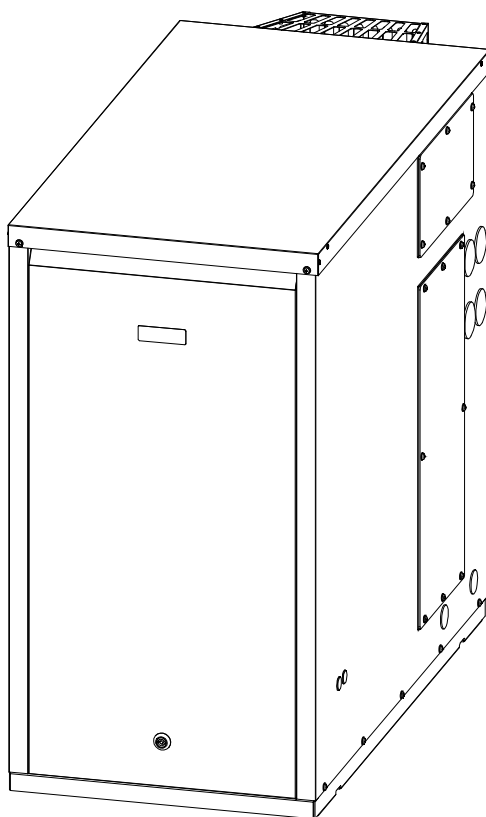




TRIANCO

INSTALLATION AND OPERATING INSTRUCTIONS

TRO EVOLUTION COMBI OUTDOOR



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1.- PRESENTATION

Thank you for choosing a **TRIANCO** heating boiler. You have chosen a boiler that, with a suitable hydraulic installation and using oil for fuel, will provide the ideal level of comfort for your home.

This manual forms an essential part of the product and it must be given to the user. Read the warnings and recommendations in the manual carefully, as they contain important information on the safety, use and maintenance of the installation.

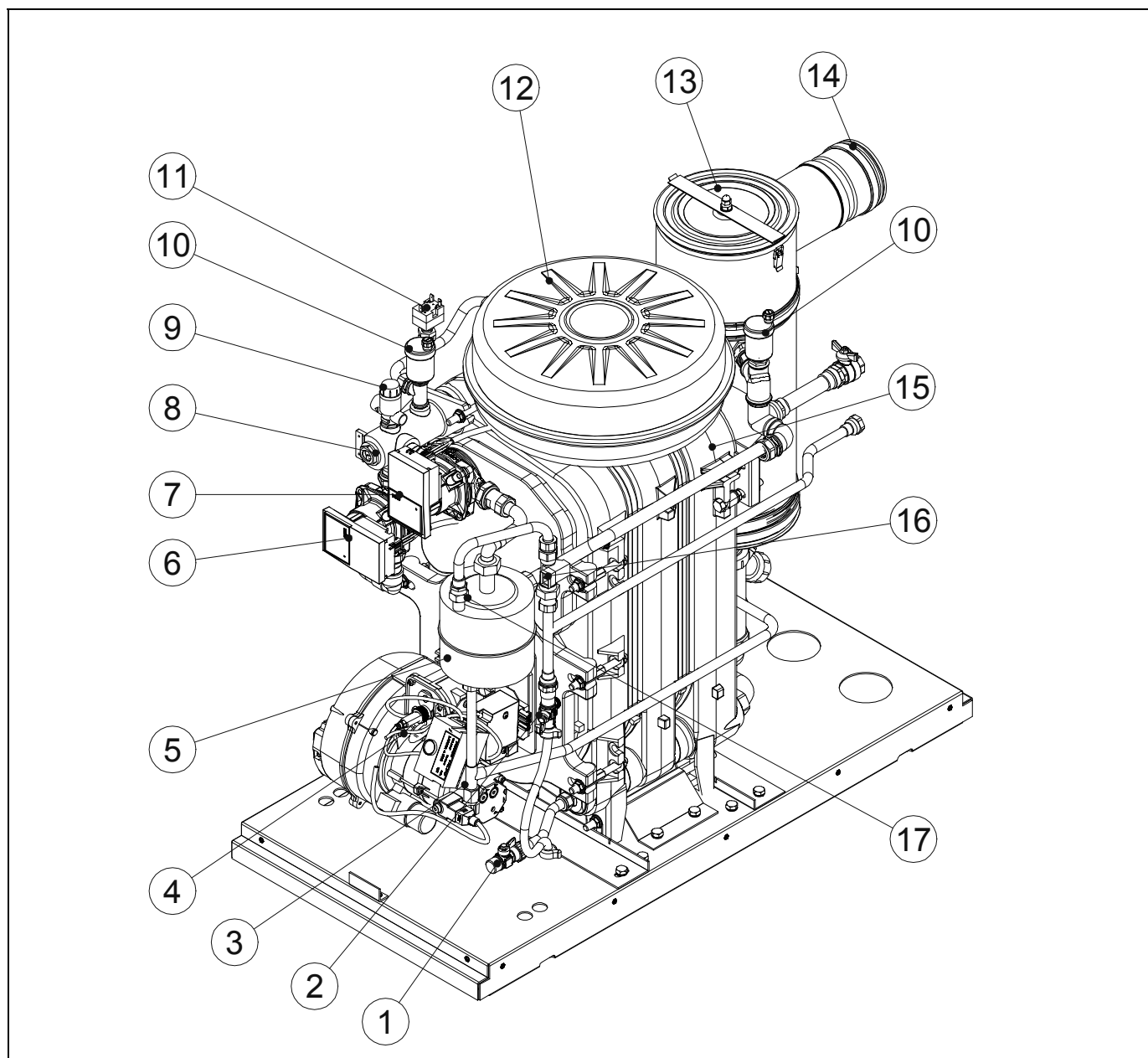
These boilers must be installed by qualified personnel only, in accordance with the legislation in force and following the manufacturer's instructions.

The start-up of these boilers and any maintenance operations must only be carried out by Official Technical Assistance Services of **TRIANCO**.

Incorrect installation of these boilers could result in damage to people, animals or property, and the manufacturer will hold no liability in such cases.

TRIANCO informs all parties concerned that, in compliance with section 1 of the first additional provision of Law 11/1997, the responsibility for delivering packaging waste or used packaging for its proper environmental management will be that of the final owner of the product (Article 18.1 Royal Decree 782/1998). At the end of its useful life, the product must be taken to a selected collection point for electrical and electronic equipment or must be returned to the distributor at the time of purchasing a new equivalent appliance. For more detailed information on the collection schemes available, contact either the collection facilities of the local authority or the distributor where the purchase was made.

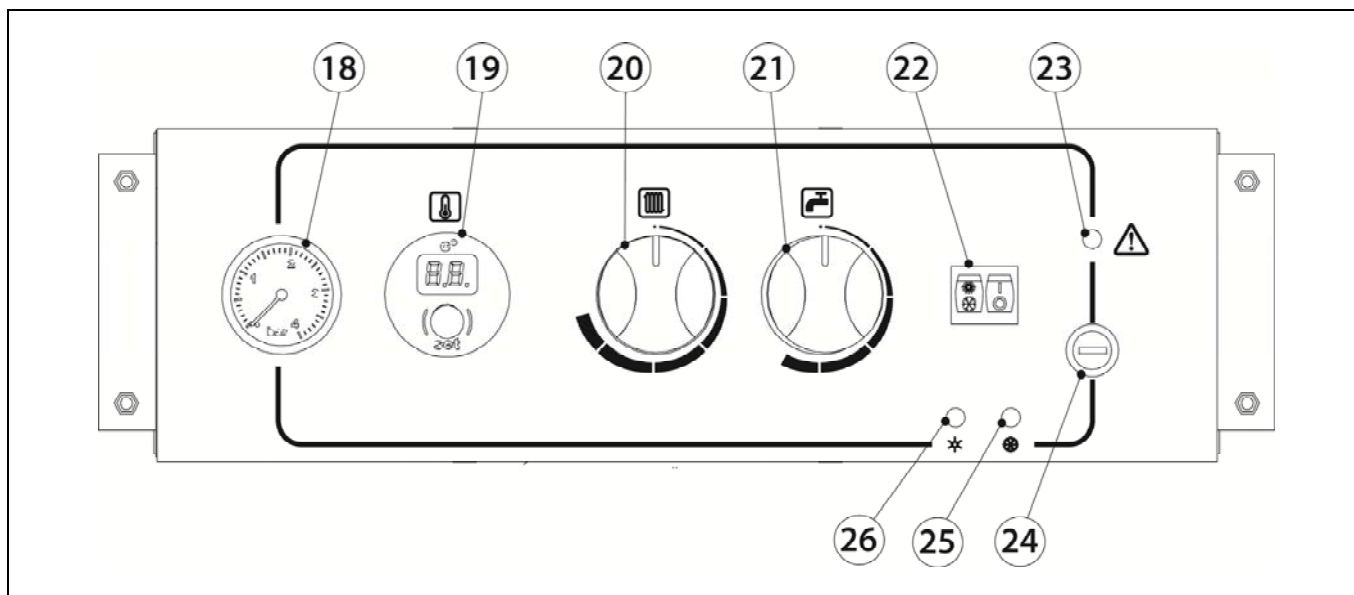
2.- DESCRIPTION OF COMPONENTS



1. Blow off valve.
2. Filling valve.
3. DHW temperature sensor
4. Balance flue burner.
5. DHW exchanger.
6. Heating pump.
7. DHW pump.
8. Boiler temperature sensors.
9. Safety valve.
10. Automatic air vent.
11. Pressure sensor.
12. Expansion vessel.
13. Condensator INOX.

14. Flue gases outlet.
15. Cast iron corp.
16. DHW flow switch.
17. DHW flow limiter.

3.- CONTROL ELEMENTS



Pressure gauge (18):

It indicates the installation pressure.

Digital display (19):

This display lets us view the different temperatures of the system as well as the functions and error codes that are activated by the electronic control of the boiler.

Adjusting the boiler temperature (20):

You will be able to, by means of this element, select the heating working temperature, stopping the burner when the boiler temperature reaches that selected or keeping it running as long as the temperature is lower than that pre-set.

Adjusting the DHW temperature (21):

It allows us to select the operating temperature of the domestic hot water.

Main selector (22):

It allows the boiler to be switched on and off by pushing "O/I" button. You can select the summer position "☀" (only DHW) or winter position "❄" (DHW + Heating).

Blocked due to temperature pilot light (23):

When lit, it indicates that the boiler operation has been blocked due to excessive temperature (higher than 110°C).

Safety thermostat (24):

It ensures that the boiler temperature does not exceed 110 °C by locking its operation.

Pilot Summer (25):

When lit, it indicates that the service is selected Summer (DHW only).

Pilot Winter (26):

When lit, it indicates that the service is selected Winter (heating + DHW).

4.- INSTALLATION INSTRUCTIONS

This boiler is suitable for heating water to a temperature below boiling point at atmospheric pressure. It must be connected to a heating installation and/or a domestic hot water distribution network, which must always be compatible with its performance and power.

This appliance must only be used for the purpose for which it has been expressly designed. Any other use is considered unsuitable and therefore hazardous. The manufacturer shall not be considered liable under any circumstances for damage caused by unsuitable, erroneous or irrational use.

Remove all the packaging and check the contents are complete. In case of doubt, do not use the boiler. Contact your supplier. Keep the packaging elements out of reach of children, as they can be dangerous.

When you no longer wish to use the boiler, disable the parts that could represent a potential hazard.

The boiler must be installed by personnel authorised in accordance with the applicable regulations and standards in force. However, the following recommendations must be complied with when installing the boiler:

4.1 Location

The **TRO Evolution Combi Outdoor** boiler must be installed taking into account the following guidelines:

- **It must be placed on a solid, level base which can bear the weight of the boiler**, even when it is full of water.
- It can be installed either against a building or in an open area at a distance from the building.
- **The relevant instructions must be followed** for the correct installation of the **flue outlet**.
- Maintain the **minimum distances from any obstacle** which may hinder the access to the components and maintenance operations.
- The boiler must be positioned in such a way that **does not obstruct the air inlets**.

4.2 Hydraulic Installation

The hydraulic installation must be made by qualified personnel. The applicable installation legislation is to be complied with, and the following recommendations should also be taken into account:

- The inside of the installation piping should be thoroughly cleaned before switching on the boiler.
- We recommend inserting cut-off valves between the installation piping and the boiler to simplify maintenance tasks.
- Fill the siphon with water before starting up the unit, to prevent fumes coming out of it.

- **The condensation pipe should lead to a drain outlet**, as the Evolution boiler is a condensation boiler and a large amount of water may be generated. This connection should be made in accordance with the regulations for draining off condensation water to the drain network.
- Drain valves and suitable devices for correctly bleeding the air from the circuit during the boiler filling stage should be fitted.
- Install all the necessary safety elements (expansion vessel, safety valve, etc.) to comply with the applicable regulations for the installation.
- The **TRO Evolution Combi Outdoor** is equipped with a standard 14 litre closed expansion vessel. Depending on the total volume of the hydraulic circuit, it may be necessary to install an additional expansion vessel consistent with this volume.

WARNING: In order to avoid damage to the boiler, antifreeze fluid must be added to the water of the heating circuit. If the boiler is to be out of use for long periods of time, we recommend draining all the water and leaving it empty.

4.3 Condensation pipe

The condensation pipe should lead to a drain outlet, as the **TRO Evolution Combi Outdoor** boiler is a condensation boiler and a large amount of water may be generated. This connection should be made in accordance with the regulations for draining off condensation water to the drain network and the following recommendations must be complied:

- The length of the pipes should be as short as possible. The sections external to the boiler should not exceed 3 m so as to reduce the risk of freezing.
- They must have a minimum inclination to the outside of 3° from the boiler.
- The diameter of the external pipe of the boiler should be greater than 30mm so as to reduce the risk of freezing.
- The condensation drainage pipe must be resistant to the acids of the condensation agents. Plastic materials used in water drainage are suitable, whereas copper or steel piping should not be used.

4.4 Electrical Connection

The boiler is equipped for connection at 230 V~, 50 Hz to terminals 1 and 2 of terminal strip J1 (see Electrical Connection Diagram). **Remember to earth the appliance.**

The boiler has two terminal strips, **TA1** (J5) and **TA2** (J7) for connecting room thermostats or room chronothermostats (see "Electrical Connection Diagram") for remote control of heating circuits 1 and 2 respectively. To correctly connect the room thermostats, firstly remove the bridge joining the terminals of terminal strip **TA1**. For connection to **TA2**, simply connect the thermostat to the terminal strip.

