EuroCombi

ARISTON

A/23 MFFI - A/27 MFFI

G.C.N. **47-116-10 / 47-116-12**

Installation Instructions

Type C Boilers

LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER

Country of destination: GB

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1. GENERAL INFORMATION

This manual is an integral and essential part of the product. It should be kept with the appliance so that it can be consulted by the user and our authorised personnel.

Please carefully read the instructions and notices about the unit contained in this manual, as they provide important information regarding the safe installation, use and maintenance of the product.

For operating instructions please consult the separate User's Manual.

1.1 General Instructions

Read the instructions and recommendations in these Installation Instructions carefully to ensure proper installation, use and maintenance of the appliance.

Keep this manual in a safe place. You may need it for your own reference while our Servicing Centre technicians or your installer may need to consult it in the future.

This is a combined appliance for the production of central heating (C.H.) and domestic hot water (D.H.W.).

This appliance **must be used only** for the purpose for which it is designed.
The manufacturer declines all liability for damage caused by improper or negligent use.

No asbestos or other hazardous materials have been used in the fabrication of this product.

Before connecting the appliance, check that the information shown on the data plate and the table on pages 4-5 comply with the electric, water and gas mains of the property. You will find the data plate on the reverse of the control panel.
The gas with which this appliance operates is also shown on the label at the bottom of the boiler.

Do not install this appliance in a damp environment or close to equipment which spray water or other liquids.
Do not place objects on the appliance.
Do not allow children or inexperienced persons to use the appliance without supervision.

If you smell gas in the room, **do not turn on** light switches, use the telephone or any other object which might cause sparks.
Open doors and windows immediately to ventilate the room.
Shut the gas mains tap (on the gas meter) or the valve of the gas cylinder and call your Gas Supplier immediately.
If you are going away for a long period of time, remember to shut the mains gas tap or the gas cylinder valve.

Always disconnect the appliance either by unplugging it from the mains or turning off the mains switch before cleaning the appliance or carrying out maintenance.

In the case of faults or failure, switch off the appliance and turn off the gas tap. Do not tamper with the appliance.
For repairs, call your local Authorised Servicing Centre and request the use of original spare parts. For in-guarantee repairs contact MTS (GB) Limited.

Check the following at least once a year:
1 - Check the seal of water connections, replacing the gaskets if necessary.
2 - Check the seal of the gas connections, replacing the gaskets if necessary.
3 - Check the general condition of the appliance and of the combustion

chamber visually.

4 - Visual check of the combustion: clean burners if necessary.

5 - With reference to point 3, dismantle and clean the combustion chamber if necessary.

6 - With reference to point 4, dismantle and clean the injectors if necessary.

7 - Visual check of the primary heat exchanger:
- check for overheating of the exchangers fins;
- clean the exhaust side of the exchanger and fan if necessary.

8 - Regulate the gas pressure, ignition pressure, partial flame, maximum flame.

9 - Check proper operation of the heating safety system:
- maximum safety temperature;
- maximum safety pressure.

10 - Check the proper operation of the gas safety system:
- gas or flame safety device;
- gas valve safety device.

11 - Check that the electrical connections have been made in compliance with the instructions shown in the installation instructions.

12 - Check the efficiency of the hot water supply (flow and temperature).

13 - Check general operation of the appliance.

14 - Check the exhaust system for the combustion products.

