Flexiheat UK
Heating and hot water solutions
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Installation, Use and Maintenance Manual for model

R2K 24 RAIN

H VERSION

Condensing boiler, with integrated heat exchanger for domestic hot water production, suitable for outdoor installation

CE 0476

R2K24RAINH-RAD-ING-Manuale-2511.1_BCS30_firm.H218D6(SAF)_SKB1.3_ST_GPA

SUMMARY

INTRODUCTION

WARNING

Before starting any operation it is mandatory to read this instruction manual, in relation to the activities to be carried out as described in each relevant section. Proper operation and optimal performance of the boiler are ensured by strict compliance with all the instructions given in this manual.

The installation, use and maintenance manual is an integral and essential part of the product and must be delivered to the user.

MANUAL USERS

The manual users are all those who install, use and maintain the boiler.

The boiler must be used and accessed only by qualified operators that fully read and understood the use and maintenance manual, paying particular attention to the warnings.

READING AND SYMBOLS OF THE MANUAL

To ease the understanding of this manual, recurrent symbols where used, in particular:

› On the outer margin of the page is placed a thumb index indicating the type of user to which the instructions in that section address.

› The titles are differentiated by thickness and size in accordance with their hierarchy.

› The images contain important parts described in the text, marked with numbers or letters.

› (See chap. "chapter name"): this entry indicates another section in the Manual that you should refer to.

› Device: this term is used referring to the boiler.

DANGER

It identifies an information related to a general danger that if not complied with, may cause serious personal damage or even death.

ATTENTION

It identifies an information that if not complied with may cause small or medium level lesions to the person or serious deterioration to the boiler.

WARNING

It identifies a precaution information that must be observed in order to avoid damaging the machine or parts of it.

MANUAL STORAGE

The manual must be carefully stored and replaced in case of deterioration and/or low legibility.

If you misplace the use and maintenance manual, you can request it from the Service Centre giving the serial number and model of the boiler indicated on the data plate placed on the right side of its casing.

MANUFACTURER WARRANTY AND RESPONSIBILITY

The technical and functional features of the device are ensured by its use in compliance:

1. with the use and maintenance instructions contained in the manuals accompanying the product, the content of which the customer certifies that he is aware;

2. with the conditions and purposes to which devices of the same type are intended.

For more information on the warranty validity, its duration, the obligations and the exemptions, please consult the First start-up certificate attached to this manual.

The manufacturer reserves:

› the right to modify the tools and relative technical documentation without any obligation to third parties; neither will the company be held responsible for any inaccuracies in this handbook deriving from printing or translation errors;

› the material and intellectual ownership of this manual and forbids its distribution and duplication, even partial, without prior written authorization.

PRODUCT CONFORMITY

› Eco-design Directive 2009/125 CE,

› Energy labelling Directive 2010/30/CE,

› Regulation EU 811/2013,

› Regulation EU 813/2013,

› Regulation EU 2016/426,

› Electromagnetic compatibility Directive 2014/30/CE,

› Performance Directive 92/42/CE,

› Low voltage Directive 2014/35/CE.

› EN15502-1:2021 + A1:2023

› EN15502-2-1:2022 + A1:2023

The materials used such as copper, brass, stainless steel create a homogeneous, compact and functional assembly, easy to install and manage. In its simplicity, the boiler is equipped with all accessories necessary to render it a veritable independent heating unit. All boilers are tested and delivered with a quality certificate signed by the tester.

1. INSTALLER SECTION

The installation operations described in this section, must be performed only by qualified personnel, having the appropriate technical training in the field for the installation and maintenance of components of civil and industrial domestic hot water production and heating plants.

1.1. INSTALLATION

1.1.1. GENERAL INSTALLATION WARNINGS

ATTENTION

This boiler may be used only for the purpose for which it has been designed: heat water to a temperature below boiling point at atmospheric pressure. Any other use is considered wrong and dangerous. The manufacturer is excluded from any contractual or extra-contractual responsibility for damages caused to people, animals or property due to errors during installation.

ATTENTION

This boiler must be installed only by qualified personnel, having the appropriate technical training in the field for the installation and maintenance of components of civil and industrial domestic hot water production and heating plants.

ATTENTION

After having removed the packing, make sure the device is intact. In case of doubt, do not use the device and contact the supplier.

BEFORE INSTALLING THE BOILER, THE INSTALLER MUST MAKE SURE THAT THE FOLLOWING CONDITIONS ARE MET:

› The device is connected to a heating system and a water supply network appropriate for its power and performance.

› The location must be properly vented through an air vent.

› The air vent must be placed at floor level to prevent it from being obstructed, protected by a grid that does not hamper the useful passage section.

› The device is suitable for use with the type of gas available by checking the boiler data plate (placed on the inner side of the front casing).

› Make sure that the pipes and joints are perfectly sealed, without any gas leaks.

› Make sure that the grounding system works properly.

› Make sure that the electrical system is suitable for the maximum power absorbed by the device, value indicated on the data plate.

1.1.2. BOILER LOCATION ENVIRONMENTAL REQUIREMENTS

The device installation location should be vented due to the presence of threaded joints on the gas supply line. The location should be therefore provided with vents as to ensure air exchange, with output grid in the natural accumulation area of potential gas losses.

WARNING

DO NOT install the boiler in a technical compartment near a swimming pool or a laundry, to avoid that the combustion air is exposed to chlorine, ammonia or alkaline agents that may worsen the corrosion phenomenon of the heat exchanger. Failure to observe this caution will void the warranty of the heat exchanger.

The ABS material boiler casing is approved for the exposition to atmospheric agents and, in particular, to UV rays.

THIS BOILER IS ABLE TO OPERATE WITHIN THE AMBIENT TEMPERATURES MINIMUM -10 °C AND MAXIMUM 60 °C.

WARNING

If the temperature in the appliance installation location goes below -10 centigrades, please fill the plant with anti-freeze liquid and insert and a frost prtotection kit (see chapter 'ANTI-FREEZE PROTECTION').

WARNING

The manufacturer will not be held responsible for damages caused by incorrect installation not in conformity with the above mentioned instructions and not duly protected from freeze.

1.1.3. REFERENCE LEGISLATION

The installation must be done according to the requirements of current legislation and in compliance with local technical regulations, according to the indications of the good technique.

1.1.4. UNPACKING

WARNING

Please unpack the boiler just before installing it. The Company is not responsible for the damages caused to the device due to incorrect storage.

WARNING

The packing elements (cardboard box, wooden crate, nails, fasteners, plastic bags, expanded polystyrene, etc.) must be kept out of the reach of children as they may be dangerous. Therefore they should be dismantled suitably differentiating them in accordance with the standards in force.

To unpack the boiler, proceed as follows:

› Place the packed boiler on the floor (fig. 1-A) and remove the fasteners opening the four flaps of the box outwards.

› Turn the boiler at 90° holding it with your hand (fig. 1-B).

› Lift the box (fig. 1-C) and remove the guards (fig. 1-D).

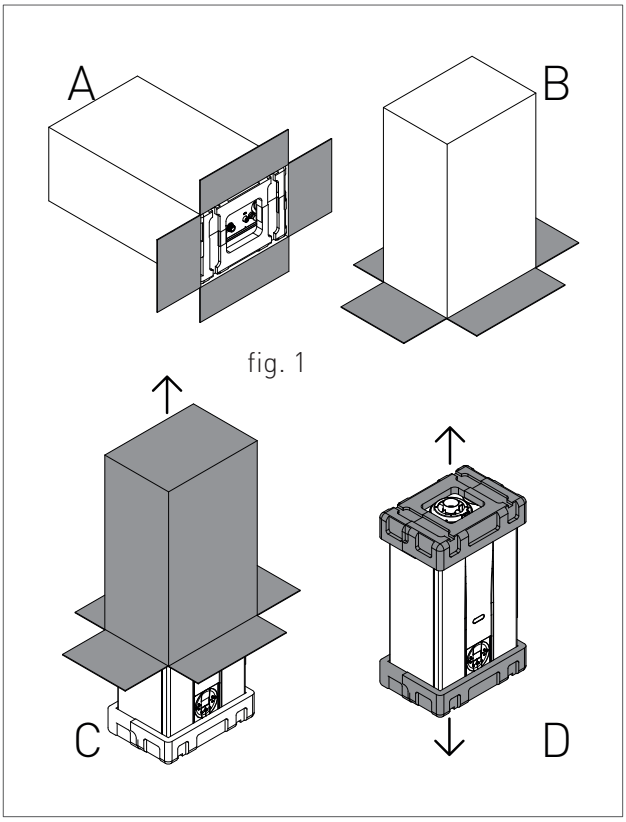
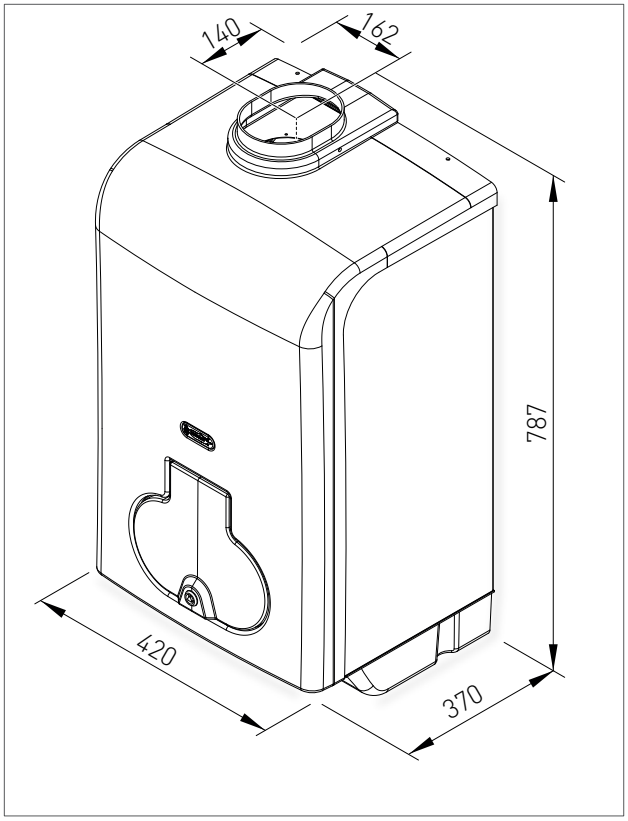
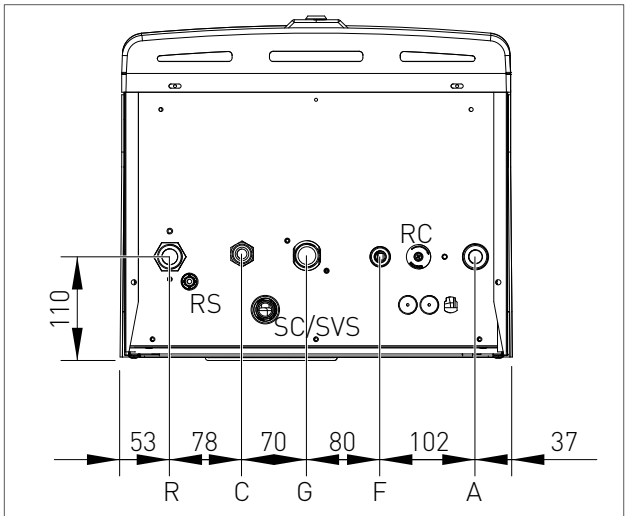


fig. 1

1.1.5. OVERALL DIMENSIONS



1.1.6. HYDRAULIC CONNECTIONS



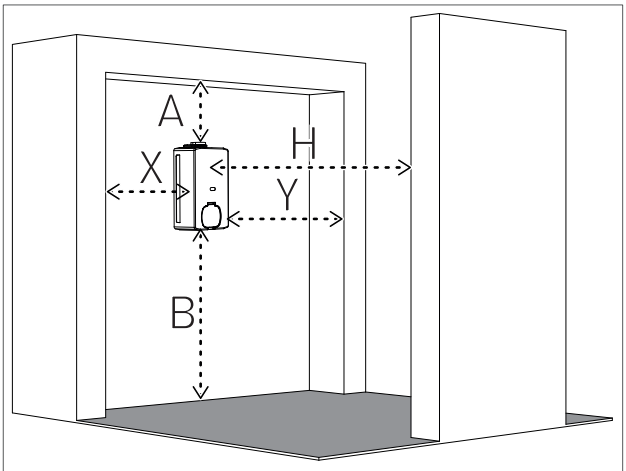
R-	HEATING RETURN	Ø 3/4
C -	D.H.W. OUTLET	Ø 1/2
G-	GAS	Ø 3/4
F-	COLD WATER INLET	Ø 1/2
A -	HEATING FLOW	Ø 3/4
RS-	DRAIN TAP	
SC/	CONDENSATE DRAIN / SAFETY VALVE	
SVS-	DRAIN	
RC-	SYSTEM FILLING TAP	

1.1.7. POSITIONING AND MINIMAL TECHNICAL SPACES

The boiler must be installed only on a vertical solid wall, able to sustain its weight.

In order to allow the access inside the boiler for maintenance operations, the minimum technical spaces indicated in figure 1 have to be respected.

Keep the same distances from flammable materials and wooden walls as well.



A - 200 mm
B - 300 mm
X - 60 mm
Y - 60 mm
H - 1000 mm

fig.1

To facilitate the installation, the boiler is provided with wall template that allows setting in advance the connections to the pipes, offering the possibility to connect the boiler once masonry works are completed.

For boiler positioning, proceed as follows (see fig. 2):

1. Trace a line using a spirit level (min. length 25 cm) on the installation wall;
2. place the top of the template along the traced line respecting the distances of the water connections; then mark the two points to insert the two wall fastening screws, then trace the points for the flue system;
3. remove the template and drill the wall;
4. hang the boiler onto the wall fastening screws or onto the wall hanging bracket and perform the connections.

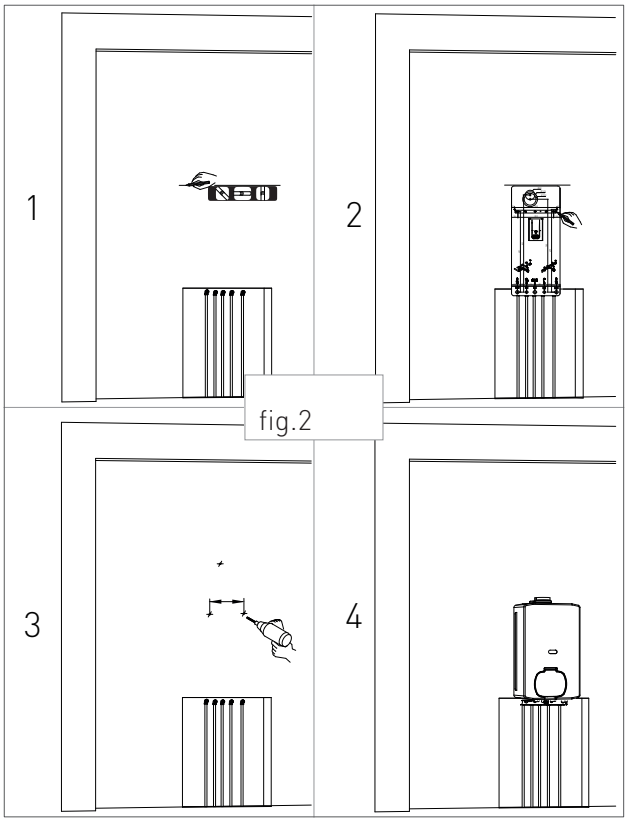


fig.2

WARNING

Make sure, using a spirit level, that the boiler is properly inclined being levelled (see fig.3) so as to allow the condensate to drain.

WARNING

The incorrect slopes of the device can cause the incorrect discharge of condensate by means of the discharge duct with consequent condensate stagnation inside the condensate module.

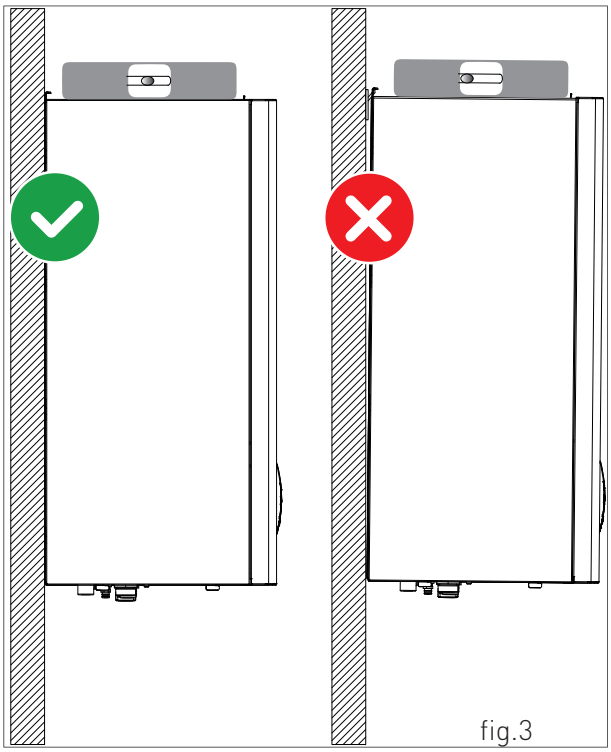
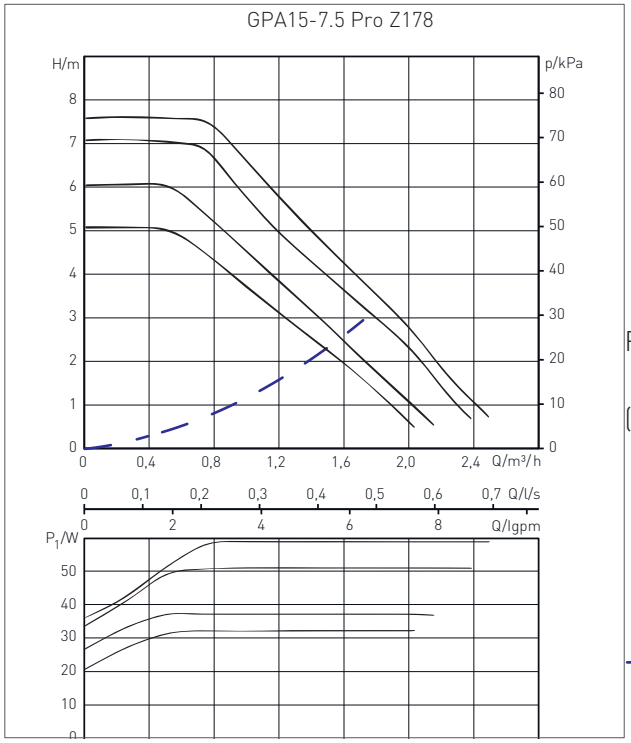
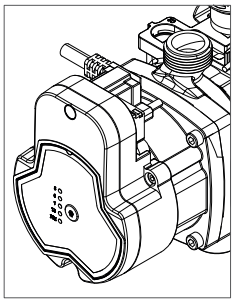


fig.3

1.1.8. PUMP HEAD / FLOW DIAGRAM





Fixed head selection button at maximum speed

(It disables the control from the PWM)

Appliance head losses

Diagramma portata-prevalenza circolatore R2K4_PM_GPA_EN

Error Code	Description
All LEDs flash simultaneously 1 time	Overvoltage protection. The pump will start again after the voltage drops below the protection limit (overvoltage limit: 270±5V).
All LEDs flash simultaneously 2 times	Undervoltage protection. The pump will start again after the voltage rises above the protection limit (undervoltage limit: 165±5V).
All LEDs flash simultaneously 3 times	Overcurrent protection. The pump attempts to restart after every 8s.
All LEDs flash simultaneously 4 times	Phase-loss protection. The pump attempts to restart after every 8s.
All LEDs flash simultaneously 5 times	Lockout protection due to impeller jammed or slowed down by impurities. Check and solve the problem. The pump attempts to restart after every 8s.
All LEDs flash simultaneously 6 times	Protection against lack of water or air in the system. The pump attempts to restart after every 8s.
All LEDs flash simultaneously 7 times	Over-temperature protection. The pump will start up again after its operating temperature falls below the protection limit for 5s.

1.1.9. HYDRAULIC CONNECTION

DANGER

Make sure that the water and heating pipes are not used as grounding system for the electrical plant. They are not suitable for such use.

WARNING

To prevent voiding the warranty and ensure proper operation of the boiler, please wash the system (if possible when hot) with suitable pickling or descaling solutions in order to remove the impurities coming from pipes and radiators.

WARNING

If the boiler is installed in a hydrostatic position lower than those of the connected devices (radiators, fan coils, etc.), install the shut-off valves on the D.H.W. and heating circuits to ease the performance of the maintenance operations, if it is necessary only to empty the boiler.

WARNING

When connecting the boiler to water supply, avoid excessive bending and recovery operations from any off axis positioning that may damage the pipes causing leaks, malfunction or early wear.

WARNING

In order to avoid any vibrations and noises, do not use pipes with small diameters or elbows with small radius and significant cut-off of the passage sections.

WARNING

Connect the boiler safety drains to a discharge funnel. The manufacturer is not responsible for any floods due to safety valve opening in case of plant overpressure.

D.H.W. CIRCUIT

In order to prevent limestone build-up and damages to the D.H.W. heat exchanger, the hardness of the domestic supply water should not exceed 15 °f. However, please check the characteristics of the water used and install suitable treating devices.

The heat exchanger coil cleaning frequency depends on the hardness of the supply water and on the presence of solid residues or impurities inside the water that are often present in case of recently installed plants. Based on the characteristics of the inlet water, the installation of suitable water treating devices is recommended, for residues presence please install a line filter.

The pressure of the cold inlet water should be between 0.5 and 6 bar. In case of higher pressure values, please install a pressure reducer upstream from the boiler.