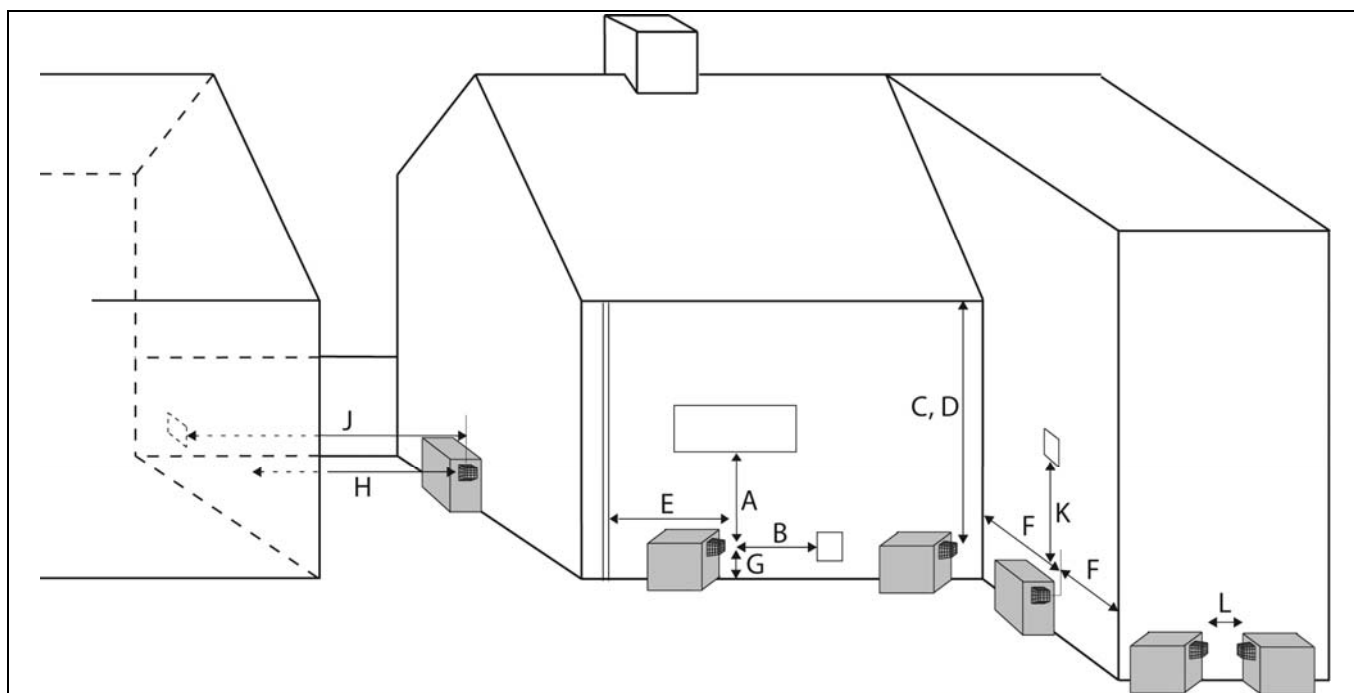
4.5 Oil installation

The **TRO Evolution Combi Outdoor** boiler is supplied with a **Domestic** gas-oil burner (see model in Technical Characteristics). To install the oil line, proceed in accordance with the burner instructions enclosed with this manual (see Burner section). The oil line installation and start-up of the burner must be carried out by qualified, authorised personnel.

4.6 Combustion products exhaustion

The installation of exhaustion of the products of combustion has to be carried out by qualified personnel staff and it will fulfill the requirements demanded in the legislation and effective regulatory schemes.

The **TRO Evolution Combi Outdoor** boilers are oil-fired boilers, and the combustion products are therefore removed through an outlet pipe. It is recommended that the position of the outside exhaust duct is as shown in the figures and in the table below:



Terminal position	Balanced horizontal flue mm
A Directly below an opening, air brick, opening window etc.	600
B Horizontally to an opening, air brick, opening window etc.	600
C Below a gutter, eaves or balcony with protection	75
D Below a gutter or balcony without protection	600
E From vertical sanitary pipework	300
F From an external or internal corner or surface or boundary alongside a terminal	300
G Above ground or balcony level	300
H From a surface or boundary facing terminal	600
J From a terminal facing a terminal	1200
K Vertically from terminal on the same wall	1500
L Horizontally from terminal on the same wall	750

Besides this figures and the table above the following recommendations must be complied with when installing the boiler:

- Terminals should be positioned to avoid products of combustion accumulating in stagnant pockets around the building, or entering into buildings.

- If the lowest part of the terminal is less than 2m above the ground, balcony, flat roof or other place to which any person has access, the terminal must be protected by a stainless steel guard.
- Notwithstanding the dimensions given in the diagram and table, a terminal should not be sited closer than 300mm to combustible material.
- Flue gases have a tendency to plume and in certain weather conditions a white plume of condensation will be discharged from the flue outlet which could be regarded as a nuisance, for example, near security lighting.
- There should be no restriction preventing the clearance of combustion products from the terminal.
- Where a flue is terminated less than 600mm away from a projection above it and the projection consists of plastic or has a combustible or painted surface, then a heat shield of at least 750mm wide should be fitted to protect these surfaces.

NOTE: All accessories used for combustion product removal and air intake should be those supplied by TRIANCO.

4.7 Draining the boiler

The boiler is emptied by opening the drain tap located in the rear of the boiler. A flexible hose must be attached to this tap to direct it to a water outlet. After draining the boiler, the valve must be closed and the flexible tube removed.

4.8 Precautions for preventing noise during operation

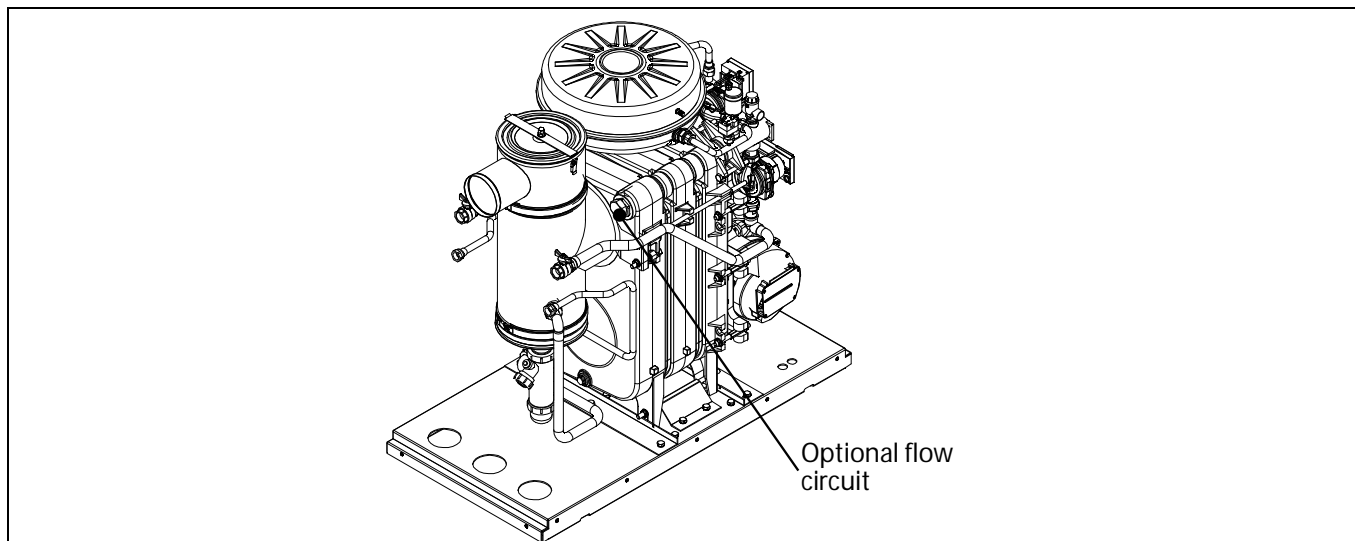
Ensure the flow and return pipes are not touching each other, or insulate them to prevent any vibration noise. The boiler must be correctly seated on its base and levelled. Before start-up, make sure that the boiler and the system have been properly bled.

4.9 Instalación del circuito de calefacción Nº 2 (Opcional)

All the models in the **TRO Evolution Combi Outdoor** range of boilers are supplied with a circulation pump connected to heating circuit 1 (BC1). In addition to this circuit, all the models are designed to control a second heating circulation pump in a second heating circuit (circuit 2, BC2).

The hydraulic installation of heating circuit 2 should be made using the **optional flow circuit** on the rear of the boiler (see "Diagrams and Measurements").

The circulation pump installed in heating circuit 2 must be electrically connected between terminals N and 6 on the supply connector block **J2** (see "Connection Diagram").



4.10 Filling and bleeding the installation

To fill the installation, open the fill valve until the manometer shows a pressure of 1 - 1.5 bars. The circuit should be filled slowly and with the automatic air bleed valve cap loose, to let the air out of the installation. The air should also be bled from the rest of the installation using the air bleed valves provided. Close the fill valve after filling.

CAUTION: Switching on the boiler with no water inside could result in serious damage.

5.- COMBUSTION PRODUCT REMOVAL

The combustion product exhaust ducts must be installed by qualified personnel and must comply with current legislation and standards.

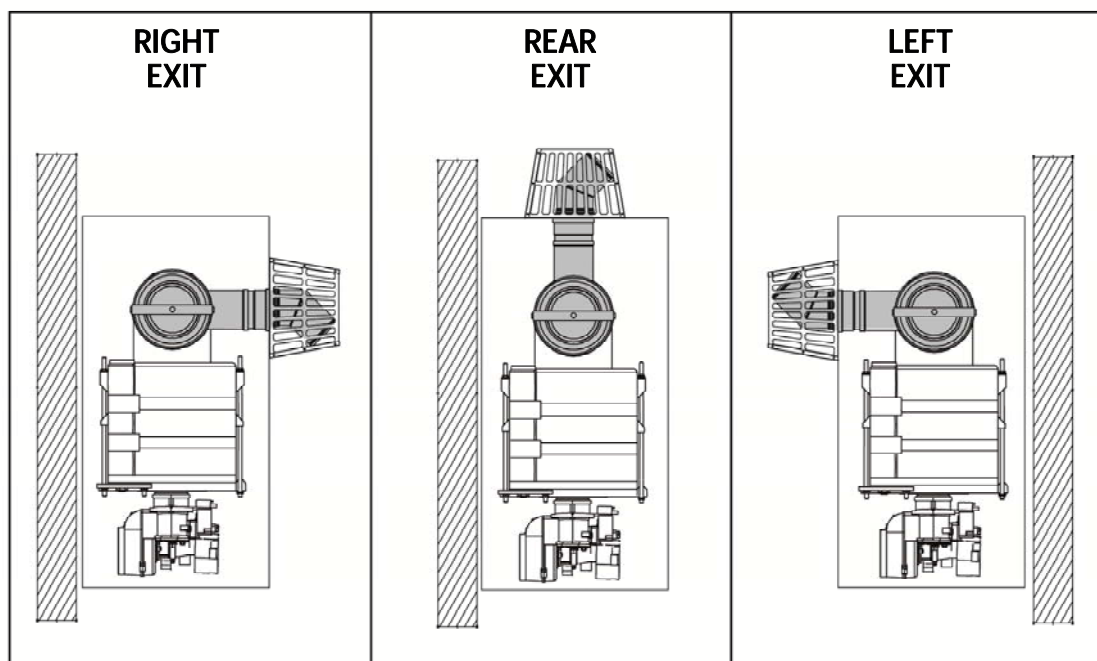
The **maximum length** of pipe that can be installed is 12 metres (**TRO Evolution 40 Combi Outdoor**) and 15 metres (**TRO Evolution 30 Combi Outdoor**). Each elbow of 90°, or two of 45°, reduces the available length by 1 metre, and 1 metre of horizontal pipe represents 2 metres of vertical pipe.

It is recommended that the flue gases outlet pipe be fitted slightly upwardly-inclined 2° to 3° thus preventing water and condensate projections from being ejected outside.

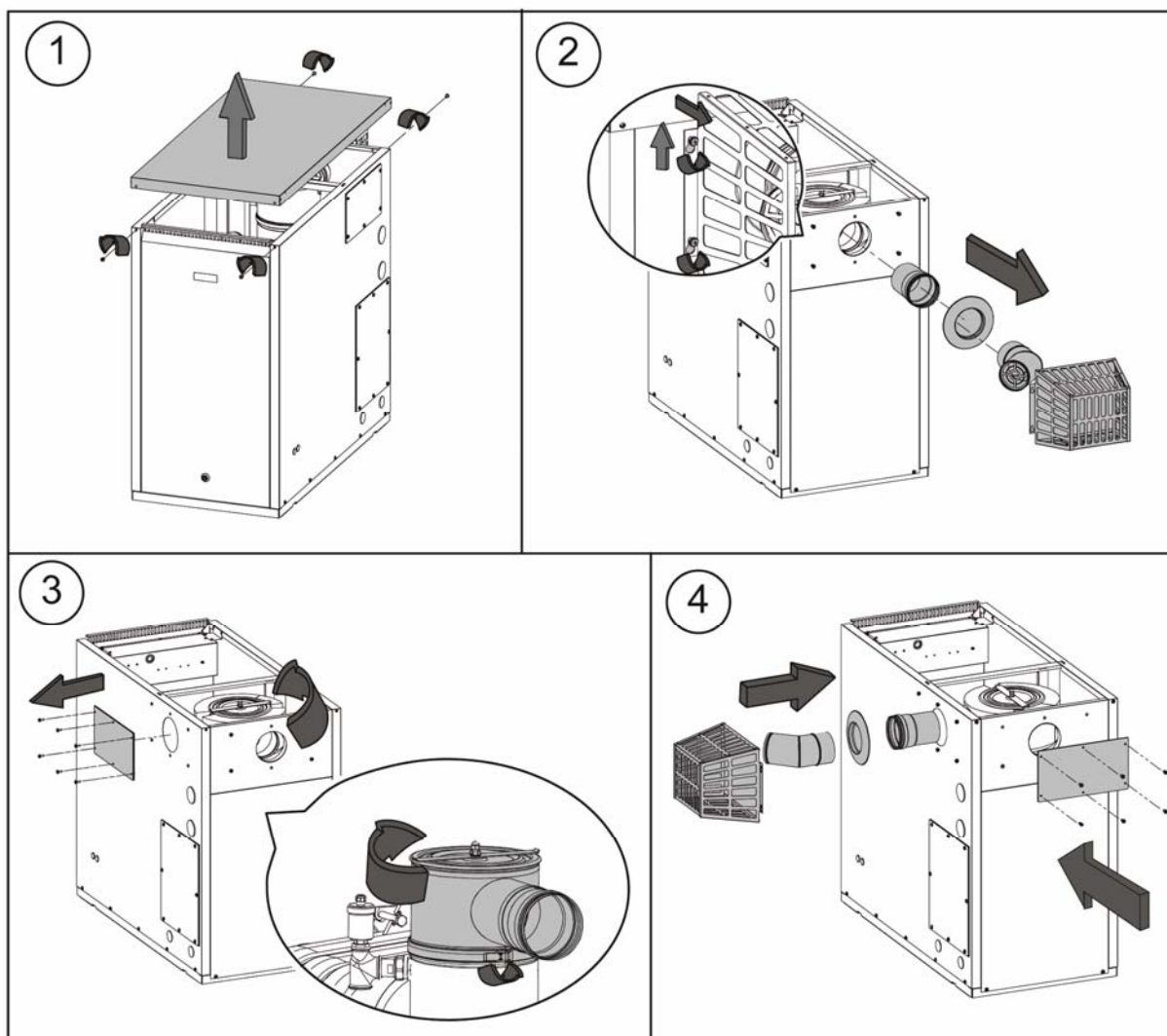
CAUTION: The air intake holes provided in the upper part of the door must not be obstructed at any time.

5.1 Horizontal combustion product removal

The **TRO Evolution Combi Outdoor** boiler comes equipped with a 45° horizontal outlet terminal which can be placed on each of the sides or on the back of the boiler for removing fumes.