1.2 Technical Information

		A/23 MFFI	A/27 MFFI
CE Certification			
Heat Input	max/min kW	25.6/11.0	29.8/12.0
Heat Output	max/min kW	23.1/9.2	27.3/10.1
Efficiency of Nominal Heat Input	%	90.2	91.6
Efficiency at 30% of Nominal Heat Input	%	87.8	88.3
Heat Loss to the Casing (^{3}T=50°C)	%	1.2	1.3
Flue Heat Loss with Burner Operating	%	8.6	7.1
Flue Heat Loss with Burner Off	%	0.4	0.4
Maximum Discharge of Fumes (G20-G25)	Kg/h	59	62
Residual Discharge Head	mbar	1.15	1.4
Consumption at Nominal Capacity (G20-G25)	m^3/h	2.72/3.32	3.16/3.86
Gas Consumption after 10 Minutes*	m^3	0.32/0.39	0.37/0.45
(15°C, 1013 mbar) (G30-G31)	Kg/h	2.02/2.00	2.35/2.32
Temp. of exhaust fumes at nominal capacity (G20-G25)	°C	137	128
CO_2 Content	%	5.8	6.6
O_2 Content	%	9.2	8.0
CO Content	ppm	32	34
Minimum Ambient Temperature	°C	+5	+5
Head Loss on Water Side (max) (^{3}T=20°C)	mbar	200	200
Residual Head of System	bar	0.25	0.25
Heating Temperature	max/min °C	82/42	82/42
Domestic Hot Water Temperature	max/min °C	56/36	56/36
D.H.W. Flow Rate ^{3}T=35°C	l/min	9.5	11.2
D.H.W. Flow Rate ^{3}T=35°C	gal/min	2.1	2.5
D.H.W. Minimum Flow Rate	l/min	2.6	2.6
Pressure of Domestic Hot Water	max/min bar	6/0.2	6/0.2
Expansion Vessel Capacity	l	7	7
Expansion Vessel Pre-load Pressure	bar	1	1
Maximum Water Content in System	l	145	145
Maximum Heating Pressure	bar	3	3
Nominal Pressure Natural Gas (G20-G25)	mbar	20-25	20-25
LPG (G30-G31)	mbar	30-37	30-37
Electrical Supply	V/Hz	230 / 50	230 / 50
Power Consumption	W	150	190
Protection Grade of Electrical System	IP	44	44
Internal Fuse Rating		FAST 2 AT	FAST 2 AT
Weight	Kg.	47	47
G.C. Number		**47-116-10**	**47-116-12**