HEATING CIRCUIT

In order to avoid any scale or deposits on the primary exchanger, the hardness of the heating circuit inlet water should not exceed 25 °f. However, please check the characteristics of the water used and install suitable treating devices.

This treatment is mandatory if frequent episodes of return water or partial or total emptying of the plant occur.

WARNING

In case the boiler is installed as part of a low temperature circuit, please install a safety thermostat on the heating flow, which can stop the boiler activity in case of high heating flow temperature. The company assumes no liability for damages caused to persons or property for failure to comply with these instructions.

1.1.10. SYSTEM FILLING

WARNING
For system filling use only clean tap water.

WARNING
If the system is filled by adding ethylene glycol-type chemical agents, the installation of a hydraulic separator on the loading system is recommended, in order to separate the heating circuit from the D.H.W. circuit.

Before powering up the boiler, fill the system as follows:

1. slightly loosen the cap of the pump air vent valve (1-fig. 1) to release the air from the system;

2. slightly loosen the cap of the air vent valve placed on top of the condensing exchanger (fig. 3) to release the air from the top of the system;

3. open the filling tap "R" (fig. 2);

4. release all the air;

5. use pressure gauge "M" (fig. 2) to make sure that the system pressure reaches 1.2 bar (fig. 4);

6. after performing this operation, make sure that the filling tap "R" (fig. 2) is properly closed.

7. open the air relief valves of the radiators and check the air removal process. When the water starts to leak close the radiators air relief valves **AND THE AIR VENT VALVE POSITIONED ON THE TOP OF THE CONDENSING EXCHANGER(FIG. 3)**.

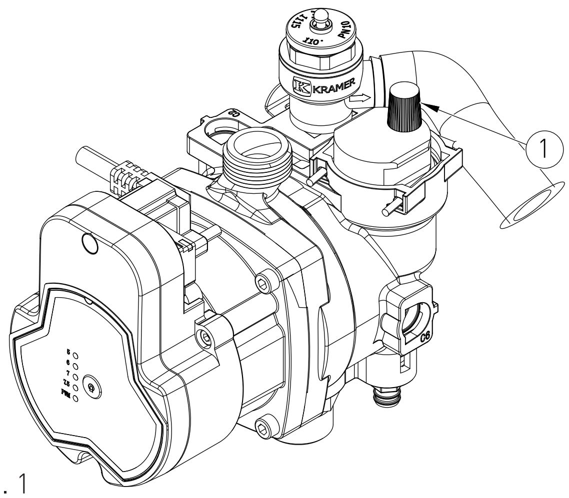


fig. 1

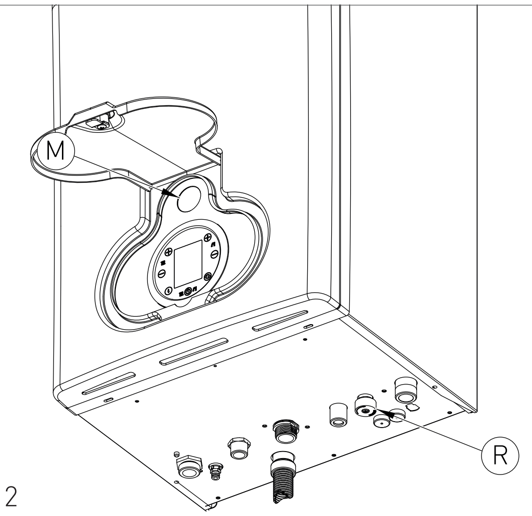
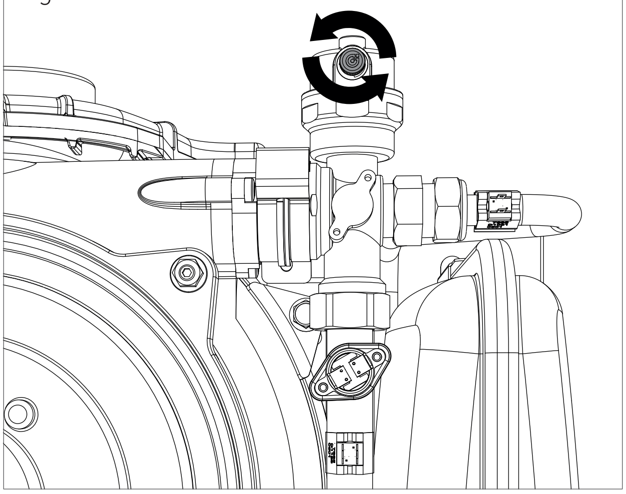


fig. 2

fig. 3


8. If after performing these operations, there is a decrease of the water pressure inside the system, open the filling tap "R" once again, until the pressure gauge indicates the value of 1.2 bar (fig. 4).

fig. 4

1.1.11. FILLING THE CONDENSATE SYPHON

Before starting the boiler, it is necessary to fill the condensate syphon in order to avoid flue reflux of combusted gases through the syphon itself.

Fill the condensate syphon as follows (see fig. 5):

› With a glass pour the water in the heat exchanger's flue exhaust duct outlet (see fig. 5), up to fill the condensate syphon to the highest point "T" (fig. 5);

› Connect the dedicated flexible condensate draining pipe to a waste disposal system. The condensate can be drained directly in the sewerage system by inserting an easily serviceable syphon.

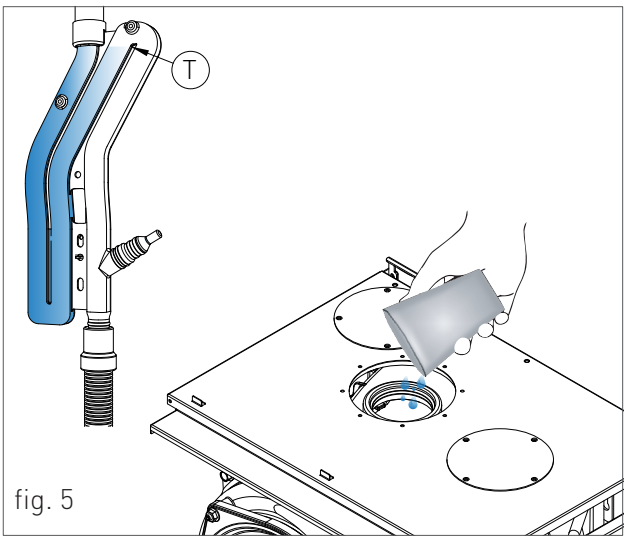


fig. 5

1.1.12. FROST PROTECTION

The boiler is protected against freezing thanks to the P.C.B. configuration with functions that start the burner and heat the concerned parts when their temperature goes below the minimum pre-set values, protecting the boiler up to an external temperature of -10 °C.

The boiler starts when the heating water temperature goes below 8 °C (this value can be modified through parameter P31), automatically starting the burner until the heating flow water temperature reaches the 30°C and, in presence of a return sensor, until the heating return water temperature reaches the 20°C.

The system starts even if on the display appears "OFF", as long as the boiler is connected to the power (230 V) and gas supply.

For long periods of standby, please empty the boiler and the system.

If the temperature goes below -10° centigrades, please fill the system with anti-freeze liquid (CLEANPASS FLUIDO AG cod. 98716LA) and insert a frost protection kit (cod. 82259LP).

CLEANPASS FLUIDO AG DILUTION PERCENTAGE	
ANTI-FREEZE - PROPYLENE GLYCOL	FREEZING POINT
(%) VOLUME	(°C)
20	-7.5
30	-13
35	-18
40	- 22.5
45	-28
50	-33.5
55	-42
60	-50
RECOMMENDED PERCENTAGE: 20 %	MINIMUM GLYCOL

1 Protezione antigelo_firm.L224A_EN

1.1.13. GAS CONNECTION

DANGER

In order to connect the boiler gas connector to the supply pipe, use a stop seal of an appropriate size and material. The use of hemp, teflon tape or similar materials is strictly forbidden.

WARNING

That the boiler is intended exclusively to be installed on a gas supply with a meter with gas pressure regulator, where applicable.

BEFORE PERFORMING THE GAS CONNECTION, MAKE SURE THAT:

› the gas supply line complies with the standards and regulations in force;

› the piping section suits the requested capacity and its length;

› the piping is equipped with all safety and control devices required by the standards in force;

› the internal and external seals of the gas inlet system are checked;

› the boiler is suitable for use with the available type of gas by checking the boiler data plate (placed on the inner side of the front casing. If they do not match, please take the necessary measures to adapt the boiler to another type of gas (see chapter GAS CONVERSION);

› the gas supply pressure falls within the values indicated on the data plate.

1.1.14. ELECTRICAL CONNECTION

DANGER

The boiler is electrically safe only if it is properly connected to an efficient earthing system, performed in compliance with the safety standards in force. Check this essential safety requirement is strictly recommended. If in doubt, request an accurate check of the electrical system performed by qualified staff, as the manufacturer is not responsible for any damages caused by lack of earthing system.

› Make sure that the electrical systems is suitable for the maximum power absorbed by the boiler, value indicated on the data plate.

› make sure that the cables section is appropriate for the maximum power absorbed by the boiler and that it is however not lower than 1 mm^2.

› The equipment works with alternating current of 230 V and 50 Hz. The electrical connection must be performed using an all-pole switch with an opening of at least 3 millimetres between contacts placed upstream from the device.

WARNING

Make sure that the live and neutral cables connection is performed in compliance with the wiring diagram (see chapter POWER SUPPLY).

WARNING

It is strictly forbidden the use of adaptors, multiple plugs and/or extensions for the general power supply of the boiler from the electrical network.

1.1.15. OPTIONAL ELECTRICAL CONNECTIONS

The cables should be inserted inside the boiler using the fairleads 'P1' and 'P2' placed on the hydraulic connections bottom plate (see fig. 1). Make a hole on the fairlead, smaller than the cable diameter, to make sure that the air cannot pass through.

To wire the optional items below:

• (TA) ROOM THERMOSTAT

• (CR) OPEN THERM REMOTE CONTROL

operate on the 'ME' clamp (see fig.2 and fig.3) which is outside the control panel, as follows:

› For the Room Thermostat (TA) or Remote Control (CR) first remove the jumper on the contacts and then connect the two non-polarised leads on the contacts.

To wire the optional items below:

• (SE) OUTDOOR TEMPERATURE SENSOR CODE 73518LA

• (RA) CONTACT CABLE COD. 40-00788 FOR: AUXILIARY RELAY FOR GENERIC DEVICE. MAXIMUM CURRENT 3A WITH 250VAC. FOR THE CONNECTION TO THE ZONE VALVE, SEE THE DIAGRAM IN FIGURE NO. 3 (SEE RELAY MANAGEMENT AT PARAMETER P34)

• (ID1) CONTACT FOR: SECONDARY ROOM THERMOSTAT / EXCLUSION OF DHW OR HEATING VIA CLOCK (SEE CONTACT MANAGEMENT IN PARAMETER P36)

• (ID2) CONTACT CABLE COD. 40-00751 FOR: EXCLUSION OF DHW OR HEATING VIA CLOCK (SEE CONTACT MANAGEMENT IN PARAMETER P37).

operate on the P.C.B. placed inside the control panel as follows:

DANGER
Cut off the voltage from the main switch.

› remove the boiler front casing (refer to chapter ACCESSING THE BOILER).

› remove the control panel back plate (see chapter ACCESSING THE P.C.B.).

› after removing the back plate, connect the items below to the P.C.B. (see fig. 2).

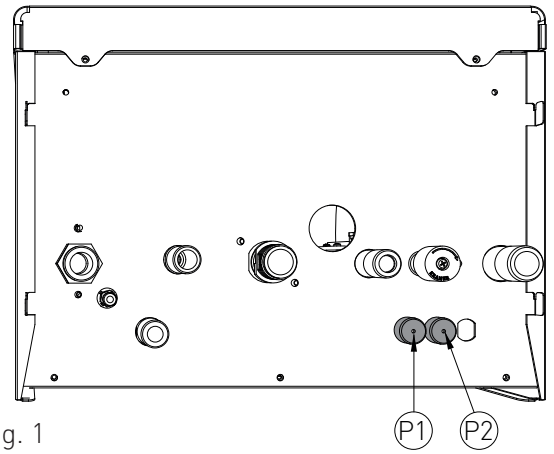


fig. 1

NB: In case of simultaneous presence of outdoor sensor and remote control, the main P.C.B. only sends the external temperature value to the remote device without using it for modulation. The communication between P.C.B. and the remote control takes place independently from the boiler's operating mode and after establishing the connection, the user interface on the P.C.B. is disabled and the display shows the symbol '↻'.

After performing these operations, remount the back plate and the front casing.

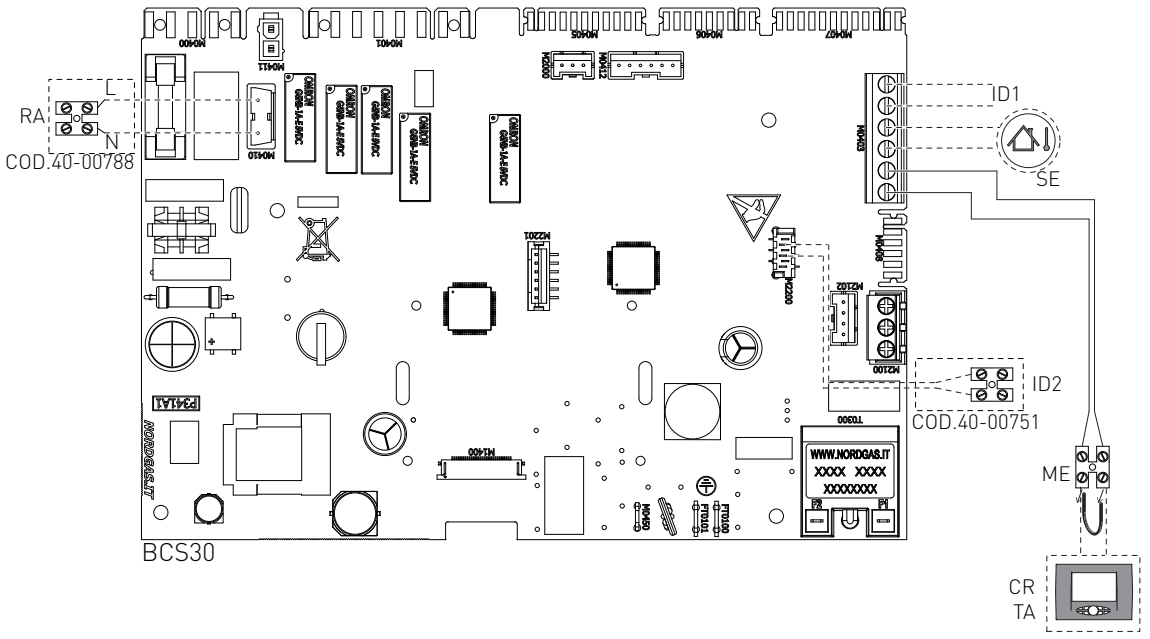


fig. 2

ZONE VALVE CONNECTION CONTROLLED BY THE REMOTE CONTROL (VZR) THROUGH THE CABLE CODE 40-00788 AND ZONE VALVES' LIMIT SWITCH (FC) CONTROLLED BY THE ROOM THERMOSTAT

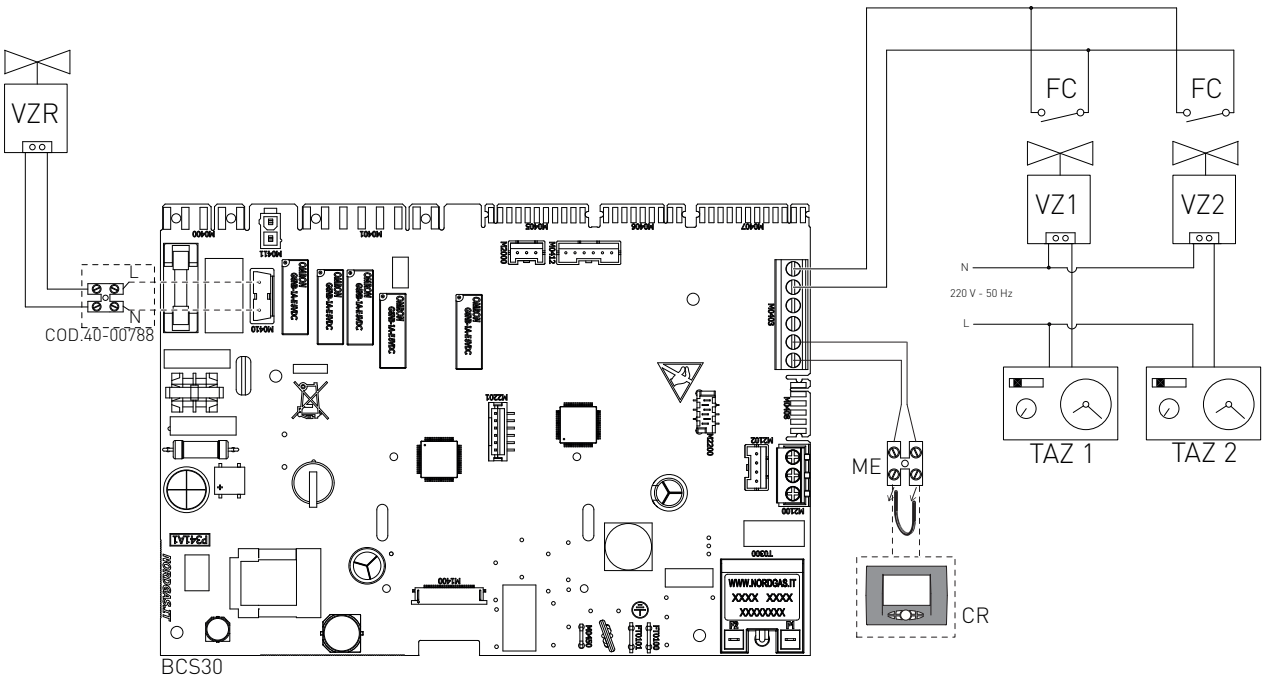


fig. 3

1.1.16. FUME EXHAUST FITTINGS

WARNING

In order to ensure proper operation and efficiency of the device you have to connect the boiler fume exhaust fitting to the fume exhaust duct using appropriate polypropylene flue fittings for condensing boilers.

WARNING

You cannot use traditional flue fittings for the discharge ducts of the condensing boilers, nor vice versa.

WARNING

For fumes exhaust and condensate collection, please follow the technical standards in force.

› For all discharge ducts, with regard to the fumes path, you should provide an uphill slope (outwards) so as to favour the reflux of the condensate towards the combustion chamber, suitably realized to collect and drain acid condensate.

› For all air suction ducts, with regard to the air path, you should provide an uphill slope (towards the boiler) so as to avoid the protrusion inside the duct of rain water, dust or foreign objects.

› In case of horizontal co-axial system installation, correctly place the horizontal co-axial terminal suitably realized to respect the slopes inside the fumes duct and to protect the air suction duct from adverse weather conditions.

› When a vertical flue system is installed, insert a condensate drain siphon at the base of the pipe, connected to the house/building sewage system (fig. 1).

› In order to discharge the fumes through a fumes exhaust duct carefully follow the technical standards in force.

› Make sure that the discharge tube doe not protrude inside the fumes exhaust duct, stop before it reaches the inner surface of the latter.

› The discharge duct must be perpendicular with the opposite internal wall of the chimney or of the fumes exhaust duct (fig. 2).

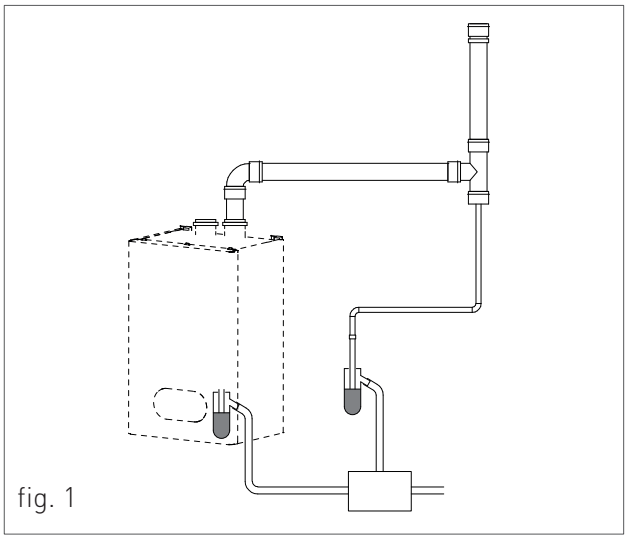


fig. 1

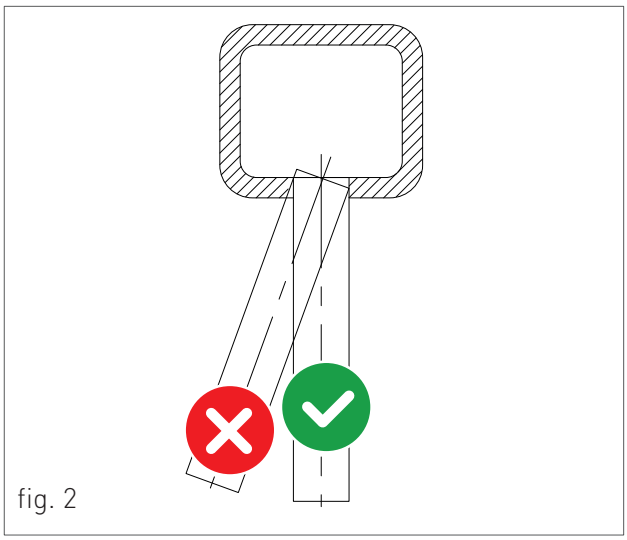


fig. 2

1.1.17. INSTALLATION MODES

For this type of boiler, the following flue exhaust configurations are available: A3, B23, B23p, B33, B53 and C13 (see Fig. 1).