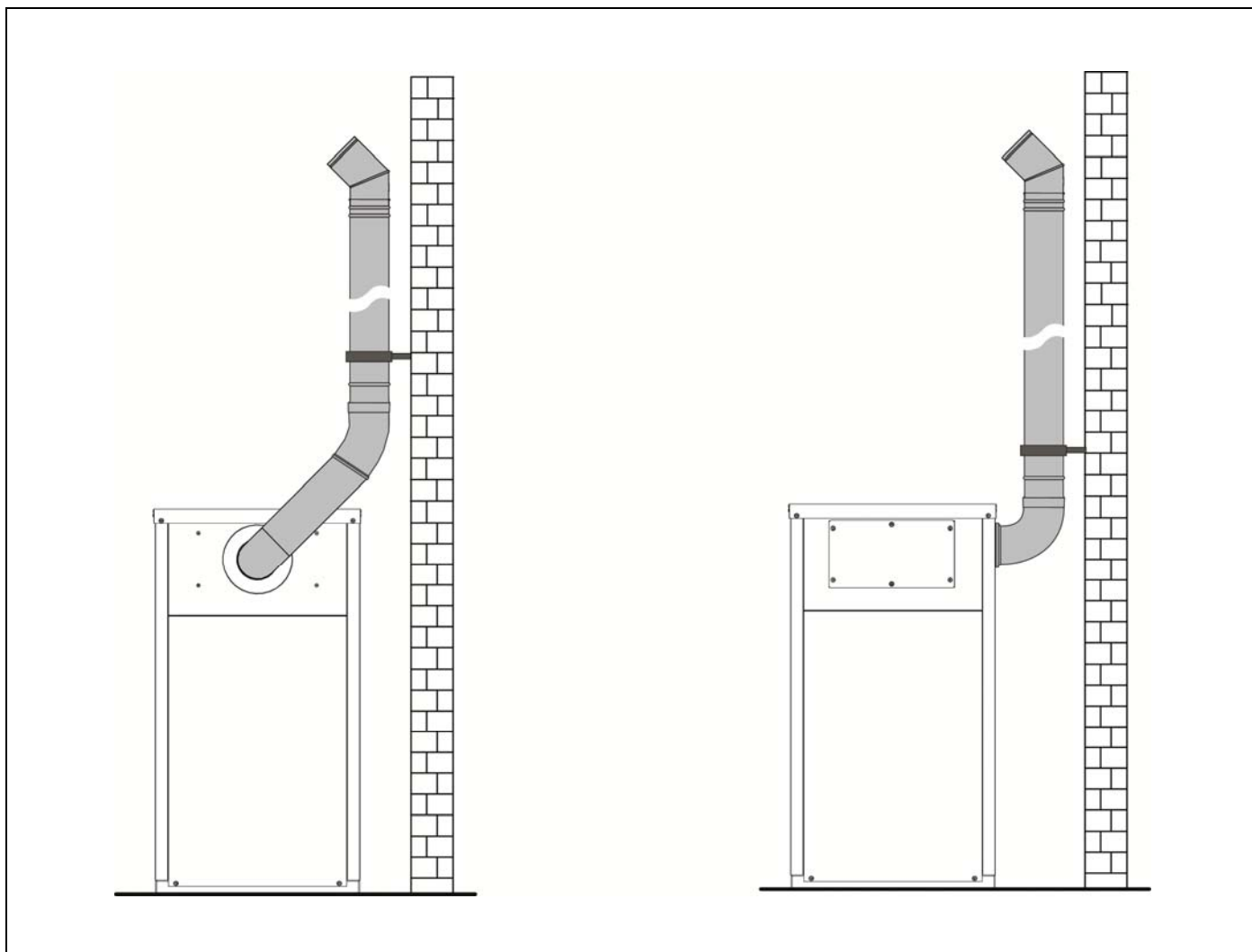
The steps for correctly modifying the position of the flue outlet are listed below:



NOTE: Fit the pipe with a slight upwards incline of around 2° - 3° , to prevent any water or condensation from dripping out.

5.2 Vertical combustion product removal

The combustion products exhaustion can be carried out through vertical pipe of Ø100 mm.



CAUTION: The flue terminal must not be conducted to the wall to avoid condensates.

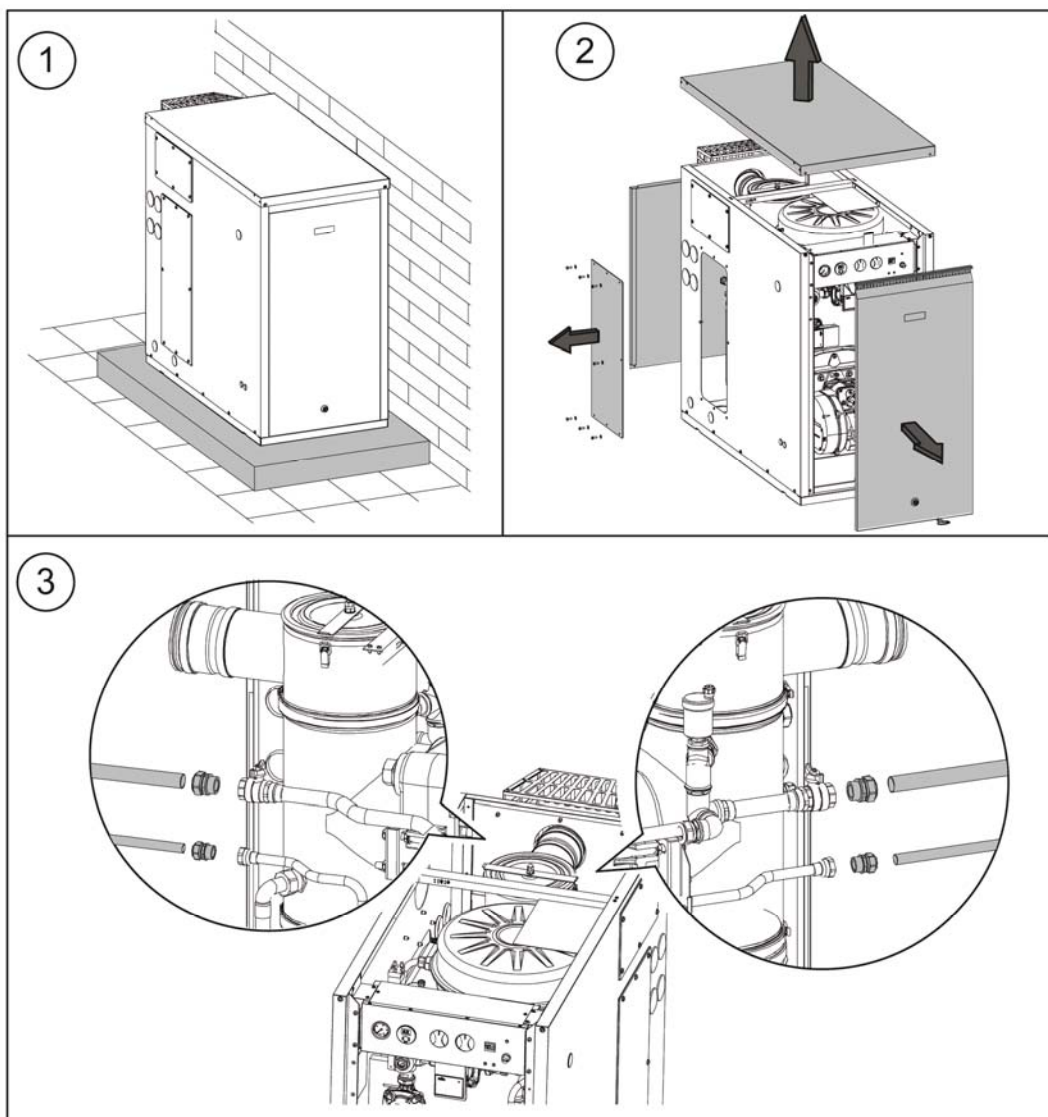
6.- PIPE CONNECTIONS

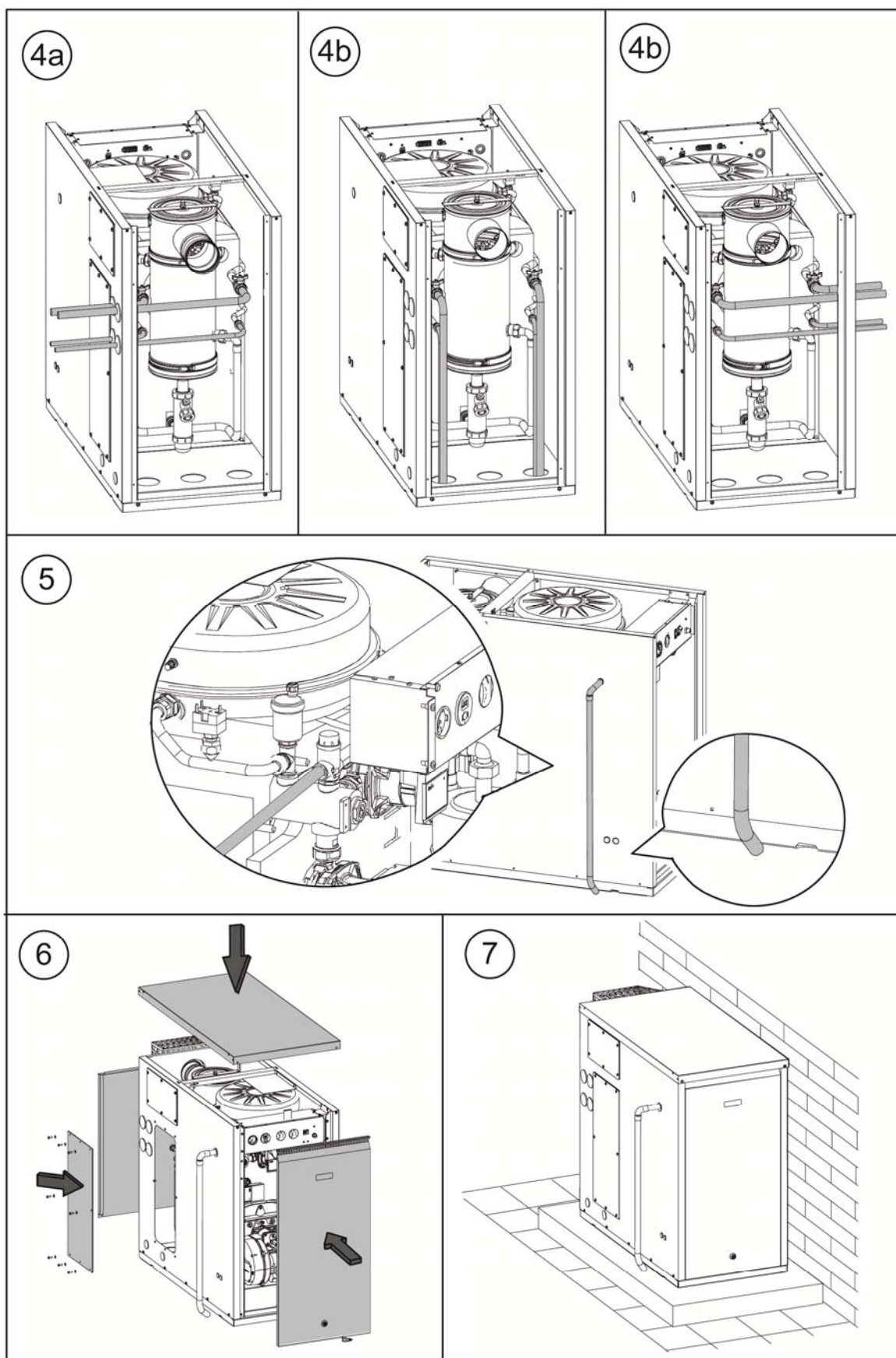
The heating and hot water outlet and inlet of the **TRO Evolution Combi Outdoor** boiler can be conducted optionally for either side of the boiler, through the pre-cut openings provided (see "Diagrams and Measurements"), when the boiler is installed against the building (see pictures N°4a and 4c). For "free standing" installations the pipework can be conducted through the pre-cut openings provided in the base of the enclosure (See picture N°4b). In this way the boiler can adapt to installation site needs. The boiler is equipped with $\frac{3}{4}$ " female connections for the heating outlet and return. For the hot water the boiler is equipped with $\frac{1}{2}$ " female connections.

The boiler is equipped with different removal panels on the rear, sides and top to gain access to the water connection, condensate pipe, components and do maintenance (see picture N°2). Withdraw them removing carefully the stainless screws.

The pressure valve should run downwards away from the boiler by at least 15 mm diameter copper pipe (see pictures N°5). It should discharge away, through one of the openings provided at the side of the enclosure, and terminate avoiding any electrical or other hazard.

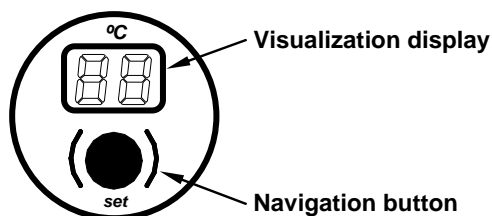
The steps for correctly connecting the heating outlet and return, safety valve discharge tube and hot water are listed below:










7.- DISPLAY DIGITAL

The boiler **TRO Evolution Combi Outdoor** is electronic and incorporates a digital display (19) for the visualization of those actual temperatures and the set point temperatures. Pressing the button SET located under the display, it will be able to navigate per rest of the available visualization options, according to the following instructions:



Pressing the button of SET successively will select the different options to visualize. Once selected desired option, lapsed three seconds, it will return to the stand by condition.

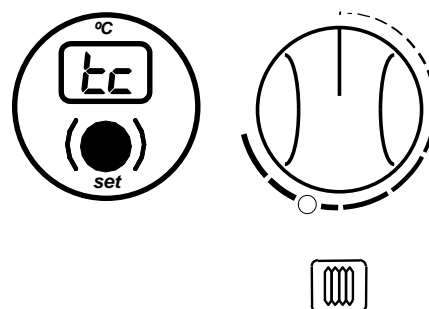
In the following table the different options of visualization of the display are described:

	Actual temperature of the boiler.
	Actual DHW temperature.
	Boiler set point temperature, selected with the boiler temperature selector button (20).
	DHW set point temperature, selected with the DHW temperature selector button (21).
	Circulation pump speed

8.- TEMPERATURE ADJUSTMENT

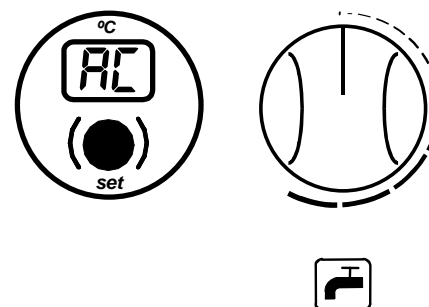
8.1 Adjusting the boiler set-point temperature

To set the desired operating temperature for the boiler, select "tc" on the screen using the browser button on the display. After three seconds, the current set-point temperature will be displayed. To change the set-point, turn the boiler temperature adjustment control on the control panel (12) until the new set-point temperature you wish to set is displayed.



8.2 Adjusting the DHW set-point temperature

To set the desired service temperature for the DHW, select "AC" on the screen using the browser button on the display. After three seconds, the current set-point temperature will be displayed. To change the set-point, turn the DHW temperature adjustment control on the control panel (13) until the new set-point temperature you wish to set is displayed.



9.- OPERATION

The **TRO Evolution Combi Outdoor** boiler is factory set to heat a heating installation and provide instant domestic hot water.

We can distinguish between two standard operating modes:

Winter position "❄"

In this position, the boiler can simultaneously heat up the heating installation and domestic hot water. To select this position, set the general selector to "❄" position. The burner will switch on. When the boiler reaches 60°C it is ready to heat up the heating installation and will start up the heating pump for this purpose. The burner will shut down when the boiler reaches its selected set-point temperature. The heating pump and the burner will stop when the room temperature reaches or exceeds the temperature set on the installation's room thermostat (if it has one). If a hot tap is turned on, the instantaneous DHW production system will start up and provide constant domestic hot water at the selected DHW set-point temperature.

Summer position "☀"

In this position, the boiler only supplies domestic hot water. To select this position, set the general selector to "☀". The burner will ignite until the boiler reaches 60°C. If a hot tap is turned on, the instantaneous DHW production system will start up and provide constant domestic hot water at the selected DHW set-point temperature.

The **TRO Evolution Combi Outdoor** boiler is equipped with a system for modulating instant DHW production and progressive adjustment of the Domestic Hot Water consumption temperature:

- **The modulation** allows the boiler power to constantly adapt to the DHW consumption requirements at all times, without altering the efficiency of the boiler. Consumption savings are thus obtained together with improved boiler functioning and lower emissions.
- **Progressive electronic adjustment** of the DHW temperature, a system designed by **TRIANCO**, enables the DHW consumption temperature to be stabilised at the temperature selected using the button on the control panel and a constant hot water temperature with no variations is obtained **regardless of the water flow required or the cold water inlet temperature at any given time**. This enables optimum hot water comfort and adaptation to each user's particular needs.

