Installation, Use and Maintenance Manual for model

SFK 55

WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.

-Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

-WHAT TO DO IF YOU SMELL GAS

→Do not try to light any appliance.

→Do not touch any electrical switch; do not use any phone in your building.

→Immediately call your gas supplier from an outside phone. Follow the gas supplier's instructions.

→If you cannot reach your gas supplier, call the fire department.

-Installation and service must be performed by a qualified installer, service agency or the gas supplier.

SFK 55 - RAD - ING - Manual - 1512.2_CSA_TTS

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INTRODUCTION

WARNING

Before starting any operation it is mandatory to read this instruction manual, in relation to the activities performed as described in each relevant section. Proper operation and optimal performance of the water heaters 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 water heaters.

The water heaters 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.

› Unit: this term is used referring to the water heaters.

DANGER

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

ATTENTION

It identifies information that if not complied with may cause small or medium level burns to the person or serious damage to the water heaters.

WARNING

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

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 a copy from the Technical Support Center providing. It is important to provide the model number and serial number of the unit which is found on the inside surface of the right panel

MANUFACTURER WARRANTY AND RESPONSIBILITY

The Manufacturer's warranty is provided only through authorized Technical Support Centers, listed for each Region on the site www.radianthydronics.com, and covers all manufacturing defects at the time of sale.

The technical and functional features of the unit are ensured when proper installation and maintenance is carried out. Conditions of Manufacturer's warranty includes the following.

1. The customer is aware of and follows instructions contained in the manuals that accompany the product.

2. Annual service check up is required to keep warranty valid.

3. The unit is installed and operated in the conditions in which it is designed to.

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;

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

PRODUCT CONFORMITY

RADIANT BRUCIATORI spa with reference to ANSI Z21.10.3-2015 • CSA 4.3-2015 GAS-FIRED Water heatersS, declares that its gas water heaters are professionally manufactured.

The materials used such as copper, brass, stainless steel create a homogeneous, compact and functional assembly, easy to install and maintain. The water heaters. is equipped with all accessories necessary to provide a dependable independent heating unit. All water heaterss are tested and delivered with a quality certificate signed by the testing department.

1. INSTALLER SECTION

The installation operations described in this section should 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

This water heater must be installed in accordance with local codes, if any; if not, follow the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CAN/CSA B149.1, as applicable.

WARNING

This unit 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 errors during installation.

WARNING

This water heater should 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.

WARNING

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

BEFORE INSTALLING THE WATER HEATER THE INSTALLER MUST MAKE SURE THAT THE FOLLOWING CONDITIONS ARE PRESENT:

› The unit is connected to a heating unit 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 airflow.

› The unit is suitable for use with the type of gas available by checking the water heater data plate placed on the inner side of the front casing.

› Make sure that the gas lines are properly 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 required by the equipment, value indicated on the data plate.

WARNING

Use only original RADIANT optional or kit accessories (including electrical).

1.1.2. WATER HEATER LOCATION ENVIRONMENTAL REQUIREMENTS

The water heater shall be installed so the gas ignition system components are protected from water (dripping, spraying, rain, etc.) during appliance operation and service (circulator replacement, condensate trap, control replacement, etc.).

The water heater installed using inside air supply must provide provisions for Combustion Air and Ventilation Air in accordance with section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z 223,1/NFPA 54, or section 7,2, 7.3, or 7.4, of CAN/CSA B 149, Installation Codes, or local codes having jurisdiction.

Where an exhaust fan or any other air consumption appliance is installed in the same space as the

water heater, sufficient air openings must be available to provide fresh air when all appliances are operating simultaneously. It is essential that in rooms where the water heater is installed to provide as much air as required by normal combustion of the gas consumed by the various appliances. Consequently, it maybe necessary to make openings in the walls to provide the air inlet into the rooms.

For applications where air from the structure is used to supply combustion air for the unit, the following openings are required:

1. Have a total free section of a least 25 mm^2 every kW (1 in^2 for every 1000 Btu/hr) of heat input, with a minimum of 100 cm^2 (15.5 in^2);

2. Where required by code or when required for additional opening must be provided at the highest practical elevation.

With a hermetically sealed combustion chamber and air supply circuit from outdoors, the water heater may be installed in any room in the home. Keep water heater area clear and free from combustible materials, gasoline and other flammable vapors and liquids.

WARNING

If the temperature in the water heaters installation location goes below 35.6°F (2°C) , insert an electrical resistances kit .

1.1.3. REFERENCE LEGISLATION

This water heater must be installed in accordance with local codes, if any; if not, follow the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CAN/CSA B149.1, as applicable.

1.1.4. UNPACKING

WARNING

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

WARNING

The packing elements (cardboard box, wooden crate, nails, fasteners, plastic bags, expanded polystyrene, etc.) are dangerous and must be kept out of the reach of children. They should be discarded properly.

To unpack the water heaters, proceed as follows:

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

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

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

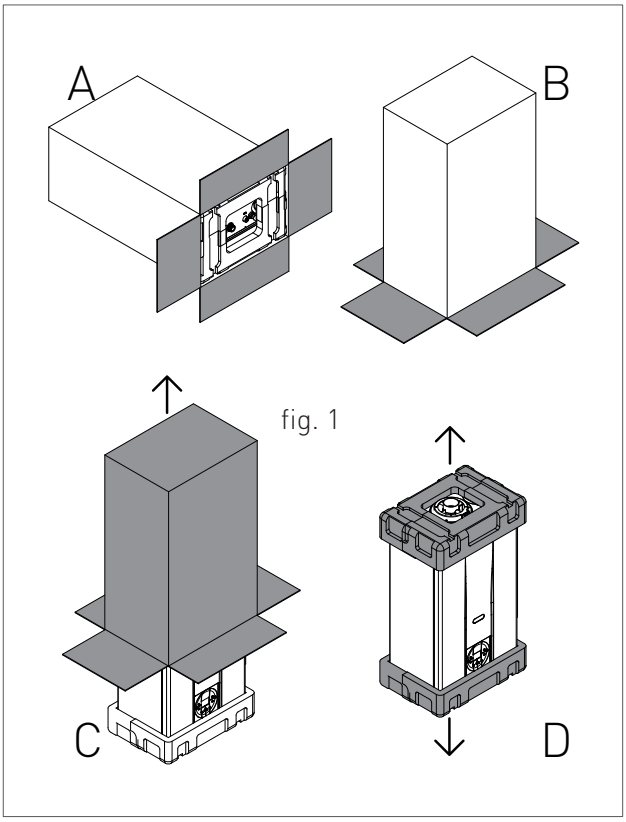


fig. 1

1.1.5. OVERALL DIMENSIONS (inch)

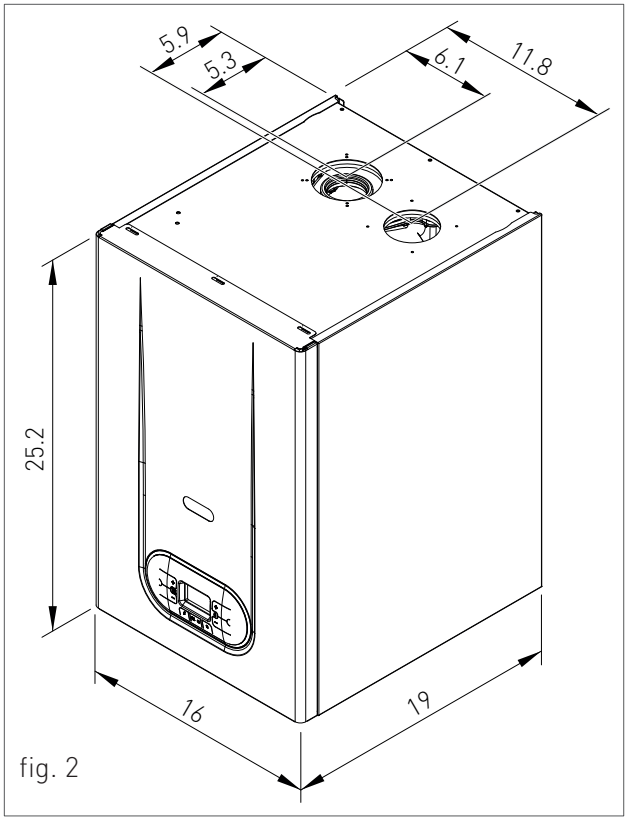
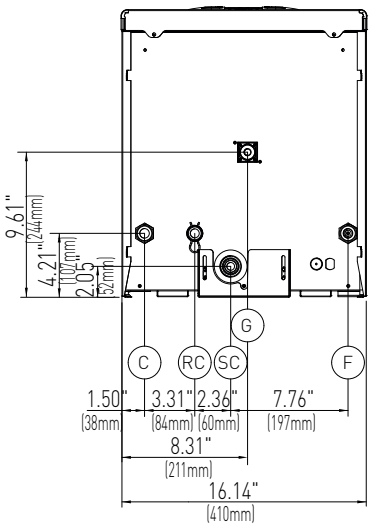


fig. 2



C	HOT WATER OUTLET	Ø3/4" BST*
F	COLD WATER INLET	Ø3/4" BST*
RC	GAS	Ø3/4" NPT
G	RECIRCULATION MODE	Ø1/2" NPT
SC	CONDENSATE DRAIN	Ø0.8"

(*) NOTE: THESE ARE CONNECTION SIZES BEFORE VALVE KIT/CONNECTION CONVERSION KIT IS INSTALLED.

HYDRAULIC CONNECTION KIT

A water connection kit equipped with water connections and safety valve (see 'VS') is shipped loose with each unit.

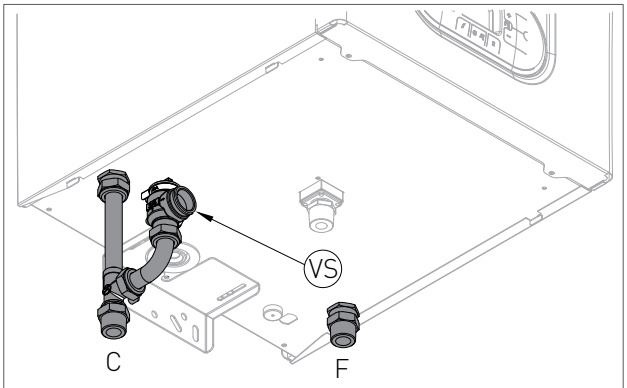


fig. 3

C	HOT WATER OUTLET	Ø3/4" NPT
F	COLD WATER INLET	Ø3/4" NPT

1.1.6. POSITIONING AND CLEARANCES TO COMBUSTIBLE MATERIAL AND SERVICE CLEARANCES

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

This water heaters has been certified to be installed with "0" clearances to combustible material.

In order to allow the access inside the water heaters for maintenance operations, follow the minimum service clearances indicated in figure 4.

To facilitate the installation, the water heater is provided with a jig that allows setting in advance the connections to the tubes providing the ablility of connecting the water heaters to completed masonry structure.

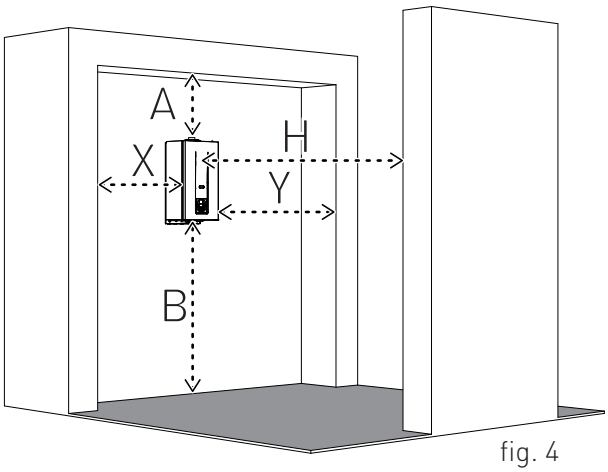


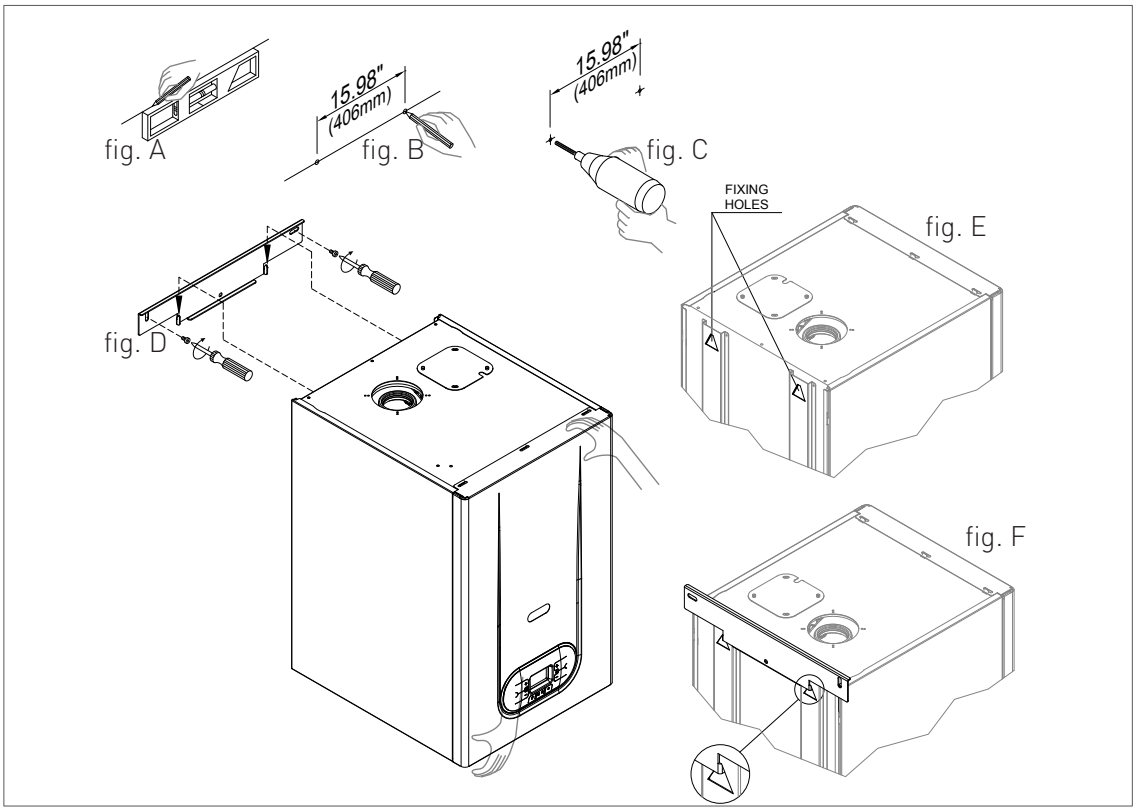
fig. 4

A - 7.8 inch
B - 11.8 inch
X - 2.3 inch
Y - 2.3 inch
H - 36 inch

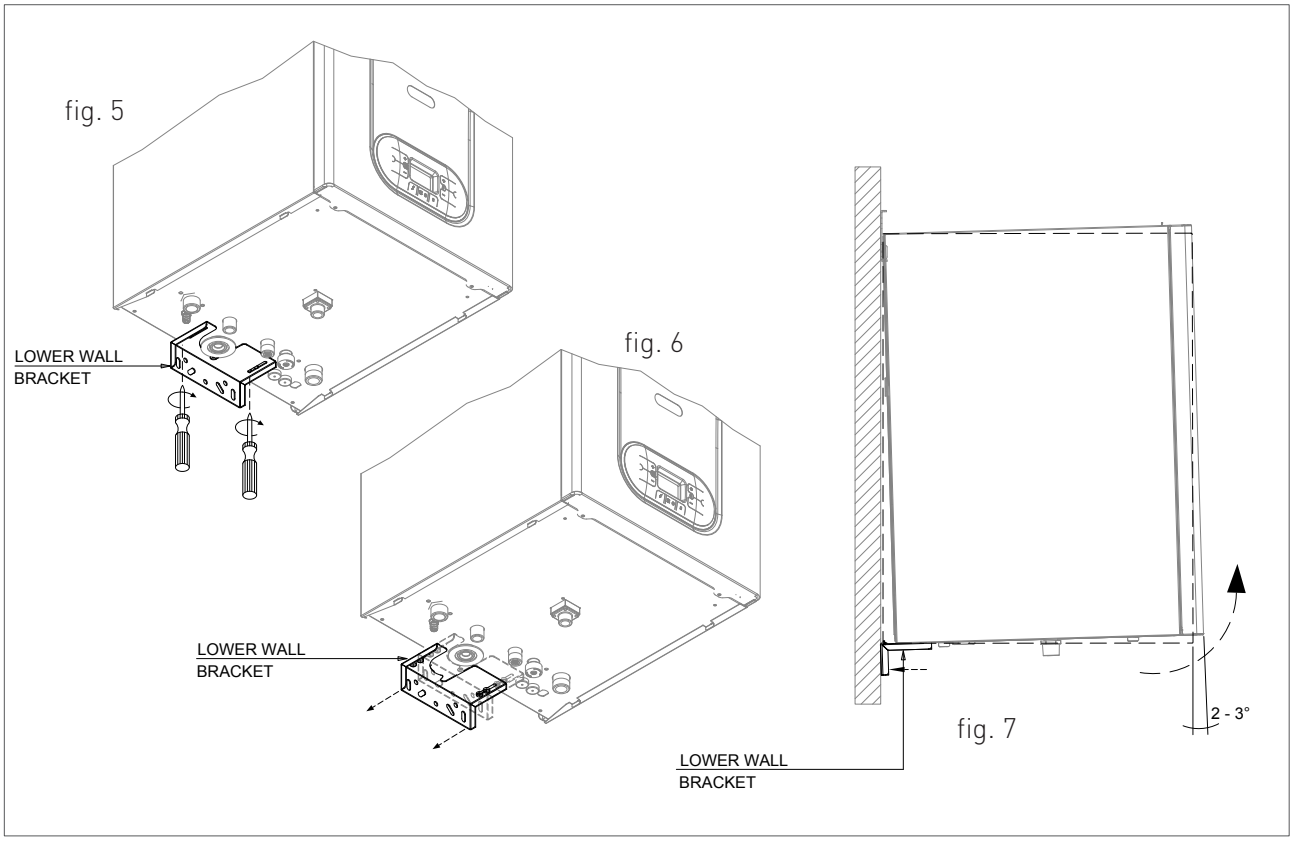
1.1.7. ATTACHING THE WATER HEATERS TO WALL

To position the unit, proceed as follows:

1. Trace a line using a spirit level (min. length 25 cm / 10") on the installation wall (fig. A).
2. Mark the two points to insert the two screws (fig. B) and drill the wall (fig. C).
3. Fix the wall bracket using the screws (fig. D) provided. Hang the water heater using the attached holes (E-F).