› A3- Outdoor air intake and outdoor flue exhaust.

› B23- Indoor air intake and outdoor flue exhaust.

› B23P- Indoor air intake and outdoor flue exhaust, with exhaust system operating under pressure.

› B33- Indoor air intake and flue exhaust duct.

› B53- Indoor air intake and flue exhaust through own fumes exhaust duct.

› C13- Wall concentric flue exhaust. The pipes can be split but the outputs must be concentric or close enough to each other to undertake similar wind conditions (within 50 cm).

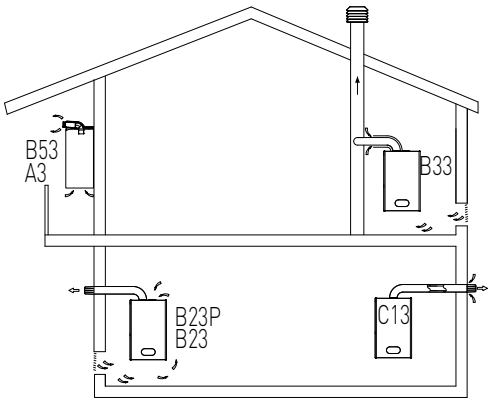


fig. 1

EXHAUST OF COMBUSTION PRODUCTS FOR B-TYPE DEVICES

Gas boilers, provided with connection for flue exhaust pipe, must be directly connected to efficient chimneys or flue exhaust ducts: only if these are missing the combustion products can be exhausted outside directly through the boiler itself.

The connection to the chimney or to the fume exhaust ducts must respect the following requirements:

· Be sealed and made of materials suitable to resist normal mechanical stress, heat, the action of combustion products and any condensate forming;

· have no more than three changes in direction, including the chimney and/or fume exhaust duct inlet connection, made with internal angles greater than 90°. The changes in direction must be made only by using curved elements;

- have the axis of the inlet end perpendicular to the internal wall opposite to the chimney or fume exhaust duct;

- have, along its entire length, a section equal to or greater than that of the connection of the device discharge pipe;

- have no shut-off devices (shutters).

- for direct outdoor discharge there must be no more than two changes in direction.

LOCATIONS VENTING FOR B-TYPE DEVICES

The locations in which the gas boiler are installed gas devices must be vented so as to ensure the amount of air necessary for a regular combustion and for location ventilation. The natural air intake must take place directly through:

- permanent openings on the external walls of the location;

- single or collective, ramified ventilation ducts.

The openings on the external walls of the location must respect the following requirements:

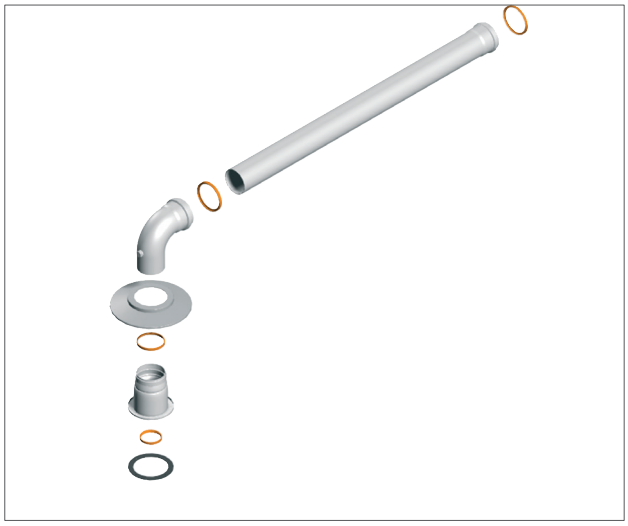
- have a net overall free passage section of at least 6 cm^2 for every kW of heat capacity installed with a minimum of 100 cm^2;

- they must be made so as to make sure that the opening inlets are not obstructed (neither indoor nor outdoor);

- they must be protected with grids, metal meshes, etc. so as to keep the useful section mentioned above.

- they must be placed at a height next to the floor level such as to allow proper operation of the combustion products discharge systems; if such position can not be obtained, please increase by at least 50% the section of the vents.

1.1.18. TYPES OF FUME EXHAUST SYSTEMS



KIT RAIN – Ø 80 HORIZONTAL POLYPROPYLENE PIPE. OUTSIDE INSTALLATION

It allows the flue exhaust through the pipe and the air intake from the environment.

Suitable for condensing boilers only.

It allows the combustion gas exhaust through a polypropylene pipe and the combustion air intake directly from the hole situated on the room sealed chamber plate protected by a metal net.

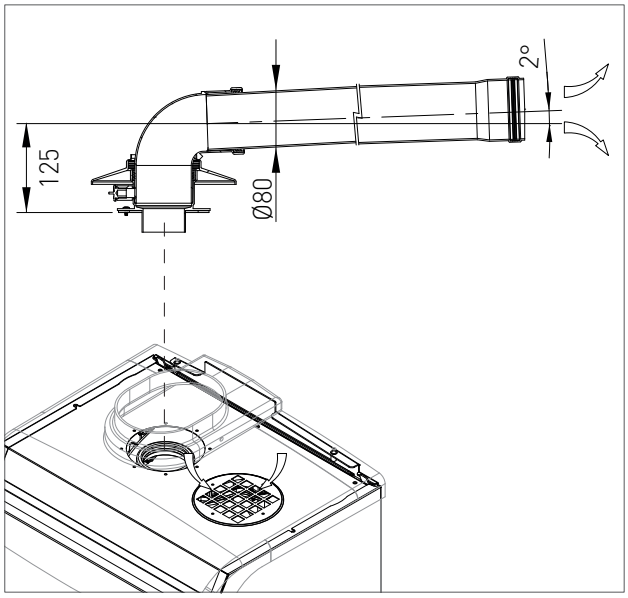
PLEASE SEE THE MAXIMUM EXHAUST LENGTH IN THE TABLE IN CHAPTER "TECHNICAL DATA".

The maximum exhaust length (or linear length) can be calculated summing the length of the linear pipe and the equivalent length of each flue bend additional to the first one.

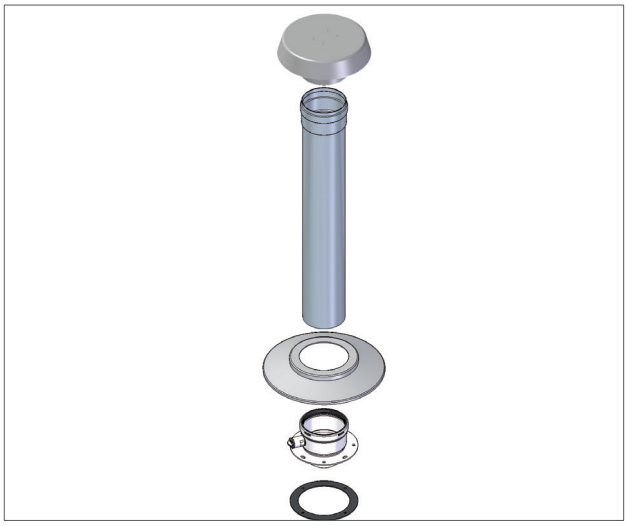
For the further addition of a bend, the linear length must be updated according to the indications below:

Flue bend Ø80 to 90° = 1.5 m

Flue bend Ø80 to 45° = 0.8 m



KIT RAIN L – Ø 80 VERTICAL POLYPROPYLENE PIPE. OUTSIDE INSTALLATION



It allows the flue exhaust from the roof e and the air intake from the environment.

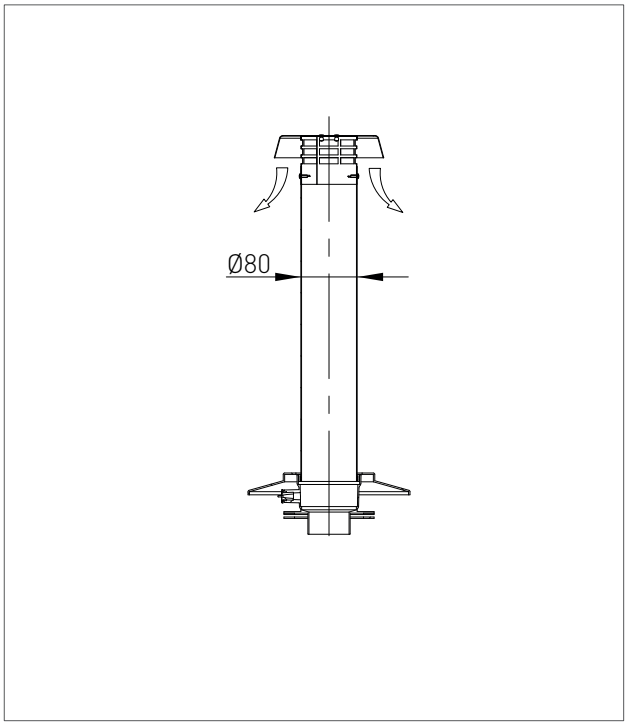
Suitable for condensing boilers only.

It allows the combustion gas exhaust through a polypropylene pipe and the combustion air intake directly from the hole situated on the room sealed chamber plate protected by a metal net.

PLEASE SEE THE MAXIMUM EXHAUST LENGTH IN THE TABLE IN CHAPTER "TECHNICAL DATA".

The maximum exhaust length (or linear length) can be calculated summing the length of the linear pipe and the equivalent length of each flue bend additional to the first one.

For the further addition of a bend, the linear length must be updated according to the indications below:



Flue bend Ø80 to 90° = 1.5 m

Flue bend Ø80 to 45° = 0.8 m

FRONTAL FLUE KIT FOR RAIN SERIES - Ø 60 POLYPROPYLENE HORIZONTAL PIPE FOR OUTDOOR INSTALLATIONS WITHOUT FLUE CHIMNEY.

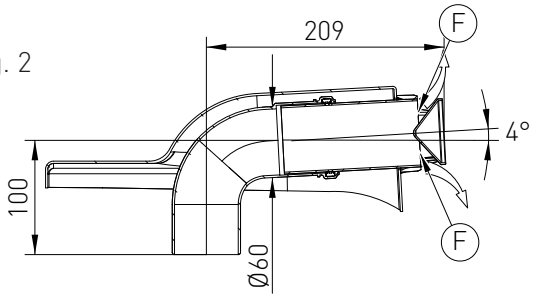
Suitable for condensing boilers only.

It allows the outside combustion flues discharge through a polypropylene pipe, and the air intake directly from the hole which is situated on the room sealed chamber plate, which is protected by a wire mesh.

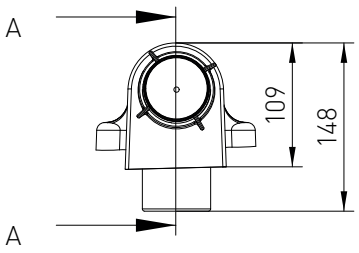
PLEASE NOTE: during the flue analysys tests, place the analyser inside the frontal flue kit terminal slots 'F' (fig. 2).

fig. 1

fig. 2



SECTION A-A



1. SERVICE CENTRE SECTION

All operations described below relative to first start-up, maintenance and replacement should be performed only by qualified personnel

2.1. COMMISSIONING

2.1.1. COMMISSIONING PRELIMINARY OPERATIONS

The commissioning operations consist in checking the correct installation, setting and operation of the device. Proceed as follows:

› check the inner system sealing in accordance with the indications provided by standard and regulations in forced;

› check if the gas used is suitable for the boiler;

› check if the gas capacity and relative pressures comply with those on the data plate;

› check the intervention of the safety device in case of lack of gas;

› make sure that the device supply voltage corresponds with that on the data plate (230 V – 50 Hz) and that the wiring is correct;

› make sure that the grounding system works properly;

› make sure that the combustion air supply and the flues and condensate discharge take place properly in compliance with the Local and National Laws and Standards in force;

› make sure that the flue kit and its connection to the flue exhaust duct comply with the requirements of the Local and National Laws and Standards;

› make sure that the heating system shut-off valves are open;

› make sure that there is no intake of gaseous combustion products within the system;

› make sure that there are no flammable liquids or materials near the device;

› open the boiler gas tap and make sure that there are no gas leaks upstream from the device (the burner gas connection must be checked while the boiler is running);

› in case of new installation of the gas supply network, the air inside the pipes may block the device at its commissioning. You might have to repeat the start-up procedure to purge all the air inside the pipe.

2.1.2. BOILER COMMISSIONING

WARNING

Make sure that the system is correctly filled.

Proceed with boiler commissioning as follows:

Make sure the gas feed valve is switched off

› Power the boiler.

THE START-UP SYSTEM WILL AUTOMATICALLY ACTIVATE THE SYSTEM AIR RELIEF CYCLE FUNCTION DISPLAYED ON SCREEN WITH CODE "F33" (ONLY AT FIRST START-UP WILL LAST FOR 5 MINUTES*). When function "F33" is active, the pump is enabled and the burner start-up request is disabled. The boiler can work normally only after completing the operation.

› Make sure the circulating pump is unblocked.

› If it should be blocked, wait for the circulating pump to activate the automatic reset (lasting 2 min.)

› If the circulating pump should be still blocked, activate the circulating pump automatic reset again (further 2 minutes), and switch off the power supply and switch it on again.

› Open the gas tap.

› Use the button '' to select the desired operation mode. If the symbol is displayed fixed, it means that the function has been activated.

› The burner will start as soon as the thermostat contact is closed ;

› If the flame is missing, the board will repeat the start-up operations after post-ventilation.

› You might have to repeat the start-up operation several times to release all the air inside the gas tube. Before repeating the operation, wait at least 5 seconds from the last start-up attempt and unlock the boiler from "E01" error code by pressing the Reset 'R' key.

(*) The boiler performs the system venting cycle function (5 minutes) only during the first starting. After every water pressure reset the boiler will automatically perform a reduced system venting cycle (2 minutes). During this function the display shows F33 code. The correct boiler operation will be allowed only after this operation has been completed.

SERVICE CENTRE

SERVICE CENTRE

2.1.3. CO2 VALUE CHECK AND CALIBRATION

WARNING

The CO_2 value should be checked with the casing assembled, while the gas valve should be adjusted with the casing open.

To check and calibrate the CO_2 value to minimum and maximum heating power proceed as follows:

FOR MINIMUM HEATING POWER

› Activate the chimney sweeper function (F07) by keeping pressed the key 'R' for 7 seconds (the maximum time of this function is 15 minutes).

› Insert the fumes analyser probe in the suitable 'PF' fumes inlet (fig. 1), then make sure that the CO_2 value complies with the requirements indicated in chapter "Technical data", otherwise adjust using a 40 Torx wrench the screw '2' (fig. 2) of the Off-Set adjuster. To increase the CO_2 value, turn the screw clockwise and vice-versa if you want to decrease it.

FOR MAXIMUM HEATING POWER

› Press the key '+' of the heating temperature setting, to adjust the maximum heating power.

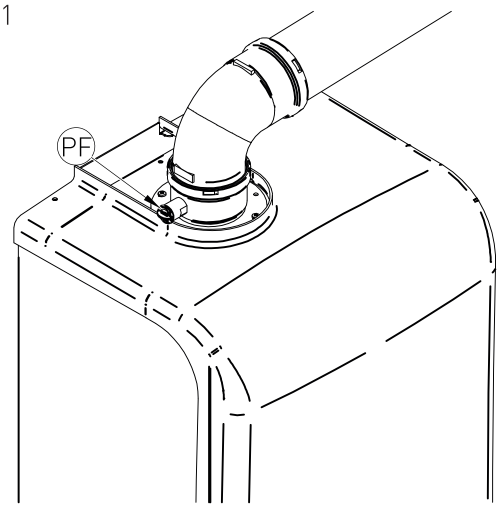
› Make sure that the CO_2 value complies with the indications in "Technical data", otherwise adjust using a 4 Allen wrench the screw '1' (fig. 2) of the gas flow adjuster. To increase the CO_2 value, turn the screw clockwise and vice-versa if you want to decrease it.

› After each adjustment variation on screw '1' (fig. 2) of the gas flow adjuster you have to wait for the boiler to stabilize itself to the set value (about 30 seconds).

› Press the key '−' of the heating temperature setting and make sure that the CO_2 value did not change to minimum, if changed repeat the calibration described in the previous paragraph.

› Deactivate the chimney sweeper function by selecting the OFF mode by using the key ''.

fig. 1



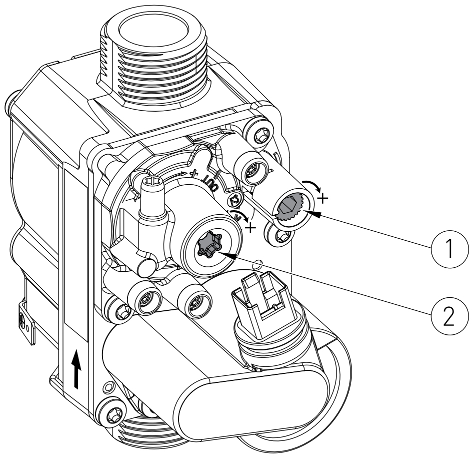
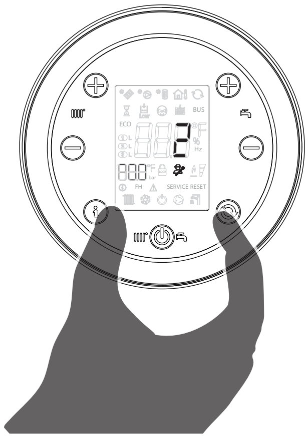


fig. 2

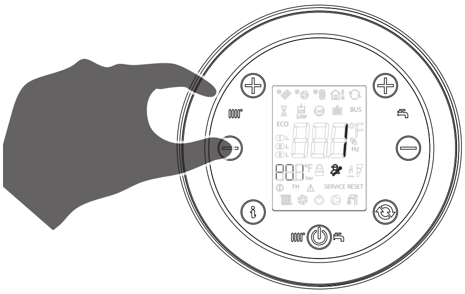
2.1.4. ACCESSING AND PROGRAMMING THE PARAMETERS

To access the parameters menu and adjust the parameter value, follow the procedure described below:

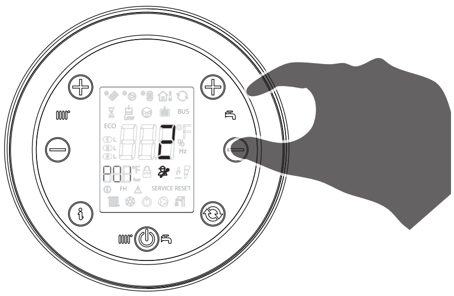
1. Press and hold the ‘i’ and ‘ ’ keys simultaneously and wait until the symbol ‘ ’ appears on the display with the message ‘P00’, and release the ‘i’ and ‘ ’ keys.



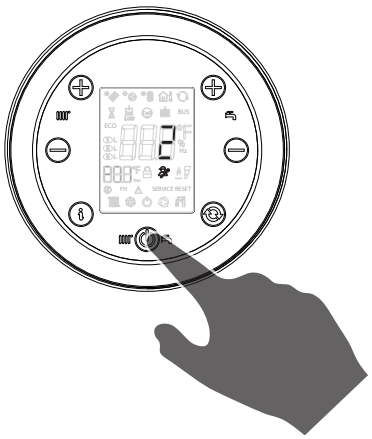
2. Use the keys ‘+’ and ‘–’ of the heating circuit to select the parameter to be edited.



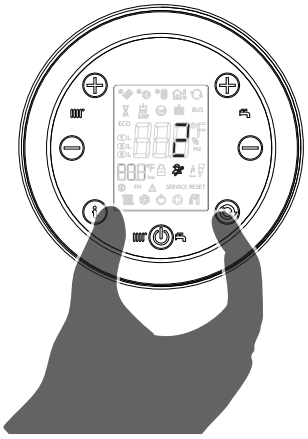
3. Use the keys ‘+’ and ‘–’ of the domestic hot water circuit to change the value of the parameter.



4. Press the '⏻' key to confirm and wait for the display to stop flashing for the setting to take effect.



5. To exit the parameters menu, press and hold the 'ⓘ' and '↻' keys simultaneously and wait for the '⏻' symbol to appear on the display.



