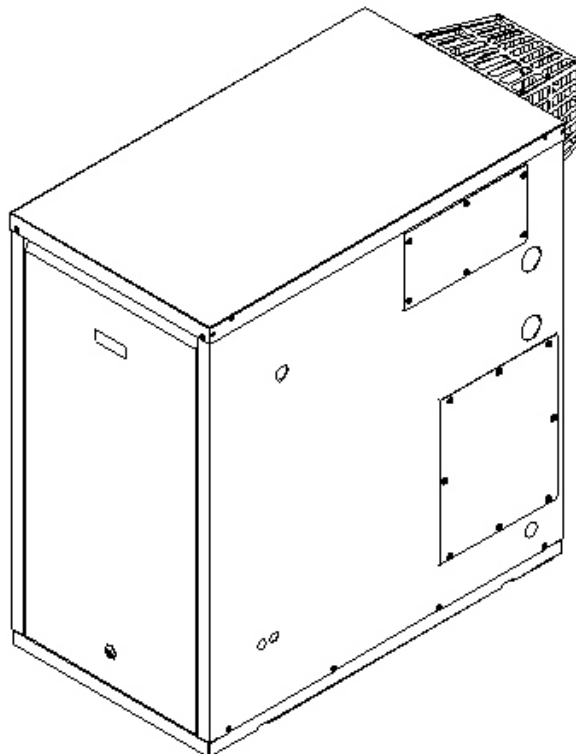




TRIANCO

INSTALLATION AND OPERATING INSTRUCTIONS

TRO EVOLUTION HEAT ONLY 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.

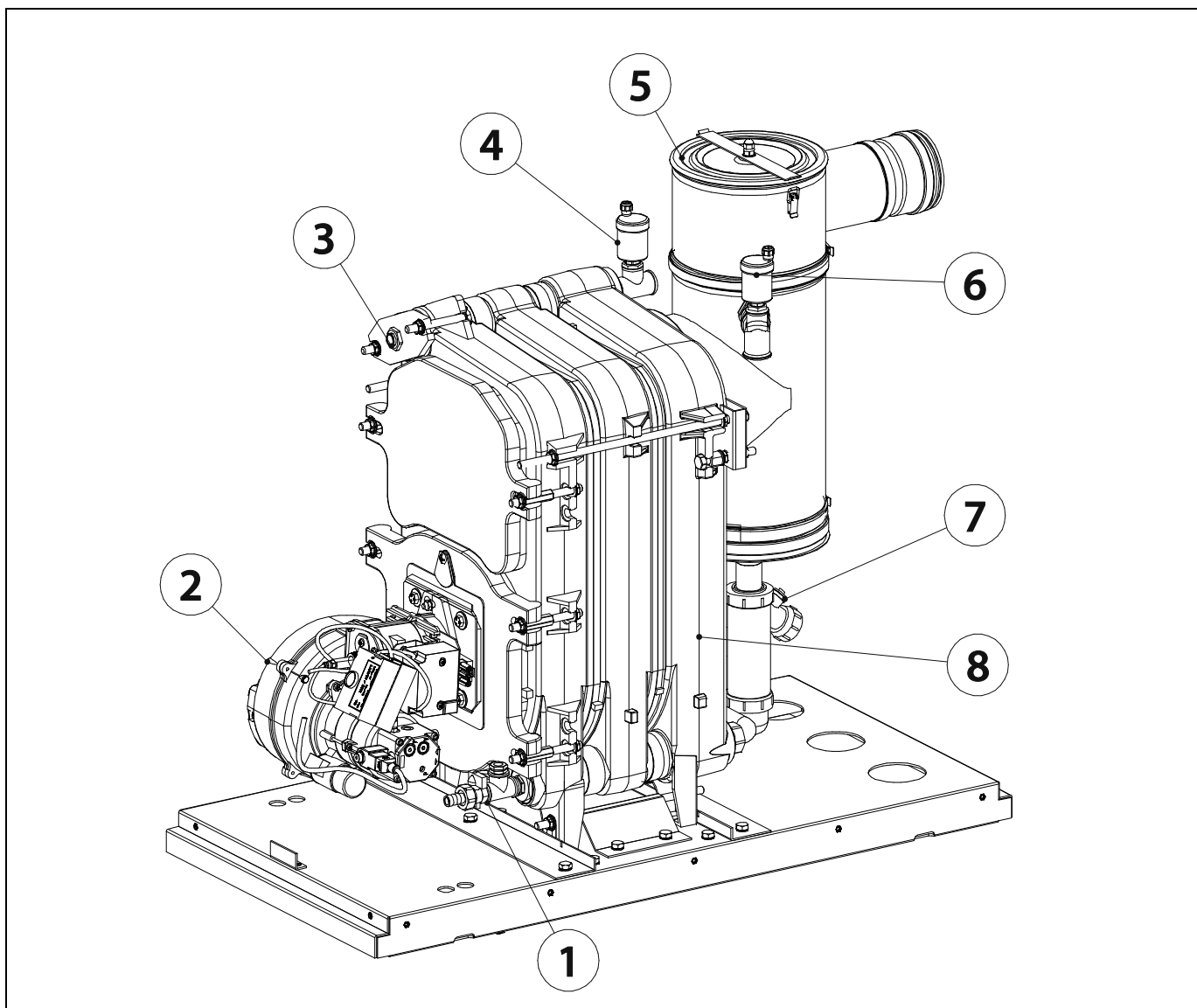
The start-up of these boilers and any maintenance operations must only be carried out by Official Technical Assistance Services of **TRIANCO**.

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

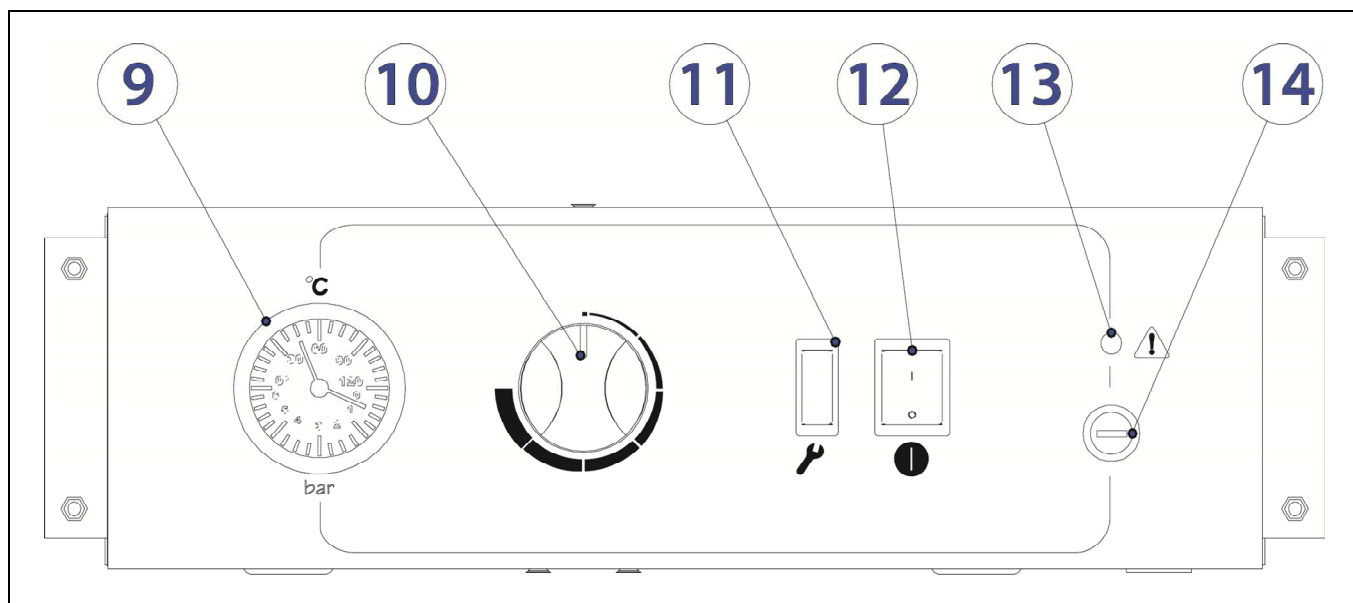
TRIANCO informs all parties concerned that, in compliance with section 1 of the first additional provision of Law 11/1997, the responsibility for delivering packaging waste or used packaging for its proper environmental management will be that of the final owner of the product (Article 18.1 Royal Decree 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. | 5. | INOX Condenser output diam. 100. |
| 2. | Domestic sealed oil burner. | 6. | Automatic air bleed valve. |
| 3. | Bulb-holder sheath. | 7. | Condensate siphon. |
| 4. | Automatic air bleed valve. | 8. | Cast body. |



3.- CONTROL ELEMENTS



Temperature and pressure meter (9):

It indicates the water pressure and temperature in the boiler.

Control thermostat (10):

With this we can select the operating temperature of the central heating, stopping the burner when the boiler temperature is equal to that selected or keeping it going when it is less.

Test switch (11):

It makes it possible to demand heating regardless of the signal from the thermostat.

Master switch (12):

This lets us turn the boiler on and off by pressing the "O/I" switch.

Blocked due to temperature pilot light (13):

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

Boiler safety thermostat (14):

This is a cut-out mechanism to ensure the boiler temperature does not exceed 110°C.

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 Heat Only 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 boiler is equipped with a standard 12 litre closed expansion vessel in the **TRO Evolution 20 Heat Only Outdoor** model and a 14 litre vessel in the **TRO Evolution 30 Heat Only Outdoor and TRO Evolution 40 Heat Only Outdoor models**. 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.

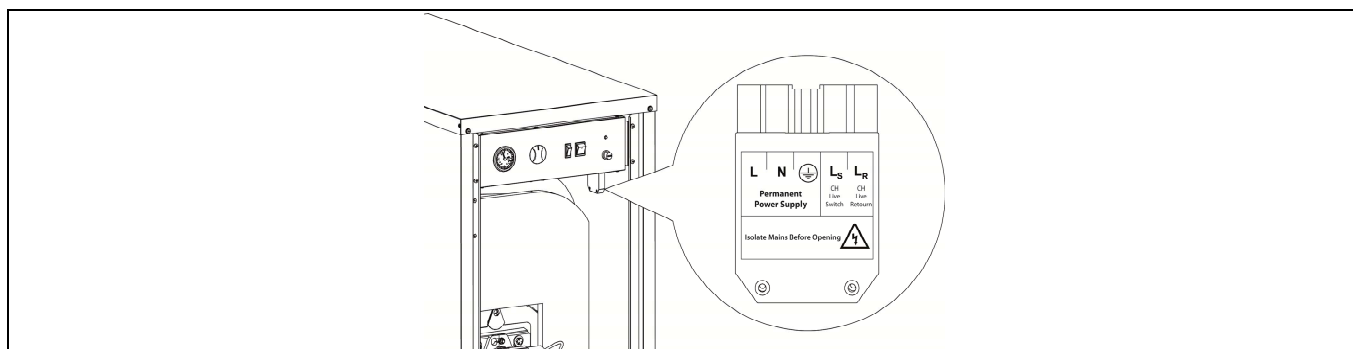
4.3.- Condensation pipe

The condensation pipe should lead to a drain outlet, as the **TRO Evolution Heat Only 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 **L** and **N** of terminal strip **J1** (see "Electrical Diagram"). **This appliance must be earthed**. The 5 poles male power supply connector is in the documentation bag. This connector has also two terminals prepared for connecting the room thermostat (see wiring diagram).



