |

(\*) If parameter "2.5. DHW Request type" is set to "Sensor", the flow temperature to the water heater is equal to the one set in point "2.2.2. Instant DHW setpoint" + 20°C.

| Technician menu    | Sub-menu 1           | Sub-menu 2                           | Factory value  | Settable values                     |
|--------------------|----------------------|--------------------------------------|----------------|-------------------------------------|
| 3. SYSTEM SETTINGS | 1. Boiler parameters | 1. Ignition power                    | (**)           | 0 ÷ 100%                            |
|                    |                      | 2. Delay siphon check                | 10 sec         | 0 ÷ 60 sec                          |
|                    |                      | 3. Number of boiler pump             | Double pump    | Pump and 3-way valve<br>Double pump |
|                    |                      | 4. Pump speed max                    | 100%           | 15 ÷ 100%                           |
|                    |                      | 5. Pump speed min                    | 15%            | 15 ÷ 100%                           |
|                    |                      | 6. Antilegionella                    | Disabled       | Enabled<br>Disabled                 |
|                    |                      | 7. Heat exchanger protection         | Disabled       | Enabled<br>Disabled                 |
|                    |                      | 8. Heat exchanger delta              | 10°C           | 5 ÷ 20°C                            |
|                    |                      | 9. Heat exchanger protection control | Enabled        | Enabled<br>Disabled                 |
|                    |                      | 10. Modbus parameters                | 1              | 0 ÷ 247                             |
|                    |                      | 11. 3-way valve travel time          | 10 sec         | 1 ÷ 255 sec                         |
|                    |                      | 12. Relay 1 output                   | Alarm function | Alarm function<br>LPG manager       |
|                    |                      | 13. Maximum fan speed                | (**)           | 300 ÷ 12750 rpm                     |
|                    |                      | 14. Minimum fan speed                | (**)           | 300 ÷ 12750 rpm                     |
|                    |                      | 15. Pre-ventilation time             | 30 sec         | 0 ÷ 255 sec                         |
|                    |                      | 16. Post-ventilation time            | 30 sec         | 0 ÷ 255 sec                         |
|                    |                      | 17. Post-ventilation speed           | 5100 rpm       | 300 ÷ 12750 rpm                     |
|                    |                      | 18. Stabilization time               | 40 sec         | 0 ÷ 255 sec                         |
|                    |                      | 19. CH slope rate                    | (**)           | 0 ÷ 60°C                            |
|                    |                      | 20. Flow burner ON                   | (**)           | 0 ÷ 3825 l/hour                     |
|                    |                      | 21. Flow burner OFF                  | (**)           | 0 ÷ 3825 l/hour                     |
|                    |                      | 22. APS Speed                        | (**)           | 0 ÷ 12750 rpm                       |
|                    |                      | 23. APS Max Speed                    | (**)           | 0 ÷ 12750 rpm                       |
|                    |                      | 24. APS Switching time               | 10 sec         | 10 ÷ 255 sec                        |
|                    |                      | 25. APS step                         | 50 rpm         | 50 ÷ 500 rpm                        |
|                    |                      | 26. Min power to start dec. slope    | 19%            | 0 ÷ 100%                            |
|                    |                      | 27. Time 0.2s for a step dur. dec.   | 10             | 0 ÷ 255                             |
|                    |                      | 28. Fan Kp Up                        | 50             | 0 ÷ 127                             |
|                    |                      | 29. Fan Ki Up                        | (**)           | 0 ÷ 255                             |
|                    |                      | 30. Fan Kp Down                      | (**)           | 0 ÷ 127                             |
|                    |                      | 31. Fan Ki Down                      | (**)           | 0 ÷ 255                             |
|                    |                      | 32. CH KP                            | 3              | 0 ÷ 127                             |
|                    |                      | 33. CH KI                            | 230            | 0 ÷ 255                             |
|                    |                      | 34. DHW KP                           | 3              | 0 ÷ 127                             |
|                    |                      | 35. DHW KI                           | 230            | 0 ÷ 255                             |

(\*\*) According to the model. See the Tab. 19 Special parameters per single model on page 65.

| Technician menu    | Sub-menu 1                 | Sub-menu 2   | Sub-menu 3  | Factory value | Settable values  |  |
|--------------------|----------------------------|--|---|---------------|--|--|
| 3. SYSTEM SETTINGS | 2. User interface settings | 1. Select Language   | -   | English       | English<br>Italian<br>Polish<br>French<br>Spanish<br>Russian<br>Turkish<br>Romanian<br>Bulgarian<br>German |  |
|                    |                            | 2. Select Units  | -   | Celsius       | Fahrenheit<br>Celsius  |  |
|                    |                            | 3. Set date  | -   | -             | day / month<br>year  |  |
|                    |                            | 4. Set time  | 24 hours<br>12 hours  | -             | hours : minutes  |  |
|                    | 3. Service settings        | 1. Service information   | Entering the Technical Service Centre telephone number (13 digits max). |               |  |  |
|                    |                            | 2. Service due date  | Entering the date of the following scheduled maintenance check.         |               |  |  |
| 4. DIAGNOSTICS     | 1. Boiler information      | Displaying the main boiler parameters.<br>Where "*" symbol is present press <input type="button" value="ok"/> to display the parameter time chart. |   |               |  |  |
|                    | 2. Lockout history         | Displaying the last boiler operation errors.<br>Press <input type="button" value="ok"/> to display the boiler status when the error occurred.      |   |               |  |  |
|                    | 3. Manual test             | -  | -   | OFF           | OFF<br>0-100%  |  |

| Technician menu  | Sub-menu 1              | Sub-menu 2                | Sub-menu 3                           | Factory value | Settable values   |
|------------------|-------------------------|---------------------------|--------------------------------------|---------------|---|
| 5. USER SETTINGS | 1. Heating              | 1. Temperature set        | 1. Temperature set                   | 75°C          | 20 ÷ 80°C   |
|                  |                         |                           | 2. Outside temperature for CH off    | OFF           | OFF<br>7 ÷ 30°C   |
|                  |                         | 2. ECO setpoint reduction | -                                    | 50°C          | 0 ÷ 50°C  |
|                  |                         | 3. Scheduler set          | 1. Enable/disable on board scheduler | Enabled       | Enabled<br>Disabled   |
|                  |                         |                           | 2. Scheduler set                     | Monday        | Monday<br>Tuesday<br>Wednesday<br>Thursday<br>Friday<br>Saturday<br>Sunday<br>Monday-Friday<br>Monday-Sunday<br>Saturday-Sunday |
|                  |                         |                           |                                      |               |   |
|                  | 2. DHW settings         | 1. Temperature set        | -                                    | 80°C          | 35 ÷ 85°C   |
|                  |                         |                           | 2. ECO setpoint reduction            | -             | 20°C  |
|                  |                         | 3. Scheduler set          | 1. Enable/disable on board scheduler | Enabled       | Enabled<br>Disabled   |
|                  |                         |                           | 2. Scheduler set                     | Monday        | Monday<br>Tuesday<br>Wednesday<br>Thursday<br>Friday<br>Saturday<br>Sunday<br>Monday-Friday<br>Monday-Sunday<br>Saturday-Sunday |
|                  |                         |                           |                                      |               |   |
| 3. Holiday       |                         | 1. CH holiday setpoint    | -                                    | 20°C          | 20 ÷ 80°C   |
|                  | 2. DHW holiday setpoint | -                         | 80°C                                 | 35 ÷ 85°C     |   |

| Technician menu             | Sub-menu 1  | Sub-menu 2   | Factory value          | Settable values   |
|-----------------------------|---|--|------------------------|---|
| 6. CASCADE                  | 1. Cascade set  | 1. Cascade switch delay  | 30 sec                 | 0 ÷ 255 sec   |
|                             |   | 2. Cascade min power   | 10% min                | 0 ÷ 100%  |
|                             |   | 3. Single burner power   | According to the model | 0 ÷ 2550 kW   |
|                             |   | 4. Boiler for DHW  | 0                      | 0 ÷ 6   |
|                             |   | 5. PI loop time  | 5 sec                  | 1 ÷ 15 sec  |
|                             |   | 6. Cascade pump speed max  | 100%                   | 15 ÷ 100%   |
|                             |   | 7. Cascade pump speed min  | 30%                    | 15 ÷ 100%   |
|                             | 2. Cascade info   | Displaying the cascade system information.<br>Where “*” symbol is present press <input type="button" value="ok"/> to display the parameter time chart. |                        |   |
|                             | 3. Cascade autodetect   | Press <input type="button" value="ok"/> to activate cascade system self-configuration.   |                        |   |
| 7. RESTORE FACTORY SETTINGS | Press <input type="button" value="ok"/> to restore factory settings (***) |  |                        |   |
| 8. BOILER TYPE              | -   | -  | According to the model | 1. 45KW AUX Natural gas<br>2. 45KW AUX LPG<br>3. 45KW Natural gas<br>4. 45KW LPG<br>5. 60KW AUX Natural gas<br>6. 60KW AUX LPG<br>7. 60KW Natural gas<br>8. 60KW LPG<br>9. 85KW AUX Natural gas<br>10. 85KW AUX LPG<br>11. 85KW Natural gas<br>12. 85KW LPG<br>13. 120KW AUX Natural gas<br>14. 120KW AUX LPG<br>15. 120KW Natural gas<br>16. 120KW LPG<br>16. 150KW AUX Natural gas<br>17. 150KW AUX LPG<br>18. 150KW Natural gas<br>19. 150KW LPG |

(\*\*\*) If factory settings are restored, parameters of natural gas 45 kW model are loaded.

**If you own a different boiler model, after having reset the factory settings, select “8. BOILER TYPE”, select the correct boiler model and press .**

| Parameter                        | KR 85       | KR 85   | KR 120      | KR 120  | KR 150      | KR 150  |
|----------------------------------|-------------|---------|-------------|---------|-------------|---------|
|                                  | Natural gas | Propane | Natural gas | Propane | Natural gas | Propane |
| 3.1.1. Ignition power [%]        | 25          | 25      | 25          | 25      | 15          | 15      |
| 3.1.13. Maximum fan speed [rpm]  | 6300        | 6050    | 7500        | 7200    | 7900        | 7700    |
| 3.1.14. Minimum fan speed [rpm]  | 1640        | 1630    | 1780        | 1720    | 1930        | 1865    |
| 3.1.19. CH slope rate            | 5           | 5       | 5           | 5       | 5           | 5       |
| 3.1.20. Flow burner ON [l/hour]  | 1500        | 1500    | 2250        | 2250    | 3000        | 3000    |
| 3.1.21. Flow burner OFF [l/hour] | 1350        | 1350    | 2025        | 2025    | 2700        | 2700    |
| 3.1.22. APS Speed [rpm]          | 3600        | 3600    | 4250        | 4250    | 4500        | 4500    |
| 3.1.23. APS Max Speed            | 3850        | 3850    | 4500        | 4500    | 4750        | 4750    |
| 3.1.29. Fan Ki Up                | 244         | 244     | 244         | 244     | 240         | 240     |
| 3.1.30. Fan Kp Down              | 50          | 50      | 50          | 50      | 40          | 40      |
| 3.1.31. Fan Ki Down              | 250         | 250     | 250         | 250     | 253         | 253     |

Tab. 19 Special parameters per single model

### 3.15.2 Description of TECHNICIAN MENU lines

| Ref.                           | Description  |
|--------------------------------|--|
| <b>1. HEATING</b>              |  |
| 1.1. CH power set              |  |
| 1.1.1. Maximum power           | Setting of maximum usable power with respect to the available one.   |
| 1.1.2. Minimum power           | Setting of minimum usable power with respect to the available one (0% corresponds to burner minimum power).                        |
| 1.2. CH temperatures           |  |
| 1.2.1. ABS max temperature     | Setting of maximum permissible heating flow temperature of the boiler.   |
| 1.2.2. CH maximum setpoint     | Heating flow temperature setpoint setting. (Corresponds to parameter "1.1.1. Temperature adjustment" in the USER MENU)             |
| 1.2.3. CH minimum setpoint     | Setting of minimum heating flow temperature.   |
| 1.2.4. CH setpoint hysteresis  | Maximum permissible value beyond the heating flow temperature setpoint. When this value is exceeded the burner is switched off.    |
| 1.3. OTC parameters            |  |
| 1.3.1. Outside temp for max CH | Setting of minimum external temperature corresponding to maximum flow temperature.   |
| 1.3.2. Outside temp for min CH | Setting of maximum external temperature corresponding to the minimum flow temperature.   |
| 1.3.3. Outside temp for CH off | Setting of external temperature for deactivation of heating function (switching to SUMMER or STAND-BY mode).                       |
| 1.3.4. OTC setpoint table      | Displaying the correspondence table between external temperature and heating flow temperature, according to the set climate curve. |
| 1.3.5. OTC curve               | Displaying the set climate curve graph.  |
| 1.4. CH pump settings          |  |
| 1.4.1. Post pump time          | Post-circulation time setting of pump in heating mode.   |
| 1.5. CH anticycling timer      | Time range between two consecutive burner ignitions.   |
| 1.6. CH request type           | Selecting the type of heating control linked to the boiler.  |
| <b>2. DOMESTIC HOT WATER</b>   |  |
| 2.1. DHW power                 |  |
| 2.1.1. Maximum power           | Setting of maximum usable power with respect to the available one.   |
| 2.1.2. Minimum power           | Setting of minimum usable power with respect to the available one (0% corresponds to burner minimum power).                        |
| 2.2. DHW temperatures          |  |
| 2.2.1. DHW storage temp        | Flow temperature setting for boiler heating (only if water heater thermostat is present) (*).                                      |
| 2.2.2. Instant DHW setpoint    | DHW temperature setting (with water heater probe only).  |
| 2.2.3. DHW setpoint hysteresis | Value below the DHW temperature setpoint that activates a DHW request.   |
| 2.3. DHW pump settings         |  |
| 2.3.1. DHW request type        | Post-circulation time setting of pump in DHW mode.   |
| 2.4. DHW priority              |  |
| 2.4.1. DHW status              | Setting of DHW function priority over heating function.  |
| 2.4.2. DHW priority timeout    | Setting of time after which priority switches to the heating function (if OFF, priority is always of DHW function).                |
| 2.5. DHW request type          | Selecting the type of DHW control linked to the boiler: Contact (thermostat) or Sensor (probe).                                    |

(\*) If parameter "2.5. DHW Request type" is set to "Sensor", the flow temperature to the water heater is equal to the one set in point "2.2.2. Instant DHW setpoint" + 20°C.

| Ref.                                     | Description  |
|--|--|
| <b>3. SYSTEM SETTINGS</b>                |  |
| 3.1. Boiler parameters                   |  |
| 3.1.1. Ignition power                    | Boiler ignition power setting (in % with respect to the maximum available power).  |
| 3.1.2. Delay siphon check                | ** Not used **   |
| 3.1.3. Number of boiler pump             | System type setting: Pump and 3-way valve or Double pump.  |
| 3.1.4. Pump speed max                    | Setting of maximum usable pump speed with respect to the available one.  |
| 3.1.5. Pump speed min                    | Setting of minimum usable pump speed with respect to the available one.  |
| 3.1.6. Antilegionella                    | Anti-legionella function enabling or disabling.  |
| 3.1.7. Heat exchanger protection         | ** Not used **   |
| 3.1.8. Heat exchanger delta              | ** Not used **   |
| 3.1.9. Heat exchanger protection control | Exchanger protection function enabling or disabling.   |
| 3.1.10. Modbus parameters                | Modbus bus parameters.   |
| 3.1.11. 3 way valve travel time          | 3-way valve switching time setting for DHW (if any).   |
| 3.1.12. Relay 1 output                   | Setting of function to be allocated to the auxiliary relay: remote alarm (Alarm function) or external LPG valve manager (LPG manager). |
| 3.1.13. Maximum fan speed                | Fan maximum speed setting.   |
| 3.1.14. Minimum fan speed                | Fan minimum speed setting.   |
| 3.1.15. Pre-ventilation time             | Pre-ventilation time setting.  |
| 3.1.16. Postventilation time             | Post-ventilation time setting.   |
| 3.1.17. Postventilation speed            | Post-ventilation speed setting.  |
| 3.1.18. Stabilization time               | Setting of time at ignition power after flame detection.   |
| 3.1.19. CH slope rate                    | Power modulation curve slope setting.  |
| 3.1.20. Flow burner ON                   | Flow rate minimum value setting for burner ignition.   |
| 3.1.21. Flow burner OFF                  | Flow rate minimum value setting to keep burner ON after its ignition.  |
| 3.1.22. APS Speed                        | Flue gas pressure switch test: fan initial speed.  |
| 3.1.23. APS Max Speed                    | Flue gas pressure switch test: maximum fan speed.  |
| 3.1.24. APS Switching Time               | Flue gas pressure switch test: test time.  |
| 3.1.25. APS Step                         | Flue gas pressure switch test: increase in fan speed.  |
| 3.1.26. Min power to start dec. slope    | Minimum power for decrease curve start.  |
| 3.1.27. Time 0.2s for a step dur. dec.   | Decrease curve duration.   |
| 3.1.28. Fan Kp Up                        | Parameters for power modulation calculation.<br><b>Do not change</b>   |
| 3.1.29. Fan Ki Up                        |  |
| 3.1.30. Fan Kp Down                      |  |
| 3.1.31. Fan Ki Down                      |  |
| 3.1.32. CH KP                            |  |
| 3.1.33. CH KI                            |  |
| 3.1.34. DHW KP                           |  |
| 3.1.35. DHW KI                           |  |