10.- HEATING CIRCUIT 2 OPERATION (OPTIONAL)

All the models in the **TRO Evolution Combi Outdoor** range of boilers have the option of controlling a second heating circuit. This requires the installation of a second circulation pump in the boiler. To correctly install this pump, carefully follow the instructions given in the "Installing heating circuit 2" section of this manual.

Heating circuit No. 2 will work at the selected boiler set point temperature "**tc**" and at the temperature of room thermostat No. 2 (**TA2**) (if the boiler has one). The burner and the heating pump of circuit 2 (**BC2**) will begin to function until the installation reaches the selected boiler set-point temperature or the temperature of room thermostat No. 2, (if the unit has one). When the temperature of the installation drops below the selected boiler temperature, the burner will start up again, running the heating cycle.

11.- ADDITIONAL FUNCTIONS

The boiler **TRO Evolution Combi Outdoor** is equipped with an electronic control able to regulate the automatic operation of the boiler in an efficient way and it also includes the following additional control features:

11.1 Pumps anti-block function

This feature prevents the blocking of the circulation pumps of the boiler, due to prolonged periods that the pumps don't work. This system will remain enable while the boiler is connected to the electric network.

11.2 Boiler anti-freezing function

This feature protects the boiler of freezing during the freeze periods. When the temperature of the boiler decreases up to 6 °C, it will start the heating circulation pump. If the temperature of boiler continues descending up to 4 °C, it will put into operation the burner, heating the installation. Once enabled this feature, will be active until reaching 8 °C in the boiler. This system will remain in alert while the boiler is connected to the electric network.

11.3 Room thermostat connection

The boiler has two terminals, in the terminal strip J5 and J6, prepared for the connection of a room thermostat or room timer (TA1 y TA2, see Electrical Connection Diagram), which allow to control the heating service depending on the temperature of home. For its connection, it should take off the bridge of the terminals J5 and J6, and connect the room thermostat there.

The installation of a room thermostat will optimize the operation of the installation, adjusting the operation of the heating to the requirements of home, and obtaining some enhanced benefits of comfort. Also, if the thermostat allows the programming of the hours of operation (room timer), it will be able to adjust the heating system schedule to the usage of the installation.

12.- OPERATION WITH TIMER (OPTIONAL)

The **TRO Evolution Combi Outdoor** boiler may optionally be supplied with a timer, which can be fitted to the main control panel. Both the boiler and the timer are equipped with a quick assembly system, described in the installation and operating instructions enclosed with the timer.

13.- E20 REMOTE CONTROL (OPTIONAL)

A remote control (E20) can optionally be supplied with the **TRO Evolution Combi Outdoor** boiler. This remote control can be used to fully operate the boiler from any room in the home in which it is installed. The E20 remote control governs the settings of heating circuit 1 and the installation's domestic hot water production (if applicable).

This remote control allows the hours of home comfort to be programmed for heating circuit 1, adjusting the installation to the particular requirements of the home by measuring the room



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temperature and consequently adapting the installation temperature. The heating and DHW set-point temperature desired at any time can be set from the control. It can also be used to display the various operating parameters of the boiler. It also warns of any functioning anomalies affecting the boiler.

The E20 remote control may optionally be connected to an external sensor, for measuring the outside temperature. When this option is installed, the remote control can adjust the home comfort level (circuit 1) according to the weather conditions at each particular time, optimising fuel consumption and heating comfort in the home.

The E20 remote control takes over the control of the boiler when it is connected to it. The various selectable boiler temperatures must be modified using the remote control. It is easy to install, only requiring 2 wires for communication between the boiler and the E20 control. It is connected to the boiler by connecting the two wires on terminal strip J4 (see "Electrical Connection Diagram"). For correct installation and functioning, carefully read the instructions enclosed with the remote control.

The following sections contain a general explanation of the E20 remote control's different operating modes and options.

13.1 Functioning without an outdoor sensor

Conventional heating installation (direct circuit)

The maximum temperature for heating circuit 1, the scheduled heating times and the desired room temperatures can be selected on the remote control. The E20 remote control will calculate the boiler temperature required at each particular time, depending on the temperature of the room, and it will activate or disable the heating mode of circuit 1 depending on the heating times and room temperatures programmed.

13.2 Functioning with an external sensor (Optional)

If the E20 remote control is fitted with an outdoor temperature sensor, it can calculate the heating temperature of heating circuit 1 according to the outside weather conditions at each particular time, with optimum adjustment of the heating installation conditions for improved comfort in the home and energy savings.

Conventional heating installation (direct circuit)

The maximum temperature, an operating curve for heating circuit 1 (see instructions enclosed with the E20 remote control) and the desired heating times and room temperatures can all be selected on the remote control. The E20 remote control calculates the required boiler temperature at each particular time, depending on the temperature inside the home and the outside weather conditions, in accordance with the operating curve selected (setting HEATSLOPE 1 on the E20), switching the heating on and off in accordance with the heating times and the room temperatures programmed.

13.3 DHW mode operation

On the **TRO Evolution Combi Outdoor** boiler, the remote control can be used to select the DHW set-point temperature and the desired hot water times. The E20 remote control regulates the instantaneous hot water temperature at each particular time and enables or disables DHW mode in accordance with the times programmed.

13.4 Telephone relay function

The E20 remote control is designed for connection to an external telephone relay. If a telephone relay is connected to the E20 remote control, the heating mode of heating circuit

1 and the DHW mode can be switched on and off from anywhere in the world, simply by making a telephone call (see instructions enclosed with the E20 remote control).

14.- SHUTTING DOWN THE BOILER

To stop the boiler, simply turn the main selector (22) to "O".

To stop the central heating mode and leave only the DHW mode running, set the general selector to the Summer position "☀".

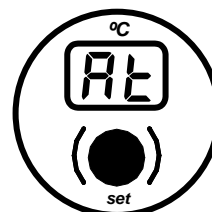
15.- SAFETY CUT-OUTS

The boiler electronic control system will be able to enable the following security locks of operation of the boiler:

15.1 Temperature safety locking

When this locking happens, in the digital display (19) will visualize blinking the code "At" (Alarm of Temperature) and the alarm warning neon light. It will stop the burner.

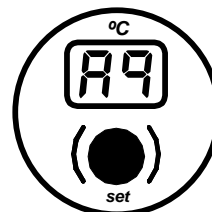
It will take place whenever the boiler surpasses 110 °C of temperature. To unlock, wait to the boiler temperature gets down below 100 °C and press the button incorporated in the security thermostat.



15.2 Burner locking

When this locking happens, in the digital display (19) will visualize blinking the code "AQ" (Alarm of Burner) and the alarm warning neon light. It will stop the burner.

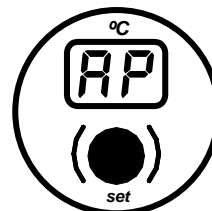
It takes place for any abnormality that could exist in the burner (4) or in the installation of fuel. To unlock, press the luminous button that lights in the burner.



15.3 Low pressure cut-out

When this cut-out occurs, the code "AP" (pressure alarm) will begin to flash on the digital display. The burner and the system circulating pumps will switch off, cutting off the heating and water flow to the installation.

This occurs when the installation pressure drops to below 0.5 bar, preventing the boiler from functioning when the water is drained from the installation, due to either leakage or maintenance operations. To unlock the boiler, fill the installation again until a pressure of 1 - 1.5 bar. is shown on the manometer (18).



NOTE: If any cut-outs occur repeatedly, call your nearest official Technical Assistance Service.

16.- FIRST START-UP

For the **guarantee to be valid**, the boiler must be started up for the first time by an **official TRIANCO Technical Assistance Service**. Before beginning the start-up process, the following must be complied with:

- The boiler must be connected to the mains.
- The installation must have been filled with water (the manometer should indicate a pressure of 1 -5 bar.).
- The fuel must be reaching the burner at a pressure of no more than 0.5 bar.

17.- DELIVERY OF THE SYSTEM

After the initial start-up, the Technical Assistance Service will explain to the user how the boiler functions, making any observations they consider relevant.

The installer is responsible for clearly explaining to the user the functioning of any control or regulation device forming part of the installation but not supplied with the boiler.

18.- BOILER MAINTENANCE

To maintain the boiler in perfect working order, a yearly service must be performed by personnel authorised by **TRIANCO**.

18.1 Cleaning the boiler

To maintain the boiler in optimal operating conditions it is recommended that an annual cleaning be undertaken of the combustion chamber, the fume outlets and the condenser. A cleaning brush of a suitable size for cleaning the inside of the exhaust ducts is supplied with the boiler for this purpose. This brush is located at the rear of the boiler, beside the condenser.

The combustion chamber and exhaust ducts should not be cleaned using chemical products or hard steel brushes. After any cleaning operation has been carried out, it is important to run several ignition cycles to check all the elements are functioning correctly.

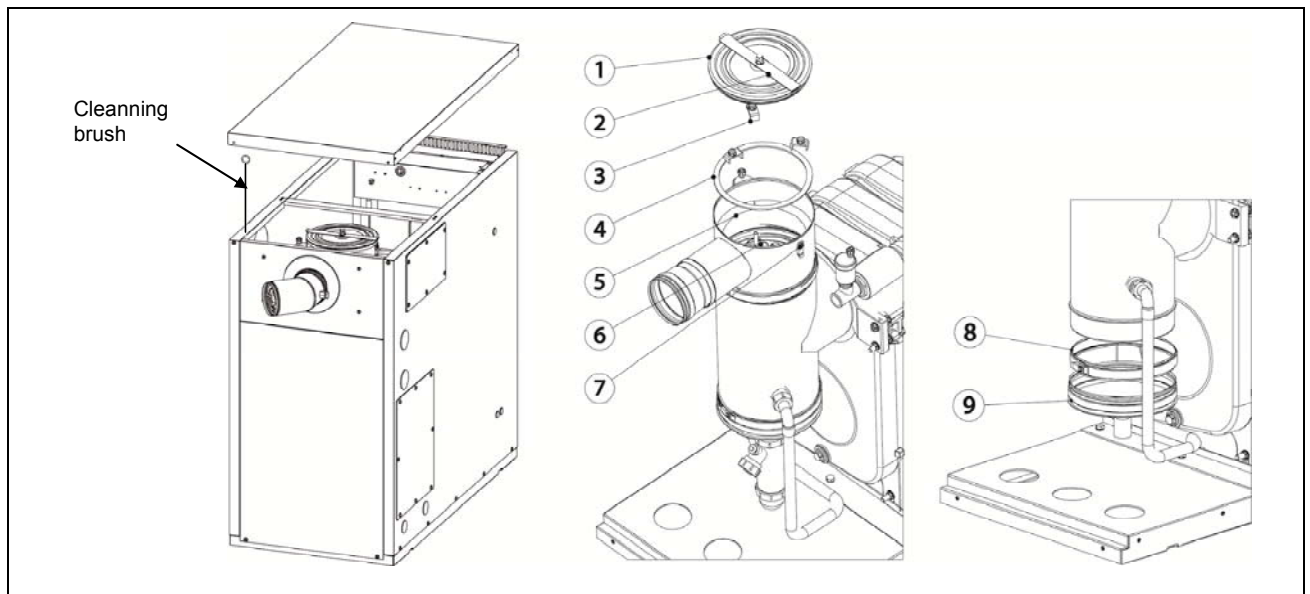
For correct cleaning, the following recommendations should be carefully observed:

18.2 Cleaning the boiler body

- Open and remove the outer door of the boiler.
- Remove the burner by unscrewing the fixing nut on the top of the burner.
- Remove the combustion chamber door and the exhaust duct cover, unscrewing the six fixing nuts around them.
- Clean the exhaust ducts on the cast body, using the cleaning brush supplied with the boiler.
- Clean the boiler combustion chamber. We recommend using a soft brush for scrubbing the combustion chamber surfaces, and a blower to remove the flakes.
- After cleaning, replace the combustion chamber door, the exhaust duct cover, the burner and the outer door of the boiler.

18.3 Cleaning the condenser

- Open and remove the top cover of the boiler to access the condenser on the rear of the boiler body.
- Open the top cover of the condenser to access its exhaust ducts. To open this cover, release the two side closures, turn the locking plate anti-clockwise and pull the cover upwards to remove it.
- Remove the exhaust deflectors inside the exhaust outlets.
- Clean the exhaust ducts using the cleaning brush supplied with the boiler. Any scale will fall through the condensation drain and onto the lower condenser cover. It is advisable to pour water into the top of the condenser for a more effective cleaning. This water will be automatically discharged through the condensation drain.
- To clean the outer part of the condenser cylinder, remove the three screws and then remove the metal ring. Take out the seal and use the brush to clean it. Next, put the components back in place again and replace and tighten the three screws and the metal ring.
- If the lower condenser cover needs cleaning, remove the side cover of the boiler to access it. Firstly remove the bracket holding it in place and pull on it to open it. Then pull the lower cover down to open and clean it.
- After cleaning, replace the fume deflectors, the top condenser cover and the top outer cover of the boiler. Then put the cleaning brush back inside the boiler.
- The condensation siphon should be cleaned once a year. To do this, remove it and wash it in soapy water. Replace the siphon after cleaning.



18.4 Boiler water characteristics

In areas with water hardness over 25-30°F, treated water must be used in the heating installation to avoid any lime scale deposits on the boiler. It should be noted that even a few millimetres of scale will greatly reduce the boiler's heat conductivity, causing a major drop in performance.

Treated water must be used in the heating circuit in the following cases:

- Very large circuits (containing a large amount of water).
- Frequent filling of the installation.

If repeated partial or total draining of the installation is necessary, we recommend filling it with treated water.

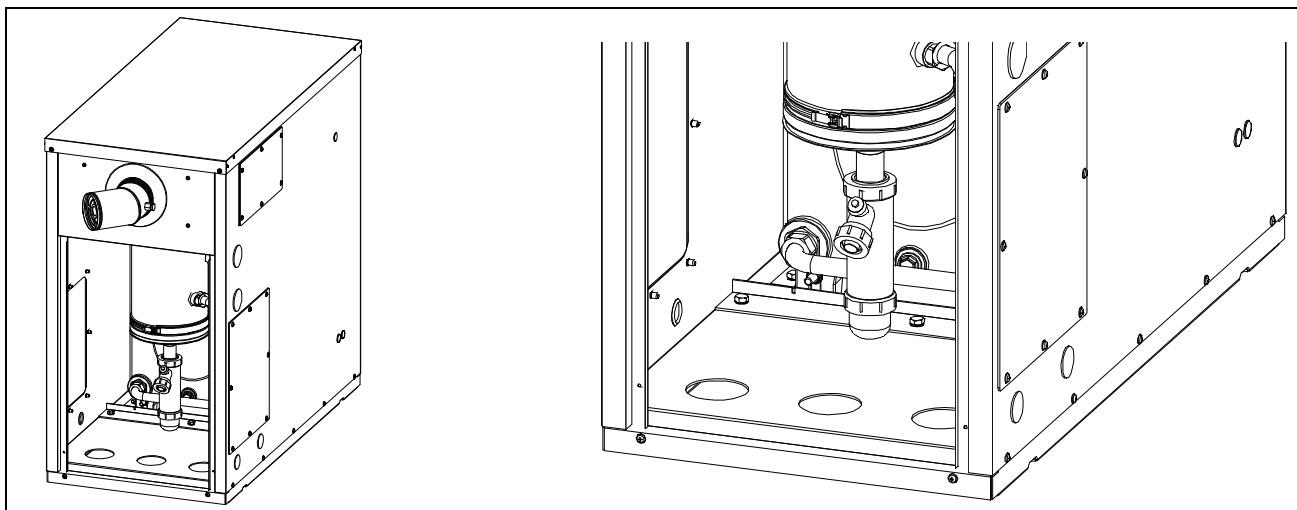
18.5 Anti-frost protection

The **TRO Evolution Combi Outdoor** boiler has a function for preventing frost damage to the installation. This will function as long as the appliance remains plugged into the mains. Despite this function, and particularly in areas with very cold weather, we recommend taking precautions in order to prevent damage to the boiler. It is advisable to add anti-freeze to the water in the heating circuit. If the boiler is to be out of use for long periods of time, we recommend **draining all the water and leaving it empty**.