2.1.5. PARAMETERS TABLE

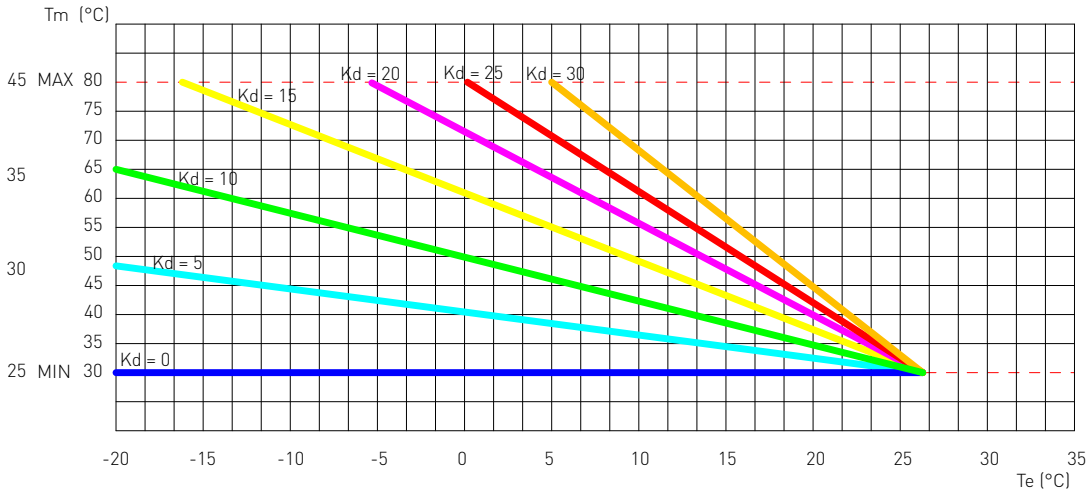
PARAMETER	DESCRIPTION	RANGE	FUNCTION
P00	***BOILER MODEL SELECTION***	0 - 7	0 = R1K 18_24-R2K 24-R2KA 24 (IN ALL VERSIONS)
			1 = R1K 25_28-R2K 28-R2KA 28 (IN ALL VERSIONS)
			2 = R1K 34-R2K 34-R2KA 34 (IN ALL VERSIONS)
			3 = R1K 50
			4 = R1K 57 / R1K 60
			5 = R1K 24 (PX90) - R2K 24 (PX90) - IN ALL VERSIONS
			6 = R1K 28 (PX90) - R2K 28 (PX90) - IN ALL VERSIONS
			7 = R1K 34 (PX90) - R2K 34 (PX90) - IN ALL VERSIONS
P01	***BOILER TYPE SELECTION***	0 - 5	0 = INSTANTANEOUS R2K
			1 = INSTANTANEOUS RKR
			2 = ACCUMULO INFERIORE A 500 LITRI
			3 = ACCUMULO SUPERIORE A 500 LITRI
			4 = INSTANTANEOUS 'COMFORT' - FAST H2O
			5 = HEATING ONLY
P02	***GAS TYPE SELECTION*** ***ATTENTION:*** BEFORE CHANGING THIS PARAMETER VALUE, CAREFULLY READ THE INSTRUCTIONS DESCRIBED IN CHAPTER 'GAS CONVERSION'.	0 - 1	0 = NATURAL GAS
			1 = LPG

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P03	***SETTING THE HEATING TEMPERATURE*** IN THE CASE THE BOILER IS INSTALLED AS PART OF A LOW TEMPERATURE CIRCUIT, INSTALL A SAFETY THERMOSTAT ON THE HEATING FLOW WHICH INTERRUPTS THE OPERATION OF THE BOILER IN THE EVENT OF A HIGH HEATING FLOW TEMPERATURE. THE COMPANY ACCEPTS NO RESPONSIBILITY FOR DAMAGE TO PERSONS OR PROPERTY RESULTING FROM FAILURE TO COMPLY WITH THIS INSTRUCTION.	0 - 1	0 = STANDARD (30-80 °C) (SET BY DEFAULT) 1 = REDUCED FOR UNDER-FLOOR HEATING SYSTEMS (25-45 °C)
P04	***HEATING RAMP-UP*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE TIME, DURING THE START-UP PHASE, THAT THE BOILER TAKES TO REACH THE MAXIMUM POWER SET (ON THE HEATING SIDE).	0 - 60	0 = DISABLED 1-60 =VALUE EXPRESSED IN MULTIPLES OF 10 SECONDS (PRESET TO 20 X 10 = 200 SECONDS)
P05	***WATER HAMMER PROTECTION SELECTION*** BY ENABLING THIS FUNCTION, THE DHW CONTACT IS DELAYED FOR A TIME EQUAL TO THE SET VALUE	0 - 20	0 = DISABLED 1-20 = VALUE EXPRESSED IN SECONDS (PRESET TO 2 SECONDS)
P06	***DOMESTIC HOT WATER KEEPING FUNCTION (FOR ISTANTANEOUS BOILERS ONLY)*** BY ENABLING THIS FUNCTION, IT IS POSSIBLE TO KEEP THE DIVERTER VALVE IN D.H.W. POSITION FOR A TIME EQUAL TO THE PUMP OVERRUN SETTING (SEE PARAMETER P09), IN ORDER TO KEEP THE SECONDARY EXCHANGER WARM.	0 - 1	0 = DISABLED (SET BY DEFAULT) 1 = ENABLED
P07	***HEATING TIMING*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE MINIMUM TIME DURING WHICH THE BURNER IS KEPT OFF ONCE THE HEATING TEMPERATURE HAS REACHED THE TEMPERATURE SET BY THE USER.	0 - 90	VALUE EXPRESSED IN MULTIPLES OF 5 SECONDS (PRESET TO 36 X 5 = 180 SECONDS)
P08	***HEATING PUMP OVERRUN TIMING*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE RUNNING TIME OF THE PUMP AFTER THE MAIN BURNER IS TURNED OFF BY THE ROOM THERMOSTAT.	0 - 90	VALUE EXPRESSED IN MULTIPLES OF 5 SECONDS (PRESET TO 36 X 5 = 180 SECONDS)

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P09	***D.H.W./STORAGE PUMP OVERRUN TIMING*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE RUNNING TIME OF THE PUMP AFTER THE DHW TAP IS CLOSED OR WHEN REACHING THE DHW STORAGE TANK SET TEMPERATURE	0 - 90	VALUE EXPRESSED IN MULTIPLES OF 5 SECONDS (PRESET TO 18 X 5 = 90 SECONDS)
P10	***FAN MINIMUM SPEED ADJUSTMENT (D.H.W MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE FAN MINIMUM SPEED WHILE IN DHW MODE, THAT CORRESPONDS TO THE MINIMUM BURNER POWER DURING A D.H.W. MODE REQUEST. THE VALUE IS PRE-SET BASED ON THE SET POWER (SEE PARAMETER P00) AND ON THE GAS TYPE (SEE PARAMETER P02)	SEE CHAPTER "HEAT INPUT / FAN FREQUENCY DIAGRAM"	VALUE EXPRESSED IN HERTZ (1HZ = 30 RPM)
P11	***FAN MAXIMUM SPEED ADJUSTMENT (D.H.W. MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE FAN MAXIMUM SPEED WHILE IN D.H.W. MODE, THAT CORRESPONDS TO THE MAXIMUM BURNER POWER DURING A D.H.W. MODE REQUEST. THE VALUE IS PRE-SET BASED ON THE SET POWER (SEE PARAMETER P00) AND ON THE GAS TYPE (SEE PARAMETER P02)	SEE CHAPTER "HEAT INPUT / FAN FREQUENCY DIAGRAM"	VALUE EXPRESSED IN HERTZ (1HZ = 30 RPM)
P12	***FAN MINIMUM SPEED ADJUSTMENT (HEATING MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE FAN MINIMUM SPEED WHILE IN HEATING MODE, THAT CORRESPONDS TO THE MINIMUM BURNER POWER DURING A HEATING REQUEST [SEE CHAPTER 'HEAT INPUT DIAGRAM (KW) / ELECTRIC FAN FREQUENCY (HZ)']. THE VALUE IS PRE-SET BASED ON THE SET POWER (SEE PARAMETER P00) AND ON THE GAS TYPE (SEE PARAMETER P02)	SEE CHAPTER "HEAT INPUT / FAN FREQUENCY DIAGRAM"	VALUE EXPRESSED IN HERTZ (1HZ = 30 RPM)
P13	***FAN MAXIMUM SPEED ADJUSTMENT (HEATING MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE FAN MAXIMUM SPEED WHILE IN HEATING MODE, THAT CORRESPONDS TO THE MAXIMUM BURNER POWER DURING A HEATING REQUEST [SEE CHAPTER 'HEAT INPUT DIAGRAM (KW) / ELECTRIC FAN FREQUENCY (HZ)']. THE VALUE IS PRE-SET BASED ON THE SET POWER (SEE PARAMETER P00) AND ON THE GAS TYPE (SEE PARAMETER P02).	SEE CHAPTER "HEAT INPUT / FAN FREQUENCY DIAGRAM"	VALUE EXPRESSED IN HERTZ (1HZ = 30 RPM)

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P14	***STARTING STEP ADJUSTMENT*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE FAN SPEED DURING START-UP. THE VALUE IS PRE-SET BASED ON THE SET POWER (SEE PARAMETER P00) AND ON THE GAS TYPE (SEE PARAMETER P02).	SEE CHAPTER "HEAT INPUT / FAN FREQUENCY DIAGRAM"	VALUE EXPRESSED IN HERTZ (1HZ = 30 RPM)
P15	***LEGIONELLA PREVENTION FUNCTION (FOR STORAGE BOILERS ONLY)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO ACTIVATE/ DEACTIVATE THE DHW STORAGE TANK "LEGIONELLA-PREVENTION" HEAT TREATMENT. EVERY 7 DAYS THE TEMPERATURE OF THE WATER INSIDE THE STORAGE TANK IS RAISED OVER 60 °C THUS GENERATING A RISK OF SCALDING. KEEP THIS D.H.W. HEAT TREATMENT UNDER CONTROL (AND INFORM ALL USERS) TO AVOID UNPREDICTABLE DAMAGES TO PEOPLE, ANIMALS AND PROPERTY. IF NECESSARY, A THERMOSTATIC VALVE MUST BE INSTALLED AT THE D.H.W. OUTLET TO PREVENT SCALDING.	0 - 2	0 = DISABLED 1 =ENABLED ONE HOUR AFTER IGNITION (PRESET AS STANDARD ON STORAGE BOILERS) 2 =ENABLED IMMEDIATELY AFTER IGNITION

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P16	***CLIMATE COMPENSATION CURVE*** ***(ONLY WITH OUTDOOR TEMPERATURE SENSOR CONNECTED)*** IT IS POSSIBLE TO CONNECT AN OUTDOOR TEMPERATURE SENSOR (SEE CHAPTER 'ELECTRICAL CONNECTION') THAT AUTOMATICALLY CHANGES THE HEATING FLOW TEMPERATURE BASED ON THE DETECTED OUTDOOR TEMPERATURE. THE EXTENT OF THE CORRECTION DEPENDS ON THE KD THERMO-ADJUSTMENT VALUE SET (SEE CHART). THE SELECTION OF THE CURVE IS DETERMINED BY THE MAXIMUM HEATING FLOW TEMPERATURE ™ AND THE MINIMUM OUTDOOR TEMPERATURE (TE) TAKING INTO ACCOUNT THE HOUSE INSULATION DEGREE. THE VALUES OF THE HEATING FLOW TEMPERATURES TM, REFER TO STANDARD SYSTEMS 30-80 °C OR UNDER-FLOOR SYSTEMS 25-45 °C. THE SYSTEM TYPE CAN BE SET FROM PARAMETER P03.	0 - 30	(SET BY DEFAULT AT 15) THE NUMBER OF THE VALUE CORRESPONDS TO 'KD' CURVES SHOWN IN THE CHART (SEE BELOW).



P17	***ACTIVATION / DEACTIVATION OF THE POWER MODULATION FUNCTION BASED ON THE FLUE TEMPERATURE***	0 - 1	0 = DISABLED 1 = ENABLED

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P18	***SELECTION OF FLUE GAS TEMPERATURE IN WHICH THE POWER MODULATION BEGINS*** THE FUNCTION CAN BE ACTIVATED BY PARAMETER P17. WHEN THE FUNCTION IS ACTIVATED, THE DISPLAY WILL SHOW 'EH ON' (UPON DEACTIVATION, 'EH OFF' WILL BE DISPLAYED). THE ACTIVATION OF THE FUNCTION WILL BE SHOWN ON THE DISPLAY ONLY AT THE EFFECTIVE START OF THE POWER MODULATION, WITH THE WORDING 'EH'.	60 - 95	THE VALUE IS EXPRESSED IN °C (PRE-SET ON 95 °C)
P19	***MINIMUM SETPOINT (HEATING MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE USER-ADJUSTABLE MINIMUM HEATING TEMPERATURE.	20 - 40	THE VALUE IS EXPRESSED IN °C (PRESET TO 30 °C)
P20	***MAXIMUM SETPOINT (HEATING MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE USER-ADJUSTABLE MAXIMUM HEATING TEMPERATURE.	40 - 90	THE VALUE IS EXPRESSED IN °C (PRESET TO 80 °C)
P21	***MAXIMUM SETPOINT (D.H.W. MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE USER-ADJUSTABLE MAXIMUM D.H.W. TEMPERATURE.	45 - 75	THE VALUE IS EXPRESSED IN °C (PRESET TO 60 °C)
P22	***FLOW-RETURN Δ T SET POINT*** ***(ONLY WITH MODULATING PUMP AND RETURN SENSOR CONNECTED)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE TEMPERATURE DIFFERENCE BETWEEN FLOW AND RETURN	0 10 - 40	0 = DISABLED THE VALUE IS EXPRESSED IN °C (PRESET TO 20 °C)
P23	***MODULATING PUMP MINIMUM SPEED*** ***(ONLY WITH MODULATING PUMP AND RETURN SENSOR CONNECTED)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE MINIMUM SPEED VALUE OF THE MODULATING PUMP DURING A HEATING DEMAND.	30 - 50	VALUE EXPRESSED IN PERCENTAGE (PRESET TO 50%)
P24	***MODULATING PUMP MAXIMUM SPEED*** ***(ONLY WITH MODULATING PUMP AND RETURN SENSOR CONNECTED)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE MAXIMUM SPEED VALUE OF THE MODULATING PUMP DURING A HEATING DEMAND.	50 - 100	VALUE EXPRESSED IN PERCENTAGE (PRESET TO 100 %)

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P25	***D.H.W STORAGE TANK RESTORE MODE DIFFERENTIAL (FOR STORAGE BOILERS ONLY)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE DIFFERENATIAL VALUE OF THE STORAGE TANK RESTORE MODE, COMPARED TO THE USER D.H.W. TEMPERATURE SETTING.	3 - 9	VALUE EXPRESSED IN °C (PRE-SET ON 9°C)
P26	***MODBUS ADDRESS*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE MODBUS ADDRESS IN CASE OF CASCADE SYSTEM INSTALLATION.	1 - 96	BOILER NUMBERING FOR MODBUS (PRESET TO 10)
P27	***MODBUS COMMUNICATION BAUD RATE*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SELECT THE MODBUS COMMUNICATION BAUD RATE SUPPORTED BY THE SAME INTERFACE.	0 - 5	0 = 9600 (SET BY DEFAULT) 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 19200
P28	***MODUBUS MODE***	0 - 2	0 = ENABLED 1 = ENABLED WITH LOCAL SETTINGS 2 = DISABLED (SET BY DEFAULT)
P29	***PUMP OVERRUN ΔT (HEATING MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE TEMPERATURE DIFFERENCE FROM THE MAIN BURNER SHUT-OFF, DUE TO THE INTERVANTION OF THE ROOM THERMOSTAT, TO THE SWITCH-OFF OF THE PUMP IN HEATING MODE.	0 - 25	VALUE EXPRESSED IN °C (PRE-SET TO 10°C)

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P30	***PUMP OVERRUN ΔT (DHW MODE/STORAGE MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE TEMPERATURE DIFFERENCE AFTER THE DHW TAP IS CLOSED OR WHEN REACHING THE DHW STORAGE TANK SET TEMPERATURE, TO THE SWITCH-OFF OF THE PUMP IN D.H.W. MODE.	0 - 25	VALUE EXPRESSED IN °C (PRE-SET TO 10°C)
P31	***FROST PROTECTION TEMPERATURE SETTING (HEATING MODE)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE HEATING WATER TEMPERATURE VALUE AT WHICH THE FROST PROTECTION SYSTEM IS ACTIVATED.	5 - 12	VALUE EXPRESSED IN °C (PRE-SET TO 12°C)
P32	***FLOW-METER ACTIVATION*** ***(ONLY WITH FLOW-METER KIT CONNECTED - CODE 65-0712)*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO ACTIVATE THE FLOW-METER FOR THE HEATING FLOW RATE DETECTION AND TO MANAGE THE BOILER START-UP BY THE FLOW RATE VALUE.	0 - 2	0 = DISABLED (SET BY DEFAULT) 1 = ENABLED 2 = FLOWMETER ENABLED FOR GAS HEAT PUMP (HYDRID BOILER)
P33	***MINIMUM BOILER ACTIVATION THRESHOLD THROUGH THE FLOW-METER*** ***(ONLY IF PARAMETER P32 IS SET ON THE VALUE '1')*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE MINIMUM WATER FLOW RATE REQUIRED TO ACTIVATE THE BOILER.	3,5 - 12,3	VALUE EXPRESSED IN L/MIN (PRESET TO 5,3 L/MIN)

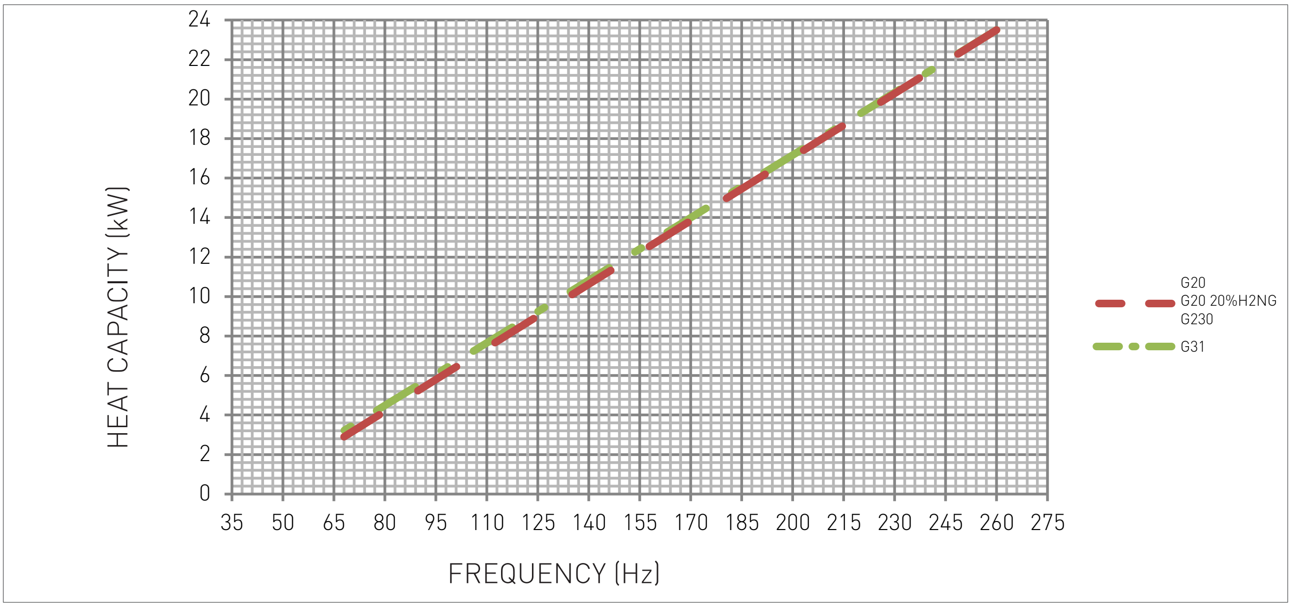
PARAMETER	DESCRIPTION	RANGE	FUNCTION
P34	**ACTIVATION OF THE AUXILIARY RELAY "RA" ON THE P.C.B. (SEE CHAPTER: OPTIONAL ELECTRICAL CONNECTIONS)** THROUGH THIS PARAMETER, IT IS POSSIBLE TO MANAGE THE TYPE OF FUNCTIONING OF THE AUXILIARY RELAY ON THE P.C.B., M0410 CLAMP. WHEN THE VALUE OF THE PARAMETER IS SET TO '3', THE ENABLING OR DISABLING OF THE AUXILIARY RELAY IS GIVEN BY THE "TP" CONTACT (M0403 CLAMP, SEE CHAPTER: OPTIONAL ELECTRICAL CONNECTIONS). WHEN THE "TP" CONTACT IS OPEN, THE RELAY STAYS ENERGIZED (WORKING RECIRCULATION PUMP) WHILE WHEN THE "TP" CONTACT IS CLOSED, THE RELAY IS DE-ENERGIZED (NOT WORKING RECIRCULATION PUMP). WHEN THE PARAMETER VALUE IS SET TO '6', THE BURNER ACTIVATES AFTER ONE MINUTE FROM THE REMOTE CONTROL REQUEST.	0 - 6	0 = DISABLED (SET BY DEFAULT) 1 = HEATING CIRCUIT BOOSTER PUMP 2 = D.H.W. BOOSTER PUMP 3 = RECIRCULATION PUMP 4 = REMOTE INDICATOR LIGHT FOR BOILER SHUTDOWN WARNING (SEE CHAPTER: OPTIONAL ELECTRICAL CONNECTIONS) 5=NON MODULATING BOILER PUMP 6= ZONE VALVE REMOTE CONTROL
P35	**SAFETY CHECK ENABLING FOR INSUFFICIENT CIRCULATION DURING IGNITION** BY ACTIVATING THIS PARAMETER, THE CORRECT FUNCTIONINGOF THE PUMP IS CHECKED AT EACH BURNER IGNITION. THIS CHECK ALLOWS TO PROTECT THE HEAT EXCHANGER AND OTHER PARTS FROM EXCESSIVE NON-DISSIPATED HEAT, IN CASE THE PUMP DOES NOT WORK PROPERLY.	0 - 1	0 = DISABLED 1 = ENABLED (SET BY DEFAULT)
P36	**ACTIVATION AND OPERATION MODE OF THE 'ID1' CONTACT (SEE CHAPTER "OPTIONAL ELECTRICAL CONNECTIONS")**	0 - 4	0 = SECONDARY ROOM THERMOSTAT (SET BY DEAFULT) 1 = EXTERNAL CONTACT FOR HEATING ACTIVATION 2 = RECIRCULATION ACTIVATION 3 = TANK CLOCK 4 = TELEPHONE DIALER