| Ref.   | Description  |
|--|--|
| <b>3.2. User interface settings</b>  |  |
| 3.2.1. Select Language   | Selecting the display language.  |
| 3.2.2. Select Units  | Selecting the unit of measurement for temperature (Celsius or Fahrenheit).   |
| 3.2.3. Set date  | Current date setting (day/month/year).   |
| 3.2.4. Set time  | Current time setting (12 or 24 hours / hours: minutes format).   |
| <b>3.3. Service settings</b>   |  |
| 3.3.1. Service information   | Entering the Technical Service Centre telephone number (13 digits max).  |
| 3.3.2. Service due date  | Entering the date of the following scheduled maintenance check.  |
| <b>4. DIAGNOSTICS</b>  |  |
| 4.1. Boiler information  | Displaying the main boiler parameters.<br>Where "***" symbol is present press <input type="button" value="ok"/> to display the parameter time chart.     |
| 4.2. Lockout history   | Displaying the last boiler operation errors.<br>Press <input type="button" value="ok"/> to display the boiler status when the error occurred.            |
| 4.3. Manual test   | Forces the boiler to the heating operation for 15 minutes, to a settable fixed power.  |
| <b>5. USER SETTINGS</b>  |  |
| 5.1. Heating   | See paragraph "1. HEATING" from USER MENU  |
| 5.2. DHW settings  | See paragraph "2. DHW" from USER MENU  |
| 5.3. Holiday   | See paragraph "3. HOLIDAY" from USER MENU  |
| <b>6. CASCADE</b>  |  |
| 6.1. Cascade set   |  |
| 6.1.1. Cascade switch delay  | Time interval range between a boiler ignition and the following one.   |
| 6.1.2. Cascade min power   | Minimum available cascade output.  |
| 6.1.3. Single burner power   | Maximum heat output of an individual burner.   |
| 6.1.4. Boiler for DHW  | Number of boilers in the cascade dedicated both to CH function and to DHW function.  |
| 6.1.5. PI loop period  | Time range to recalculate the power required by the system.  |
| 6.1.6. Cascade pump speed max  | Setting of maximum speed allowed for cascade pump.   |
| 6.1.7. Cascade pump speed min  | Setting of minimum speed allowed for cascade pump.   |
| 6.2. Cascade info  | Displaying the cascade system information.<br>Where "***" symbol is present press <input type="button" value="ok"/> to display the parameter time chart. |
| 6.3. Cascade autodetect  | Press <input type="button" value="ok"/> to activate cascade system self-configuration.   |
| <b>7. FACTORY SETTINGS</b>   |  |
| Press <input type="button" value="ok"/> twice to restore factory settings (***)  |  |
| <b>8. TYPE OF BOILER</b>   |  |
| Selecting the boiler model and the supply gas type.<br>To be used in case of factory setting reset (parameter "7. FACTORY SETTINGS" of TECHNICIAN MENU). |  |

(\*\*\*) If factory settings are restored, parameters of natural gas 45 kW model are loaded.

**If you own a different boiler model, after having reset the factory settings, select "8. BOILER TYPE", select the correct boiler model and press .**



### 3.16 Hydraulic resistance

The boilers are supplied without circulation pump.  
Below are the boiler hydraulic resistances.

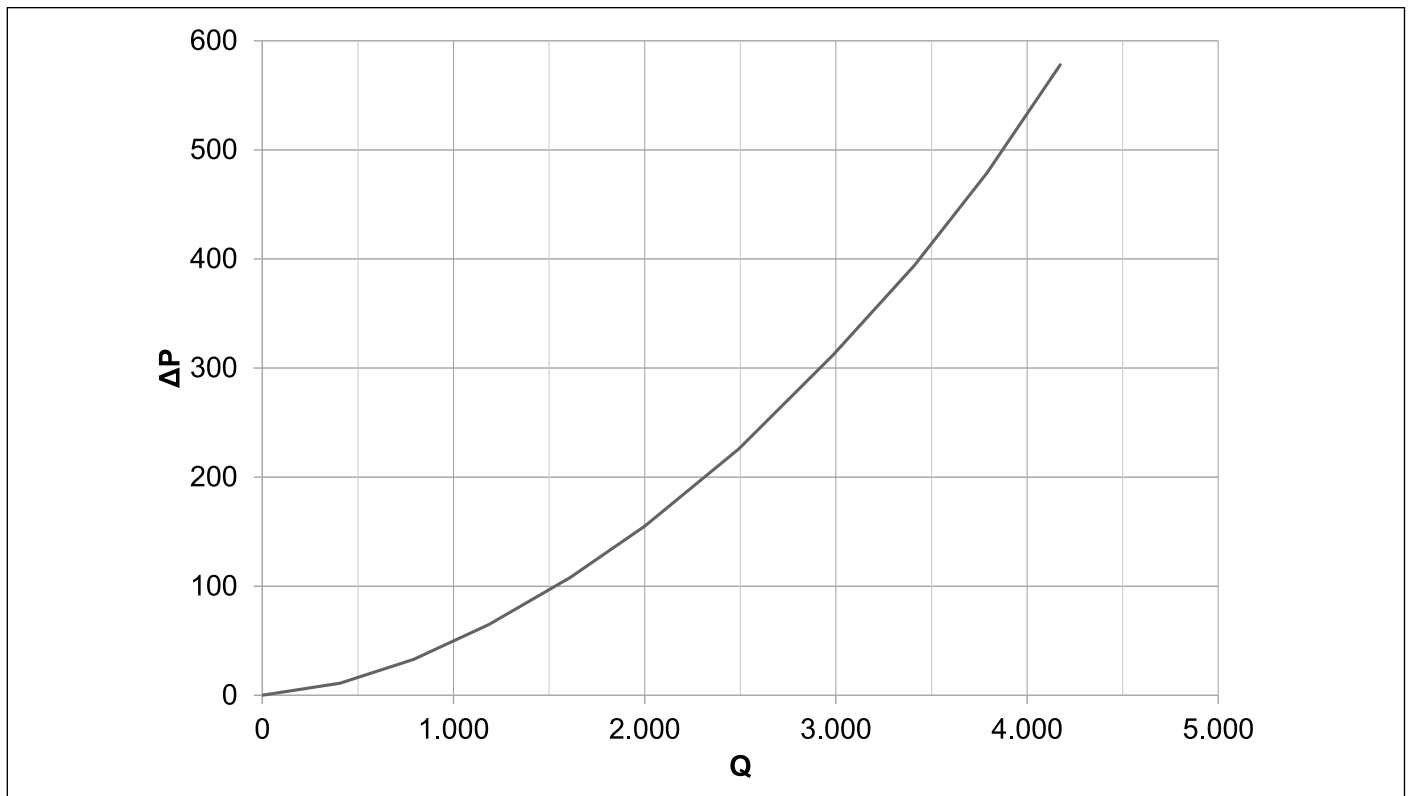


Fig. 24 Hydraulic Resistance KR 85

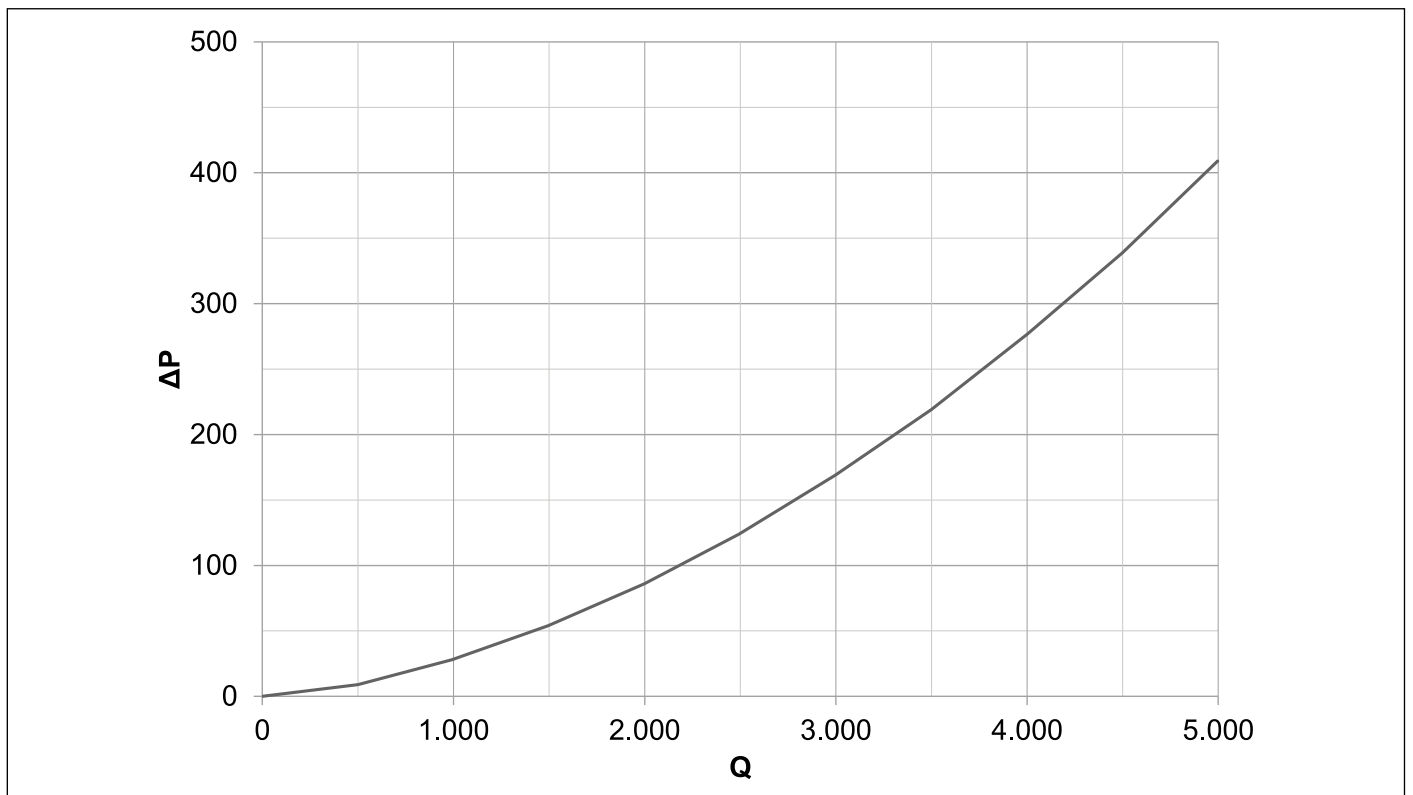


Fig. 25 Hydraulic Resistance KR 120

ΔP ..... Hydraulic resistance (mbar)

Q ..... Flow rate (l/h)

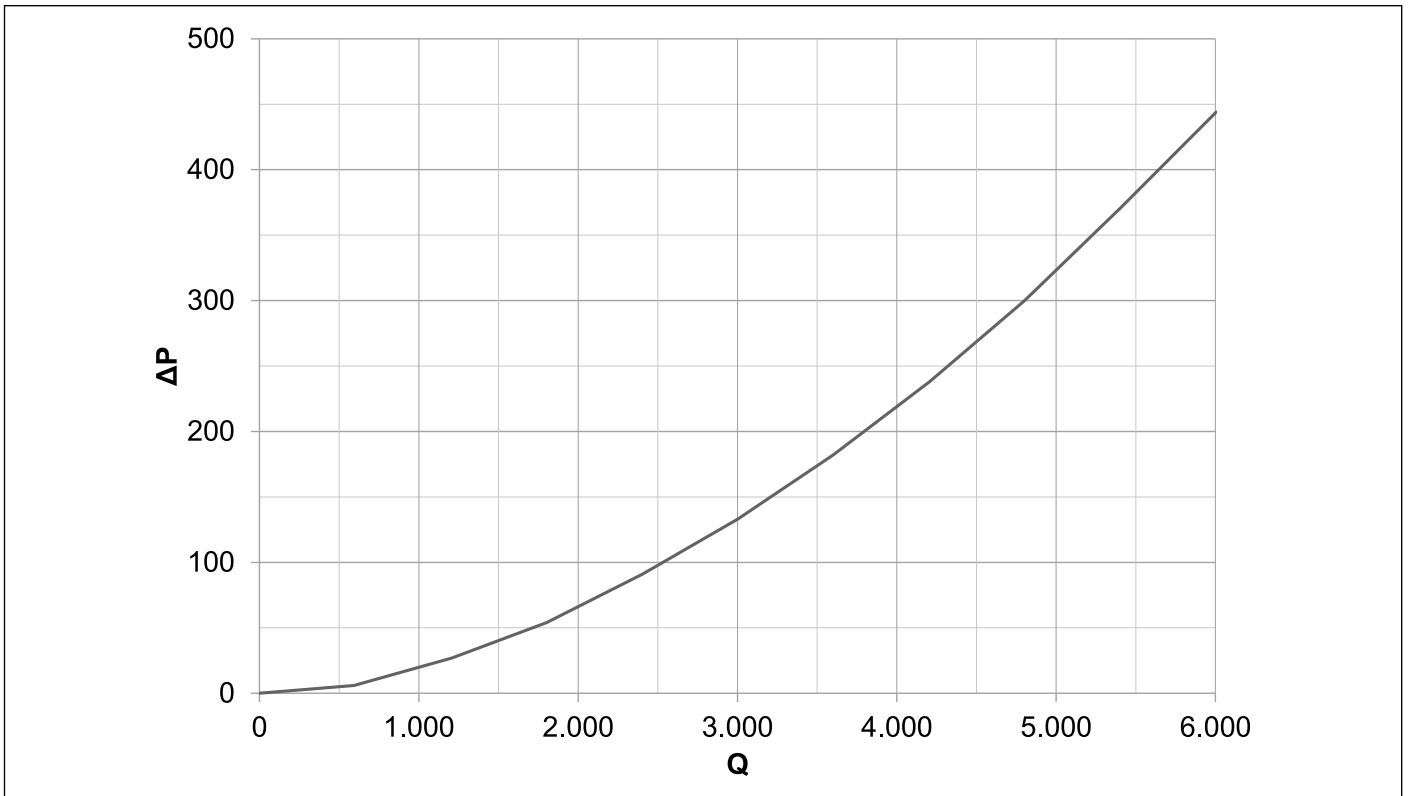


Fig. 26 Hydraulic Resistance KR 150

**ΔP** ..... Hydraulic resistance (mbar)  
**Q** ..... Flow rate (l/h)

### 3.17 Circulation pumps

The boilers are supplied without circulation pump.

The boilers can manage external circulation pumps with PWM or ON/OFF command.

#### 3.17.1 Circulation pumps supplied by the boiler manufacturer (optional)

Some circulation pumps are available as accessories.

Below are the head curves of circulation pumps available as accessories.

#### CIRCULATION PUMPS WILO

##### STRATOS PARA 25/1-8 (KR 85 only)

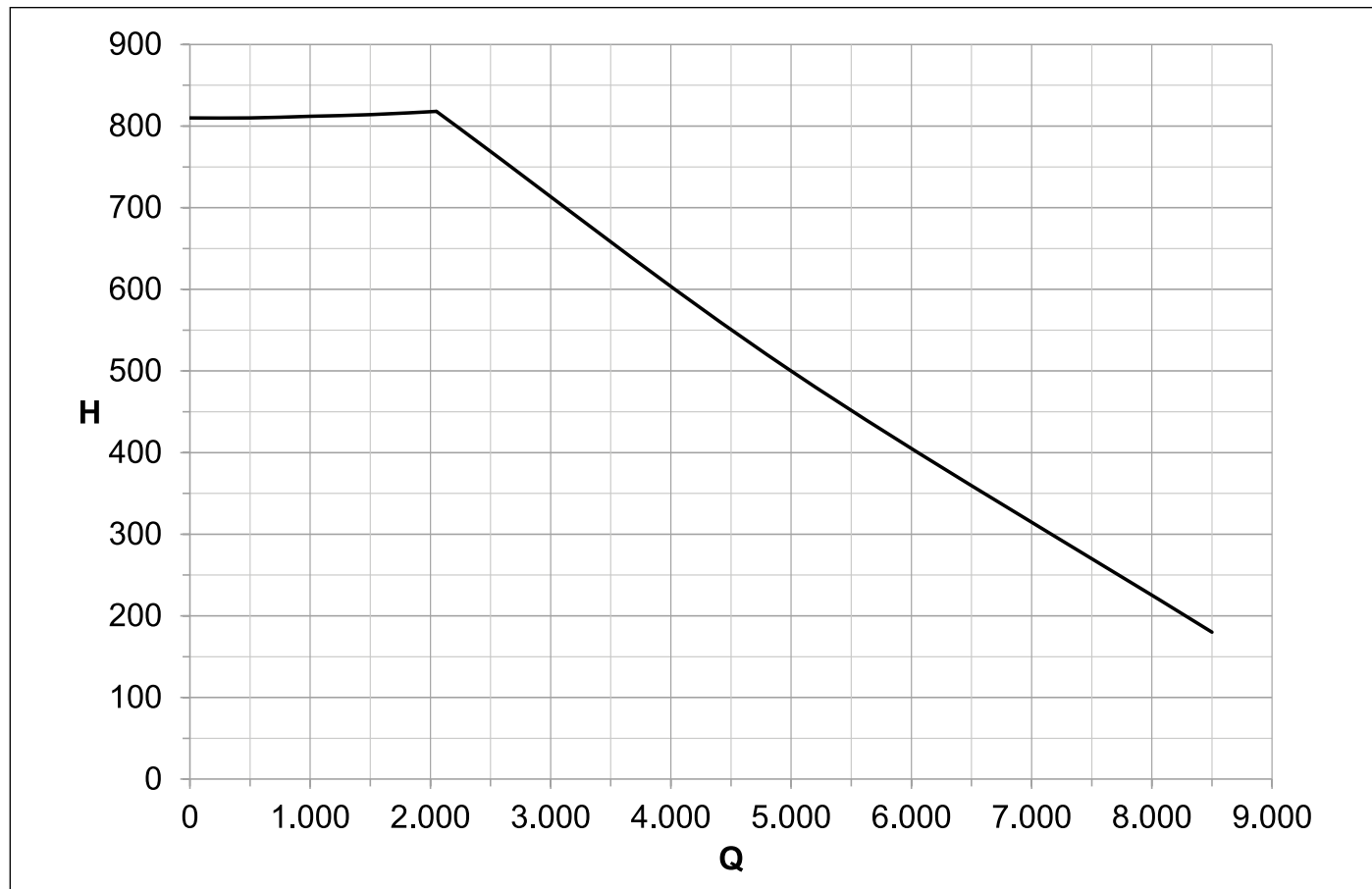


Fig. 27 Available head STRATOS PARA 25/1-8

**H** . . . . . Available head (mbar)

**Q** . . . . . Flow rate (l/h)

The circulation pump must be connected to the following terminals of boiler electronic board (see *Wiring diagram*).