4. To make it easier the outlet of the condensate, the water heaters, once it is hung onto the wall, must have the right slope. Please use the lower wall bracket (fig.5);
5. Unscrew the lower bracket screws from the bottom of the water heater. Place the lower bracket into position and loosely screw the lower bracket (fig. 5). Slide the lower bracket (fig. 6) in order to separate the water heater from the wall from 2-3° (fig. 7).
6. Perform the connections.



1.1.8. CIRCULATOR PERFORMANCE CURVE

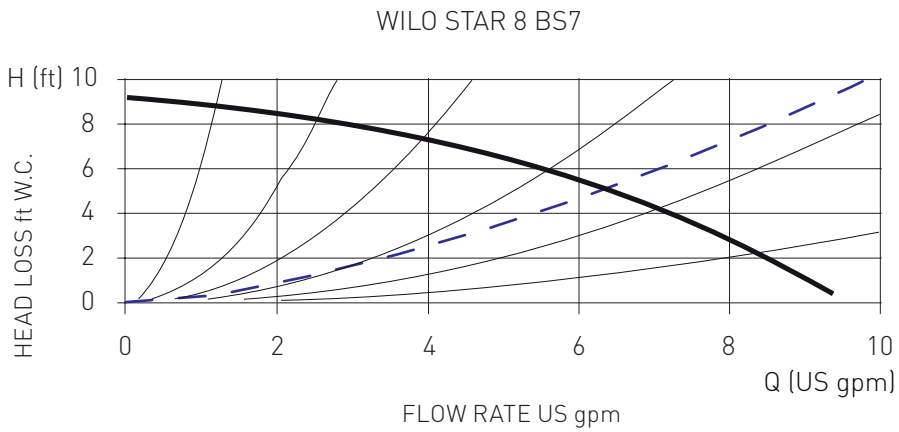


fig. 8

—— Circulator priority maximum speed

- - - - Appliance Loss

1.1.9. WATER CONNECTION

DANGER

Make sure that the water tubes are not used as grounding system for the electrical plant. There are not suitable for such use.

WARNING

To prevent voiding the warranty and to ensure the proper operation of the water heaters, please wash the unit (if possible when hot) with suitable descaling solution to remove the impurities coming from tubes.

WARNING

When connecting the equipment to water supply, avoid excessive bending and recovery operations from improper positioning that may damage the tubes causing leaks, malfunction or premature wear.

WARNING

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

DOMESTIC CIRCUIT

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

The pressure of the cold inlet water should be between 7.2 psi (0.5 bar) and 150 psi (10.34 bar).

In case of greater pressure values, please install a pressure reducer upstream from the water heaters.

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 recently installed units. Based on the characteristics of the inlet water, you should install suitable water treatment devices, for residues presence please install an inline filter.

1.1.10. RECIRCULATION MODE

The tankless water heaters has a built in recirculation system a circulating pump which is designed to provide a controlled flow rate of domestic hot water thus reducing wait times and water waste.

To activate the recirculation mode, please proceed as follows:

› Turn the three-way-valve to the "recirculation" position, as shown in figure 9.

› Activate the recirculation mode by simultaneously pressing the Ⓡ and ⊖ ' buttons of the control panel (figure 10). The activation of the recirculation mode is displayed on the control panel as indicated by the RC symbol.

› Adjust the setting of the return temperature by pressing ⊕ and ⊖ (figure 11). The activation of the pump is displayed the control panel as indicated by the pump symbol ▷.

To detect the return temperature, the system activates the pump for 20 seconds every 10 minutes.

If the temperature detected, by the recirculation sensor, is lower than required, the pump activates and the unit operates at the minimum fire rating.

When the required temperature is achieved, the unit shuts-off and the pump runs for 40 seconds (this latter value can be adjusted by means of parameter P04). The highest possible temperature of the domestic hot water, during the recirculation mode, is of 127 °F (53 °C). When this temperature is achieved, the appliance shuts-off while the pump keeps running. The appliance is activated again when the temperature falls to 122 °F (50 °C).

fig. 9

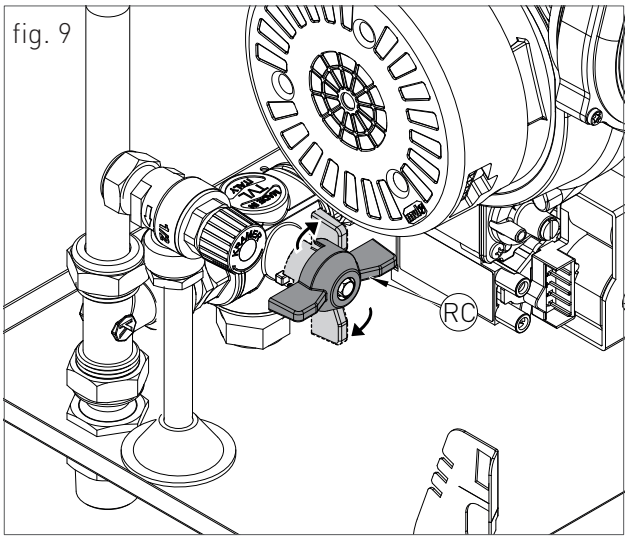


fig. 10

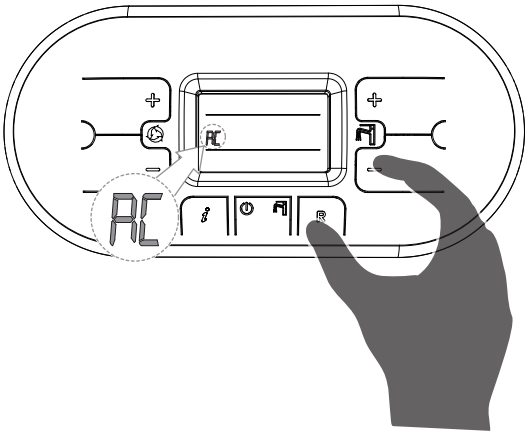
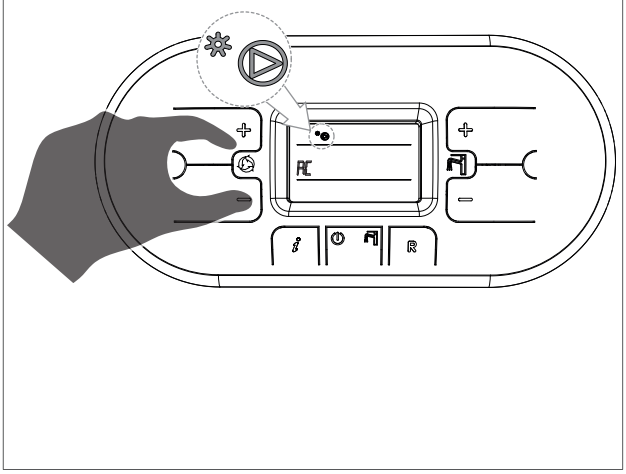


fig. 11



1.1.11. PIPING DIAGRAM FOR BASIC INSTALLATION

This is not an engineering drawing. It is intended only as a guide and not as a replacement for professionally engineering project drawings.

This drawing is not intended to describe a complete system. It is up to the contractor / engineer to determine the necessary components and configuration of the particular system being installed.

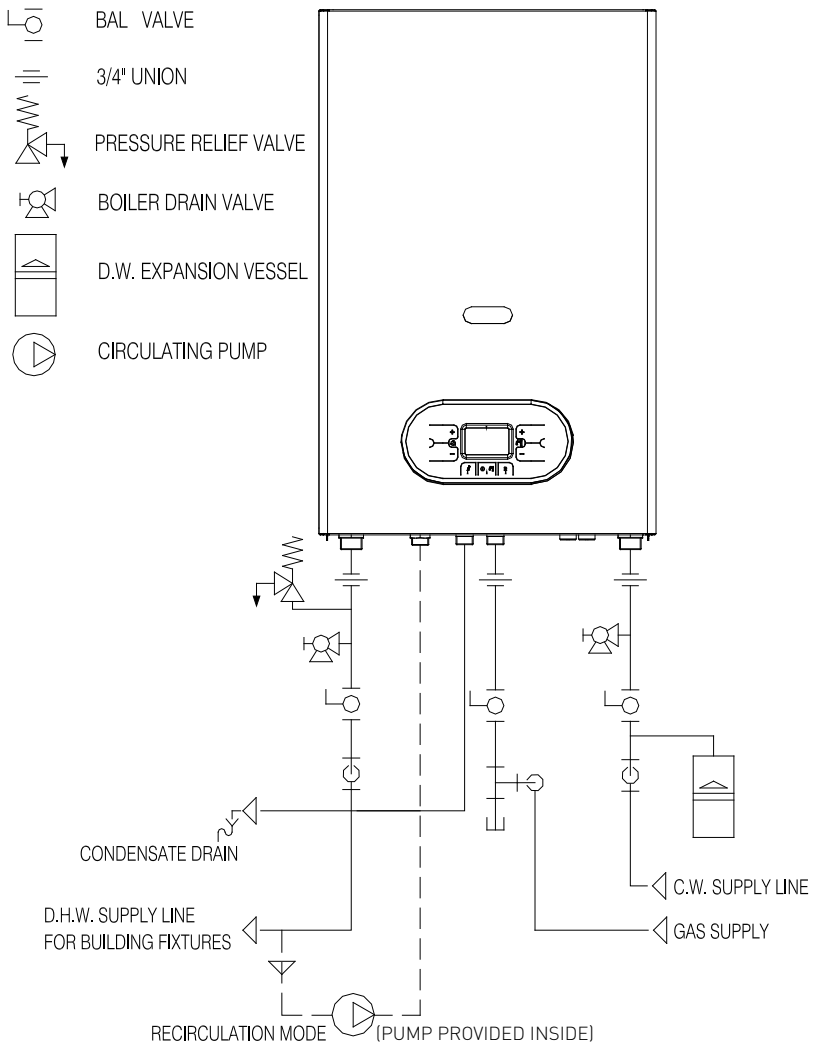


fig. 12

1.1.12. CONDENSATE DRAIN

FILLING THE CONDENSATE COLLECTION SIPON

Before starting the water heaters you have to fill the condensate collection siphon in order to avoid fuel backup through the siphon.

Fill the condensate collection siphon as follows (see fig. 13):

› Unscrew the "T" cap from the siphon, fill three quarters of the the siphon with water and screw the "T" cap back in;

› Connect the dedicated flexible condensate drain tube "P" to a waste disposal system.

WARNING

After the first months of water heaters operation, it is recommended to clean the condensate trap, to eliminate possible deposits coming from the first flow of the condensate inside the water heaters technical components. These deposits could cause a malfunctioning of the trap.

CONDENSATE DRAIN

The water heaters produces a significant amount of condensate during operation. This condensation has an acidic pH of 3-5. Follow all local codes and regulations when disposing of condensate from the water heaters.

The project engineer should consider the possibility of installing systems to eliminate the acidic condensation, according to system power and buildings' use.

The system should be designed to avoid the condensate freezing. Before the water heaters commissioning, check the correct condensate flow.

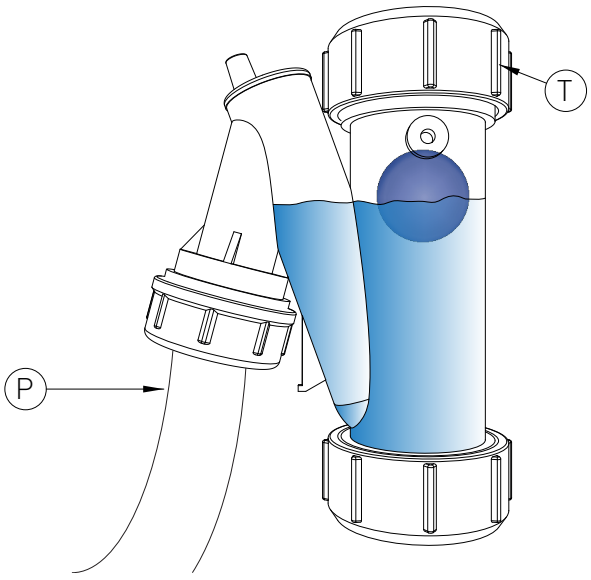


fig. 13

WARNING

Check before connecting the condensate trap to the drain pipe, for the proper gradient of water heaters as described in paragraphs "1.1.8 ATTACHING THE WATER HEATERS TO WALL".

WARNING

Properly connect the siphon condensate from the water heaters to a drain system having adequate slope. Where possible, you should make this connection using transparent tubing to check for proper condensate drainage and avoid stagnation that could cause hazardous backflow of the condensate into the *water heaters*.

To connect the condensate drain use only corrosion-resistant material for the drain line.

CONDENSATE NEUTRALIZER KIT

The condensate neutralization system neutralizes the condensate created by the products of combustion.

Acid condensate, introduced into the neutralization box, follows a two-step set course. First phase: nitrates and sulphates filtration through active carbons contained in the first part of the carbon site pipe. In the second phase the pH rises.

The acidity of the condensate can be controlled through the use of appropriate tools for the determination of Ph, such as the litmus paper. Neutralized condensate can then be routed to the drainage system.

Maintenance

The pH value of the condensate after the neutralizer must be in between <5,5 – 9,5> .

Every six months, you need to determine the pH of the condensate treated in the neutralizer. Litmus paper or a digital instrument can be used to measure the pH level.

Neutral point is on the 6,8-7 value; in case of lower value the condensate is acid, in case of a higher value it is basic.

If necesssary, replace the active carbon and the reagent granulate.

1.1.13. ANTI-FREEZE PROTECTION

The water heater is protected against freezing using the electronic board design with a function that start the burner and heat the water in the boiler when their water temperature goes below the minimum pre-set values, protecting the water heater up to an external temperature of 14 °F (-10 °C).

The device starts when the hot water temperature goes below 41 °F (5 °C), automatically starting the burner until the water reaches the temperature of 59 °F (15 °C).

The system starts even if display appears "OFF", as long as the water heater is connected to the power (120 V) and gas supply.

For long periods of standby, please empty the water heater and the plant.

If the temperature goes below 14 °F (-10 °C) centigrades, please insert the electrical resistances kit (cod. 82259LP).

1.1.14. PRESSURE RELIEF VALVE KIT

To complete the installation of the water heaters, you must install an approved 3/4", maximum 150 PSI pressure relief valve on the hot water outlet.

An hydraulic kit equipped with hydraulic connections and safety valve is available and supplied by Radiant

ATTENTION

The pressure relief valve MUST TO BE INSTALLAED.

ATTENTION

The pressure relief valve should be installed as close to the water heaters as possible. No other valve should be placed between the pressure relief valve and the water heaters.

DANGER

Improper installation of the pressure relief valve may result in property damage, personal injury, or death. Follow all instructions and guidelines when installing the pressure relief valve. The valve should be installed only by a licensed professional.

When installing the valve, follow these guidelines:

› Direct the discharge piping of the pressure relief valve so that hot water will not splash on anyone or any nearby equipment.

› Attach the discharge line to the pressure relief valve and run the end of the line to within 6-12" (150-300mm) of the floor.

› Ensure that the discharge line will allow free and complete drainage without restriction. Do not install a reducing coupling or other restriction on the discharge line.

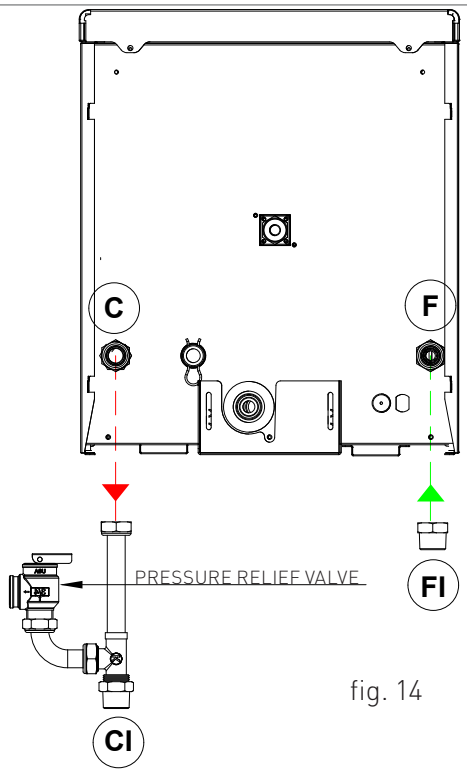


fig. 14

C	HOT WATER OUTLET (Wather heater)	Ø 3/4" BST
F	COLD WATER INLET (Wather heater)	Ø 3/4" BST
CI	HOT WATER OUTLET	Ø 3/4" NPT
FI	COLD WATER INLET	Ø 3/4" NPT

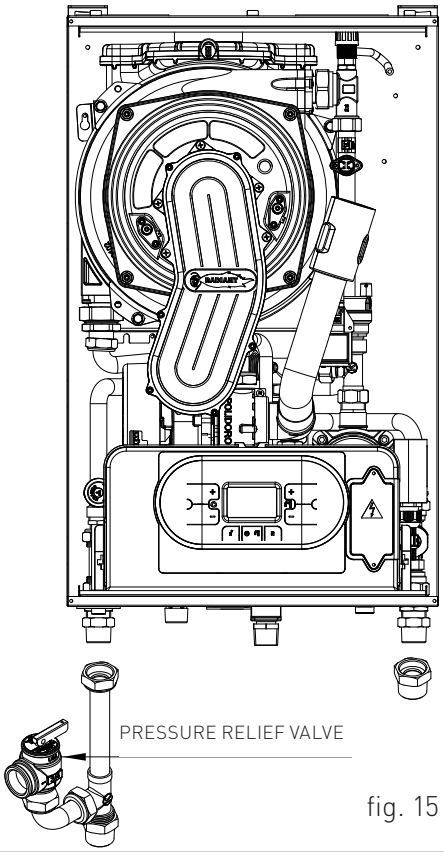


fig. 15

1.1.15. GAS CONNECTION

WARNING

The gas piping must be installed according to all local and state codes, or in absence of local and state codes, with the latest "Natural gas and propane installation code", CAN/CSA-B 149.1 or "National Fuel Gas Code", ANSI Z223.1 (NFPA 54). Consult the "Natural gas and propane installation code" or "National Fuel Gas Code" for the recommended gas pipe size of other materials.