*Calculated at 70% maximum output

1.3 Overall View

A/23 MFFI - A/27 MFFI

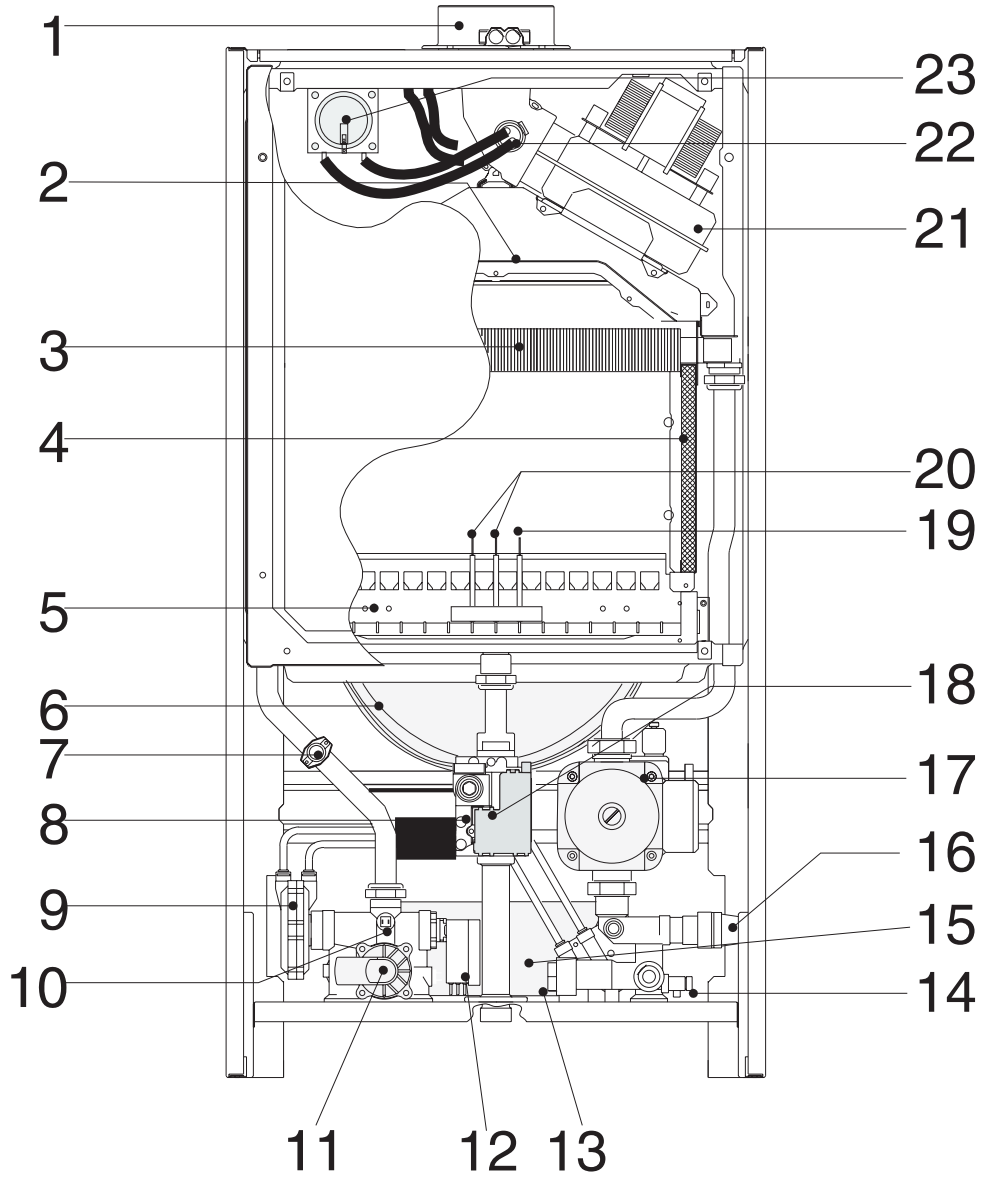

Fig. 1.1

Legend:

1. Flue Connector
2. Combustion Chamber Hood
3. Main Heat Exchanger
4. Combustion Chamber Insulation Panel
5. Burner
6. Expansion Vessel
7. Overheat Thermostat
8. Spark Generator
9. Diverter Valve
10. Main Circuit Temperature Probe
11. Main Circuit Flow Switch
12. Diverter Valve Microswitch
13. Filter Seat
14. Drain Valve
15. Secondary Heat Exchanger
16. Safety Valve (3 bar)
17. Circulation Pump with Automatic Air Release Valve
18. Gas Valve
19. Detection Electrodes
20. Ignition Electrodes
21. Fan
22. Venturi
23. Air Pressure Switch

2. INSTALLATION

The technical information and instructions provided herein below are intended for the installer so that the unit may be installed correctly and safely.

2.1 Reference Standards

The installation and initial start up of the boiler must be by a CORGI Approved Installer in compliance with the installation standards currently in effect, as well as with any and all local health and safety standards i.e. CORGI .

This appliance must be installed by a competent installer in accordance with the 1984 Gas Safety (installation & use) Regulations (as amended)

The installation of this appliance must be in accordance with the relevant requirements of the 1984 Gas Safety (installation & use) Regulations, the Local Building Regulations, the current I.E.E. Wiring Regulations, the byelaws of the local water authority, and in Scotland, in accordance with the Building Standards (Scotland) Regulation and Health and Safety document No. 635 “Electricity at work regs. 1989”.
Installation should also comply with the following British Standard Codes of Practice:

Low pressure pipes	BS 6891	1988
Boilers of rated input not exceeding 60 kW	BS 6798	1987
Forced circulation hot water system	BS 5449	1990
Installation of gas hot water supplies for domestic purposes (2nd family gases)	BS 5546	1990
Flues	BS 5440-1	1990
Air supply	BS 5440-2	1989

2.2 Siting the Appliance

The appliance may be installed in any room or indoor area, 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 combined appliance in a room containing a bath or shower.
Where a room-sealed appliance is installed in a room containing a bath or shower the boiler and any electrical switch or appliance control, utilising mains electricity should be situated so that it cannot be touched by a person using the bath or shower.
The location must permit adequate space for servicing and air circulation around the appliance as indicated in paragraph 2.4.
The location must permit the provision of an adequate flue and termination.
For unusual locations special procedures may be necessary.
BS 6798-1987 gives detailed guidance on this aspect.
A compartment used to enclose the appliance must be designed specifically for this purpose. No specific ventilation requirements are needed for an installation within a cupboard
This appliance is not suitable for outdoor installation.

The type C appliances (in which the combustion circuit, air vent intake and combustion chamber are air-tight with respect to the room in which the appliance is installed) can be installed in any type of room.
There are no limitations with respect to ventilation and the volume of the room itself. The boiler must be installed on a solid, permanent wall to prevent access to the electrical parts (when live) through the aperture on the back frame.