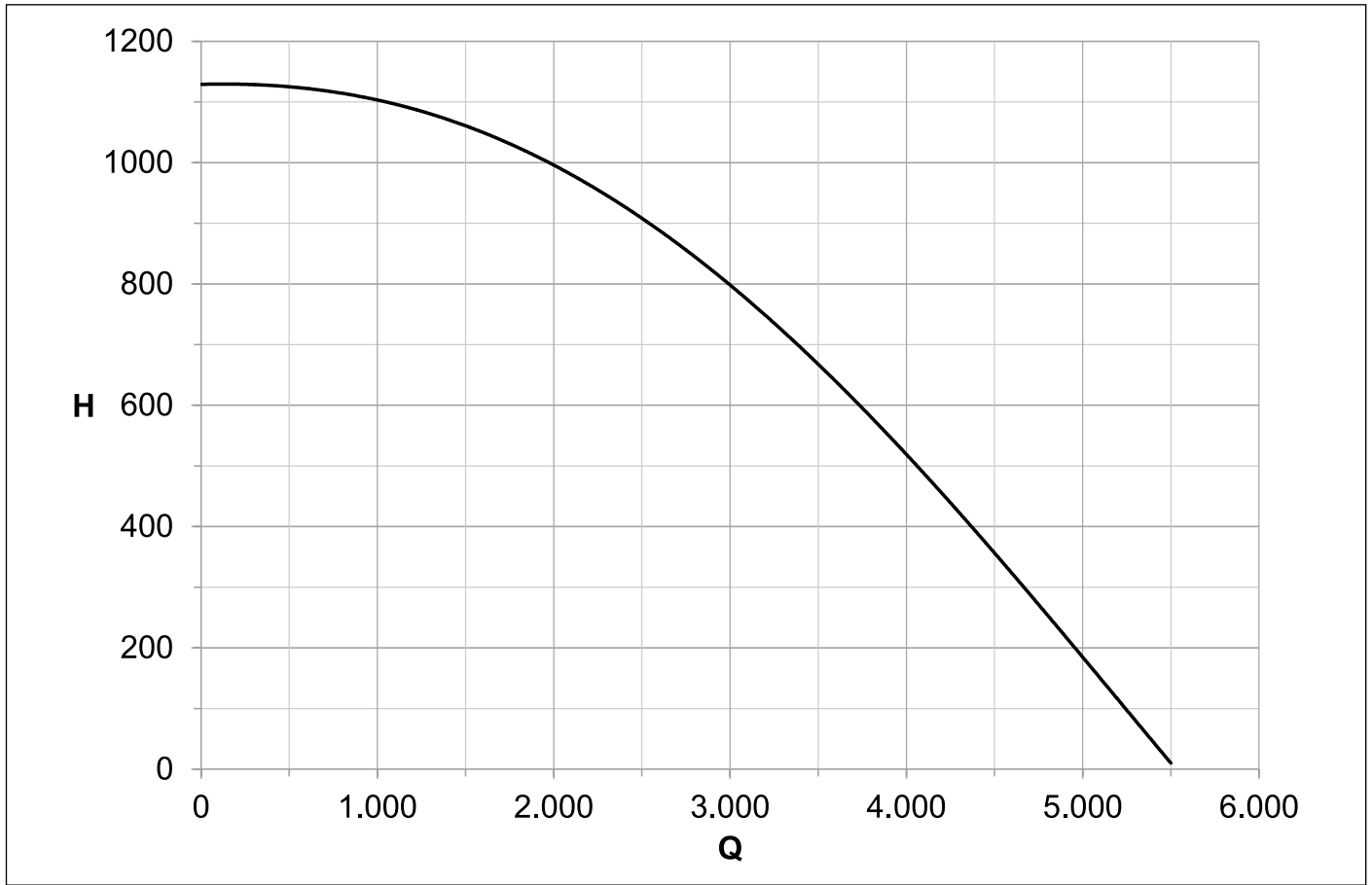
15-16 . . . . . Electric power supply 230V-50Hz

42-43 . . . . . PWM Signal

42 . . . . . GND

43 . . . . . PWM

**STRATOS PARA 25/1-11 (KR 85 only)**



*Fig. 28 Available head STRATOS PARA 25/1-11*

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

The circulation pump must be connected to the following terminals of boiler electronic board (see *Wiring diagram*).

- 15-16 . . . . . Electric power supply 230V-50Hz
- 42-43 . . . . . PWM Signal
  - 42 . . . . . GND
  - 43 . . . . . PWM

**YONOS PARA HF 25/12**

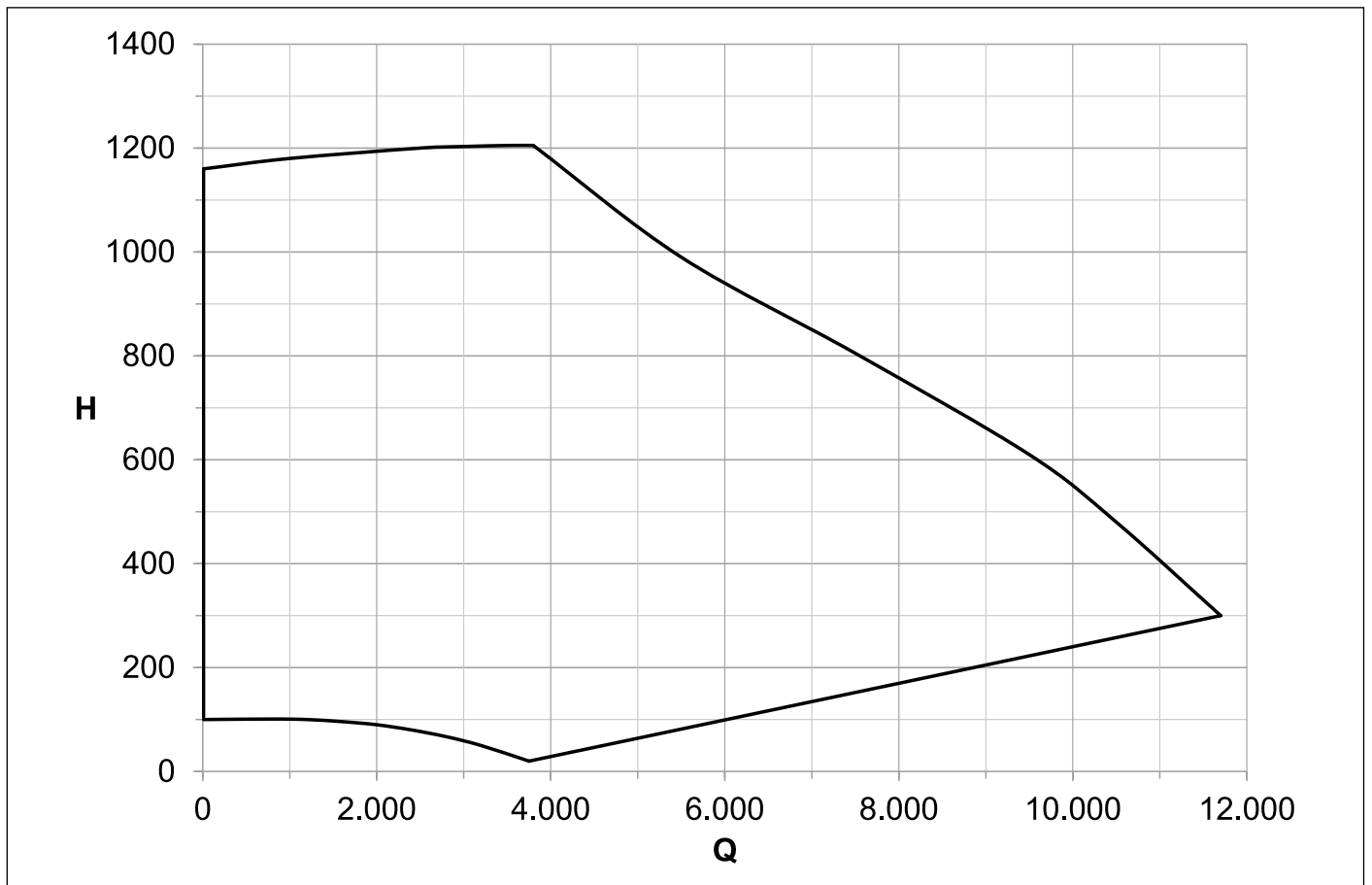


Fig. 29 Available head YONOS PARA HF 25/12

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

The circulation pump must be connected to the following terminals of boiler electronic board (see *Wiring diagram*).

15-16 ..... Electric power supply 230V-50Hz

**CIRCULATION PUMPS GRUNDFOS**

**UPML 25 - 105 - 180 PWM (only KR 85)**

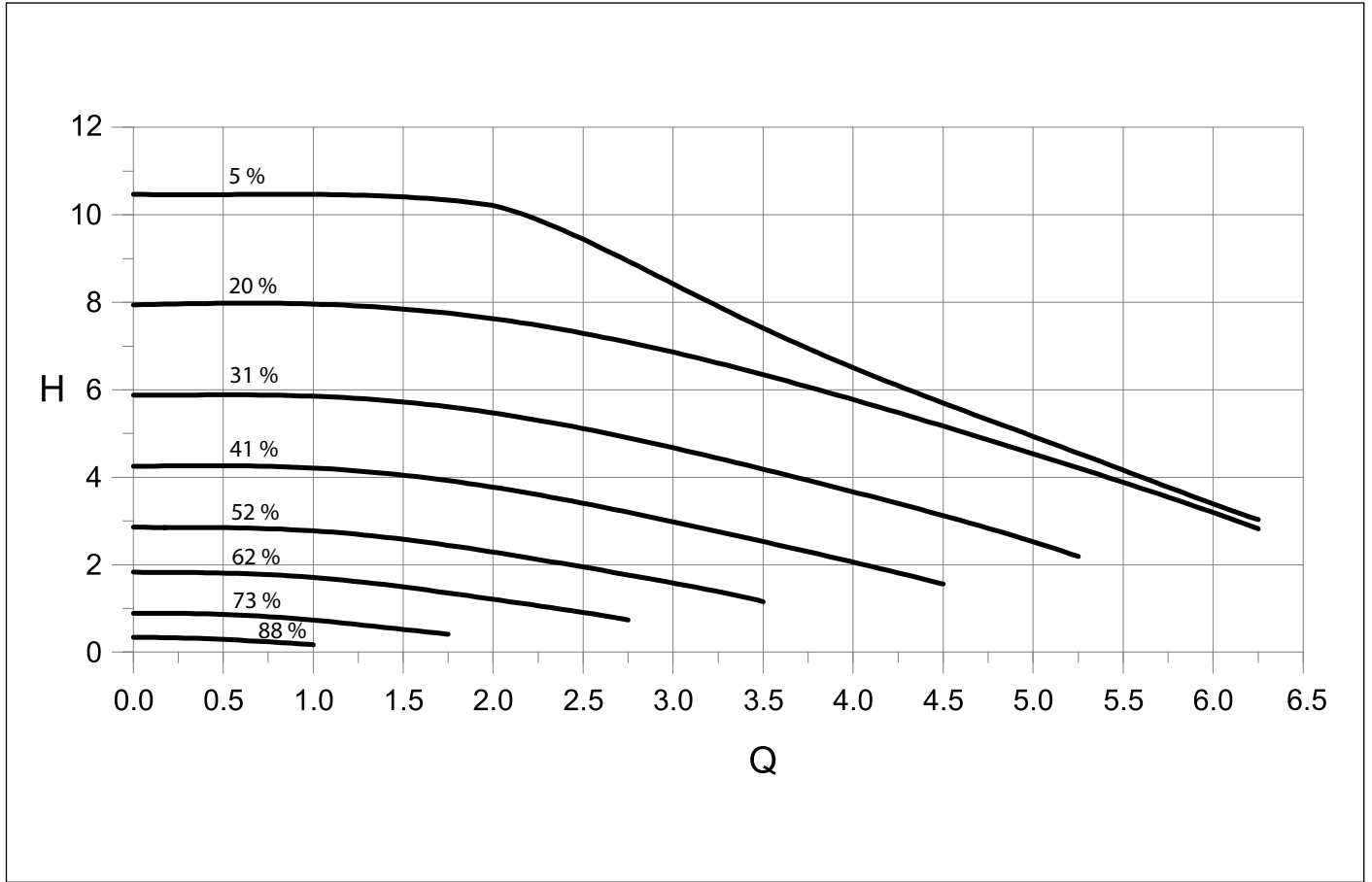


Fig. 30 Available head UPML 25 - 105 - 180 PWM

**H** ..... Available head (m)

**Q** ..... Flow rate (m³/h)

The circulation pump must be connected to the following terminals of boiler electronic board (see *Wiring diagram*).

15-16 ..... Electric power supply 230V-50Hz

42-43 ..... PWM Signal

42 ..... GND

43 ..... PWM

**UPMXL 25 - 125 - 180 PWM (only KR 120 - KR 150)**

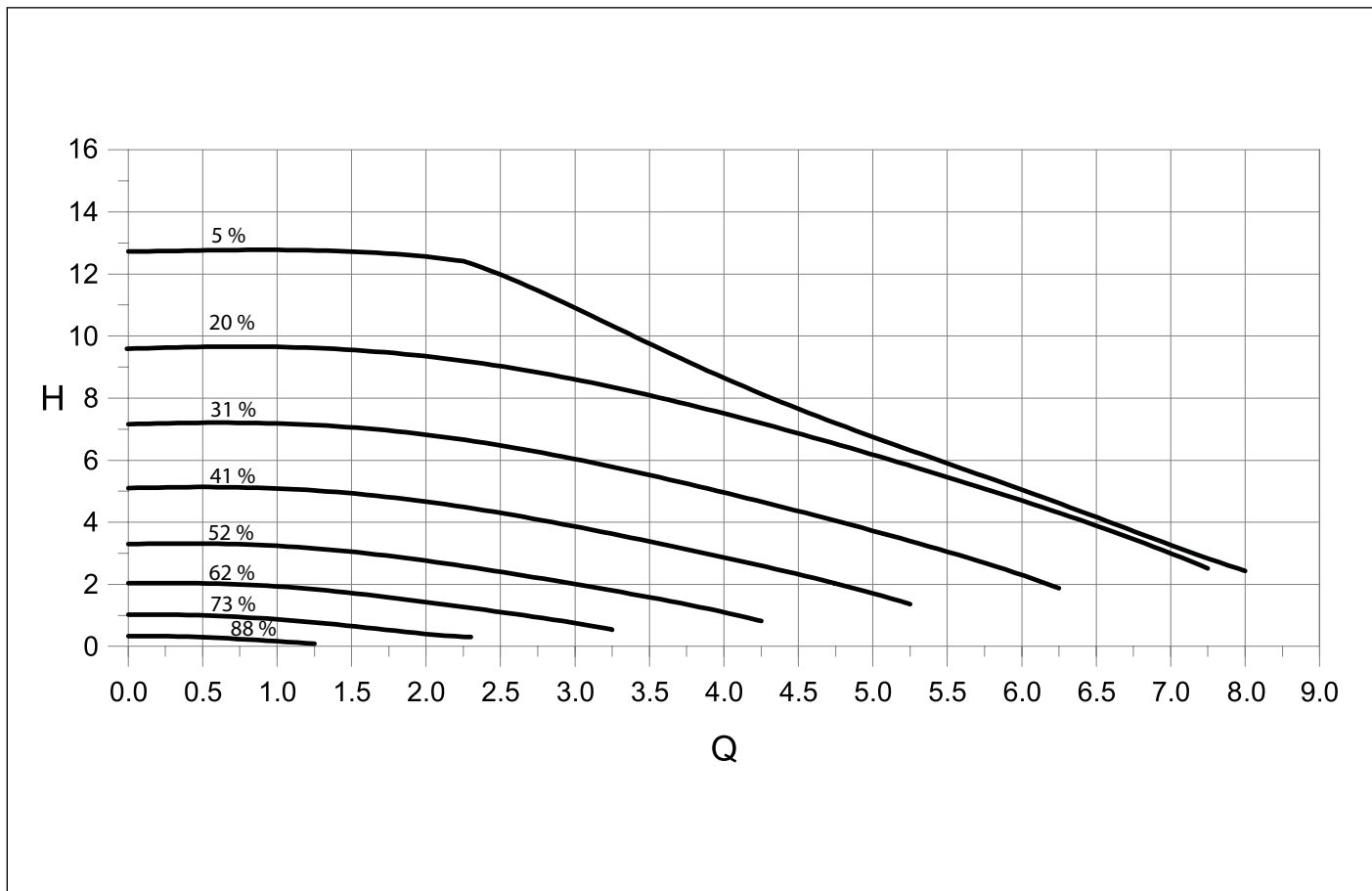


Fig. 31 Available head UPMXL 25 - 125 - 180 PWM

**H** ..... Available head (m)  
**Q** ..... Flow rate (m³/h)

The circulation pump must be connected to the following terminals of boiler electronic board (see *Wiring diagram*).