BEFORE PERFORMING THE GAS CONNECTION, MAKE SURE THAT:

› the gas line size and length meets requested capacity;

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

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

› the unit is suitable for use with the type of gas available by checking the water heater data plate (located on the inner side of the front casing. If they do not match you must take the necessary measures to adapt the water heater to another type of gas (see 2.2.17 CONVERSION TO A DIFFERENT GAS TYPE);

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

1.1.16. ELECTRICAL CONNECTION

DANGER

The equipment is electrically safe only if it is properly connected to an efficient grounding system, performed in compliance with the safety standards in force (National Electrical Code, ANSI/NFPA 70 and or the Canadian Electrical Code Part I, CSA C22.1, Electrical Code). You should check this essential safety requirement. 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 grounding system.

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

› make sure that the cables section is appropriate for the maximum power consumed by the equipment.

› The equipment works with alternating current of 120 V and 60 Hz. The electrical connection must be installed using an all-pole switch with an opening of at least 0.12 in (3 mm) between contacts placed upstream from the device.

WARNING

Make sure that the phase and neutral cables connection is installed in compliance with the wiring diagram (see 1.1.16 POWER SUPPLY).

WARNING

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

1.1.17. POWER SUPPLY

To power the water heaters connect the electrical cables to the terminal inside the control panel as follows:

DANGER
Shut off the voltage from the main switch.

› remove the water heaters's front casing (refer to 2.2.13 ACCESSING THE WATER HEATERS).

› loosen the two screws and remove the plate "A" (see fig. 1).

› after removing the plate, connect the electrical cables to terminal "B" (see fig. 16):

- the yellow/green cable to the terminal marked with grounding symbol "⏚".
- the white cable to the terminal marked with "N".
- the black cable to the terminal marked with "L".

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

Note: A 3-prong plug is provided with every unit and the above wiring has been performed.

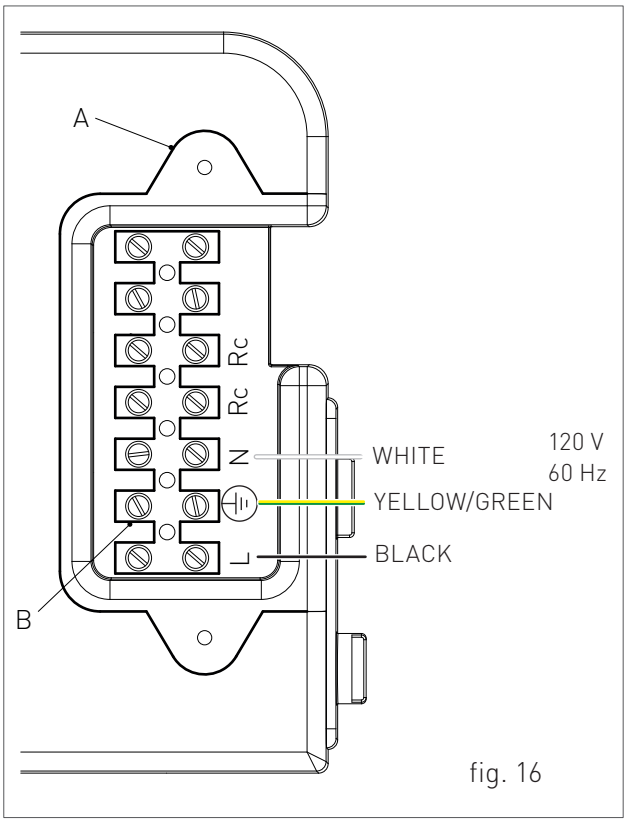


fig. 16

1.1.18. OPTIONAL ELECTRICAL CONNECTIONS

The cables should be inserted inside the water heater using the cable glands 'P1' and 'P2' placed under the board (see fig. 17). Make a hole on the cable gland, smaller than the cable diameter, to make sure that the air cannot pass through.

To wire the optional below:

(TP) DOMESTIC HOT WATER PRE-HEATING DEACTIVATION TIMER

use the terminal placed inside the control panel as follows:

DANGER

Cut off the voltage from the main switch.

› remove the water heaters's front casing (refer to 2.2.13 ACCESSING THE WATER HEATERS).

› unscrew the screws and remove plate "A" (see fig. 18).

› After removing the plate, connect the electrical cables to terminal "B" (see fig. 18);

› After performing these operations, remount plate "A" and the front casing.

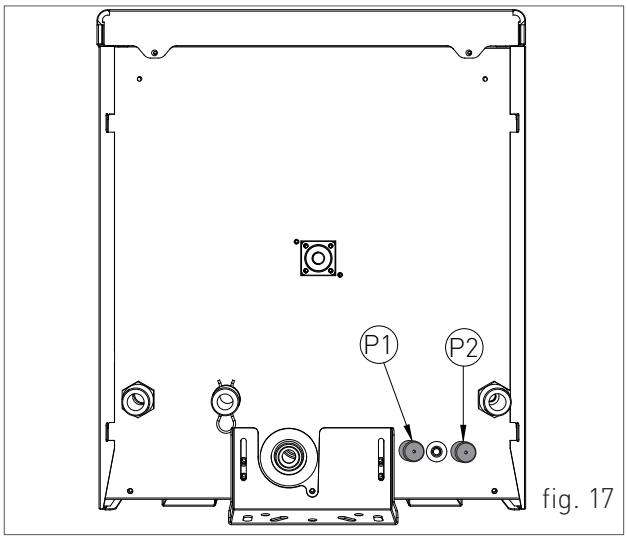


fig. 17

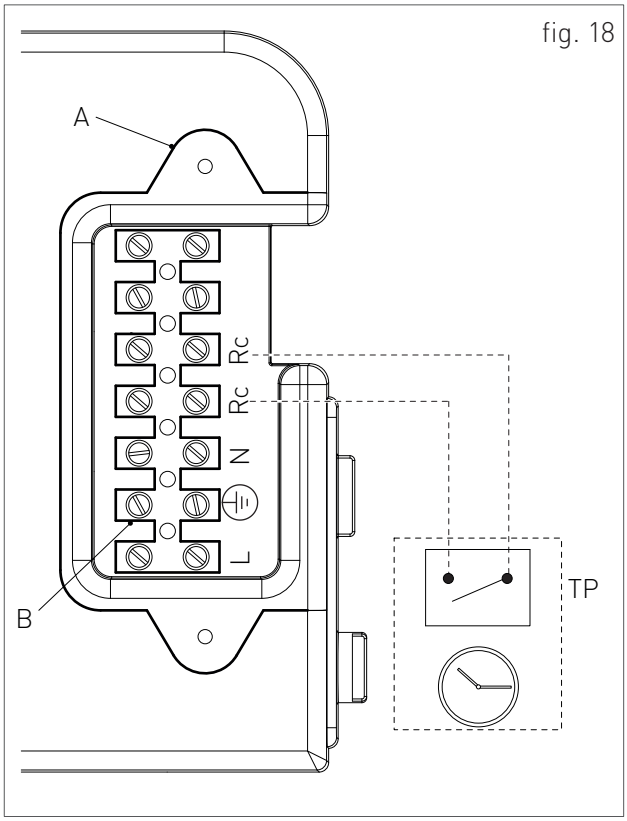


fig. 18

1.1.19. VENTING

WARNING

In order to ensure proper operation and efficiency of the device you have to connect the water heater fume exhaust fitting to the exhaust and fresh air adapters (loosely supplied in water heaters). It is recommended to install discharge systems approved by Radiant.

WARNING

All termination kits must be located and installed in accordance with local building code and CSA B149.1 Natural Gas and Propane Installation Code.

WARNING

For condensate collection please follow the local codes.

› All exhaust runs shall be sloped such that any condensate would move towards the combustion chamber so that it can be collected and drained via the internal condensate trap of the appliance (Refer to section 1.1.18).

› All combustion air intake runs where possible should be sloped in a manner to avoid rain water, dust or foreign objects from entering the appliance (Refer to section 1.1.18).

› In case of horizontal polypropylene co-axial system installation, properly orientate the horizontal co-axial terminal in relation to the slopes inside the exhaust pipe and to protect the combustion air pipe from adverse weather conditions (Refer to section 1.1.18, sub-section **III (a)** and figure 20).

This appliance is certified to be installed using polypropylene, PVC and CPVC. For Canada use System 636 polypropylene, PVC and CPVC Type BH Gas Venting Systems certified to ULC S636. Types of venting configurations for this appliance are, co-axial vent (pipe with in a pipe), co-linear vent (separate pipes for exhaust and combustion air), and single exhaust vent (uses room air for combustion).

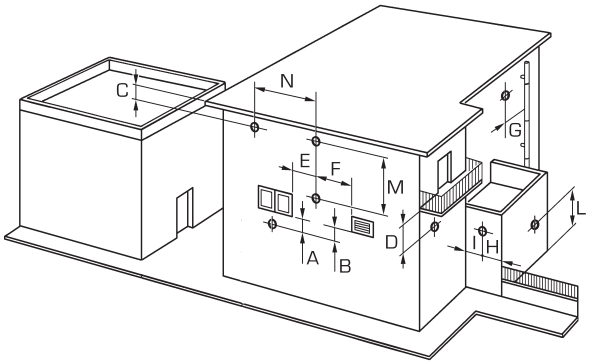


TABLE MINIMUM DISTANCE	feet	mm
A- below openable window or door	3*	900*
B- below ventilation opening (non mechanical)	3*	900*
C- below soffits	1	300
D- below balcony	1	300
E- from adjacent window or door	3*	900*
F- from adjacent ventilation opening (non mechanical)	3*	900*
G- from horizontal or vertical soil or drain pipes	1	300
H- from corner of building	1	300
I - from recess in building	1	300
L - above a paved sidwalk or a paved driveway that is located on public property	7	2100
M- between two terminals set vertically	2	600
N- between two terminals set horizontally	2	600

(*)- FOR APPLIANCE WITH INPUTS UP TO AND INCLUDING 100,000 Btu/h (29.3 kW) THIS DISTANCE REDUCES TO 1 ft (300 mm).

1. The vent shall not terminate:

a) where it may cause hazardons frost or ice accumulations on adjacent property surfaces;

b) less that 7 ft (2.1 m) above a paved sidewalk or a paved driveway that is located on public property;

c) within 6 ft (1.8 m) of a mechanical air-supply inlet to any building;

d) above a regulator within 3 ft (900 mm) horizontally of the vertical centerline of the regulator vent outlet to a maximum vertical distance of 15 ft (4.5 m);

e) within 3 ft (900 mm) of any gas service regulator vent outlet;

f) less than 1 ft (300 mm) above grade level plus expected snow level;

g) within the following distances of a window or door that can be opened in any building, of any non-mechanical air supply inlet to any building, or of any combustion air inlet of any other appliance;

- i) 12 in (300 mm) for inputs up to and including 100,000Btu/h.
- ii) 3 ft (900 mm) for inputs exceeding 100,000 Btu/h.

h) Underneath a veranda, porch, or deck unless;

- i) the veranda, porch, or deck is fully open on a minimum of two sides beneath the floor; and
- ii) the distance between the top of the vent termination and the underside of the veranda, porch, or deck is greater than 1 ft (300 mm);

2. Building material within 5 ft (1,5m) of a vent terminal will be subjected to products of combustion and therefore may be subject to discoloration or deterioration, of building materials.

1.1.20. TYPES OF EXHAUST SYSTEMS

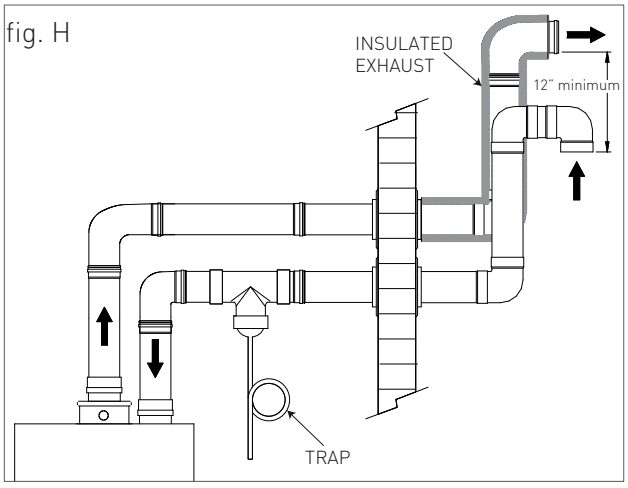
GENERAL INTRODUCTION

The venting installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the National Fuel Gas Code, ANSI Z223.1/NFPA 54, and/or Natural Gas and Propane Installation Code, CAN/CSA B149.1.

Horizontal exhaust runs shall slope upwards not less than 1/4 in/ft [21 mm/m] from the water heater to the vent terminal. Venting shall be installed so as to prevent the accumulation of condensate throughout the vent run. Provide means for drainage of condensate on all vertical exhaust runs and where necessary.

Horizontal combustion air intake runs should slope downwards not less than 1/4 in/ft [21 mm/m] from the water heater to the air intake terminal where possible.

For installations in which the combustion air run cannot slope to the outdoors, it is recommended that a trap be installed closed to the appliance (see figure 'H').



Where not possible a water trap shall be installed so as to collect moisture or water from entering into the air box of the water heater. Provide means for drainage of moisture and water on all vertical air intake runs and where necessary.

Traps, if used, should have pipe slopes not less than 1/4 in/ft [21 mm/m] downwards to the trap.

I - CO-LINEAR VENT (FRESH AIR AND EXHAUST)

The Gas-Fired wall mounted hot water heaters can be installed with two separate pipes. The two separate pipes consists of one for the exhaust an the other for combustion air intake.

Please refer to Table 1: Allowable vent lengths for maximum vent and combustion air intake runs.

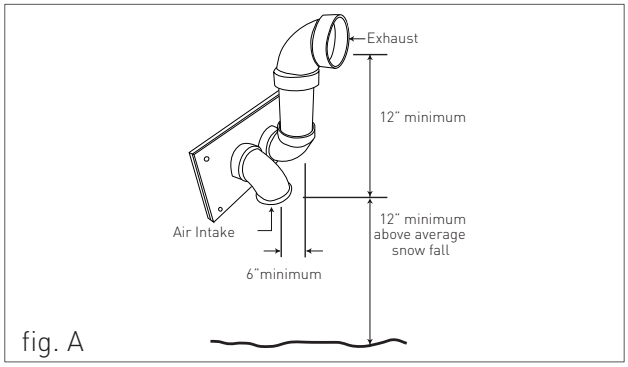
Co-linear vent installations can be either be installed through the wall or through the roof.

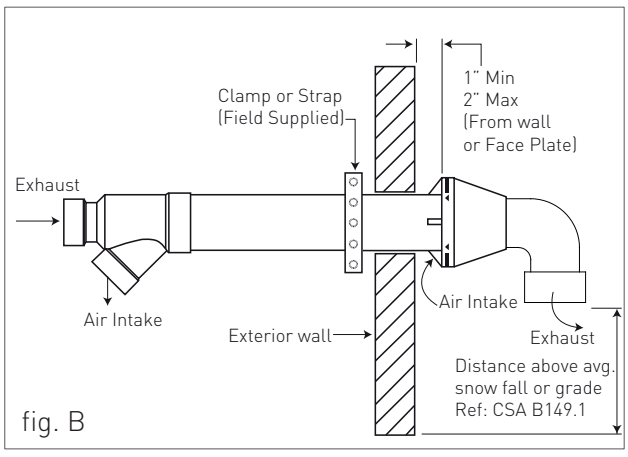
I (a) - THROUGH THE WALL LNSTALLATION:

Through the wall installations can terminate with two separate pipes or with a concentric terminal.

Please refer to figure 'A' for installations using terminations using co-linear vent.

Refer to figure 'B' for installations using co-linear vent with co-axial terminal.





I (b) - THROUGH THE ROOF LNSTALLATION:

Through the roof installations can terminate with two separate pipes or with a co-axial terminal.

Please refer to figure 'C' for installations using co-linear vent with vertical termination.

Refer to figure 'D' for installations using a co-linear vent with vertical co-axial terminal.

II - SINGLE VENT

This gas-fired wall mounted hot water heaters can be installed with one single vent pipe for exhaust.

Please refer to Table 1: Allowable vent lenghts for maximum vent run.

Single vent installations can be either be installed through the wall or through the roof.

II (a) - THROUGH THE WALL INSTALLATION:

Please refer to figure 'E' for through the wall single vent installations.