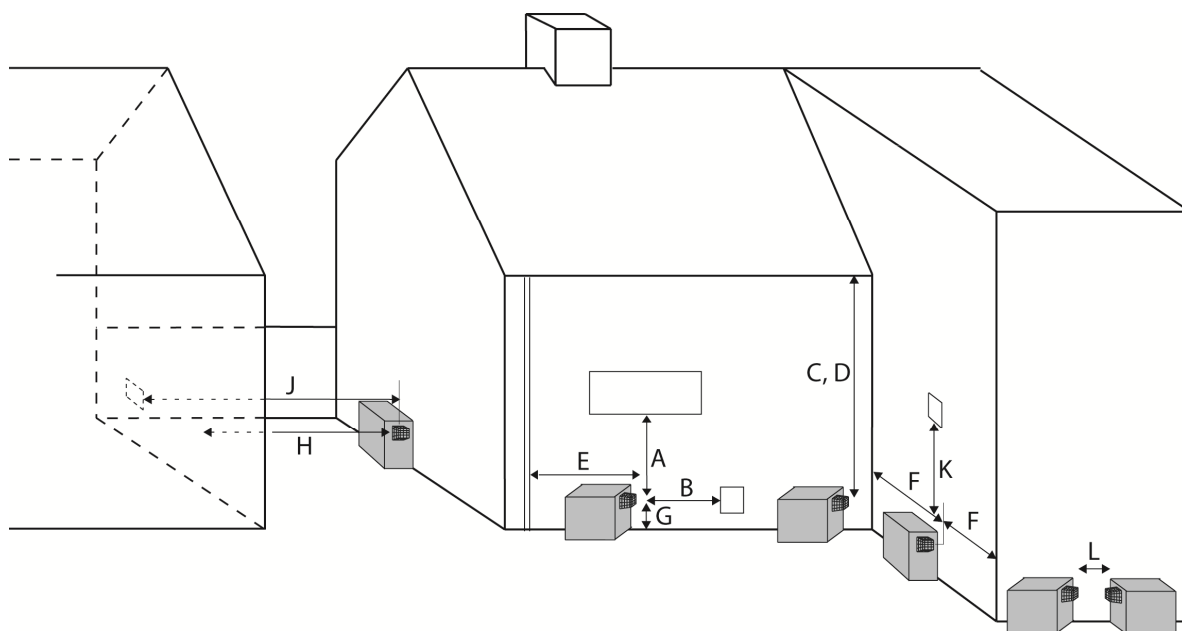
4.5.- Oil installation

The **TRO Evolution Heat Only 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 Heat Only 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.- 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.

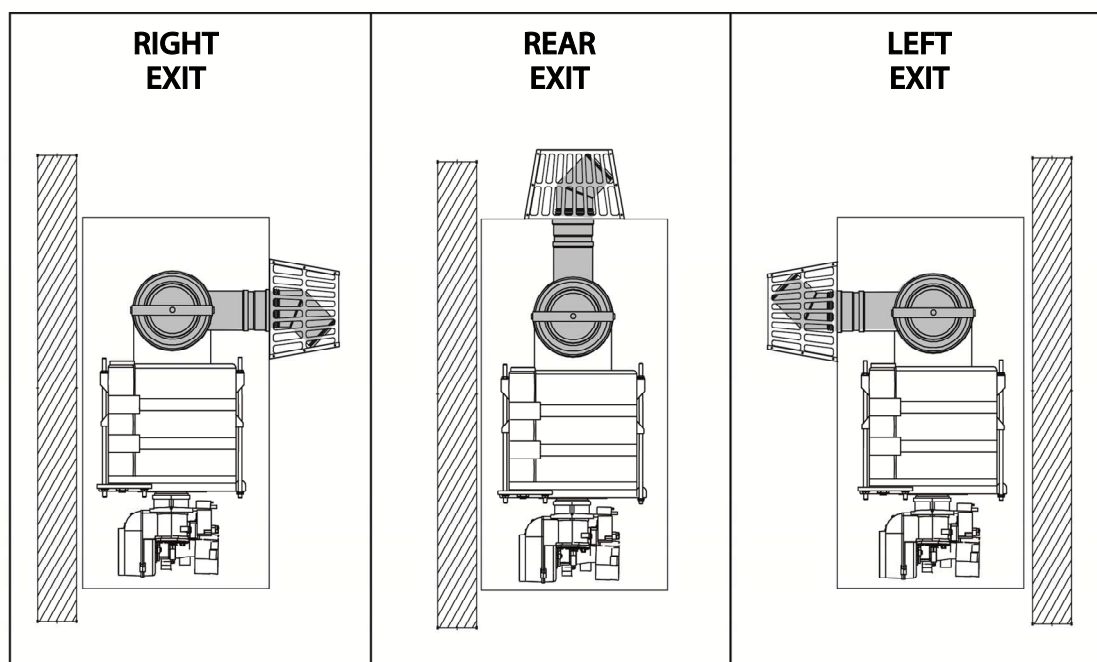
The **maximum length** of pipe that can be installed is 12 metres (TRO Evolution 40 Heat Only Outdoor) and 15 metres (TRO Evolution 20/30 Heat Only Outdoor). Each elbow of 90°, or two of 45°, reduces the available length by 1 metre, and 1 metre of horizontal pipe represents 2 metres of vertical pipe.

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.

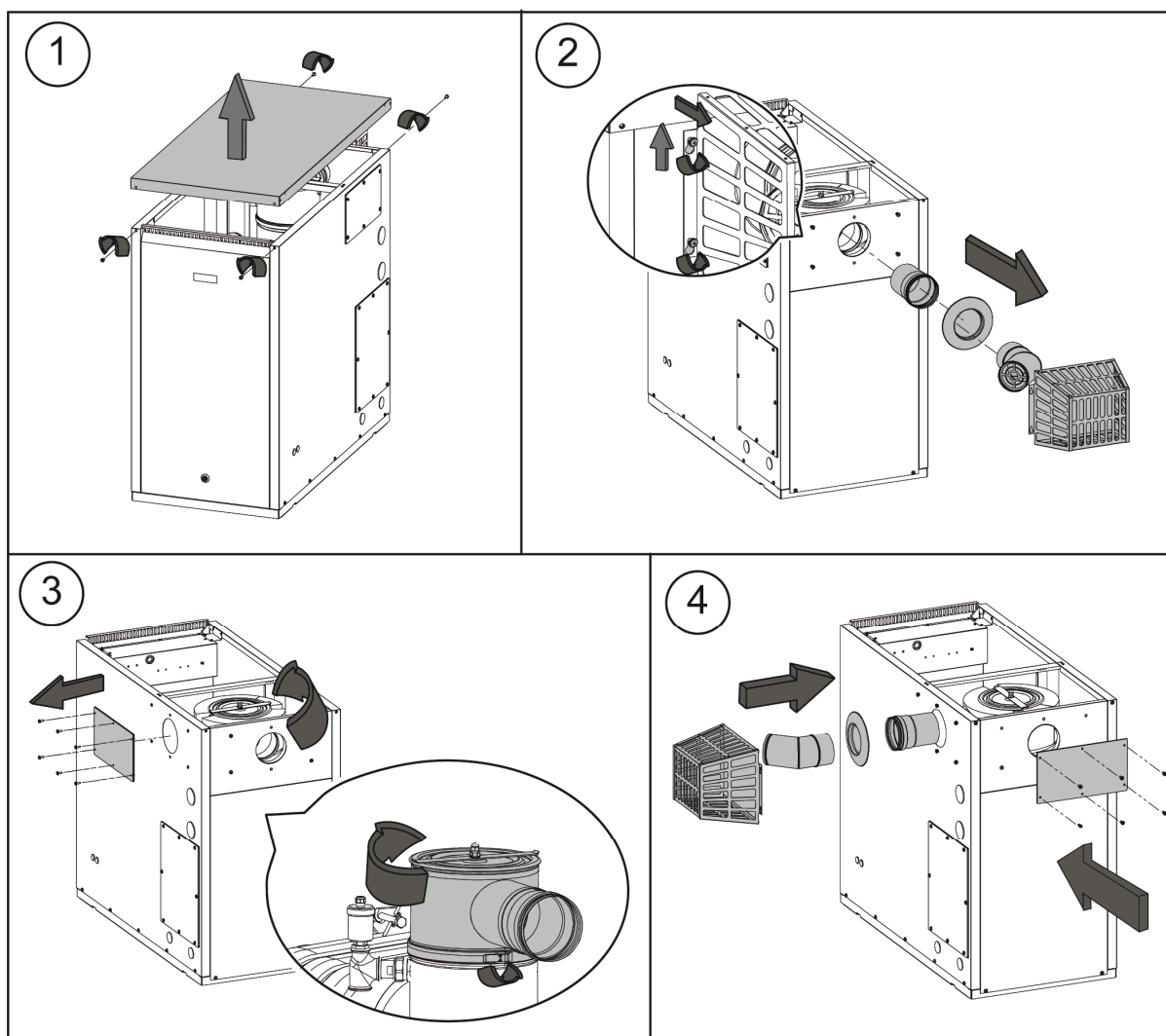
CAUTION: The air intake holes provided in the upper part of the door must not be obstructed at any time.

5.1.- Horizontal combustion product removal

The **TRO Evolution Heat Only 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.



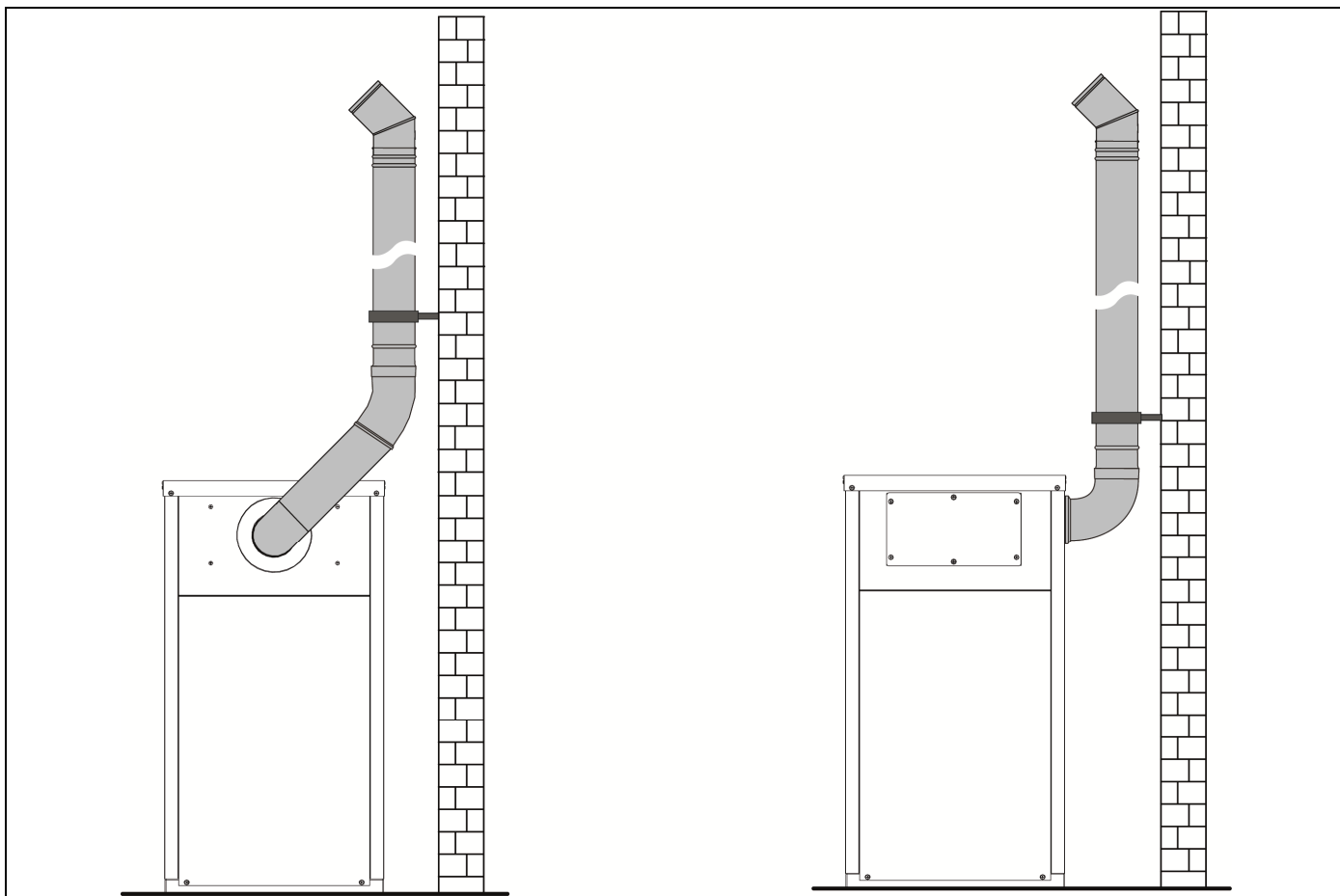
The steps for correctly modifying the position of the flue outlet are listed below:



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.