18.6 Condensate drain-off

The drain for boiler condensate must not be altered and must be kept clear of obstructions. Annual maintenance of the condensate trap is recommended to avoid obstructions that hinder the discharge.

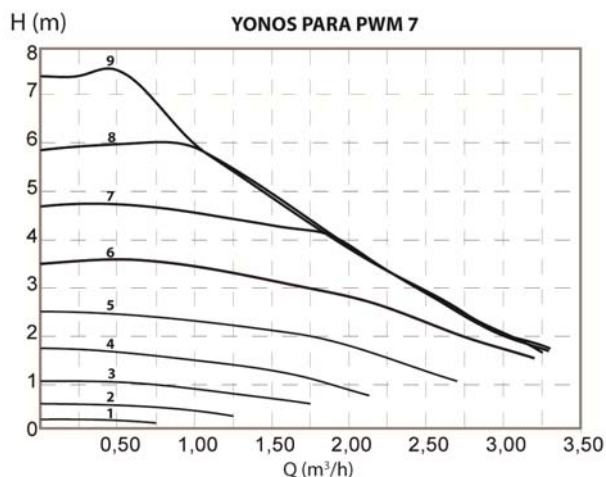
If a neutralisation system is installed in the condensate drain, it is essential to conduct annual maintenance of the system, following the instructions of the manufacturer of the neutralisation system.



19.- CIRCULATING PUMPS FLOW CURVES

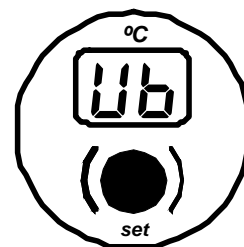
The hydrodriving pressure available in the installation at the boiler output can be deduced from the following graphs, having taken the boiler pressure drop into account.

19.1 Characteristic curves of the pump



19.2 Regulation of the circulation pump

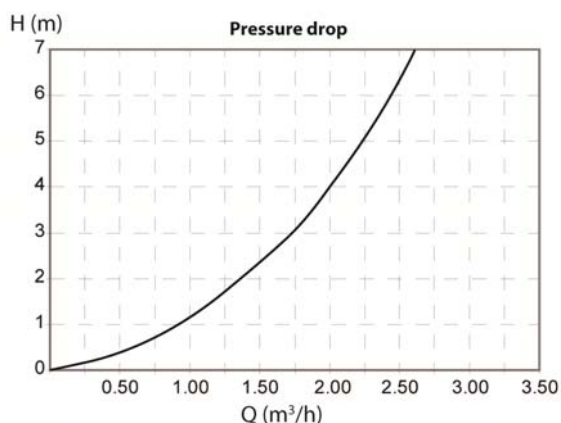
To adjust the BC1 circulation pump speed, select "UB" on the screen using the browser button on the display. After three seconds, the current speed will be displayed. To change the speed, hold down the SET button for 5 seconds until the "UB" symbol flashes. If the SET button is pressed repeatedly, the BC1 speed will change. When the desired speed has been selected, hold down the set button again for 5 seconds until it stops flashing. The value selected will be stored in the memory.



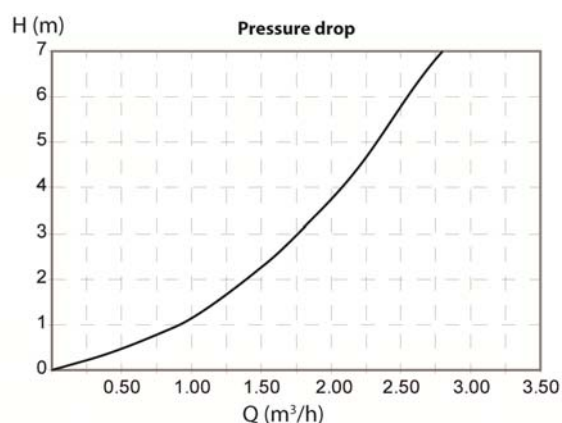
WARNING: Any interference in the operation and installation of the heating circuit must be done by authorised personnel, always respecting current legislation and installation safety standards, both national and local level.

19.3 Pressure drop

TRO Evolution 30 Combi Outdoor:



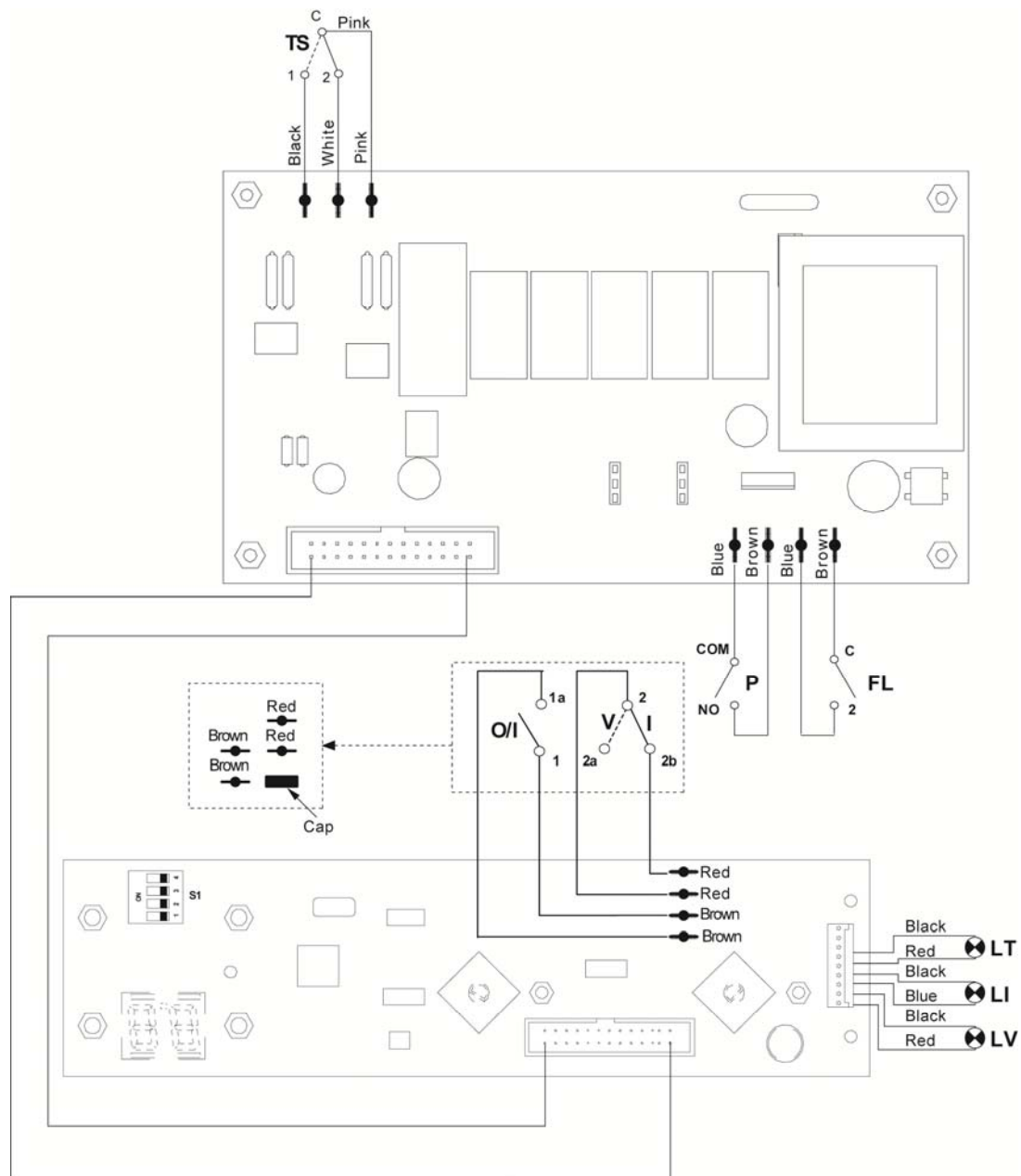
TRO Evolution 40 Combi Outdoor:



20. - TECHNICAL DATA

TRO EVOLUTION COMBI OUTDOOR			30	40
Boiler type	-		Condensation Combi	
Rated heat output	P _{rated}	kW	30	40
Useful heat output	P ₄	kW	28,7	38,7
Useful heat output (30%)	P ₁	kW	8,5	12,4
Seasonal space heating energy efficiency	η _s	%	91	92
Useful efficiency	η ₄	% (PCI)	97,96	97,29
		% (PCS)	92,38	91,74
Useful efficiency (30%)	η ₁	% (PCI)	103,45	104,15
		% (PCS)	97,55	98,21
Auxiliary electricity consumption at full load	e _{lmax}	kW	0,226	
Auxiliary electricity consumption at part load	e _{lmin}	kW	0,078	
Auxiliary electricity consumption in standby mode	PSB	kW	0,001	
Standby heat loss	P _{stby}	kW	0,135	0,17
Emissions of nitrogen oxides	NO _x	mg/kWh	118	119
Declared load profile	-		XL	XL
Water heating energy efficiency	η _{wh}	%	80	80
Daily electricity consumption	Q _{elec}	kWh	0,337	0,296
Daily fuel consumption	Q _{fuel}	kWh	24,110	24,630
DHW Production Δt = 30°C	l/min.		12,8	17,8
Heating temperature adjustment	°C		OFF, 30-85	
DHW temperature adjustment	°C		OFF, 15-65	
Maximum safety temperature	°C		110	
Maximum pressure for heating mode	bar		3	
Heating expansion vessel capacity	Lts.		8	12
Heating water volume	Lts.		19,2	23,2
Water pressure drop	mbar		163	272
Fume temperature	°C		67	83
Volume on fume side	m ³		0,114	0,175
Maximum fume flow	Kg/s		0,0132	0,0186
Fume pressure drop	mbar		0,20	0,21
Combustion chamber length	mm		300	400
Combustion chamber type	-		wet, three smoke steps	
Burner adjustment type	-		ON/OFF	
Electrical supply	-		~220-230 V - 50 Hz - 200 W	
Gross weight	Kg		160	190

21.- ELECTRICAL DIAGRAM



LV: Summer Pilot Led.

LI: Winter Pilot Led.

LT: Temperature Blocked Pilot Light.

LQ: Burner Blocked Pilot Light.

O/I: Start-Stop Switch.

V/I: Summer-Winter Selector.

P: Heating Pressure Switch.

FL: DHW flow switch.

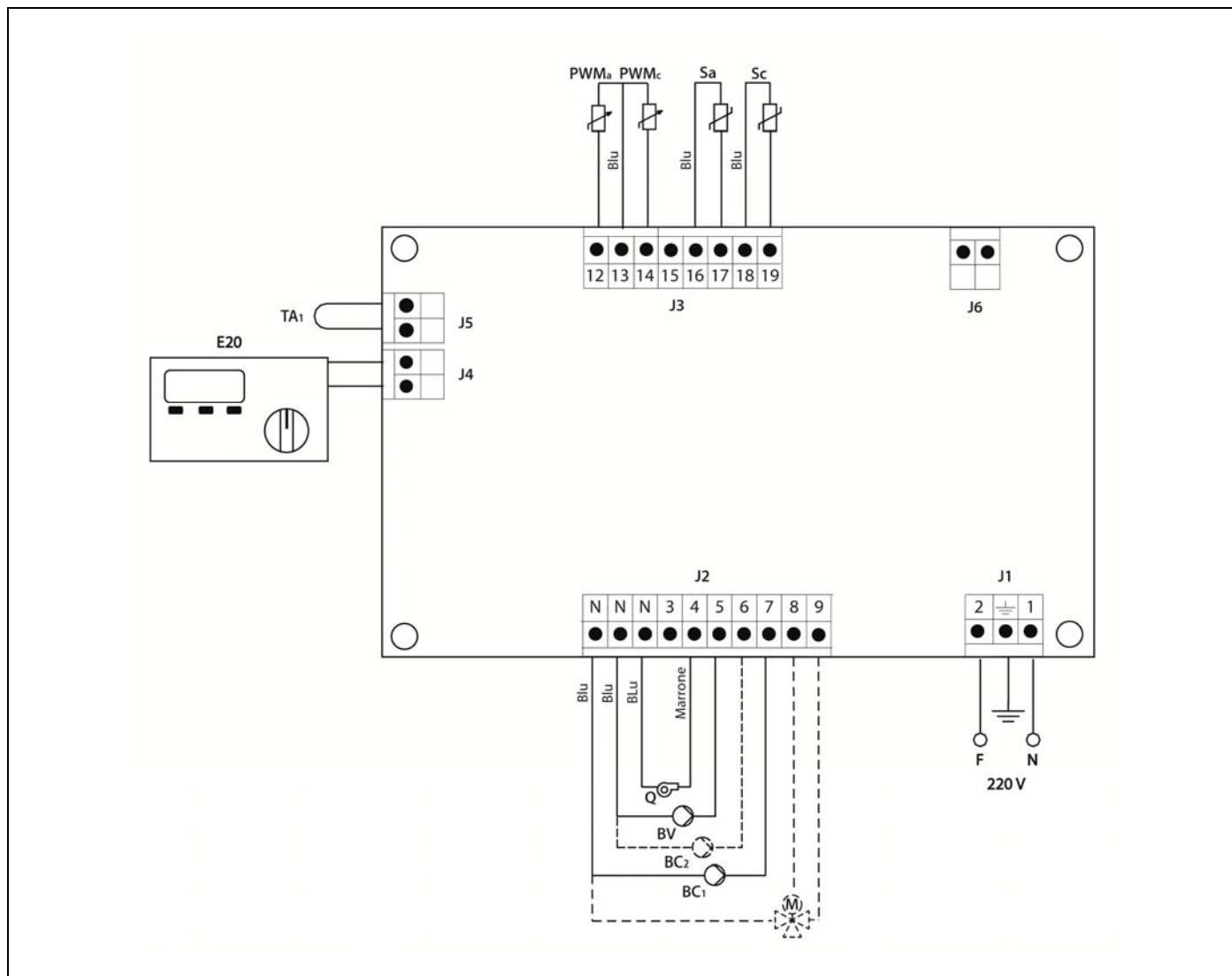
TS: Safety Thermostat (in boiler).

J7: Communication connector between boards.

S1: Boiler model selector.

22.- ELECTRICAL CONNECTION DIAGRAM

There are a series of removable connectors located on the rear of the control panel, for connecting the various options and components for this model. For correct connection, carefully follow the indications shown below:



Ph: Phase.

N: Neutral.

Q: Burner.

BV: DHW charge pump.

BC₁: Heating circuit N. 1 circulating pump.

BC₂: Heating circuit N. 2 circulating pump.

M: Underfloor 3 way valve motor.

E20: Remote control E20 (optional).

TA₁: Heating circuit N. 1 room thermostat.

PWM_a: DHW PWM cable.

PWM_c: Heating PWM cable.

Sa: DHW temperature sensor.

Sc: Boiler temperature sensor.

J1: Power supply connector.

J2: Components connector.