- 15-16 ..... Electric power supply 230V-50Hz
- 42-43 ..... PWM Signal
- 42 ..... GND
- 43 ..... PWM

**UPMXXL 25 - 120 - 180 AUTO (only KR 120 - KR 150)**

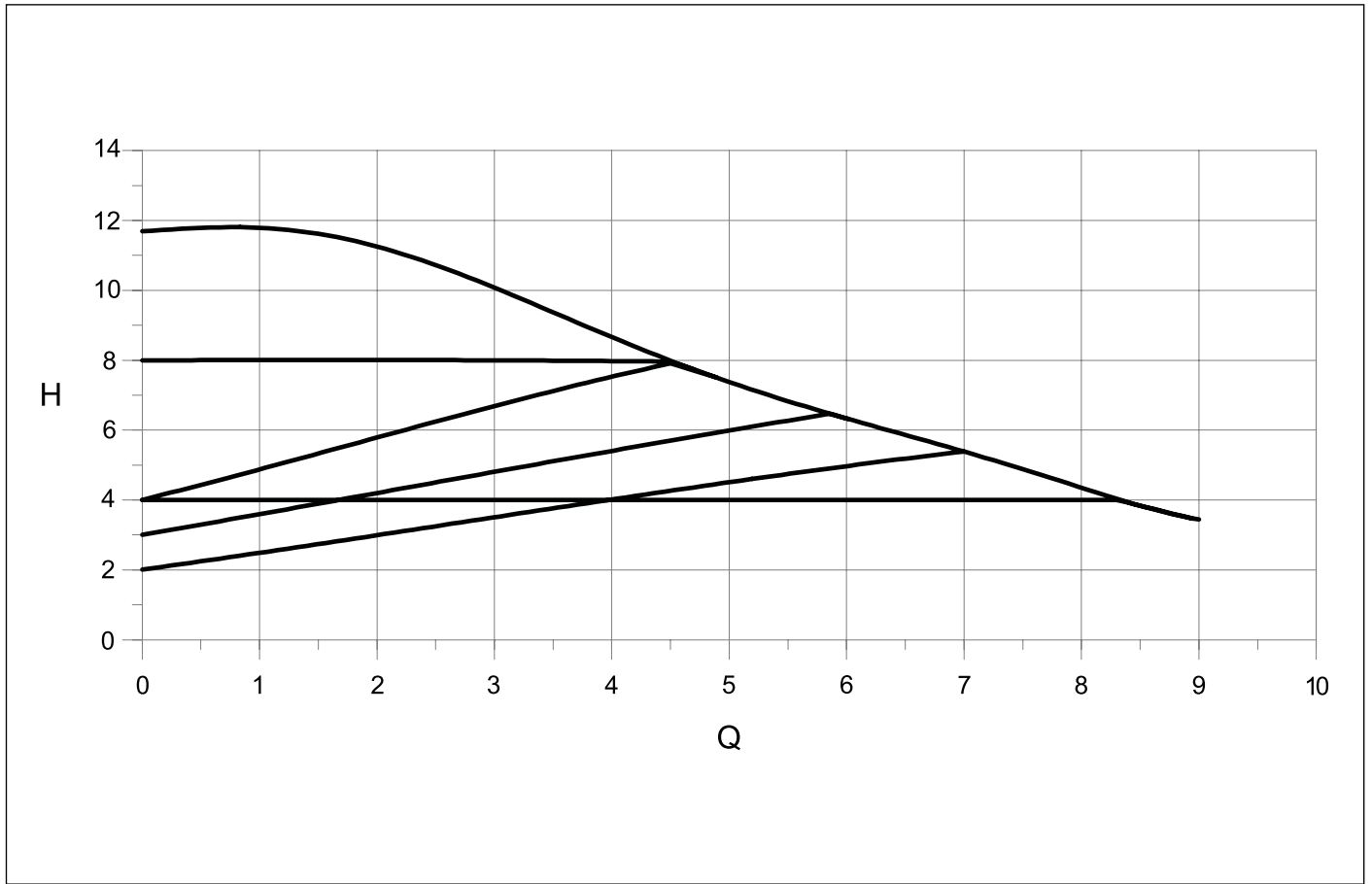


Fig. 32 Available head UPMXXL 25 - 120 - 180 AUTO

- H . . . . . Available head (m)
- Q . . . . . Flow rate (m³/h)

The circulation pump must be connected to the following terminals of boiler electronic board (see *Wiring diagram*).

15-16 . . . . . Electric power supply 230V-50Hz



### 3.17.2 Circulation pumps not supplied by the boiler manufacturer

The boilers can manage external circulation pumps with PWM or ON/OFF command.

If circulation pumps different from those supplied by the boiler manufacturer are used, carry out the following checks:

- Check compatibility of circulation pump hydraulic connections with those of the boiler.
- Check compatibility of the circulation pump performance with system and boiler performance.
- Check compatibility of the PWM signal generated by the boiler with the input one requested by the circulation pump (see below).

The circulation pumps must be connected to the following terminals of boiler electronic board (see *Wiring diagram*).

#### **PWM circulation pumps**

15-16 . . . . . Electric power supply 230V-50Hz

41-42-43-44 . . . . PWM Signal

41 . . . . . +6V (optional)

42 . . . . . GND

43 . . . . . PWM

44 . . . . . +24V (optional)

#### **Circulation pumps ON/OFF**

15-16 . . . . . Electric power supply 230V-50Hz



#### **WARNING**

**If the circulation pump requires a PWM signal different from the boiler one, the PWM command must not be connected and the circulation pump will operate in ON/OFF mode.**

### 3.17.3 PWM Signal

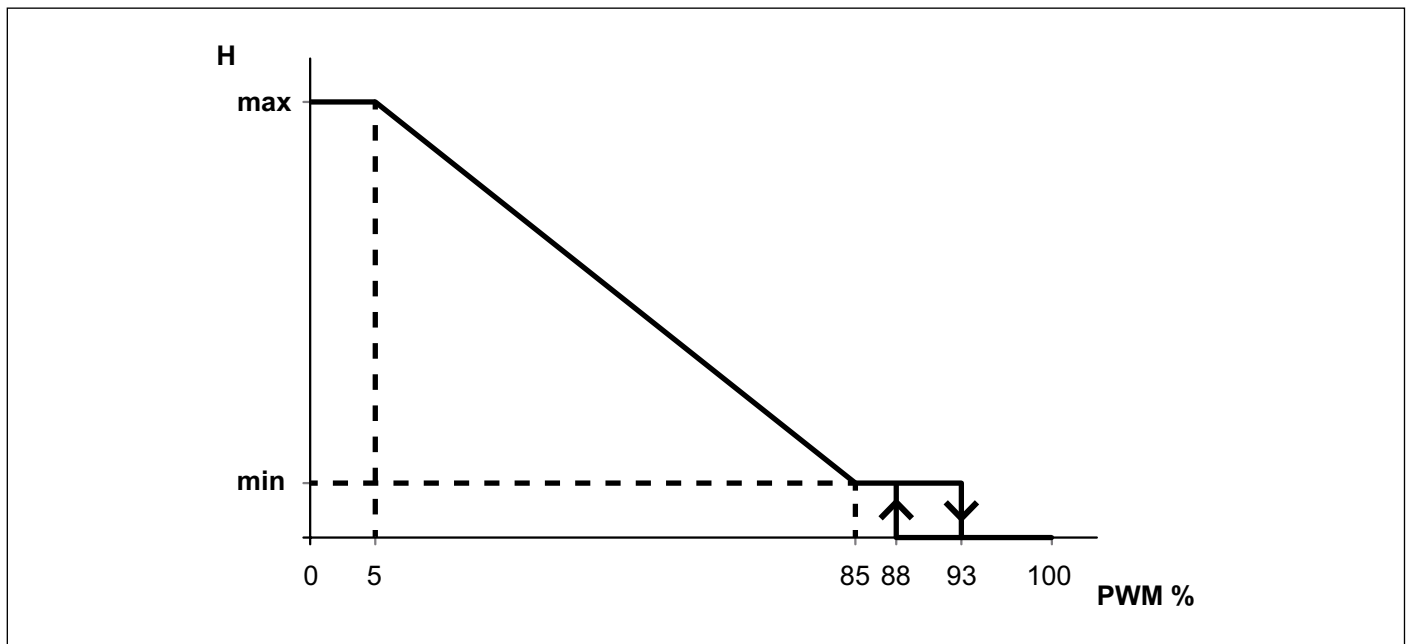


Fig. 33 PWM Signal

PWM<5: . . . . . The circulation pump operates at maximum number of revolutions.

5<PWM<85: . . . . The number of circulation pump revolutions decreases linearly from  $n_{max}$  to  $n_{min}$ .

85<PWM<93: . . . . The circulation pump operates at minimum number of revolutions (operation).

85<PWM<88: . . . . The circulation pump operates at minimum number of revolutions (start-up).

93<PWM<100: . . . . The circulation pump stops (stand-by).

### 3.18 Wiring diagram

To access the electric connections it is necessary to:

- Disconnect the boiler from power supply.
- Remove the boiler front casing (see Fig. 34 Casing opening).
- Rotate the electric box forward by 90° (see Fig. 35 Electric box).
- Remove the two covers of external electrical connections (A and B) by loosening the screws that fasten them to the electric box (see Fig. 35 Electric box).

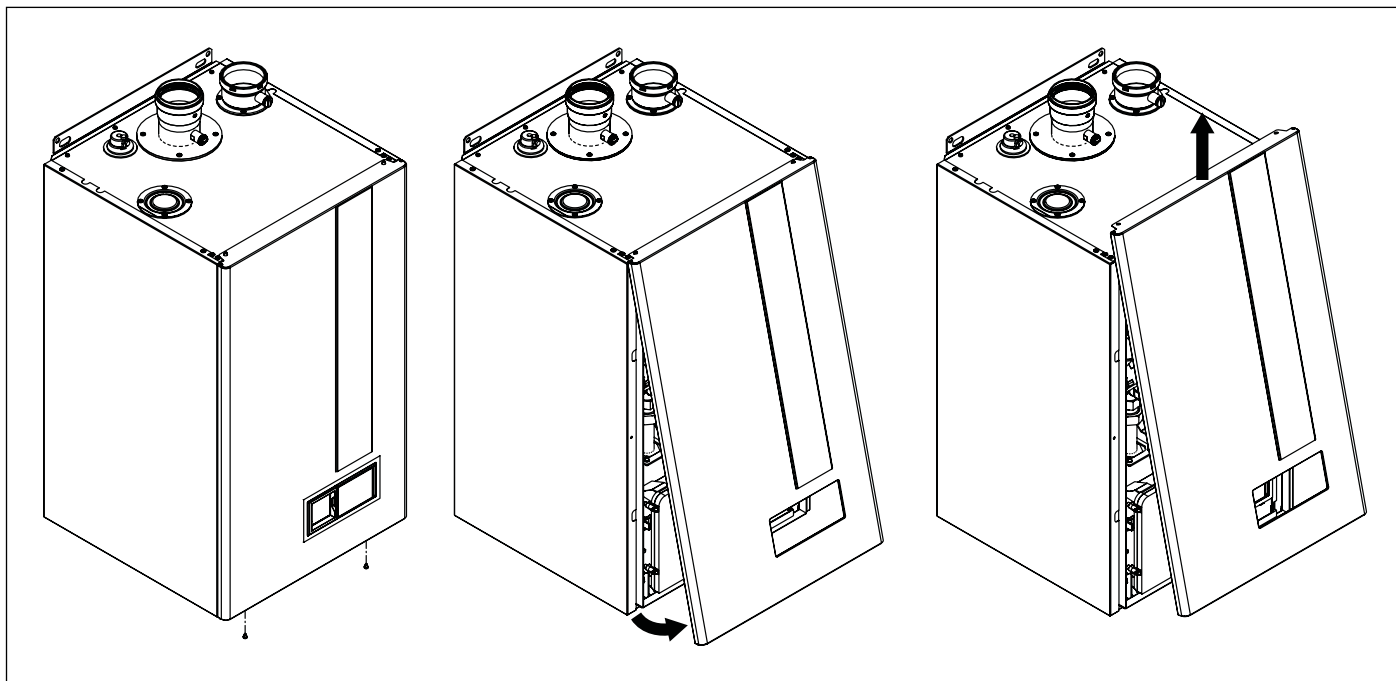


Fig. 34 Casing opening

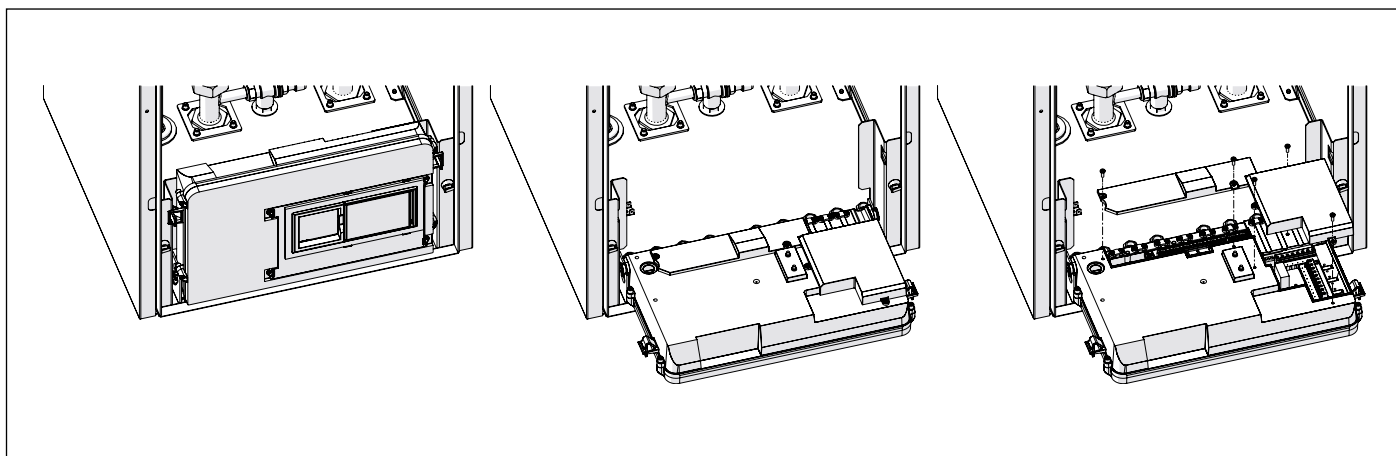


Fig. 35 Electric box



#### **WARNING**

The total current for:

- Boiler pump
- cascade pump
- 3-way deviating valve
- solar pump

it's equal to 1.5 A.