2.3 Overall Dimensions

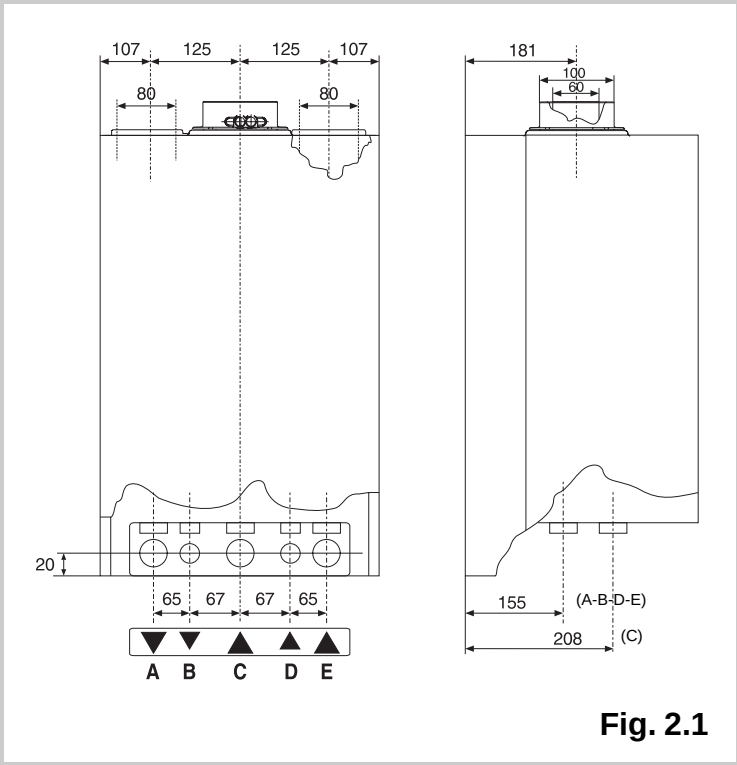

Fig. 2.1

Legend:

A = Central Heating Flow (3/4")
B = Domestic Hot Water Outlet (1/2")
C = Gas Inlet (3/4")
D = Domestic Cold Water Inlet (1/2")
E = Central Heating Return (3/4")

2.4 Clearances

In order to allow for access to the interior of the boiler for maintenance purposes, the boiler must be installed in compliance with the minimum clearances indicated in the diagram below.

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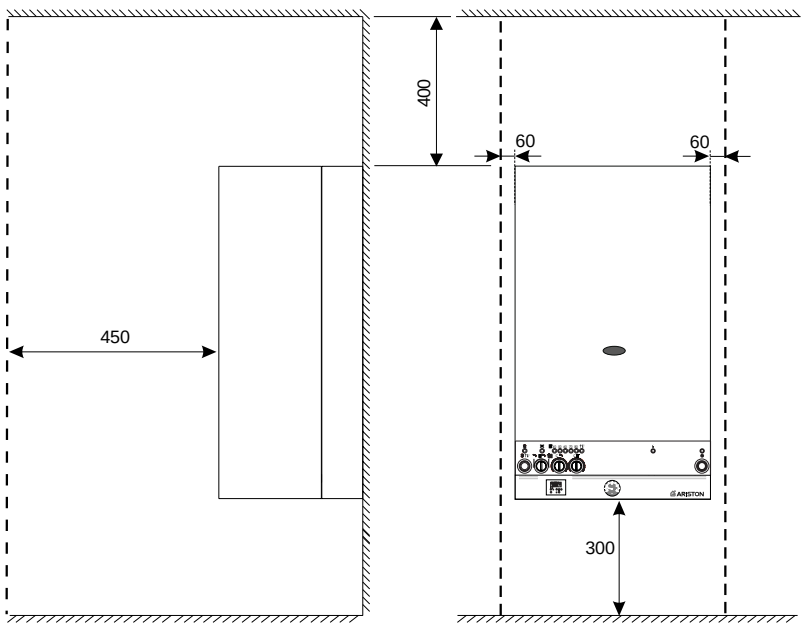

Fig. 2.2

2.5 Mounting the Appliance

Fasten the boiler in place using the template and anchors supplied with the unit. It is highly recommended that a spirit level be used to position the boiler so that it is perfectly level.
For additional information, please consult the instructions contained in the connection kit and the flue kit.