II (b) - THROUGH THE ROOF INSTALLATION:

Please refer to figure 'F' for through the roof single vent installations.

fig. C

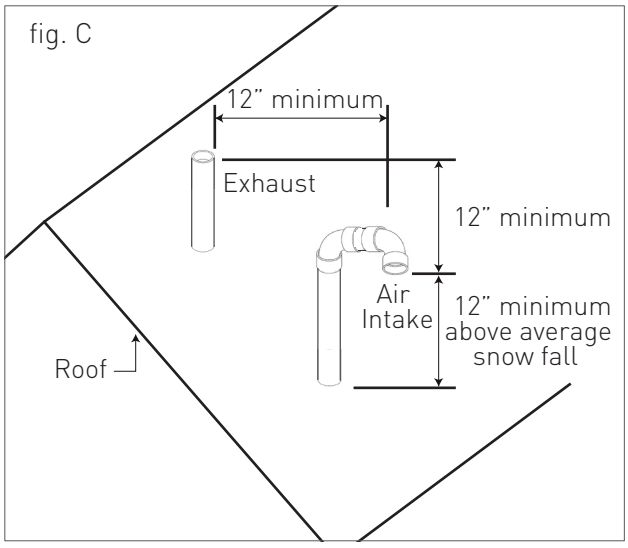


fig. D

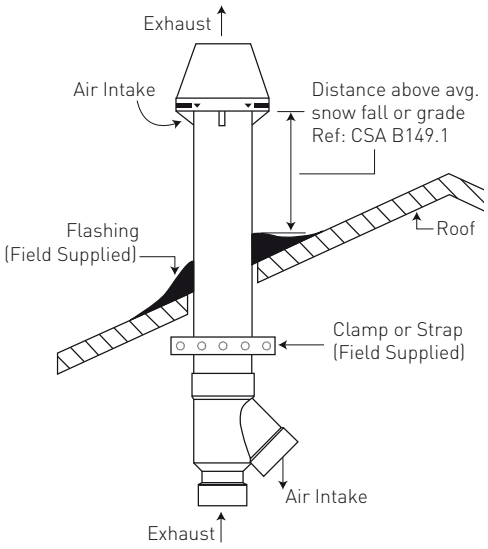


fig. E

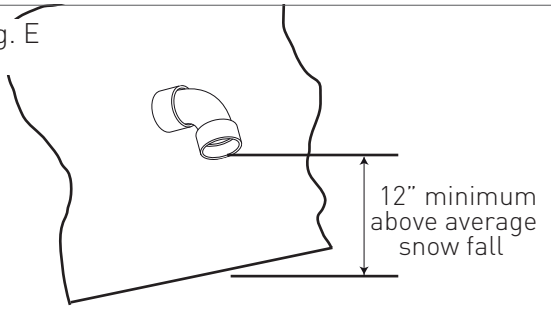
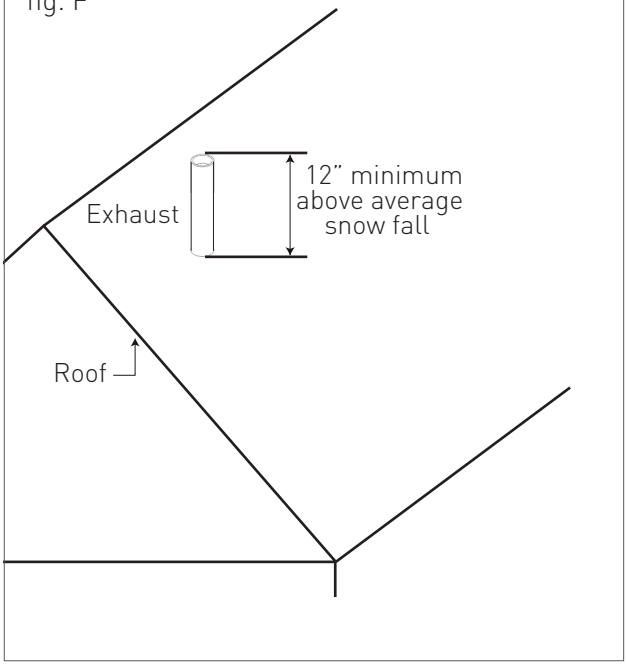


fig. F



AIR INTAKE / FLUE EXHAUST Ø 3" (80 MM) ADAPTORS WITH PP TEST POINT (COD.: 65-00433)

These adapters are to be installed on co-linear vent (two separate pipes for exhaust and combustion air), and single exhaust vent (using room air for combustion). Additional bushings or couplings are required to transition from 3" schedule 40 pipe to 2" or 4" schedule 40 pipe only for installations using 2" or 4" schedule 40 pipe. Additional transition adapters are not needed for installations using only 60 mm or 80 mm polypropylene, or 3" schedule 40 PVC or CPVC pipe.

Ensure that the adapters are installed correctly into the correct locations as per the attached figure 19.

Installation instructions:

- Remove the air intake cover plate.
- Clean the inspection collar surface and the area of the air intake hole.
- Stick the appropriate neoprene gaskets onto the underside of the mounting flange of the adapters. Pay attention to aligning the four mounting through holes.
- Mount the intake/flue exhaust adaptors with self tapping screws provided with the flue kit.
- Install the first piece of 60 mm or 80 mm polypropylene or 3" schedule 40 PVC or CPVC pipe until it bottoms out.
- Finally use the gear clamp to tighten the first piece of pipe to the adaptor.

cod.: 65-00433

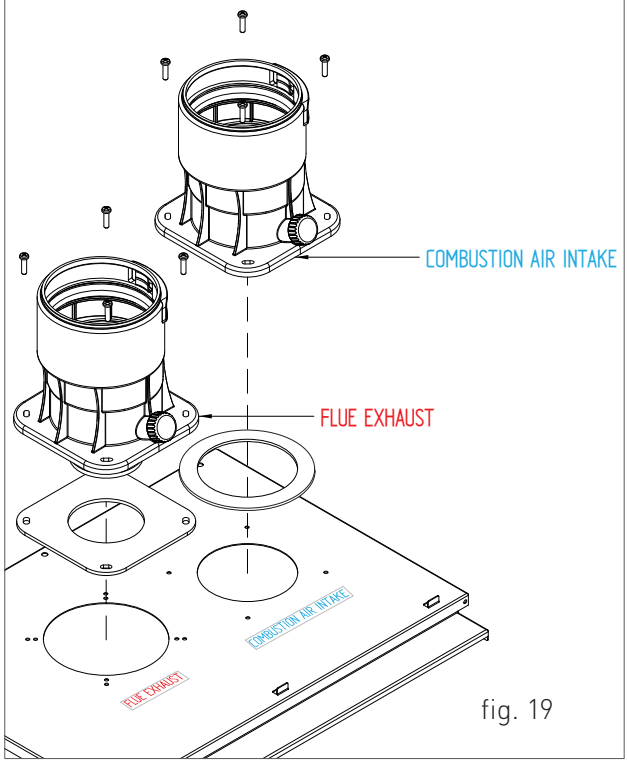


fig. 19

III (a) - KIT M&G HORIZONTAL CO-AXIAL SYSTEM Ø3/4.9 in (Ø80/125 mm) INTERNAL POLYPROPYLENE DUCT ADJUSTABLE AT 360°.

It allows exhaust and air intake from external wall.

Suitable only for condensing unit.

It allows exhaust and air intake for combustion through co-axial ducts, the external one for air intake, the plastic internal one for exhaust.

PLEASE SEE THE MAXIMUM EXHAUST LENGTH IN THE TABLE 1 IN 1.1.19 "ALLOWABLE VENT LENGTHS".

The maximum exhaust length (or linear reference length) can be calculated by summing the length of the linear tube.

When terminating horizontally, install an elbow at the end of the terminal. For area where snow is a concern it is recommended to point the elbow downwards.

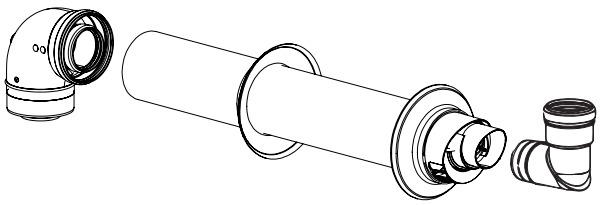


fig. 20

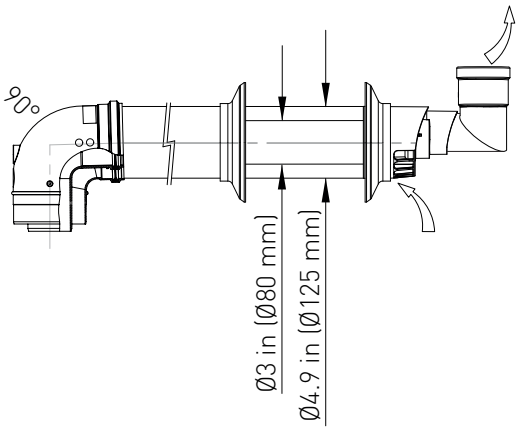


fig. 21

1.1.21. TABLE 1: ALLOWABLE VENT LENGTHS

Vent Cofiguration	Pipe Size	Minimum Lenght Vertical and Horizontal per Vent Run	Max Equivalent lenght Vertical and Horizontal per vent run	Gas Type	Exhaust Vent	Intake Vent
Horizontal Co-axial vent S636 Polypropylene	80mm – 60mm	1 ft (0.3 m) + elbow	3.28 ft (1 m) + elbow	Natural or Propane	Polypropylene	Polypropylene
Horizontal Co-axial vent S636 Polypropylene	125mm – 80mm	3.3 ft (1 m) + elbow	16.4 ft (5 m) + elbow	Natural or Propane	Polypropylene	Polypropylene
Horizontal/ Vertical Co-linear Vent** (2 Separate pipes)	2" / 60mm	3.3 ft (1 m)	41 ft (12.5 m)*	Natural or Propane	PVC, CPVC, Polypropylene	PVC, CPVC, Polypropylene, ABS
Horizontal/ Vertical Co-linear Vent** (2 Separate pipes)	3" / 80 mm	3.3 ft (1 m)	85 ft (26 m)	Natural or Propane	PVC, CPVC, Polypropylene	PVC, CPVC, Polypropylene, ABS
Horizontal/ Vertical Co-linear Vent** (2 Separate pipes)	4" / 100 mm	3.3 ft (1 m)	150 ft (46 m)	Natural or Propane	PVC, CPVC, Polypropylene	PVC, CPVC, Polypropylene, ABS
Horizontal/ Vertical Forced Draft	2" / 60mm	1.6 ft (0.5 m)	41 ft (12.5 m)*	Natural or Propane	PVC, CPVC, Polypropylene	PVC, CPVC, Polypropylene, ABS
Horizontal/ Vertical Single Vent	3" / 80 mm	1.6 ft (0.5 m)	65 ft (20 m)	Natural or Propane	PVC, CPVC, Polypropylene	PVC, CPVC, Polypropylene, ABS
Horizontal/ Vertical Single Vent	4" / 100 mm	1.6 ft (0.5 m)	100 ft (30 m)	Natural or Propane	PVC, CPVC, Polypropylene	PVC, CPVC, Polypropylene, ABS

NOTE: In Canada, exhaust vent must be approved to ULC S636 standard.
Each 2"/ 3"/ 4"/60mm/80mm 45° elbow equates to 2.5 linear feet to vent pipe.
Each 2"/ 3"/ 4"/60mm/80mm 90° short radius elbow equates to 7.5 linear feet to vent pipe.
Each 2"/ 3"/ 4"/60mm/80mm 90° long radius elbow equates to 5 linear feet to vent pipe.
Each 125mm-80mm 45° elbow equates to 5 linear feet to vent pipe.
Each 125mm-80mm 90° short radius elbow equates to 16.4 linear feet to vent pipe.
Each 125mm-80mm 90° long radius elbow equates to 12 linear feet to vent pipe.
The total maximum equivalent vent pipe distance cannot exceed the maximum length listed for horizontal and vertical venting distance.
The maximum lengths are not including elbows unless otherwise stated.
Exceeding the maximum venting distances will cause the appliance to malfunction or cause an unsafe condition.

Gas Type	Minimum Heating Frequency	Maximum Heating Frequency
	(Hz)	(Hz)
Gas A (Natural)	46	255 (270*)
Gas E (Propane)	47	251 (270*)

*** The frequency must be change to a value of 270 Hz only with 2" diameter pipe that has a total vent run of above 18 ft (5.5 m).**

**** Vent run consists of allowable vent length for exhaust pipe and an additional allowable vent length for combustible air.**

2. SUPPORT CENTER SECTION

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

2.1. FIRST START-UP

2.1.1. PRELIMINARY OPERATIONS FOR FIRST START-UP

The first start-up operations consist of checking the correct installation, adjustment and operation of the unit. Proceed as follows:

- check the inner component and ensure that they are sealed in accordance with the specifications provided by standard and regulations;
- check if the gas used is suitable for the water heaters;
- check if the gas capacity and relative pressures comply with those on the rating plate;
- check the operation of the safety device in case of lack of gas;
- make sure that the unit supply voltage corresponds with that on the plate (120 V – 60 Hz) and that the wiring is correct;
- make sure that the grounding system works properly;
- make sure that the combustion air circulation, exhaust and condensate discharge take place properly in compliance with the Local and National Laws and Standards in force;
- make sure that the venting and their connections comply with the requirements of the Local and National Laws and Standards;
- make sure that the D.H.W. system gate valves are open;
- make sure that there is no intake of gaseous products within the system;
- make sure that there are no flammable liquids or materials near the unit;
- open the water heaters gas tap and make sure that there are no gas leaks upstream from the unit (the burner gas connection must be checked while the machine is running);
- in case of new installation of the gas supply network, the air inside the tubes may block the unit at first start-up. Repeat the start-up procedure to purge all the air inside the tube.

2.1.2. WATER HEATERS COMMISSIONING

Proceed with water heaters commissioning as follows:

› Power the water heaters.

› Open the gas valve.

› Ignite the unit by pressing the button 

› Open the D.H.W. taps at the maximum flow rate.

The unit is ignited

WARNING

Please make sure all the air is flushed-off by means of the drain valve located within the unit (A - figure 22) and thru the air separator plug (B - figure 22).

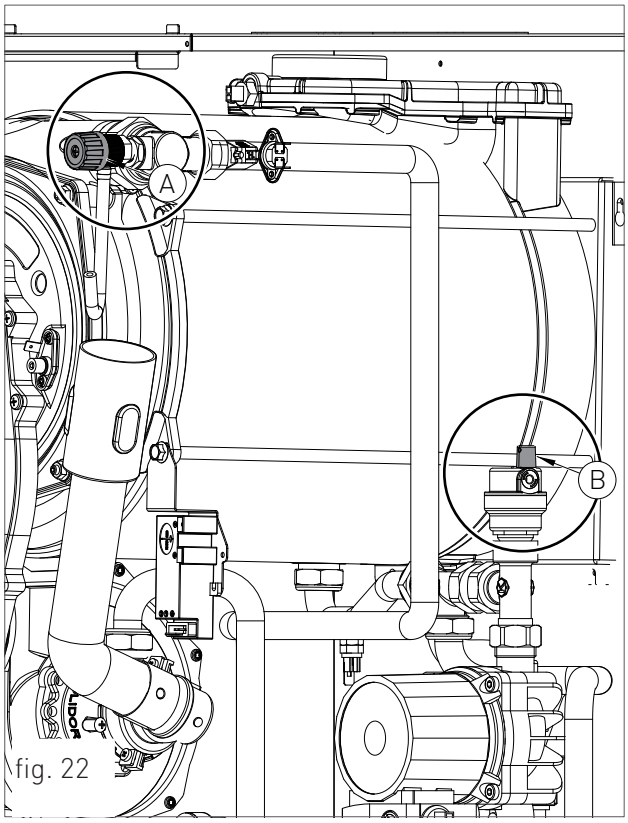


fig. 22

› if the flame is not sensed the board will repeat the start-up operations after post-ventilation (20 seconds).

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

2.1.3. CO2 VALUE CHECK AND CALIBRATION

WARNING

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

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

FOR MINIMUM POWER

› Access parameter 'P06' following the procedure described in 2.1.4 "Parameters accessing and programming" and stay in edit mode until the calibration is completed (the maximum time before forced to exit the edit mode is 7 minutes.

› Insert the combustion analyser probe in the suitable 'PF' exhaust tap (fig. 23), then make sure that the CO_2 value complies with the indications in 2.2.8 "Technical data", otherwise unscrew the protection screw 'A' (fig. 24) and adjust using a 4 Allen wrench the screw '2' (fig. 24) of the Off-Set adjuster. To increase the CO_2 value, turn the screw counter-clockwise and clockwise if you want to decrease it.

› Once the adjustment has been completed, tighten the protection screw 'A' (fig. 24) on the Off-Set adjuster.

› Exit parameter 'P06' following the procedure described in 2.1.4 "Parameters accessing and programming".

FOR MAXIMUM POWER

› Open several D.H.W. taps at the highest flow rate.

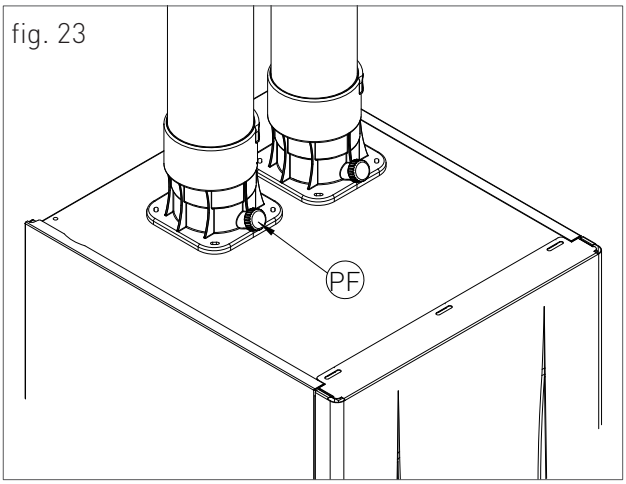
› Access parameter 'P07' following the procedure described in 2.1.4 "Parameters accessing and programming" and stay in edit mode.