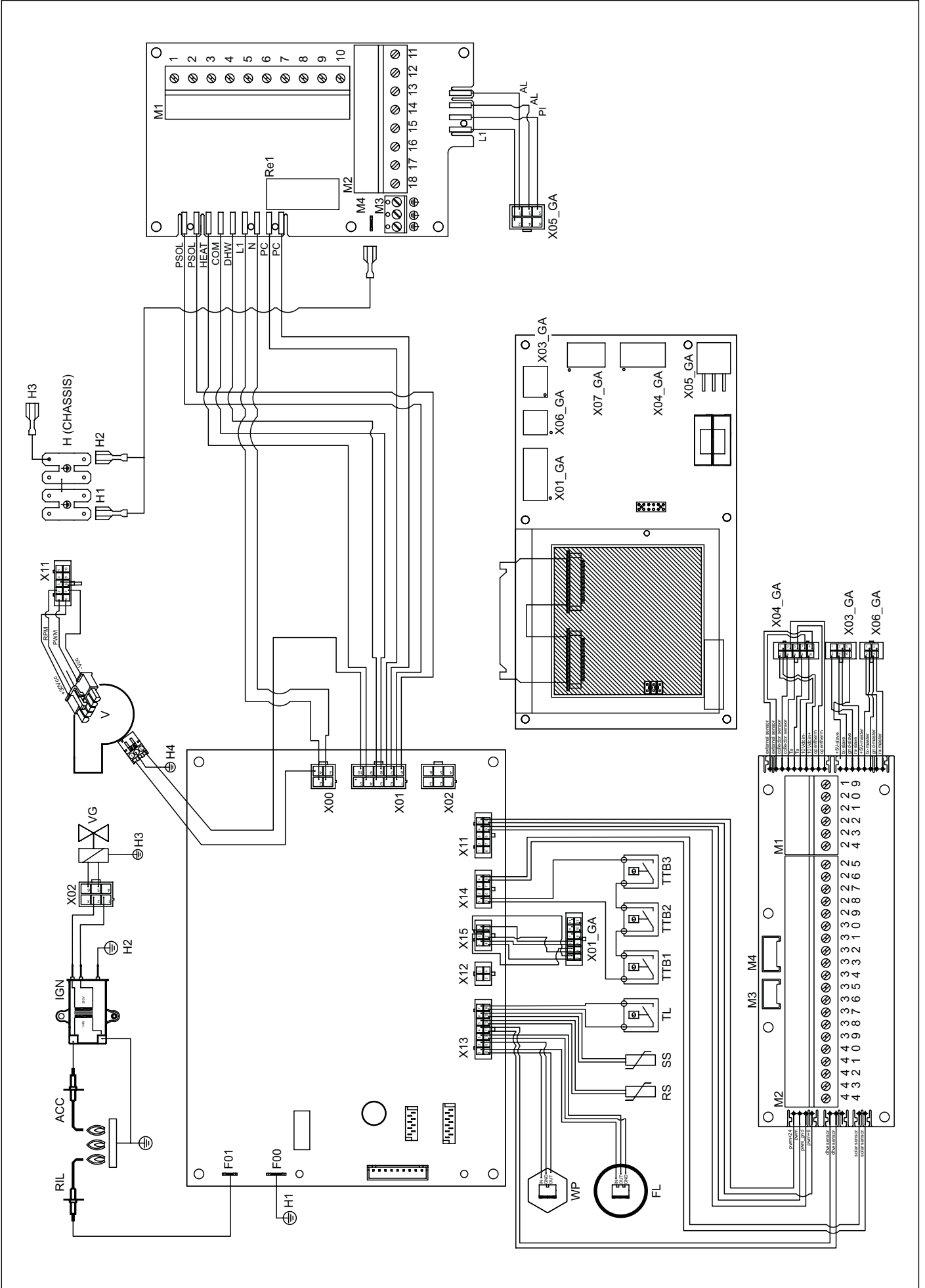


Fig. 36 Wiring diagram KR 85 - KR 120

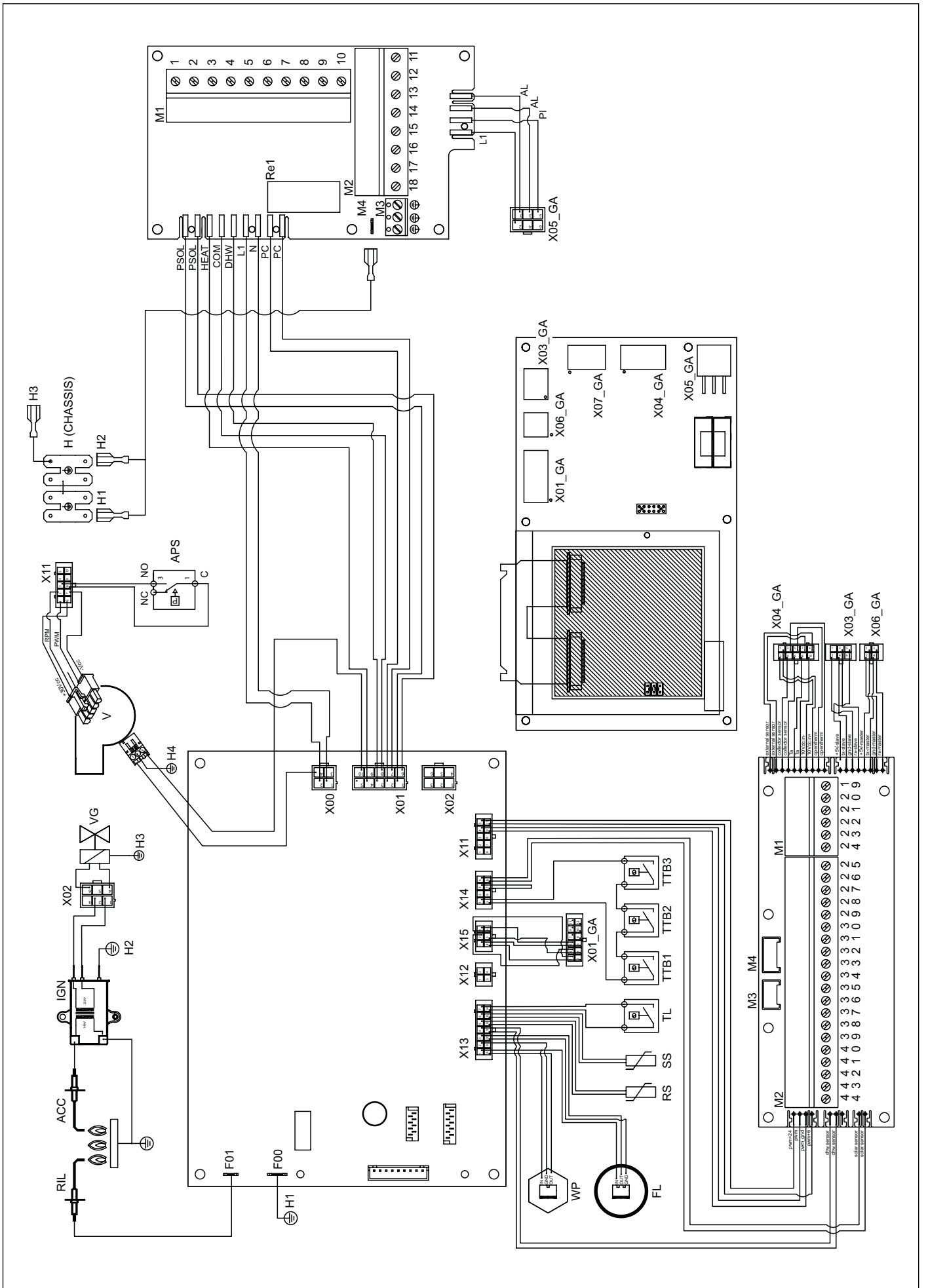


Fig. 37 Wiring diagram KR 150

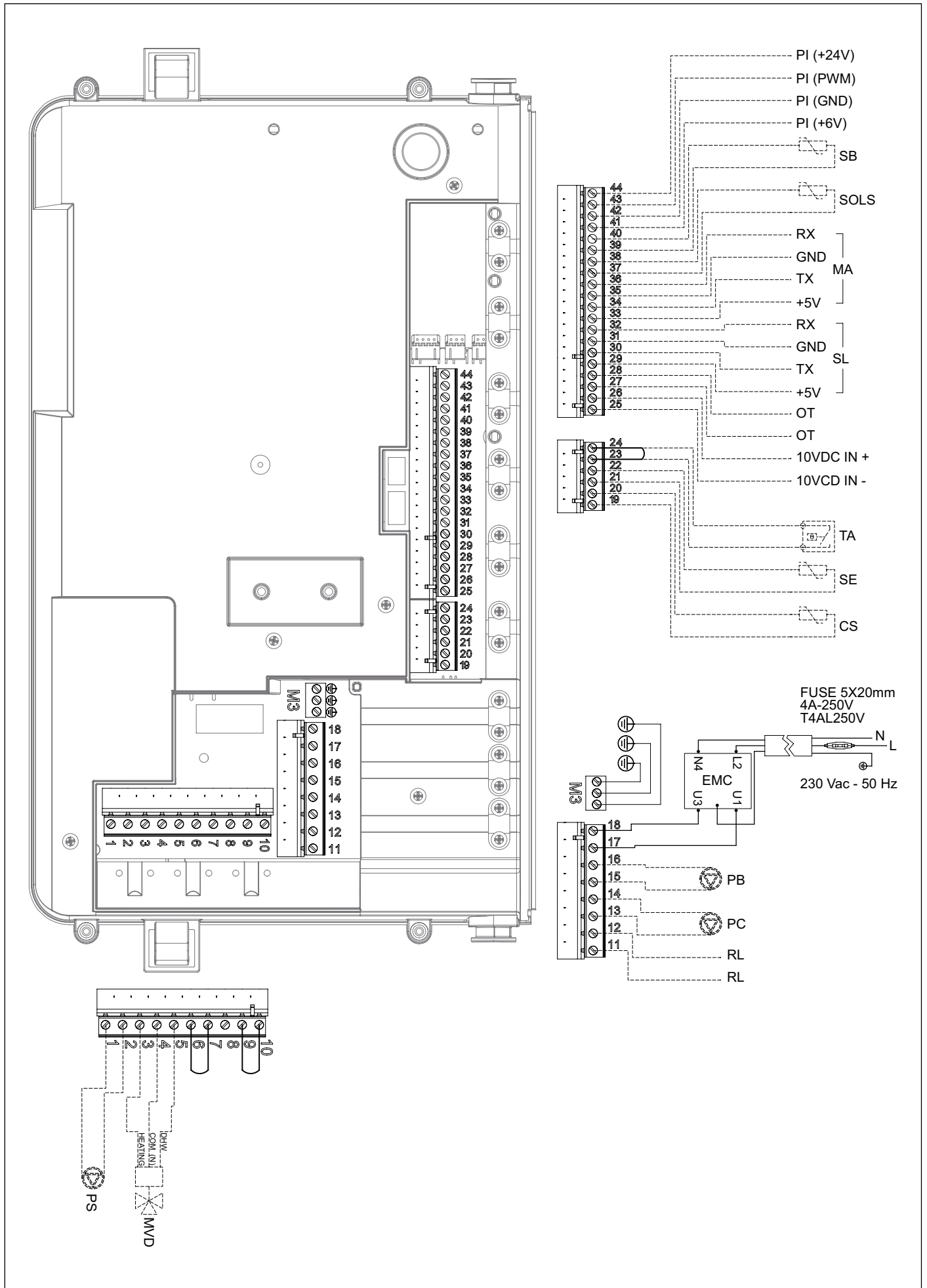


Fig. 38 Connections performed by the installer

### **Internal connections**

|                 |  |
|-----------------|--|
| <b>ACC:</b>     | Ignition electrode                         |
| <b>RIL:</b>     | Detection electrode                        |
| <b>IGN:</b>     | ignition transformer                       |
| <b>VG:</b>      | gas valve                                  |
| <b>V:</b>       | Modulating fan                             |
| <b>APS:</b>     | Air pressure switch (KR 150 only)          |
| <b>TTB1:</b>    | Limit thermostat (260 °C)                  |
| <b>TTB2:</b>    | Thermofuse                                 |
| <b>TTB3:</b>    | Thermofuse                                 |
| <b>TL:</b>      | Safety thermostat on CH flow               |
| <b>FL:</b>      | Flow meter                                 |
| <b>WP:</b>      | Heating circuit pressure sensor            |
| <b>SS:</b>      | CH NTC flow probe 10k Ohm at 25°C B=3435   |
| <b>RS:</b>      | CH NTC return probe 10k Ohm at 25°C B=3435 |
| <b>EMC:</b>     | EMC filter                                 |
| <b>X00-X15:</b> | Load/signal connectors                     |
| <b>H0-H3:</b>   | ground connectors                          |

### **Electrical connections to be made by the installer**

|                     |   |
|---------------------|---|
| <b>1-2:</b>         | PS - Solar pump (max 0.8 A@cosφ>0.6)                              |
| <b>3-4-5:</b>       | MDV - Electric 3-way valve  |
| <b>3:</b>           | Heating (phase)   |
| <b>4:</b>           | Common (neutral)  |
| <b>5:</b>           | DHW (phase)   |
| <b>6-7-8-9-10:</b>  | Do not use  |
| <b>11-12:</b>       | RL - Auxiliary relay (remote alarm or external LPG valve manager) |
| <b>13-14:</b>       | PC - Cascade pump (max 0.8 A@cosφ>0.6)                            |
| <b>15-16:</b>       | PB - Boiler pump (max 1.5 A@cosφ>0.6)                             |
| <b>17-18-M3:</b>    | Electric power supply 230V-50Hz (already connected)               |
| <b>17:</b>          | Phase   |
| <b>18:</b>          | Neutral   |
| <b>M3:</b>          | Ground  |
| <b>19-20:</b>       | CS - Cascade probe  |
| <b>21-22:</b>       | SE - External probe   |
| <b>23-24:</b>       | TA – Ambient thermostat   |
| <b>25-26:</b>       | 10 VDC input  |
| <b>25:</b>          | IN-   |
| <b>26:</b>          | IN+   |
| <b>27-28:</b>       | OT - Remote Control   |
| <b>29-30-31-32:</b> | SL - Slave (connections for cascade systems)                      |
| <b>29:</b>          | +5V   |
| <b>30:</b>          | TX  |
| <b>31:</b>          | GND   |
| <b>32:</b>          | RX  |
| <b>33-34-35-36:</b> | MA - Master (connections for cascade systems)                     |
| <b>33:</b>          | +5V   |
| <b>34:</b>          | TX  |
| <b>35:</b>          | GND   |
| <b>36:</b>          | RX  |
| <b>37-38:</b>       | SOLS - Solar collector probe                                      |
| <b>39-40:</b>       | SB - Water heater probe   |
| <b>41-42-43-44:</b> | PI - PWM signal (for system circulation pump)                     |
| <b>41:</b>          | +6V   |
| <b>42:</b>          | GND   |
| <b>43:</b>          | PWM   |
| <b>44:</b>          | +24V  |

### 3.19 Cascade connection

It is possible to connect up to 6 boilers in a cascade-type connection.

The boilers connected with a cascade-type connection work with the MASTER-SLAVE logic: the first boiler (MASTER) controls the entire cascade.

For the electric cascade connection of the boilers, refer to the following diagram:

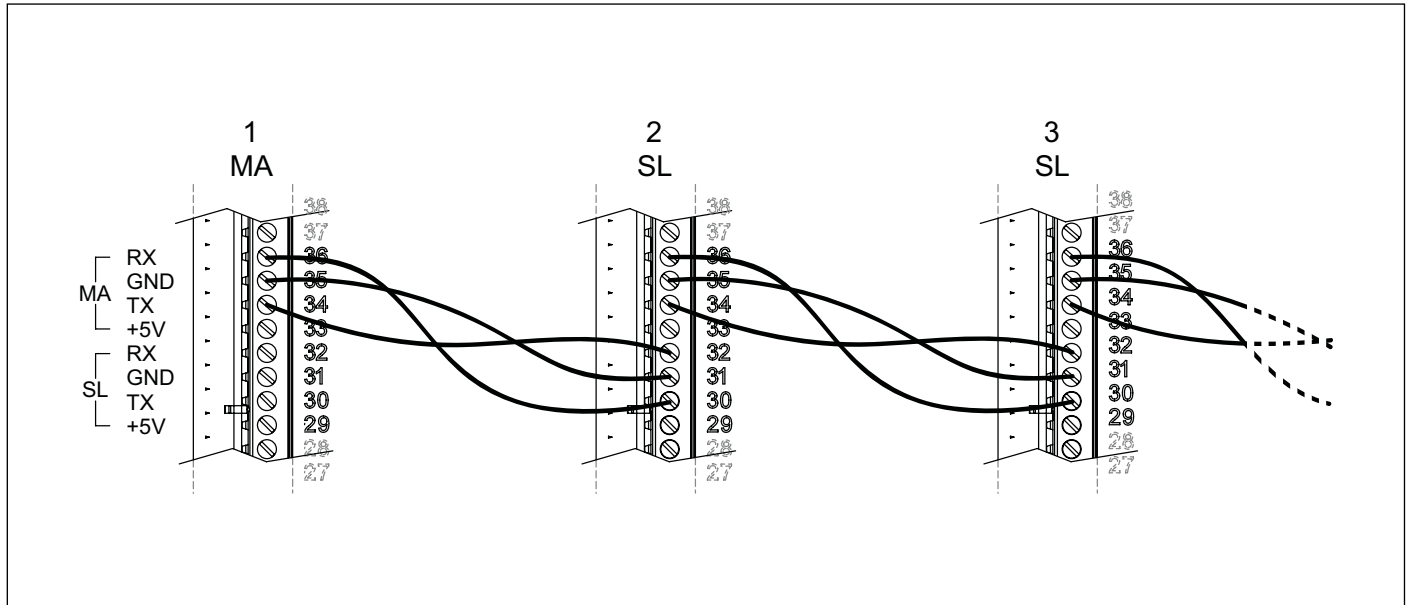


Fig. 39 Cascade connection

The MASTER boiler is number 1, without connections on terminals 29-30-31-32.

The cascade operating devices (optional) must be connected to the MASTER boiler: cascade pump, cascade probe, external probe, ambient thermostat, 0-10V input, water heater pump, water heater probe.

For the connection of the boiler pumps refer to paragraphs: *Hydraulic resistance* and *Circulation pumps*.

The cascade pump (system pump) must be connected to terminals 13 and 14 of the MASTER boiler.

The cascade probe must be connected to terminals 19 and 20 of the MASTER boiler.

Once the connections are ready, proceed with the cascade system self-configuration.

- Reach the control panel of the MASTER boiler.
- Accessing the TECHNICIAN MENU (see *TECHNICIAN MENU* on page 60).
- Select "6. CASCADE" and press .
- Select "3. Cascade autodetect" and press .
- Press  to activate cascade system self-configuration.

It is possible to modify the cascade management parameters in section "6. CASCADE" of the MASTER boiler TECHNICAL MENU. If cascade management parameters are modified, it is necessary to repeat the cascade system self-configuration procedure.



#### WARNING

**For a correct cascade system operation we recommend performing a cascade connection of boilers with the same or similar power: KR 45-KR 60 or KR 60-KR 85 or KR 85-KR 120 or KR 120-KR 150.**

### 3.20 Adaptation to other gas types and burner adjustment

KR 85 - KR 120



#### WARNING

This boiler is built to run on the type of gas specified on the packaging and on the boiler rating plate.

Any later transformation is to be exclusively carried out by qualified personnel, using manufacturer designed accessories and following the procedure and adjustment instructions for an accurate boiler setting-up.