2.6 Electrical Connection

For safety purposes, have a competent person carefully check the electrical system in the property, as the manufacturer will not be held liable for damage caused by the failure to earth the appliance properly or by anomalies in the supply of power. Make sure that the residential electrical system is adequate for the maximum power absorbed by the unit, which is indicated on the rating plate. In addition, check that the section of cabling is appropriate for the power absorbed by the boiler.

The boiler operates with alternating current, as indicated in the technical data table (1.2), where the maximum absorbed power is also indicated. Make sure that the connections for the neutral and live wires correspond to the indications in the diagram. The appliance electrical connections are situated on the reverse of the control panel (see the servicing manual for further information)

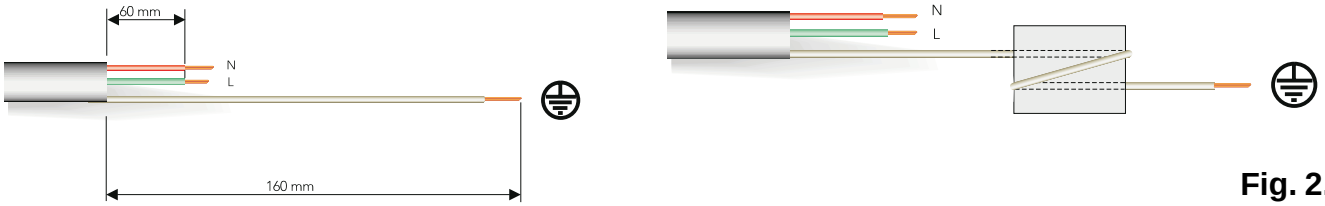

Fig. 2.3

Important!
In the event that the power supply cord must be changed, replace it with one with the same specifications. Make the connections to the terminal board located within the control panel, as follows:
- The yellow-green wire should be connected to the terminal marked with the earth symbol; make sure to re-use the ferrule mounted on the other supply cord;
- The blue wire should be connected to the terminal marked “N”;
- The brown wire should be connected to the terminal marked “L”.

Note: The diagrams for the electrical system are indicated in section 2.11.

Warning, this appliance must be earthed.
External wiring to the appliance must be carried out by a qualified technician and be in accordance with the current I.E.E. Regulations and applicable local regulations. The EuroCombi range of boilers are supplied for connection to a 230 V~ 50 Hz supply.
The supply must be fused at 3 A.
The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance, by the use of a fused double pole isolator having a contact separation of at least 3 mm in all poles or alternatively, by **means of a 3 A** fused three pin plug and unswitched shuttered socket outlet both complying with BS 1363.
The point of connection to the electricity supply must be readily accessible and adjacent to the appliance unless the appliance is installed in a bathroom when this must be sited outside the bathroom.

2.7 Gas Connection

The local gas region contractor connects the gas meter to the service pipe.
If the gas supply for the boiler serves other appliances ensure that an adequate supply is available both to the boiler and the other appliances when they are in use at the same time.
Pipe work must be of an adequate size. Pipes of a smaller size than the boiler inlet connection should not be used.

2.9 Water Connections

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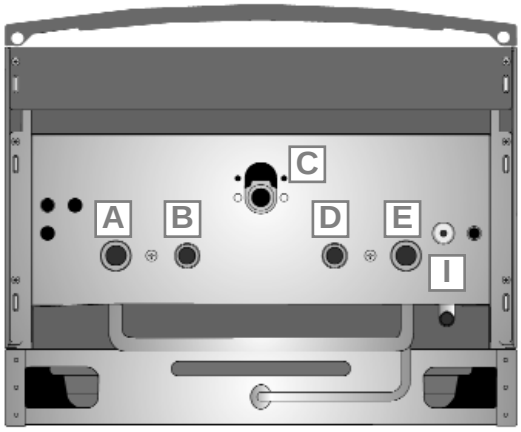


Fig. 2.4

Legend

A = Central Heating Flow
B = Domestic Hot Water Outlet
C = Gas Inlet
D = Domestic Cold Water Inlet
E = Central Heating Return
I = Safety Valve

Central Heating

Detailed recommendations are given in BS 6798:1987 and BS 5449-1:1990, the following notes are given for general guidance.

