



# INSTALLATION, USE, AND MAINTENANCE MANUAL FOR GAS FIRED, WALL-HUNG BOILERS

Model **RCM**

**TYPE B** OPEN COMBUSTION CHAMBER

Model **RSF**

**TYPE C** ROOM SEALED

**COMFORT**  
*Slim*



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## BOILER OPERATION AND ADJUSTMENT PROCEDURES FOR USER

**Before turning on the boiler read the following warnings carefully .**

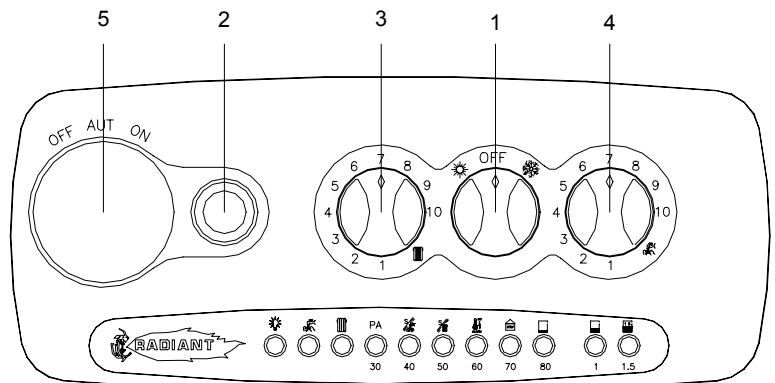
Make sure that the warranty booklet carries the stamp of the authorised technician responsible for installing the boiler. Installation, starting up for the first time, adjustments and maintenance operations must all be carried out solely by qualified technicians. Incorrect installation may cause damage to persons, animals or property for which the manufacturer cannot be held liable.

### WARNING!

- ⇒ **Do not start the boiler unless you are sure it has been thoroughly tested by an authorised technician.**
- ⇒ **Check that the regulations regarding air intakes and ventilation of the room where the boiler is installed have been fully complied with (see installation instructions pag.2).**
- ⇒ **The anti-freeze system will come into operation only if the boiler is in the winter (❄) or summer (☀) position (with selector switch 1 in fig. 1 turned to the summer or winter position) and the gas supply turned on. The manufacturer can accept no responsibility for damage to the boiler caused by lack of observation of these requirements.**
- ⇒ **If the boiler should freeze up, under no circumstances attempt to turn it on but call the service centre immediately.**

**LEGEND** (see fig. 1)

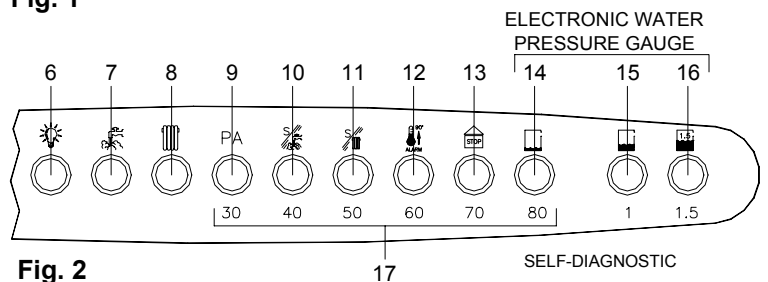
1. SUMMER-WINTER ON-OFF SWITCH
2. LOCK-OUT INDICATOR
3. HEATING TEMPERATURE ADJUSTMENT KNOB
4. WATER TEMPERATURE ADJUSTMENT KNOB
5. SPACE FOR ADDING AN OPTIONAL TIMER



**Fig. 1**

**SELF- DIAGNOSTIC LEGEND** (see fig. 2)

6. OPERATING/ POWER INDICATOR
7. DOMESTIC HOT WATER OPERATION
8. HEATING OPERATION
9. FLASHING LIGHT DENOTING AIR PRESSURE SWITCH FAILURE
10. FLASHING LIGHT DENOTING DOMESTIC WATER SENSOR FAILURE
11. FLASHING LIGHT DENOTING HEATING SENSOR FAILURE
12. FLASHING LIGHT DENOTING 90° C MAX TEMPERATURE SENSOR FAILURE
13. FLASHING LIGHT DENOTING FLUE SAFETY - THERMOSTAT FAILURE
14. FLASHING LIGHT DENOTING LACK OF WATER IN SYSTEM
15. WATER PRESSURE LEVEL 1 BAR
16. WATER PRESSURE LEVEL 1.5 BAR
17. ELECTRONIC TEMPERATURE INDICATOR



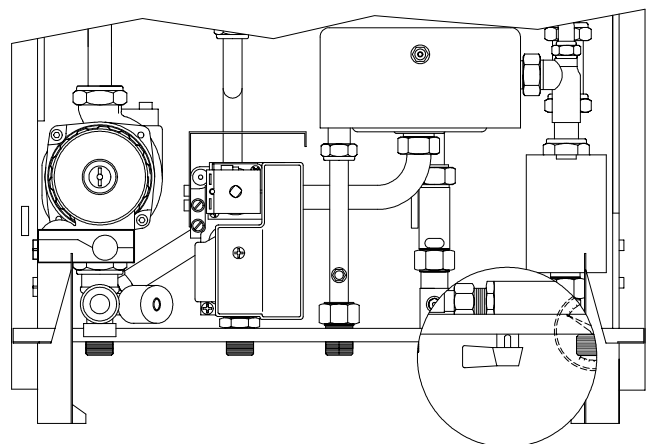
**Fig. 2**

### Turning on the electronic ignition:

- turn on the gas cock situated under the boiler grill;
- turn selector switch 1 to the ❄ symbol denoting winter (see fig.2);
- make sure that 6 light is ON (see fig. 2) and the no.15 or no.16 lights are ON (see fig. 2); if light no.14 flashes, it means water deficiency in the system: open the filling tap located under the boiler (see fig. 3) and fill the system until a pressure of 1.5 bar has been reached (light no.16 ON; see fig. 2) and then **close the filling tap**.
- The automatic ignition system will turn the burner on.

It may be necessary to repeat the procedure a few times to purge air from the pipes. To repeat the ignition procedure press release button 2 (see fig.1) and then try the ignition procedure once again. If the boiler does not start, press the reset button 2 (see fig. 1). **IMPORTANT** should the boiler fail to ignite **wait 3 minutes** before pressing button again.

If locking-out persists, turn boiler OFF and call an authorised radiant service engineer.



**Fig. 3**

**Turning on procedure for electronic ignition** (only for U.k. and Ireland):

- turn on the gas cock situated under the boiler grill;
- turn selector switch **1** to the ❄ symbol denoting winter (see fig.1);
- make sure that **6** light is ON (see fig. 2 pag. I) and the no.**15** or no.**16** lights are ON (see fig. 2 pag. I); if light no.**14** flashes, it means water deficiency in the system: open the tap on the filling loop and fill the system until a pressure of 1.5 bar has been reached (light no.**16** ON; see fig. 2 pag. I) and then **close the tap**.
- The automatic ignition system will turn the burner on.

It may be necessary to repeat the procedure a few times to purge air from the pipes. To repeat the ignition procedure press release button **2** (see fig. 1 pag. I) and then try the ignition procedure once again. If the boiler does not start, press the reset button (see fig. 1 pag. I). **IMPORTANT** should the boiler fail to ignite **wait 3 minutes** before pressing button again.

If locking-out persists, turn boiler OFF and call an authorised service engineer.

**Turning off boilers with electronic ignition :**

- turn selector switch **1** to the **OFF** position;;
- if the boiler will not be used for long periods it is recommended that the gas cock under the boiler grill be shut off.

**THE BOILER IN USE**

Summer-winter use (see fig. 1 pag. I).

- turn the selector switch **1** to the ❄ program to operate the boiler in the WINTER position for both heating and hot water;
- turn the selector switch **1** to the ☀ program to operate the boiler in the SUMMER position for just hot water;
- if the system has a room thermostat, set this to the temperature required (the law states 20°C).

**REGULATING THE HEATING TEMPERATURE**

The heating temperature is regulated by turning knob **3** (see fig. 1 pag. I).

- turn it counter-clockwise to lower the temperature.
- turn it clockwise to raise the temperature.
- the temperature range can be adjusted from a minimum of 30°C to a maximum of 80°C.

**REGULATING THE HOT WATER TEMPERATURE**

The hot water temperature is regulated by turning knob **4** (see fig. 1 pag. I).

- turn it counter-clockwise to lower the temperature
- turn it clockwise to raise the temperature
- the temperature range can be adjusted from a minimum of 35°C to a maximum of 60°C.

**WARNINGS FOR THE USER**

To keep the boiler in efficient and safe operating condition, carefully follow the instructions listed below:

- Have normal maintenance performed at least once a year by one of our authorised service centres (a fee will be charged), combustion tests are necessary every two years and should again be carried out by a qualified technician (in accordance with D.P.R. 412 regulations, 26-08-93).
- Periodically check system pressure on the pressure gauge and check that pressure is between 0.5 - 1.5 bar with the system cold.
- Do not clean the casing or internal parts of the boiler with reducing agents or solvents. Clean only with soap and water.
- Never leave flammable materials in the immediate vicinity of the boiler.
- For greater comfort and more rational use of heat, it is advisable to install a room thermostat connected to a clock timer to turn the boiler on and off during the course of the day or week (in accordance with D.P.R. 412 regulations, 26-08-93).
- The boiler is equipped with an anti-freeze system, which is operative with switch 1 in either SUMMER ☀ or WINTER ❄ position, even if the room thermostat is set at zero, as long as there is electrical power and gas feed.

**FLUE SAFETY**

Natural draft boilers are equipped with a device that controls correct evacuation of exhaust fumes. This device guarantees maximum safety during operation. If the flue is partially or completely obstructed, or if its section is insufficient for evacuation of exhaust fumes, the device will intervene and block the flow of gas to the main burner and to the pilot light, turning off the boiler. If this occurs, contact an authorised technician, close the gas tap and turn electrical mains off.

***Do not tamper with the device in any way.***

## THE FRIENDLY POWER OF HEAT

At your service for 40 years in the heating sector.  
Thank you for choosing RADIANT

*re: declaration for purposes of Art. 7 of Law 46 of 5 April 1990.*

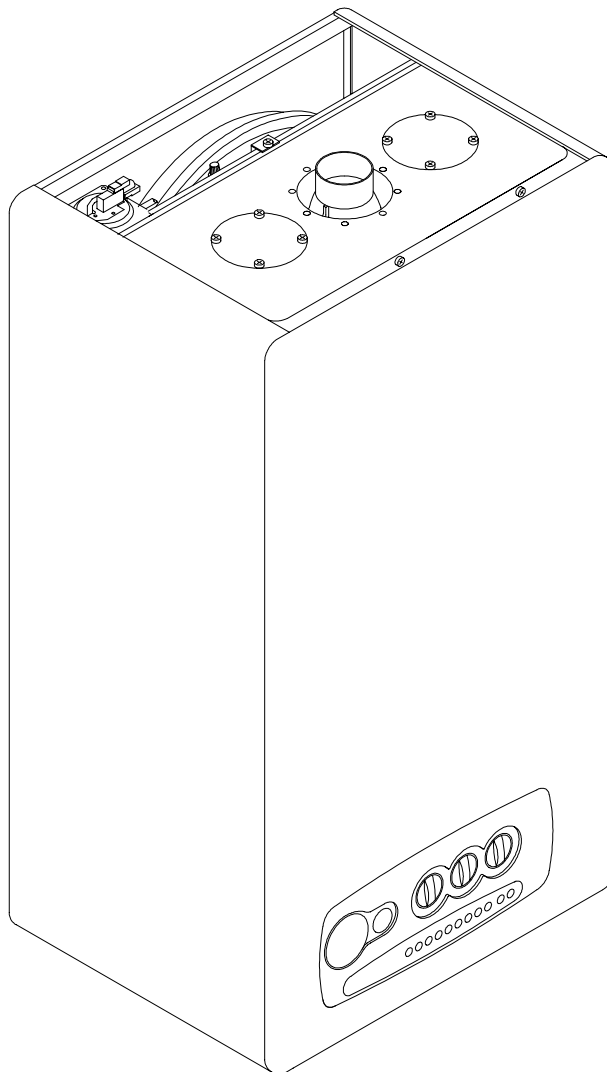
RADIANT BRUCIATORI S.p.A. hereby declares that all of its products are constructed to industry standards as required by the Article in question and by Article 5 of the law in effect (D.P.R. no. 447/91).

**RADIANT BRUCIATORI S.p.A. products are type tested EC.**

All **RADIANT** boilers are constructed according to UNI - CIG (**EC**) norms. The materials used, such as copper, brass, and stainless steel, form a compact, homogeneous, highly functional unit that is easy to install and simple to operate. The wall-mounted boiler is equipped with all of the approved accessories required to make it a true, independent heating plant for home heating and for the production of hot water for domestic needs. All boilers are fully inspected, and come with a certificate of quality signed by the inspector and with a warranty certificate. This booklet must be read carefully and stored in a safe place **near the boiler.**

**RADIANT BRUCIATORI S.p.A. declines any and all responsibility for misinterpretations of this booklet deriving from any translations of same.**

**RADIANT BRUCIATORI S.p.A. will not be responsible for non-observance of the instructions contained in this booklet or for the consequences of any action not specifically described herein.**



## INSTALLATION INSTRUCTIONS WARNINGS

THIS INSTALLATION, USE, AND MAINTENANCE MANUAL IS AN ESSENTIAL AND INTEGRAL PART OF THE PRODUCT, AND MUST ALWAYS BE KEPT NEAR THE DEVICE.

THE WARNINGS CONTAINED IN THIS SECTION ARE ADDRESSED BOTH TO THE USER AND TO INSTALLATION AND MAINTENANCE PERSONNEL.

THE USER WILL FIND INFORMATION ON OPERATION AND LIMITS OF USE IN THE ACCOMPANYING MANUAL, WHICH SHOULD BE READ VERY CAREFULLY. STORE THE MANUAL CAREFULLY FOR FUTURE REFERENCE.

### 1) GENERAL WARNINGS

Installation must be performed in observance of current norms, according to the constructor's instructions, and by professionally qualified personnel.

Professionally qualified personnel are those having technical competence in the sector of application of the device (civil or industrial), and, in particular, the constructor's authorised service centres.

Incorrect installation may cause damage to persons, animals, or property, for which the constructor assumes no liability.

- After completely removing the packing, make sure that the contents are in perfect condition.
- In case of doubt, do not use the equipment. Consult the supplier.
- Packing materials (cardboard carton, wooden crate, nails, clips, plastic bags, polystyrene, etc.) are potentially dangerous and must be kept away from children.
- Before performing any cleaning or maintenance operation, turn off the unit by means of the mains switch and/or by means of the appropriate cut-off devices.
- Do not block the air intake or heat dissipation grates.
- In the event of breakdown and/or poor functioning of the device, turn it off and do not attempt to repair it or take any direct action. Refer to professionally qualified personnel only.
- Any repairs must be performed exclusively by a service centre authorised by the constructor, and with original spare parts only.
- Non-observance of the above instruction may compromise the safety of the device. To guarantee efficient and correct operation, the device should undergo period maintenance by professionally qualified personnel according to the constructor's instructions.
- Whenever the device is to be put out of service, secure all potentially hazardous parts to prevent accidents or damage.
- If the device is sold or transferred to another owner, or if you move and leave the boiler, make sure that this booklet stays with the boiler so that it may be consulted by the new owner and/or by the installer.
- Use only original spare parts for all devices with optionals or kits (including electrical ones).

**WARNING:** this device must be used for its intended purpose, i.e., heating and production of domestic hot water. Any other use is improper and therefore dangerous. The constructor will have no contractual or extracontractual liability for damage caused by incorrect installation and/or use or by non-observance of instructions supplied by the constructor.

**This device must be used exclusively with a sealed central heating system equipped with an expansion vessel.**

### 2) WARNINGS REGARDING INSTALLATION

Warranty expires **12 months from date of installation and in all cases no later than 18 months from date of construction**. First start-up must be performed by **authorised personnel only**. For any operation on the hydraulic, gas, or electrical circuit regarding the heating unit, refer to **authorised technicians only and use original spare parts only**. Wall-mounted boilers are not to be installed in damp rooms, and must be protected against sprays or jets of water or other liquids to prevent malfunctions of the electrical and heating devices. They must not be exposed to direct steam from cookers, and nothing must be placed on top of them. This heating unit has been constructed to heat the home and to produce hot water. **The constructor declines all responsibility for incorrect installation and/or use of the device.** Do not leave the device on when it is not being used: **close the gas cock and turn off the mains switch**. If you smell gas in the room in which the device is installed, do not operate any electrical switches, telephones, or any other device that might cause a spark. Immediately open doors and windows to create an air current to clear the room. Close the main gas cock (at the meter) or the cylinder cock, and request immediate technical service.

**Do not tamper with the device.**

### SYSTEMS WITH THERMOSTATS

A by-pass must be installed in heating systems with radiators thermostats.

As required by current norms, these devices must be installed by **qualified personnel only**, who must respect norms **UNI-CIG 7129 and 7131** and revisions, fire department regulations, and requirements of the local gas company. Before installing the boiler, make sure that the water and heating systems are compatible with its output. The room must be properly ventilated by means of an air intake (see UNI 7129/92 and UNI 7129/95 FA).