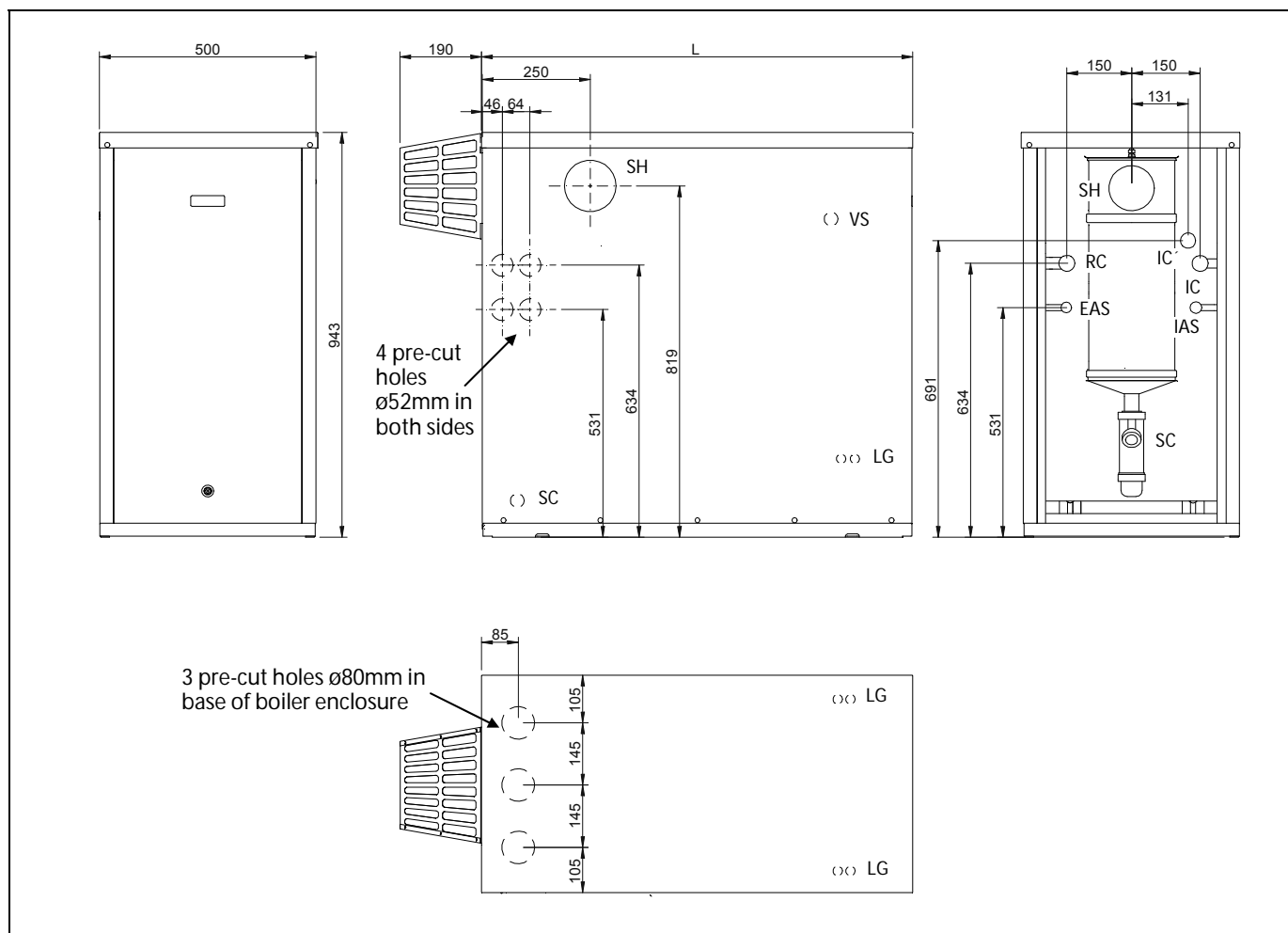
J3: Sensor connector.

J4: Remote control connector.

J5: Room thermostat N. 1 connector.

J6: Room thermostat N. 2 connector

23.- DIAGRAMS AND MEASUREMENTS



IC: Heating outlet

RC: Heating return

IC': Optional heating outlet

EAS: DHW Inlet

IAS: DHW Outlet

VS: Pressure valve pipework

SH: Fume exhaust duct, Ø100

SC: Condensate disposal pipe

LG: Fuel pipes

MODEL	IC, RC	EAS, IAS	L
TRO EVOLUTION 30 COMBI OUTDOOR	3/4" F	1/2" F	1000
TRO EVOLUTION 40 COMBI OUTDOOR	3/4" F	1/2" F	1100

24.- BURNER

24.1 Assembly

Secure the burner support to the boiler. Then fix the burner to the support. This will allow the correct tilt of the flame tube towards the combustion chamber. Fit the intake and return pipes.

24.2 Burner start-up

First place a manometer and a vacuum gauge and prepare the combustion analyser.

The "**Domestic**" burner is equipped with a self-extracting pump to enable fuel intake from a tank installed at a lower level than the burner, providing that the pressure difference measured with the vacuum gauge at the pump does not exceed 0.4 bar (30 cmHg).

Make sure there is fuel in the tank, that the oil valves are open and that voltage is reaching the burner. Turn on the master switch. Unscrew the air bleed screw (manometer point). Then, when the valve opens, remove the photocell sensor and move it towards a light source until the oil comes out. Disconnect the burner and screw the bleed screw back in.

24.3 Adjusting the combustion conditions

As each particular installation has a different combustion circuit, it is essential to adjust the combustion conditions of each boiler. In order for the **guarantee to be valid**, the burner must be adjusted by an **official TRIANCO Technical Assistance Service**.

Observe the flame. If there is insufficient combustion air, it will be dark in colour and will produce smoke, rapidly obstructing the flue outlet.

On the contrary, if there is an excess of combustion air, the flame will be whitish or bluish-white in colour. This will reduce the performance of the boiler and it will fail to comply with anti-pollution standards, and the excess air may also hinder the ignition process.

The flame should be orange in colour.

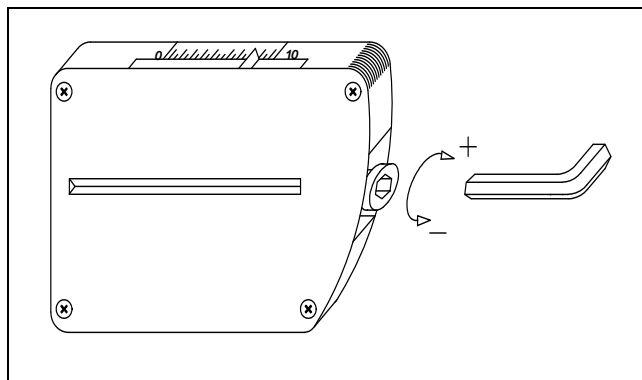
If the shape of the boiler makes it difficult or impossible to observe the flame, the combustion air flow can be regulated by observing the smoke coming out of the flue. If the smoke is dark in colour, more air will need to be provided to the burner, or if it is a very whitish colour, the air in the burner will need to be decreased until no smoke at all is observed.

If you have a device for determining the composition of the combustion gases, this will be the best guide for flame adjustment. If not, simply follow the above indications.

To adjust the air and burner line conditions, carefully follow the instructions given below.

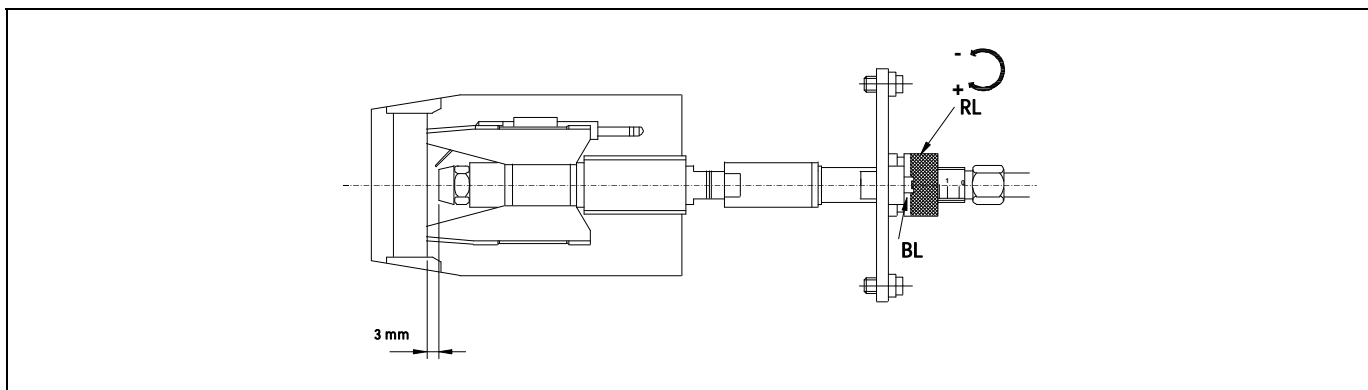
24.4 Primary air adjustment

To adjust the primary combustion air, turn the screw using a 6 mm. Allen key, as shown in the diagram. Turn it clockwise to increase the airflow, and anticlockwise to decrease it.



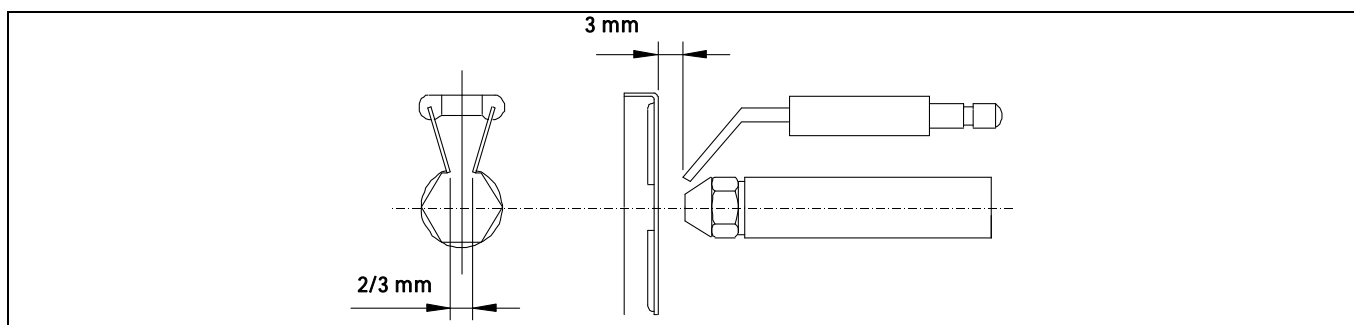
24.5 Combustion line adjustment

To adjust the combustion line, loosen the combustion line blocking screw "BL". Turn the line regulator "RL" clockwise to increase the airflow and anticlockwise to decrease it. After adjustment, tighten the combustion line blocking screw "BL".



24.6 Correct position of electrodes

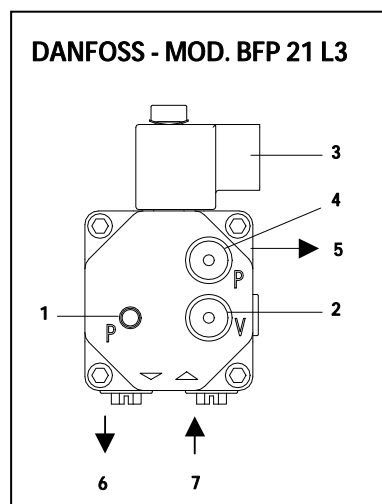
To ensure correct ignition of the **"Domestic"** burner, the measurements shown in the diagram must be observed. Also ensure the electrode fixing screws have been screwed in place before replacing the flame tube.



24.7 Oil pressure adjustment

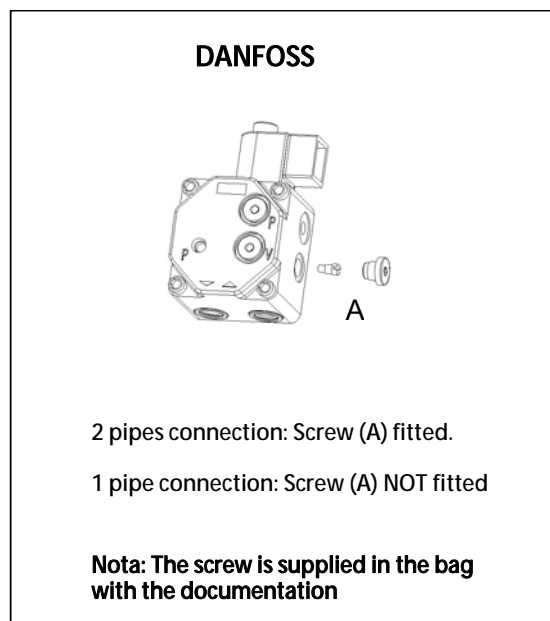
To adjust the oil pump pressure, turn the screw (1) clockwise to increase the pressure, and anticlockwise to decrease it.

- 1 - Pressure adjustment.
- 2 - Vacuum gauge point.
- 3 - Valve.
- 4 - Manometer point.
- 5 - Nozzle outlet.
- 6 - Return.
- 7 - Intake.



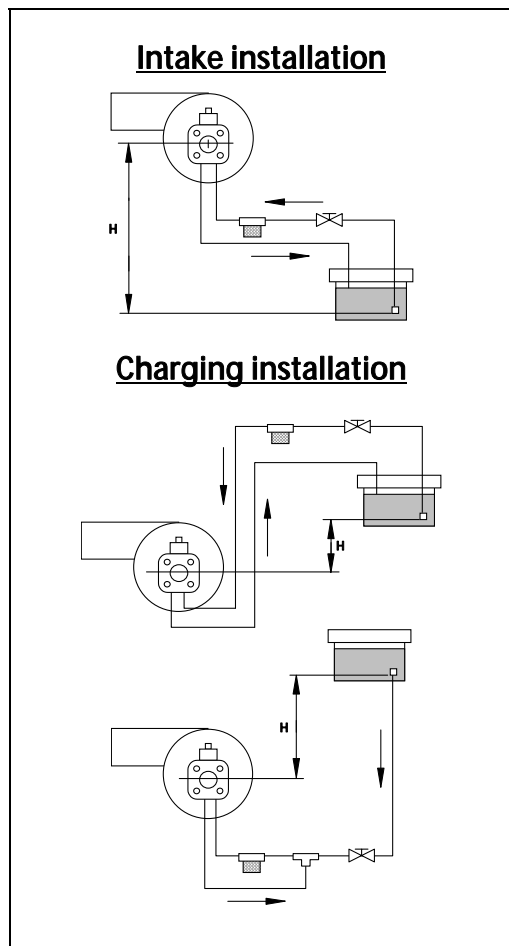
24.8 Pipe operation

According to the oil feeding system selected for the burner, double pipe or single pipe, it is necessary to update the oil pump. The screw (A), identified in the below drawing, is fitted or not according to the selected double pipe or single pipe feeding system.



24.9 Oil supply piping diagrams

The diagrams and tables below correspond to installations without reductions and with a perfect hydraulic seal. It is recommended to use copper pipes. A pressure drop of 0.4 bar (30 cmHg) must not be exceeded (reading via a vacuum gauge).