Pipe Work:

Copper tubing to BS EN 1057:1996 is recommended for water pipes. Jointing should be either with capillary soldered or compression fittings.

Where possible pipes should have a gradient to ensure air is carried naturally to air release points and water flows naturally to drain taps.

The appliance has a built-in automatic air release valve, however it should be ensured as far as possible that the appliance heat exchanger is not a natural collecting point for air.

Except where providing useful heat, pipes should be insulated to prevent heat loss and avoid freezing.

Particular attention should be paid to pipes passing through ventilated spaces in roofs and under floors.

By-pass:

The appliance includes an automatic by-pass valve, which protects the main heat exchanger in case of reduced or interrupted water circulation through the heating system, due to the closing of thermostatic valves or cock-type valves within the system.

System Design:

This boiler is suitable only for sealed systems.

Drain Cocks:

These must be located in accessible positions to permit the draining of the whole system. The taps must be at least 15mm nominal size and manufactured in accordance with BS 2870:1980.

Safety Valve Discharge:

The discharge should terminate facing downwards on the exterior of the building in a position where discharging (possibly boiling water & steam) will not create danger or nuisance, but in an easily visible position, and not cause damage to electrical components and wiring.

The discharge must not be over an entrance or a window or any other type of

public access.

Air Release Points:

These must be fitted at all high points where air naturally collects and must be sited to facilitate complete filling of the system.

The appliance has an integral sealed expansion vessel to accommodate the increase of water value when the system is heated.

It can accept up to 7 l (1.5 gal) of expansion water. If the heating circuit has an unusually high water content, calculate the total expansion and add an additional sealed expansion vessel with adequate capacity.

Mains Water Feed - Central Heating:

There must be no direct connection to the mains water supply even through a non-return valve, without the approval of the Local Water Authority.

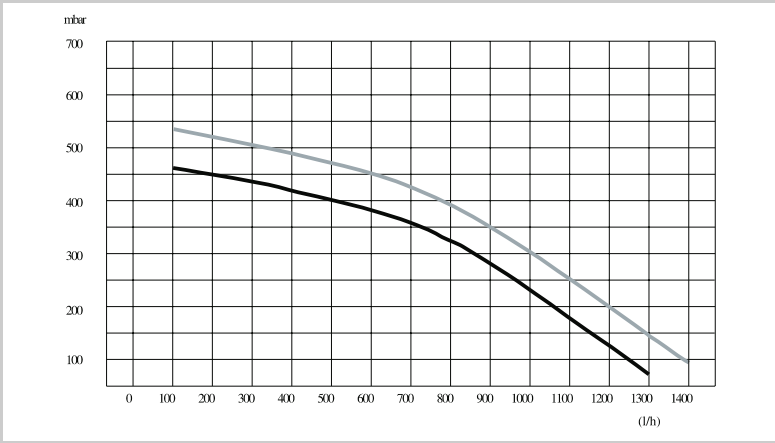
Filling:

A temporary method for initially filling the system and replacing lost water during servicing in accordance with Water Supply Byelaw 14 must be provided.

Domestic Water

The domestic water must be in accordance with the relevant recommendation of BS 5546:1990. Copper tubing to BS EN 1057:1996 is recommended for water carrying pipe work and must be used for pipe work carrying drinking water.

Residual Head of the Boiler



2.9 Flue Connections

Flue System

The provision for satisfactory flue termination must be made as described in BS 5440-1.

The appliance must be installed so that the flue terminal is exposed to outdoor air.

The terminal must not discharge into another room or space such as an outhouse or lean-to.

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

The terminal should be located with due regard for the damage or discolouration that might occur on buildings in the vicinity.

In cold or humid weather water vapour may condense on leaving the flue terminal.

The effect of such "steaming" must be considered.

If the terminal is less than 2 metres above a balcony, above ground or above a flat roof to which people have access, then a suitable terminal guard must be fitted. When ordering a terminal guard, quote the appliance model number.

A suitable terminal guard is available from:

TOWER FLUE COMPONENTS
Morley Road
Tonbridge
Kent TN9 1RA

The minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in Fig. 2.5.