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P37	**ACTIVATION AND OPERATION MODE OF THE 'ID2' CONTACT (THROUGH ACCESSORY CODE 40-00751) SEE CHAPTER "OPTIONAL ELECTRICAL CONNECTIONS"**	0 - 7	0 = DISABLED (SET BY DEFAULT)
			1 = AIR PRESSURE-SWITCH SAFETY
			2 = EXTERNAL CONTACT FOR HEATING ACTIVATION
			3 = RECIRCULATION ACTIVATION
			4 = TANK CLOCK
			5 = DHW CLOCK
			6 = NOT APPLICABLE
			7 = TELEPHONE DIALER
P38	***MODULATING PUMP SPEED PERCENTAGE DURING THE FLOW TO THE 3-WAY VALVE***	0 - 100	VALUE EXPRESSED IN PERCENTAGE (PRESET TO 100 %)
P39	***MODULATING PUMP SPEED REDUCTION TIME DURING THE FLOW TO THE 3-WAY VALVE***	0 - 10	VALUE EXPRESSED IN SECONDS (PRESET TO 0)
P40	***ACTIVATION OF THE OPTIONAL HOT WATER SENSOR AT REMOTE TANK OUTLET TO BOILER AND SELECTION OF BURNER IGNITION DIFFERENTIAL***	0 - 10	0 = DISABLED (SET BY DEFAULT)
			1÷ 10 = VALUE EXPRESSED IN °C
P41	***STORAGE TANK PREHEATING CYCLE INTEGRATION***	0 - 1	0 = DISABLED (SET BY DEFAULT)
			1 = ENABLED

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P42	***AUXILIARY TEMPERATURE DISPLAY*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO ENABLE THE TEMPERATURE TO BE DISPLAYED, IN THE SMALL FRAME OF THE DISPLAY, ACCORDING TO THE SET VALUE.	0 - 4	0 = DISABLED (SET BY DEFAULT) 1 = DHW TEMPERATURE DISPLAY 2 = OUTDOOR TEMPERATURE DISPLAY 3 = FLUE TEMPERATURE DISPLAY 4 = MIXED CIRCUIT SENSOR TEMPERATURE DISPLAY
P43	***START CYCLE TEMPERATURE OF THE "SCREED HEATING FUNCTION"*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE HEATING CYCLE START TEMPERATURE FOR THE SCREED HEATING FUNCTION. (TO ACTIVATE THE SCREED HEATING FUNCTION SEE CHAPTER 'FUNCTION CODES').	20 - 45	VALUE EXPRESSED IN °C (PRESET TO 25 °C)
P44	***END-CYCLE TEMPERATURE OF THE "SCREED HEATING FUNCTION"*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE END-CYCLE TEMPERATURE FOR THE SCREED HEATING FUNCTION. (TO ACTIVATE THE SCREED HEATING FUNCTION SEE CHAPTER 'FUNCTION CODES').	20 - 45	VALUE EXPRESSED IN °C (PRESET TO 45 °C)
P45	***STAND-BY POSITION OF THE DIVERTER VALVE*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO SET THE POSITION OF THE DIVERTER VALVE WHEN NO OPERATION REQUEST IS ACTIVE.	0 - 1	0 = DHW POSITION (SET BY DEFAULT) 1 = HEATING POSITION
P46	***PUMP DIAGNOSTICS ACTIVATION*** THROUGH THIS PARAMETER, IT IS POSSIBLE TO ENABLE THE DISPLAY OF THE PUMP DIAGNOSTICS ACCORDING TO THE PUMP TYPE.	0 - 2	0 = DISABLED (SET BY DEFAULT) 1 = ENABLED FOR WILO PUMP 2 = ENABLED FOR SHINHOO PUMP

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P47	***ACTIVATION OF DHW EXTERNAL MIXING VALVE (OPTIONAL KIT CODE: 65-01187)***	0 - 1	0 = DISABLED (SET BY DEFAULT) 1 = MIXING VALVE ENABLED
P48	***ACTIVATION OF AUXILIARY SENSOR CABLE / 0-10V***	0 - 4	0 = DISABLED (SET BY DEFAULT) 1 = OLD VERSION FLUE SENSOR 2 = TEMPERATURE CONTROL WITH 0-10V 3 = OUTPUT CONTROL WITH 0-10V 4 = INCOMING DHW SENSOR (NTC 10K) - OPTIONAL
P49	***ACTIVATION OF SCHEDULED ANNUAL MAINTENANCE DEADLINE WARNING*** WHEN THE 365 DAYS HAVE EXPIRED SINCE ITS ACTIVATION, THE FLASHING HOURGLASS AND TECHNICIAN ICONS AND THE FIXED 'SERVICE' ICON WILL APPEAR ON THE DISPLAY. AFTER PERFORMING THE SCHEDULED ANNUAL MAINTENANCE, YOU CAN RESTART THE 365-DAY TIMER BY SIMULTANEOUSLY PRESSING THE 'MODE' AND ' - ' OF THE HEATER, UNTIL THE ICONS DISAPPEAR.	0 - 1	0 = DISABLED (SET BY DEFAULT) 1 = ENABLED

2.1.6. ELECTRIC FAN FREQUENCY/HEAT CAPACITY DIAGRAM



GAS TYPE		MINIMUM FREQUENCY	MAXIMUM FREQUENCY	STARTING STEP ADJUSTMENT
G20	Hz	68	260	150
G20 20%H2NG	Hz	68	260	
G31	Hz	65	260	
G230	Hz	68	260	

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2.2. MAINTENANCE

2.2.7. GENERAL MAINTENANCE WARNINGS

DANGER

Before each components cleaning or replacement operation, ALWAYS cut off the POWER, WATER and GAS supply of the boiler.

WARNING

To ensure greater life span and proper operation of the device, during the maintenance operations use only original spare parts.

ATTENTION

To ensure the efficiency and safety of the device, the maintenance operations must be realized on an annual basis. The operations described below, are essential to the validity of the standard warranty and must be performed by professionally qualified personnel in accordance with current legislation and authorized

Please perform the following operations once a year:

- Check that the system's water PH is between 6.5 and 8.5;
- check the pre-load pressure of the expansion vessel;
- check the sealing of the water components, and replace if necessary the gaskets;
- check that the wiring is performed in compliance with the requirements in the boiler instruction manual;
- check the wiring inside the control panel;
- remove and clean the burner from oxidation;
- check the integrity and the position of the sealed chamber sealing gasket;
- check the primary exchanger, if necessary, clean it;
- check the operation of the gas light up and safety systems. If necessary, remove and clean the flame detection and light up electrodes from incrustations paying attention to respect the distances with respect to the burner;
- check the sealing of the gas components, and replace if necessary the gaskets;
- visually check the flame and the condition of the combustion chamber;

DANGER

- Verify that the concentration of CO in the flue gas does not exceed 400 ppm, otherwise an immediate verification and repair is required. If the situation cannot be resolved immediately, the appliance must be put out of operation.

- if necessary make sure that the combustion is suitably adjusted and if required proceed as indicated in section "CO2 VALUE CHECK AND CALIBRATION";
- periodically check the integrity of the fume exhaustion system for safety and proper operation;
- make sure that the permanent ventilation outlets are present, correctly sized and functioning, based on the installed devices. Respect the requirements provided by Local and National legislation;
- check the heating circuit safety systems: limit temperature safety thermostat; limit pressure safety;
- check the proper operation of the condensate draining system, including the devices outside the boiler such as condensate collection devices

installed along the path of the fume exhaust duct or neutralization devices for acid condensate. Check that the liquid flow is not obstructed and that there are no combustion gas refluxes inside the internal system;

› check the flow and temperature of domestic hot water.

2.2.8. TECHNICAL DATA

Model		R2K 24 Rain H
CE certification	no.	0476CQ0134
Gas category		II2EYM3P
Flue system type	type	A3-B23-B23p-B33-B53-C13
Energy efficiency 92/42 CEE	no. stars	4
Energy efficiency EN13203-1	no. stars	3
Heat Input max (C.H.)	kW	23,50
Heat Input max (D.H.W.)	kW	23,50
Heat Input min (C.H.)	kW	2,90
Heat Input min (D.H.W.)	kW	2,90
Heat Input min LPG	kW	2,90
Heat Input max (C.H.) 20%H2NG	kW	22,50
Heat Input max (D.H.W.) 20%H2NG	kW	22,50
Heat Input min (C.H.) 20%H2NG	kW	2,90
Heat Input min (D.H.W.) 20%H2NG	kW	2,90
Heat Output max. - 60/80°C	kW	22,94
Heat Output min. - 60/80°C	kW	2,75
Heat Output max. - 30/50°C	kW	24,79
Heat Output min. - 30/50°C	kW	3,02
Heat Output max at 30% Heat Input average - return 30°C	kW	4,26
Efficiency at 100% Heat Input - 60/80°C	%	97,60%
Efficiency at 30% Heat Input - return 30°C	%	107,60%
Heat Input average efficiency - 60/80°C	%	97,20%
Efficiency at 30% Heat Input average - return 30°C	%	107,70%
Efficiency Heat Output min. - 60/80°C	%	94,70%
Efficiency at 100% Heat Input - 30/50°C	%	105,50%
Efficiency Heat Output min - 30/50°C	%	104,20%
Maximum combustion efficiency	%	97,80%
Minimum combustion efficiency	%	98,10%
Flue efficiency losses with burner on (Heat Input max.)	%	2,20%
Flue efficiency losses with burner on (Heat Input min.)	%	1,90%
Flue temperature - Heat Input max.	°C	64,30
Flue temperature - Heat Input min.	°C	58,50
Maximum flue temperature	°C	102,00
CO2 - Heat Input max. - G20	%	9,30 - 9,10%
CO2 - Heat Input min. - G20	%	9,00 - 8,80%
CO2 - Heat Input max. - G20 20%H2NG	%	8,3 - 7,9%
CO2 - Heat Input min. - G20 20%H2NG	%	8,1 - 7,7%
O2 - Heat Input max. - G20 20%H2NG	%	5,4 - 6,1%
O2 - Heat Input min. - G20 20%H2NG	%	5,8 - 6,5%
CO2 - Heat Input max. - G31	%	10,40 - 10,20%
CO2 - Heat Input min. - G31	%	10,00 - 9,80%
CO2 - Heat Input max. - G230	%	10,20 - 10,00%
CO2 - Heat Input min. - G230	%	9,90 - 9,70%

CO - Heat Input max.	ppm	77
CO - Heat Input min.	ppm	1
Weighted CO (0% O2)	ppm	5
Casing efficiency losses (Heat Input max.)	%	0,20%
Fumes mass - Heat Input max.	g/s	10,38
Fumes mass - Heat Input min.	g/s	1,26
NOx class	class	6
Weighted NOx (0% O2) ppm	ppm	20
Weighted NOx (0% O2) on GCV mg/kWh	mg/kWh	32
Central heating circuit		
Temperature setting - Central heating	°C	30-80 / 25-45
Max. operating temperature - Central heating	°C	80
Max. operating pressure - Central heating	bar	3
Min. operating pressure - Central heating	bar	0,3
Expansion vessel pre-charge pressure	bar	1
Available pump head with 1000 l/h flow rate	kPa	0
Expansion vessel capacity (C.H.)	litres	8
Domestic Hot Water (D.H.W.) circuit		
Temperature setting - D.H.W.	°C	35-60
Max. operating pressure - D.H.W.	bar	6
Min. operating pressure - D.H.W.	bar	0,5
D.H.W. flow rate - continuous flow - Δt 25°C	litres/min	13,5
D.H.W. flow rate - continuous flow - Δt 30°C	litres/min	11,2
D.H.W. flow rate - continuous flow - Δt 35°C	litres/min	9,6
Dimensions		
Width	mm	420
Depth	mm	370
Height	mm	787
Gross weight	Kg	36,4
Hydraulic Connections		
C.H. Flow	Ø	3/4"
Cold water inlet	Ø	1/2"
D.H.W. outlet	Ø	1/2"
Gas	Ø	3/4"
C.H. Return	Ø	3/4"
Flue systems		
Fan - Max. available pressure	Pa	200
Fan - Min. available pressure	Pa	21
Flue bend 45° MF Ø60/100 - Pressure loss	m	0,6
Flue bend 90° MF Ø60/100 - Pressure loss	m	1
Flue extension MF Ø60/100 L=1000 - Pressure loss	m	1
Flue bend 45° MF Ø80/125 - Pressure loss	m	0,5
Flue bend 90° MF Ø80/125 - Pressure loss	m	0,8
Flue extension MF Ø80/125 L=1000 - Pressure loss	m	1
Flue adapter Ø80/60 MF - Pressure loss	m	0,4
Flue bend 45° MF Ø60 - Pressure loss	m	0,8
Flue bend 90° MF Ø60 - Pressure loss	m	1,5

Flue extension MF Ø60 L=1000 - Pressure loss	m	1
T-connection MF Ø60 - Pressure loss	m	3,5
Max. Flue length Ø50 - Horiz. Pipe	m	24
Max. Flue length Ø60 - Horiz. Pipe	m	40
Max. Flue length Ø80 - Horiz. Pipe	m	70
Flue bend 45° MF Ø80 - Pressure loss	m	0,8
Flue bend 90° MF Ø80 - Pressure loss	m	1,5
Flue extension MF Ø80 L=1000 - Pressure loss	m	1
T-connection MF Ø80 - Pressure loss	m	3,5
Max. Flue length Ø50 - Vert. Pipe	m	24
Max. Flue length Ø60 - Vert. Pipe	m	40
Max. Flue length Ø80 - Vert. Pipe	m	70
Electrical specifications		
Voltage-frequency	V/Hz	220-230/50
Nominal power consumption	A	0,62
Electric power with boiler OFF	W	3.50
Max Power consumption	W	78
Max Power consumption - boiler pump (100%)	W	40
Protection rating	IP	X5D
Gas supply		
Supply pressure - G20	mbar	20
Supply pressure min. - G20	mbar	17
Supply pressure max. - G20	mbar	25
Fan speed Max. HEATING output - G20	Hz	260
Fan speed Max. D.H.W. output - G20	Hz	260
Fan speed Min. HEATING output - G20	Hz	68
Fan speed Min. D.H.W. output - G20	Hz	68
Gas consumption - G20	m^3/h	2,49
Supply pressure - G20 20%H2NG	mbar	20
Supply pressure min. - G20 20%H2NG	mbar	17
Supply pressure max. - G20 20%H2NG	mbar	25
Fan speed Max. HEATING output - G20 20%H2NG	Hz	260
Fan speed Max. D.H.W. output - G20 20%H2NG	Hz	260
Fan speed Min. HEATING output - G20 20%H2NG	Hz	68
Fan speed Min. D.H.W. output - G20 20%H2NG	Hz	68
Gas consumption - G20 20%H2NG	m^3/h	2,77
Supply pressure - G31	mbar	37
Supply pressure min. - G31	mbar	25
Supply pressure max. - G31	mbar	45
Fan speed Max. HEATING output - G31	Hz	260
Fan speed Max. D.H.W. output - G31	Hz	260
Fan speed Min. HEATING output - G31	Hz	65
Fan speed Min. D.H.W. output - G31	Hz	65
Gas consumption - G31	kg/h	1,83
Supply pressure - G230	mbar	20
Supply pressure min. - G230	mbar	17
Supply pressure max. - G230	mbar	25

Fan speed Max. HEATING output - G230	Hz	260
Fan speed Max. D.H.W. output - G230	Hz	260
Fan speed Min. HEATING output - G230	Hz	68
Fan speed Min. D.H.W. output - G230	Hz	68
Gas consumption - G230	m^3/h	1,93

Technical parameters for boiler space heaters, boiler combination heaters and cogeneration space heaters

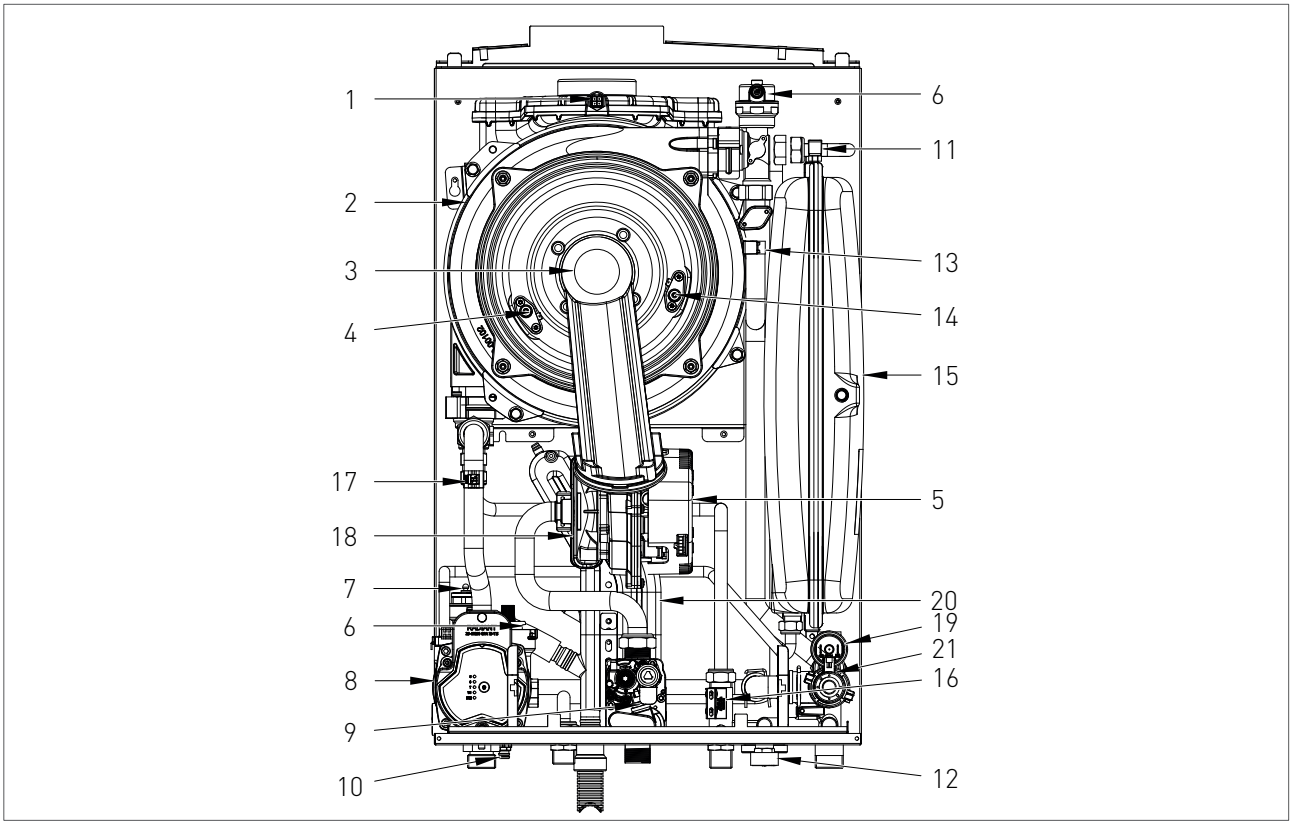
Model		**R2K 24 Rain H**
Condensing boiler	[yes/no]	yes
Low-temperature (**) boiler:	[yes/no]	no
B11 boiler	[yes/no]	no
Cogeneration space heater	[yes/no]	no
If yes, equipped with a supplementary heater	[yes/no]	no
Combination heater	[yes/no]	yes
Rated heat output Prated	kW	23
For boiler space heaters and boiler combination heaters: Useful heat output		
At rated heat output and high-temperature regime (*) P_4	kW	22,9
At 30 % of rated heat output and low-temperature regime (**) P_1	kW	7,6
For cogeneration space heaters: Useful heat output		
At rated heat output of cogeneration space heater with supplementary heater disabled $P_{CHP100+Sup0}$	kW	-
At rated heat output of cogeneration space heater with supplementary heater enabled $P_{CHP100+Sup100}$	kW	-
For cogeneration space heaters: Electrical efficiency		
At rated heat output of cogeneration space heater with supplementary heater disabled $\eta_{el,CHP100+Sup0}$	%	-
At rated heat output of cogeneration space heater with supplementary heater enabled $\eta_{el,CHP100+Sup100}$	%	-
Auxiliary electricity consumption		
At full load elmax	kW	0,038
At part load elmin	kW	0,016
In standby mode PSB	kW	0,004
Seasonal space heating energy efficiency η_s	%	94
Seasonal space heating energy efficiency class		A
For boiler space heaters and boiler combination heaters: Useful efficiency		
At rated heat output and high-temperature regime (*) η_4	%	87,5
At 30 % of rated heat output and low-temperature regime (**) η_1	%	97,0
For cogeneration space heaters: Useful efficiency		
At rated heat output of cogeneration space heater with supplementary heater disabled $\eta_{CHP100+Sup0}$	%	-
At rated heat output of cogeneration space heater with supplementary heater enabled $\eta_{CHP100+Sup100}$	%	-
Supplementary heater		
Rated heat output Psup	kW	-
Type of energy input		-
Other items		
Standby heat loss P_{stby}	kW	0,059
Ignition burner power consumption P_{ign}	kW	0,000

SERVICE CENTRE

Emissions of nitrogen oxides NOx	mg/kWh	32
Annual energy consumption Q_{HE}	kWh / GJ	20513 / 73,85
Sound power level, indoors L_{WA}	dB	52
For combination heaters:		
D.H.W. energy efficiency class		A
Declared load profile		XL
Daily electricity consumption Q_{elec}	kWh	0,146
Water heating energy efficiency η_{wh}	%	86
Daily fuel consumption Q_{fuel}	kWh	23,929

(*) 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).