- Close the gas cock.
- Disconnect the boiler from the electric power supply.
- Remove boiler outer front panel.
- Refit the intake pipe **C** to the mixer (KR 85 only) (see Fig. 41 Intake pipe).
- Disconnect the gas pipe **D** from the mixer **B** (see Fig. 41 Intake pipe).
- Loosen the three socket head screws, and remove the mixer (see Fig. 42 Mixer).
- Loosen the two retaining screws **G** and slide out mixer plastic body (see Fig. 43 Mixer plastic body).
- Insert the new plastic body in the mixer, corresponding to the type of gas used in the system.
- Screw the plastic body to the mixer using the **G** retaining screws. Take care not to damage the **F** O-rings and to comply with the assembly direction (see Fig. 43 Mixer plastic body and Fig. 44 Assembling direction).
- Refit the reassembled mixer onto the fan with the socket head screws, making sure to insert the O-ring between mixer and fan (see Fig. 42 Mixer).
- Connect the **D** gas pipe to the mixer (see Fig. 41 Intake pipe).
- Release the keys, then press them again at the same time until flashing "P13" and its value "0" are displayed (KR 85 only).
- Refit the boiler outer front panel.
- Reconnect boiler to electric power supply, and open the gas cock.
- Check the value of parameter "8. BOILER TYPE" of TECHNICIAN MENU according to the power and the new boiler gas (see *TECHNICIAN MENU* on page 60).
- Adjust the gas valve (see *Gas valve setting* on page 87).

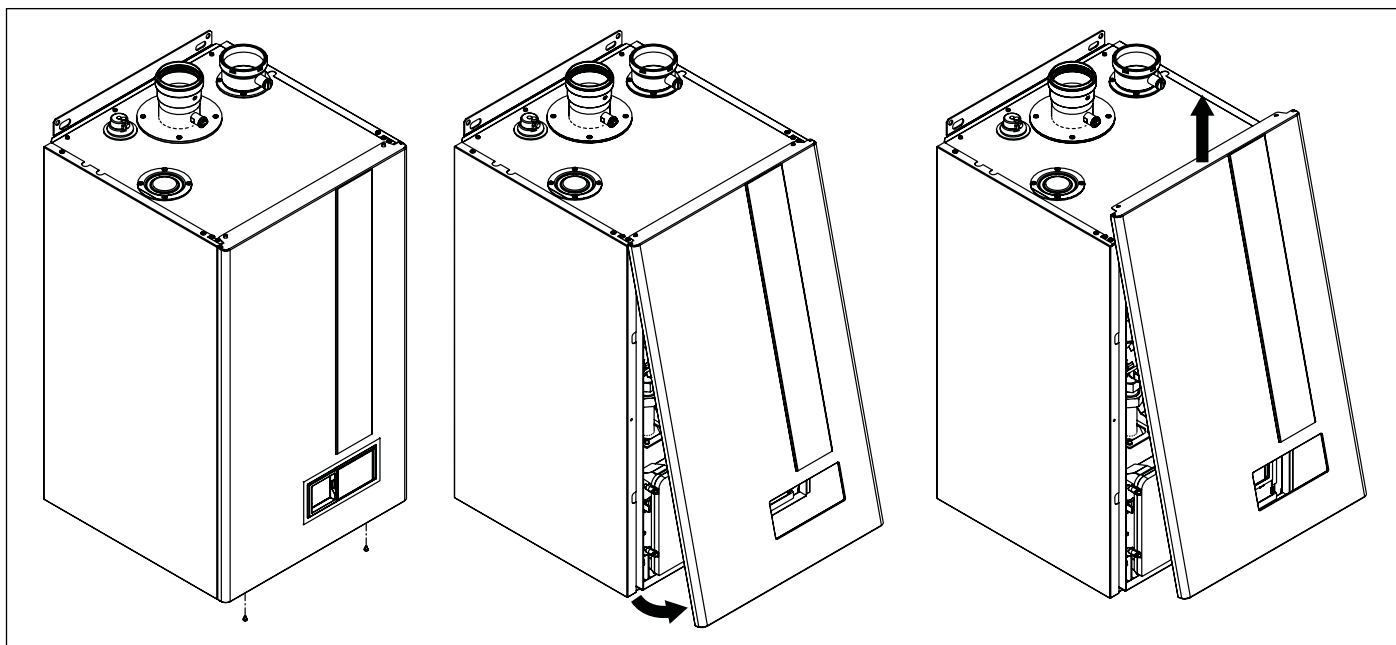


Fig. 40 Casing opening



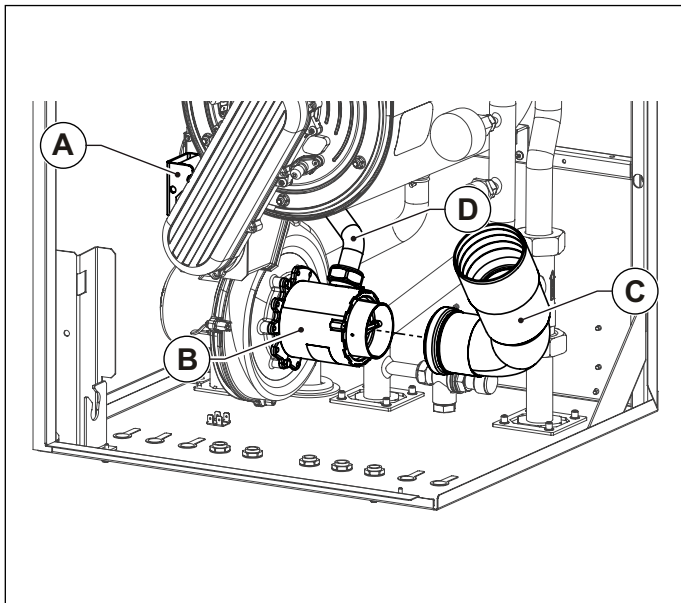


Fig. 41 Intake pipe

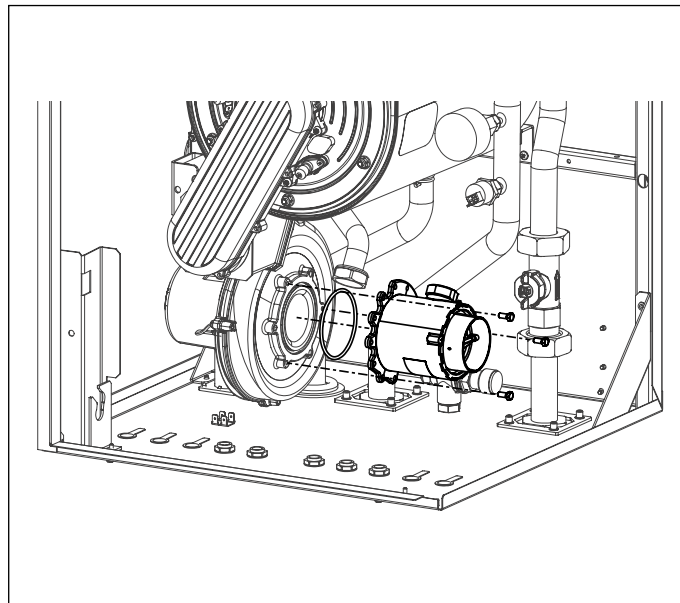


Fig. 42 Mixer

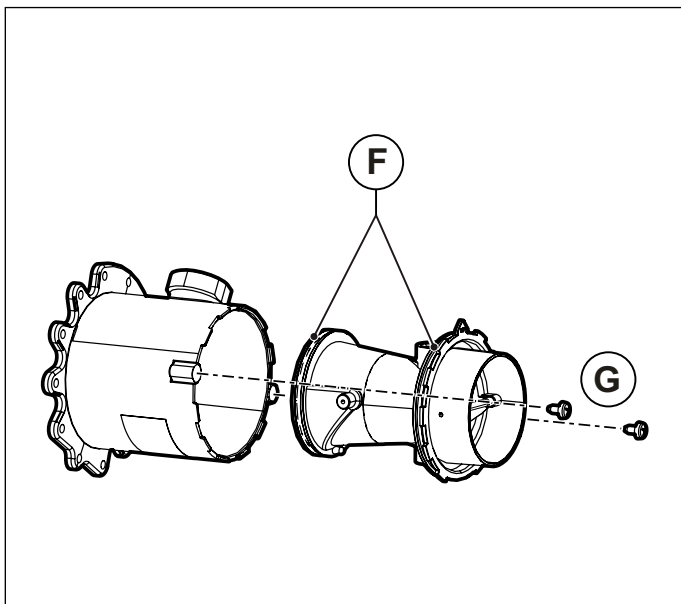


Fig. 43 Mixer plastic body

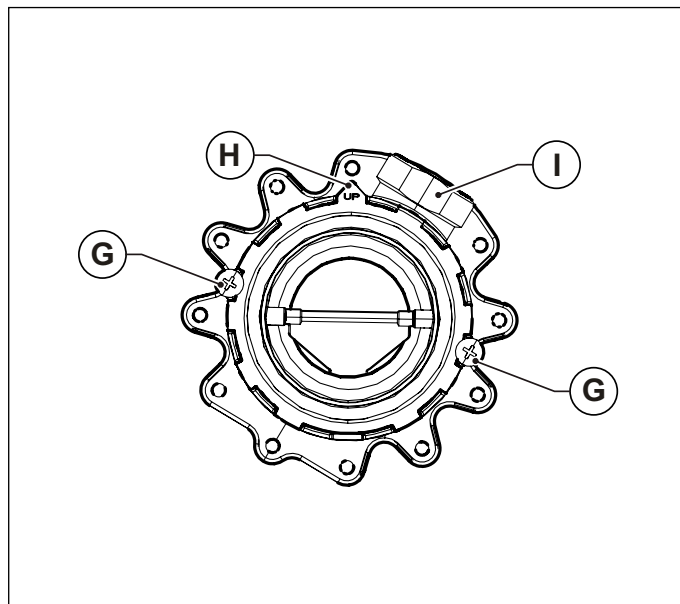


Fig. 44 Assembling direction

- A. Gas valve
- B. Mixer
- C. Air intake
- D. Gas pipe
- E. Pipe coupling
- F. O-ring
- G. Venturi to mixer retaining screws
- H. Direction tab
- I. Gas fitting

**WARNING**

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

- Close the gas cock.
- Disconnect the boiler from the electric power supply.
- Remove boiler outer front panel.
- Disconnect the gas pipe (B) from the mixer (see Fig. 46 Gas diaphragm replacement KR 150).
- Replace the gas diaphragm (A) with the new gas type (see Fig. 46 Gas diaphragm replacement KR 150).
- Reconnect the gas pipe to the mixer.
- Refit the boiler outer front panel.
- Reconnect boiler to electric power supply, and open the gas cock.
- Check the value of parameter "8. BOILER TYPE" of TECHNICIAN MENU according to the power and the new boiler gas (see *TECHNICIAN MENU* on page 60).
- Adjust the gas valve (see *Gas valve setting* on page 87).

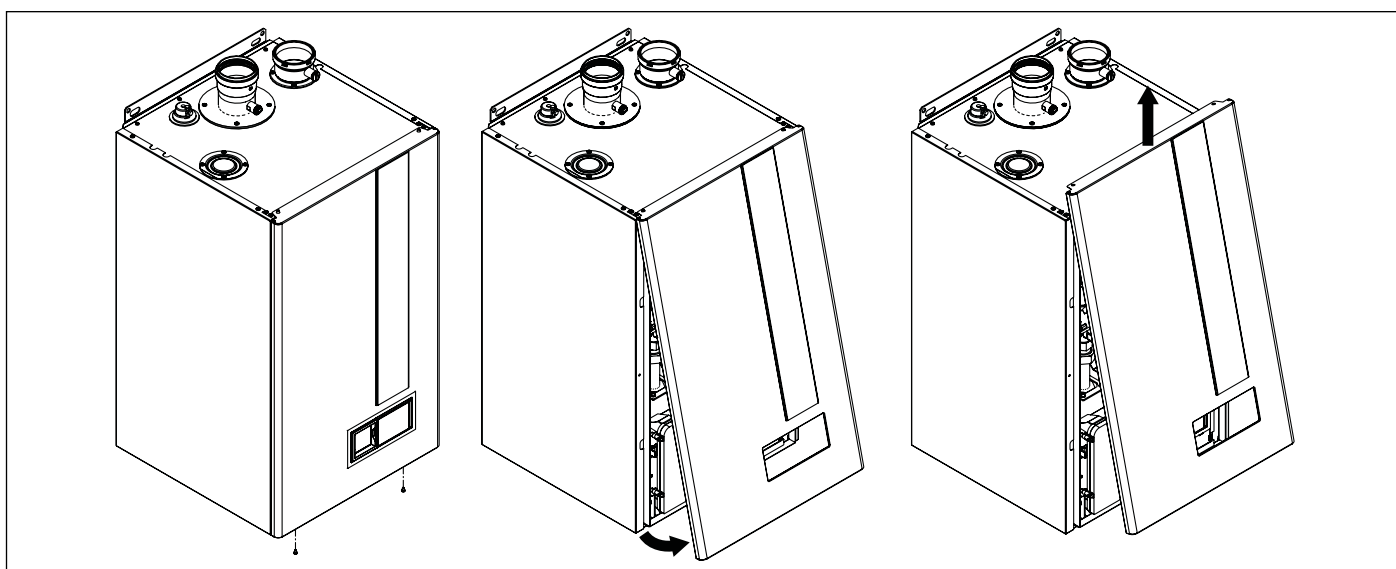


Fig. 45 Casing opening

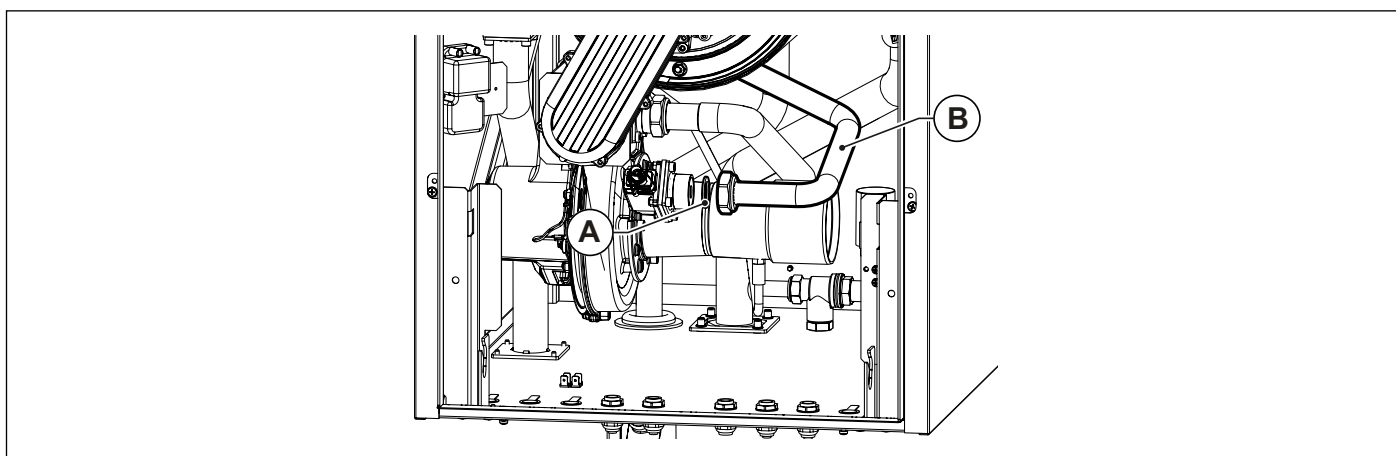

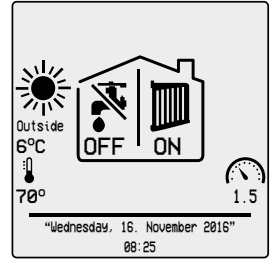



Fig. 46 Gas diaphragm replacement KR 150

### 3.21 Gas valve setting


- Make sure that the ambient thermostat (optional), if fitted, is set to **ON**.
- Select the CH ONLY mode on the control panel by pressing  key until the side screen is displayed.
- Start MANUAL TEST function from TECHNICIAN MENU (see *MANUAL TEST function* on page 54).
- The MANUAL TEST function allows using the boiler with a settable fixed power.
- Maximum duration of the MANUAL TEST is 15 minutes.




#### Maximum heating output adjustment

- Press  key to increase power up to 100% (the boiler switches to operation with maximum  $Q_n$ ).
- Set flue gas CO<sub>2</sub> content by turning the ratio adjuster **B** (see Fig. 47 Adjusting CO<sub>2</sub> value KR 85 - KR 120 and Fig. 48 Adjusting CO<sub>2</sub> value KR 150) and ensure that reading falls within the limits of Tab. 1 Adjustment specifications KR 85 and of Tab. 2 Adjustment specifications KR 120 and of Tab. 3 Adjustment specifications KR 150.

#### Minimum heating output adjustment

- Press  key to decrease power up to 0% (the boiler switches to operation with minimum  $Q_r$ ).
- Set flue gas CO<sub>2</sub> content by turning the offset control **C** (see Fig. 47 Adjusting CO<sub>2</sub> value KR 85 - KR 120 and Fig. 48 Adjusting CO<sub>2</sub> value KR 150) and ensure that reading falls within the limits of Tab. 1 Adjustment specifications KR 85 and of Tab. 2 Adjustment specifications KR 120 and of Tab. 3 Adjustment specifications KR 150.

To interrupt the MANUAL TEST function, press .