› Insert the combustion analyser probe in the suitable 'PF' exhaust tap (fig. 23), then make sure that the CO_2 value complies with the requirements indicated in 2.2.8 "Technical data", otherwise adjust using screw '1' (fig. 24) of the gas flow adjuster. To increase the CO_2 value, turn the screw counter-clockwise and clockwise if you want to decrease it.

› After each adjustment variation on screw '1' (fig. 24) of the gas flow adjuster you have to wait for the water heater to stabilize itself to the set value (about 30 seconds).

› Enter again the parameter P06 and make sure that the CO_2 value did not change to maximum, if changed repeat the calibration described in the previous paragraph.

fig. 23



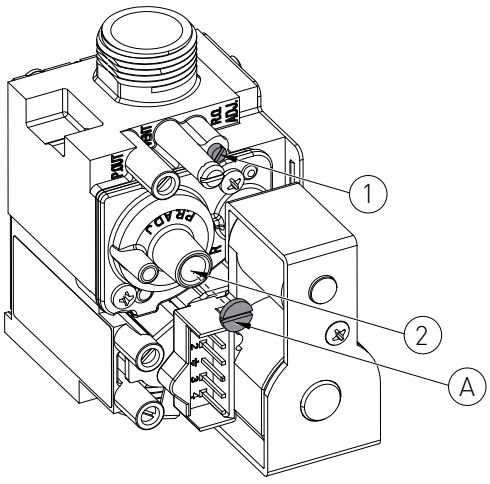


fig. 24

2.1.4. ACCESSING AND PROGRAMMING THE PARAMETERS

To access the parameters menu and adjust their values, follow the procedure below:

1. Press the button '⏻' to select the OFF mode displayed using the symbol '⏻'.

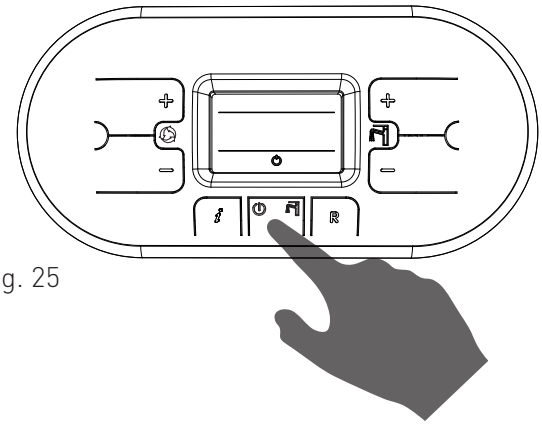


fig. 25

2. Hold at the same time the keys 'ⓘ' and 'Ⓡ' until on the display appears the symbol '🔧' with the message 'P00', and release the keys 'ⓘ' and 'Ⓡ'.

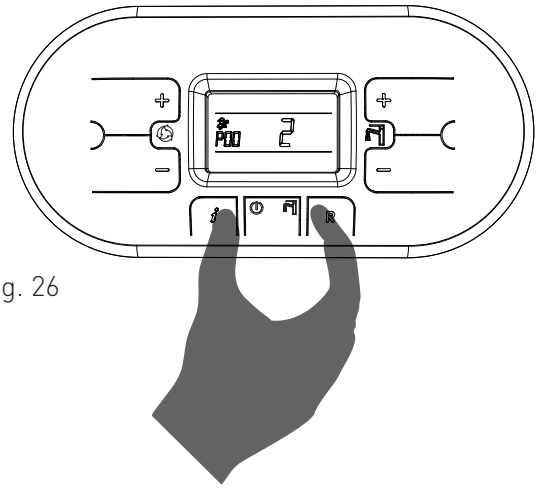


fig. 26

3. Use the keys '⊕' and '⊖' of the symbol recirculation ⟳ to select the parameter to be edited.

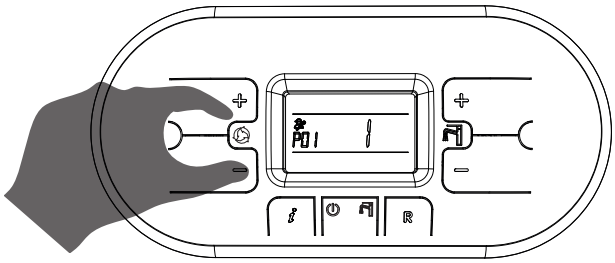


fig. 27

4. Use the keys '⊕' and '⊖' of the domestic circuit to change the value of the parameter.

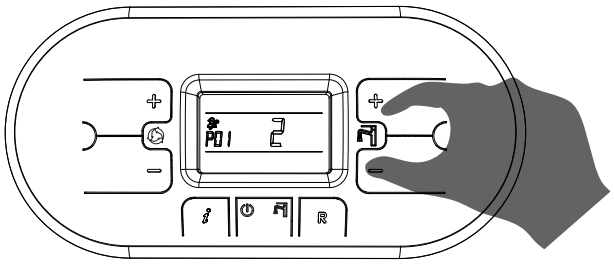


fig. 28

5. Press the key '⏻' to confirm the action and wait for the display to stop blinking, indication of the fact that the adjustment was implemented.

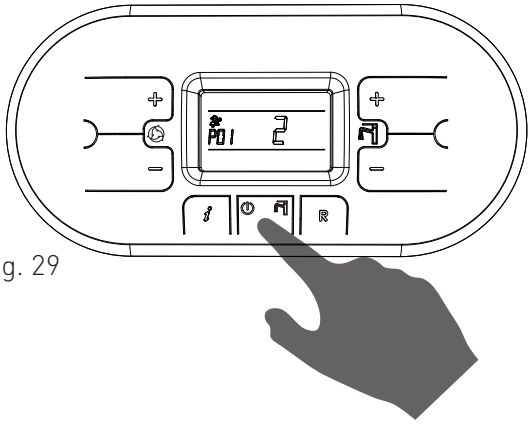


fig. 29

6. To exit the parameters menu, hold at the same time the keys 'i' and 'R' and wait for the symbol '⏻' to appear on the display.

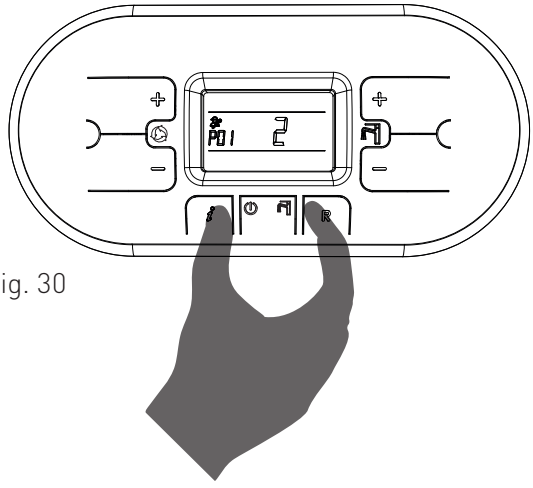


fig. 30

2.1.5. PARAMETERS TABLE

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P00	***SELECTION OF THE FIRE RATING***	0 - 3	0 = 24 KW
			1 = 28 KW
			2 = 34 KW
			3= SFK 55 (55 KW)
P01	***GAS TYPE SELECTION*** ***ATTENTION:*** READ THE INSTRUCTION IN CHAPTER 'GAS TRANSFORMATION' BEFORE CHANGING THIS PARAMETER.	0 - 1	0 = NATURAL GAS
			1 = LPG
P02	***WATER HEATER TYPE SELECTION***	0 - 1	0 = ISTANTANEOUS
			1 = STORAGE TANKLESS
P03	***POST-CIRCULATION TIMING (RECIRCULATION MODE NON ACTIVE)*** THROUGH THIS PARAMETER YOU CAN SET THE PUMP OPERATION DURATION ON THE DOMESTIC CIRCUIT, AFTER THE TAP IS CLOSED.	0 - 90	VALUE EXPRESSED IN MULTIPLES OF 5 SECONDS (FACTORY SET AT 12 X 5 = 60 SECONDS)
P04	***POST-CIRCULATION TIMING (RECIRCULATION MODE ACTIVE)*** THROUGH THIS PARAMETER YOU CAN SET THE PUMP OPERATION DURATION ON THE DOMESTIC CIRCUIT, WHEN THE RECIRCULATION MODE IS ACTIVE, AFTER THE TAP IS CLOSED.	0 - 90	VALUE EXPRESSED IN MULTIPLES OF 5 SECONDS (FACTORY SET AT 8 X 5 = 40 SECONDS)

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P05	***RECIRCULATION DIFFERENTIAL ACTIVATION*** THROUGH THIS PARAMETER YOU CAN ANTICIPATE THE RECIRCULATION FUNCTION, COMPARED TO THE RECIRCULATION SET POINT PRESET BY THE END-USER, BY MODIFYING THE TEMPERATURE DIFFERENCE.	5 - 15	VALUE EXPRESSED IN °C
P06	***FAN MINIMUM SPEED ADJUSTMENT*** THROUGH THIS PARAMETER YOU CAN SET THE FAN MINIMUM SPEED CORRESPONDING TO THE MINIMUM POWER OF THE BURNER. THE VALUE IS PRE-SET BASED ON THE SET POWER (SEE PARAMETER P00) AND ON THE GAS TYPE (SEE PARAMETER P01).	43 - 255	VALUE EXPRESSED IN HERTZ (1HZ = 30 RPM)
P07	***FAN MAXIMUM SPEED ADJUSTMENT*** THROUGH THIS PARAMETER YOU CAN SET THE MAXIMUM FAN SPEED CORRESPONDING TO THE MAXIMUM POWER OF THE BURNER. THE VALUE IS PRE-SET BASED ON THE SET POWER (SEE PARAMETER P00) AND ON THE GAS TYPE (SEE PARAMETER P01).	43 - 270	VALUE EXPRESSED IN HERTZ (1HZ = 30 RPM)
P08	***STARTING STEP ADJUSTMENT*** THROUGH THIS PARAMETER YOU CAN SET THE FAN SPEED DURING THE START-UP. THE VALUE IS PRE-SET BASED ON THE SET POWER (SEE PARAMETER P00) AND ON THE GAS TYPE (SEE PARAMETER P01).	43 - 255	VALUE EXPRESSED IN HERTZ (1HZ = 30 RPM)
P09	***D.H.W RUN-DOWN*** THROUGH THIS PARAMETER YOU CAN SET THE TIME NECESSARY FOR THE WATER HEATER TO REACH THE MINIMUM SET POWER, AFTER THE BURNER START-UP.	02 - 15	VALUE EXPRESSED IN SECONDS (FACTORY SET AT 3 SECONDS)
P10	***TYPE OF UNIT SELECTION***	0 - 1	0 = °C - l/min 1 = °F - gpm

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P11	***EXECUTION PERIOD OF THE OVERHEATING FUNCTION*** THROUGH THIS PARAMETER YOU CAN ENABLE AND SET THE DURATION OF THE EXECUTION PERIOD OF THE OVERHEATING FUNCTION, DURING WHICH THE CIRCULATING PUMP ACTIVATES BY DISSIPATING THE HEAT IN EXCESS.	0 - 60	VALUE EXPRESSED IN SECONDS (FACTORY SET AT 10 SECONDS)
P12	***ACTIVATION PERIOD OF THE OVERHEATING FUNCTION*** THROUGH THIS PARAMETER YOU CAN SET THE TIME INTERVAL FROM THE END OF THE POST-CIRCULATION TO THE ACTIVATION OF THE OVERHEATING FUNCTION.	0 - 20	VALUE EXPRESSED IN MINUTES (FACTORY SET AT 10 MINUTES)
P13	***MAXIMUM DOMESTIC SETPOINT*** THROUGH THIS PARAMETER YOU CAN SET THE USER-ADJUSTABLE MAXIMUM DOMESTIC TEMPERATURE.	50 - 67	VALUE EXPRESSED IN °C (FACTORY SET AT 60°C)
P14	***MINIMUM DOMESTIC SETPOINT*** THROUGH THIS PARAMETER YOU CAN SET THE USER-ADJUSTABLE MINIMUM DOMESTIC TEMPERATURE.	35 - 45	VALUE EXPRESSED IN °C (FACTORY SET AT 40°C)
P15	***ANTI-LEGIONELLA FUNCTION (FOR STORAGE TANK)*** THROUGH THIS PARAMETER YOU CAN ACTIVATE/DEACTIVATE THE "ANTILEGIONELLA" HEAT TREATMENT OF THE STORAGE TANK. EVERY 7 DAYS THE WATER TEMPERATURE INSIDE THE STORAGE IS HEATED BEYOND 60 °C THUS GENERATING A BURNING HAZARD. KEEP UNDER CONTROL SUCH DOMESTICH HOT WATER TREATMENT (AND INFORM THE USERS) TO AVOID UNFORSEEABLE DAMAGES TO PERSONS, ANIMALS AND PROPERTY. A THERMOSTATIC VALVE SHOULD BE INSTALLED AT THE DOMESTIC HOT WATER OUTLET TO AVOID ANY BURNS.	0 - 1	0 = DISABLED 1 = ENABLED

PARAMETER	DESCRIPTION	RANGE	FUNCTION
P16	***DIFFERENTIAL OF THE STORAGE TANK CYCLE ACTIVATION*** THROUGH THIS PARAMETER YOU CAN ANTICIPATE THE PRE-HEATING FUNCTION OF THE STORAGE TANK, COMPARED TO THE D.H.W SET POINT PRE-SET BY THE END-USER, BY MODIFYING THE TEMPERATURE DIFFERENCE.	1 - 20	VALUE EXPRESSED IN °C (FACTORY SET AT 5°C)
P17	***MINIMUM D.H.W FLOW RATE SETTING*** THROUGH THIS PARAMETER YOU CAN SET THE MINIMUM D.H.W. FLOW RATE NECESSARY TO ACTIVATE THE WATER HEATER. THE VALUE IS PRE-SET BASED ON THE SET POWER (SEE PARAMETER P00).	20 - 68	VALUE EXPRESSED IN HERTZ (FACTORY SET AT 30 HZ = 0.55 GPM (2.1 L/MIN)
P18	***ADDITIONAL POST-VENTILATION TIMING*** THROUGH THIS PARAMETER YOU CAN SET A PERIOD OF OPERATION, ADDITIONAL TO THE 20 STANDARD SECONDS OF THE FAN, AFTER THE BURNER SHUTDOWN.	20 - 120	VALUE EXPRESSED IN SECONDS (FACTORY SET AT 30 SECONDS)
P19	***ANTI-WATER HAMMER SELECTION*** ONCE THIS FUNCTION IS ENABLED, THE D.H.W CONTACT WILL BE DELAYED FOR A TIME EQUAL TO THE SET VALUE.	0 - 20	0 = DISABLED (FACTORY SET AT 0') 1-20 = VALUE EXPRESSED IN SECONDS
P20	***DESTINATION COUNTRY SELECTION*** BY MODIFYING THIS PARAMETER THE COMBUSTION CONTROL PARAMETERS WILL BE AUTOMATICALLY CONFIGURATED, ACCORDING TO THE VALUES FIXED IN THE DESTINATION COUNTRY OF THE PRODUCT.	0 - 1	0 = U.S.A. 1 = DIFFERENT COUNTRY
P21	***PUMP OPERATION IN WATER HEATER MODE*** THROUGH THIS PARAMETER YOU CAN ACTIVATE/DEACTIVATE THE CIRCULATING PUMP DURING THE NORMAL OPERATION OF THE WATER HEATER.	0 - 1	0 = DISABLED 1 = ENABLED

2.2. MAINTENANCE

2.2.6. GENERAL MAINTENANCE WARNINGS

ATTENTION

All maintenance operations must be performed in compliance with standards and subsequent amendments by qualified staff and authorized by RADIANT BRUCIATORI spa.

WARNING

The maintenance operations are recommended to once every twelve months starting from the water heaters installation date.

WARNING

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

DANGER

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

Please perform the following operations once a year:

- check the sealing of the gas components, and replace the gaskets if necessary;
- check the sealing of the water components, and replace the gaskets if necessary;
- visually check the flame and the condition of the combustion chamber;
- if necessary make sure that the combustion is adjusted correctly and if required proceed as indicated in section "CO2 VALUE CHECK AND CALIBRATION";
- 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 burner start up and safety systems. If necessary, remove and clean the flame detection and start up electrodes from incrustations paying attention to respect the distances with respect to the burner;
- if present, check the pre-load pressure of the D.H.W. expansion tank;
- make sure that the permanent ventilation outlets are present, correctly sized and functioning, based on the installed devices. Follow the requirements provided by Local and National legislation;
- periodically check the integrity of the venting system for safety and proper operation;
- check that the wiring is installed in compliance with the requirements in the water heater instruction manual;
- check the wiring inside the control panel;
- check the flow and temperature of domestic hot water;
- check the proper operation of the condensate draining system, including the devices outside the water heaters such as condensate collection devices installed along the path of the venting duct or neutralization devices for acid condensate.
- check that the liquid flow is not obstructed and that there is no combustion gas build up inside the internal system.