Intake installation		
H (m)	Pipe length	
	Øint 8 mm.	Øint 10 mm.
0.0	25	60
0.5	21	50
1.0	18	44
1.5	15	38
2.0	12	26
2.5	10	26
3.0	8	20
3.5	6	16

Charging installation		
H (m)	Pipe length	
	Øint 8 mm.	Øint 10 mm.
0.5	10	20
1.0	20	40
1.5	40	80
2.0	60	100

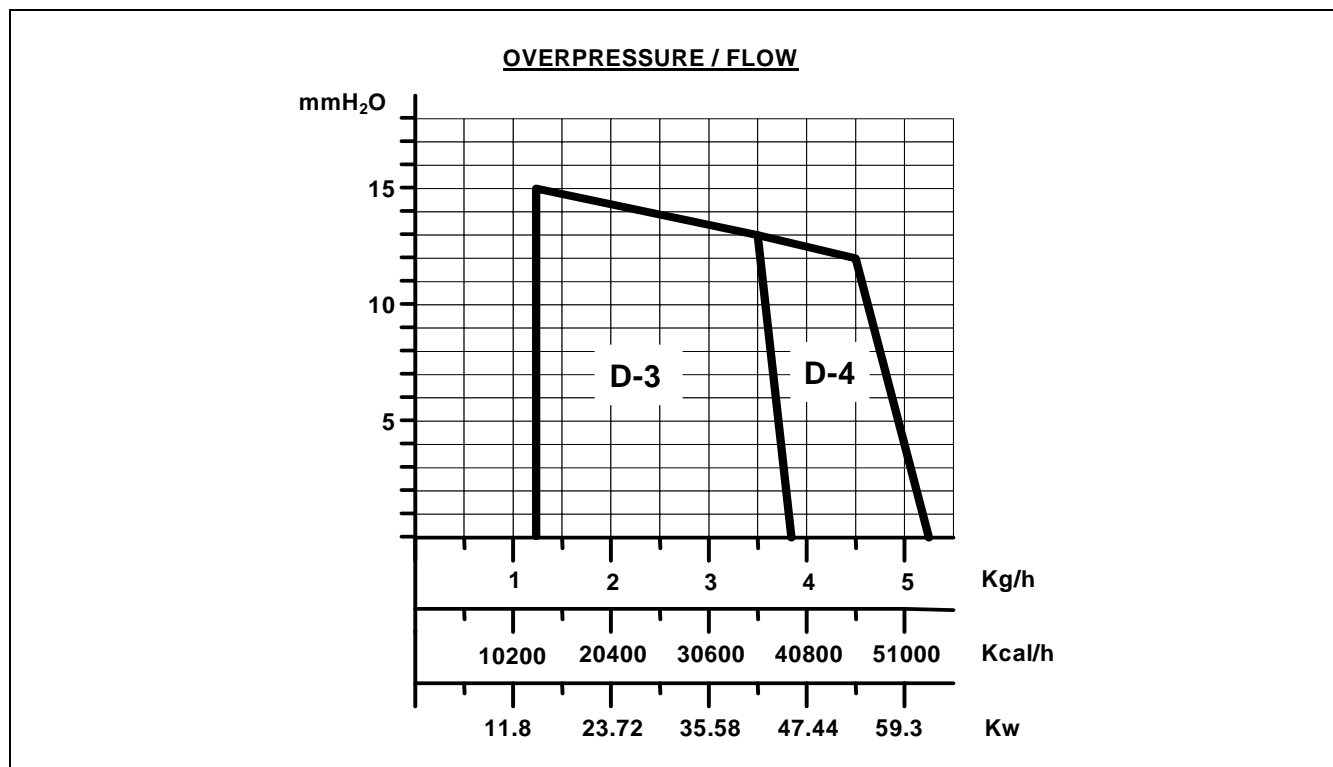
24.10 Technical specifications

MODEL		D-3	D-4
Minimum consumption	Kg/h	1,5	2,3
Maximum consumption	Kg/h	3	4,65
Minimum power	kW	17,7	27,2
Maximum power	kW	35,5	55,2
Fuel		Gas oil 35 Sec max. Viscosity 6 mm²/s at 20°C Kerosene 28 Sec	
Motor power at 2800 r.p.m.	W	90-110	
Adjustment type		On/Off	
Electric current		220 V - 50 Hz	
Weight	Kg	12.5	
Preheater		YES	



TRIANCO

24.11 Operating curves



24.12 Recommended nozzle and pump pressure

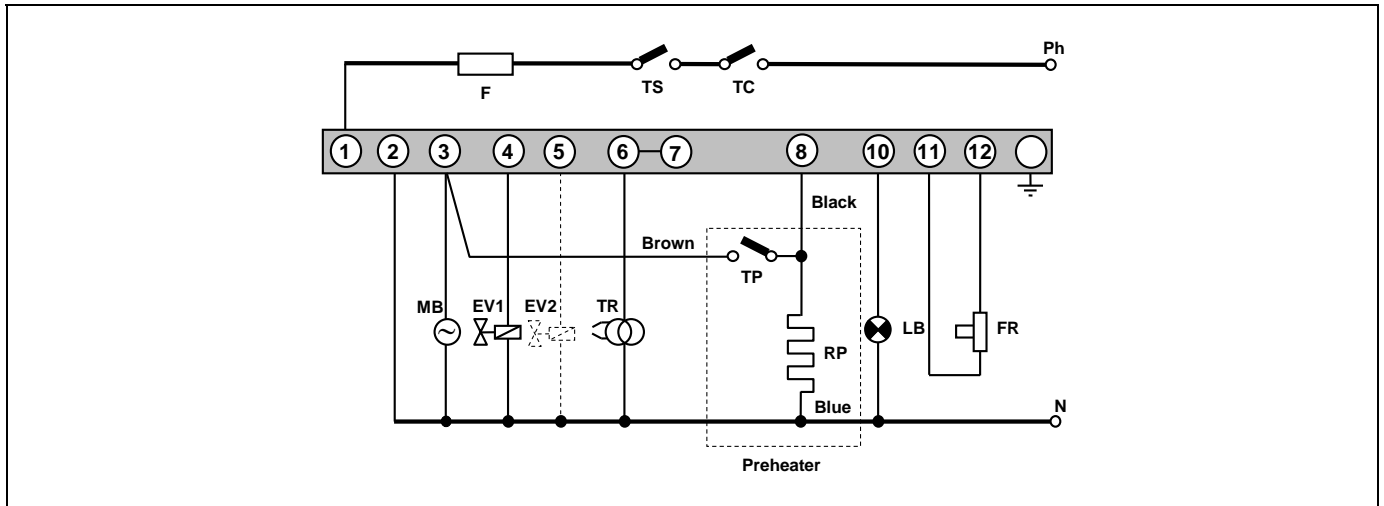
TRO Evolution Combi Outdoor boilers are supplied with the burner fitted, with their corresponding nozzle and with the standard pre-adjustment. The following table shows the nozzles and adjustments for each particular model:

MODEL	Nozzle	Burner pressure (bar)	Air adjustment	Line adjustment
TRO EVOLUTION 30 COMBI OUTDOOR	0,65 60° H	10	3,5	1
TRO EVOLUTION 40 COMBI OUTDOOR	1,00 45° H	9	3,5	1

24.13 Oil flow versus nozzle and pump pressure

Nozzle GPH	Oil Kg./h		Kerosene Kg/h	
	9 bar	10 bar	9 bar	10 bar
0,45	1,58	1,67	1,4	1,5
0,65	2,29	2,42	2,02	2,17
1,00	3,53	3,72	3,12	3,35

24.14 Electrical connection diagram



TC: Control thermostat (in boiler).

TS: Safety thermostat (in boiler).

F: Fuse.

LB: Pilot light.

FR: Photocell.

TR: Transformer.

MB: Motor pump.

EV: Valve.

RP: Preheater element.

Ph: Phase.

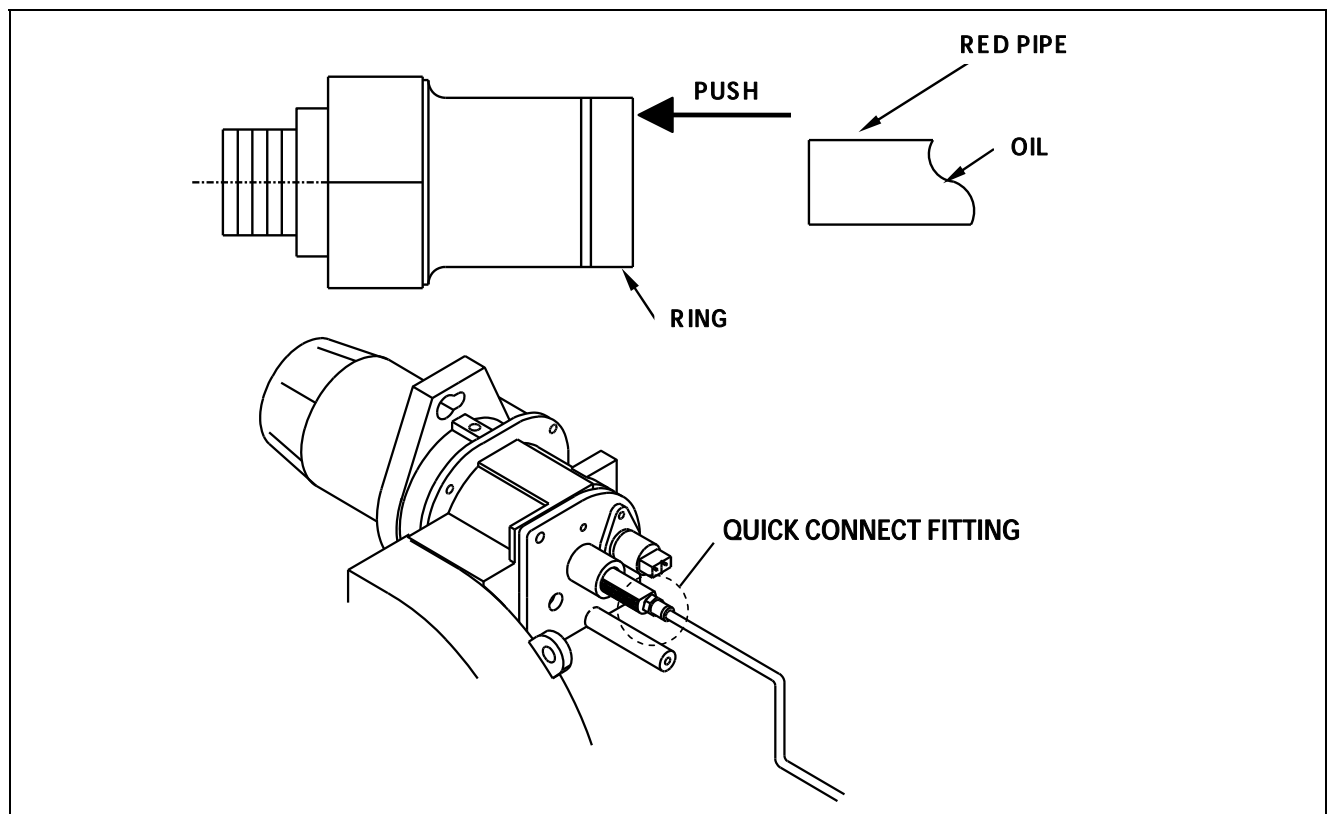
N: Neutral.

TP: Preheater thermostat.

24.15 Quick connector

To connect and disconnect the red oil intake tube to the nozzle, proceed as follows:

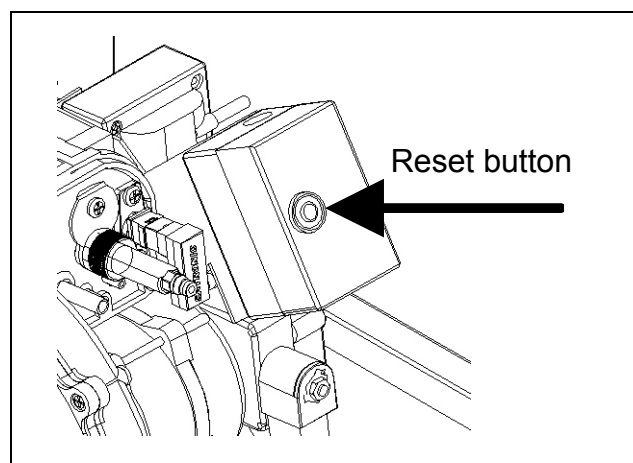
- Press the connector ring in the direction of the arrow, pulling on the red tube at the same time.



24.16 Burner control operating sequence

The burner's LMO14 control box has a reset button "EK", which is the key element for resetting the burner control and activating/deactivating the diagnostic functions.

The multi-colour LED on the reset button is the indicator for visual diagnosis. The "EK" button and the LED are located under the transparent cover of the reset button. During normal functioning, the various operating statuses are indicated in the form of colour codes (see the colour code table below). During ignition, the indication is as shown in the following table:



If the button is on, press to reset.
If the button stays on, call the Technical Assistance Service.

Colour code table for multi-colour indicator lights (LEDs)		
Status	Colour code	Colour
Wait time "tw", other standby statuses	○	Off
Fuel pre-heater on	●	Yellow
Ignition phase, controlled ignition	● ○ ● ○ ● ○ ● ○ ● ○ ●	Flashing yellow
Functioning, flame OK	□	Green
Functioning, flame not OK	□ ○ □ ○ □ ○ □ ○ □ ○	Flashing green
External light during burner ignition	□ ▲ □ ▲ □ ▲ □ ▲ □ ▲	Red/green
Undervoltage	● ▲ ● ▲ ● ▲ ● ▲ ●	Yellow/red
Failure, alarm	▲	Red
Error code output (see "Error code table")	▲ ○ ▲ ○ ▲ ○ ▲ ○ ▲ ○	Flashing red
Interface diagnosis	▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲	Flashing red light

..... Steady light
○ Off

▲ Red
● Yellow
□ Green

□

25.- FAILURES

This section provides a list of the most common burner and boiler failures.

25.1 Burner error code

We have already mentioned that the burner is equipped with a cut-out system, indicated by the reset button light. It may cut out accidentally, and in this case the steady red light on this button will come on. You may unblock it by pressing the button for approx. 1 second. When the burner is blocked and the steady red light is on, visual failure diagnosis may be activated, in accordance with the error code table. To enter visual failure diagnosis mode, hold down the reset button for at least three seconds.

Error code table		
Red flashing LED code	"AL" on term. 10	Possible cause
Flashes 2 times	On	No flame established when ignition safety time ends. - Fuel valves defective or dirty - Flame detector defective or dirty - Burner maladjustment, no fuel - Ignition unit defective
Flashes 4 times	On	External light during burner ignition
Flashes 7 times	On	Excessive flame loss during functioning (limited number of repetitions) - Fuel valves defective or dirty - Flame detector defective or dirty - Burner maladjustment
Flashes 8 times	On	Supervision of fuel pre-heater time
Flashes 10 times	On	Cabling fault or internal failure, output contacts, other failures

During the failure diagnosis time, the control outputs are disabled and the burner remains off. To exit failure diagnosis and activate the burner again, reset the burner control. Hold down the reset button for approx. 1 second (<3 s).

25.2 Boiler failures:

FAILURE	CAUSE	SOLUTION
RADIATOR DOES NOT HEAT UP	- The pump is not turning - Air in hydraulic circuit	Unblock the pump Drain the installation and the boiler (the automatic air drain valve cap must always be loose)
EXCESSIVE NOISE	- Burner badly adjusted - Flue not correctly sealed - Flame unstable - Flue not insulated	Adjust it correctly Eliminate any leaks Examine the burner Suitably insulate it






25.3 Circulating pump alarms

The high efficiency pumps include a Led (light) which displays their status.