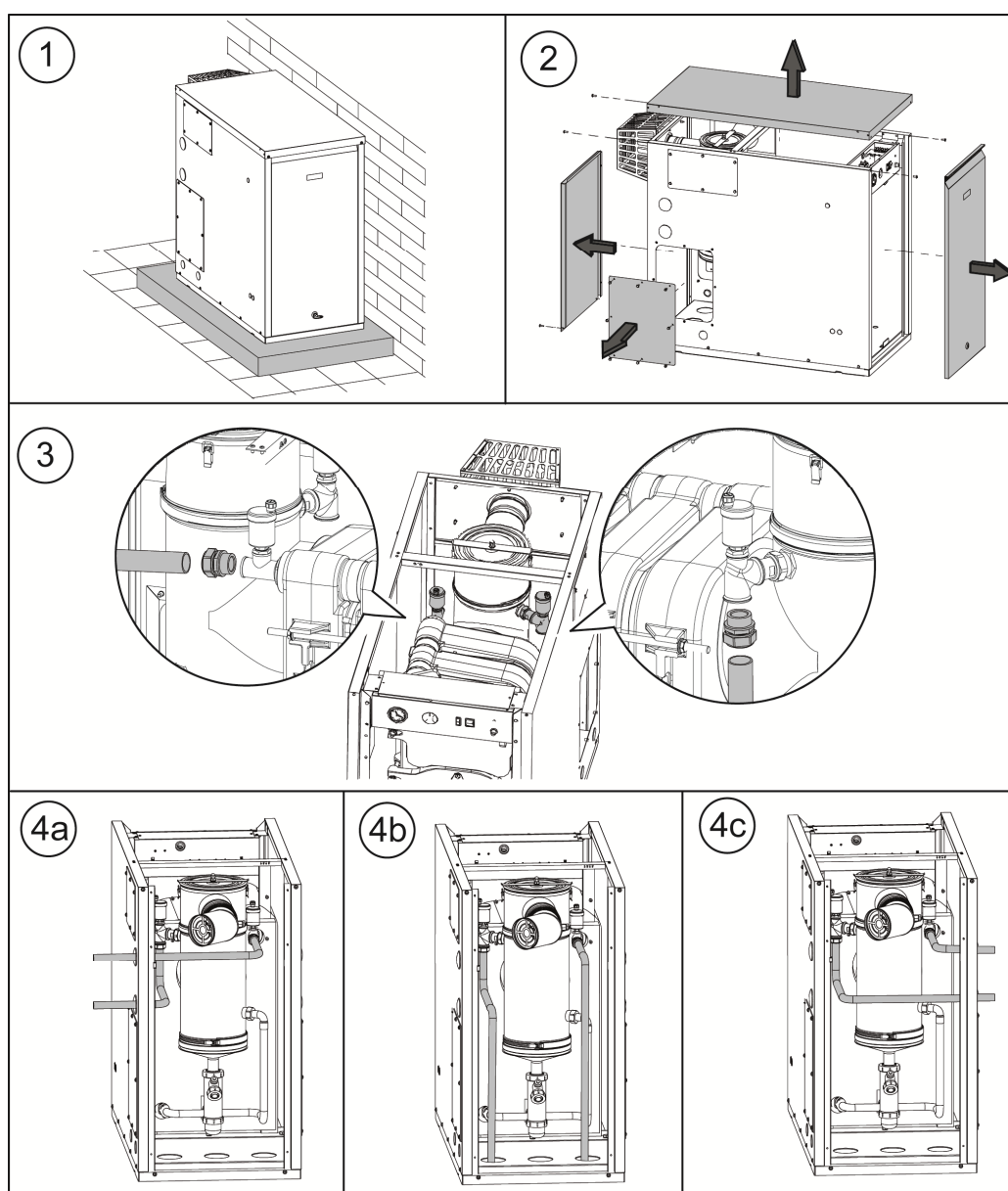
CAUTION: The flue terminal must not be conducted to the wall to avoid condensates.

6.- PIPE CONNECTIONS

The heating outlet and the heating return of the **TRO Evolution Heat Only 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.

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.

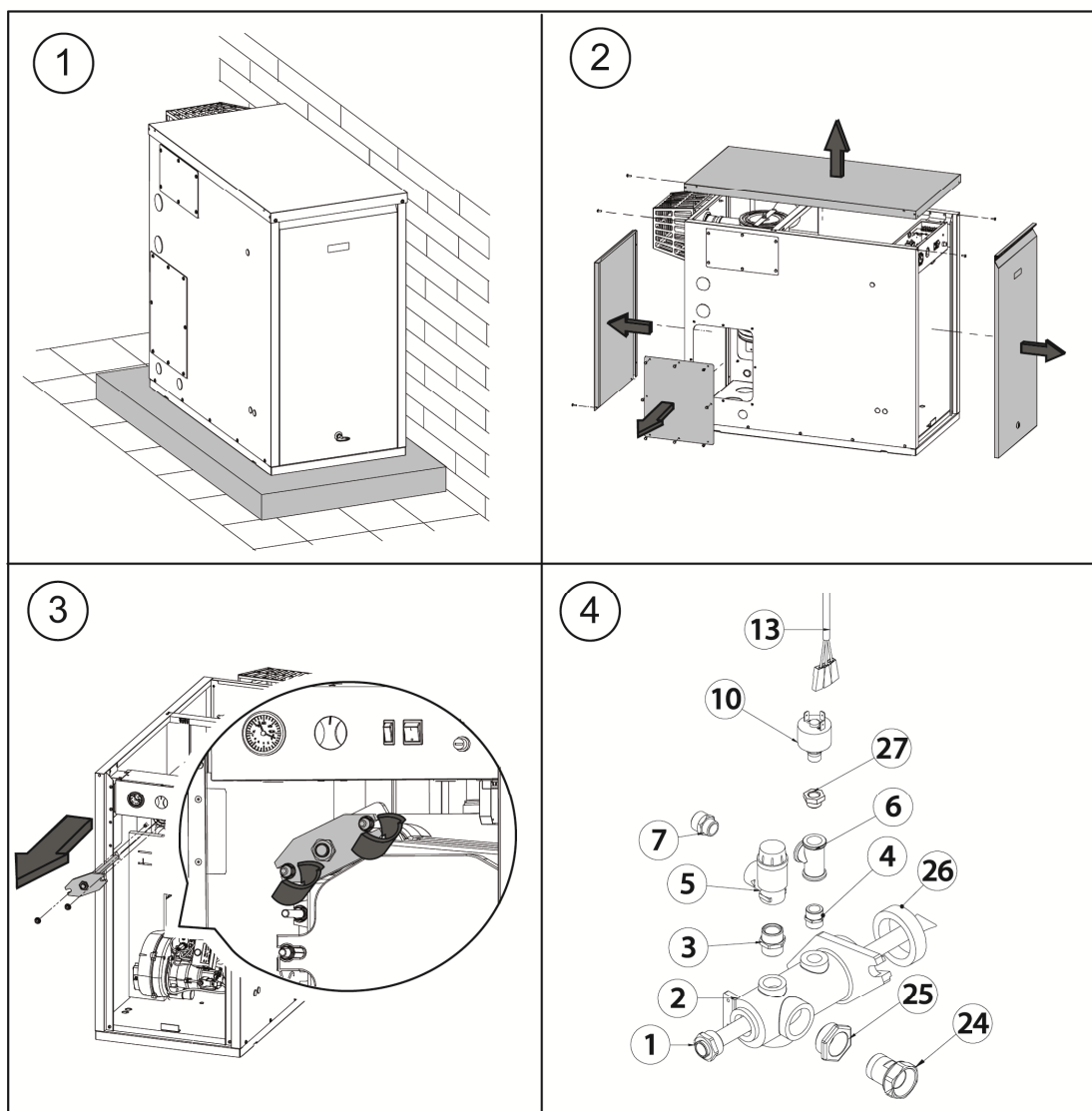
The steps for correctly connecting the heating outlet and return are listed below:

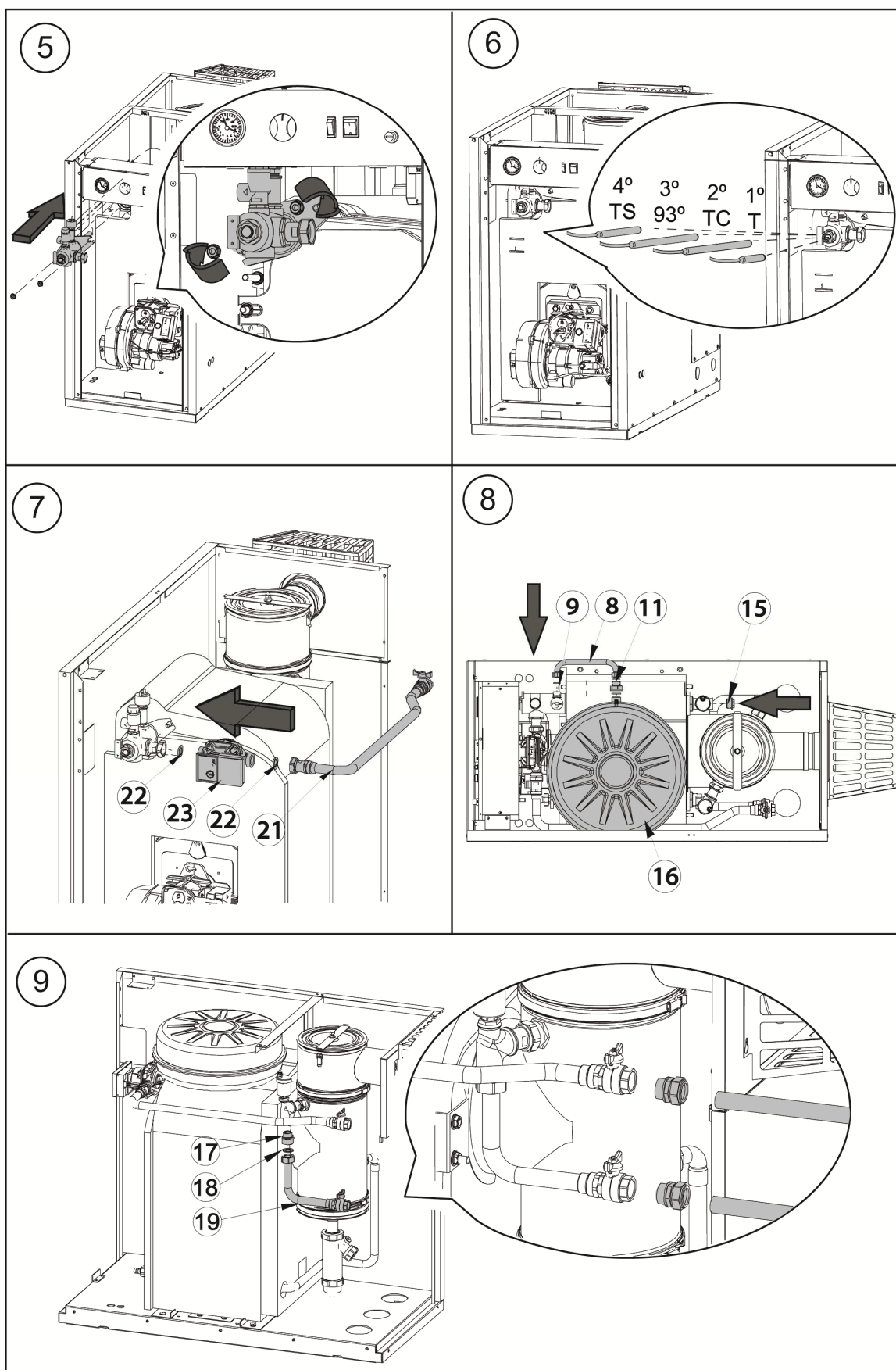


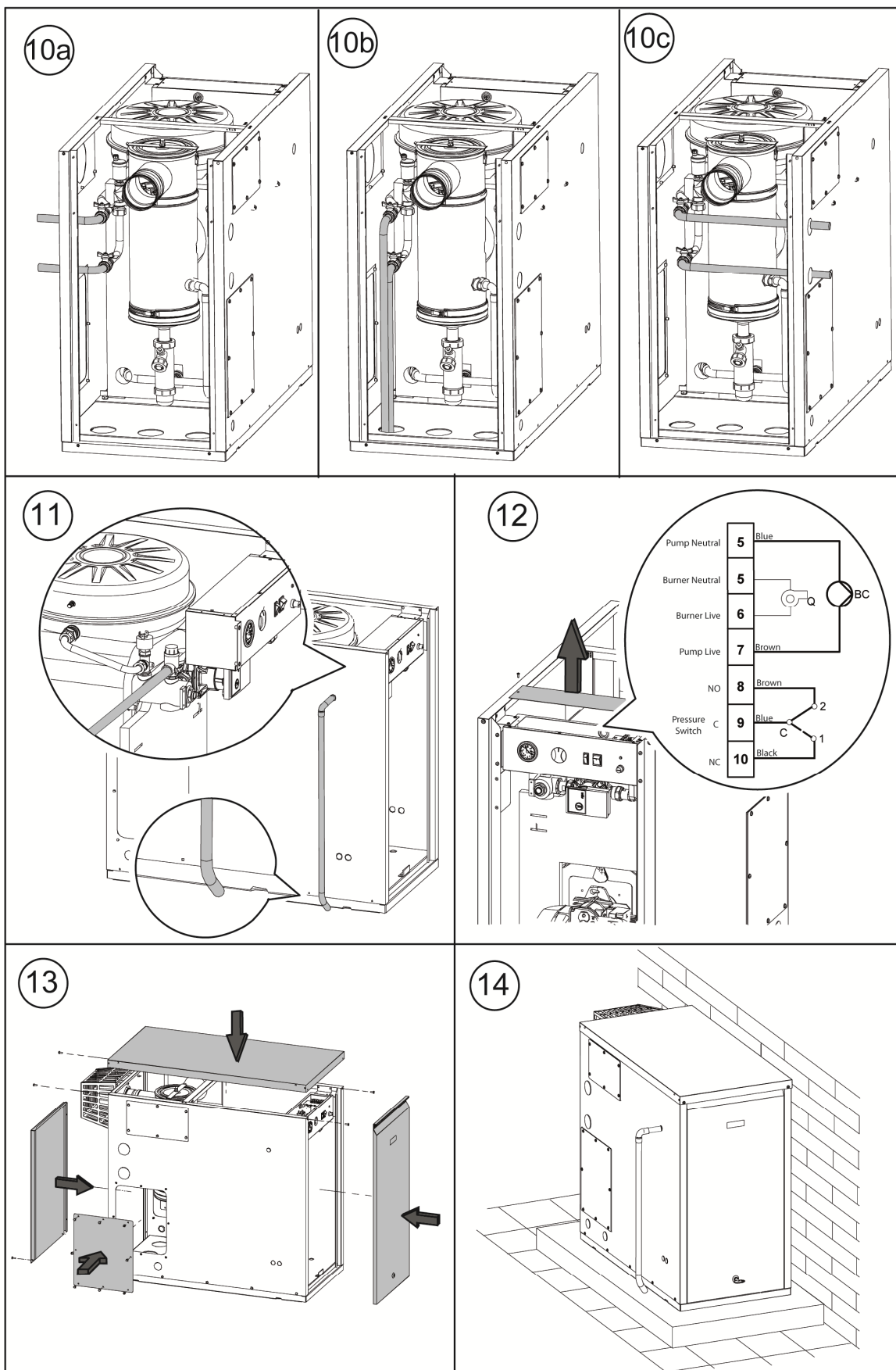
6.1.- Hydraulic Kit OD (Optional)

A **Hydraulic Kit OD** may optionally be supplied together with the **TRO Evolution Heat Only Outdoor** boiler. This kit basically consists of a heating circuit pump, heating outlet and return pipes, pressure switch and the expansion vessel. For correct hydraulic installation, carefully follow the assembly and connection instructions enclosed with the kit.

The procedure for suitably connecting the **Hydraulic KIT OD** to the **TRO Evolution Heat Only Outdoor** boiler is as follows:







7.- OPERATION

7.1.- Boiler functioning

Set the control thermostat and the room thermostat (if applicable) to the desired temperature. Move the main switch to the "I" position. The burner and the pump will begin to function until the installation reaches the pre-selected temperature of the control thermostat (or the room thermostat, if the unit has one). When the temperature in the installation drops below the selected boiler temperature, the burner will start up again, running the heating cycle.

7.2.- Test switch

The boiler is provided with a switch in order to make possible to demand heating regardless of the signal from the thermostat.

7.3.- Frost protection

The **TRO Evolution Heat Only Outdoor** models are supplied with a factory fitted frost protection thermostat, located behind the electric panel inside the boiler. This thermostat is pre-wired to the boiler electrical system and factory set to 3°C. This will function as long as the appliance remains plugged into the mains and the **master switch is switched on**. 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**.

7.4.- Room thermostat connection

The boiler has two terminals, **Ls** and **Lr** in the power supply connector, for connecting room thermostat or room chronothermostat (J1 see "*Electrical Diagram*"). This allows the heating mode for each circuit installed to be switched off according to the room temperature. To suitably connect them simply connect the thermostat to the terminal strip.

Installing a room thermostat will optimise the installation's performance, adapting the heating to the requirements of your home and obtaining enhanced comfort. Also, if the thermostat allows the hours of functioning to be programmed (chronothermostat), it can adapt the heating system to the hours of use of the installation.

8.- SAFETY CUT-OUTS

The boiler has three types of safety cut-outs:

8.1.- Excessive temperature safety cut-outs (Thermostat TS)

This cut-out is indicated by the pilot light for blocking due to temperature. This occurs when the boiler exceeds a temperature of 110°C. To restart, press the button on the safety thermostat after first removing the button cover.

8.2.- Low pressure cut-out

If the **Hydraulic Kit OD** is installed, optional in the **TRO Evolution Heat Only Outdoor** models, this cut-out occurs when the boiler 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. This cut-out is indicated by the blocking pilot light. To unblock it, fill the installation again until a pressure of between 1 - 1.5 bar is indicated on the thermostat pressure gauge.

8.3.- Burner cut-out

This occurs as a result of an anomaly in the burner or in the fuel installation. To unblock it, press the illuminated button that lights up on the burner.

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

9.- SHUTTING DOWN THE BOILER

To stop the boiler, simply turn the master switch to "O".

10.- START-UP

Before beginning the start-up process of the boiler, check that:

- The boiler is connected to the mains.
- The installation has been filled with water (the manometer should indicate a pressure of 1 - 5 bar).
- The fuel reaches the burner.
- The isolation valves are open, if there are any installed.
- The room thermostat is set to the desired temperature.
- The boiler room has effective and free ventilation (ventilation based on 0.5 dm² minimum).

To start-up the boiler, position the main switch and the room thermostat to the desired temperature.

11.- 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.

12.- 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.

13.- BOILER MAINTENANCE

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

13.1.- 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:

Cleaning the boiler body

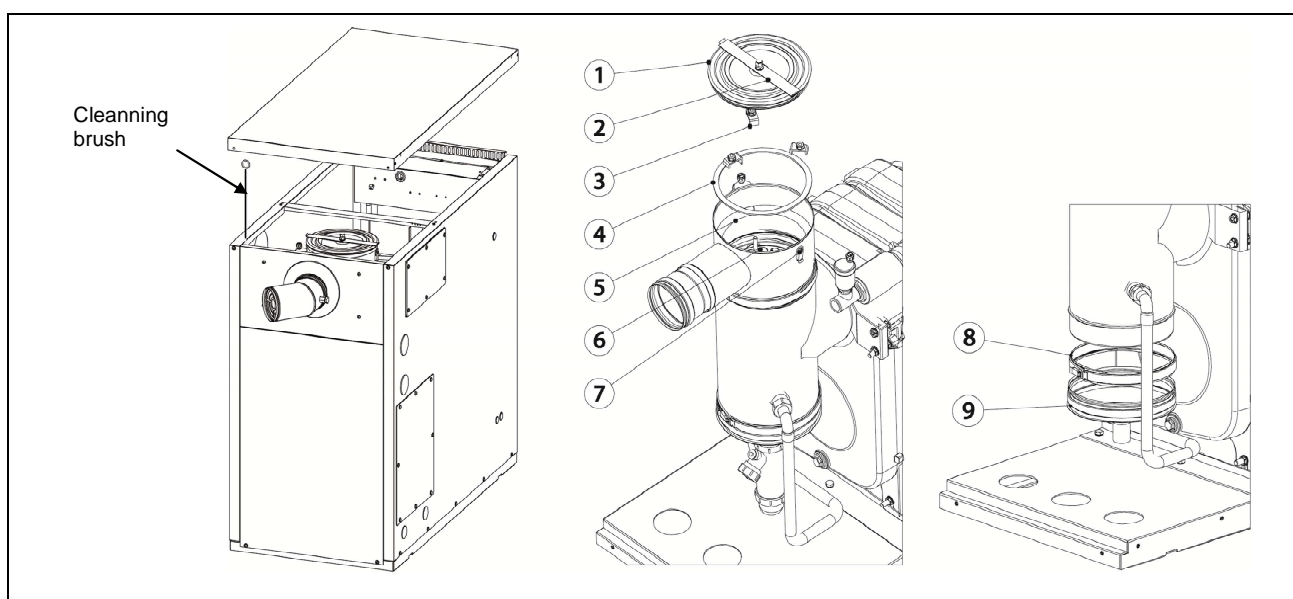
- Open and remove the outer door of the boiler.
- Remove the burner by unscrewing the fixing nut on the top of the burner.
- Remove the combustion chamber door and the exhaust duct cover, unscrewing the six fixing nuts around them.
- Clean the exhaust ducts on the cast body, using the cleaning brush 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.

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.



13.2.- 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.