2.2.7. TECHNICAL DATA

Model		**SFK 55**
Gas category		Natural Gas (Gas A) / Propane (Gas E)
Maximum nominal heat capacity	BTU/hr (kW)	187667 (55)
Minimum nominal heat capacity	BTU/hr (kW)	18766 (5.5)
Noise factor	dB	52.4
Combustion data		
Fumes temperature at nominal heat capacity 176-140°F (80-60°C)	°F (°C)	150.80 (66)
Fumes temperature at minimum heat capacity 176-140°F (80-60°C)	°F (°C)	131.00 (55)
CO_2 at nominal heat capacity - Gas A	%	9.6 - 9.2
CO_2 at minimum heat capacity - Gas A	%	9.3 - 8.9
CO_2 at nominal heat capacity - Gas E	%	10.7 - 10.3
CO_2 at minimum heat capacity - Gas E	%	9.70
Fumes mass at nominal heat capacity - Gas A	g/s	22.0
Fumes mass at minimum heat capacity - Gas A	g/s	2.20
Fumes mass at nominal heat capacity - Gas E	g/s	22.5
Fumes mass at minimum heat capacity - Gas E	g/s	2.20
Domestic circuit		
Adjustable domestic temperature	°F (°C)	104 - 140 (40 - 60)
Maximum pressure for domestic circuit	PSI (bar)	150 (10.34)
Minimum pressure for domestic circuit	PSI (bar)	10 (0.69)
Specific capacity in continuous service - ΔT 54°F (30°C)	GPM (litres/min)	7.08 - (26.8)
Specific capacity in continuous service - ΔT 77°F (43°C)	GPM (litres/min)	5.1 - (19.3)
Minimum flow rate	GPM (litres/min)	0.66 (2.5)
Dimension (Water heater casing size)		
Width	in (mm)	16.14 (410)
Depth	in (mm)	19.09 (485)
Height	in (mm)	25.19 (640)
Gross weight	lb (kg)	110.23 (50)
Water connections		
Cold water inlet	Ø	3/4" NPT
Hot water outlet	Ø	3/4" NPT
Gas	Ø	3/4" NPT
Recirculation mode	Ø	3/4" NPT
Condensate drain	Ø	0.78 in (20mm)
Flue Systems		
Flue outlet fitting	in (mm)	3 (80)
Air intake fitting	in (mm)	3 (80)
Max discharge length - Hor. coaxial Ø2.36"/3.94" (60/100mm)	ft (m)	3.28 (1)
Max discharge length - Hor. coaxial Ø3"/5" (80/125mm)	ft (m)	16.40 (5)
Max discharge length Ø2"/2" (Ø50/50 mm) - Hor Split with frequency 255 Hz [1]	ft (m)	18.04 (5.5)

Max discharge length Ø2"/2" (Ø50/50 mm) - Hor Split with frequency 270 Hz [1]	ft (m)	41.01 (12.5)
Max discharge length Ø3"/3" (Ø80/80 mm) - Hor Split	ft (m)	85.30 (26)
Electrical specifications		
Voltage-frequency	V/Hz	120/60
Maximum absorbed power	W	75
Recirculation pump electrical power consuption	W	15.7
Absorbed power (water heater OFF)	W	2.8
Gas supply		
Nominal supply pressure - Natural Gas (Gas A)	inWC (mbar)	7 (17.4)
D.H.W Max fan speed - Natural Gas (Gas A)	Hz	255
D.H.W Min. fan speed - Natural Gas (Gas A)	Hz	46
Fuel consumption - Natural Gas (Gas A)	ft^3/h (m^3/h)	183.7 (5.20)
Nominal supply pressure - Propane (Gas E)	inWC (mbar)	11 (27.4)
D.H.W Max fan speed - Propane (Gas E)	Hz	251
D.H.W Min. fan speed - Propane (Gas E)	Hz	47
Fuel consumption - Propane (Gas E)	lb/h (kg/h)	71.1 (2.03)

[1] NOTE:

The frequency would change based on vent length. In particular, anything above 5m for 2" PVC pipe, the frequency must be changed incrementally by the installer. These values must be shown in a chart form in the manual. In addition, there should be a warning to the installer that if the correct frequency is not assigned a hazardous condition can exist.

2.2.8. TECHNICAL ASSEMBLY

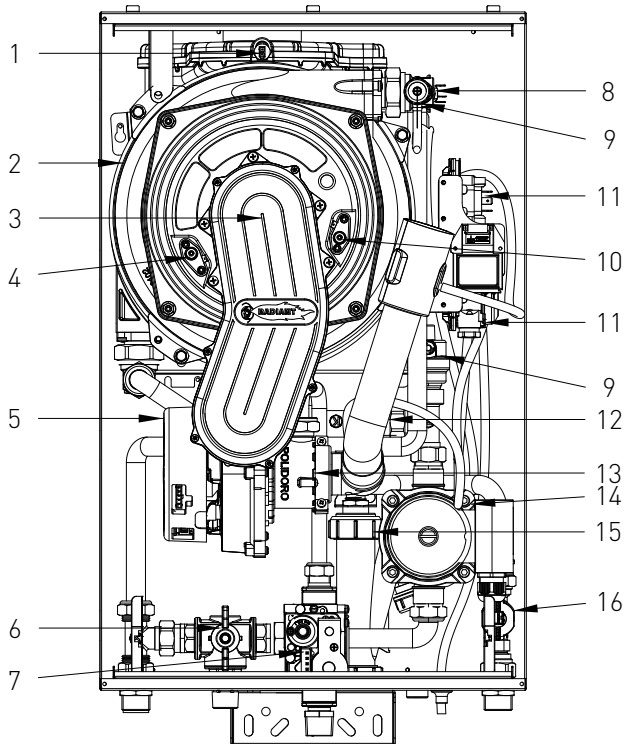


fig. 31

KEY

1. EXHAUST SAFETY HIGH LIMIT SWITCH
2. HEAT EXCHANGER
3. BURNER UNIT
4. IONIZATION ELECTRODE
5. COMBUSTION BLOWER
6. 3-WAY VALVE - RECIRCULATION MODE
7. GAS VALVE
8. WATER TEMPERATURE HIGH LIMIT SWITCH
9. AIR ELIMINATOR
10. SPARK ELECTRODE
11. IGNITION TRANSFORMER
12. AIR SUCTION TUBE
13. PROPORTIONAL VENTURI
14. CIRCULATOR
15. CONDENSATE COLLECTION SIPHON
16. FLOW SWITCH

2.2.9. INTERNAL PIPING SCHEMATIC

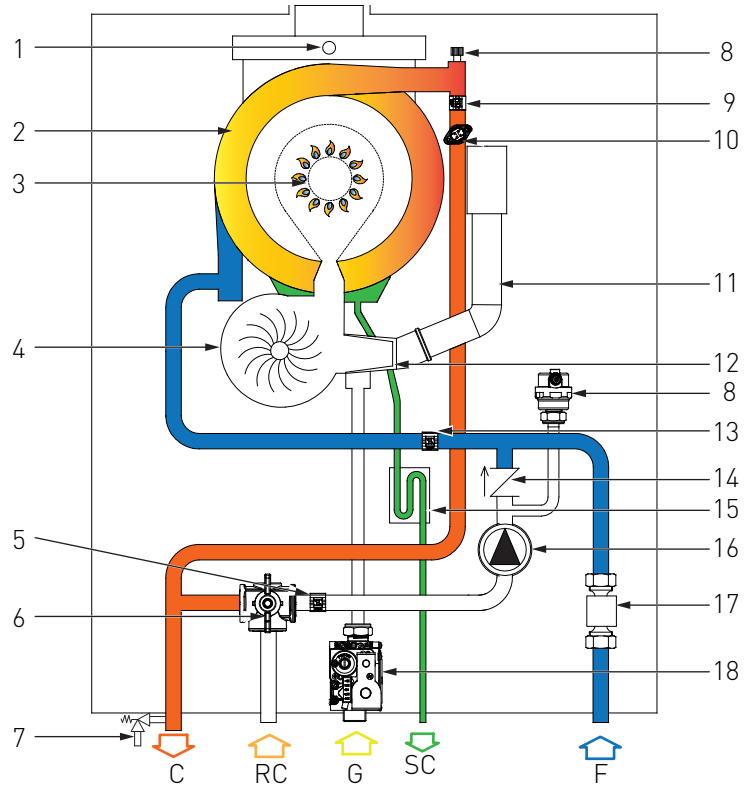


fig. 32

KEY

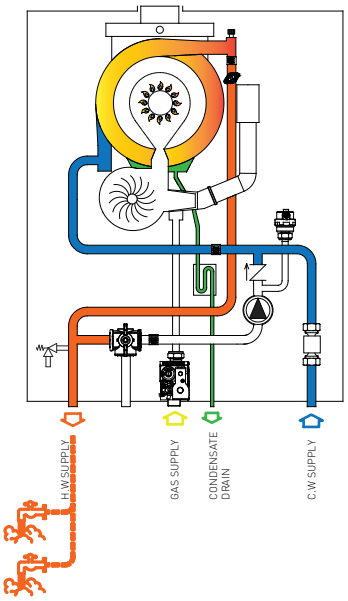
C. DOMESTIC HOT WATER OUTLET
F. COLD WATER INLET
RC. RECIRCULATION MODE
G. GAS INLET
SC. CONDENSATE DRAIN

13. DOMESTIC TEMPERATURE PROBE INLET
14. CHECK VALVE
15. CONDENSATE COLLECTION SIPHON
16. CIRCULATOR
17. FLOW SWITCH
18. GAS VALVE

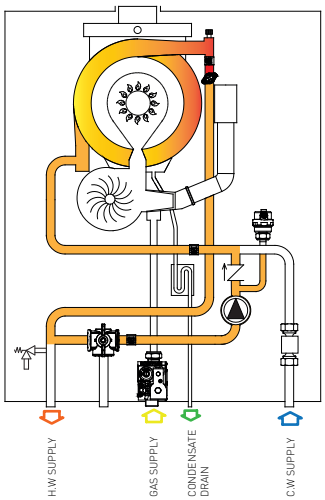
1. EXHAUST SAFETY HIGH LIMIT SWITCH
2. HEAT EXCHANGER
3. BURNER UNIT
4. COMBUSTION BLOWER
5. RECIRCULATION PROBE
6. 3-WAY VALVE - RECIRCULATION MODE
7. PRESSURE RELEIF VALVE
8. AIR ELIMINATOR
9. DOMESTIC TEMPERATURE PROBE OUTLET
10. WATER TEMPERATURE HIGH LIMIT SWITCH
11. AIR SUCTION TUBE
12. PROPORTIONAL VENTURI

2.2.10. OPERATIONAL SCHEMES

DRAW MODE
(RECIRCULATION NON ACTIVE)



POST-CIRCULATION MODE
(RECIRCULATION NON ACTIVE)



RECIRCULATION MODE
(POST-CIRCULATION ACTIVE)

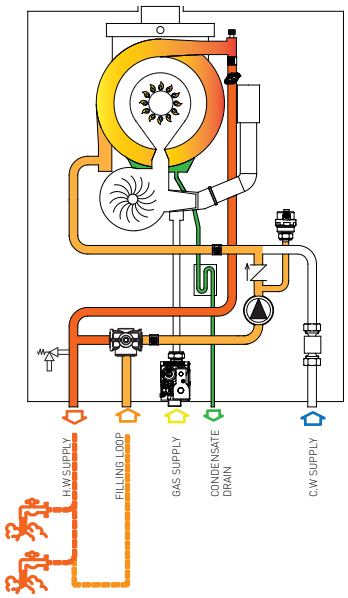


fig. 33

SUPPORT CENTER

2.2.11. WIRING DIAGRAM

CAUTION: Label all wires prior to disconnection when servicing controls.
Wiring errors can cause improper and dangerous operation.
Verify proper operation after servicing.

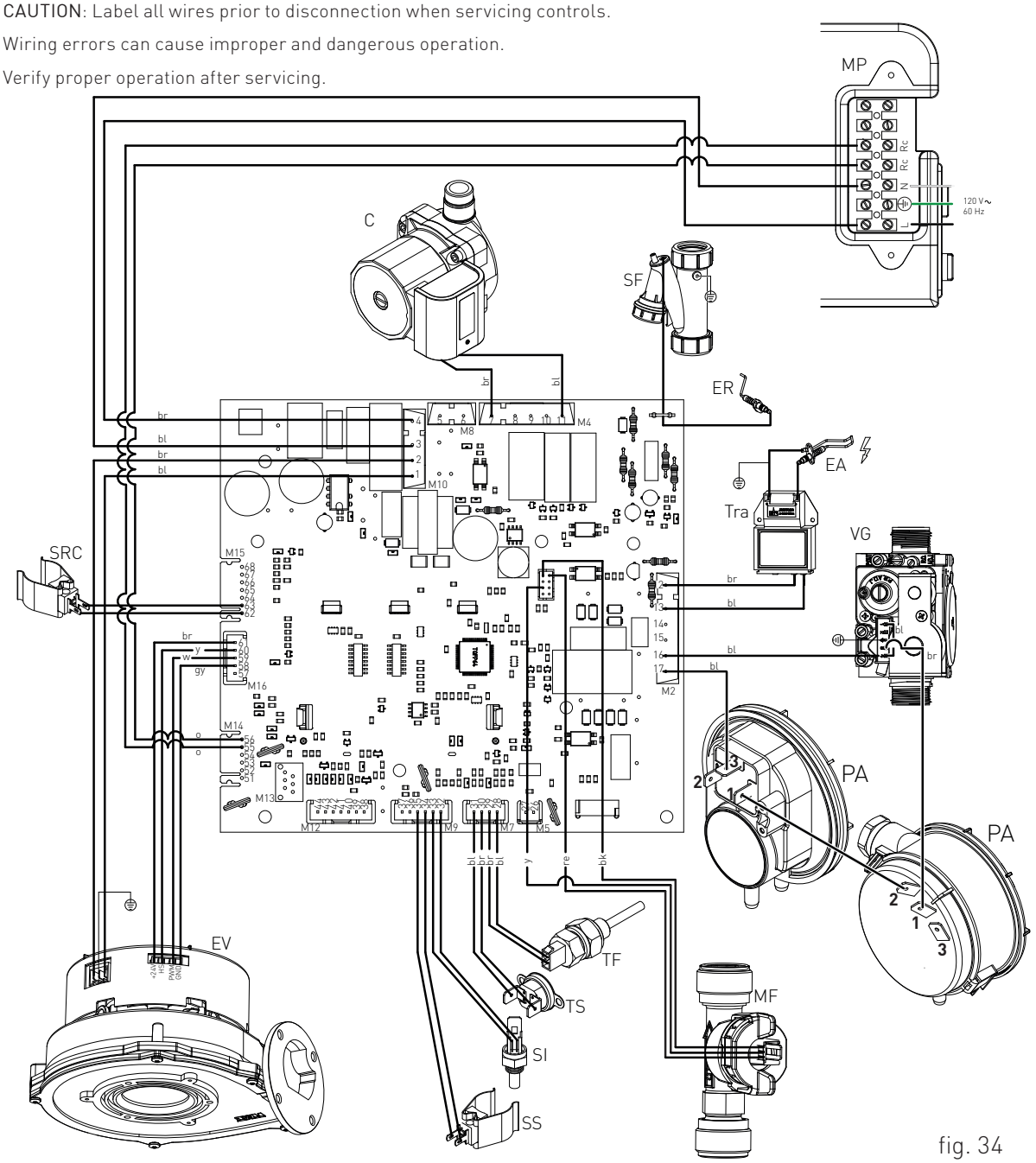


fig. 34

ER: IONIZATION ELECTRODE
EA: SPARK ELECTRODE
C: CIRCULATOR
VG: GAS VALVE
TRA:IGNITION TRANSFORMER
TF: EXHAUST SAFETY HIGH LIMIT SWITCH_(102°C)
SRC: RECIRCULATION TEMPERATURE PROBE
RC: DOMESTIC HOT WATER PRE-HEATING DEACTIVATION TIMER
TS: WATER TEMPERATURE HIGH LIMIT SWITCH
PACQ:WATER PRESSURE TRANSDUCER
MF: FLOW SWITCH
SI: DOMESTIC TEMPERATURE PROBE INLET
SS: DOMESTIC TEMPERATURE PROBE
EV: COMBUSTION BLOWER
PA: AIR PRESSURE SWITCH
SF: CONDENSATE COLLECTION SIPHON
MP: PANEL TERMINAL
L: LINE
N: NEUTRAL
G: GREEN
RE: RED
BK: BLACK
BL: BLUE
BR: BROWN
O: ORANGE
Y: YELLOW
W: WHITE
GY. GREY

2.2.12. ACCESSING THE WATER HEATERS

For the majority of the control and maintenance operations you have to remove one or more panels of the casing.

The side panels can be removed only after removing the front panel.

To intervene on the front of the water heaters proceed as follows:

› remove the fastening screws (1 - fig.35) placed on the lower edge of the front panel;

› grab the front panel from the bottom and remove it pulling it towards you A and then upwards B (see fig. 35).

To intervene on the side panels of the water heaters proceed as follows:

› remove the fastening screws (2 - fig. 35) placed on the front edge of the side panel;

› grab the bottom of the panel and remove it by moving it sideways C and then pulling it upwards D (see fig. 35).