The air intake must be at floor level open flue only, at a point where it cannot be obstructed, and protected by a grate that does not reduce the useful section of flow.

The use of air flows from adjacent rooms is permitted as long as such rooms are in depression with respect to the outside and as long as there are **no wood-burning fireplaces or fans** installed there. If the boiler is to be installed externally (for example, on balconies or terraces), make sure that it is protected against atmospheric agents to prevent damage to components and voiding of the warranty. In such cases we recommend building a heat compartment to protect the boiler against inclement weather.

**Check the technical data on the packing and on the plate** located inside the front casing. Check that the burner is suitable for use with the type of gas available.

**Make sure that all pipes and connections are perfectly sealed and that there are no gas leaks.**

We recommend that the pipes be cleaned out to remove any residues that might negatively affect the operation of the boiler.

### 3) GENERAL WARNINGS BASED ON TYPE OF POWER SUPPLY

#### POWER SUPPLY

Electrical safety is achieved only when the device is correctly and efficiently earthed as per current safety norms (IEC 64-8 Electrical Part).

- This fundamental safety requirement must be checked. In case of doubt, request a check of the electrical system by professionally qualified personnel. The constructor will not be liable for any damage caused by lack of or improper earthing of the system.
- Have professionally qualified personnel check that the electrical system is adequate for the maximum absorbed power of the device (indicated on the plate). In particular, make sure that the section of the system wires is suitable for the maximum absorbed power of the device.
- Do not use adapters, multiple sockets, and/or extension cords to power the device from the electrical mains.
- Provide a unipolar switch as required by current safety regulations to connect the device to the mains.
- The use of any electrical device requires the observance of some fundamental rules, such as:
  - do not touch the device with wet or damp parts of the body and/or with bare feet
  - do not pull on electrical cables
  - do not expose the device to atmospheric agents (rain, sun, etc.) unless specifically provided for
  - do not allow the device to be used by children or anyone unfamiliar with its operation
- The power cable must not be replaced by the user.
- If the cable becomes damaged, turn off the device and have the cable replaced by professionally qualified personnel only.
- If you decide not to use the device for an extended length of time, turn off the mains switch that feeds all components of the system using electrical energy (pumps, burner, etc.).

## TECHNICAL DATA

### Type B unit

Type B boilers have open combustion chambers, and must be connected to a flue duct to convey combustion exhaust out of the room. Air for combustion is taken directly from the room in which the boilers are installed.

### Type C unit

Type C devices are devices in which the combustion circuit (air intake, combustion chamber, exchanger, combustion exhaust) is sealed off from the place where they are installed.

### CENTRAL HEATING - DOMESTIC HOT WATER

*open combustion circuit type*

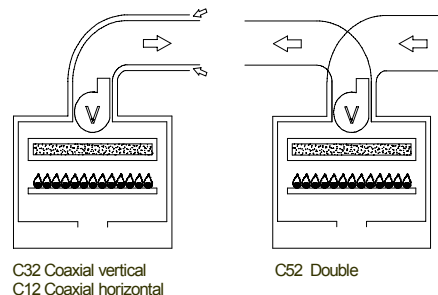
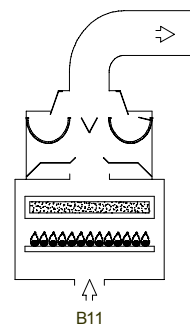
**RCM 20 E** - electronic ignition

### CENTRAL HEATING - DOMESTIC HOT WATER

*sealed combustion circuit type*

**RSF 20 E** - electronic ignition

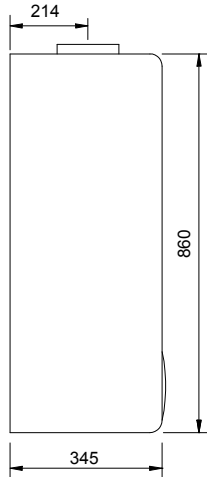
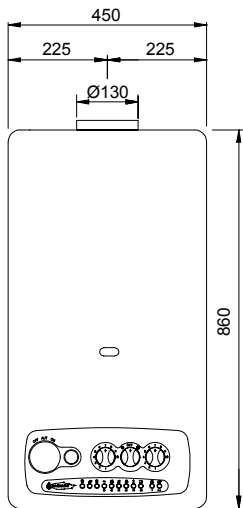
**RSF 24 E** - electronic ignition



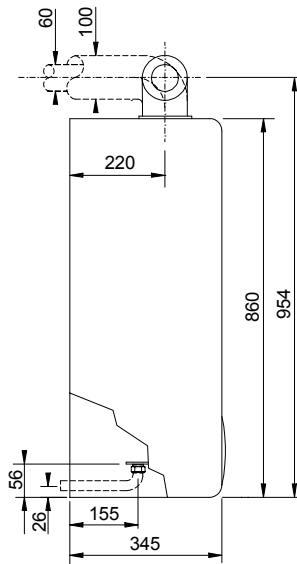
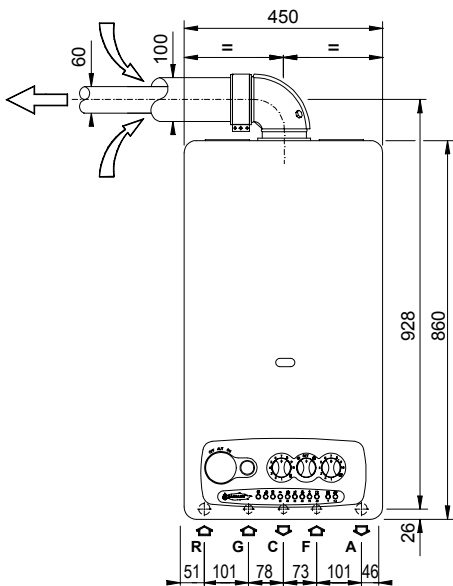
### Technical data

MODELLI		RCM 20 E	RSF 20 E	RSF 24 E
Maximum rated input	KCal/h	22900	22900	25628
	Kw	26.6	26.6	29.8
	BTU/h	90867	90867	101692
Minimum rated input	KCal/h	11000	11000	15000
	Kw	12.8	12.8	17.5
	BTU/h	43648	43648	59250
Maximum rated output	KCal/h	20550	20900	23090
	Kw	23.9	24.34	26.85
	BTU/h	81542	82931	91621
Minimum rated output	KCal/h	9370	9450	12900
	Kw	10.9	11	15
	BTU/h	37180	37498	51187
Heating temperature adjustment	°C	30-80	30-80	30-80
Max. working pressure (heating)	bar	3	3	3
Min. working pressure (heating)	bar	0.3	0.3	0.3
Expansion vessel capacity (initial pressure 1 bar)	Litres	8	8	8
Hot water flow rate $\Delta t$ 25°	Litres	13	13	15
Max. working pressure (water)	bar	6	6	6
Min. working pressure (water)	bar	0.5	0.5	0.5
Width	mm.	450	450	450
Height	mm.	860	860	860
Depth	mm.	345	345	345
Weight	Kg.	44	49	49
Flue diameter	Ø	130	100/60 80/80	100/60 80/80
Flow/return connections	Ø	3/4"	3/4"	3/4"
Cold water connections	Ø	1/2"	1/2"	1/2"
Hot water connections	Ø	1/2"	1/2"	1/2"
Gas connections	Ø	1/2"	1/2"	1/2"
Electrical connection 50 Hz	V	230	230	230
Power supply	W	120	170	170
Burner jets NP 13 G30	Ø	1.25	1.25	1.25
Burner jets NP 13 G30	Ø	0.75	0.75	0.77
Gas category: IT II2H3	Gas supply pressure: <b>G20</b> 20 mbar / <b>G30/31</b> 29-30/37 mbar			
FORCED CIRCULATION				





## TYPE B WALL-MOUNTED BOILERS OPEN COMBUSTION CIRCUIT:



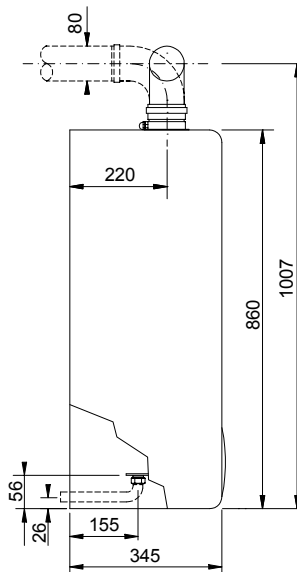
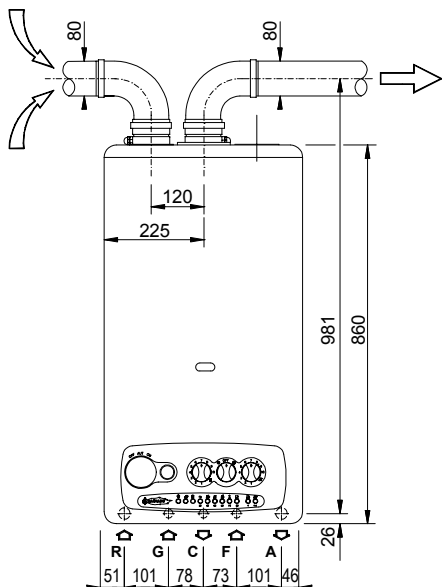
## TYPE C WALL-MOUNTED BOILERS SEALED COMBUSTION CIRCUIT:

### Kit A

#### Horizontal coaxial exhaust flue system with 360° rotation.

It allows the flue exhaust and the air intake directly to an external wall.

**To insert a bend, reduce total flue length by 0.8 m.**



### Kit B

#### Double exhaust/emission twin flue system with 360° rotation.

It allows the flue exhaust into a flue duct and the air intake directly from an external wall.

**To insert a bend, reduce total flue length by 1.5 m.**

R RETURN 3/4"  
G GAS 1/2"  
C HOT WATER 1/2"  
F COLD WATER 1/2"  
A HEATING FLOW 3/4"

**ATTENTION:** USE APPROVED TYPE FLUE TERMINALS ONLY WITH THE FLUE KIT.

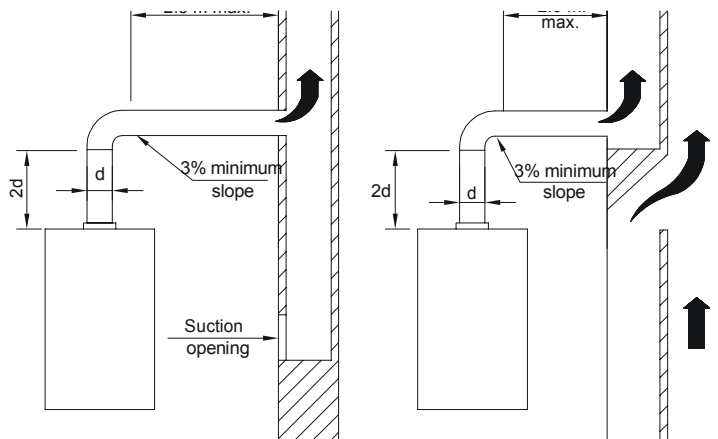


Fig. 1

← **FLUE EXHAUST DIRECTLY INTO A DUCT (CHIMNEY) OR COLLECTIVE BRANCH-TYPE FLUE**  
**VERTICAL EXHAUST**  
Open chamber model

A maximum of 3 changes of direction are allowed.  
Keep to the distances and angles shown in the diagram.

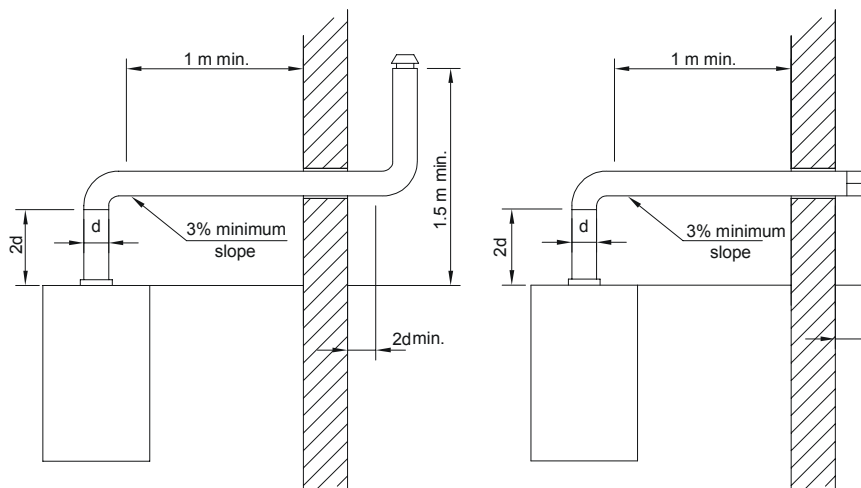


Fig. 2

← **FLUE EXHAUST DIRECTLY TO OUTSIDE**  
**VERTICAL EXHAUST**  
Open chamber model

A maximum of 2 changes of direction are allowed including the first connection to the boiler.  
Keep to the distances and angles shown in the diagram

For the flue exhaust from multiple superimposed type "B" gas boilers with natural draught into newly installed collective flues (CCR) with natural draught, follow the directions set out in the UNI 10640 standard.

It should be noted that these type of flues do not apply in the case of boilers equipped with mechanical means of flue exhaust.

For the FLUE EXHAUST from multiple combined type "C" room sealed gas boilers equipped with exhaust fans into single-chimney collective flues with natural draft or multiple combined flues, follow the directions set out in the UNI 10640 standard.

### CONNECTION OF FLUE PIPES

All boilers must be connected to a duct for discharging the burnt gasses; the section of this duct must not be less than the diameter of the pipe coming out of the boiler and must be sealed airtight so that no burnt gasses can leak out. There must be no long horizontal sections or abrupt deviations along its length (see fig. 1-2).

- For type **B** open combustion circuit boilers;  
connect the boiler to the chimney using a  $\varnothing 130$  link.
- For type **C12** sealed combustion circuit boilers;  
KIT A - COAXIAL EXHAUST connect using the  $\varnothing 100 - 60$  double elbow and 2 coaxial pipes;  $\varnothing 60$  for EXHAUST of combustion gasses -  $\varnothing 100$  for air INTAKE.
- For type **C32** sealed combustion circuit boilers;  
KIT B - TWIN PIPE SYSTEM connect using 2 sections with a  $\varnothing 80$  elbow for the EXHAUST of combustion gasses -  $\varnothing 80$  for air INTAKE.

**N.B.:** FLUE KITS are supplied in a separate box.

## GENERAL INSTALLATION REQUIREMENTS

### GAS SAFETY

It is the law that all gas appliances are installed by a CORGI registered installer in accordance with the regulations listed below. Failure to install appliances correctly could lead to prosecution. It is in your own interest and that of safety to ensure that the law is complied with. Failure to have your appliance installed to comply with the installation instructions and the requirements listed below could invalidate your guarantee.

### RELATED DOCUMENTS

The installation of the boiler must be in accordance with the relevant requirements of the Gas Safety regulations, Building regulations, I.E.E. regulations and the byelaws of the local water authority.

It should be in accordance also with any relevant requirements of the local authority and the relevant recommendations of the following British Standard Codes of Practice:

B.S 6400:	1985 & B.S. 6891 : 1988.
BS 5376:	Selection and Installation of Gas Space Heating ( 1 and 2 family gases) Part 2: Boilers of rated input not exceeding 60 Kw
BS 5449:	Central Heating for domestic premises Part 1: Forced circulation Hot Water System
CP 342:	Centralised Hot Water Supply BS 6700 : 1987 Part 2: Buildings other than individual
BS 5440:	Flues and air supply for Gas Appliances of rated input not exceeding 60 Kw (1 and 2 family gases) Part 1: Flues Part 2: Air Supply
BS 5446:	1990: Installation of Gas Hot Water supplies for domestic purposes

### GAS SUPPLY

**Service Pipes:** The local gas region should be consulted at the installation planning stage in order to establish the availability of supply of gas. An existing service pipe must not be used without prior consultation with the local gas region.

**Meters:** A gas meter is connected to the service pipe by the local gas region or local gas region contractor. An existing meter should be checked to ensure that it is capable of passing an additional 3.4 m<sup>3</sup>/hr (125 ft<sup>3</sup>/hr) before the appliance is installed. The meter outlet governor should ensure a nominal dynamic pressure of 20m Bar, (8 in wg) at the boiler. Installation pipes should be fitted in accordance with BS6891.1988. Pipework from the meter to the boiler must be 22mm copper tube. The complete installation must be tested for soundness as described in the above code, BS 6400: 1985 & BS6891.

**IMPORTANT:** BOTH THE USER AND THE MANUFACTURER RELY UPON THE INSTALLER, WHOSE JOB IS TO INSTALL THE BOILER AND CONNECT IT TO A CORRECTLY DESIGNED HEATING SYSTEM. THE INSTALLER SHOULD ACQUAINT HIMSELF WITH THE CONTENTS OF THIS PUBLICATION AND THE RELEVANT BRITISH STANDARDS CONCERNING INSTALLATION REQUIREMENTS.