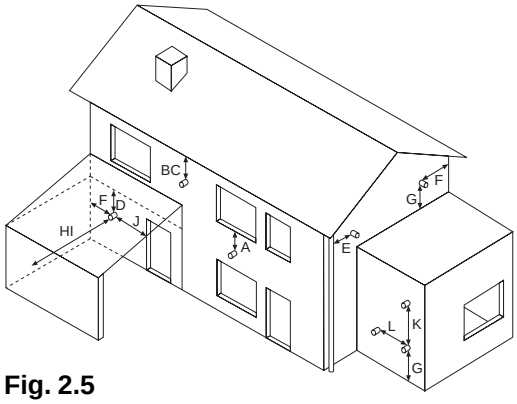
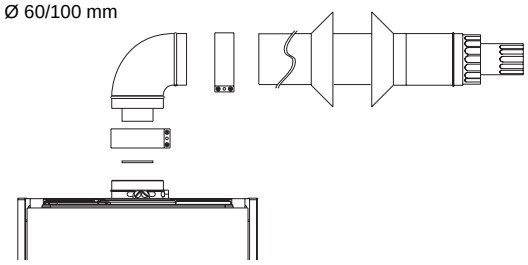


Fig. 2.5

TERMINAL POSITION	mm
A - Directly below an open window or other opening	300
B - Below gutters, solid pipes or drain pipes	75
C - Below eaves	200
D - Below balconies or car-port roof	200
E - From vertical drain pipes and soil pipes	75
F - From internal or external corners	300
G - Above ground or below balcony level	300
H - From a surface facing a terminal	600
I - From a terminal facing a terminal	1200
J - From an opening in the car port (e.g. door, window) into dwelling	1200
K - Vertically from a terminal in the same wall	1500
L - Horizontally from a terminal in the same wall	300

The boiler is designed to be connected to a coaxial flue discharge system.



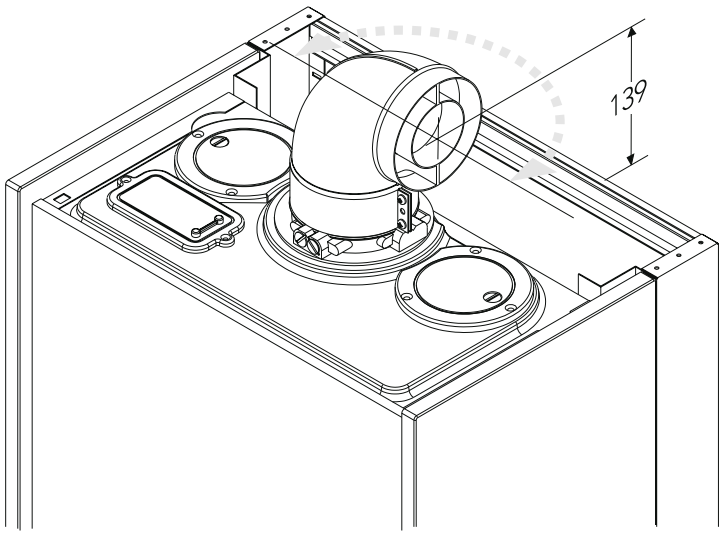
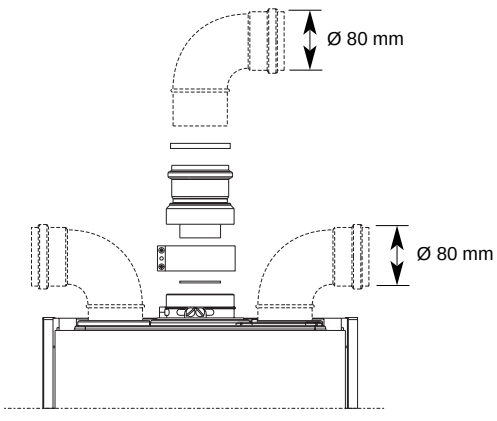
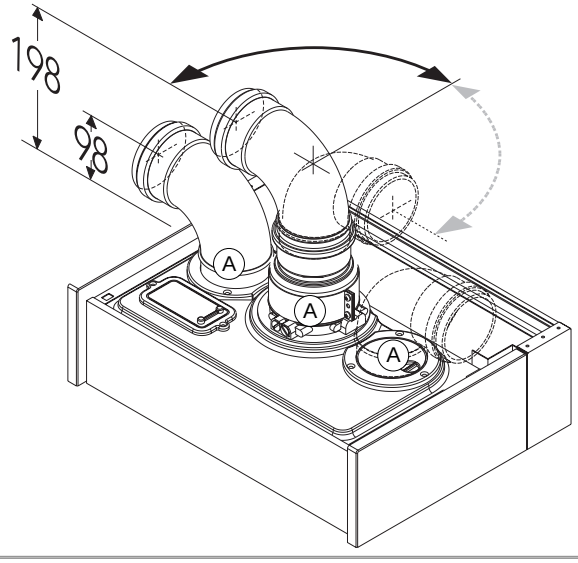