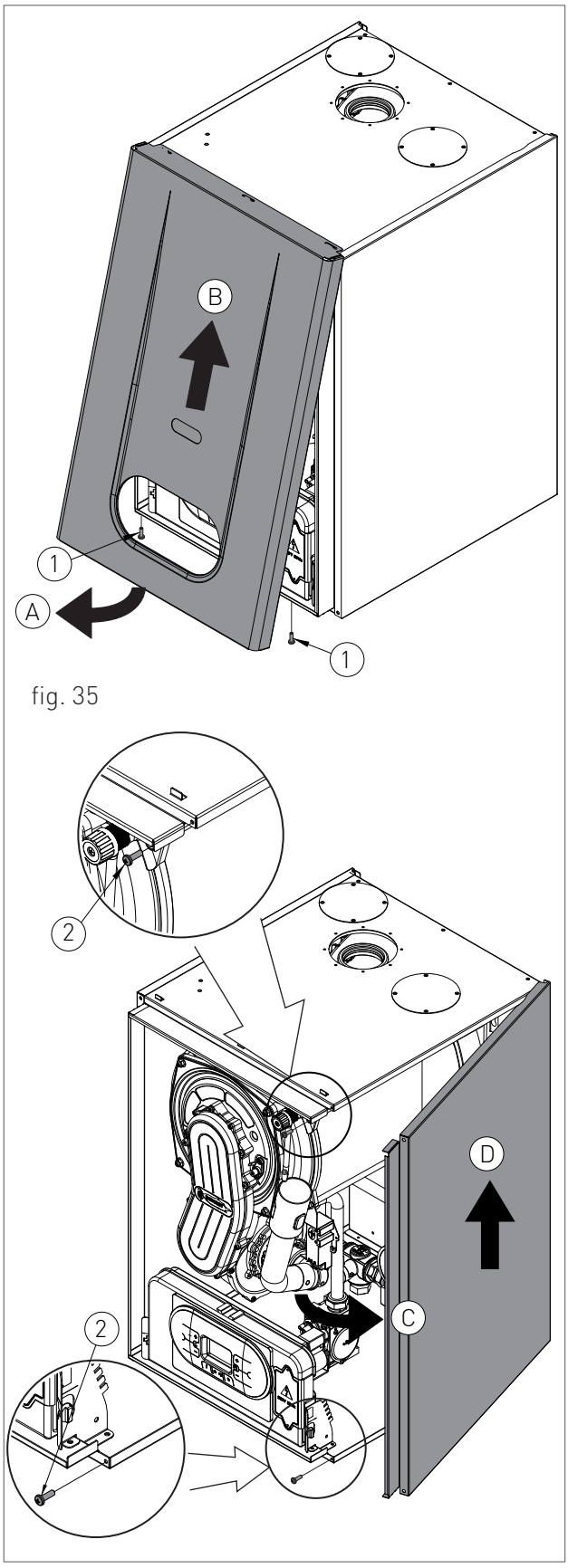


fig. 35

2.2.13. ACCESSING THE ELECTRONIC BOARD

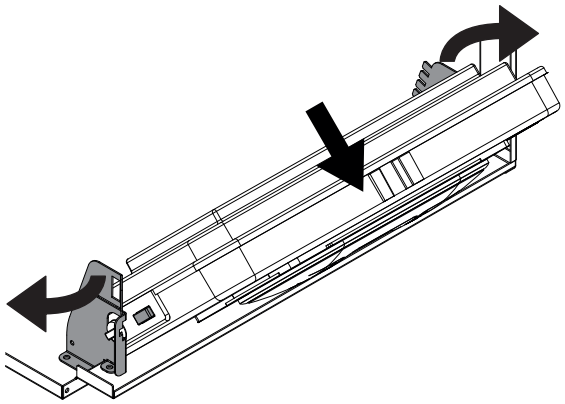
In order ot intervene on the wirings of the control panel, please proceed as follows:

DANGER
Shut off the voltage from the main switch.

› Grab at the same time the support brackets of the control panel (fig. 36) loosening them and turn the panel downwards;

› unscrew the four fastening screws 1 - fig. 36;

› remove the crankcase pulling it upwards.



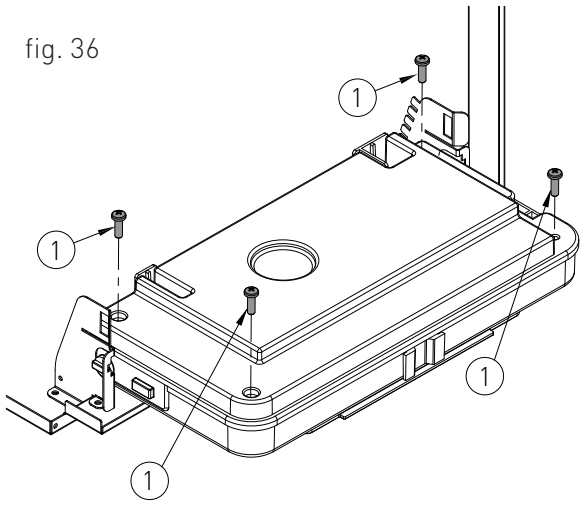
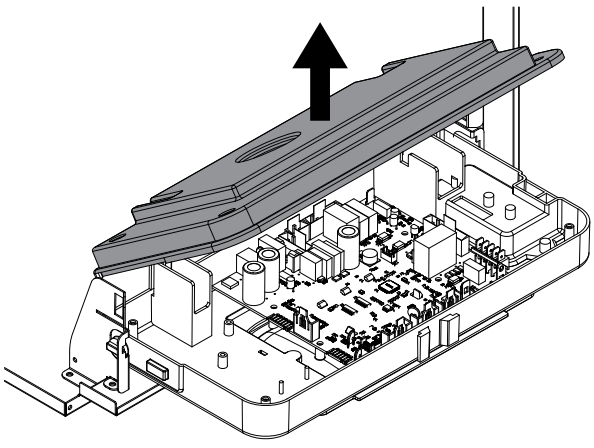


fig. 36



2.2.14. EMPTYING THE DOMESTIC SYSTEM

If there is freezing risk, you have to empty the domestic system as follows:

› close the main supply tap of the water supply network;

› open all cold and hot water taps;

› after completing all operations, close the discharge tap and all previously opened water taps.

2.2.15. FAULT SIGNALLING CODES

To view the last 5 fault signalling codes chronologically, starting with the most recent one, activate the 'OFF' mode by pressing the FUNCTION '⏻' key and hold the key INFO 'i' for 5 seconds. Use keys '⊕' and '⊖' of the symbol recirculation to scroll through the list of saved faults. To reset the fault history press the RESET 'R' key. To exit display mode press the INFO 'i' key.

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E01	FLAME FAILURE	**NO FLAME LIGHT UP**		MANUAL RESET (PRESS THE RESET 'R' KEY).
		NO GAS PRESSURE;	CHECK THE GAS SUPPLY NETWORK;	
		MASS OR BROKEN START-UP ELECTRODE;	REPLACE IT;	
		GAS VALVE NOT OPENING;	REPLACE IT;	
		SLOW LIGHT UP TOO LOW ADJUSTMENT;	ADJUST MINIMUM OR SLOW LIGHT UP;	
		VALVE INFEED PRESSURE TOO HIGH (ONLY FOR GPL WATER HEATERS).	CHECK THE MAXIMUM ADJUSTMENT PRESSURE	
		WITH FLAME LIGHT UP		
		NEUTRAL AND PHASE INVERTED POWER SUPPLY;	PROPERLY CONNECT THE POWER SUPPLY;	
		IONIZATION ELECTRODE BROKEN;	REPLACE IT;	
		IONIZATION 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)	
	AIR PRESSURE SWITCH	SWITCH OUT OF ORDER, EXHAUST VENT OR AIR INLET PIPE OBSTRUCTED	REPLACE PART , CHECK EXHAUST VENT OR AIR INLET PIPE	

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E02	WATER TEMP. HIGH LIMIT SWITCH 203 °F (95°C)	THERMOSTAT CABLE DISCONNECTED;	CHECK THE WIRING:	MANUAL RESET (PRESS THE RESET (R) KEY).
		BROKEN HIGH LIMIT.	REPLACE IT.	
E03	EXHAUST SAFETY HIGH LIMIT SWITCH 216°F (102°C)	HIGH LIMIT BROKEN;	REPLACE IT;	MANUAL RESET (PRESS THE RESET (R) KEY).
		HIGH LIMIT CABLE DISCONNECTED.	CHECK THE WIRING.	
E05	DOMESTIC INLET TEMP. PROBE (COLD WATER)	BROKEN OR INCORRECTLY CALIBRATED PROBE (RESISTANCE VALUE 10 KOHM AT 77°F (25°C) NTC);	REPLACE IT;	AUTOMATIC.
		DISCONNECTED OR WET PROBE CONNECTOR.	CHECK THE WIRING.	
E06	DOMESTIC INLET TEMP. PROBE	BROKEN OR INCORRECTLY CALIBRATED PROBE (RESISTANCE VALUE 10 KOHM AT 77°F (25°C) NTC);	REPLACE IT;	AUTOMATIC.
		DISCONNECTED OR WET PROBE CONNECTOR.	CHECK THE WIRING.	
E15	RECIRCULATION TEMP. PROBE	BROKEN OR INCORRECTLY CALIBRATED PROBE (RESISTANCE VALUE 10 KOHM AT 77°F (25°C) NTC);	REPLACE IT;	AUTOMATIC.
		DISCONNECTED OR WET PROBE CONNECTOR.	CHECK THE WIRING.	
E16	COMBUSTION BLOWER	COMBUSTION BLOWER BOARD BROKEN;	REPLACE IT;	AUTOMATIC.
		COMBUSTION BLOWER BROKEN;	REPLACE IT;	
		FAULTY POWER SUPPLY CABLE.	REPLACE IT.	

CODE	FAULT	POSSIBLE CAUSE	SOLUTION	RESET
E21	GENERAL INTERNAL BOARD ERROR	INCORRECT SIGNAL RECOGNITION BY THE MODULATION BOARD MICRO-PROCESSOR.	IF THE MODULATION BOARD DOES NOT RESET THE ERROR AUTOMATICALLY, REPLACE IT.	AUTOMATIC.
E22	PARAMETERS PROGRAMMING REQUEST	MICRO=PROCESSOR MEMORY LOSS.	PARAMETERS REPROGRAMMING.	MANUAL RESET (CUT OFF THE TENSION).
E35	RESIDUAL FLAME	FAULTY IONIZATION ELECTRODE;	CLEAN IT OR REPLACE IT;	MANUAL RESET (PRESS THE RESET "Ⓡ" KEY).
		FAULTY IONIZATION ELECTRODE CABLE;	REPLACE IT;	
		FAULTY MODULATION BOARD.	REPLACE IT.	
E40	SUPPLY VOLTAGE	SUPPLY VOLTAGE OFF THE OPERATION RANGE (≤ 80 VOLTS).	CHECK THE POWER SUPPLY NETWORK (THE ERROR DEACTIVATES AUTOMATICALLY AS SOON AS THE SUPPLY VOLTAGE FALLS BACK WITHIN THE REQUESTED LIMITS).	AUTOMATIC.

2.2.16. ACTIVE FUNCTIONS SIGNALLING CODES

CODE	FUNCTION	DESCRIPTION
F09	***D.H.W CIRCUIT ANTI-FREEZE***	WHEN THE SANITARY SENSOR DETECTS A TEMPERATURE BELOW 41 °F (5°C), THE PUMP RUNS AND THE BURNER LIFTS UP THE TEMPERATURE TO 68 °F (20°C). WHEN THIS LATTER TEMPERATURE IS ACHIEVED, THE BURNER SHUTS OFF AND THE PUMP RUNS FOR 20 SECONDS AS POST CIRCULATION.
F28	***ANTI-LEGIONELLA***	THE FUNCTION IS ACTIVATED FOR THE FIRST TIME, 60 MINUTES AFTER THAT THE WATER HEATER 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 140°F (60°C). THIS FUNCTION IS ENABLED INDEPENDENTLY FROM THE CONTACT TO THE CYLINDER CLOCK, PROVIDING THAT THE RELATIVE PARAMETER (P15) IS ENABLED.
FH	***FAST H2O***	YOU CAN ACTIVATE/DEACTIVATED IT BY HOLDING SIMULTANEOUSLY AND FOR 7 SECONDS THE RESET "Ⓡ" AND "⊕" OF THE SYMBOL RECIRCULATION . THE "FAST H2O" FUNCTION GUARANTEES THE IMMEDIATE D.H.W SUPPLY AT THE REQUESTED TEMPERATURE.

2.2.17. POSITIONS OF THE ELECTRODES

If the water heaters does not restart, check the positions of the electrodes (especially the ignition electrode).

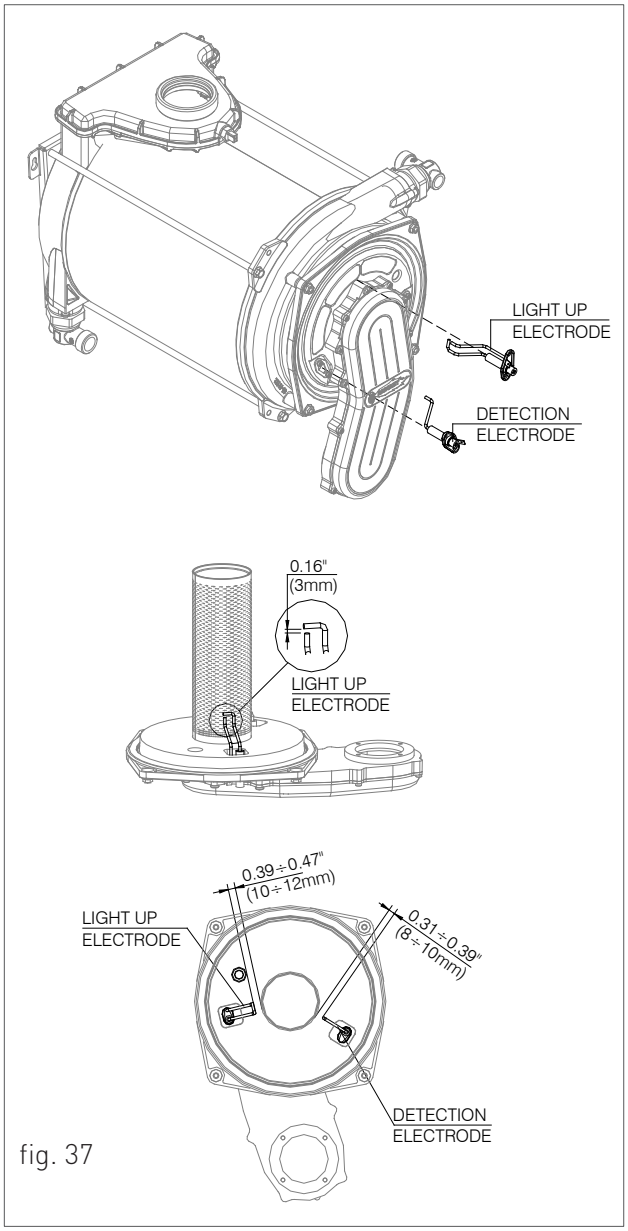


fig. 37

2.2.18. CONVERSION TO A DIFFERENT GAS TYPE

ATTENTION

Make sure that the gas induction tube is suitable for the new type of fuel with which the water heaters is supplied.

FOR CONVERSION PROCEED AS FOLLOWS:

- loosen the two screws '1' (fig. 38) from the fastening bush, and remove the air suction tube;
- unscrew the tube coupling that connects the gas valve to venturi;
- unscrew the three fastening screws '2' (fig. 38) of the venturi 'V' (fig. 38) using a 10 key, as shown in figure 39;
- remove the two screws '3' (fig. 40) and apply pressure on the rear side of venturi 'C' (fig. 40);
- replace the venturi with the one suitable for the type of supply gas (cod. 30-00230 for Gas A, cod. 30-00229 for Gas E), and remount the components following the demounting operations in reverse making sure that gasket 'G' is re-assembled as shown in fig. 38;
- set the water heater to operate with the new type of gas, changing the value of the parameter P02 'GAS TYPE SELECTION' from the control panel (see 2.1.5 and 2.1.4 'DIGITECH CS PARAMETERS TABLE' and 'ACCESSING AND PROGRAMMING THE PARAMETERS');
- adjust the CO2 combustion value as indicated in 2.1.3 'CO2 VALUE CHECK AND CALIBRATION'.

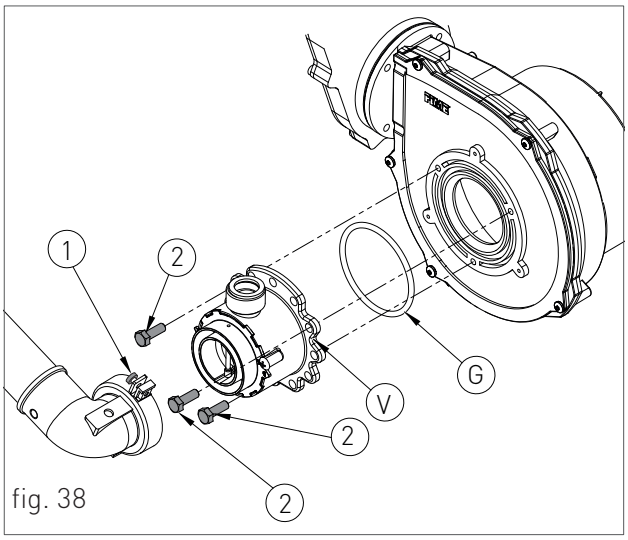


fig. 38

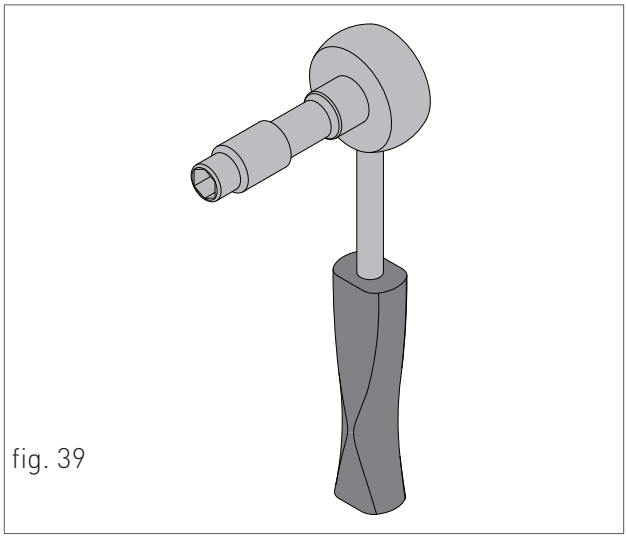


fig. 39

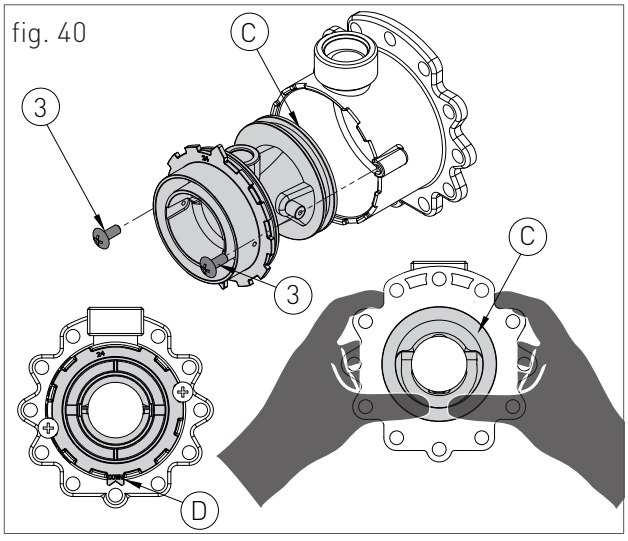


fig. 40

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 water heaters the User must make sure that the First start-up certificate has the stamp of the technical Support Center proving the testing and the first start-up of the water heaters.