### LOCATION OF BOILER

In siting the combination boiler, the following limitations **MUST** be observed:

The position selected for installation should be within the building, and **MUST** allow adequate space for installation, servicing and operation of the combination boiler, and for air circulation around it. The boiler is not suitable for external installation.

This position **MUST** also allow for a suitable flue termination to be made. The boiler must be installed on a flat vertical wall which is capable of supporting the weight of the combination boiler, and any ancillary equipment.

If the boiler is to be fitted in a timber framed building it should be fitted in accordance with the British Gas publication "Guide for Gas Installations in Timber Frame Housing, Reference DM2". If in doubt, advice must be sought from the local region of British Gas.

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current I.E.E. Wiring Regulations, and in Scotland the electrical provisions of the Building Regulations applicable in Scotland, with respect to the installation of the boiler in a room or internal space containing a bath or shower.

Where a room-sealed appliance is installed in a room containing a bath or shower, any electrical switch or appliance control utilising mains electricity must be so situated that it cannot be touched by a person using the bath or shower.

A compartment used to enclose the combination boiler **MUST** be designed and constructed specifically for this purpose. An existing cupboard, or compartment, may be used provided it is modified accordingly.

Where installation will be in an unusual location, special procedures may be necessary. BS 6798 gives detailed guidance on this aspect.

For clearances to be made available for installation and servicing, see Sections 5.2.2. to 5.2.4.

## FLUE POSITION

**IMPORTANT:** THE FLUE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN BS 5440:1.

The boiler **MUST** be installed so that the terminal is exposed to the external air.

It is important that the position of the terminal allows free passage of air across it at all times.

If the terminal discharges into a pathway or passageway check that combustion products will not cause nuisance and that the terminal will not obstruct the passageway.

In certain weather conditions a terminal may emit a plume of steam. Positions where this would cause a nuisance should be avoided.

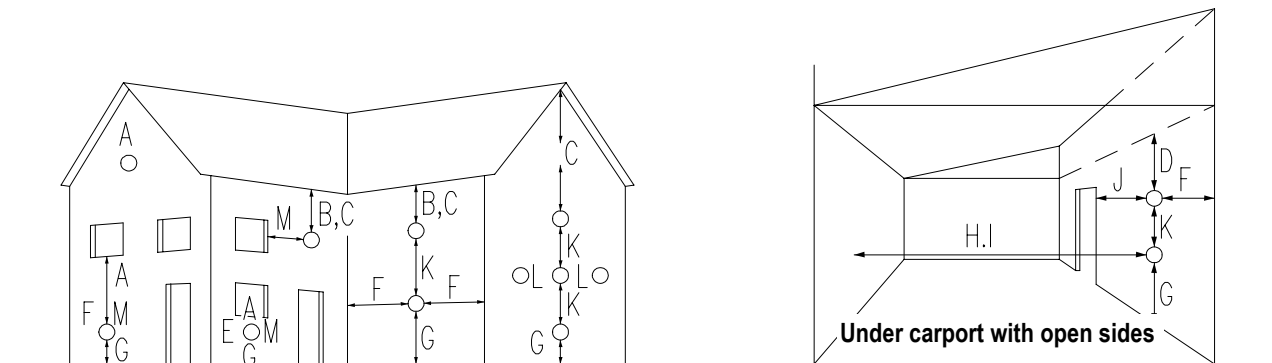
**IMPORTANT REQUIREMENT:** The correct dimensional relationship between the terminal and any obstruction, openable window or ventilator as shown in Fig 1 pag.7 It is **ESSENTIAL TO ENSURE**, in practice, that products of combustion discharging from the terminal cannot re-enter the building, or any other adjacent building, through ventilators, windows, doors, other sources of natural air infiltration, or forced ventilation/air conditioning systems. If this should occur, the appliance **MUST BE TURNED OFF IMMEDIATELY** and the local gas region consulted.

Where the lowest part of the terminal is fitted less than 2m (6.6ft) above a balcony, above ground, or above a flat roof to which people have access, the terminal **MUST** be protected by a purpose designed guard.

Where the terminal is fitted within 850mm (34in) of a plastic or painted gutter, or 450mm (18in) of painted eaves, an aluminium shield of at least 1500mm (59in) long should be fitted to the underside of the gutter painted surface.

The air inlet/products outlet duct and the terminal of the boiler **MUST NOT** be closer than 25mm (1in) to combustible material.

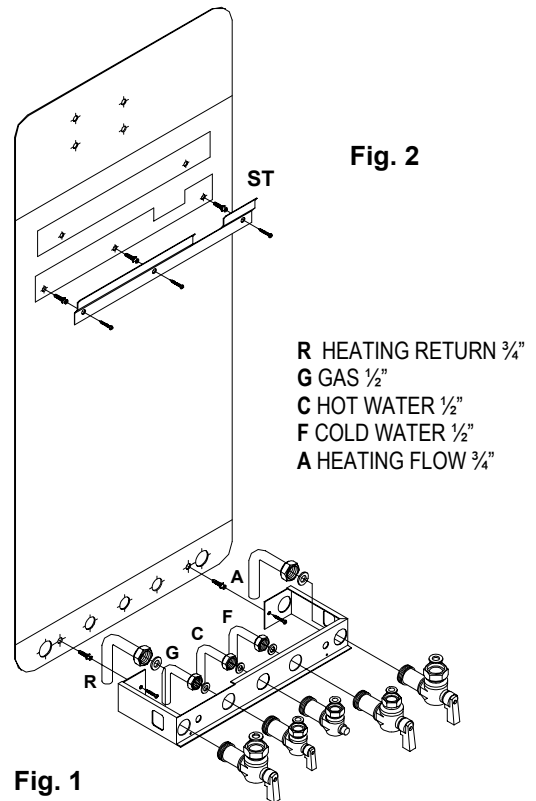
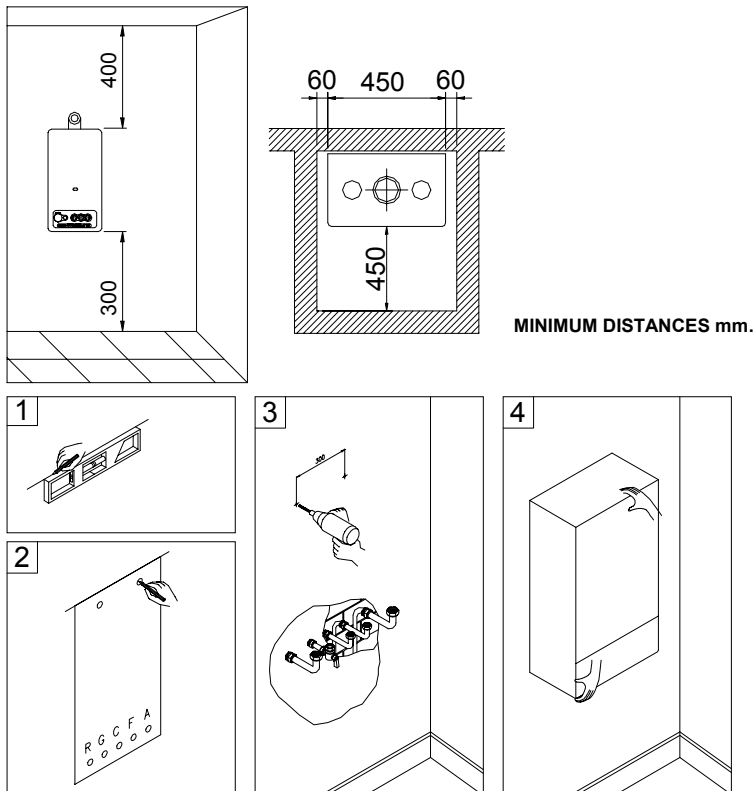
## TERMINAL POSITION



**Fig. 1**

A	Directly below an openable window, air vent or any other ventilation opening	300 mm (12in)
B	Below guttering, drain pipes or soil pipes	75 mm (3in)
C/D	Below eaves, balconies or carport roof	200 mm (8in)
E	From vertical drain pipes or soil pipes	75 mm (3in)
F	From internal or external corners	300 mm (12in)
G	Above adjacent ground, roof or balcony level	300 mm (12in)
H	From a surface facing the terminal	600 mm (24in)
I	From a terminal facing the terminal	1200 mm (48in)
J	From an opening in the carport (eg door, window) into the dwelling	1200 mm (48in)
K	Vertically from a terminal on the same wall	1500 mm (60in)
L	Horizontally from a terminal on the same wall	300 mm (12in)
M	Adjacent to opening	300 mm

## MINIMUM DISTANCES FOR FIXING TO WALL



To allow access in the boiler for maintenance operations, the minimum distances shown below must be respected (fig. 1):

To facilitate installation, the boiler is supplied with a template for advance location of connections to pipes. In this way, you may simply hook up the boiler when wall work is completed (fig.2).

### Installation Instruction

- 1) With a spirit level, draw a line on the wall on which the boiler will be installed (fig. 1).
- 2) Position the top of the template on the line drawn with the spirit level (respecting the distances – see fig. 1) than mark the three points for insertion of the 3 screw anchors or wall anchors for fixing the boiler hanging bracket. (choose proper anchors according to the wall type). Next, mark the two points for insertion of the two screw anchors for fixing the JIG to wall.
- 3) Fix the hanging bracket and the JIG.
- 4) Make connections to the hot and cold water supply, to the gas pipe and to the heating system with the fittings supplied with the boiler JIG. Connect pipes and valves as shown in the picture
- 5) Position the boiler paying attention to hang it to the hanging bracket (do not lean the boiler on the JIG) and make final connections.

### WATER CONNECTIONS

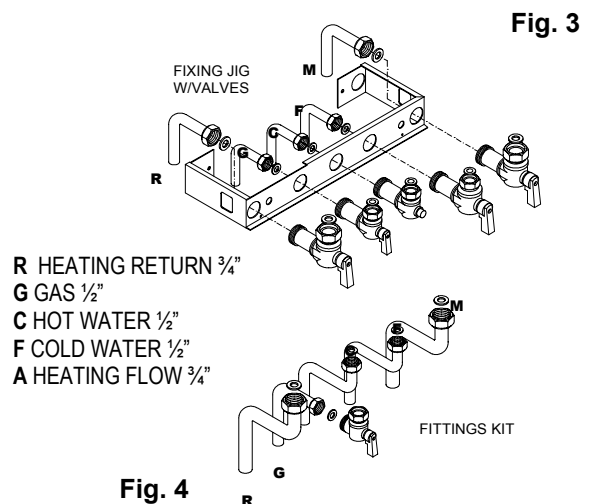
To facilitate installation, the boiler is equipped with a fittings kit (see fig. 3 and 4).

#### IMPORTANT:

*Before connecting the heating system pipes, carefully clean the system to prevent residual dirt from entering into circulation and negatively affecting boiler function. Install a funnel with discharge under the safety valve (calibrated to 3 bar) to collect water in case of leaking due to overpressure. No safety valve is needed for the domestic water circuit, but be sure that pressure does not exceed 6 bar.*

- avoid using pipelines of reduced diameter;
- avoid the use of tight bends and adapters in important sections;
- clean out the system thoroughly before connecting up the boiler in order to eliminate any residue left in the pipes and radiators.

**N.B.:** Make sure that the water and heating pipes are not used as earth connections for electrical apparatus.



## GAS CONNECTIONS

**The gas supply must be connected up by qualified person.**

The following standards must be complied with: UNICIG 7131/72 and UNICIG 7129/92 (of 21/04/93)

Before installing the boiler, make sure of the following:

- the pipeline must be of an adequate section and length to carry the flow required and must be fitted with all safety devices and measures prescribed by current norms;
- before turning on the boiler make sure the type of gas which it is designed to run on is available
- the gas supply pressure must lie within the values shown on the plate it is recommended that the gas supply pipeline should be checked for residual obstructions before installing the boiler;
- where the internal gas supply pipe meets the boiler, a gas shutter cock must be fitted which has the same diameter as the gas inlet pipe;
- check thoroughly that the gas inlets and outlets are properly sealed.
- conversion to allow the boiler to run on LPG to natural gas or vice versa must be carried out by a qualified gas fitter in accordance with law no.46 of 5th March '90 (see p.18).

## ANTI-FREEZE SYSTEM

### ANTI-FROST SYSTEM

Radiant boilers are equipped with an Anti-Freeze system which comes into operation when the temperature falls to 5° C (Heating sensor) and 4° C (Hot water sensor) and protects the boiler down to -2°C external temperature.

To protect the internal Radiators, a room thermostat or remote control must be fitted.

NOTE: The frost system will only come into operation if the boiler is filled with water, and connected to a live gas supply, with electrical supply and boiler controls in the "ON" position (With the Main switch turned to Summer or Winter position) ) *and the gas supply turned on.*

### FOR THE INSTALLER

For boilers installed outdoors, where the temperature may drop below -2° degrees Centigrade, the system should be filled with antifreeze liquid by an authorised technician and a set of electrical heating elements should be fitted to protect the domestic hot water heat exchanger.

Table n°1

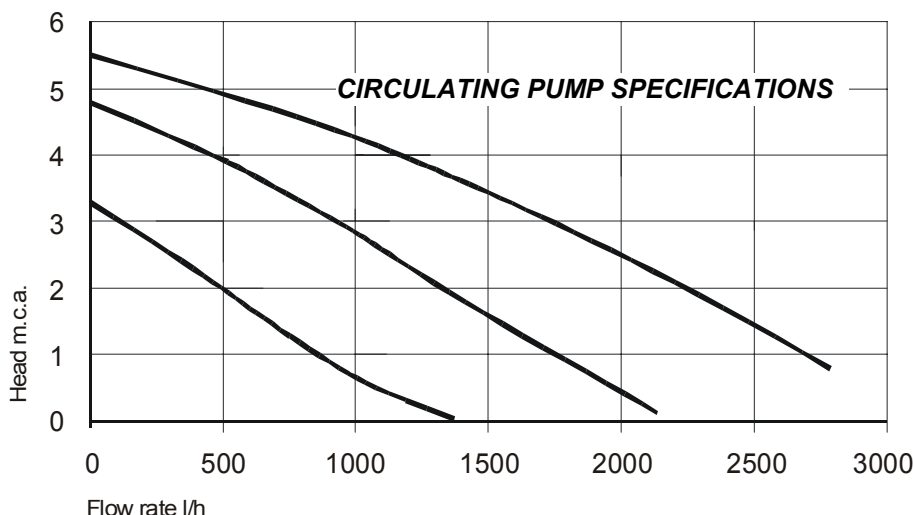
Antifreeze	Temperature	
Ethylene glycol (%) volume	freezing point (°C)	boiling point (°C)
10	- 4	101
20	-10	102
30	- 17	104
40	- 27	106
50	- 40	109
60	- 47	114

### ADVICE FOR THE SERVICE TECHNICIAN

If the boiler is out of service because it is frozen, check that no parts have been locked in position by ice before putting it into operation.

It is advisable to empty the boiler and the system in case of no operation for a long period.