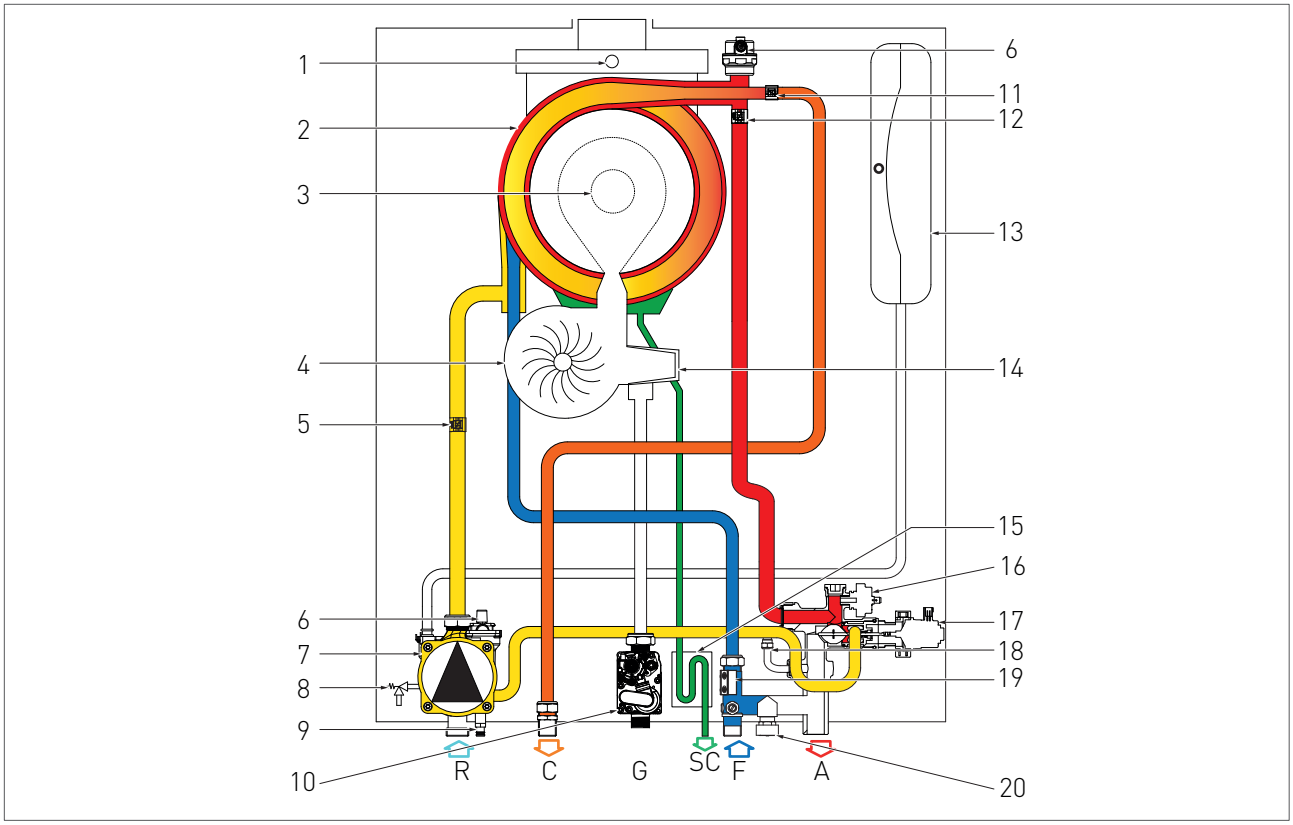
2.2.9. TECHNICAL ASSEMBLY



KEY

1. FLUE SENSOR + FLUE SAFETY THERMO FUSE
2. CONDENSING HEAT EXCHANGER (PIPE IN PIPE)
3. BURNER
4. FLAME DETECTION ELECTRODE
5. FAN
6. AIR VENT VALVE
7. 3 bar SAFETY VALVE
8. MODULATING PUMP
9. GAS VALVE
10. SYSTEM DRAINING TAP
11. D.H.W. SENSOR
12. SYSTEM FILLING TAP
13. HEATING SENSOR + SAFETY THERMOSTAT
14. IGNITION ELECTRODE
15. EXPANSION VESSEL
16. FLOW SWITCH
17. SYSTEM RETURN SENSOR
18. VENTURI
19. WATER PRESSURE SWITCH
20. CONDENSATE SYPHON
21. 3-WAY VALVE

2.2.10. HYDRAULIC BOARD

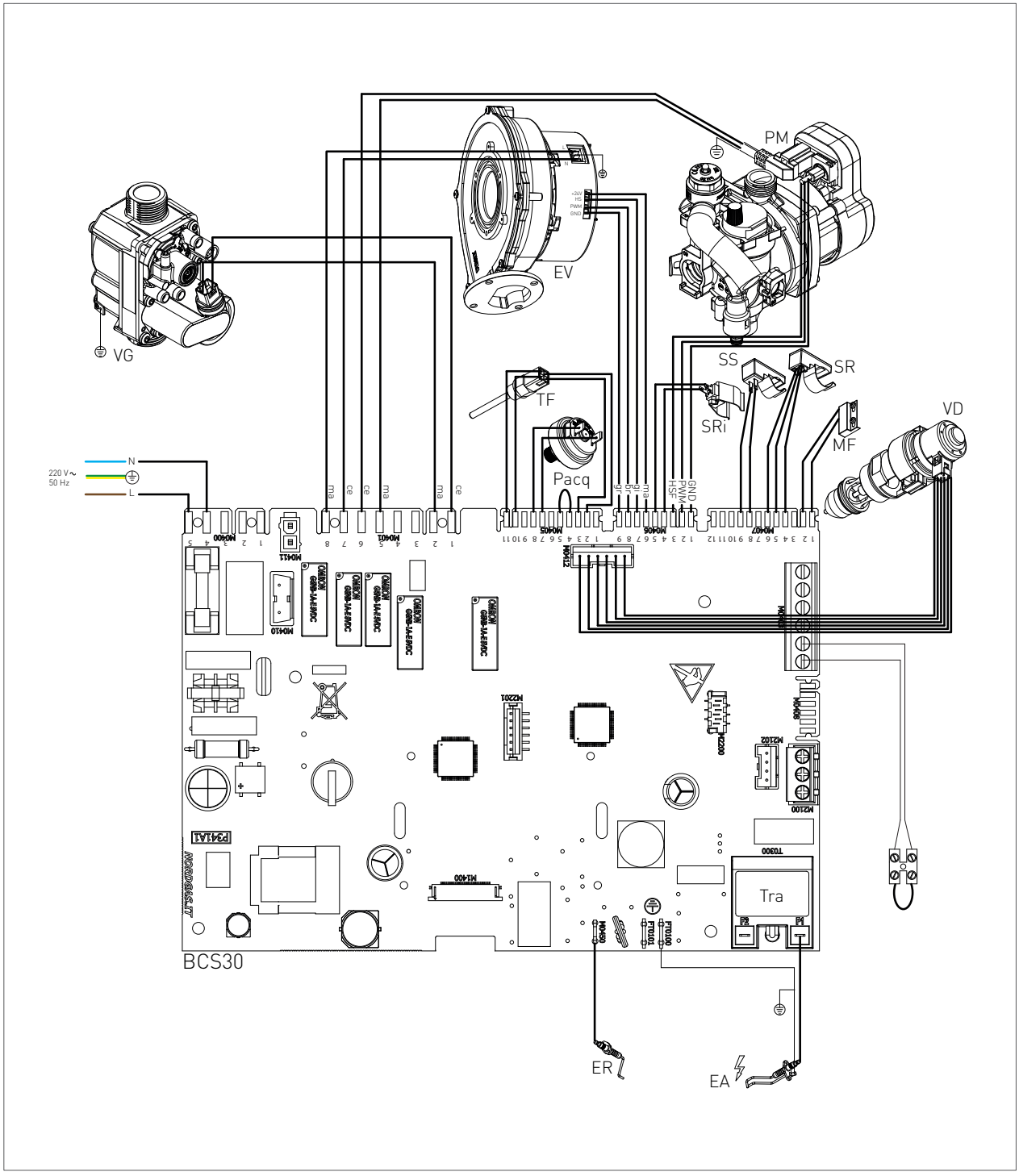


KEY

R. HEATING RETURN
C. D.H.W. OUTLET
G. GAS
SC. CONDENSATE DRAIN
F. COLD WATER INLET
A. HEATING FLOW

1. FLUE SENSOR + FLUE SAFETY THERMO FUSE
2. CONDENSING HEAT EXCHANGER (Pipe in Pipe)
3. BURNER
4. FAN
5. SYSTEM RETURN SENSOR
6. AIR VENT VALVE
7. PUMP
8. 3 bar SAFETY VALVE
9. SYSTEM DRAINING TAP
10. GAS VALVE
11. D.H.W. SENSOR
12. HEATING SENSOR + SAFETY THERMOSTAT
13. EXPANSION VESSEL
14. VENTURI
15. CONDENSATE SYPHON
16. WATER PRESSURE SWITCH
17. 3-WAY VALVE
18. BY-PASS
19. FLOW SWITCH
20. SYSTEM FILLING TAP

2.2.11. WIRING DIAGRAM



EA: IGNITION ELECTRODE	TF: FLUE SENSOR + FLUE SAFETY THERMO FUSE (102°C)	L: LIVE / PHASE	BI: WHITE
ER: ELETTRODO RIVELAZIONE	SS: D.H.W. SENSOR	N: NEUTRAL	GR. GREY
TRA: IGNITION TRANSFORMER	SR: HEATING SENSOR + SAFETY THERMOSTAT	NE: BLACK	
VG: GAS VALVE		CE: BLUE	
EV: FAN	PM: MODULATING PUMP	MA: BROWN	
PACQ:WATER PRESSURE SWITCH	MF: FLOW SWITCH MICRO	AR: ORANGE	
SRI: RETURN SENSOR	VD: 3-WAY VALVE	GI: YELLOW	

2.2.12. ACCESSING THE BOILER

For most control and maintenance operations, the panels of the casing have to be removed.

To remove the panel of the boiler, please follow the instructions below (see fig.1):

› remove the fastening screws (1) placed on the side of the panel flange and remove it;

› remove the fastening screws (2) placed on the upper and lower side of the panel, and remove it by pulling it towards yourself;

› remove the fastening screws (3) placed on the lower side of the boiler and remove the connection cover.

To intervene on the front of the boiler, please proceed as follows:

› remove the fastening screws (4) placed on the front panel;

› grab the front panel and remove it by pulling it towards yourself;

To intervene on the side panels of the boiler, please proceed as follows:

› remove the fastening screws (5) placed on the front edge of the side panel;

› grab the bottom of the panel, and remove it by moving it sideways and pulling it upwards.

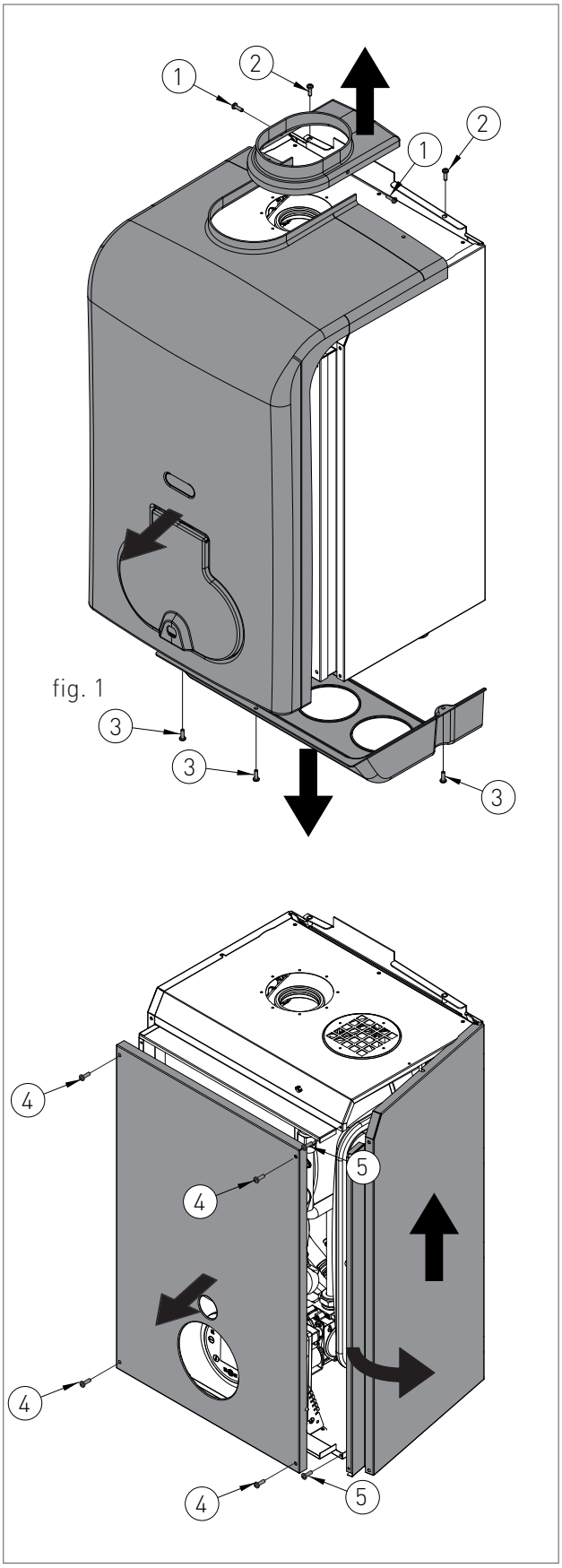


fig. 1

2.2.13. ACCESSING THE ELECTRONIC BOARD

In order ot intervene on the wirings of the control panel, please proceed as follows:

DANGER
Cut off the voltage from the main switch.

› Grab at the same time the support brackets of the control panel (fig. 1) loosening them and turn the panel downwards;

› unscrew the four fastening screws 1 - fig. 1;

› remove the crankcase pulling it upwards.

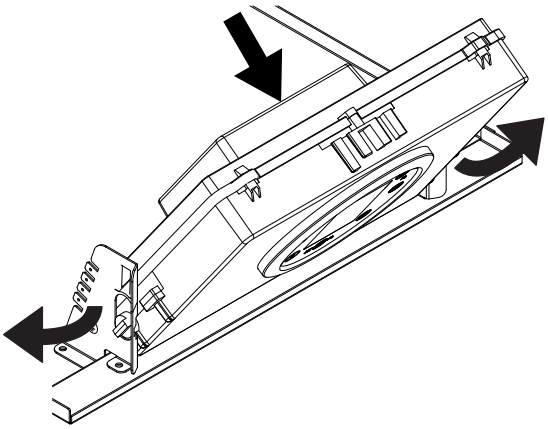
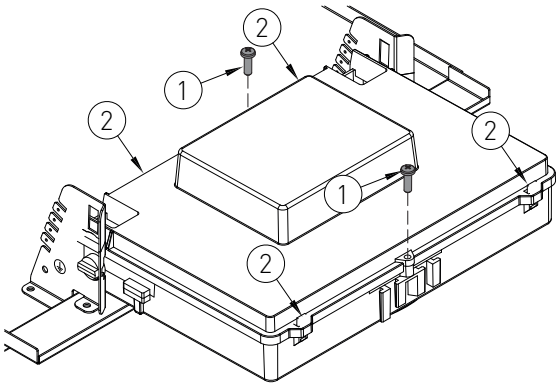
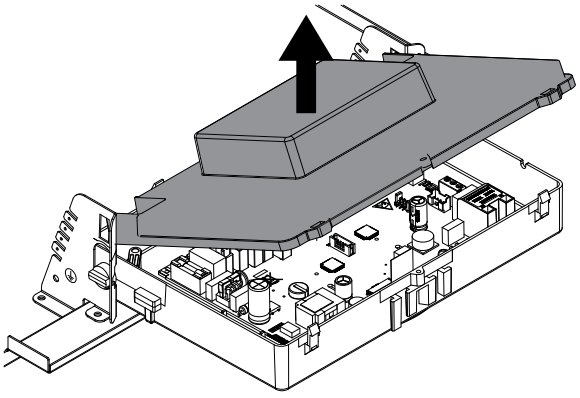


fig. 1





2.2.14. SYSTEM EMPTYING

HEATING SYSTEM EMPTYING

Whenever you need to empty the system, proceed as follows:

› switch the boiler to "WINTER" mode and activate it;

› turn off the main power supply switch;

› wait for the boiler to cool down;

› connect a flexible tube to the system emptying outlet and connect the other end of the tube to a suitable discharge;

› turn the discharge tap of the system 'RS' (fig. 1);

› open the relief valves of the radiators starting from the one at the top and continuing downwards;

› after draining out all water, close the relief valves of the radiators and the emptying tap.

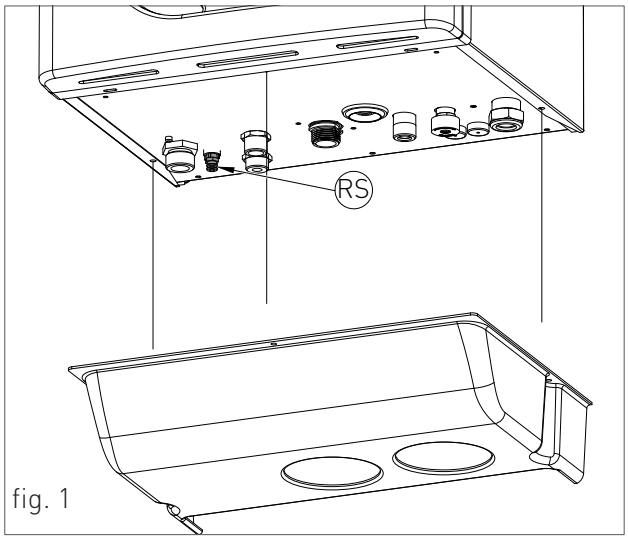


fig. 1

2.2.15. FAULT / ERROR CODES

To display the last 5 fault codes, from the most recent one in chronological order, activate the 'OFF' mode by pressing the FUNCTION '' key and hold down the INFO '' key for 5 seconds. Use keys '' and '' of the heating circuit to scroll through the list of stored faults. To clear the fault history, press the RESET '' key. To exit display mode press the INFO '' key.

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E01	***FLAME BLOCK***	**NO FLAME LIGHT UP**		MANUAL RESET (PRESS THE RESET '' KEY).
		GAS MISSING;	CHECK THE ADDUCTION NETWORK;	
		MASS OR BROKEN START-UP ELECTRODE;	REPLACE IT;	
		GAS VALVE BROKEN;	REPLACE IT;	
		SLOW LIGHT UP TOO LOW ADJUSTMENT;	ADJUST MINIMUM OR SLOW LIGHT UP;	
		VALVE INFEED PRESSURE TOO HIGH (ONLY FOR GPL BOILERS).	CHECK THE MAXIMUM ADJUSTMENT PRESSURE	
		WITH FLAME LIGHT UP		
		NEUTRAL AND PHASE INVERTED POWER SUPPLY;	PROPERLY CONNECT THE POWER SUPPLY;	
		DETECTION ELECTRODE BROKEN;	REPLACE IT;	
		DETECTION ELECTRODE CABLE DISCONNECTED.	CHECK THE WIRING.	
		ELECTRICAL CURRENT PHASE-PHASE	IF THE TENSION MEASURES BETWEEN NEUTRAL AND GROUND IS ALMOST EQUAL TO THE ONE MEASURED BETWEEN PHASE AND GROUND, YOU HAVE TO INSTALL A PHASE-PHASE TRANSFORMER KIT (COD. 88021LA)	
E02	***SAFETY THERMOSTAT (95°C)***	THERMOSTAT CABLE DISCONNECTED;	CHECK THE WIRING:	AUTOMATIC.
		BROKEN THERMOSTAT.	REPLACE IT.	

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E03	***FUMES SAFETY THERMOFUSE (102°C)***	THERMOFUSE BROKEN;	REPLACE IT;	MANUAL RESET (PRESS THE RESET ' ' KEY).
		THERMOFUSE CABLE DISCONNECTED.	CHECK THE WIRING.	
E04	***WATER MISSING IN THE SYSTEM***	INSUFFICIENT WATER PRESSURE INSIDE THE SYSTEM (LOWER THAN 0.3 BAR);	LOAD THE SYSTEM;	AUTOMATIC.
		WATER PRESSURE SWITCH CABLE DISCONNECTED;	CHECK THE WIRING;	
		WATER PRESSURE SWITCH BROKEN.	REPLACE IT.	
E05	***HEATING PROBE***	BROKEN OR INCORRECTLY CALIBRATED PROBE (RESISTANCE VALUE 10 KOHM AT 25 °C NTC);	REPLACE IT;	AUTOMATIC.
		DISCONNECTED OR WET PROBE CONNECTOR.	CHECK THE WIRING.	
E06	***DOMESTIC CIRCUIT PROBE***	BROKEN OR INCORRECTLY CALIBRATED PROBE (RESISTANCE VALUE 10 KOHM AT 25 °C NTC);	REPLACE IT;	AUTOMATIC.
		DISCONNECTED OR WET PROBE CONNECTOR.	CHECK THE WIRING.	
E10	***LOW FLOW RATE***	THE FLOW RATE VALUE DETECTED BY THE FLOWMETER IS LOWER THAN THE VALUE SET AT PARAMETER P33.	INCREASE THE FLOW RATE OR LOWER THE VALUE AT PARAMETER P33.	AUTOMATIC.
E14	***AIR PRESSURE SWITCH***	AIR PRESSURE SWITCH CABLE DISCONNECTED;	CHECK THE WIRING;	MANUAL RESET (PRESS THE RESET ' ' KEY).
		DISCHARGE OR SUCTION CLOSED;	CHECK THE FUMES DISCHARGE DUCT;	
		AIR PRESSURE SWITCH DEFECTIVE.	REPLACE IT.	