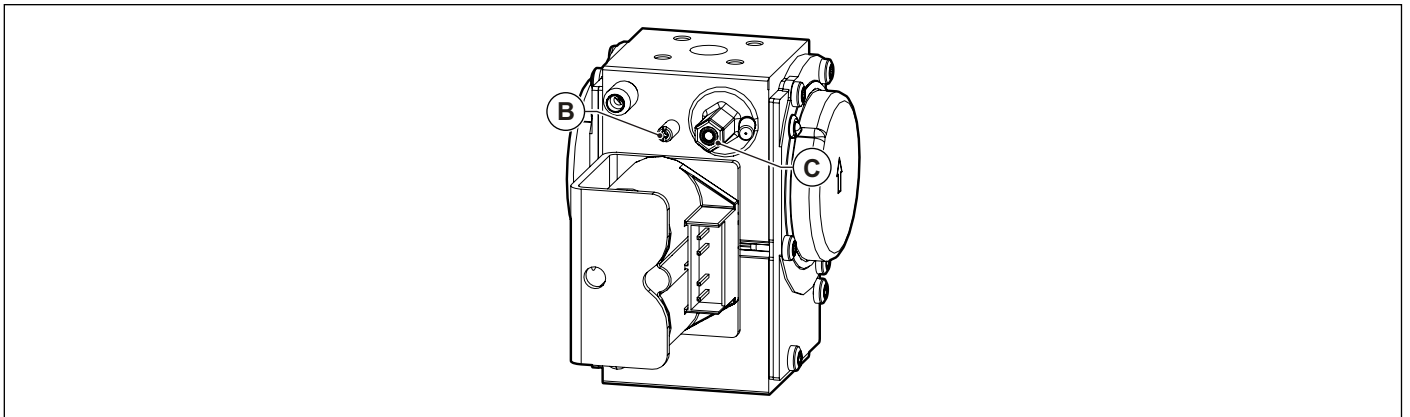


Fig. 47 Adjusting CO<sub>2</sub> value KR 85 - KR 120

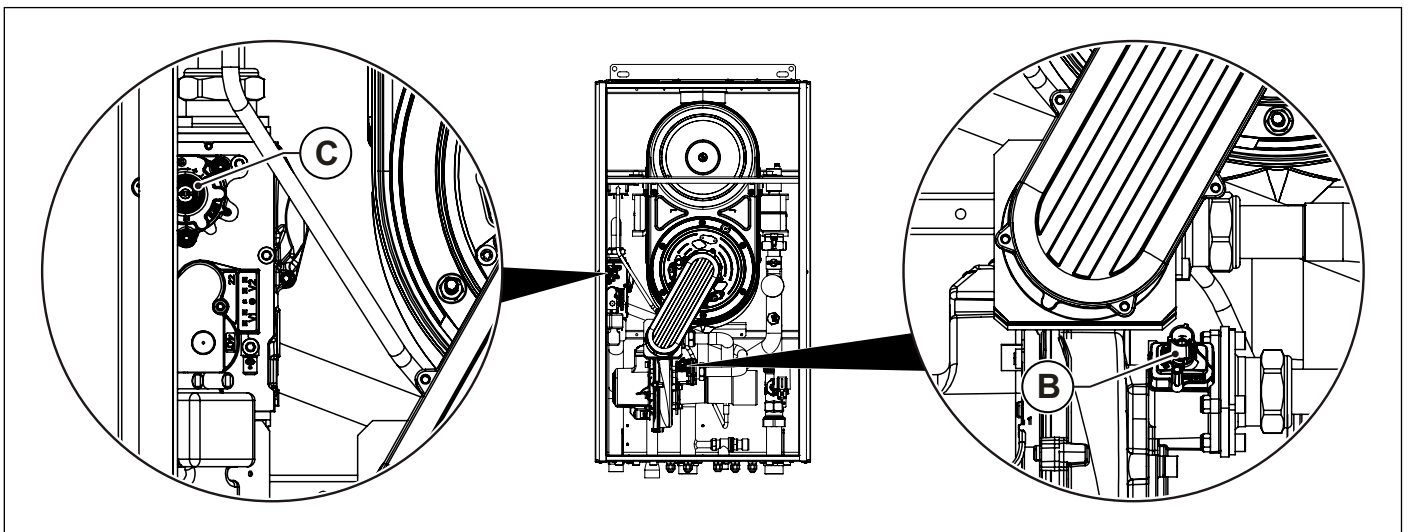


Fig. 48 Adjusting CO<sub>2</sub> value KR 150

### 3.22 Filling the system



#### WARNING

In order to optimise efficiency and safety of the heating system, to ensure its regular operation, to preserve such conditions over time, to minimise energy consumption, to inhibit corrosion and build-up of limescale, scale and sludge inside the system, proceed with the treatment of the heating system water according to the standards and laws in force in the country of installation.

The treatment of the heating system water must be carried out for both new and existing systems.

During system routine maintenance, check the characteristics of system water and, if necessary, proceed with the treatment of the heating system water.

For the treatment of the heating system water, it is recommended to use specific products suitable for multi-metal systems.



#### WARNING

**The treatment of the heating system water is a condition required for the heat generator warranty.**

The build-up of limescale, scale and sludge inside the heating system may result in an irreversible damage to the heat generator, even quickly and regardless of the quality level of the component materials used.

Heat generators are subjected to corrosion from the moment in which they are filled with water.

A proper treatment of the heating system water can prevent the creation or worsening of this situation.

To avoid unpleasant problems, the water in the heating system must comply with the following characteristics:

| Parameter               | Value   | m.u.  |
|-------------------------|---|-------|
| Appearance              | Colourless and sediment-free                              | -     |
| pH                      | 7,5 ÷ 9,5<br>7.5 ÷ 8.5 in the presence of aluminium parts | -     |
| Total hardness          | 5 ÷ 15  | °f    |
| Dissolved oxygen        | < 0,05  | mg/l  |
| Total iron (Fe)         | < 0,3   | mg/l  |
| Total copper (Cu)       | < 0,1   | mg/l  |
| Chlorides               | < 100   | ppm   |
| Electrical conductivity | < 200   | µS/cm |

Tab. 20 System water characteristics

If the analysis of the samples of the heating system water shows values other than those indicated in the table, proceed with the treatment of the heating system water to bring the values to the levels indicated in the table.



#### WARNING

**Do not start the heat generator if the water in the heating system does not comply with the values indicated in the table.**

To avoid that the characteristics of the heating system water are altered, it is important to comply with the following recommendations:

- Reduce the presence of oxygen in the system as much as possible, avoiding water leakage during installation. Immediately repair any leakage or drips that may cause air infiltration into the system.
- Provide the system with specific systems for removal of air and impurities up to 5 µm (e.g. air micro-bubble separators and anti-sludge filters).
- The filling and topping-up water of the heating system must always be filtered (filters with synthetic or metallic mesh with a filtering capacity not lower than 50 µm) to avoid deposits that may trigger the corrosion phenomenon.
- Avoid frequent top-ups of the heating system. Avoid the use of automatic loading systems in the absence of litre counters in order to timely detect any leakage.

Moreover:

- Avoid the installation of heat generators near swimming pools or laundry rooms, as the combustion air must not contain chlorine, ammonia or other similar substances. The latter are very corrosive for the heat exchanger.
- In case of low-temperature systems, use specific products to avoid bacteria growth.
- Avoid constant draining of water from the system during routine maintenance operations by installing proper shut-off valves before and after the filters.



**WARNING**

---

**Damage suffered by the heat generator or heating system caused by corrosion, build-up of limescale, scale and sludge inside the heating system is not covered by the generator warranty.**

**Failure to comply with the requirements specified in this section will invalidate the generator warranty.**

---



**WARNING**

---

**Pressure sensor will not electrically enable the burner ignition when water pressure is below 0.8 bar. It is advisable to fill the system with a pressure greater than or equal to 1.5 bar.**

**In any case, pressure must be lower than the "Safety valve calibration pressure" (see Tab. 4 General specifications) and to the maximum design pressure of the system.**

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

---

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

The procedure is to be cautiously carried out, following each step:

1. Switch power supply off.
2. Remove the boiler outer casing.
3. Open the bleeding valves on all radiators and verify the boiler automatic valve operation.
4. Gradually open the system filler cock, checking that any automatic bleeding valve installed in the system works properly.
5. Close all radiator bleeding valves as soon as water starts coming out.
6. Check on the boiler pressure gauge that pressure is not lower than 0.8 bar and does not exceed the maximum allowed pressure in the boiler and in the system. It is advisable to fill the system with a pressure greater than or equal to 1.5 bar.
7. Shut the system filler cock and bleed any air out again, by opening the air bleeding valves.
8. Start the boiler and bring the system to working temperature, stop the pump, and repeat air bleeding procedure.
9. Let the system cool down and repeat point 6.

The boiler is fitted with a freeze protection system, which works with all the operating modes: "OFF", "STAND-BY", "SUMMER", "WINTER" and "CH ONLY".



**DANGER**

---

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

---

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



**WARNING**

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

---



**WARNING**

---

**To ensure the correct operation of pump anti-seize function the boiler must be electrically supplied and the gas cock must be open.**

---

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

### 3.23 Filling the trap

Before starting the boiler, and each time it is at a standstill for several days, make sure the trap is full of water. If the trap is empty, fill it by pouring water into the boiler through the flue gas venting duct.

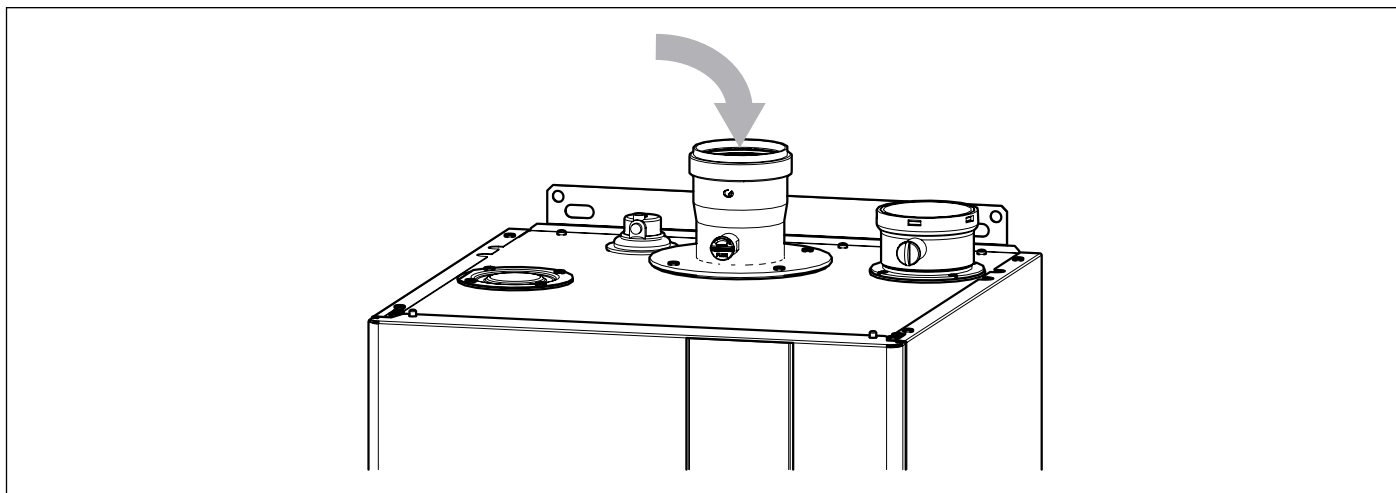


Fig. 49 Filling the trap

### 3.24 Condensate neutralisation

Drainage and neutralisation of the condensate water produced by the heat generator and the flue gas exhaust pipes must be carried out according to the standards and laws in force in the country of installation, using components resistant to the acidity of condensate water.

The system for drainage and neutralisation of condensate water produced by the heat generator and the flue gas exhaust pipes must be carried out in such a way as to prevent clogging and freezing of the liquid it contains.



#### **WARNING**

---

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

---

### 3.25 Starting up the boiler

To start the boiler, refer to section *Testing the boiler* on page [91](#).

## 4. Testing the boiler

### 4.1 Preliminary checks

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

- The flue gas venting duct and the relevant terminal are installed in conformity with the instructions: with the boiler operating, there must be no leakage of combustion by-products from any of the gaskets.
- The supply power to the boiler must be 230 V ~ 50 Hz.
- The system is correctly filled with water (pressure is not lower than 0.8 bar and does not exceed the maximum allowed pressure for the system).
- Any shut-off cocks in the system pipes are open.
- The mains gas type is correct for the boiler calibration: convert the boiler to the available gas if necessary (see *Adaptation to other gas types and burner adjustment* on page 84). This operation is to be exclusively carried out by qualified personnel.
- The gas supply cock is open.
- There are no fuel gas leaks.
- The main switch installed adjacent to the boiler is turned on.
- The safety valve is not blocked.
- There are no water leaks.
- The condensate trap installed on the boiler is filled with water, is discharging condensate correctly and is not stuck.



#### **WARNING**

---

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

---

### 4.2 Switching on and switching off

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

## 5. Maintenance



### WARNING

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



### WARNING

A proper boiler routine maintenance is an essential requirement to ensure safety.



### WARNING

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

The boiler must be serviced at least once every year.



### WARNING

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

### 5.1 Maintenance schedule

Maintenance operations include check and cleaning procedures. In particular:

#### **Inspections and checks**

- Check general integrity of the boiler.
- Check boiler and network gas supply for leakage.
- Check gas supply pressure to boiler.
- Check boiler ignition sequence.
- Check the condition and seal integrity of the flue gas venting ducts.
- Check air pressure switch operation. (KR 150 only)
- Check integrity of safety devices of the boiler in general.
- Check for water leaks and oxidised areas on the boiler's couplings.
- Check efficiency of the boiler safety valve.
- Check system expansion vessel filling pressure.
- Check water pressure switch efficiency.
- Check boiler combustion parameters by flue gas analysis.
- Check the state of combustion fan.
- Check correct draining of condensate from the condensate trap installed on the boiler.

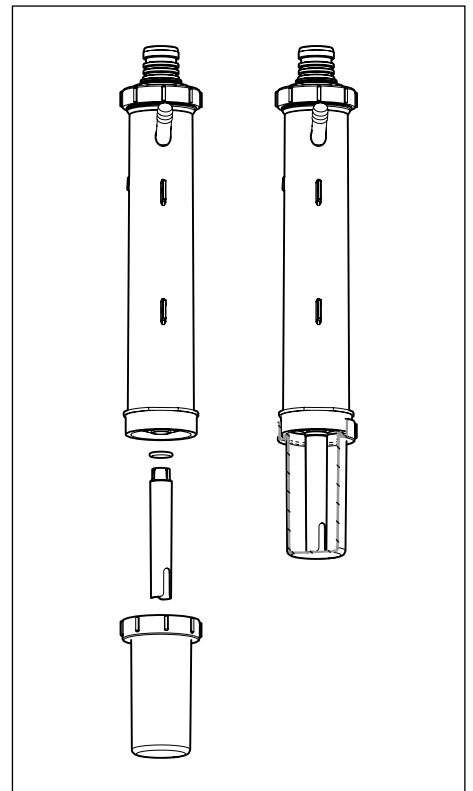
#### **The following cleaning is to be done**

- Clean the general interior of the boiler.
- Clean the gas nozzles.
- Clean the air intake and flue gas venting circuits.
- Clean the heat exchanger.
- Clean the condensate trap and discharge ducts.
- Cleaning system filters (if any).



### WARNING

After the trap cleaning operations, make sure that the internal tube and the O-ring are in their original position.





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

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



**WARNING**

---

Should the device not operate correctly, while not posing danger to people, animals or property, or should you find any discrepancy with reference to prevailing standards and regulations, notify the system supervisor both verbally and in writing.

---



**WARNING**

---

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

---

## 5.2 Combustion analysis

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

## 5.3 Extraordinary maintenance

Extraordinary maintenance includes changing equipment components that are worn out or broken.



**WARNING**

---

**Strictly comply with the instructions below.**

---

### **Gas valve**

The seals between gas valve and gas pipes must be replaced. And then checked for sealing.

The tightening torque for gas pipe fittings must be 23 Nm.

Gas valve calibration is mandatory: for calibration operations please strictly follow the procedures in paragraphs *Gas valve setting* on page 87, for details on these topics.

The perfect sealing of valve pressure taps must be checked.

### **Flame electronic control board**

It is mandatory to set up the electronic board according to the boiler model, based on the instructions supplied together with the valve. In case of loss or doubts, contact the boiler manufacturer.

It is mandatory to set up the spare electronic board based on the gas type for which boiler is preset and its power.

For configuration, carefully follow the procedures in paragraph *TECHNICIAN MENU* on page 60, to set parameter "8. BOILER TYPE". Make sure that all wirings have been correctly connected according to the wiring diagrams in paragraph *Wiring diagram* on page 78.

### **Safety thermostats and temperature probes**

Spare part must be perfectly fastened and adhere to the element whose temperature must be measured.

### **Combustion fan**

It is mandatory to properly position the seals in their seats and change any old ones with the new ones supplied together with the spare part.

Fasten the fan plate using all screws and check sealing.

### **Heat exchanger**

In case of operations involving opening the heat exchanger, for instance in order to reach the burner, all affected seals must be changed and sealing checked and ensured.

***Ignition electrode and flame detection, inspection glass***

In case of operations involving removing and/or changing the ignition electrodes and/or inspection glass, all affected seals must be changed and sealing checked and ensured.

***Hydraulic components***

In case of operations involving removing and/or changing any hydraulic components, all affected seals must be changed and sealing checked and ensured to avoid water leakage.