PUMP LIGHT	DESCRIPTION	STATUS	CAUSE	SOLUTION
It is lit green	The pump is functioning	The pump operates according to its setting	Standard functioning	
It flashes green	Standby mode (PWM version)	The pump is in standby mode		
It flashes red/green	The is ready for service but is not functioning	The pump will start up again automatically once the error has been solved	1. Low voltage $U < 160 \text{ V}$ or Excess voltage $U > 253 \text{ V}$	1. Check the power supply $195 \text{ V} < U < 253 \text{ V}$
			2. Excess temperature of the module: the temperature of the motor is too high	2. Check the room temperature and that of the fluid
Flashes red	The pump is out of order	The pump is stopped (blocked)	The pump does not start up automatically.	Change the pump. Please contact your nearest official technical assistance service to have it replaced
Light off	There is no power supply	The electrical system is not receiving power supply	1. The pump is not connected to the power supply	1. Check the connection of the cable
			2. The LED is faulty	2. Check if the pump works
			3. The electrical system is faulty	3. Change the Pump. Change the pump. Please contact your nearest official technical assistance service to have it replaced

26.- ALARM CODES

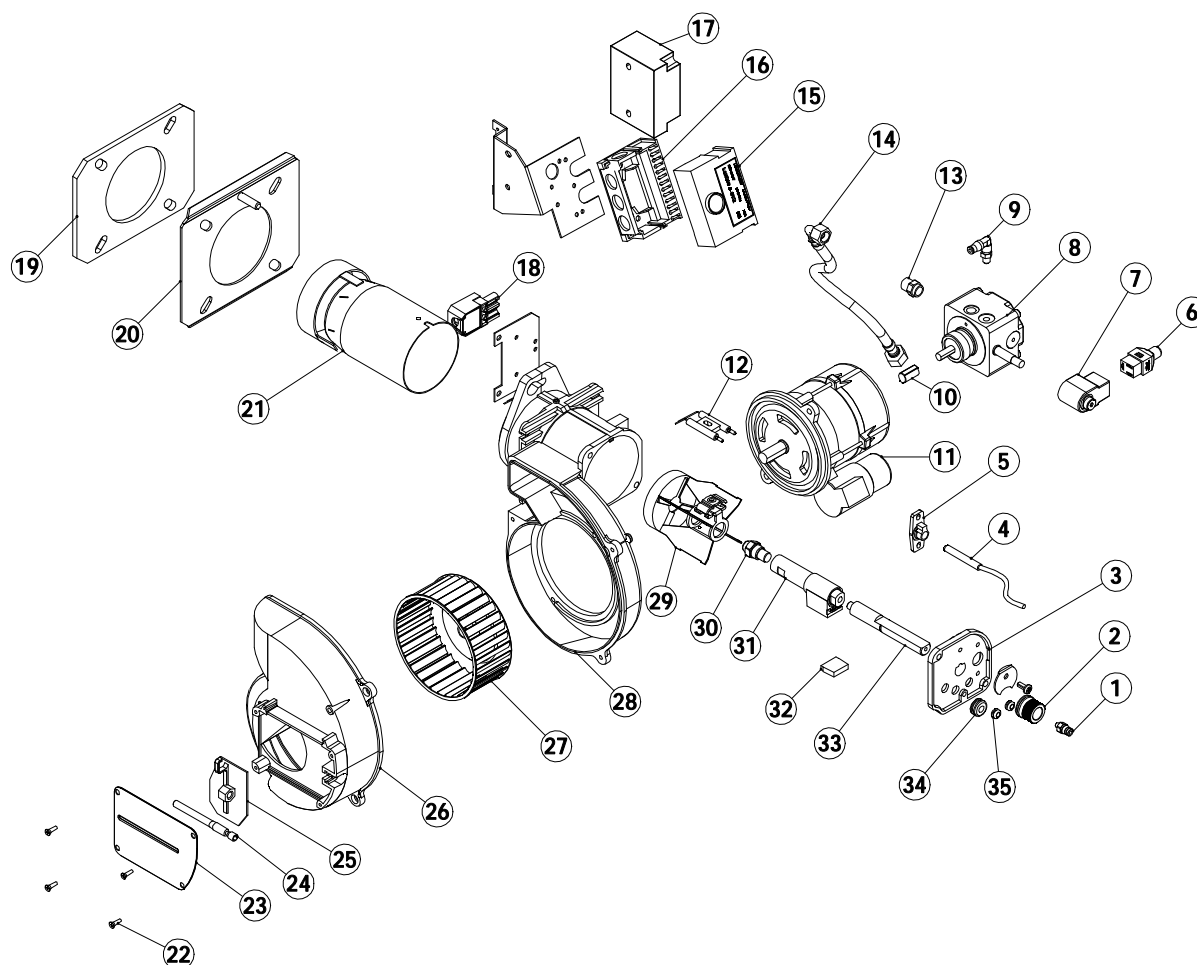
The boiler **TRO Evolution Combi Outdoor** is equipped by an electronic circuit able to sense, by means of a continuing autotest, the operation lockouts and alarms of the boiler. When the electronic control senses an operation error, indicates it showing an alarm code in the screen of the display. In the following list the possible alarm codes are described:

CODE	ALARM	DESCRIPTION
	Pressure.	The pressure of the boiler is lower than 0,5 bar. The boiler stops working. To restart working it is necessary to fill the boiler between 1 and 1.5 bar. This alarm happens when the installation is emptying or when it is a leakage. If this alarm is repetitive, put in contact with the nearest technical service support.
	Temperature.	The boiler rise to the security temperature of 110 °C. The boiler stops working. To restart working, push the security thermostat's button, once the temperature has decreased. If this alarm is repetitive, put in contact with the nearest technical service support.
	Burner.	Burner is lockout. To restart working, push the button located at the burner (4) . This alarm happens when there is any operation error in the burner or in the oil installation. If this alarm is repetitive, put in contact with the nearest technical service support.
	Boiler sensor.	The boiler temperature sensor (8) is broken or disconnected. To change it, put in contact with the nearest technical service support.
	DHW sensor	DHW temperature sensor (3) is broken or disconnected. To change it, put in contact with the nearest technical service support.

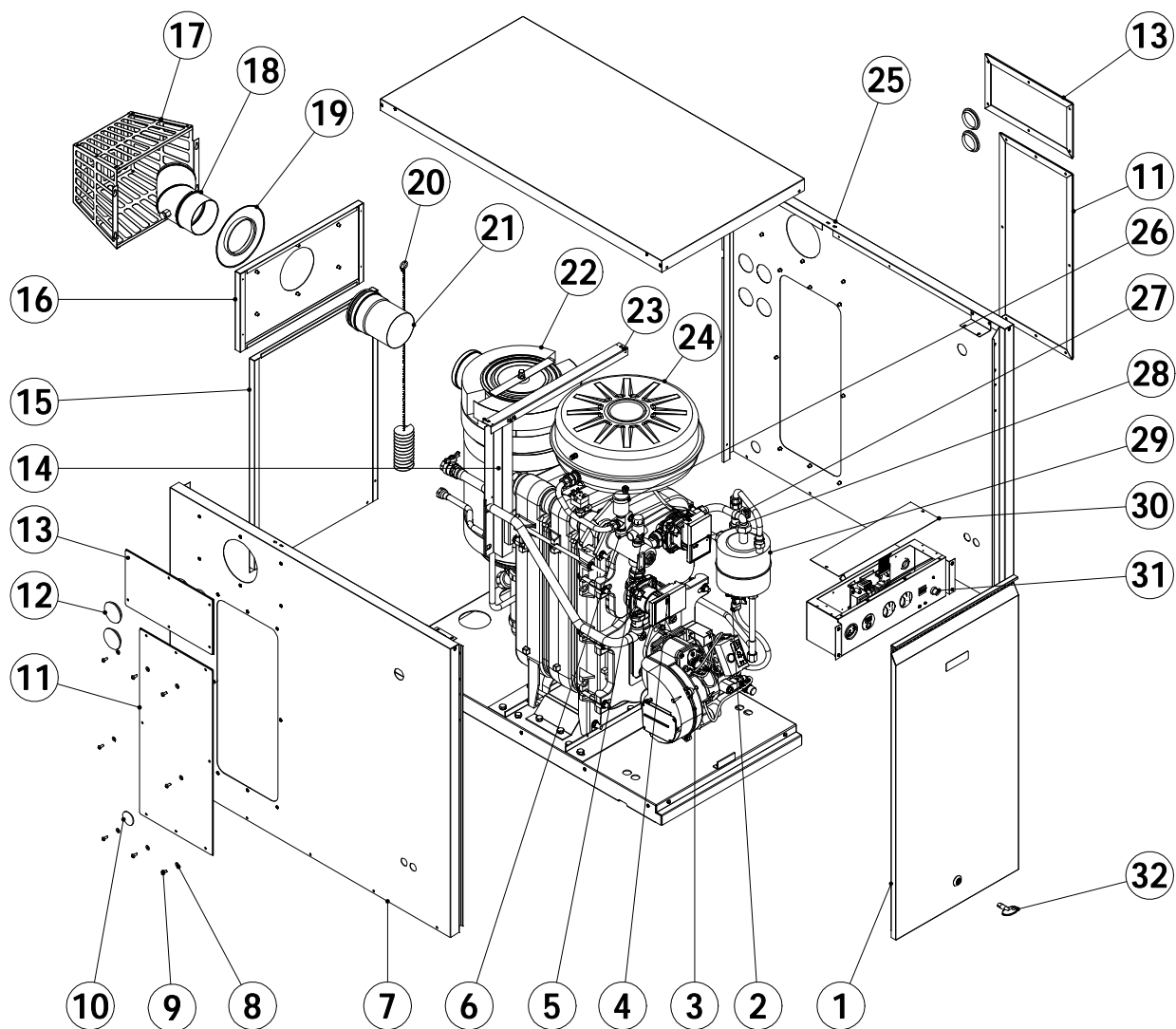
NOTE: It will be very useful for the technical assistance service if you can inform them of the alarm code that has appeared on call-out.

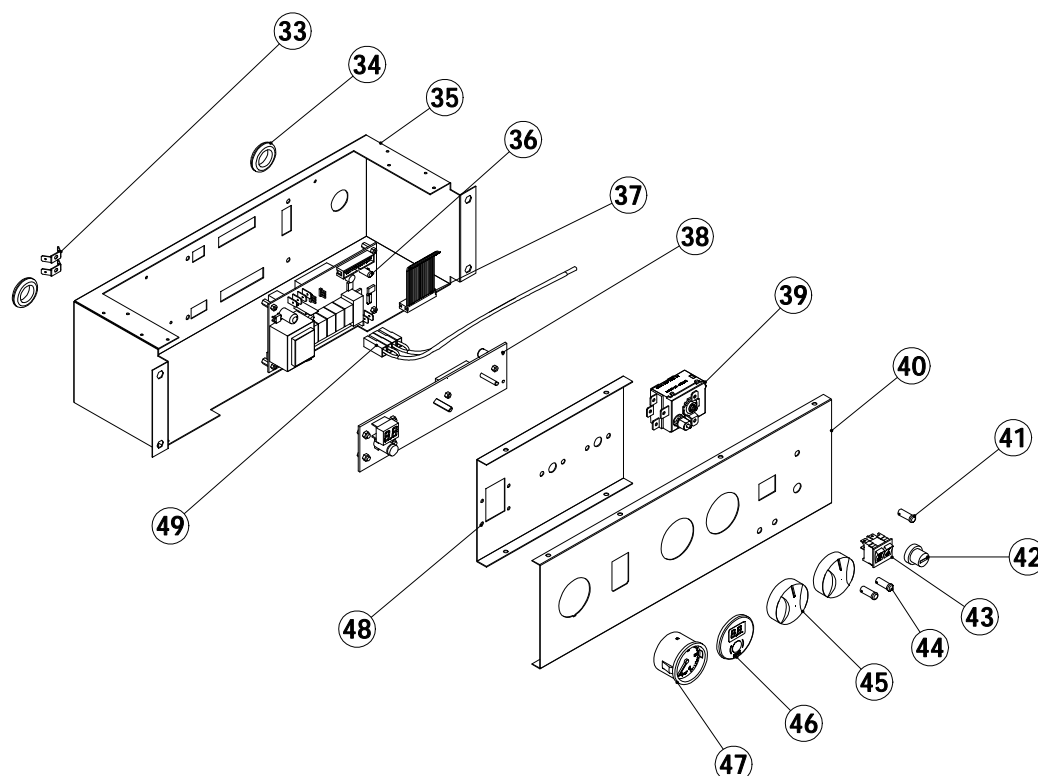
27.- SPARE PARTS LIST

Burner



<u>Pos.</u>	<u>Code</u>	<u>Description</u>	<u>Pos.</u>	<u>Code</u>	<u>Description</u>
1	CTOR000006	Straight connector	22	CTOR000025	Screw DIN-7982 3,9x13
2	CTOE000054	Line adjustment	23	SEPO001237	Air adjustment plate (20/30)
3	SEPO001256	Line cover		SEPO001250	Air adjustment plate (40)
4	CQUE000156	Photocell Siemens (30/40)	24	CTOE000064	Air adjustment screw
	CQUE000050	Photocell Brahma rojo (20)	25	CQUE000151	Air adjustment plate
5	CQUE000149	Photocell suport	26	SEPO001255	Air adjustment support
6	CQUE000124	Valve coil cable Danfoss	27	CQUE000044	Fan
7	CQUE000089	Valve coil Danfoss	28	SEPO001254	Motor support
8	CQUE000088	Oil pump Danfoss	29	CQUE000155	Turbulator disc (20/30)
9	CTOR000007	Elbow connector		CQUE000013	Turbulator disc (40)
10	CQUE000004	Motor pump coupling	30	CQUE000077	Nozzle OD-H 0,65 60°
11	CQUE000102	Motor		CQUE000193	Nozzle OD-H 1,00 45°
12	CQUE000019	Set of electrodes		CQUE000192	Nozzle OD-H 0,45 80°
13	CTOE000065	Counter thread	31	CQUE000061	Preheater
14	CQUE000191	Oil hose	32	CQUE000027	Preheater cable
15	CQUE000169	Transformer	33	CTOE000063	Burner line D4
16	CQUE000129	Control box plugs	34	CFER000187	Cable gland
17	CQUE000159	Transformer	35	CFER000074	Cable gland
18	CELC000409	3 poles female plug			
19	CQUE000173	Flange seal			
20	SCON000766	Flange			
21	SCON000391	Flame tube (30)			
	SCON000291	Flame tube (40)			
	SCON000296	Flame tube (20)			





<u>Pos.</u>	<u>Code</u>	<u>Description</u>	<u>Pos.</u>	<u>Code</u>	<u>Description</u>
1	SEPO002265	Door	26	GFOV000002	Air vent
2	CFOV000163	Disconnecter Robofil	27	CFOV000061	Flowswitch
3	RQUEEVO045	Burner 30 ODM	28	CFOV000148	Pump
	RQUEEVO046	Burner 40 ODM	29	CFOV000033	Heatexchanger K21
4	CFOV000148	Pump		CFOV000067	Heatexchanger K28
5	CVAL000004	Pressure release valve	30	SEPO002272	Drawer cover
6	CFUR000020	Manifold ODM	31	RELEEVO013	Electrical main board
7	RCON000947	Left side 30	32	CFER000202	Key for bolt
	RCON000949	Left side 40	33	CELC000429	Earth plug
8	CFER000245	Shutter plug D32	34	CFER000062	Gland D22
9	CFER000244	Washer nylon M5	35	RCON000952	Buck
10	CTOR000210	Screw INOX DIN 7985 M5x12	36	CELC000358	Main board
11	RCON000951	Bottom cover	37	CELC000089	Communication cable
12	CFER000192	Shutter plug D52	38	RELC000293	Display board
13	RCON000936	Fume cover	39	CELC000022	Safety thermostat
14	SCHA011739	Rigidity	40	SEPO002300	Panel
15	SEPO002291	Bottom rear side	41	CELC000039	Red switch
16	RCON000938	Rear side	42	CELC000022	Cap safety thermostat
17	RCON000931	Guard	43	CELC000138	Master switch
18	CGAS000365	45° fume terminal	44	CELC000040	Orange switch
19	CGAS000366	Black fume seal	45	CELC000099	Black rotary knob
20	CFER000058	Cleaning brush	46	COTR000076	Enamel stamp
21	CGAS000364	Extensible adapter	47	CELC000137	Manometer
22	RCON000932	Capacitor	48	SCHA011612	Display suport
23	SCHA011378	Rear rigidity	49	CELC000240	Flowswitch connector
24	CFOV000164	Expansion vessel			
25	RCON000948	Right side 30			
	RCON000950	Right side 40			

[illegible]



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