13.3.- Anti-frost protection

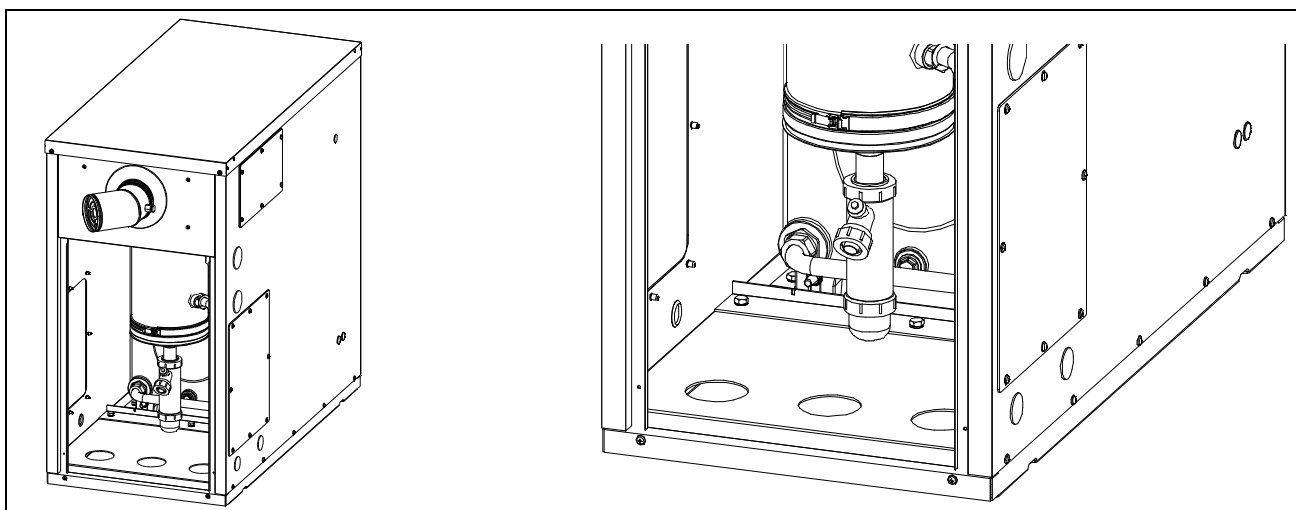
The **TRO Evolution Heat Only Outdoor** models are supplied with a factory fitted frost protection thermostat, located behind the electric panel inside the boiler. This thermostat is pre-wired to the boiler electrical system and factory set to 3°C. This will function as long as the appliance remains plugged into the mains and the **master switch is switched on**. 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.**

13.4.- 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.

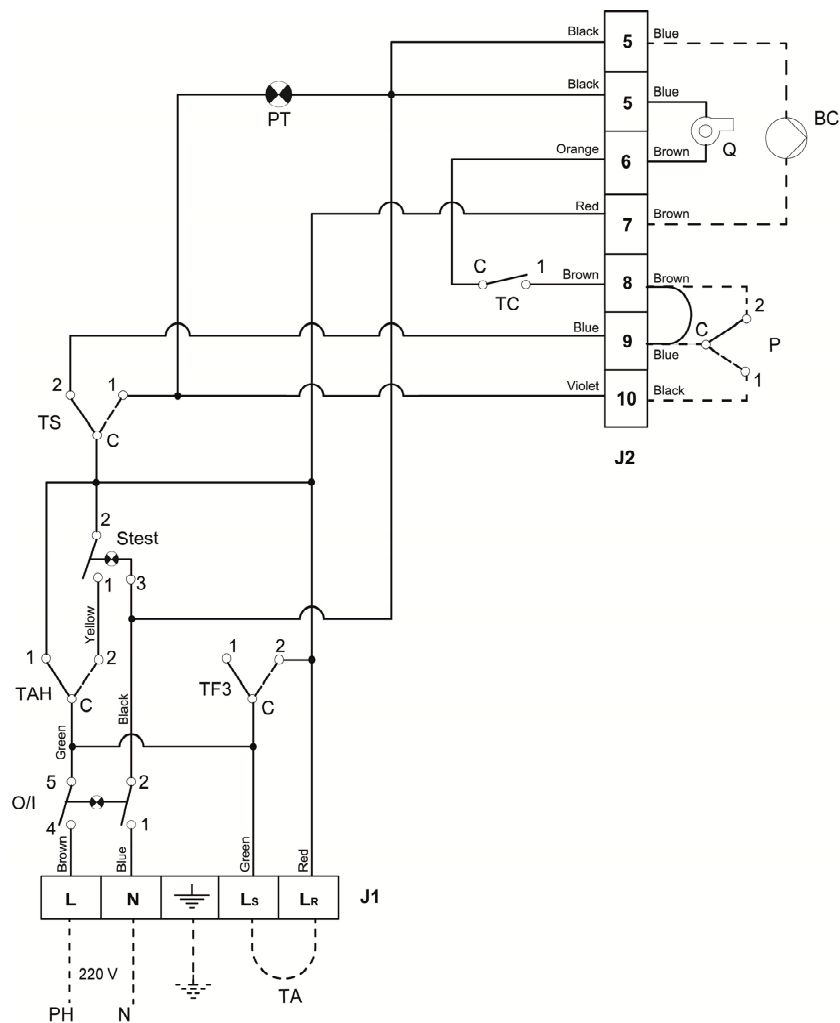
If a neutralisation system is installed in the condensate drain, it is essential to conduct annual maintenance of the system, following the instructions of the manufacturer of the neutralisation system.



14.- TECHNICAL DATA

TRO EVOLUTION HEAT ONLY OUTDOOR			20	30	40
Boiler type	-		Condensation		
			Heating only		
Rated heat output	P_{rated}	kW	19	30	40
Useful heat output	P_4	kW	19,0	28,7	38,7
Useful heat output (30%)	P_1	kW	6,1	8,5	12,4
Seasonal space heating energy efficiency	η_s	%	90	91	92
Useful efficiency	η_4	% (PCI)	96,55	97,96	97,29
		% (PCS)	91,04	92,38	91,74
Useful efficiency (30%)	η_1	% (PCI)	103,82	103,45	104,15
		% (PCS)	97,90	97,55	98,21
Auxiliary electricity consumption at full load	el_{max}	kW	0,226		
Auxiliary electricity consumption at part load	el_{min}	kW	0,078		
Auxiliary electricity consumption in standby mode	PSB	kW	0,001		
Standby heat loss	P_{stby}	kW	0,127	0,135	0,17
Emissions of nitrogen oxides	NOx	mg/kWh	92	118	119
Heating temperature adjustment	°C		0 - 85		
Maximum safety temperature	°C		110		
Maximum pressure for heating mode	bar		3		
Heating expansion vessel capacity	Lts		12	14	14
Heating water volume	Lts		14	19,2	23,2
Water pressure drop	mbar		96	163	272
Fume temperature	°C		69	67	83
Volume on fume side	m^3		0,094	0,114	0,175
Maximum fume flow	Kg/s		0,0085	0,0132	0,0186
Fume pressure drop	mbar		0,20	0,20	0,21
Combustion chamber length	mm		220	300	400
Combustion chamber type	-		Wet, with three flue runs		
Burner adjustment type	-		ON/OFF		
Electrical supply	-		~220-230 V - 50 Hz - 200 W		
Gross weight	Kg		157	188	217

15.- ELECTRICAL DIAGRAM



Q: Burner.

BC: Circulating pump

O/I: Main on/off switch.

TA: Room thermostat.

TC: Control thermostat (in boiler).

J1: Power supply connector.

J2: Components connector.

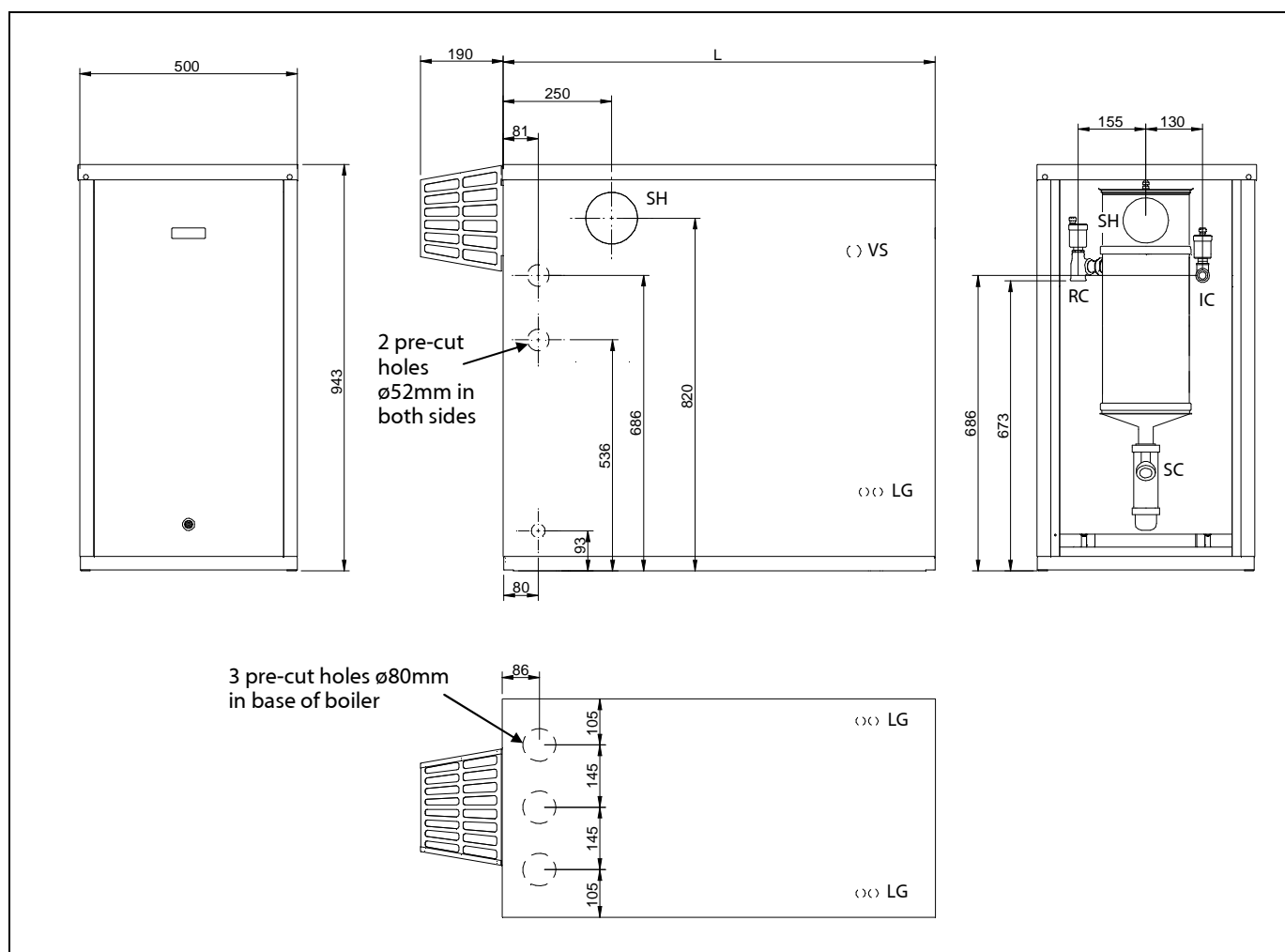
TS: Safety thermostat (in boiler).

tf3: 93° Anti-inertia thermostat (in boiler).

PT: Temp blocking pilot light.

tAH: Antifrost thermostat.

16.- DIAGRAMS AND MEASUREMENTS



IC: Heating outlet

RC: Heating return

VS: Pressure valve pipework

SH: Fume exhaust duct, Ø100.