*Recommended percentage of glycol for temperatures down to - 8°C is 20%. The antifreeze liquid used must be of a good make and in a solution which has already been diluted to avoid the risk of uncontrolled dilution.*



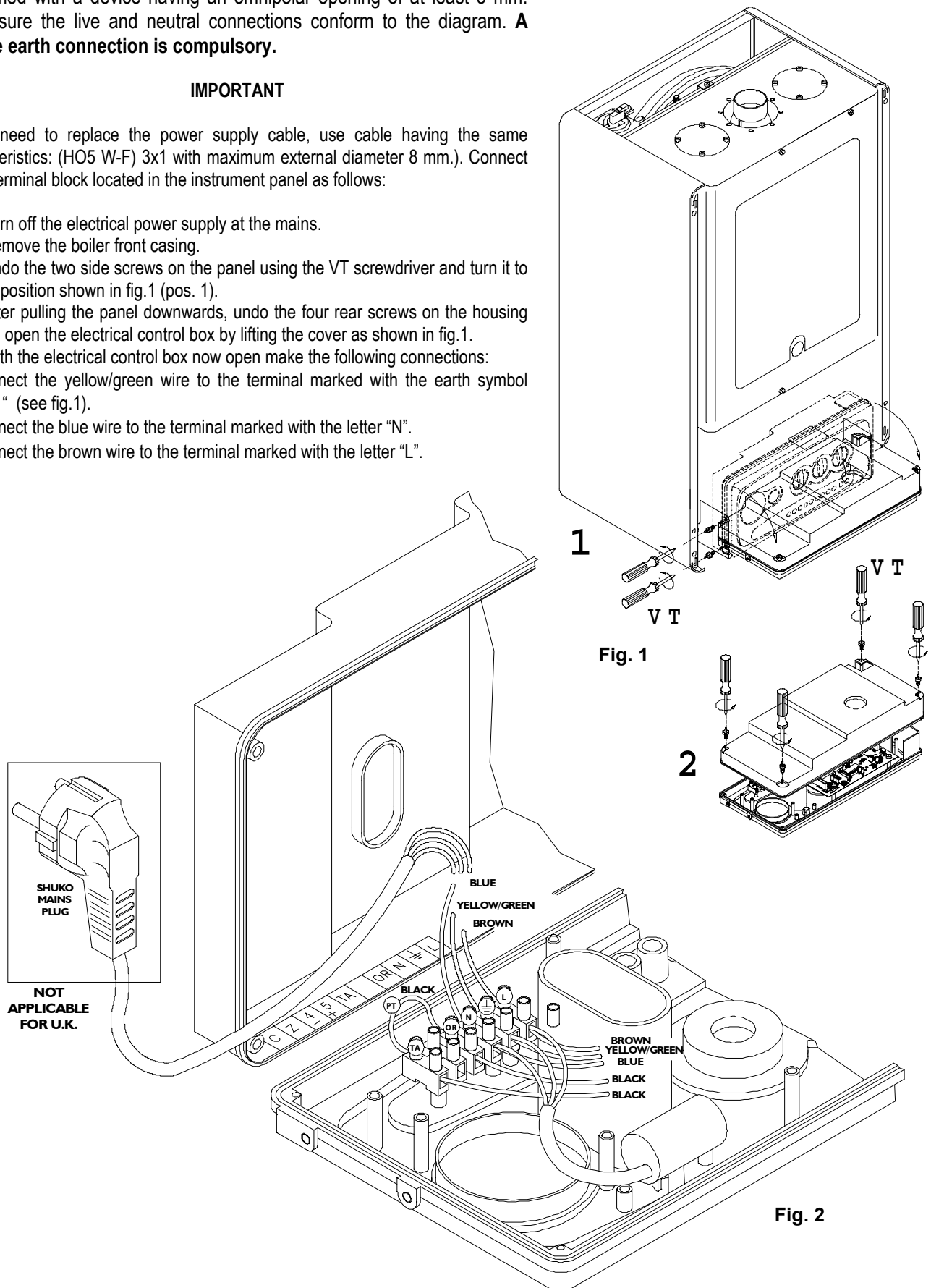
## ELECTRICAL CONNECTIONS

The boiler works with 230 V 50 Hz AC current and has maximum input of 170 W. Connection to the electrical mains must be performed with a device having an omnipolar opening of at least 3 mm. Make sure the live and neutral connections conform to the diagram. **A secure earth connection is compulsory.**

### IMPORTANT

If you need to replace the power supply cable, use cable having the same characteristics: (HO5 W-F) 3x1 with maximum external diameter 8 mm.). Connect to the terminal block located in the instrument panel as follows:

- A. Turn off the electrical power supply at the mains.
- B. Remove the boiler front casing.
- C. Undo the two side screws on the panel using the VT screwdriver and turn it to the position shown in fig.1 (pos. 1).
- D. After pulling the panel downwards, undo the four rear screws on the housing and open the electrical control box by lifting the cover as shown in fig.1.
- E. With the electrical control box now open make the following connections:
  - Connect the yellow/green wire to the terminal marked with the earth symbol " $\perp$ " (see fig.1).
  - Connect the blue wire to the terminal marked with the letter "N".
  - Connect the brown wire to the terminal marked with the letter "L".



## CONNECTION OF ROOM THERMOSTAT

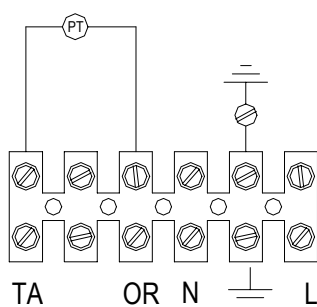
**NOTE:** use class II room thermostats only.

The thermostat wire must not be placed in the channel containing high tension wires, but must have its own line  
The room thermostat lead must not exceed 50m in length; minimum section 0.5 mm.

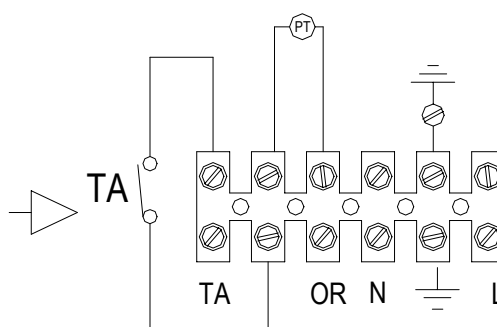
**Connection:** after carrying out the operations described on page 15, proceed as follows:

- Insert the room thermostat lead into the entry point on the electrical control box along with all the other leads on the boiler.
- Move the bridge **PT** (see fig.1) from terminal **TA** to the free one next to it.
- Insert the thermostat wires (fig.2) one in terminal **TA** and the other in the one next to it occupied by bridge **PT** which you have just moved.

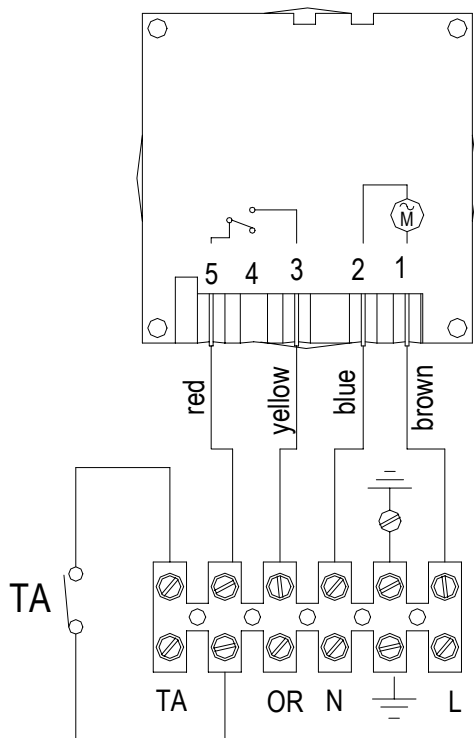
If a timer is fitted as well as a room thermostat, carry out the electrical connections for the timer according to the indications in figures 3 (time clock + room thermostat) and 4 (time clock only).



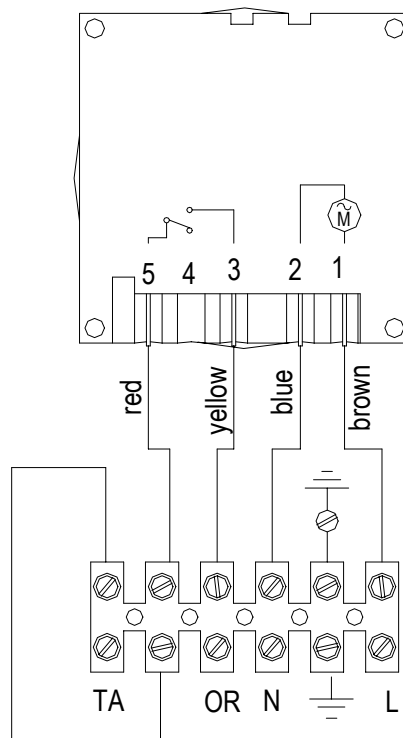
**Fig. 1**



**Fig. 2**



**Fig. 3**



**Fig. 4**



## CONTROL PANEL

LEGEND (see fig. 1)

1. SUMMER-WINTER ON-OFF SWITCH
2. LOCK-OUT INDICATOR
3. HEATING TEMPERATURE ADJUSTMENT KNOB
4. WATER TEMPERATURE ADJUSTMENT KNOB
5. SPACE FOR ADDING AN OPTIONAL TIMER

SELF-DIAGNOSTIC LEGEND (see fig. 2)

6. OPERATING/ POWER INDICATOR
7. DOMESTIC HOT WATER OPERATION
8. HEATING OPERATION
9. FLASHING LIGHT DENOTING AIR PRESSURE SWITCH FAILURE
10. FLASHING LIGHT DENOTING DOMESTIC WATER SENSOR FAILURE
11. FLASHING LIGHT DENOTING HEATING SENSOR FAILURE
12. FLASHING LIGHT DENOTING 90° C MAX TEMPERATURE SENSOR FAILURE
13. FLASHING LIGHT DENOTING FLUE SAFETY - THERMOSTAT FAILURE
14. FLASHING LIGHT DENOTING LACK OF WATER IN SYSTEM
15. WATER PRESSURE LEVEL 1 BAR
16. WATER PRESSURE LEVEL 1.5 BAR
17. ELECTRONIC TEMPERATURE INDICATOR

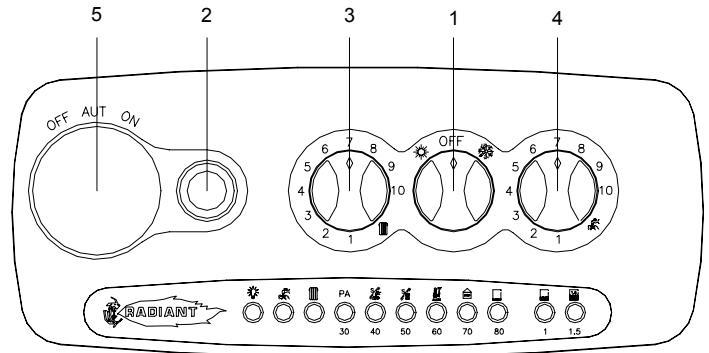


Fig. 1

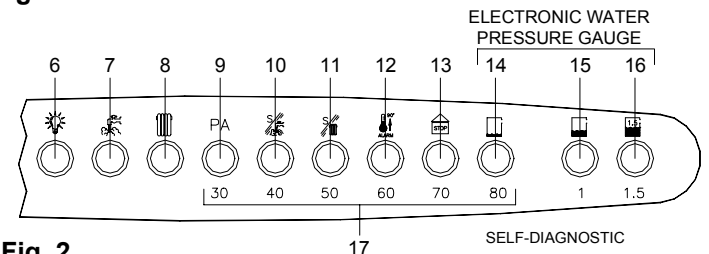


Fig. 2

## STARTING UP THE BOILER

After connecting up the water supply, before starting up the boiler, carry out the following procedures:

### Preliminary procedure

- Do as follows:
- make sure the power supply for the boiler is the same as that stated on the plate (230V - 50Hz) and that the live, neutral and earth connections have been properly connected;
- make sure the type of gas being supplied is the same as the type for which the boiler has been tested and approved (see plate data);
- make sure the unit is properly earthed;
- make sure there are no flammable liquids or materials in the immediate vicinity of the boiler;
- make sure that any shut-off valves in the heating circuit are open;
- open the gas cock and check the gas seals, making sure the counter shows no sign of leaks; in any case, double check by using a soapy solution and eliminate all eventual leaks. The checking procedure for the gas burner attachment is carried out with the boiler working;
- make sure the electrical mains switch is OFF;
- remove the front cover by pulling it forwards;
- undo the side screws and rotate the panel downwards

### Filling the system

After making sure the gas cock is closed, fill the heating system as follows;

- fill the system until a pressure of 1.5 bar has been reached (light no. 16 ON; see fig. 2) and then close the filling tap located under the boiler;
- make sure the cap on the auto air vent valve is slightly loose to allow air to escape from the system (see fig. 1 pag. 13);
- undo the cap on the circulation pump to eliminate any eventual air locks (see fig. 1 pag. 13). Undo the valve on the heat exchanger and then close it again as soon as water appears (see fig. 2 pag. 13); it is a good idea to purge all radiators of air at this point too;
- before starting up the boiler the water pressure must be checked again; if this is seen to be below 0.5 bar (light no. 14 flashes; see fig. 2), bring it back up to 1.5 bar (light no. 16 ON; see fig. 2) **and then close the filling tap** located under the boiler;
- switch on the electrical power supply to the boiler;
- turn selector switch 1 to the WINTER ❄ position (see fig. 1), after a few seconds the pump will come into action;
- once the boiler is working, if any noises are heard in the system, repeat the above air purging procedures until there is no air left in the system;
- turn on a hot water tap briefly;
- if any noises are heard, loosen the valve on the heat exchanger (see fig.2 pag. 13) and close it again as soon as water appears;
- check there are no obstructions in the exhaust duct;

- check the pressure in the system: if this has gone down and LED 16 (see fig. 2) comes on (pressure gauge shows 1.5 bar) restore pressure;
- **close the filling tap once this operation is completed;**

#### Filling the system (only for U.K. and Ireland)

After making sure the gas cock is closed, fill the heating system as follows;

- fill the system until a pressure of 1.5 bar has been reached (light no. 16 ON; see fig. 2 pag. 12) and then close the tap on the filling loop;
- make sure the cap on the auto air vent valve is slightly loose to allow air to escape from the system (see fig. 1);
- undo the cap on the circulation pump to eliminate any eventual air locks (see fig. 1). Undo the valve on the heat exchanger and then close it again as soon as water appears (see fig. 2); it is a good idea to purge all radiators of air at this point too;
- before starting up the boiler the water pressure must be checked again; if this is seen to be below 0.5 bar (light no. 14 flashes; see fig. 2 pag. 12), bring it back up to 1.5 bar (light no. 16 ON; see fig. 2 pag. 12) **and close the tap on the filling loop**
- switch on the electrical power supply to the boiler;
- turn selector switch **1** to the WINTER ❄ position (see fig. 1 pag. 12), after a few seconds the pump will come into action;
- once the boiler is working, if any noises are heard in the system, repeat the above air purging procedures until there is no air left in the system;
- turn on a hot water tap briefly;
- if any noises are heard, loosen the valve on the heat exchanger (see fig.2) and close it again as soon as water appears;
- check there are no obstructions in the exhaust duct;
- check the pressure in the system: if this has gone down and LED 16 (see fig. 2 pag. 12) comes on (pressure gauge shows 1.5 bar) restore pressure;
- **close the tap on the filling loop once this operation is completed;**

#### Starting up the boiler

- open the gas cock;
- turn on the boiler;
- set selector switch **1** to either the ☀ summer or ❄ winter symbols (see fig.1 pag. 12); make sure that no. **6** light is ON (see fig. 2 pag. 12). The automatic ignition system will turn the burner on. It may be necessary to repeat the procedure a few times to purge air from the pipes. To repeat the ignition procedure press release button **2** (see fig.1 pag. 12) and then try the ignition procedure once again. If the boiler does not start, press the reset button **2** (see fig. 1 pag. 12). **IMPORTANT** should the boiler fail to ignite **wait 3 minutes** before pressing button again.
- turn selector switch **1** to the «off» position (see fig. 1 pag. 12), insert a gauge into the pressure point (see fig. 4 pag. 15; pos. no. 4), turn on the boiler and check the minimum and maximum calibration pressures of the modulator in accordance with those stated on the gas plate; (to check the maximum modulation pressure of the modulator, turn on a hot water tap and check that the maximum pressure is equal to that stated on the plate; to check the minimum, undo one wire from the modulator coil and check on the gauge that the minimum pressure is equal to that stated on the plate; if the maximum pressure is not the same as stated on the plate, calibrate the modulator again;
- once the calibration procedure has been completed, unplug the mains lead or turn off the mains switch, close the gas cock and remove the gauge from the pressure point; tighten the screw making sure there are no gas leaks;
- after carrying out this operation, return the panel to its correct position and put the front casing back.

#### CHECK the maximum heating power.

For procedure regarding regulation of the heating system thermal capacity see «BOILER ADJUSTMENTS» on pag. 14.