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E15	***RETURN PROBE***	BROKEN OR INCORRECTLY CALIBRATED PROBE (RESISTANCE VALUE 10 KOHM AT 25 °C NTC);	REPLACE IT;	AUTOMATIC.
		DISCONNECTED OR WET PROBE CONNECTOR.	CHECK THE WIRING.	
E16	***ELECTRIC FAN***	ELECTRIC FAN BOARD BROKEN;	REPLACE IT;	AUTOMATIC.
		ELECTRIC FAN BROKEN;	REPLACE IT;	
		FAULTY POWER SUPPLY CABLE.	REPLACE IT.	
E18	***INSUFFICIENT CIRCULATION***	EXCHANGER OBSTRUCTED;	CLEAN OR REPLACE THE EXCHANGER;	AUTOMATIC.
		CIRCULATOR BROKEN OR DIRTY IMPELLER.	CLEAN THE IMPELLER OR REPLACE THE CIRCULATOR.	
E22	***PARAMETERS PROGRAMMING REQUEST***	MICRO=PROCESSOR MEMORY LOSS.	PARAMETERS REPROGRAMMING.	MANUAL RESET (CUT OFF THE TENSION).
E24	***SOLAR PANEL SENSOR - PT1000- (SCS)***	BROKEN OR OUT OF CALIBRATION SENSOR; SENSOR CONNECTOR UNPLUGGED OR WET;	REPLACE IT; CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.
E25	***UPPER SOLAR TANK SENSOR (SBSS)***	BROKEN OR OUT OF CALIBRATION SENSOR (RESISTANCE VALUE 10KOHM AT 25°C) SENSOR CONNECTOR UNPLUGGED OR WET;	REPLACE IT; CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.
E26	***LOWER SOLAR TANK SENSOR (SBSS)***	BROKEN OR OUT OF CALIBRATION SENSOR (RESISTANCE VALUE 10KOHM AT 25°C) SENSOR CONNECTOR UNPLUGGED OR WET;	REPLACE IT; CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E27	***SOLAR PANEL NO.2 SENSOR - PT1000- (SCSS)***	BROKEN OR OUT OF CALIBRATION SENSOR; SENSOR CONNECTOR UNPLUGGED OR WET;	REPLACE IT; CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.
E29	***OPTIONAL SOLAR TANK SENSOR - NTC - (SBS3)***	BROKEN OR OUT OF CALIBRATION SENSOR (RESISTANCE VALUE 10KOHM AT 25°C) SENSOR CONNECTOR UNPLUGGED OR WET;	REPLACE IT; CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.
E31	***INCOMPATIBLE REMOTE CONTROL***	FUNCTION ACTIVE WHEN THE CONNECTED REMOTE CONTROL IS NOT COMPATIBLE WITH THE P.C.B.	REPLACE IT WITH A COMPATIBLE ONE.	AUTOMATIC.
E35	***RESIDUAL FLAME***	FAULTY DETECTION ELECTRODE;	CLEAN IT OR REPLACE IT;	MANUAL RESET (PRESS THE RESET " " KEY).
		FAULTY DETECTION ELECTRODE CABLE;	REPLACE IT;	
		FAULTY MODULATION BOARD.	REPLACE IT.	
E44	***FLUE TEMPERATURE LIMIT SENSOR ERROR***	BROKEN OR OUT OF CALIBRATION SENSOR; SENSOR CONNECTOR UNPLUGGED OR WET;	REPLACE IT; CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.
E45	***FLUE TEMPERATURE LIMIT SENSOR ERROR / CABLE NOT DETECTED***	BROKEN OR OUT OF CALIBRATION SENSOR; SENSOR CONNECTOR UNPLUGGED OR WET;	REPLACE IT; CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.
		IF THE PCB HAS BEEN REPLACED, THE FLUE SENSOR CABLE, EVEN IF CONNECTED, IS NOT DETECTED BECAUSE IT IS COMPATIBLE WITH A PREVIOUS PCB VERSION;	SET PARAMETER P48 TO 1.	
E49	***HEATING FLOW SENSORS ERROR***	SENSOR CONNECTOR UNPLUGGED OR WET;	REPLACE IT; CHECK THE ELECTRICAL CONNECTION;	MANUAL RESET (PRESS THE RESET " " KEY).

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E50	***HEATING FLOW SENSORS INTEGRITY***	BROKEN OR OUT OF CALIBRATION SENSOR;	REPLACE IT; CHECK THE ELECTRICAL CONNECTION;	MANUAL RESET (PRESS THE RESET ' ' KEY).
E52	***COMMUNICATION ERROR BETWEEN MODBUS BOARD AND MODBUS CONTROL UNIT***	NO ELECTRICAL CONNECTION;	CHECK ELECTRICAL CONNECTION;	AUTOMATIC.
		BROKEN MODBUS CONTROL UNIT;	REPLACE IT;	
E57	***COMMUNICATION ERROR OF INTERNAL MICROCONTROLLERS***			AUTOMATIC.
E79	***SHINOO PUMP CONNECTION FEEDBACK ERROR***	IPWM INTERFACE IN OPEN CIRCUIT	CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.
E80	***WILO PUMP CONNECTION FEEDBACK ERROR***	IPWM INTERFACE IN OPEN CIRCUIT	CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.
E81	***WILO PUMP MALFUNCTION***	UNDERVOLTAGE 160/170-194V; SELF THERMAL PROTECTING MODE.	WAIT FOR CORRECT RESTORATION OF VOLTAGE	AUTOMATIC.
E82	***WILO PUMP MALFUNCTION IN MODE 1***	UNDERVOLTAGE <160/170V; OVERVOLTAGE; UNEXPECTED EXTERNAL FLOW.	WAIT FOR CORRECT RESTORATION OF VOLTAGE	AUTOMATIC.
E83	***WILO PUMP MALFUNCTION IN MODE 2***	FAILURE ON ANOTHER COMPONENT THAN PUMP; DEBRIS IN THE INSTALLATION; BAD TEMPERATURE SETUP.	CHECK THAT THE PUMP IS NOT OBSTRUCTED BY SYSTEM / INSTALLATION RESIDUES.	AUTOMATIC.
E84	***WILO PUMP PERMANENT FAILURE***	PUMP BLOCKED; ELECTRONIC MODULE OUT OF ARDER.	REPLACE IT;	AUTOMATIC.
E85	***SHINOO PUMP STUCK***	THE PUMP DOES NOT WORK AND WILL RE-START ONLY AFTER TROUBLE IS ADDRESSED.	UNLOCK THE PUMP AND RESTART THE BOILER	AUTOMATIC.

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E86	***SHINOO PUMP MALFUNCTION***	THE PUMP DOES NOT WORK AND WILL RE-START ONLY AFTER TROUBLE IS ADDRESSED.	CHECK THE ELECTRICAL CONNECTION;	AUTOMATIC.
E88	***COMMUNICATION ERROR BETWEEN MIXING VALVE BOARD AND BOILER BOARD***	NO ELECTRICAL CONNECTION	CHECK THE WIRING;	AUTOMATIC.
		MIXING VALVE BOARD BROKEN	REPLACE IT.	
E96	***SHINOO PUMP ALARM***	PUMP RUNS, TROUBLE HAS BEEN DETECTED. THE TROUBLE/ MALFUNCTION IS NOT CRITICAI, AND THE PUMP CAN STILI WORK.	/	AUTOMATIC.
E97	***OT COMMUNICATION ERROR WITH EXTERNAL RELAYS***			AUTOMATIC.
E98	***POWER SUPPLY VOLTAGE***	SUPPLY VOLTAGE OUT OF OPERATING RANGE (⇱170 VOLTS).	CHECK THE POWER SUPPLY (THE ERROR IS AUTOMATICALLY DEACTIVATED AS SOON AS SUPPLY VOLTAGE IS RESTORED WITHIN THE REQUIRED LIMITS).	AUTOMATIC.

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E99	***ELECTRICAL LEAKAGE ON THE HIGH-VOLTAGE CIRCUIT***	DEFECTIVE GAS VALVE	TRY TO DISCONNECT THE GAS VALVE CABLE AND START THE WATER HEATER AGAIN. IF THE E01 ERROR OCCURS UPON RE-STARTING INSTEAD OF THE PREVIOUS E21, REPLACE THE GAS VALVE. DISASSEMBLE THE COILS OF THE OLD VALVE TO CHECK IF THEY ARE WET, ALSO CHECK THAT NO WATER ENTERS FROM THE COMBUSTION AIR INTAKE.	AUTOMATIC.
		DEFECTIVE IGNITION TRANSFORMER	TRY TO DISCONNECT THE IGNITION TRANSFORMER CABLE AND START THE WATER HEATER AGAIN. IF THE E01 ERROR OCCURS UPON RE-STARTING INSTEAD OF THE PREVIOUS E21, REPLACE THE IGNITION TRANSFORMER.	
	ELECTRICAL NOISE DUE TO SPARK DISCHARGE	IF AT THE START OF THE IGNITION CYCLE THE BOILER SWITCHES OFF AND TURNS ON AGAIN, THE TRAIN OF SPARKS DISCHARGES TOWARDS THE LOW VOLTAGE CABLES OR TOWARDS THE FRAME INSTEAD OF THE ELECTRODES.	REPLACE THE SPARK ELECTRODES IF THE CABLE LEAKS SPARK OR REPLACE THE IGNITION TRANSFORMER IF SPARK GOES FROM THE TRANSFORMER TO THE SURROUNDING PLATES OR CABLES. CHECK THAT THE DISTANCE BETWEEN THE IGNITION ELECTRODES IS NOT GREATER THAN 5 MM.	
		THE ARC OF THE SPARK IS TOO SHORT	CHECK THAT THE DISTANCE BETWEEN THE ELECTRODES IS BETWEEN 3 AND 5 MM, A DISTANCE LESS THAN 3 MM CAUSES A NOISE WHICH MAKES THE PCB SWITCH OFF. CHECK THAT THE 1000 OHM ANTIINTERFERENCE RESISTOR IS PRESENT IN THE IGNITION CABLE.	

2.2.16. FUNCTION CODES

CODICE	FUNZIONE	DESCRIZIONE
ECO	***ECO FUNCTION ACTIVE***	YOU CAN ACTIVATE/DEACTIVATED IT BY HOLDING SIMULTANEOUSLY AND FOR 7 SECONDS THE KEYS "⊖" OF THE DOMESTIC CIRCUIT AND "⊖" OF THE HEATING CIRCUIT . THE "ECO" FUNCTION IS USEFUL FOR REDUCING CONSUMPTION, ALLOWING FIXED ECONOMY OF HEATING AND DHW TEMPERATURES.
EH	***DISPLAY OF ACHIEVEMENT OF THE MAXIMUM SET FLUE GAS TEMPERATURE. ACTIVATED AS STANDARD.***	WHEN THE FLUE GAS TEMPERATURE REACHES THE VALUE SET ON PARAMETER P18, THE MESSAGE "EH" APPEARS ON THE DISPLAY. THIS INDICATES THAT THE BOILER, IN ORDER NOT TO EXCEED THE SET FLUE GAS TEMPERATURE, WILL MODULATE WHILST KEEPING THE FLUE TEMPERATURE CONSTANT. TO DISABLE THIS FUNCTION, TO DISABLE THIS FUNCTION, MODIFY THE VALUE OF PARAMETER P17.
F07	***CHIMNEY SWEEP ACTIVE***	YOU CAN ACTIVATE IT BY HOLDING FOR 7 SECONDS THE RESET "↻" KEY AND YOU CAN DEACTIVATE IT BY TURNING OFF THE BOILER OR BY PRESSING THE "↻" KEY. THIS FUNCTION BRINGS THE BOILER TO ITS MINIMUM AND MAXIMUM HEATING POWER FOR 15 MINUTES DEACTIVATING THE MODULATION FUNCTION. GENERALLY USED FOR PERFORMING THE COMBUSTION AND CALIBRATION TESTS.
F08	***FROST PROTECTION (HEATING CIRCUIT)***	IT ACTIVATES AUTOMATICALLY WHEN THE HEATING PROBE DETECTS A TEMPERATURE OF 12°C. THE BOILER OPERATES AT MINIMUM GAS PRESSURE WITH THE DIVERTER VALVE SET TO 'WINTER' MODE. IT DEACTIVATES WHEN THE HEATING FLOW WATER TEMPERATURE REACHES THE 30°C AND, IN PRESENCE OF A RETURN SENSOR, WHEN THE HEATING RETURN WATER TEMPERATURE REACHES THE 20°C.
F09	***FROST PROTECTION (DHW CIRCUIT)***	THE FUNCTION IS AUTOMATICALLY ENABLED WHEN THE D.H.W SENSOR DETECTS A TEMPERATURE OF 4 °C. THE BOILER OPERATES AT MINIMUM GAS PRESSURE WITH THE DIVERTER VALVE IN THE 'SUMMER' POSITION. THE FUNCTION IS DISABLED WHEN THE TEMPERATURE DETECTED BY THE SENSOR IS 8 °C IN THE D.H.W CIRCUIT.
F28	***LEGIONELLA PREVENTION SYSTEM***	THE FUNCTION IS ACTIVATED FOR THE FIRST TIME, 60 MINUTES AFTER THAT THE BOILER HAS BEEN ELECTRICALLY POWERED. STARTING FROM THAT MOMENT IT COMES AUTOMATICALLY INTO OPERATION EVERY 7 DAYS, BRINGING THE HOT WATER TEMPERATURE OF THE STORAGE CYLINDER UP TO 60°C. THIS FUNCTION IS ENABLED INDEPENDENTLY FROM THE CONTACT TO THE CYLINDER CLOCK, PROVIDING THAT THE RELATIVE PARAMETER (P15) IS ENABLED.
F33	***SYSTEM AIR RELEASE CYCLE***	IT ACTIVATES AUTOMATICALLY AT FIRST BOILER START-UP, PERFORMING FOR 5 MINUTES A SERIES OF CYCLES DURING WHICH THE PUMP IS ACTIVATED FOR 40 SECONDS AND DEACTIVATED FOR 20 SECONDS. REGULAR OPERATION IS ALLOWED ONLY AFTER THIS FUNCTION IS COMPLETED. IT CAN ALSO ACTIVATE DURING NORMAL BOILER OPERATION, IF THE WATER PRESSURE SWITCH CONFIRMATION IS MISSING, WHEN THE CONTACT IS RE-CLOSED, A 2 MINUTES RELEASE CYCLE WILL BE PERFORMED.

2. MAINTENANCE

CODICE	FUNZIONE	DESCRIZIONE
FH	***FAST H2O***	YOU CAN ACTIVATE/DEACTIVATED IT BY HOLDING SIMULTANEOUSLY AND FOR 7 SECONDS THE RESET ' ' AND ' ' OF THE DOMESTIC CIRCUIT . THE "FAST H2O" FUNCTION GUARANTEES THE IMMEDIATE D.H.W SUPPLY AT THE REQUESTED TEMPERATURE.
SCM	***SCREED HEATING FUNCTION ENABLED***	THIS FUNCTION IS PROVIDED TO FACILITATE THE INSTALLATION OPERATIONS OF LOW-TEMPERATURE FLOOR SYSTEMS. ACTIVATION IS CARRIED OUT BY SIMULTANEOUSLY PRESSING THE KEYS "+" AND "-" OF THE HEATING SYSTEM FOR 10 SECONDS. THE DISPLAY SHOWS THE MESSAGE "SCM". UPON ACTIVATION A HEATING CYCLE IS FORCED, WITH A SETPOINT CORRESPONDING TO THE VALUE SET IN PARAMETER 'P43' (START CYCLE TEMPERATURE OF THE "SCREED HEATING FUNCTION", SEE CHAPTER 'PARAMETER TABLE'). ONCE THE START TEMPERATURE OF THE SCREED HEATING FUNCTION IS REACHED, IT WILL BE KEPT CONSTANT FOR 3 DAYS (72 HOURS). AT THE END OF 72 HOURS THE HEATING SYSTEM WILL REACH THE TEMPERATURE SET IN PARAMETER 'P44' (END-CYCLE TEMPERATURE OF THE SCREED HEATING FUNCTION, SEE CHAPTER 'PARAMETER TABLE') AND WILL BE MAINTAINED UNTIL THE END OF THE PERIOD (4 DAYS).
SERVICE	***SCHEDULED ANNUAL MAINTENANCE TO BE CARRIED OUT***	ACTIVATION OF SCHEDULED ANNUAL MAINTENANCE DEADLINE WARNING. WHEN THE 365 DAYS HAVE EXPIRED SINCE ITS ACTIVATION, THE FLASHING HOURGLASS AND TECHNICIAN ICONS AND THE FIXED 'SERVICE' ICON WILL APPEAR ON THE DISPLAY. AFTER PERFORMING THE SCHEDULED ANNUAL MAINTENANCE, YOU CAN RESTART THE 365-DAY TIMER BY SIMULTANEOUSLY PRESSING THE 'MODE' AND ' - ' OF THE HEATER, UNTIL THE ICONS DISAPPEAR. THE SET TIMER REMAINS IN MEMORY EVEN IF THE BOILER POWER SUPPLY IS INTERRUPTED.

2.2.17. GAS TYPE TRANSFORMATION

ATTENTION

Make sure that the gas adduction tube is suitable for the new type of fuel with which the boiler is supplied.

1. Unscrew the tube coupling that connects the gas valve to venturi.

CONVERSION TO LPG:

2. Insert the diaphragm '1' (for LPG – Ø 6 mm diaphragm - code 15-01728) and gaskets '2' and re-tighten the coupling '3' (see fig.1).

CONVERSION TO NATURAL GAS:

2. Remove the diaphragm '1' and re-tighten the coupling '3' (see fig.1).

3. Remount the components following the demounting operations in reverse (see fig.1);

4. use soapy water method to check for gas leaks each time gas connections are dismantled and reassembled;

5. set the boiler to operate with the new type of gas, changing the value of the parameter P02 'GAS TYPE SELECTION' from the control panel (see chapters 'PARAMETERS TABLE' and 'ACCESSING AND PROGRAMMING THE PARAMETERS');

6. adjust the CO2 combustion value as indicated in chapter 'CO2 VALUE CHECK AND CALIBRATION'.

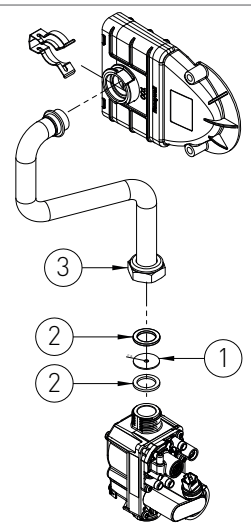
IN THE CASE OF CONVERSION TO PROPANE GAS (G230):

› Follow steps 1 to 4 described for conversion to natural gas.

5. Set the boiler to operate with the new type of gas by changing the value to "0" (methane) for parameter P02 "GAS TYPE SELECTION" from the control panel (see chapters "PARAMETER TABLE" and "PARAMETER ACCESS AND PROGRAMMING").

6. adjust the CO2 combustion value as indicated in chapter 'CO2 VALUE CHECK AND CALIBRATION'.

fig. 1



SERVICE CENTRE

3. USER SECTION

The operations described in this section are addressed to all those who will use the machine. The machine must be used and accessed only by qualified operators that fully read and understood the User section, paying particular attention to the warnings.

3.1. USE

3.1.1. GENERAL USE WARNINGS

WARNING

Before starting the boiler the User must make sure that the First start-up certificate has the stamp of the technical Support Centre proving the testing and the first start-up of the boiler.

WARNING

In order to take advantage of the guarantee provided by the manufacturer, the customer should carefully and exclusively observe the instructions given in the USER section of the manual.

ATTENTION

This machine may be used only for the purpose for which it has been designed: heat water to a temperature below boiling point at atmospheric pressure. Any other use is considered wrong and dangerous. The manufacturer is excluded from any contractual or out of contract responsibility for damage caused to people, animals or property due to incorrect use.

DANGER

The boiler should not be used by persons (including children) with reduced physical, sensory or mental capacities or without suitable knowledge or experience unless they are instructed on the device use or monitored by a person responsible for their safety.

DANGER

DO NOT obstruct the air vents of the location in which the gas device is installed to prevent the formation of toxic explosive mixes.