SC: Condensate disposal pipe

LG: Fuel pipes

MODEL	IC, RC	L
TRO EVOLUTION 20 HEAT ONLY OUTDOOR	3/4" F	900
TRO EVOLUTION 30 HEAT ONLY OUTDOOR	3/4" F	1000
TRO EVOLUTION 40 HEAT ONLY OUTDOOR	3/4" F	1100

17.- BURNER

17.1.- 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.

17.2.- 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.

17.3.- 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.

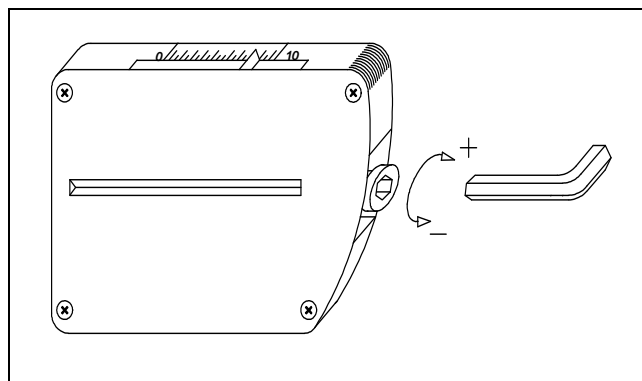
If the shape of the boiler makes it difficult or impossible to observe the flame, the combustion air flow can be regulated by observing the smoke coming out of the flue. If the smoke is dark in colour, more air will need to be provided to the burner, or if it is a very whitish colour, the air in the 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.

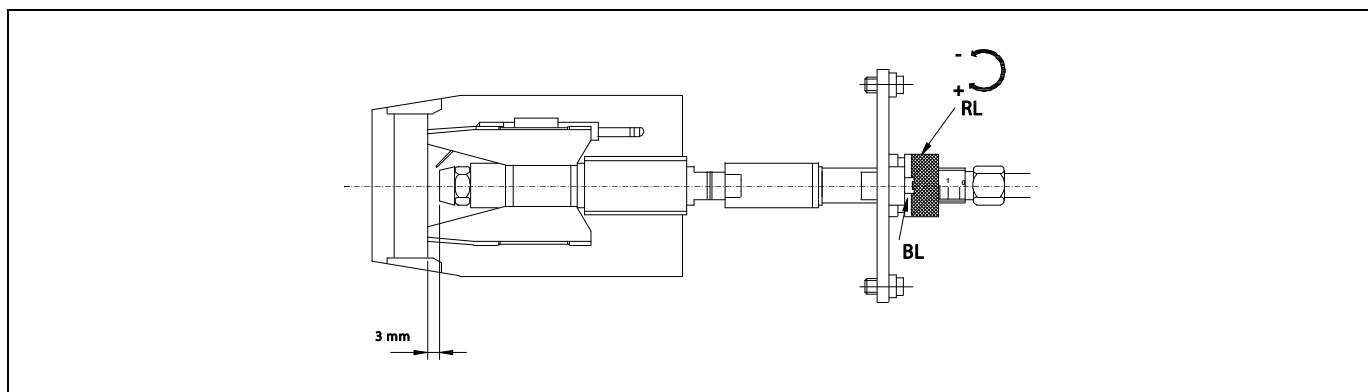
17.4.- Primary air adjustment

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.



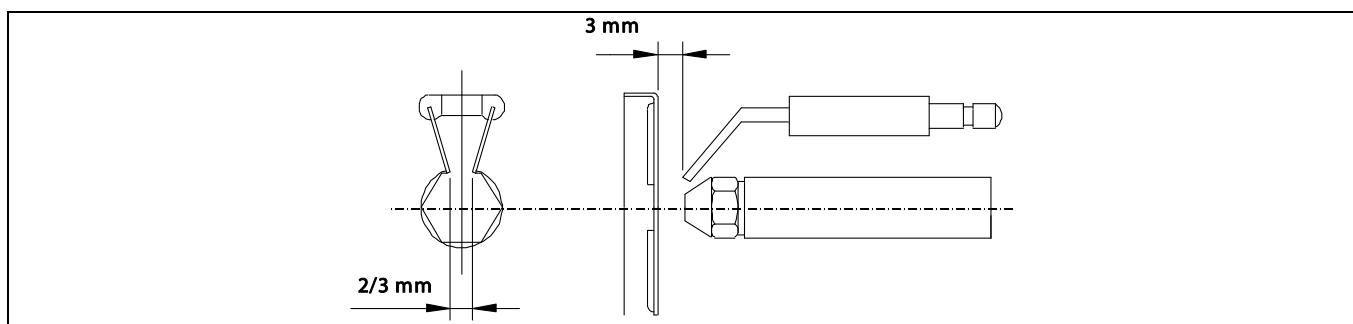
17.5.- Combustion line adjustment

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".



17.6.- Correct position of electrodes

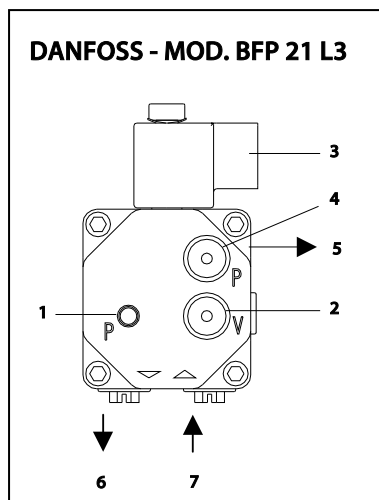
To ensure correct ignition of the "Domestic" burner, the measurements shown in the diagram must be observed. Also ensure the electrode fixing screws have been screwed in place before replacing the flame tube.



17.7.- Oil pressure adjustment

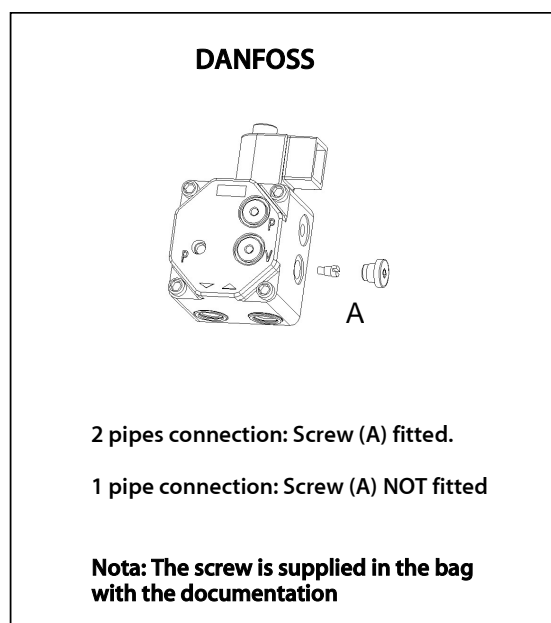
To adjust the oil pump pressure, turn the screw **(1)** clockwise to increase the pressure, and anticlockwise to decrease it.

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



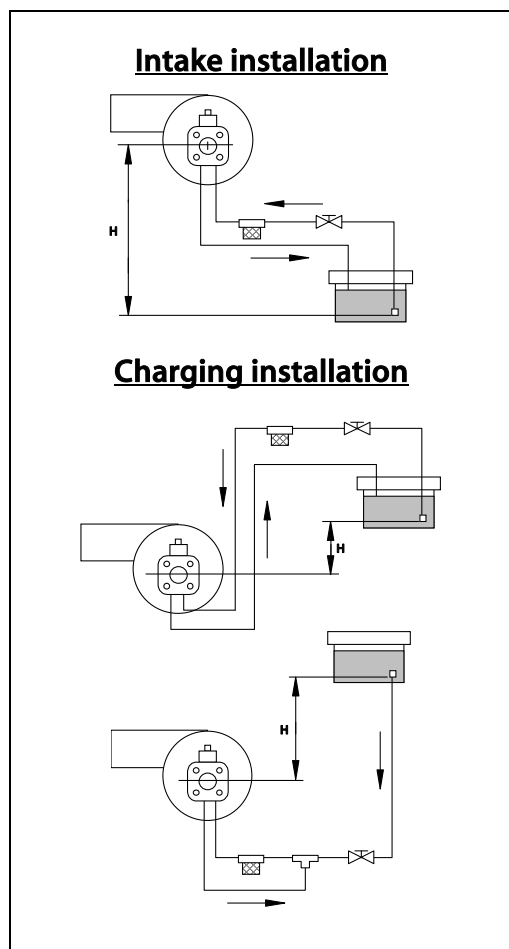
17.8.- Pipe operation

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.



17.9.- 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).



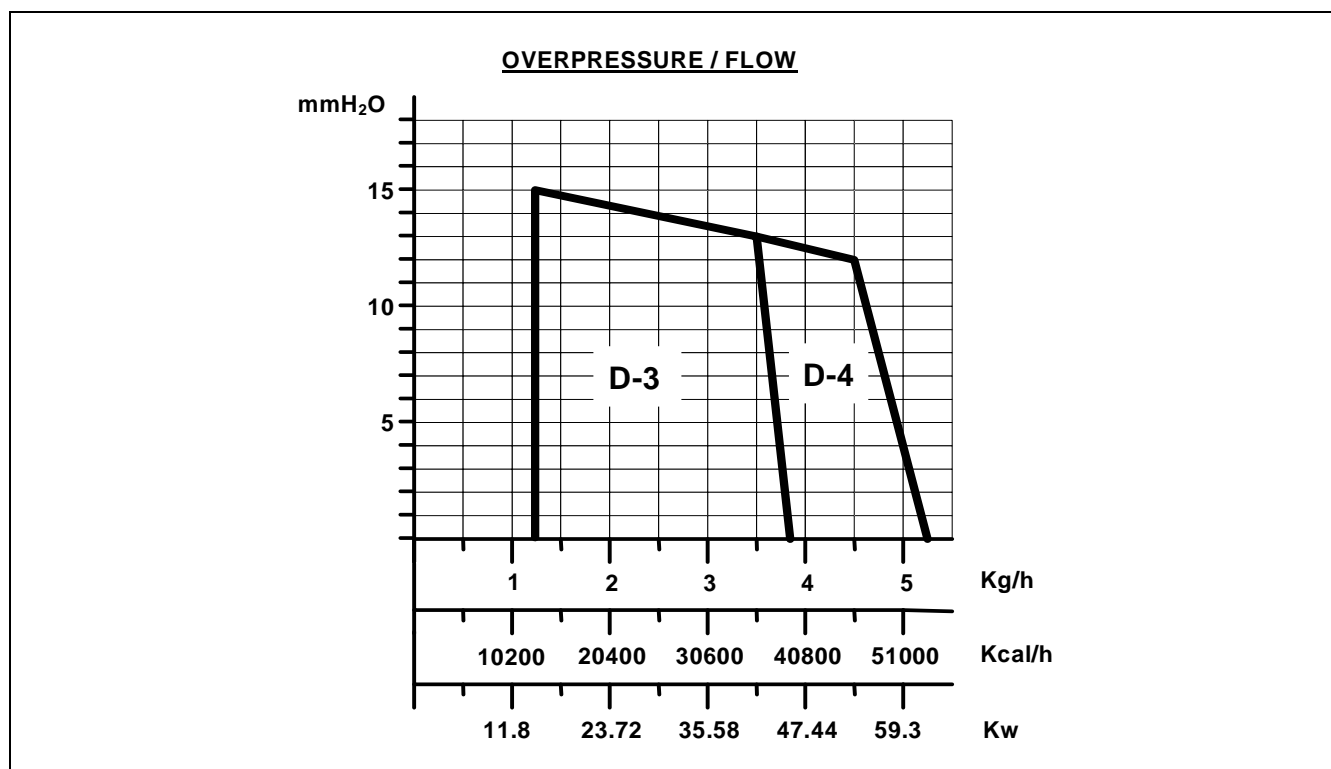
Intake installation		
H (m)	Pipe length	
	Øint 8 mm.	Øint 10 mm.
0.0	25	60
0.5	21	50
1.0	18	44
1.5	15	38
2.0	12	26
2.5	10	26
3.0	8	20
3.5	6	16