#### EMPTYING THE CENTRAL HEATING SYSTEM

Whenever it is necessary to empty the system, proceed as follows:

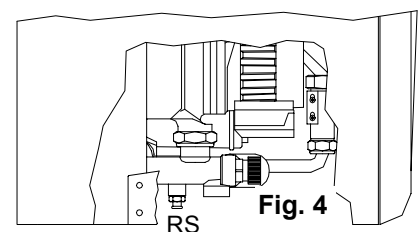
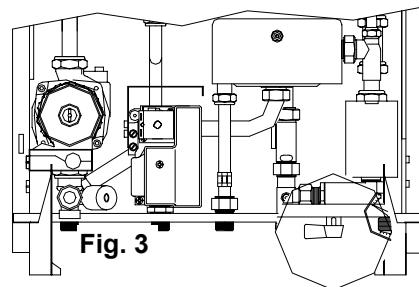
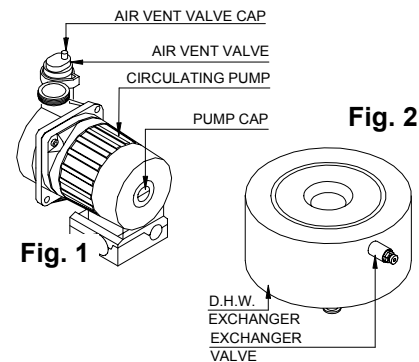
- turn off the main power supply switch;
- wait for the boiler to cool down;

turn the system drain tap **RS** (see fig. 4) and use a container to collect the water that runs out;

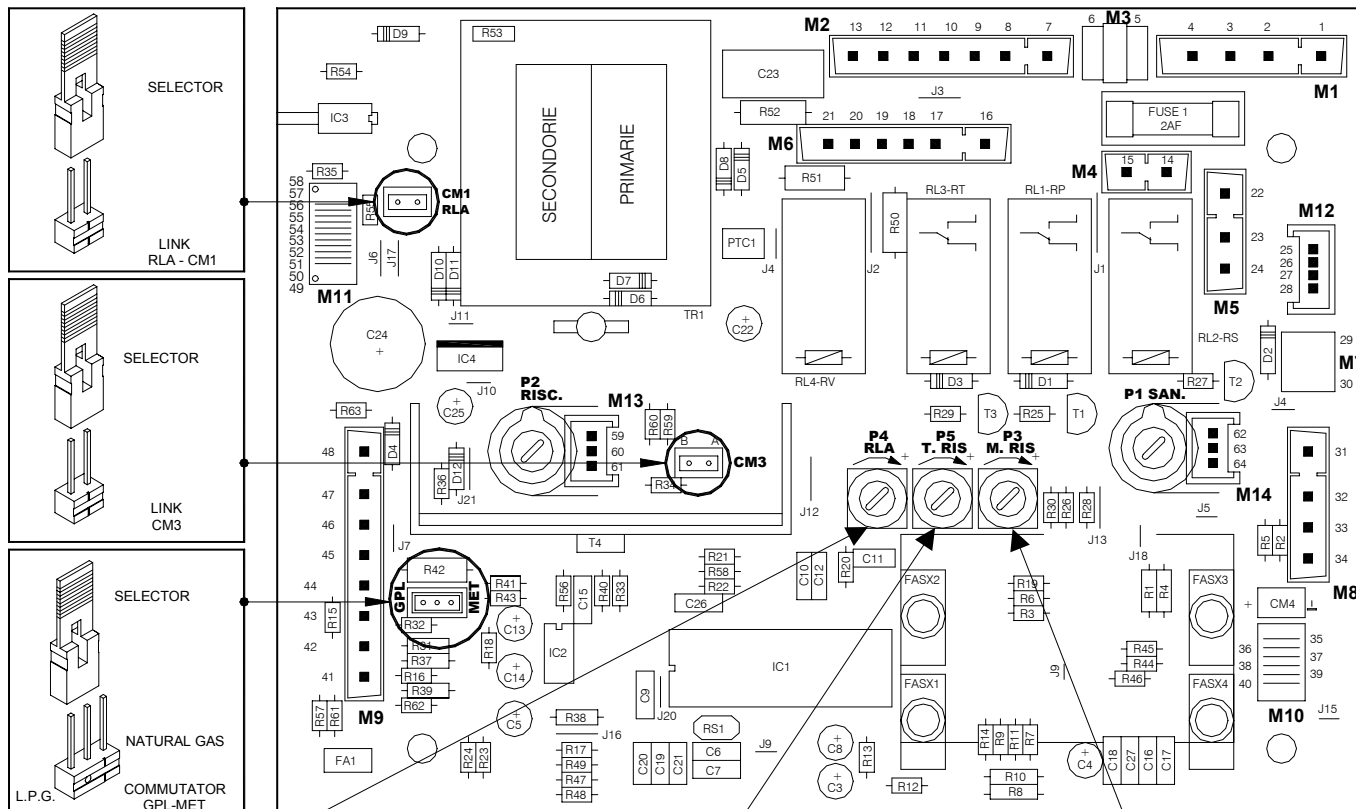
#### EMPTYING THE DOMESTIC HOT WATER SYSTEM

Whenever there is danger of freezing, the hot water system should be emptied in the following way:

- shut off the water at the mains;
- open all hot and cold water taps;
- empty from the lowest point (where possible).



## BOILER ADJUSTMENTS



### STARTING STEP RLA P4

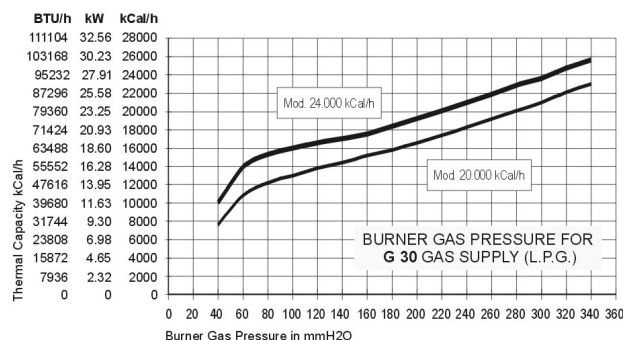
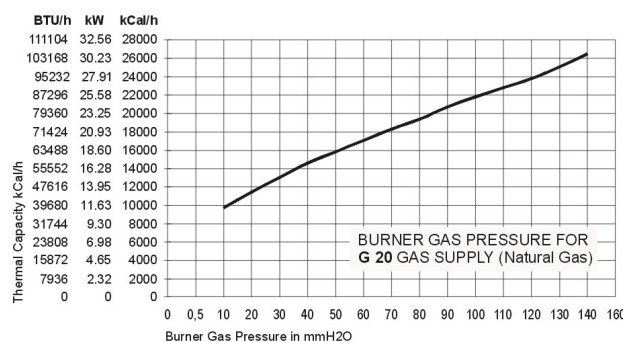
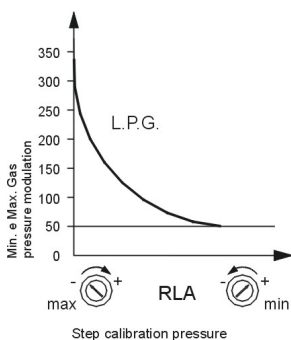
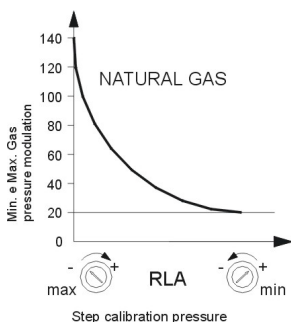
This trimmer is a slow ignition regulator and it is calibrated at minimum during factory test. Use a small screwdriver for any adjustments. Turn clockwise to increase gas pressure to the burner at start-up (by setting the trimmer to maximum calibration pressure of modulator – see page 16). Turn counter-clockwise to decrease gas pressure to the burner at start-up (by setting the trimmer to the minimum pressure at start-up will correspond to minimum calibration pressure of modulator – see page 16). Through the RLA commutator you can verify the minimum gas pressure adjusted to the modulator. Remove the commutator from the MET-GPL selector located on the RAMIRE 2 circuit board and insert it on the RLA CM1 selector located on the same circuit board. Once pressure on the gauge has been checked, remove the commutator and insert it on the MET-GPL selector.

### HEATING TIMER

Delays start-up times of the various ignitions once the boiler has reached optimum temperature (the range of adjustment is from 0 to 6 minutes, the value set during testing at the factory, to 2.5 min.) Use a screwdriver to adjust the delay time. Turn clockwise to increase time and counter-clockwise to decrease time down to zero.

### MAXIMUM HEATING TRIMMER.

The trimmer is calibrated at 80% of the max. rated output during factory testing. For the first ignition of the boiler, adjust according to heating power of the system. Use a screwdriver to adjust it. Turn clockwise to increase, counter-clockwise to decrease.



## CONVERSION OF GAS TYPE

Conversion of the boiler from natural gas to LPG and vice versa must be performed by qualified personnel only. Conversion is performed as follows:

- a) turn off the main power switch;
- b) close the gas cock;
- c) substitute the jets on the main burner as follows:

- undo the gas pipe 5 (fig.1) from the burner manifold using a size 24 spanner;
- separate the burner manifold 2 from the burner ramps 1 by undoing the 4 screws 3 using a Philips screwdriver;
- fit new jets 4 to the burner suitable for the type of gas the boiler will run on using a no. 7 spanner. The jets must be fitted with new gaskets;

- reassemble the entire burner unit. Use the soapy water method to check for gas leaks each time gas connections are dismantled and reassembled;

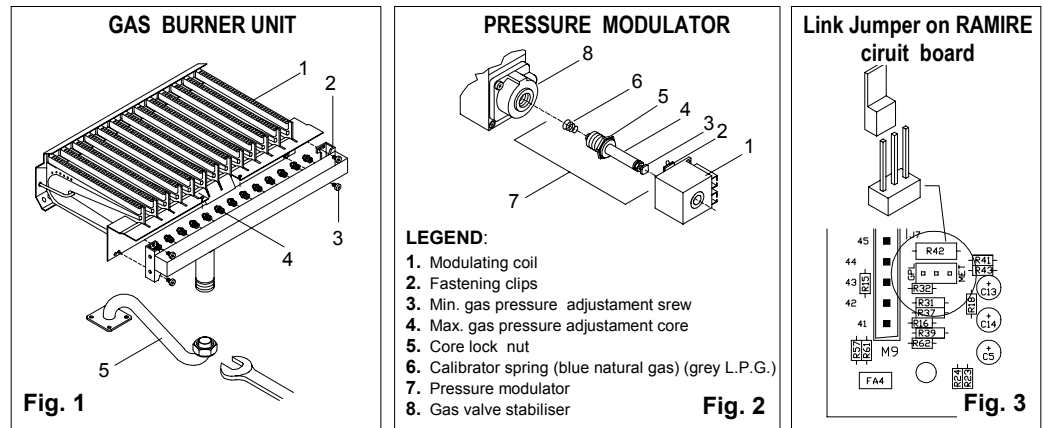
d) change the spring 6 (fig.2) to suit the type of gas used. The spring is located inside the stabiliser in the gas valve 8. To change the spring, open the fastening clips 2 and, after unhooking the coil 1, remove the modulator core 7 and change the spring; once this has been done reassemble everything;

e) move the jumper on the circuit board to suit the type of gas (fig.4).

f) on boilers with pilot flame ignition, the pilot flame jet 6 (fig.3) must be changed to suit the type of gas used; undo fixing nut 8 on the thin aluminium gas pipe 9 and change the jet;

g) replace the gas setting plate that indicates the type of gas and nominal pressure for the boiler. When converting the boiler to work with a different type of gas, remove the existing plate and replace it with the new one supplied in the conversion kit.

h) calibrate the new max. and min. settings for the modulator.



## REGULATING THE GAS PRESSURE

Maximum and minimum modulation pressures.

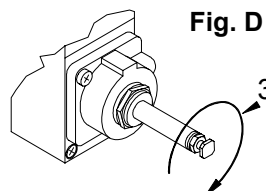
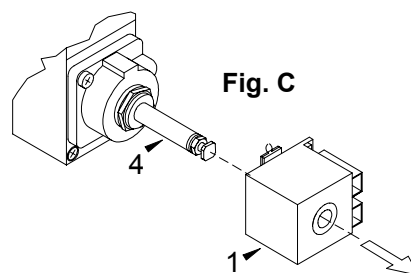
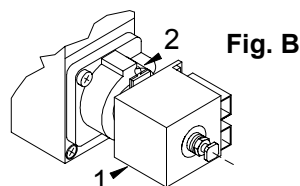
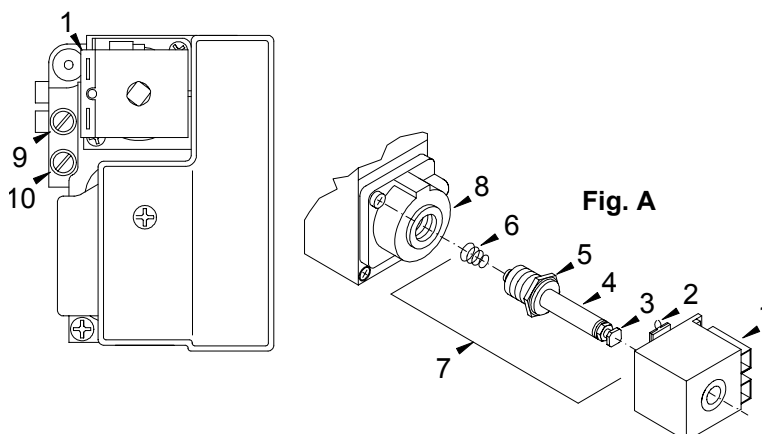
N.B. The following operations must only be carried out by authorised personnel and are necessary when the boiler is converted to run on one type of gas or another or also in cases where the maximum pressure is not the same as that shown on the plate.

Calibration pressure.

Boiler Power Rating		Natural Gas		L.P.G.	
		Min.	Max.	Min.	Max.
20.000 kcal/h	mm. H <sub>2</sub> O	20	110	50	290
24.000 kcal/h	mm. H <sub>2</sub> O	42	130	50	310

**KEY:** (see fig. A)

- 1) Modulating coil
- 2) Fastening clips
- 3) Min. gas pressure adjustment screw
- 4) Max gas pressure adjustment core
- 5) Core lock nut
- 6) Calibrator spring
- 7) Modulator core
- 8) Gas valve stabiliser

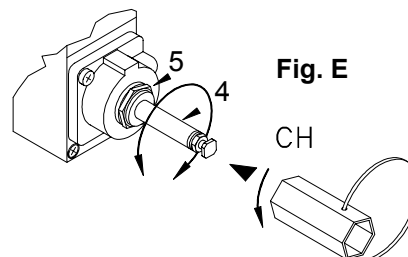


**Fig. B)** Widen locking clips (2);

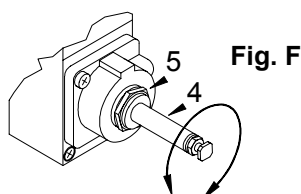
**Fig. C)** Slide out the coil (1) located above the gas valve;

**Fig. D)** Tighten plastic screw (3) by turning it clockwise, be careful not to break it.

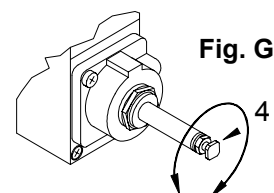
**Fig. E)** Use a no.17 spanner to undo the lock nut (5) which holds the core (4) of the coil in place; undo the screw and insert a pressure gauge;



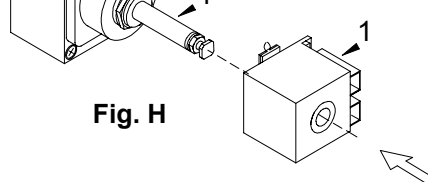
**Fig. F)** Turn on the boiler, regulate the maximum pressure by turning the core (4) (clockwise to increase pressure, counter clockwise to decrease). Once maximum pressure has been set, tighten the lock nut (5);



**Fig. G)** Adjust minimum modulation pressure with the coil disengaged: slowly unscrew plastic screw (3) until the pressure gauge shows the minimum pressure required.



**Fig. H)** Once these operations are completed, seal the plastic screw with paint or enamel; reassemble the coil (1) by pressing it back into place; remove the gauge, tighten the screw and use a soapy solution to check for any eventual leaks.



## TECHNICAL DATA

### DIFFERENTIAL AIR PRESSURE SWITCH FOR FAN CONTROL

To guarantee maximum safety in flue exhaust, a differential pressure switch is installed on the Room Sealed Combustion Chamber Model (wall-mounted, room-sealed boilers) and on forced draught boilers. This pressure switch automatically controls perfect functioning of the fan and the passage of both external air and exhaust flue pipes.

### FLUE SAFETY THERMOSTAT

Natural draught boilers model Open Combustion hamber Model are equipped with a device (see fig. 1) to control correct exhaust of combustion gases. This device guarantees maximum safety of operation if the flue should become partially or totally blocked, or if its section is not suitable for exhaust of combustion gases.

**N.B. It is strictly forbidden to tamper with the device.**

Before resetting the device, check the exhaust flue section and make sure there are no blockages obstructing the correct escape of fumes.

#### RESETTING:

before resetting the thermostat, carry out the following operations:

- turn off the main power supply switch;
- turn the summer-winter selector switch to the **OFF** position, detach the electrical connection (1) on the flue safety thermostat (see fig.1), press the button (2) between the two electrical contacts and then attach the electrical connection 1 again.;
- turn the main power supply switch on again and set the summer/winter selector switch to the position required.

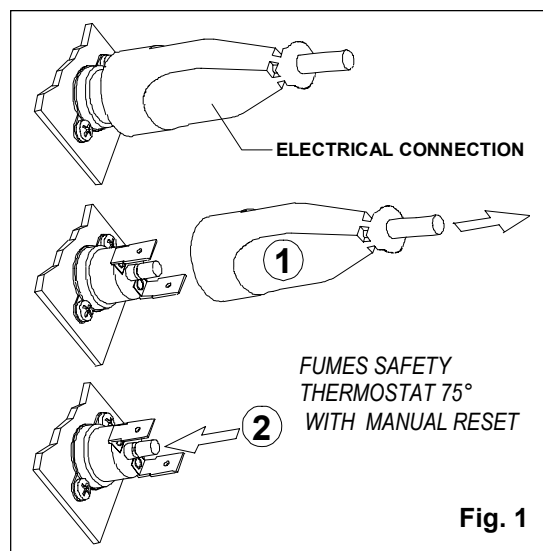


Fig. 1

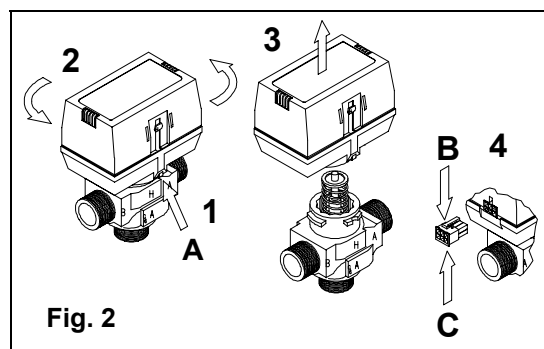


Fig. 2

### DIVERTER VALVE VC 6012MG6000

The diverter valve is the device which controls the boiler switching from central heating to d.h. water circuit and vice versa. The diverter valve is fitted with a manual command lever **C** (see fig. 3) which, when set on the top position, towards the valve head, allows the boiler operating on the domestic hot water circuit while, when set on the low position, the boiler operates on the central heating circuit.