## 6. Decommissioning, disassembly and disposal



### **WARNING**

---

Gas boilers are electrical and electronic equipment (EEE) and when decommissioned they become waste electrical and electronic equipment (WEEE), therefore, they must be disposed of in compliance with the legislation in force in the country of installation.

Gas boilers are classified as domestic appliances and must be disposed of in the same way as washing machines, dish washers and tumble dryers (R4 WEEE waste).

The disassembly of gas boilers and their disposal is therefore forbidden through channels not specifically provided for by law.

---



### **Warning**

---

If you decide to definitively decommission the boiler, have decommissioning, disassembly and disposal procedures carried out by qualified personnel, only.

The user is not authorised to carry out such operations.


---

Decommissioning, disassembly and disposal operations must be performed with boiler cold and disconnected from gas and power mains.

## 7. Malfunctions, possible causes and solutions

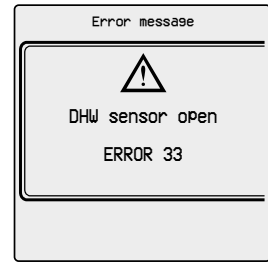
The boiler shuts down automatically if a malfunction occurs. The type of malfunction is signalled on the display.

To determine the possible causes of malfunction, see the table below.

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

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

To reset ERROR 13 it is necessary to switch the boiler power supply off and on again.



| Error     | Malfunction                                    | Probable cause  | User's tasks   | Qualified personnel's tasks                  |
|-----------|--|---|--|--|
| ERROR 1 * | Burner does not ignite                         | Gas supply failure.   | Check gas supply.<br>Check gas supply cock opening or gas network safety valve intervention. |  |
|           |  | Gas valve is disconnected.  | Contact qualified personnel.   | Reconnect it.                                |
|           |  | Gas valve is faulty.  | Contact qualified personnel.   | Replace it.                                  |
|           |  | The electronic board is faulty.                                     | Contact qualified personnel.   | Replace it.                                  |
|           | Burner does not ignite: no spark               | Ignition electrode is faulty.                                       | Contact qualified personnel.   | Replace the electrode.                       |
|           |  | Ignition transformer is faulty                                      | Contact qualified personnel.   | Replace the ignition transformer.            |
|           |  | Electronic board does not ignite. It is faulty.                     | Contact qualified personnel.   | Replace electronic board.                    |
|           | Burner ignites for a few seconds and goes off. | Electronic board does not detect flame: inverted phase and neutral. | Contact qualified personnel.   | Verify correct neutral and phase connection. |
|           |  | Detection electrode cable is interrupted.                           | Contact qualified personnel.   | Reconnect or replace cable.                  |
|           |  | Detection electrode is faulty.                                      | Contact qualified personnel.   | Replace the electrode.                       |
|           |  | Electronic board does not detect flame: it is faulty.               | Contact qualified personnel.   | Replace electronic board.                    |
|           |  | Ignition heat input setting is too low.                             | Contact qualified personnel.   | Increase it.                                 |
|           |  | Minimum heat input is not set correctly.                            | Contact qualified personnel.   | Check burner setting.                        |
| ERROR 2 * | A false flame has been detected.               | The board is faulty   | Contact qualified personnel.   | Replace it.                                  |
|           |  | Ignition/detection electrode faulty                                 | Contact qualified personnel.   | Replace it.                                  |

| <b>Error</b> | <b>Malfunction</b>  | <b>Probable cause</b>                            | <b>User's tasks</b>          | <b>Qualified personnel's tasks</b>                |
|--------------|---|--|------------------------------|---|
| ERROR 3 *    | The flow temperature and/or return temperature reached the limit value (105°C). | Circulation pump is seized.                      | Contact qualified personnel. | Check pump electrical connection.                 |
|              |   | Circulation pump is faulty.                      | Contact qualified personnel. | Replace it.                                       |
|              | The safety thermostat has shut the boiler down.                                 | Circulation pump is seized.                      | Contact qualified personnel. | Check pump electrical connection.                 |
|              |   | Circulation pump is faulty.                      | Contact qualified personnel. | Replace it.                                       |
|              | Flue thermostat triggering.   | Flue vent / air intake duct is obstructed.       | Contact qualified personnel. | Check for any duct obstruction, and eliminate it. |
|              |   | Flue gas thermostat is faulty.                   | Contact qualified personnel. | Replace it.                                       |
| ERROR 5 *    | Fan speed is not correct or is null.  | Fan disconnected.                                | Contact qualified personnel. | Reconnect it.                                     |
|              |   | Fan faulty.                                      | Contact qualified personnel. | Replace it.                                       |
| ERROR 7 **   | Flue gas probe triggering.  | Flue vent / air intake duct is obstructed.       | Contact qualified personnel. | Check for any duct obstruction, and eliminate it. |
|              |   | Flue probe is faulty.                            | Contact qualified personnel. | Replace it.                                       |
| ERROR 8 *    | Flame detection circuit fault.  | Detection electrode cable is interrupted.        | Contact qualified personnel. | Reconnect or replace cable.                       |
|              |   | Detection electrode is faulty.                   | Contact qualified personnel. | Replace the electrode.                            |
|              |   | The board is faulty                              | Contact qualified personnel. | Replace it.                                       |
| ERROR 9 **   | Gas valve circuit fault.  | The board is faulty                              | Contact qualified personnel. | Replace it.                                       |
|              |   | Wirings are disconnected.                        | Contact qualified personnel. | Reconnect them.                                   |
| ERROR 11 **  | Flow-Return $\Delta T > 5^{\circ}\text{C}$ for at least 5 seconds in OFF mode.  | Flow probe faulty.                               | Contact qualified personnel. | Replace it.                                       |
|              |   | Return probe faulty.                             | Contact qualified personnel. | Replace it.                                       |
| ERROR 12     | Electronic board error.   | An internal wiring is disconnected.              | Contact qualified personnel. | Check the internal wirings.                       |
|              |   | The electronic board is faulty.                  | Contact qualified personnel. | Replace it.                                       |
| ERROR 13     | After 5 manual resets within less than 15 minutes.                              | Switch the boiler power supply off and on again. |                              |   |
| ERROR 15 *   | Upon start-up: (Flow Temp. - Ret. Temp.) $> 3^{\circ}\text{C}$ .                | Probes are faulty.                               | Contact qualified personnel. | Replace them.                                     |

| Error                        | Malfunction  | Probable cause                        | User's tasks   | Qualified personnel's tasks |
|------------------------------|--|---------------------------------------|--|-----------------------------|
| ERROR 16 *                   | Upon start-up Flow Temp. does not vary by at least 1°C.  | Flow probe faulty.                    | Contact qualified personnel.   | Replace it.                 |
| ERROR 17 *                   | Upon start-up Return Temp. does not vary by at least 1°C.                                      | Return probe faulty.                  | Contact qualified personnel.   | Replace it.                 |
| ERROR 18 *                   | Generic sensor fault, reading out of range.  | One of the probes is faulty.          | Contact qualified personnel.   | Replace it.                 |
| ERROR 21 *                   | The board is faulty  |                                       | Contact qualified personnel.   | Replace it.                 |
| ERROR 25 *                   | Electronic board firmware fault.   | The board is faulty                   | Contact qualified personnel.   | Replace it.                 |
| ERROR 27 **<br>(KR 150 only) | The air pressure switch is closed with fan stopped.  | The pressure switch is faulty.        | Contact qualified personnel.   | Replace it.                 |
| ERROR 28 **<br>(KR 150 only) | The air pressure switch does not close during ventilation.                                     | The pressure switch is faulty.        | Contact qualified personnel.   | Replace it.                 |
| ERROR 30 *                   | The flow probe detected a temperature outside the allowed range (equivalent to short circuit). | Probe is faulty.                      | Contact qualified personnel.   | Replace it.                 |
| ERROR 31 *                   | The flow probe detected a temperature outside the allowed range (equivalent to circuit open).  | Probe is faulty.                      | Contact qualified personnel.   | Replace it.                 |
|                              |  | Probe is disconnected.                | Contact qualified personnel.   | Reconnect it.               |
| ERROR 32 **                  | The DHW probe detected a temperature outside the allowed range (equivalent to short circuit).  | Probe is faulty.                      | Contact qualified personnel.   | Replace it.                 |
| ERROR 33 **                  | The DHW probe detected a temperature outside the allowed range (equivalent to circuit open).   | Probe is faulty.                      | Contact qualified personnel.   | Replace it.                 |
|                              |  | Probe is disconnected.                | Contact qualified personnel.   | Reconnect it.               |
| ERROR 34 **                  | The mains voltage is < than (230 Volt -15%)  | There are problems on the power line. | Contact qualified personnel.   | Check the electrical line.  |
| ERROR 37 **                  | CH system water pressure is low (< 0.8 bar).   | The system has been recently bled.    | Fill the system.<br>If the error occurs again soon or repeatedly, contact the qualified personnel. | Check system.               |
|                              |  | The system is leaking.                | Check system.  |                             |
|                              |  | Pressure transducer is disconnected.  | Contact qualified personnel.   | Reconnect it.               |
|                              |  | Pressure transducer is faulty.        | Contact qualified personnel.   | Replace it.                 |

| <b>Error</b> | <b>Malfunction</b>   | <b>Probable cause</b>                | <b>User's tasks</b>          | <b>Qualified personnel's tasks</b> |
|--------------|--|--------------------------------------|------------------------------|------------------------------------|
| ERROR 41 **  | System water pressure signal update frequency is insufficient.   | Pressure transducer is disconnected. | Contact qualified personnel. | Reconnect it.                      |
|              | There are communication problems between pressure switch and board.  | Pressure transducer is faulty.       | Contact qualified personnel. | Replace it.                        |
| ERROR 43 *   | The return probe detected a temperature outside the allowed range (equivalent to short circuit).   | Probe is faulty.                     | Contact qualified personnel. | Replace it.                        |
| ERROR 44 *   | The return probe detected a temperature outside the allowed range (equivalent to circuit open).  | Probe is faulty.                     | Contact qualified personnel. | Replace it.                        |
|              |  | Probe is disconnected.               | Contact qualified personnel. | Reconnect it.                      |
| ERROR 45 **  | The flue gas probe detected a temperature outside the allowed range (equivalent to short circuit).   | Probe is faulty.                     | Contact qualified personnel. | Replace it.                        |
| ERROR 46 **  | The flue gas probe detected a temperature outside the allowed range (equivalent to circuit open).  | Probe is faulty.                     | Contact qualified personnel. | Replace it.                        |
|              |  | Probe is disconnected.               | Contact qualified personnel. | Reconnect it.                      |
| ERROR 47 **  | The pressure transducer has detected a pressure outside the allowed range.   | Pressure transducer is disconnected. | Contact qualified personnel. | Reconnect it.                      |
|              |  | Pressure transducer is faulty.       | Contact qualified personnel. | Replace it.                        |
| ERROR 74 **  | The solar probe detected a temperature outside the allowed range (equivalent to short circuit).  | Probe is faulty.                     | Contact qualified personnel. | Replace it.                        |
| ERROR 75 **  | The solar probe detected a temperature outside the allowed range (equivalent to circuit open).   | Probe is faulty.                     | Contact qualified personnel. | Replace it.                        |
|              |  | Probe is disconnected.               | Contact qualified personnel. | Reconnect it.                      |
| ERROR 80     | Reading of flow and return probes is inconsistent.   | Probes are faulty.                   | Contact qualified personnel. | Replace them.                      |
| ERROR 81 **  | The temperature probe control test is in progress. In case of positive outcome the boiler starts its normal operation.<br>A negative outcome will generate code: ERROR 15. |                                      | Nothing.                     | Nothing.                           |

| <b>Error</b> | <b>Malfunction</b>   | <b>Probable cause</b>                               | <b>User's tasks</b>          | <b>Qualified personnel's tasks</b> |
|--------------|--|---|------------------------------|------------------------------------|
| ERROR 87 **  | The detected water flow rate is lower than the minimum value for burner ignition.                  | The system is provided with closed shut-off valves. | Check the system.            |                                    |
|              |  | Pump is seized.                                     | Contact qualified personnel. | Unseize the pump.                  |
|              |  | Pump is faulty.                                     | Contact qualified personnel. | Replace it.                        |
|              |  | Air present inside heating system.                  | Contact qualified personnel. | Bleed the system.                  |
|              |  | Heat exchanger primary circuit is obstructed.       | Contact qualified personnel. | Clean or replace the exchanger.    |
| ERROR 88 **  | The detected water flow rate is lower than the minimum value to keep the burner ON.                | The system is provided with closed shut-off valves. | Check the system.            |                                    |
|              |  | Pump is seized.                                     | Contact qualified personnel. | Unseize the pump.                  |
|              |  | Pump is faulty.                                     | Contact qualified personnel. | Replace it.                        |
|              |  | Air present inside heating system.                  | Contact qualified personnel. | Bleed the system.                  |
|              |  | Heat exchanger primary circuit is obstructed.       | Contact qualified personnel. | Clean or replace the exchanger.    |
| ERROR 89 **  | The values of some parameters are inconsistent.<br>Example: Max temperature < Min. temperature     |   | Change the wrong parameters. | Change the wrong parameters.       |
| ERROR 91 **  | The cascade probe detected a temperature outside the allowed range (equivalent to short circuit).  | Probe is faulty.                                    | Contact qualified personnel. | Replace it.                        |
| ERROR 92 **  | The cascade probe detected a temperature outside the allowed range (equivalent to circuit open).   | Probe is faulty.                                    | Contact qualified personnel. | Replace it.                        |
|              |  | Probe is disconnected.                              | Contact qualified personnel. | Reconnect it.                      |
| ERROR 93 **  | The external probe detected a temperature outside the allowed range (equivalent to short circuit). | Probe is faulty.                                    | Contact qualified personnel. | Replace it.                        |
| ERROR 94 **  | There is a malfunction in the display board.   | The display board is disconnected.                  | Contact qualified personnel. | Reconnect it.                      |
|              |  | The display board is faulty.                        | Contact qualified personnel. | Replace it.                        |



| <b>Error</b> | <b>Malfunction</b>  | <b>Probable cause</b>                   | <b>User's tasks</b>          | <b>Qualified personnel's tasks</b>                    |
|--------------|---|---|------------------------------|---|
| ERROR 95 **  | The cascade probe has detected a temperature outside the allowed range.                           | Probe is faulty.                        | Contact qualified personnel. | Replace it.   |
|              |   | Probe is disconnected.                  | Contact qualified personnel. | Reconnect it.   |
| ERROR 96 **  | The external probe detected a temperature outside the allowed range (equivalent to circuit open). | Probe is faulty.                        | Contact qualified personnel. | Replace it.   |
|              |   | Probe is disconnected.                  | Contact qualified personnel. | Reconnect it.   |
| ERROR 97 **  | The cascade connection between boilers is not correct.  | Wirings are disconnected.               | Contact qualified personnel. | Reconnect them.                                       |
|              |   | Wirings are not correct.                | Contact qualified personnel. | Check wirings.  |
|              |   | Wirings are faulty.                     | Contact qualified personnel. | Replace them.   |
| ERROR 98 **  | Boilers do not communicate data.  | Setting or boiler bus connection fault. | Contact qualified personnel. | Check electrical connections between cascade boilers. |
| ERROR 99 **  | Boiler board error.   | Internal boiler bus fault.              | Contact qualified personnel. | Check electrical connections between cascade boilers. |

## 8. Declaration of conformity

| <b>EU DECLARATION OF CONFORMITY</b>  |                 | n° 007/18815   |                 |
|--|-----------------|--|-----------------|
|  |                 | 20/01/2020   | Ed. 2           |
| <b>Gas Regulation (EU) 2016/426</b><br><b>Efficiency Requirements Directive 92/42/EEC</b><br><b>Electromagnetic Compatibility Directive 2014/30/EU</b><br><b>Low Voltage Directive 2014/35/EU</b><br><b>Ecodesign Directive 2009/125/EU</b><br><b>Energy Labelling Regulation (EU) 2017/1369</b> |                 |  |                 |
| <b>FONDITAL S.p.A.</b><br><small>having its registered office in</small><br><b>Via Cerreto 40 - 25079 Vobarno (BS) - Italy</b><br><br>states under its own responsibility that the listed products fulfill the essential requirements set out in the Directives and Regulations outlined above   |                 |  |                 |
| Type:  | 18815           |  |                 |
| Brand:   | Fondital        |  |                 |
| Models:  | Itaca CH KR 35  | Itaca CH KR 45   | Itaca CH KR 50  |
|  | Itaca CH KR 60  | Itaca CH KR 70   | taca CH KR 85   |
|  | Itaca CH KR 99  | Itaca CH KR 115  | Itaca CH KR 120 |
|  | Itaca CH KR 135 | Itaca CH KR 150  |                 |
| Certificate (EU) 2016/426  | 51CT4883        | Issued by 0051 IMQ Milano<br>Module B - on 04/06/2018<br>ten-year validity |                 |
| Certificate 92/42/CEE  | 51CT4884        | Issued by 0051 IMQ Milano<br>Module B - on 04/06/2018                      |                 |
| Applied technical standards:<br>EN 15502-1:2012+A1:2015; EN 15502-2-1:2012+A1:2016<br>EN 60335-2-102 (2016)<br>EN 55014-1 (2006) + A1(2009) + A2 (2011); EN 55014-2 (1997) + A1 (2001) + A2 (2008)<br>EN 61000-3-2 (2014); EN 61000-3-3 (2013)   |                 |  |                 |

Fondital S.p.A.

For management

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

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