WARNING

To validate the warranty, the water heaters must be started by a technical Support Center authorized by RADIANT no later than 30 days from the date of installation.

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 unit 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 water heaters 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 unit use or monitored by a person responsible for their safety.

DANGER

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

DANGER

If you sense a gas odor in the location in which the water heater 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 vent the location;

› Close the gas valves;

› Request immediate intervention of qualified staff.

DANGER

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

› DO NOT touch the unit with wet and/or humid parts and/or with bare feet;

› DO NOT pull the electrical cables;

› DO NOT leave the unit 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.

DANGER

Water temperatures over 125°F (52°C) can cause severe burns or sclding resuling in death. Children, disabled or orderly are at highest risk of being scaled. Feel water before bathing or showering.

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance does not have a pilot. It is equipped with a direct ignition device, which automatically lights the burner. Do not try to light the burner by hand.

B. BEFORE OPERATING: Smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

C. Use only your hand to operate the remote control keypad. Never use tools. If the remote keypad doesn't work, do not try to repair it, call a qualified service technician. Forced or improper repair may result in a fire or explosion.

D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above before proceeding.
2. Set the thermostat to the lowest setting.
3. Turn off all power to the electrical appliance.
4. This appliance does not have a pilot. It is equipped with a direct ignition device, which automatically lights the burner. Do not try to light the burner by hand.
5. Turn the manual valve located at the gas inlet of the appliance clockwise to "OFF"
6. Wait (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to next step.
7. Turn the manual valve located at the gas inlet of appliance counterclockwise to "ON" (see Figure 1).
8. Turn on all electric power to the appliance.
9. Set the thermostat to desired setting.
10. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

TO TURN OFF GAS TO THE APPLIANCE

1. Set the thermostat to the lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Turn the manual valve at gas inlet of appliance clockwise to "OFF" (see figure 1).

Manual Gas Valve

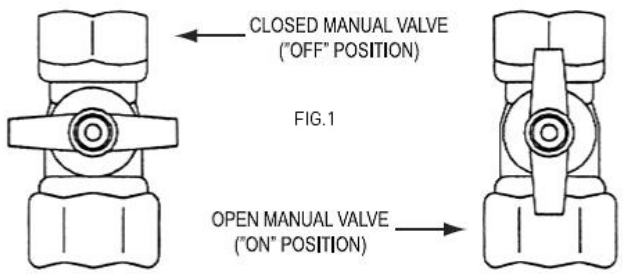


FIG.1

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Can result in serious injury or death

⚠ Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Storage of or use of gasoline or other inflammable vapors or liquids in the vicinity of this or any other appliance can result in serious injury or death.

Vapors from flammable liquids can explode and catch fire causing death or severe burns.

Do not use or store flammable products such as gasoline, solvents or adhesives in the same room or area near this appliance, or any other appliance or any possible ignition source.

Keep flammable products:

1. far from any possible ignition source,
2. in approved containers
3. tightly closed and
4. out of children's reach

Vapors:

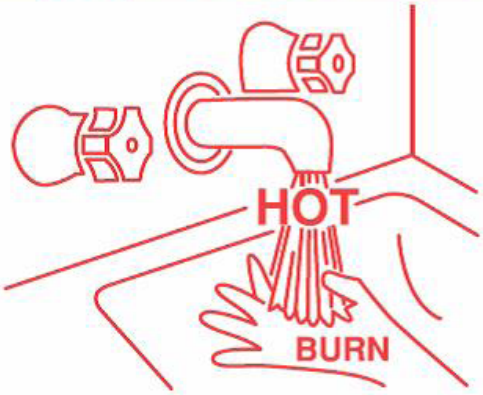
1. cannot be seen,
2. are heavier than air
3. go a long way on the floor
4. can be carried away from other rooms to possible ignition sources by air currents

Water heaters in residential garages must be installed and located, or protected, to avoid physical damage.

Read and follow water heater warnings and instructions. If owner's manual is missing contact the distributor or manufacturer.

USER

⚠ DANGER



The temperature at which injury occurs varies with the person's age and time of exposure.

The slower response time of disabled persons increases the hazards to them. Never allow small children to use a hot water tap, or to draw their own bath water. Never leave a child or disabled person unattended in a bathtub or shower.

The water heater should be located in an area where the general public does not have access to the temperature control.

Lower water temperatures should be used to avoid the risk of scalding. It is further recommended, in all cases, that the water temperature be set for the lowest temperature which satisfies the user's hot water needs. This will also provide the most energy efficient operation of the water heater and minimize scale formation in the heat exchanger, thus prolonging the life of the unit.

Setting the water heater temperature at 120°F will reduce the risk of scalds. Some states require settings at specific lower temperatures. The table below shows the approximate time-to-burn relationship for normal adult skin.

Hot water temperatures required for automatic dishwasher and laundry use can cause scalds and burns resulting in serious personal injury and/or death.

Table - Risk of Scalds

Temperature Setting	Time to Produce, 2nd, 3rd Degree Burns on Adult Skin
Over 170 °F	Nearly instantaneous
160 °F	About 1/2 second
150 °F	About 1-1/2 seconds
140 °F	Less than 5 seconds
130 °F	About 30 seconds
120 °F or less	More than 5 minutes

To protect against injury, you should install a tempering valve in the water system. This valve will reduce point of discharge temperature by mixing cold and hot water in branch supply lines. Such valves are available from the local plumbing supplier.

WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result, causing property damage, personal injury or death.

-Do not store or use gasoline or other flammable vapours and liquids in the vicinity of this or any other appliance.
-WHAT TO DO IF YOU SMELL GAS
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbour's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

-Installation and service must be performed by a qualified installer, service agency or the gas supplier.
Minimum clearances from combustible construction, 0-inches sides, 0-inches back, 0-inches top.
For closet installation, 0-inches front, or for alcove installation.
This water heater is provided with a pressure relief valve. For safe operation of the water heater, the relief valve(s) must not be removed from its designated point of installation or unplugged.
The temperature and pressure relief valve provided by the manufacturer shall be installed at the time of installation of the heater in the location specified by the manufacturer. Local codes shall govern installation of relief devices. For safe operation of the water heater, the relief valve must not be removed or unplugged.

"Warning"
"This appliance must be installed in accordance with the local codes or, in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the CSA B149.1, Natural Gas and Propane Installation Code".

SUITABLE FOR WATER (POTABLE) HEATING AND SPACE HEATING
Toxic chemicals, such as used for boiler treatment, shall not be introduced into potable water heater used for space heating. This water heater may never be connected to any existing heating system or component(s) previously used with a non potable water heating appliance.

"For operation at outlet water temperatures not in excess of 180°F (88°C)"

USER

3.1.2. CONTROL PANEL

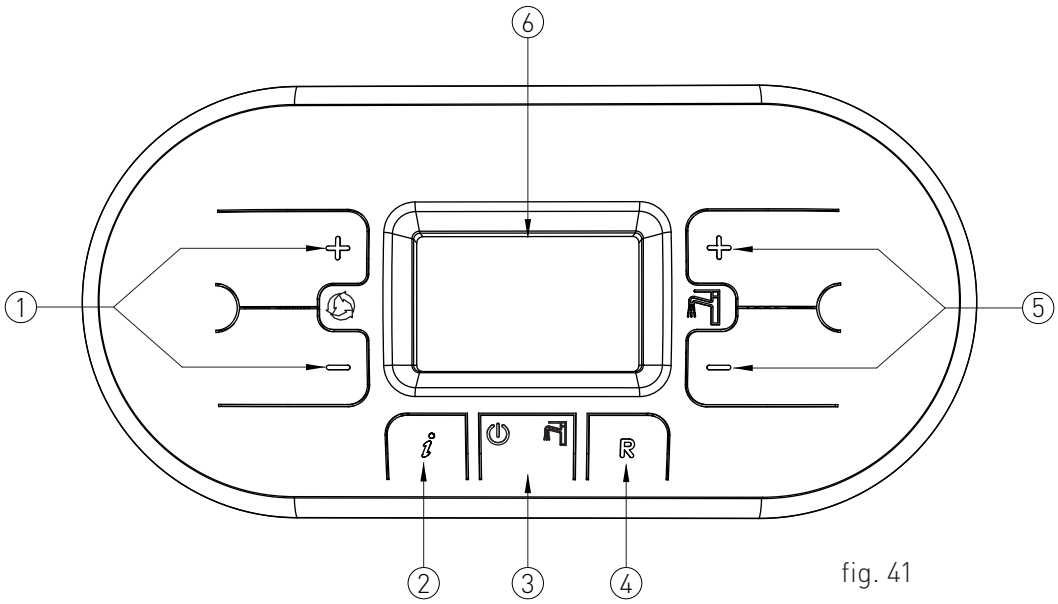


fig. 41

KEY

1. RECIRCULATION MODE TEMPERATURE ADJUSTMENT KEYS.

2. INFO KEY: PRESS ONCE TO VIEW THE TEMPERATURES AND OTHER INFORMATION (see 5.1.4 'INFO MENU DISPLAY) - HOLD FOR 5 SECONDS, IN OFF OPERATING MODE, TO VIEW THE LAST 5 FAULTS.

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

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

5. DOMESTIC HOT WATER TEMPERATURE ADJUSTMENT KEY / HOLD THE KEYS AT THE SAME TIME FOR 5 SECONDS TO ACTIVATE DISPLAY BACK LIGHT FOR 10 MINUTES.

6. DISPLAY

3.1.3. DISPLAY ICONS

KEY

1. INDICATION OF PARAMETER NUMBER OR DISPLAYED INFO CODE / RECIRCULATION MODE ACTIVE
2. PARAMETERS PROGRAMMING FUNCTION ACTIVE
3. RECIRCULATION PUMP ACTIVE
4. TEMPERATURE DISPLAY / SET POINT / PARAMETER VALUE
5. FLAME PRESENT SIGNALLING / IT ALSO INDICATES, ON 3 PERCENTAGE LEVELS, THE MODULATING POWER LEVEL OF THE WATER HEATER (fig.43)
6. OPERATION IN DOMESTIC MODE ENABLED
7. ERROR DISPLAY THAT CAN BE RESET
8. OFF OPERATING MODE
9. ERROR DISPLAY THAT CAN NOT BE RESET

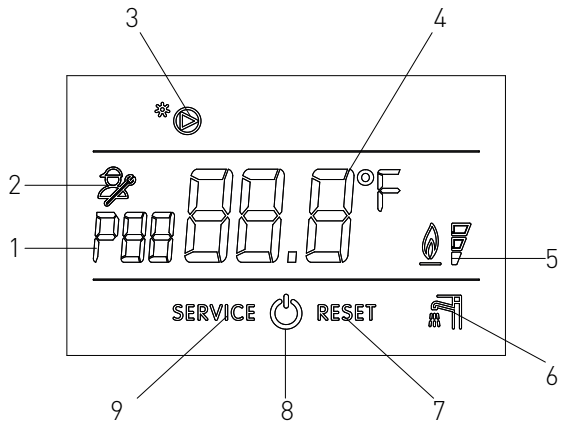


fig. 42

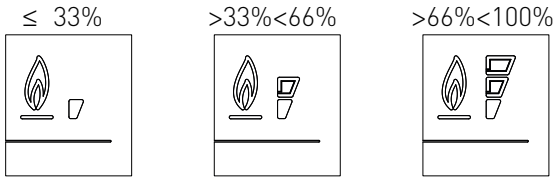


fig. 43

USER

3.1.4. INFO MENU DISPLAY DATA

To view the water heaters data from info menu press the INFO 'ⓘ' 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 symbol RECIRCULATION to scroll through the list of displayed data. To exit display mode press the INFO 'ⓘ' key.

LIST OF DISPLAYED DATA

INFO CODE	ICON	DESCRIPTION
d0		COLD CIRCUIT INLET PROBE TEMPERATURE
d1		HOT WATER CAPACITY
d2		FAN SPEED
d4		RECIRCULATION PROBE TEMPERATURE

3.1.5. START-UP

Before starting the water heaters make sure that it is powered and that the gas tap below the machine is open.

To start the water heaters press the function key "".

3.1.6. OPERATING MODE

DOMESTIC HOT WATER TEMPERATURE ADJUSTMENT

You can adjust the temperature using keys '⊕' and '⊖' of the domestic circuit:

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

The hot domestic water temperature adjustment field ranges from 104°F (40 °C) to 140°F (60 °C).

RECIRCULATION MODE TEMPERATURE ADJUSTMENT

You can adjust the temperature using keys '⊕' and '⊖' of the symbol recirculation:

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

The hot domestic water temperature adjustment field ranges from 86°F (30 °C) to 113°F (45 °C).

OFF MODE

In this mode the water heaters no longer meets the domestic hot water demands, the anti-freeze, pump anti-locking anti-locking systems still remain active.

To switch the water heaters to OFF operating mode, press the function key "", the symbol '⏻' will appear fixed on the display, indicating that the function is enabled.

If the water heaters 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 water heaters for a long period of time, proceed leave the water heaters 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 water heaters is protected against freezing with the electronic board design with functions that start the burner and heat the necessary parts when their temperature goes below the minimum pre-set values.
When the sanitary sensor detects a temperature below 41°F (5°C), the pump runs and the burner lifts up the temperature to 60°F (20°C).
When this latter temperature is achieved, the burner shuts off and the pump runs for 20 seconds as post circulation.

WARNING

This function is available only if:

› the water heaters is powered;

› the gas supply is open;

› the water heaters is not blocked.

USER

3.1.8. FAULT SIGNALLING CODES

The water heater 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 water heater.

CODE	ICON	FAULT	INTERVENTION
E01	RESET	***FLAME FAILURE***	MAKE SURE THAT THE WATER HEATER AND SUPPLY 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 WATER HEATER WILL START AUTOMATICALLY. IF THE ERROR PERSISTS CONTACT A QUALIFIED SERVICE TECHNICIAN.
E02	RESET	***WATE TEMP. HIGH LIMIT SWITCH (95 °C)***	PRESS THE RESET "Ⓡ" BUTTON ON THE CONTROL PANEL TO RESET THE FAULT, AS SOON AS THE ERROR CODE DISAPPEARS FROM THE DISPLAY, THE WATER HEATER WILL START AUTOMATICALLY. IF THE ERROR PERSISTS CONTACT A QUALIFIED SERVICE TECHNICIAN.
E03	RESET	***EXHAUST SAFETY HIGH LIMIT SWITCH (102 °C)***	CONTACT A QUALIFIED SERVICE TECHNICIAN.
E05	SERVICE	***DOMESTIC INLET TEMP. PROBE***	CONTACT A QUALIFIED SERVICE TECHNICIAN.
E06	SERVICE	***DOMESTIC INLET TEMP. PROBE***	CONTACT A QUALIFIED SERVICE TECHNICIAN.
E15	SERVICE	***RECIRCULATION TEMP. PROBE***	CONTACT A QUALIFIED SERVICE TECHNICIAN.
E16	SERVICE	***COMBUSTION BLOWER***	CONTACT A QUALIFIED SERVICE TECHNICIAN.
E21	SERVICE	***GENERAL INTERNAL BOARD ERROR***	CUT OFF THE POWER SUPPLY FROM THE MAIN SWITCH AND THEN RESTORE IT, AS SOON AS THE ERROR CODE DISAPPEARS, THE WATER HEATER WILL RESTART AUTOMATICALLY. IF THE ERROR PERSISTS CONTACT A QUALIFIED SERVICE TECHNICIAN.

CODE	ICON	FAULT	INTERVENTION
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 WATER HEATER WILL RESTART AUTOMATICALLY. IF THE ERROR PERSISTS CONTACT A QUALIFIED SERVICE TECHNICIAN.
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 WATER HEATER WILL START AUTOMATICALLY.
E40	SERVICE	***SUPPLY VOLTAGE***	CONTACT A QUALIFIED SERVICE TECHNICIAN.

3.1.9. ACTIVE FUNCTIONS SIGNALLING CODES

CODE	FUNCTION	INTERVENTION
F09	***D.H.W CIRCUIT ANTI-FREEZE***	WAIT UNTIL THE OPERATION IS COMPLETED
F28	***ANTI-LEGIONELLA FUNCTION***	WAIT UNTIL THE OPERATION IS COMPLETED
FH	***FAST H2O***	YOU CAN ACTIVATE/ DEACTIVATED IT BY HOLDING SIMULTANEOUSLY AND FOR 7 SECONDS THE RESET (R) AND (−) OF THE SYMBOL RECIRCULATION

3.1.10. FAST H2O FUNCTION

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

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'.

3.1.11. MAINTENANCE

To ensure proper water heaters safety and efficiency, please contact RADIANT technical support network to check the unit every year.

An accurate maintenance should improve system management.

3.1.12. COVER CLEANING

Clean the cover of the unit using a wet cloth and mild soap.

WARNING

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

3.1.13. DISPOSAL

The water heaters and all its accessories must be differentiated, suitably disposed of in accordance with the standards in force.

The use of the symbol WEEE (Waste Electrical and Electronic Equipment) shows that this product can not be dismantled as domestic waste. Proper dismantle of this product helps preventing potentially negative consequences on human health and environment.

RADIANT BRUCIATORI s.p.a.

Via Pantanelli, 164/166 - 61025 Loc. Montelabbate (PU)

Tel. +39 0721 9079.1 • fax. +39 0721 9079279

e-mail: info@radiant • Internet: http://www.radiant.it