When the **C** lever is set on the central position, it allows the actuator on midway.

In this position, *to be used only in case of motor failure or damage*, both central heating and domestic hot water ports are open and both domestic hot water and central heating circuits are operating.

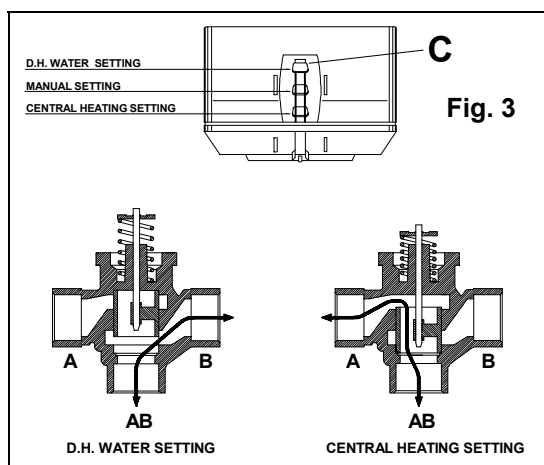


Fig. 3

To restore the initial position, separate the actuator and the valve body following instructions from no.1 to no.4 (see fig.2).

To separate the motor from the valve body proceed as follows (see fig.2):

1. Press button **A** under the motor.
2. Simultaneously keep the **A** button pressed and turn the actuator counter-clockwise;
3. Lift off the motor
4. To disconnect the power supply cable press the **B** tap located on the pin **C**.

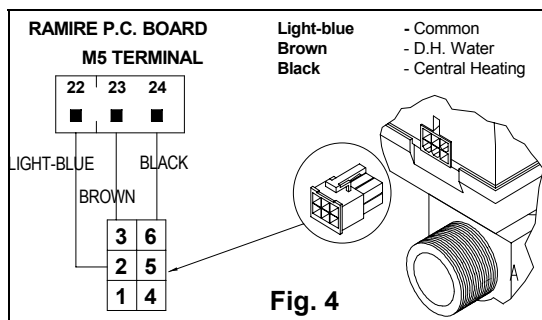


Fig. 4

See fig.4 to perform the electrical wiring of the diverter valve to the main printed circuit board.

## LIMITER

The boiler is equipped with a variable flow limiter at the cold water inlet. The flow limiter can be adjusted by turning the screw (see fig.2 pos. **C**) in order to obtain the correct flow rate of domestic hot water for the specific boiler output.

## FLOWSWITCH

This device gives precedence to domestic hot water and is fitted to boilers which supply instantaneous hot water (see fig.1 – fig. 2 pos. **B**). It allows conversion to hot water even with a minimum hot water demand (min. 2 litres), using an electromagnetic principle with electrical switching by means of a relay. The device is made of non-toxic, corrosion-proof ZYTEL 101 L plastic material which has type approval with non-toxic characteristics and is unaffected by hard water. In addition, a filter is fitted before the flowswitch and at the cold water inlet which eliminates any water impurities. These features guarantee that the flowswitch operation is highly efficient.

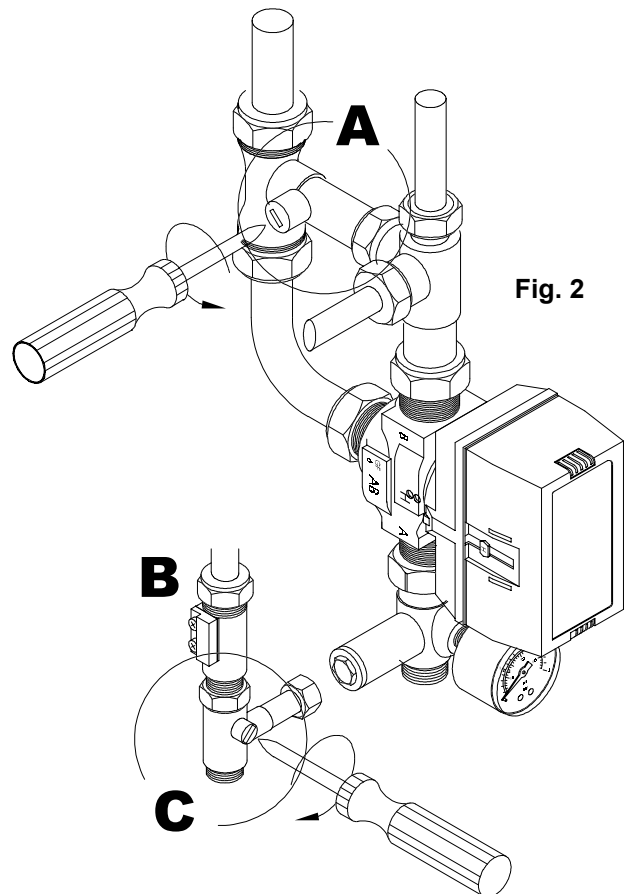
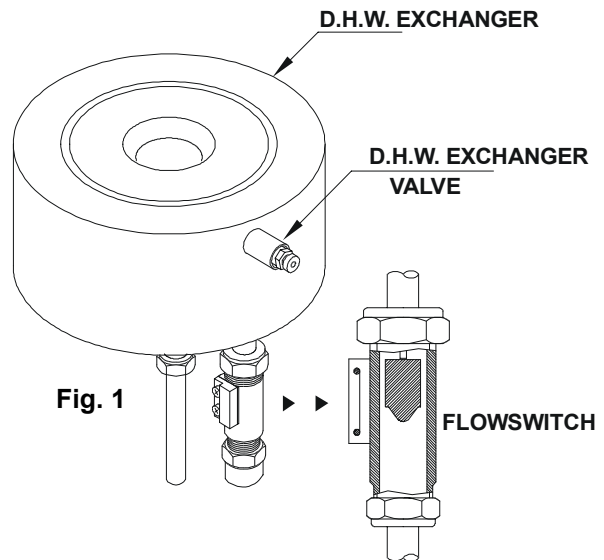
## BY-PASS

**All boilers are fitted with a by-pass. This element is essential in the following cases:**

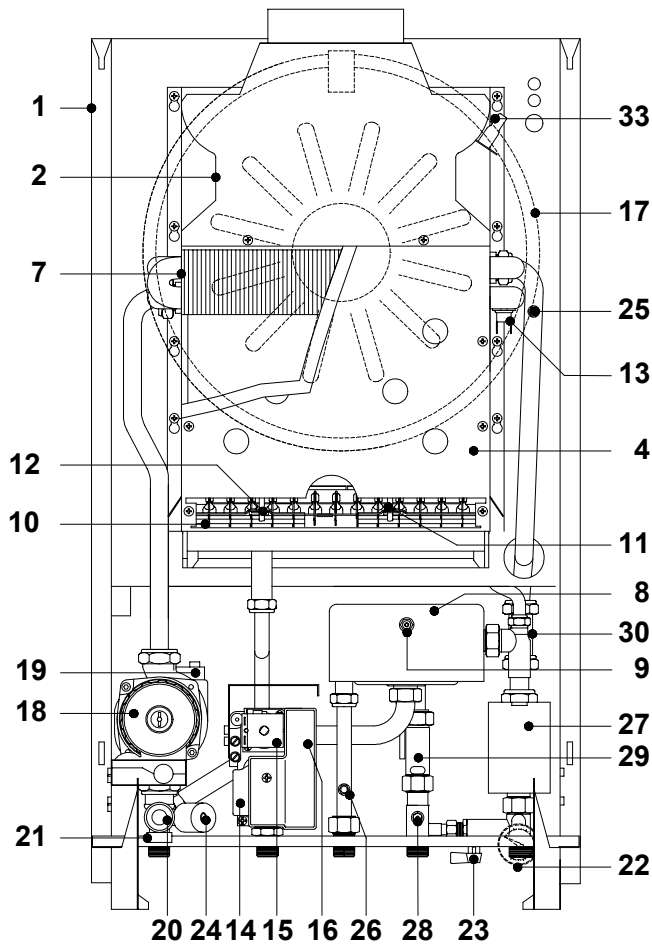
- if a two-way zone valve is installed
- if thermostat valves are installed in the radiators.

To adjust the by-pass proceed as follows (see fig.2 pos. **A**):

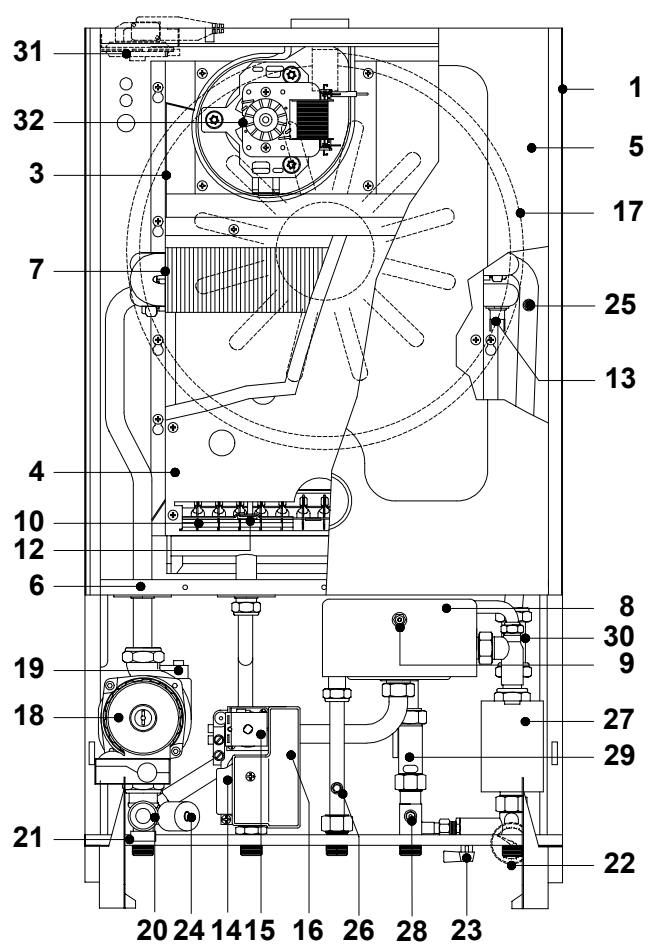
fit the screwdriver to the plastic screw of the by-pass, bearing in mind that when the slot of the screw is horizontal the by-pass is totally open, allowing all the water to pass, while when it is vertical the by-pass is totally closed. For partial by-pass flows, use the adjuster screw.



**mod. RCM 20 E**  
Open Combustion Chamber Model



**mod. RSF 20 E – RSF 24 E**  
Room Sealed Combustion Chamber Model



## KEY

1. FRAME
2. FLUE HOOD – OPEN COMBUSTION CHAMBER
3. FLUE HOOD – ROOM SEALED COMBUSTION CHAMBER
4. COMBUSTION CHAMBER
5. ROOM SEALED CHAMBER COVER
6. ROOM SEALED CHAMBER BACK
7. HEAT EXCHANGER Mod. 20.000  
HEAT EXCHANGER Mod. 24.000
8. D.H.W. EXCHANGER H20-H20 PB 21-73  
D.H.W. EXCHANGER H20-H20 PB 24-73
9. EXCHANGER AIR VENT VALVE
10. MULTIGAS BURNER WITH 13 RAMPS
11. IGNITION ELECTRODE
12. FLAME IONISATION ELECTRODE
13. HEATING SAFETY THERMOSTAT
14. ELECTRONIC GAS VALVE VK4105 A 1001
15. GAS PRESSURE MODULATOR
16. ELECTRONIC IGNITION BOARD
17. EXPANSION VESSEL
18. 3-SPEED CIRCULATION PUMP WITH AIR VENT

19. AUTOMATIC AIR VENT
20. HEATING CIRCUIT 3 bar PRESSURE RELIEF VALVE
21. DRAINING TAP
22. WATER PRESSURE GAUGE
23. FILLING TAP (*Not for U.K. and Ireland*)
24. WATER PRESSURE SWITCH
25. HEATING SENSOR
26. HOT WATER SENSOR
27. 3-WAY DIVERTER VALVE
28. FLOWSWITCH CONNECTION WITH FLOW LIMITER
29. ELECTRONIC FLOWSWITCH
30. BY-PASS
31. AIR PRESSURE SWITCH
32. FAN
33. FLUE SAFETY THERMOSTAT

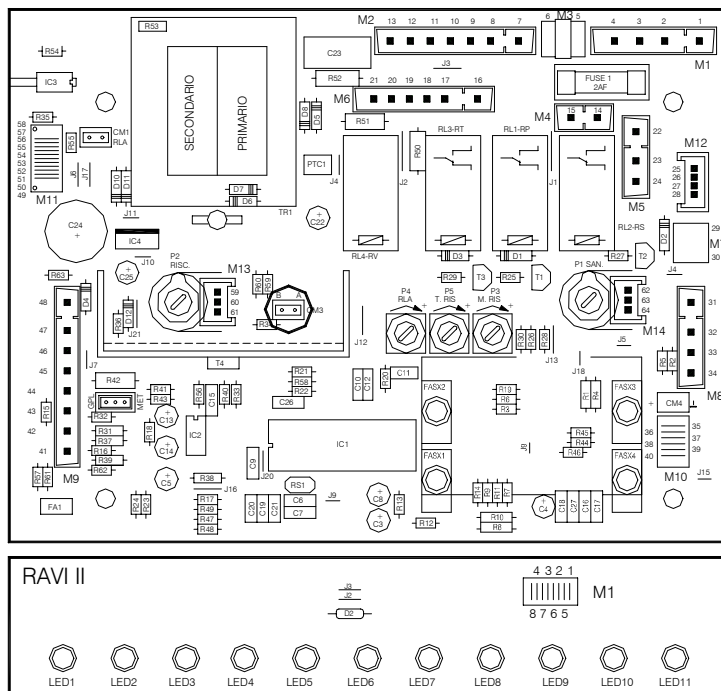
## COMPONENTS INSIDE THE INSTRUMENT PANEL

MAIN PRINTED CIRCUIT BOARD (P.C.B.)  
TEMPERATURE INDICATOR P.C.B.



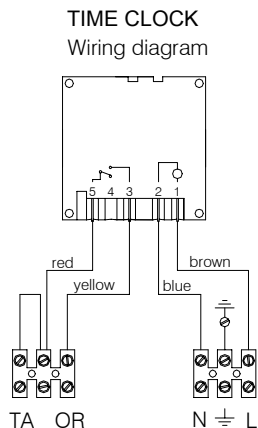
# ELECTRICAL CONNECTION FOR OPEN COMBUSTION CHAMBER ELECTRONIC IGNITION BOILER – mod. RCM 20 E