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

17.10.- 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	

17.11.- Operating curves



17.12.- Recommended nozzle and pump pressure

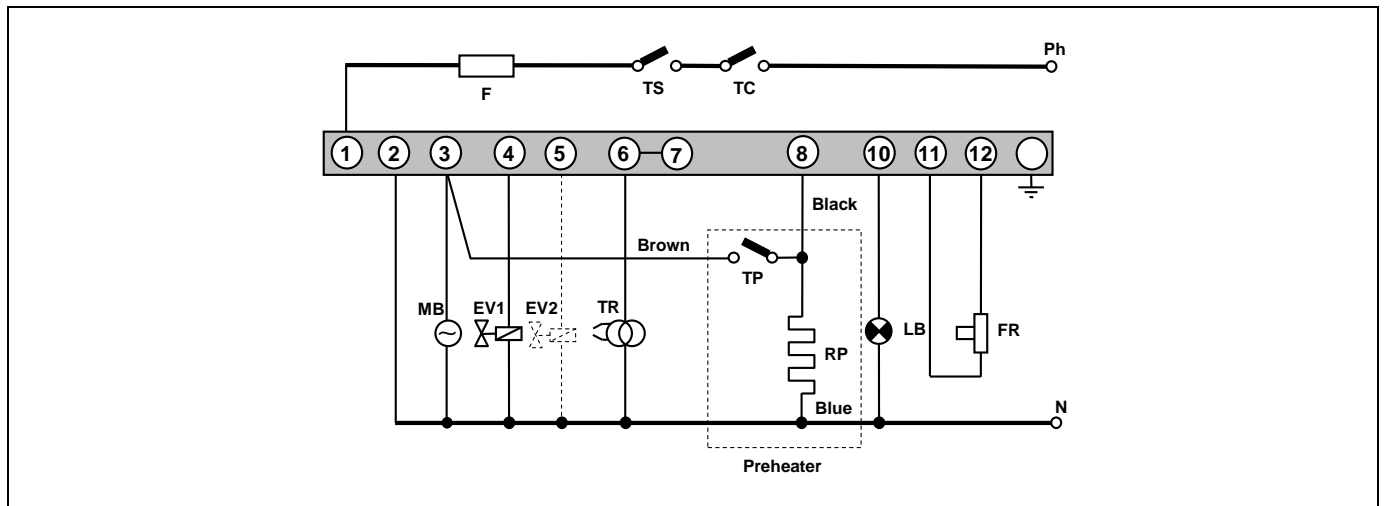
TRO Evolution Heat Only Outdoor boilers are supplied with the burner fitted, with their corresponding nozzle and with the standard pre-adjustment. The following table shows the nozzles and adjustments for each particular model:

MODEL	Nozzle	Burner pressure (bar)	Air adjustment	Line adjustment
TRO EVOLUTION 20 HEAT ONLY OUTDOOR	0,45 80° H	10	7	1
TRO EVOLUTION 30 HEAT ONLY OUTDOOR	0,65 60° H	10	3,5	1
TRO EVOLUTION 40 HEAT ONLY OUTDOOR	1,00 45° H	9	3,5	1

17.13.- 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

17.14.- 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.

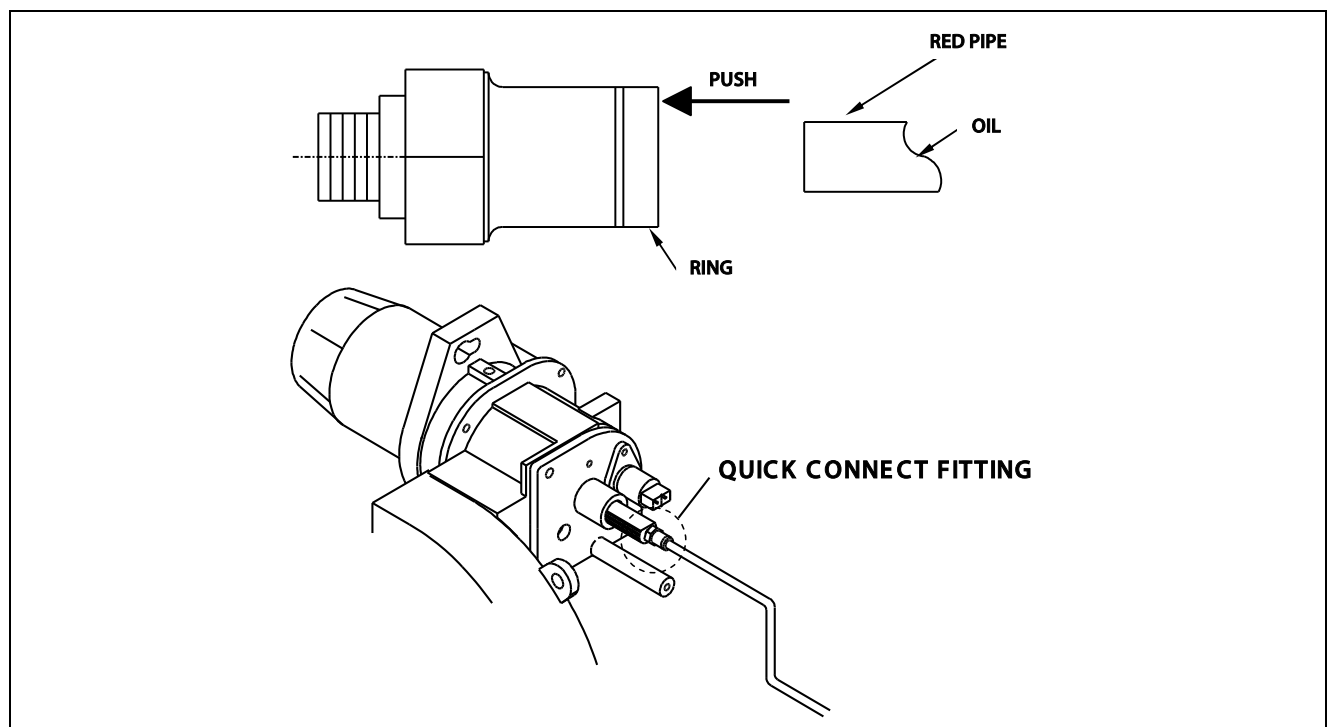
N: Neutral.

TP: Preheater thermostat.

17.15.- Quick connector

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

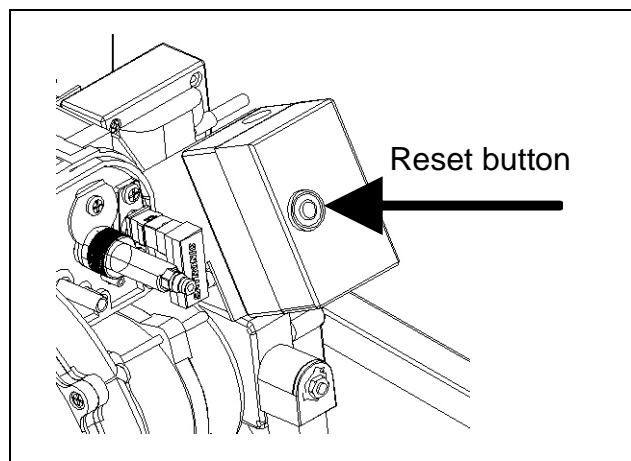
- Press the connector ring in the direction of the arrow, pulling on the red tube at the same time.



17.16.- 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

□

18.- FAILURES

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

18.1.- 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

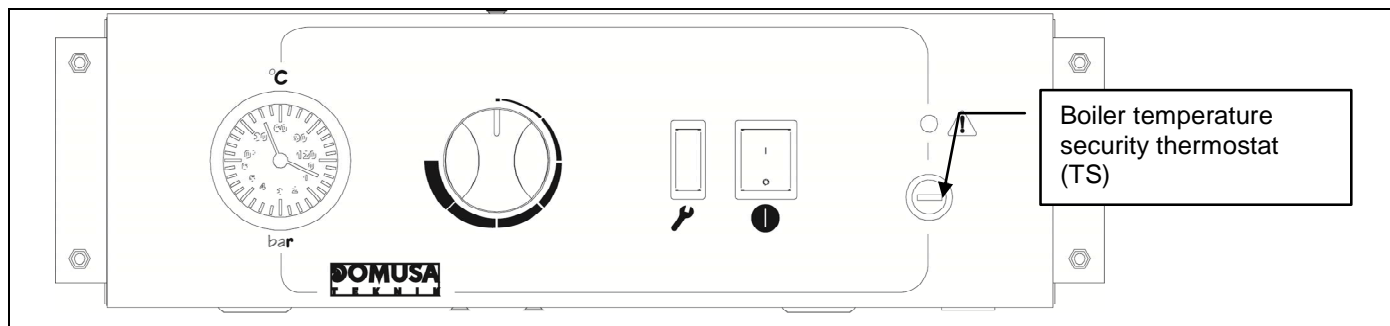
During the failure diagnosis time, the control outputs are disabled and the burner remains off.

To exit failure diagnosis and activate the burner again, reset the burner control. Hold down the reset button for approx. 1 second (<3 s).

18.2.- 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

18.3.- Boiler Security Thermostat



If the boiler goes into safety lockout due to overheating of the boiler (TS), reset by pressing the appropriate button on the thermostat. To access the buttons, unscrew the black cap.

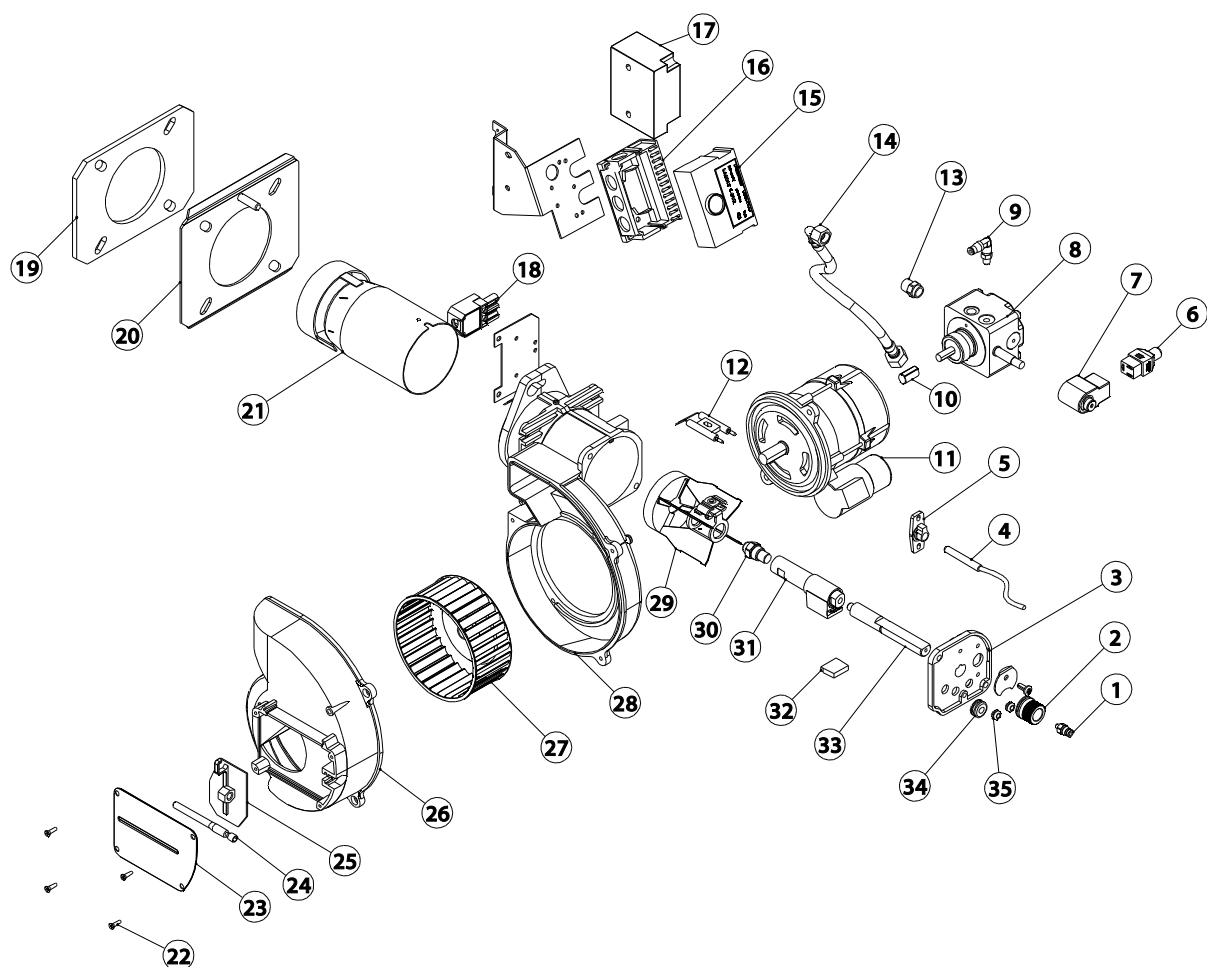
18.4.- Circulating pump alarms

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 pump 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