DANGER

If you sense a gas odour in the location in which the boiler is installed, proceed as follows:

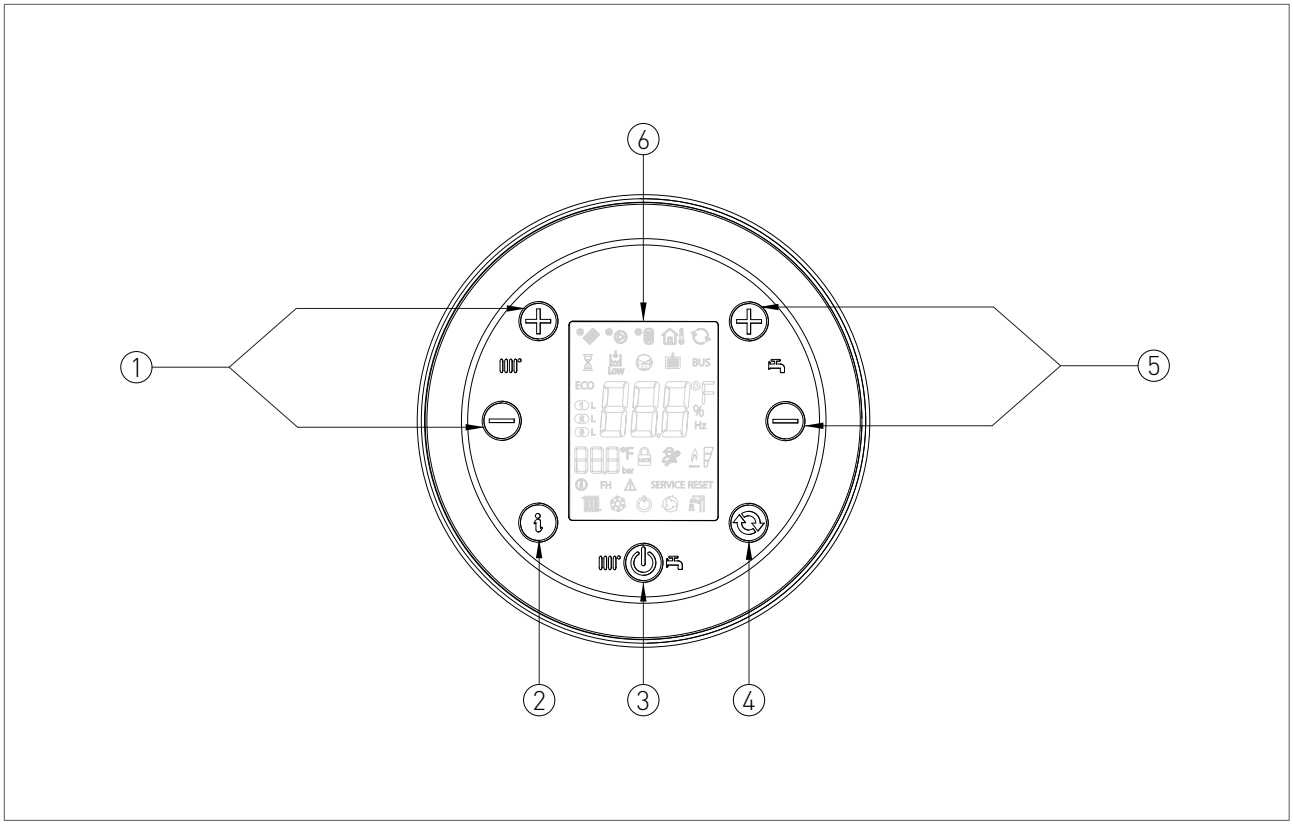
- DO NOT use electrical switches, the telephone or any other device that might generate electrical discharges or sparks;
- Immediately open all doors and windows to create an air exchange that can quickly clean the location;
- Close the gas valves;
- Request immediate intervention of qualified staff.

DANGER

The use of the electrical power boiler implies respecting some fundamental rules such as:

- DO NOT touch the device with wet and/or humid parts and/or with bare feet;
- DO NOT pull the electrical cables;
- DO NOT leave the device exposed to atmospheric agents (rain, sun, etc.) unless specifically intended;
- in case of cable damage, turn off the device and contact qualified professional staff to replace it.

3.1.2. CONTROL PANEL



KEY

1. HEATING TEMPERATURE ADJUSTMENT KEYS

2. INFO KEY: PRESS ONCE TO DISPLAY TEMPERATURES AND OTHER INFORMATION (see chapter 'INFO MENU DISPLAY) - PRESS AND HOLD FOR 5 SECONDS, IN OFF MODE, TO DISPLAY THE LAST 5 FAULTS

3. OPERATING MODE SELECTION KEY: SUMMER / ONLY HEATING / WINTER / OFF

4. RESET KEY: FAULTS RESET - CHIMNEY SWEEP FUNCTION ACTIVATION (PRESS AND HOLD FOR 7 SECONDS)

5. DOMESTIC HOT WATER TEMPERATURE ADJUSTMENT KEY / PRESS THE KEYS SIMULTANEOUSLY FOR 5 SECONDS TO ACTIVATE THE DISPLAY BACKLIGHTING FOR 10 MINUTES

6. DISPLAY

3.1.3. DISPLAY ICONS

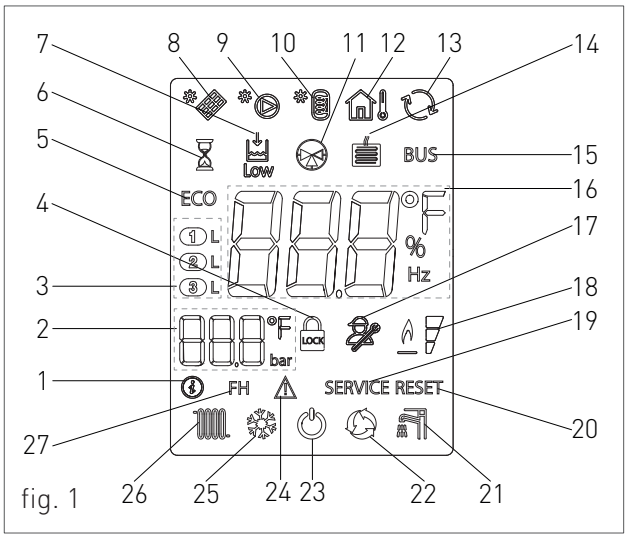


fig. 1

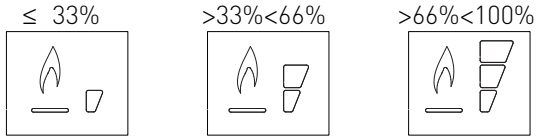


fig. 2

KEY

1. MENU INFO DISPLAY
2. DISPLAY OF PARAMETER NUMBER OR INFO CODE OR AUXILIARY TEMPERATURE (IF ACTIVATED THROUGH PARAMETER P42)
3. HIGH AND LOW TEMPERATURE ZONES ENABLED
4. PARAMETER PROGRAMMING LOCK ENABLED
5. ECO FUNCTION ENABLED
6. WAITING TIME BETWEEN BURNER IGNITIONS
7. LACK OF WATER IN THE SYSTEM / INSUFFICIENT WATER PRESSURE
8. CONNECTED SOLAR P.C.B. SIGNALLING / SOLAR COLLECTOR TEMPERATURE DISPLAY (d5)
9. ACTIVE SOLAR PUMP
10. DHW TANK LOWER TEMPERATURE DISPLAY (d6) / DHW TANK UPPER TEMPERATURE DISPLAY (d7)
11. MIXING VALVE ENABLED
12. OUTDOOR SENSOR INSTALLED / OUTDOOR TEMPERATURE SENSOR (d1)
13. OPENTHERM COMMUNICATION PRESENT (REMOTE CONTROL / ZONES CONTROLLER)
14. LOW TEMPERATURE ENABLED
15. ACTIVE MODBUS
16. TEMPERATURE DISPLAY / SET POINT / PARAMETER VALUE
17. PARAMETERS PROGRAMMING FUNCTION ACTIVE
18. FLAME PRESENCE SIGNALLING / IT ALSO INDICATES, ON 3 PERCENTAGE LEVELS, THE DEGREE OF BOILER MODULATING POWER (fig.2)
19. NON-RESETTABLE ERROR DISPLAY, REQUIRING TECHNICAL SERVICE
20. RESETTABLE ERROR DISPLAY
21. D.H.W. MODE ENABLED
22. RECIRCULATION FUNCTION ENABLED/ IF FLASHING, THE FUNCTION IS ACTIVE

23. OFF OPERATING MODE

24. WARNING INFORMATION

25. COOLING MODE ENABLED

26. HEATING MODE ENABLED

27. FAST H2O FUNCTION ENABLED

3.1.4. INFO MENU DISPLAY

To view the boiler data from info menu you just have to press the INFO '(i)' key. The info code will be displayed on the left side of the screen and its relative value will be displayed on the centre of the screen. Use keys '⊕' and '⊖' of the heating circuit to scroll through the list of displayed data. To exit display mode press the INFO '(i)' key.

LIST OF DISPLAYED DATA

INFO CODE	ICON	DESCRIPTION
d0		DOMESTIC CIRCUIT PROBE TEMPERATURE
d1		EXTERNAL PROBE TEMPERATURE
d2		FAN SPEED
d3		BOTTOM AREA PROBE TEMPERATURE (IF AREA BOARD INSTALLED)
d4		RETURN PROBE TEMPERATURE
d5		SOLAR COLLECTOR TEMPERATURE (IF SOLAR BOARD INSTALLED) (SCS)
d6		SOLAR BOILER TEMPERATURE (BOTTOM) (IF SOLAR BOARD INSTALLED) (SBSI)
d7		SOLAR BOILER TEMPERATURE (TOP) (IF SOLAR BOARD INSTALLED) (SBSS)
d8		SOLAR COLLECTOR PROBE TEMPERATURE 2 (IF SOLAR BOARD INSTALLED) (SCS2)
d9		EXTRA SOLAR BOILER TEMPERATURE (IF SOLAR BOARD INSTALLED) (SBS3)
d10		SETPOINT CALCULATED BY CLIMATE CONTROL
d11		CURRENT PERCENTAGE OF BURNER POWER
d12		HEATING FLOW RATE DISPLAY EXPRESSED IN L/MIN (IF THERE IS A FLOWMETER).
d13		LOW-TEMPERATURE HEATING CIRCUIT RETURN SENSOR TEMPERATURE (IN HYBRID SYSTEM BOX MODE) - HEATING PUMP RETURN SENSOR TEMPERATURE (IN HYBRID DOMESTIC SYSTEM MODE)
d14		INERTIAL STORAGE SENSOR TEMPERATURE
d15		HYBRID SYSTEM BOX D.H.W. TANK SENSOR TEMPERATURE - HOT WATER TEMPERATURE OUT OF THE REMOTE TANK TO THE BOILER (ONLY FOR HYBRID DOMESTIC SYSTEM WITH OPTIONAL SENSOR)
d16		POWER SUPPLIED BY THE HEATING PUMP IN KW/H (ONLY FOR HYBRID DOMESTIC SYSTEM)
d17		FLUE EXHAUST TEMPERATURE

INFO CODE	ICON	DESCRIPTION
d18		DHW OUTLET SENSOR TEMPERATURE FROM MIXING VALVE
d19		MIXING VALVE OPENING STATUS DISPLAY (OP = COLD WATER INLET WHILE IN OPENING POSITION; CO = COLD WATER INLET WHILE IN CLOSING POSITION)
d20		INLET DHW TEMPERATURE (°C) - (SIS)
d21		0 - 10 VOLTS SIGNAL READING
d22		REMAINING DAYS FROM SCHEDULED ANNUAL MAINTENANCE
d23		/
d24		/
d25		/
d26		/
d27		/
d28		/
d29		LCD FIRMWARE VERSION
d30		SECURITY FIRMWARE VERSION

3.1.5. START-UP

Before starting the boiler make sure that it is powered and that the gas tap below the boiler is open.

To start the boiler press the function key '  ' and select the desired operating mode. If the symbol is displayed fixed, it means that the function was activated.

3.1.6. OPERATING MODE

ONLY HEATING MODE

In this mode the boiler meets only the demands of heating.

To switch the boiler to ONLY HEATING operating mode, press the function key '  ', the symbol '  ' will appear fixed on the display, indicating that the function is enabled.

Whenever heating energy is needed to heat the rooms the automatic start-up system will start the burner; this is indicated by displaying the symbol '' blinking.

ADJUSTING THE HEATING TEMPERATURE

You can adjust the temperature using keys '  ' and '  ' of the heating circuit  :

- press key '  ' to decrease the temperature.
- press key '  ' to increase the temperature.

The heating temperature adjustment field ranges from 30 °C to 80 °C (25 °C – 45 °C for floor systems).

OFF MODE

In this mode the boiler no longer meets the heating demands, the anti-freeze and pump anti-locking systems still remain active.

To switch the boiler to OFF operating mode, press the function key '  ', the symbol '  ' will appear fixed on the display, indicating that the function is enabled (for non condensing models will appear the message 'OFF').

If the boiler was previously running, it will be turned off and the post-ventilation and post-circulation functions will be enabled.

If you have to deactivate the boiler for a long period of time, proceed as follows:

› contact the Technical support centre that will empty the water system, where no anti-freeze is intended, and will cut off the power, water and gas supply.

› Or leave the boiler in OFF operating mode keeping active the electrical and gas supplies so that the anti-freeze function may activate.

3.1.7. INFORMATIONAL NOTE ON ANTI-FREEZE FUNCTION

The boiler is protected against freezing thanks to the electronic board preparation with functions that start the burner and heat the concerned parts when their temperature goes below the minimum pre-set values.

WARNING
This function is available only if:

- the boiler is powered;
- the gas supply is open;
- the pressure of the system is proper;
- the boiler is not blocked.

3.1.8. SYSTEM FILLING

To restore the water pressure inside the system open the loading tap "R" (fig. 1) and make sure using pressure gauge "M" (fig. 1), that the system pressure reaches 1.2 bar (see fig. 2).

After performing this operation, make sure that the loading tap "R" (fig. 1) is properly closed.

After the water pressure reset the boiler will automatically perform a 2 minutes system relief cycle. Throughout this function the display will show the code "F33". The boiler can work normally only after completing the operation.

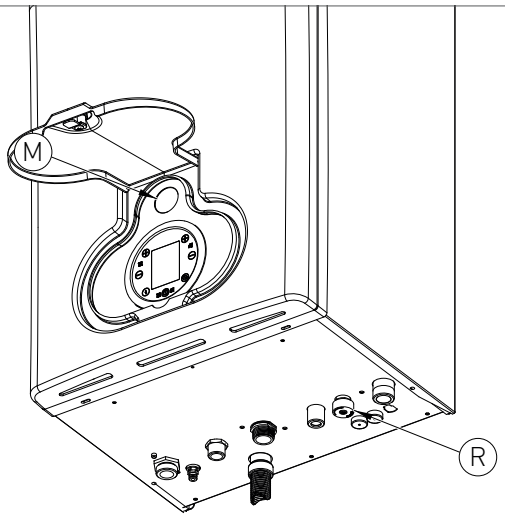


fig. 1

fig. 2

3.1.9. FAULT SIGNALLING CODES

The boiler might signal some faults by displaying a code. Below you have a list of the codes and of the operations to be performed in order to unlock the boiler.

CODE	ICON	FAULT	INTERVENTION
E01	RESET	***FLAME BLOCK***	MAKE SURE THAT THE BOILER AND CONTACTOR GAS VALVES ARE OPEN.
			PRESS THE RESET BUTTON ON THE CONTROL PANEL TO RESET THE FAULT, AS SOON AS THE ERROR CODE DISAPPEARS FROM THE DISPLAY, THE BOILER WILL START AUTOMATICALLY.
			IF THE BLOCK PERSISTS CONTACT THE TECHNICAL SUPPORT CENTRE.
E02	RESET	***SAFETY THERMOSTAT (95 °C)***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E03	RESET	***FUMES SAFETY THERMOFUSE (102 °C)***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E04	LOW RESET	***WATER MISSING IN THE SYSTEM***	IF THE SYSTEM PRESSURE IS BELOW 1.2 BAR, FILL THE SYSTEM AS DESCRIBED IN CHAPTER "SYSTEM FILLING".
			IF THE BLOCK PERSISTS CONTACT THE TECHNICAL SUPPORT CENTRE.
E05	SERVICE	***HEATING PROBE***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E06	SERVICE	***DOMESTIC CIRCUIT PROBE***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E10	SERVICE	***LOW FLOW RATE***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E14	SERVICE	***AIR PRESSURE SWITCH***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E15	SERVICE	***RETURN PROBE***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E16	SERVICE	***ELECTRIC FAN***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E18	SERVICE	***INSUFFICIENT CIRCULATION***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E22	SERVICE	***PARAMETERS PROGRAMMING REQUEST***	CUT OFF THE POWER SUPPLY FROM THE MAIN SWITCH AND THEN RESTORE IT, AS SOON AS THE ERROR CODE DISAPPEARS, THE BOILER WILL RESTART AUTOMATICALLY.
			IF THE BLOCK PERSISTS CONTACT THE TECHNICAL SUPPORT CENTRE.
E24	SERVICE	***SOLAR PANEL SENSOR - PT1000- (SCS)***	CONTACT THE TECHNICAL SUPPORT CENTRE.

USER

CODE	ICON	FAULT	INTERVENTION
E25	SERVICE	*UPPER SOLAR TANK SENSOR (SBSS)*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E26	SERVICE	*LOWER SOLAR TANK SENSOR (SBSS)*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E27	SERVICE	*SOLAR PANEL NO.2 SENSOR - PT1000- (SCSS)*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E29	SERVICE	*OPTIONAL SOLAR TANK SENSOR - NTC - (SBS3)*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E31	SERVICE	*INCOMPATIBLE REMOTE CONTROL*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E35	RESET	*RESIDUAL FLAME*	PRESS THE RESET BUTTON ON THE CONTROL PANEL TO RESET THE FAULT, AS SOON AS THE ERROR CODE DISAPPEARS FROM THE DISPLAY, THE BOILER WILL START AUTOMATICALLY.
E44	SERVICE	*FLUE TEMPERATURE LIMIT SENSOR ERROR*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E45	SERVICE	*FLUE TEMPERATURE LIMIT SENSOR ERROR / CABLE NOT DETECTED*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E49	RESET	*HEATING FLOW SENSORS ERROR*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E50	RESET	*HEATING FLOW SENSORS INTEGRITY*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E52	SERVICE	*COMMUNICATION FAULT BETWEEN MODBUS CONTROLLER AND MODBUS CONTROL UNIT*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E57	SERVICE	*COMMUNICATION ERROR OF INTERNAL MICROCONTROLLERS*	CONTACT THE TECHNICAL SUPPORT CENTRE.
E79	SERVICE	*SHINOO PUMP CONNECTION FEEDBACK ERROR*	CONTACT THE TECHNICAL SUPPORT CENTRE.

CODE	ICON	FAULT	INTERVENTION
E80	SERVICE	***WILO PUMP CONNECTION FEEDBACK ERROR***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E81	SERVICE	***WILO PUMP MALFUNCTION***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E82	SERVICE	***WILO PUMP MALFUNCTION IN MODE 1***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E83	SERVICE	***WILO PUMP MALFUNCTION IN MODE 2***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E84	SERVICE	***WILO PUMP PERMANENT FAILURE***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E85	SERVICE	***SHINOO PUMP STUCK***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E86	SERVICE	***SHINOO PUMP MALFUNCTION***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E88	SERVICE	***COMMUNICATION ERROR BETWEEN MIXING VALVE BOARD AND BOILER BOARD***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E96	SERVICE	***SHINOO PUMP ALARM***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E97	SERVICE	***OT COMMUNICATION ERROR WITH EXTERNAL RELAYS***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E98	SERVICE	***SUPPLY VOLTAGE***	CONTACT THE TECHNICAL SUPPORT CENTRE.
E99	SERVICE	***ELECTRIC LEAKAGE ON THE HIGH CIRCUIT VOLTAGE / ELECTRICAL NOISE DUE TO SPARK DISCHARGE***	CUT OFF THE POWER SUPPLY FROM THE MAIN SWITCH AND THEN RESTORE IT, AS SOON AS THE ERROR CODE DISAPPEARS, THE BOILER WILL RESTART AUTOMATICALLY.
			IF THE BLOCK PERSISTS CONTACT THE TECHNICAL SUPPORT CENTRE.

USER

3.1.10. ACTIVE FUNCTIONS SIGNALLING CODES

CODE	FUNCTION	INTERVENTION
ECO	***ECO FUNCTION ACTIVE***	YOU CAN ACTIVATE/DEACTIVATED IT BY HOLDING SIMULTANEOUSLY AND FOR 7 SECONDS THE KEYS "⊖" OF THE DOMESTIC CIRCUIT AND "⊖" OF THE HEATING CIRCUIT .
EH	***DISPLAY OF ACHIEVEMENT OF THE MAXIMUM SET FLUE GAS TEMPERATURE. ACTIVATED AS STANDARD.***	WAIT UNTIL THE OPERATION IS COMPLETED
F08	***HEATING ANTI-FREEZE FUNCTION ACTIVE***	WAIT UNTIL THE OPERATION IS COMPLETED
F09	***D.H.W CIRCUIT ANTI-FREEZE FUNCTION ACTIVE***	WAIT UNTIL THE OPERATION IS COMPLETED
F33	***SYSTEM AIR RELEASE CYCLE IN PROGRESS***	WAIT UNTIL THE OPERATION IS COMPLETED
FH	***FAST H2O***	YOU CAN ACTIVATE/DEACTIVATED IT BY HOLDING SIMULTANEOUSLY AND FOR 7 SECONDS THE RESET "↻" AND "⊖" OF THE DOMESTIC CIRCUIT .
SCM	***ACTIVE SCREED HEATING***	WAIT UNTIL THE OPERATION IS COMPLETED

USER

3.1.11. ECO FUNCTION

This function is useful for reducing consumption, allowing fixed economy of heating and DHW temperatures.

Once the function is enabled, the maximum DHW settable temperature will be 42°C, while the maximum Heating settable temperature will be: 60°C in case of a high temperature system or 32°C in case of a low temperature system.

To activate or deactivate the ECO function, follow the instructions at the chapter 'ACTIVE FUNCTIONS SIGNALLING CODES'.

3.1.12. FAST H2O FUNCTION

The Fast H2O function keeps a constant temperature in the DHW circuit within the boiler, according to the temperature set by the user.

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The Fast H2O function offers three advantages:

› the hot water is immediately supplied at the requested temperature.

› unnecessary delays are avoided by increasing the comfort of the final user.

› water wastes are limited waiting that the water reaches the right temperature.

To activate/deactivate the Fast H2O function please follow the instruction indicated in the paragraph 'ACTIVE FUNCTIONS SIGNALLING CODES'.

3.1.13. MAINTENANCE

An accurate maintenance should improve system management.

3.1.14. EXTERNAL CASING CLEANING

Clean the cover of the device using a wet cloth and come neutral soap.

WARNING

DO NOT use abrasive or powder detergents as they might damage the plastic cover and control elements.

3.1.15. DISPOSAL INFORMATION

The boiler and all its accessories must be disposed of by differentiating them appropriately according to the recycling regulation in force.

The use of the symbol WEEE (Waste Electrical and Electronic Equipment) indicates that this product can not be dismantled as domestic waste. Proper disposal of this product helps preventing potentially negative consequences for the environment and person's health.

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