RAMIRE 3 CIRCUIT BOARD STANDARD ON ALL MODELS

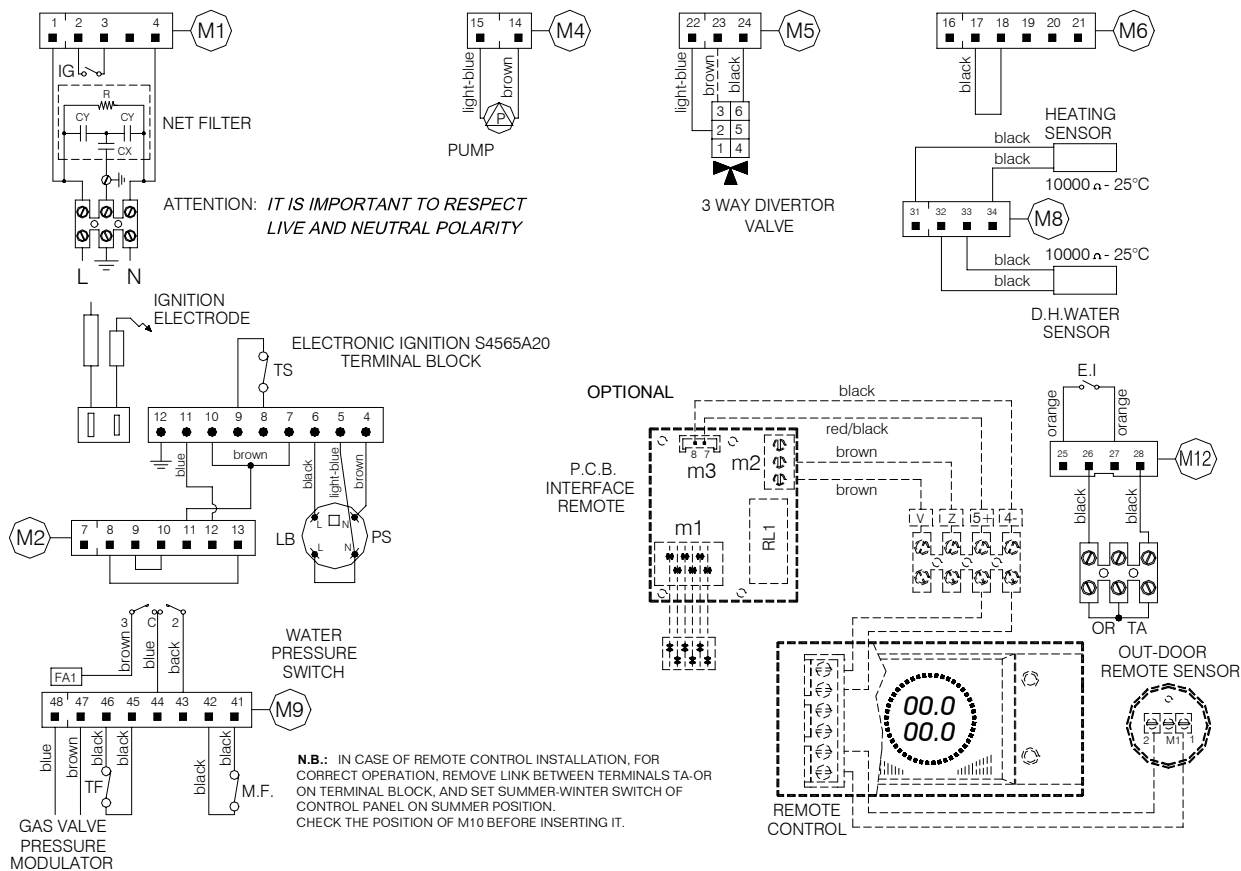


RAVI 2 CIRCUIT BOARD-ELECTRONIC TEMPERATURE INDICATOR WITH SELF-DIAGNOSTIC

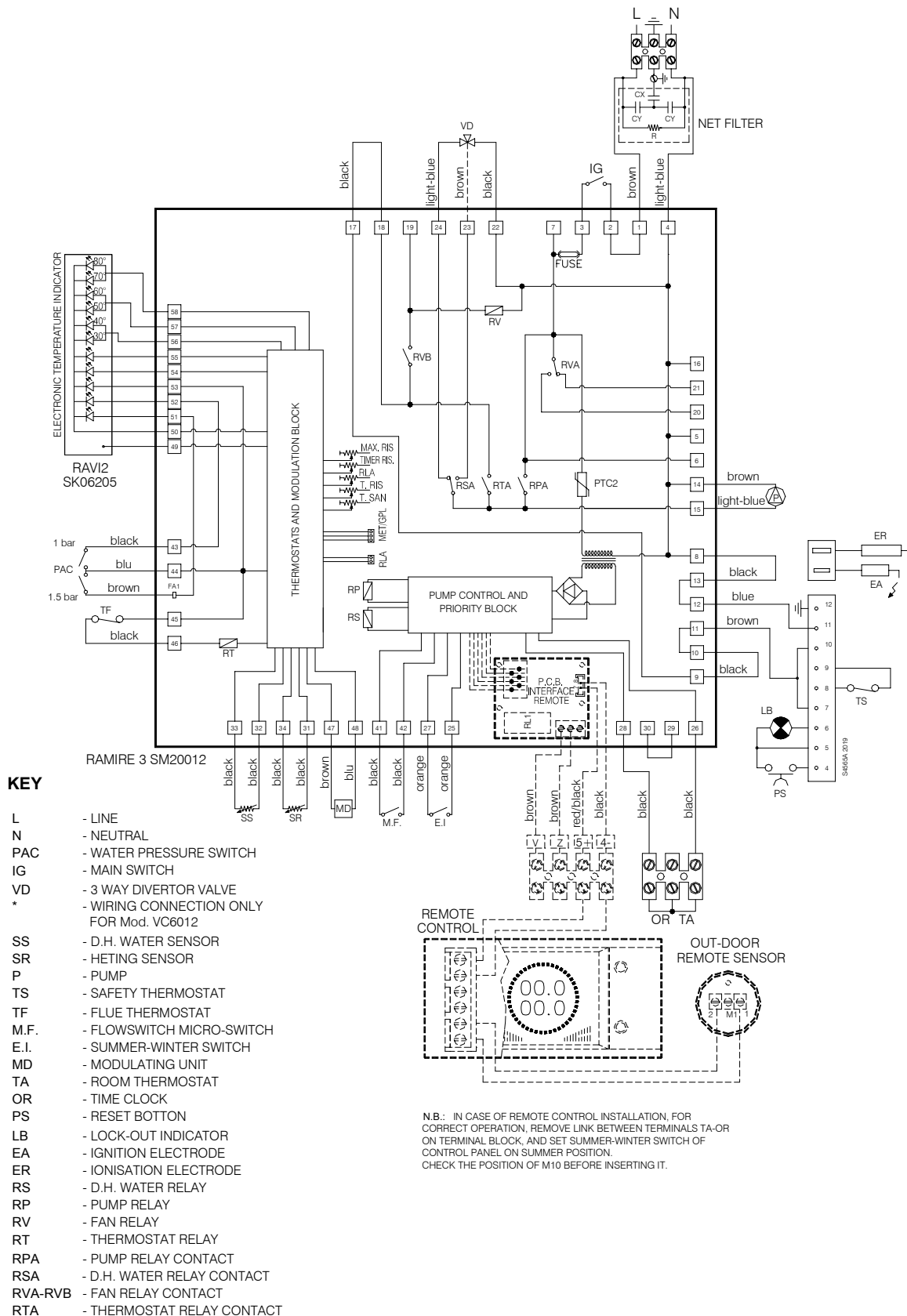
N.B. M1 CONNECTOR OF THE RAVI 2 CIRCUIT BOARD MUST BE CONNECTED TO THE M11 CONNECTOR OF THE RAMIRE3 CIRCUIT BOARD.



## WIRING OF COMPONENTS BY MEANS OF CONNECTORS



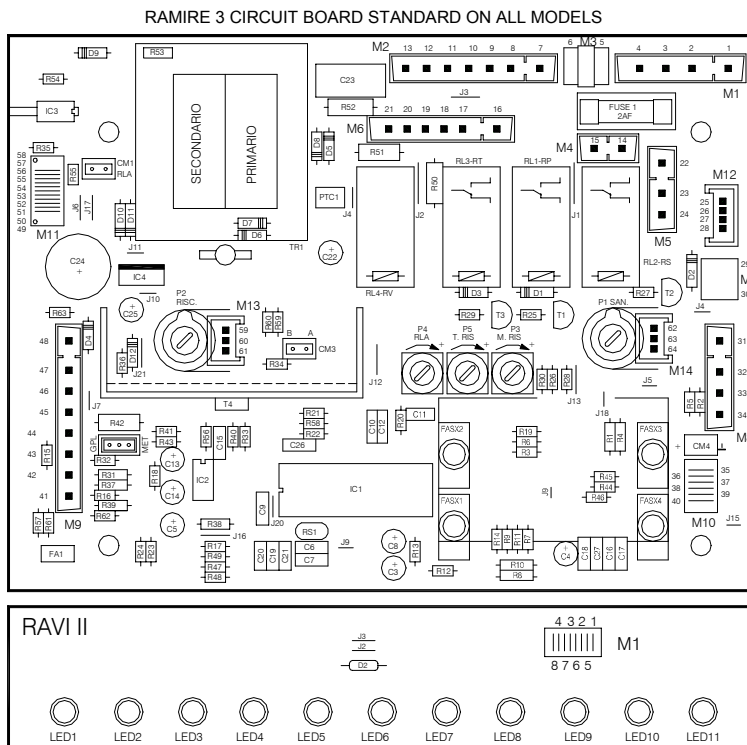
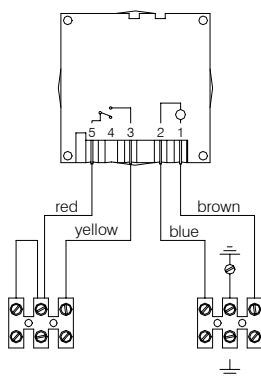
## WIRING DIAGRAM FOR OPEN COMBUSTION CHAMBER ELECTRONIC IGNITION BOILER – mod. RCM 20 E



# ELECTRICAL CONNECTION FOR ROOM SEALED COMB. CHAMBER ELECTRONIC IGNITION BOILER – mod. RSF 20 E - RSF 24 E

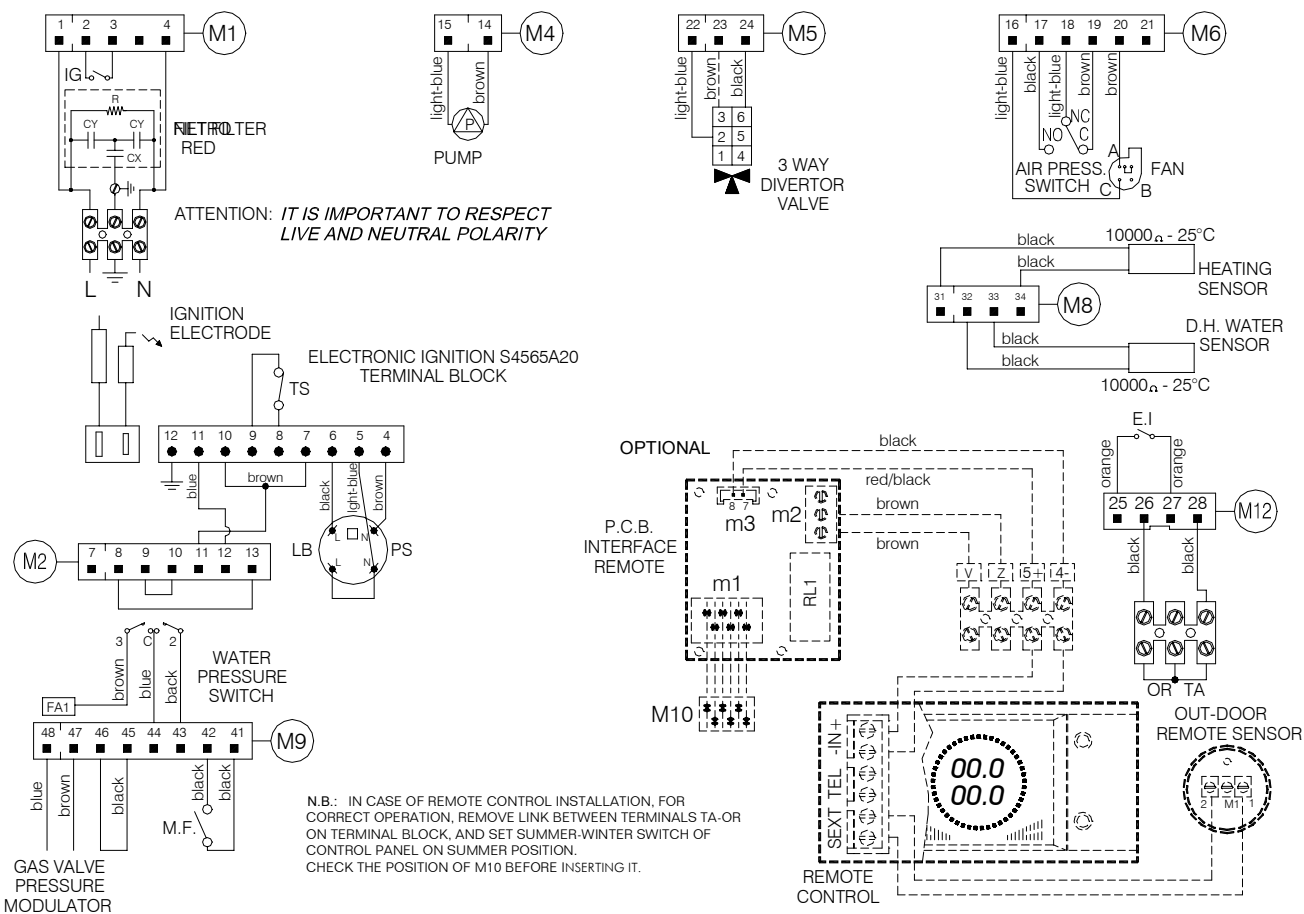
N.B. M1 CONNECTOR OF THE RAVI 2 CIRCUIT BOARD MUST BE CONNECTED TO THE M11 CONNECTOR OF THE RAMIRE 3 CIRCUIT BOARD.

TIME CLOCK  
Wiring diagram

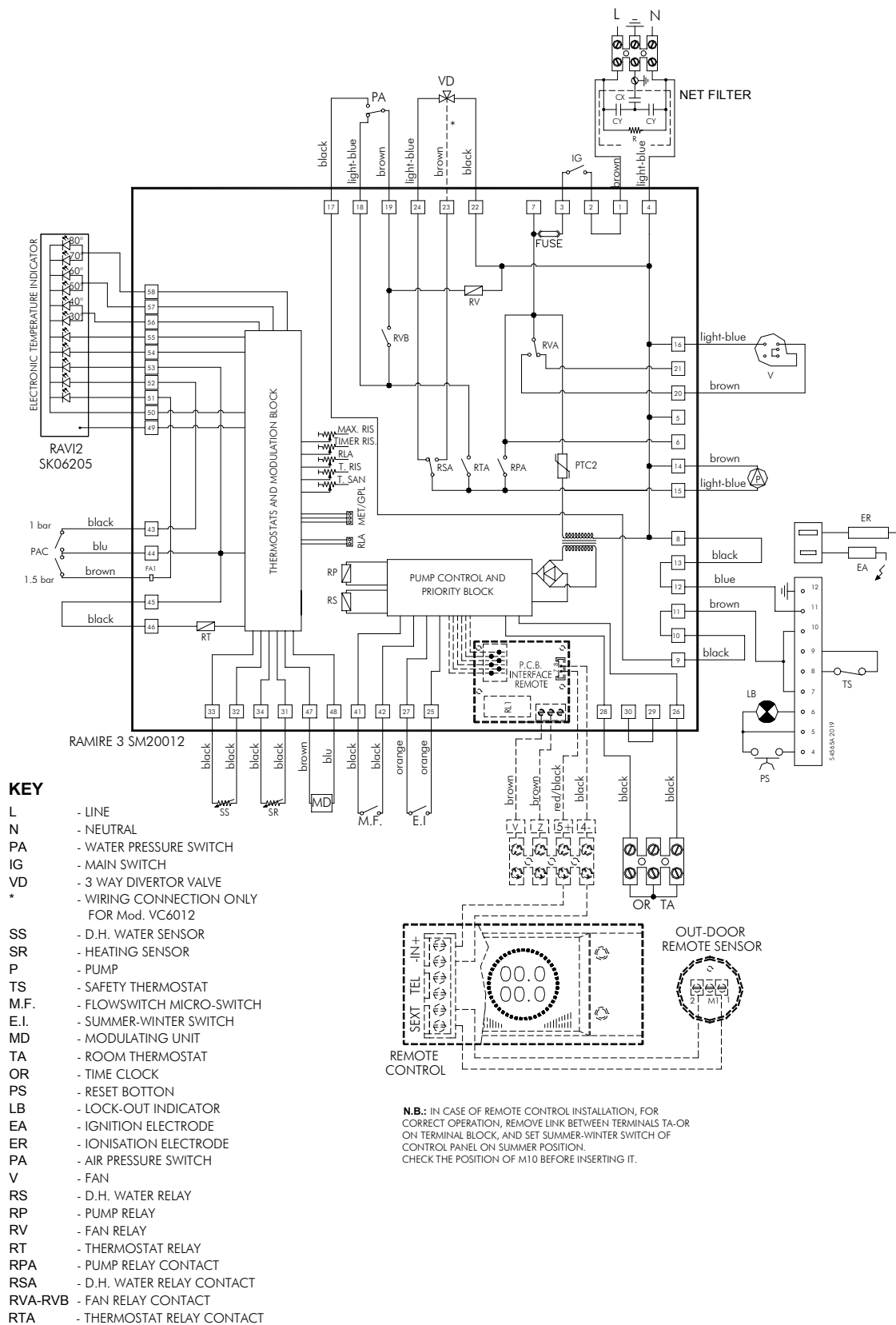


RAVI 2 CIRCUIT BOARD-ELECTRONIC TEMPERATURE INDICATOR WITH SELF-DIAGNOSTIC

## WIRING OF COMPONENTS BY MEANS OF CONNECTORS



## WIRING DIAGRAM FOR ROOM SEALED COMB. CHAMBER ELECTRONIC IGNITION BOILER – mod. RSF 20 E - RSF 24 E

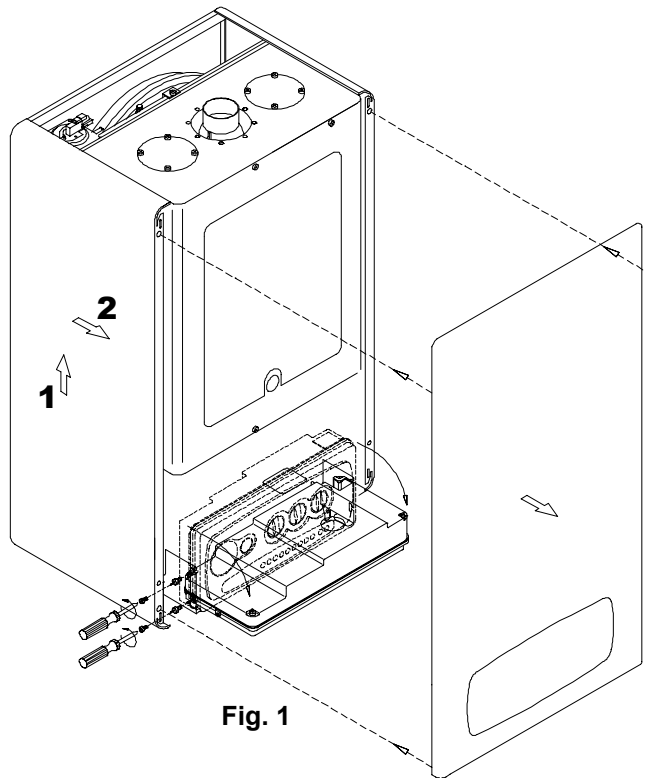


## MAINTENANCE

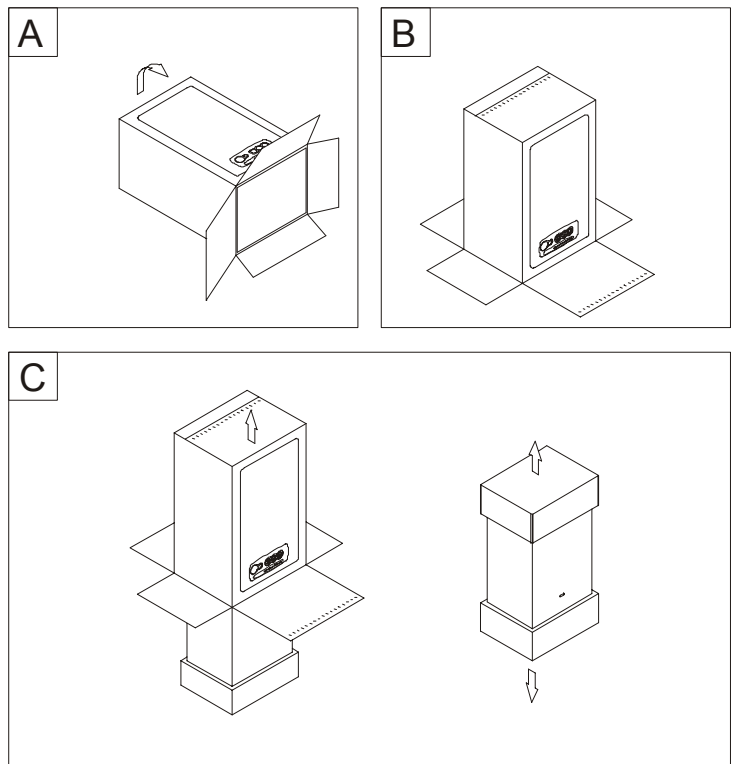
To keep the boiler in efficient and safe operating condition, we recommend you perform the following checks at least once a year:

- Check all seals on the gas side and replace gaskets to restore perfect seal as required.
- Check all seals on the water side and replace gaskets to restore perfect seal as required.
- Visually check combustion and the combustion chamber; dismantle and clean the chamber if necessary.
- Check the primary exchanger and clean it if necessary.
- Check functioning of gas safety systems: Insufficient gas safety device (flame detection sensor for electronic ignition boilers) thermocouple for pilot light boilers.
- Check functioning of heating safety systems: safety thermostat for temperature limit, safety sensor for pressure limit.
- Check the exhaust flue safety device
- Check the max. and min. modulation pressures and the modulation.
- Check that the electrical connection conforms to the description in the instruction manual for the boiler.
- Check the domestic hot water flow rate and temperature.

*When dismantling the boiler casing, be careful when removing the side panels after having removed the front panel; the front panel is removed by undoing the lower and front fixing screws and then removing as shown in fig.1, lifting it and then pulling it away. The new side panels are connected to the frame by means of two hooks which correspond with two slots on the frame to ensure quick and efficient fixing*



**Fig. 1**



**Fig. 2**

## UNPACKING

- Set the packed boiler (fig. 2) down on the floor making sure that the arrow is pointing upwards and remove the sticking tape. Open the 4 flaps outwards.
- Turn the boiler 180° supporting it by hand.
- Lift the boiler with the packing pieces positioning it vertically in order not to damage the lower corners of the casing and remove the packing pieces. Lift the boiler by holding it at the back and proceed with installation.

**N.B.** It is recommended that the boiler be unpacked before installation. The company cannot be held responsible for any damage caused to the boiler due to incorrect handling of the boiler.

## IMPORTANT!

The packing materials (cardboard) are recyclable.

## IMPORTANT!

The inner packing materials (plastic bags, polystyrene foam, nails etc.) are potentially dangerous and must not be left within reach of small children.

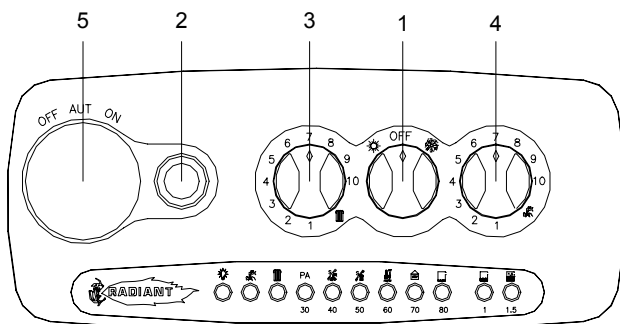


Fig. 1

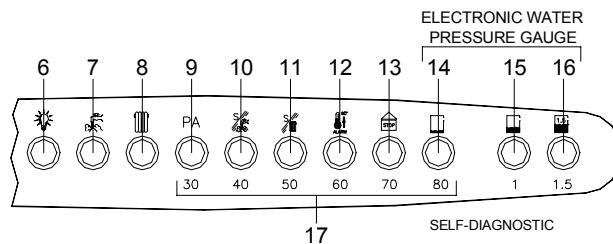


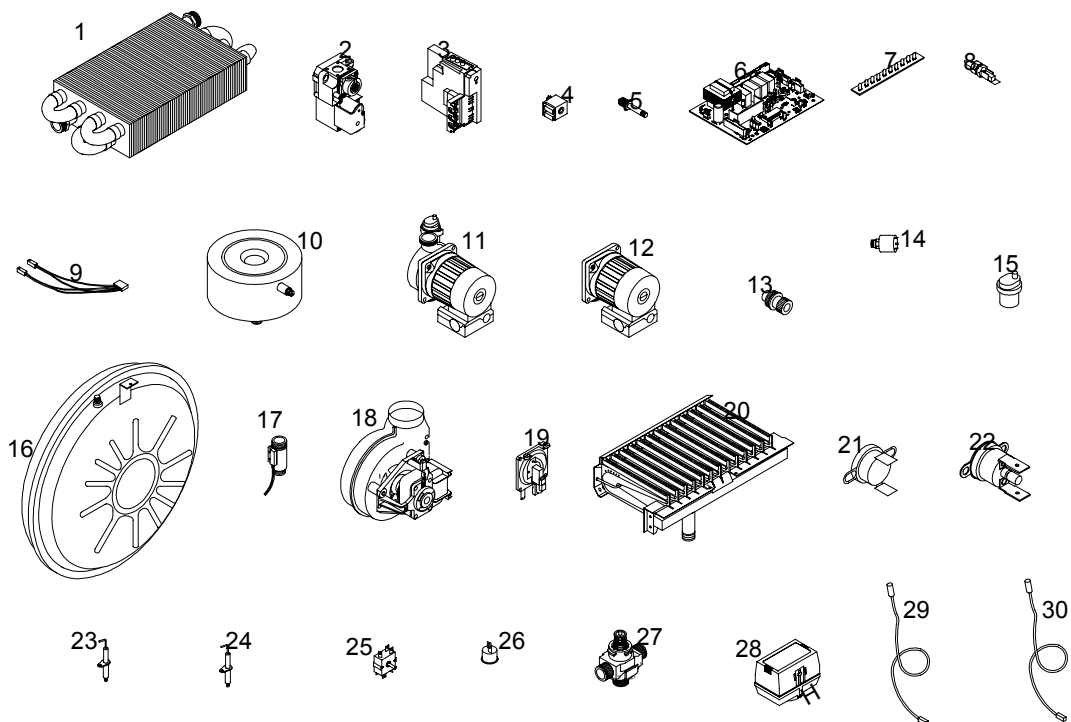
Fig. 2

MALFUNCTION	POSSIBLE CAUSE	SOLUTION
1) Light 6 (fig.2) is on but nothing works.	<ul style="list-style-type: none"> <li>a. water pressure switch</li> <li>b. water pressure below 0.5 bar (light 14 fig. 2 flashing).</li> <li>c. RAMIRE circuit board damaged</li> </ul>	<ul style="list-style-type: none"> <li>a. replace it</li> <li>b. load water</li> <li>c. replace it</li> </ul>
2) Light 6 (fig.2) is on, the circulation pump is running, but the flame does not ignite	<ul style="list-style-type: none"> <li>a. RAMIRE circuit board malfunction</li> <li>b. broken sensors (lights 10 or 11 fig. 2 flashing)</li> <li>c. gas valve failure (light 2 fig.1 on)</li> <li>d. ignition unit broken (light 2 fig.1 on)</li> <li>e. electric fan does not work (light 9 fig. 2 on)</li> <li>f. air switch does not work</li> <li>g. gas turned off (light 3 fig. 1 on)</li> <li>h. modulator regulated to below minimum (light 2 fig.1 on)</li> <li>i. ignition electrode broken (light 2 fig.1 on)</li> <li>j. ignition electrode wire detached (light 2 fig.1 on)</li> <li>k. limit thermostat broken or wrongly calibrated (light 2 fig. 1 on)</li> <li>l. exhaust fume safety thermostat broken (light 13 fig. 2 flashing)</li> </ul>	<ul style="list-style-type: none"> <li>a. replace it</li> <li>b. replace it</li> <li>c. replace it</li> <li>d. replace it</li> <li>e. replace it</li> <li>f. replace it</li> <li>g. open gas cock</li> <li>h. adjust it</li> <li>i. replace it</li> <li>j. re-connect it</li> <li>k. replace it</li> <li>l. reset or replace it</li> </ul>
3) Light 6 (fig.2) is on, the circulation pump is running, the flame ignites but goes out after 10 seconds	<ul style="list-style-type: none"> <li>a. flame ionisation electrode broken (light 2 fig.1 on)</li> <li>b. flame ionisation electrode wire detached, broken or damp (light 2 fig.1 on)</li> <li>c. ignition unit broken (light 2 fig.1 on)</li> <li>d. LIVE - NEUTRAL polarity inverted (light 2 fig.1 on)</li> <li>e. no earth connection (light 2 fig.1 on)</li> <li>f. power supply (LIVE - LIVE) (light 2 fig.1 on)</li> </ul>	<ul style="list-style-type: none"> <li>a. replace it</li> <li>b. re-connect or replace it</li> <li>c. replace it</li> <li>d. change over polarity</li> <li>e. make earth connection</li> <li>f. fit conversion kit</li> </ul>
4) Boiler on, temperature rises rapidly and extinguishes flame (light 2 fig.1 on)	<ul style="list-style-type: none"> <li>a. circulation pump burned out or blocked</li> <li>b. air in system</li> <li>c. flowswitch jammed open</li> <li>d. heating system turned off</li> </ul>	<ul style="list-style-type: none"> <li>a. unblock or replace it</li> <li>b. bleed system</li> <li>c. unblock or replace it</li> <li>d. open heating system cut-off valve</li> </ul>
5) Noise as flame ignites	<ul style="list-style-type: none"> <li>a. ignition electrode wrongly positioned</li> <li>b. RLA trimmer set too high</li> <li>c. modulator minimum too high</li> <li>d. dirty pilot burner</li> <li>e. dirty main burner</li> </ul>	<ul style="list-style-type: none"> <li>a. check the distance between burner and electrode is 2.5 - 3 mm.</li> <li>b. adjust it</li> <li>c. adjust it</li> <li>d. clean it</li> <li>e. clean it</li> </ul>
6) Boiler ignites but goes out when temperature is reached without modulating	<ul style="list-style-type: none"> <li>a. modulator tube blocked</li> <li>b. modulator only calibrated at maximum</li> <li>c. RAMIRE circuit board breakdown</li> </ul>	<ul style="list-style-type: none"> <li>a. unblock or replace it</li> <li>b. re-calibrate</li> <li>c. replace it</li> </ul>
7) Boiler on (light 6 fig.2 on), selector switch 1 (fig.1) set to Winter, but radiators do not heat up	<ul style="list-style-type: none"> <li>a. diverter valve blocked or broken</li> <li>b. valve VC 6012 connecting wires wrongly positioned</li> </ul>	<ul style="list-style-type: none"> <li>a. unblock or replace it</li> <li>b. connect wires correctly</li> </ul>
8) Boiler on (light 6 fig.2 on), but gas pressure at burner is always at minimum	<ul style="list-style-type: none"> <li>a. broken modulator coil</li> <li>b. RAMIRE circuit board breakdown</li> <li>c. MAX. HEATING trimmer at minimum (only on Winter setting)</li> </ul>	<ul style="list-style-type: none"> <li>a. unblock or replace it</li> <li>b. replace it</li> <li>c. make adjustments</li> </ul>
9) No hot water when tap is turned on	<ul style="list-style-type: none"> <li>a. cold water entry pressure below 0.3 bar</li> <li>b. dirty cold water entry filter</li> <li>c. microflowswitch broken or piston demagnetised</li> </ul>	<ul style="list-style-type: none"> <li>a. increase pressure</li> <li>b. clean filter</li> <li>c. replace</li> </ul>



## SPARE PARTS SHORT LIST

n°	CODE	DESCRIPTION	RCM 20 E	RSF 20 E	RSF 24 E
			Open Chamber Electronic Ignition	Room Sealed Electronic Ignition	Room Sealed Electronic Ignition
1	58006LP	MAIN HEAT EXCHANGER Mod. 20.000 - 63 A	✓	✓	
	58007LP	MAIN HEAT EXCHANGER Mod. 24.000 - 66 A			✓
2	36064LA	ELECTRONIC GAS VALVE VK4105 A 1035B	✓	✓	✓
3	76616LA	ELECTRONIC IGNITION BOARD S4565 A 2019	✓	✓	✓
4	18003LA	MODULATING COIL	✓	✓	✓
5	97007LA	MODULATING UNIT	✓	✓	✓
6	76623LA	PRINTED CIRCUIT BOARD RAMIRE 3 SM 20012	✓	✓	✓
7	76622LA	INDICATORS P.C.B. RAVI 2 CE	✓	✓	✓
8	73507LA	D.H.WATER – HEATING 1/8" SENSOR	✓	✓	✓
9	31011LA	D.H.W. – HEATING SENSOR WIRE	✓	✓	✓
10	20029LA	D.H. WATER EXCHANGER H20-H20 PC21	✓	✓	
	20035LA	D.H. WATER EXCHANGER H20-H20 PC25			✓
11	24027LA	CIRCULATING PUMP GOLD 50V1 SHUL CLF6 W/ AIR VENT	✓	✓	✓
12	24028LA	CIRCULATING PUMP MOTOR	✓	✓	✓
13	96008LA	3 BAR PRESSURE RELIEF VALVE 1/2"	✓	✓	✓
14	59010LA	WATER PRESSURE SWITCH 1/8"	✓	✓	✓
15	96030LA	AUTOMATIC AIR VENT VALVE 5020 3/8"	✓	✓	✓
16	95011LA	8 LT. EXPANSION TANK W/BACKET	✓	✓	✓
17	96007LA	ELECTRONIC FLOWSWITCH - 1/2" CONNECTIONS	✓	✓	✓
18	37008LA	EXHAUST FAN 230V		✓	✓
19	59006LB	AIR PRESSURE SWITCH CE C6065AH1095		✓	✓
20	21001LA	GAS BURNER 13 R. 1,25 NATURAL GAS	✓	✓	✓
	21002LA	GAS BURNER 13 R. 0,75 L.P.G.	✓	✓	
	21004LA	GAS BURNER 13 R. 0,77 L.P.G.			✓
21	86006LA	SAFETY THERMOSTAT 95°C WATER	✓	✓	✓
22	86021LA	FLUE SAFETY THERMOSTAT 75°C W/ MANUAL RESET	✓		
23	35007LA	IGNITION ELECTRODE x ELECTRONIC	✓	✓	✓
24	35009LA	IONISATION ELECTRODE	✓	✓	✓
25	47021LA	3 POSITION COMMUTATOR SWITCH R11C2X401	✓	✓	✓
26	47014LA	LOCK-OUT INDICATOR 60118C00	✓	✓	✓
27	96023LA	DIVERTER VALVE BODY VCZMG6000E	✓	✓	✓
28	96022LA	DIVERTER VALVE VC6012 MOTOR	✓	✓	✓
29	31054LA	IGNITION ELECTRODE CABLE x ELECTRONIC	✓	✓	✓
30	31055LA	IONISATION ELECTRODE CABLE	✓	✓	✓







**RADIANT BRUCIATORI S.p.A.**

*Gas Oil, Heavy-oil burners  
Wall-hung boilers  
Cast iron thermal unit  
Storage cylinder boilers  
Water heaters*

**Registered Office:**

61025 Montelabbate (PU) Italy • Via Pantanelli, 164  
Tel +39 0721 498822 • Fax +39 0721 499815  
Email: [italia@radiant.it](mailto:italia@radiant.it) • [tecnico@radiant.it](mailto:tecnico@radiant.it) • [export@radiant.it](mailto:export@radiant.it)  
Internet: <http://www.radiant.it>

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