19.- SPARE PARTS LIST

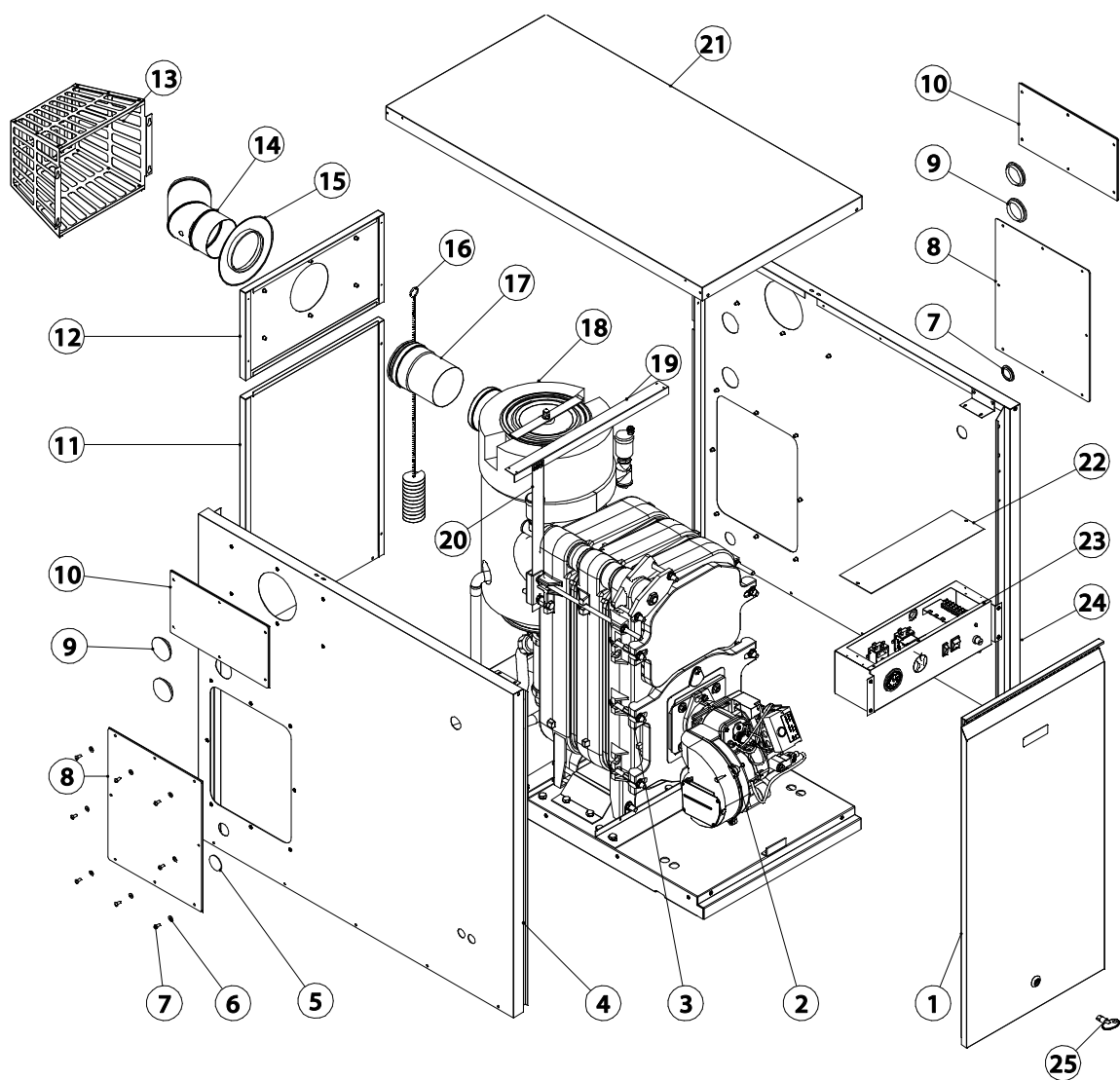
Burner



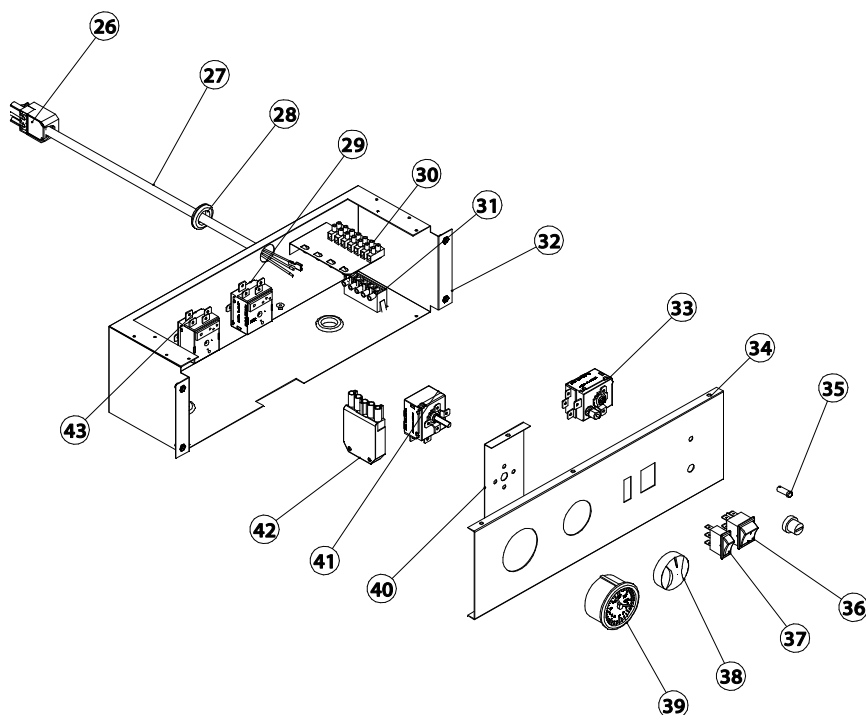
Pos.	Code	Description
1	CTOR000006	Straight connector
2	CTOE000054	Line adjustment
3	SEPO001256	Line cover
4	CQUE000156	Photocell Siemens (30/40)
5	CQUE000050	Photocell Brahma rojo (20)
6	CQUE000149	Photocell support
7	CQUE000124	Valve coil cable Danfoss
8	CQUE000089	Valve coil Danfoss
9	CQUE000088	Oil pump Danfoss
10	CTOR000007	Elbow connector
11	CQUE000004	Motor pump coupling
12	CQUE000102	Motor
13	CQUE000019	Set of electrodes
14	CTOE000065	Counter thread
15	CQUE000191	Oil hose
16	CQUE000169	Transformer
17	CQUE000129	Control box plugs
18	CQUE000159	Transformer
19	CELC000409	3 poles female plug
20	CQUE000173	Flange seal
21	SCON000766	Flange

Pos.	Code	Description
21	SCON000391	Flame tube (30)
22	SCON000291	Flame tube (40)
23	SCON000296	Flame tube (20)
24	CTOR000025	Screw DIN-7982 3,9x13
25	SEPO001237	Air adjustment plate (20/30)
26	SEPO001250	Air adjustment plate (40)
27	CTOE000064	Air adjustment screw
28	CQUE000151	Air adjustment plate
29	SEPO001255	Air adjustment support
30	CQUE000044	Fan
31	SEPO001254	Motor support
32	CQUE000155	Turbulator disc (20/30)
33	CQUE000013	Turbulator disc (40)
34	CQUE000077	Nozzle OD-H 0,65 60°
35	CQUE000193	Nozzle OD-H 1,00 45°
36	CQUE000192	Nozzle OD-H 0,45 80°
37	CQUE000061	Preheater
38	CQUE000027	Preheater cable
39	CTOE000063	Burner line D4
40	CFER000187	Cable gland
41	CFER000074	Cable gland

Boiler



Electric Board



<u>Pos.</u>	<u>Code</u>	<u>Description</u>	<u>Pos.</u>	<u>Code</u>	<u>Description</u>
1	SEPO002265	Door		RCON000941	Top cover 30 ODT
2	RQUEEVO040	Burner 20 ODT		RCON000944	Top cover 40 ODT
	RQUEEVO041	Burner 30 ODT	22	SEPO002272	Cover of electric board
	RQUEEVO042	Burner 40 ODT	23	RELEEVO012	Electrical main board
3	REVO000000	Boiler body 20 ODT	24	RCON000934	Right side 20
	REVO000001	Boiler body 30 ODT		RCON000940	Right side 30
	REVO000002	Boiler body 40 ODT		RCON000943	Right side 40
4	RCON000933	Left side 20	25	CFER000202	Key for bolt
	RCON000939	Left side 30	26	CELC000410	3 pole male plug
	RCON000942	Left side 40	27	CELC000415	Burner cable
5	CFER000245	Shutter plug D32	28	CFER000062	Gland D22
6	CFER000244	Washer nylon M5	29	CELC000034	93° Anti-inertia thermostat
7	CTOR000060	Screw. INOX DIN.7985 M5x16	30	RCON000946	Circuit board
8	RCON000937	Bottom cover	31	CELC000407	5 pole female plug
9	CFER000192	Shutter plug D52	32	RCON000945	Buck
10	RCON000936	Fume cover	33	CELC000022	Safety thermostat
11	SEPO002291	Bottom rear side	34	SEPO002271	Panel
12	RCON000938	Rear side	35	CELC000039	Red switch
13	RCON000931	Guard	36	CELC000011	Main switch
14	CGAS000365	45° fume terminal	37	CELC000060	Test switch
15	CGAS000366	Black fume seal	38	CELC000099	Black rotary knob
16	CFER000058	Cleaning brush	39	CELC000084	Termohydrometre
17	CGAS000364	Extensible adapter	40	SCHA011396	Knob support
18	RCON000932	Condenser	41	CELC000007	Control thermostat
19	SCHA011378	Rear rigidity	42	CELC000408	5 poles male plug
20	SCHA011377	Rigidity	43	CELC000411	Antifreeze thermostat
21	RCON000935	Top cover 20 ODT			



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