Fig. 2.6

In addition, it is also possible to use a twin-pipe (split) system by fitting a special adaptor to the flue discharge collar and using one of the apertures for the air vent intake located on the top part of the combustion chamber (A).

Fig. 2.7





This procedure must be done as follows:

1 - Remove the air vent intake you want to use, in the area indicated in Fig. 2.8, by breaking the perforated ring.
2 - Use a tool to grasp the lid and remove it completely.
3 - Clean any burrs or sharp edges with a knife or an appropriate tool.

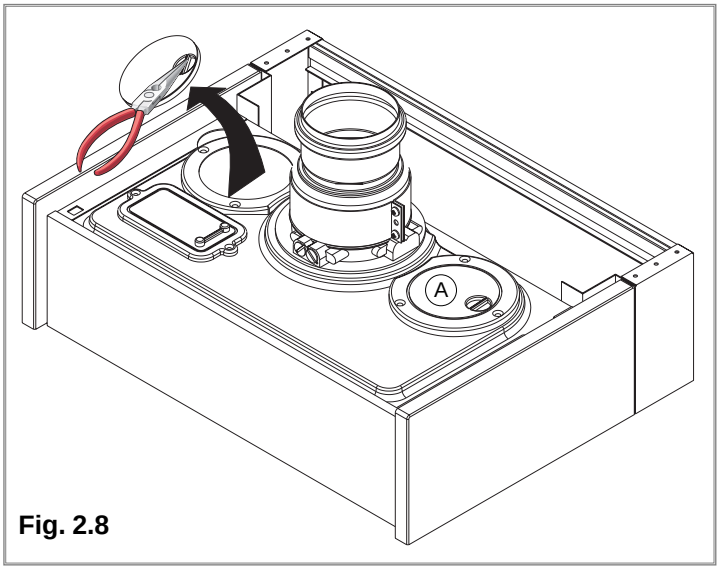


Fig. 2.8

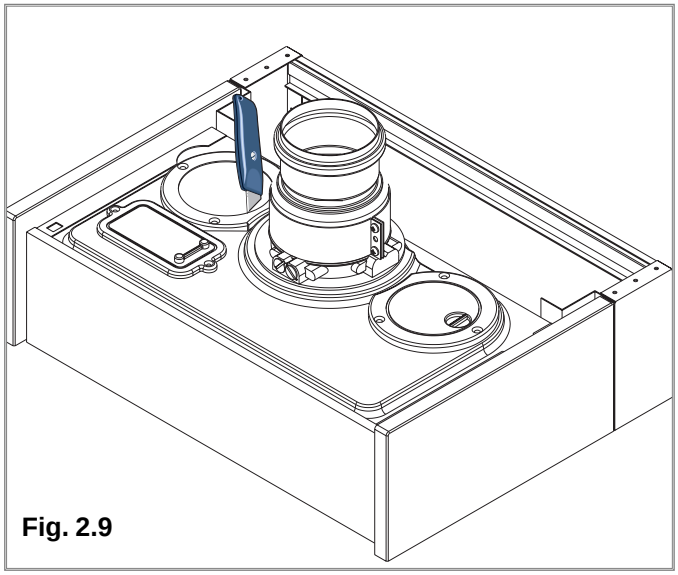


Fig. 2.9

In Fig. 2.10 below, several different types of flue systems are shown.
For additional information regarding the flue accessories, please consult the Flue Pipe Accessories manual.

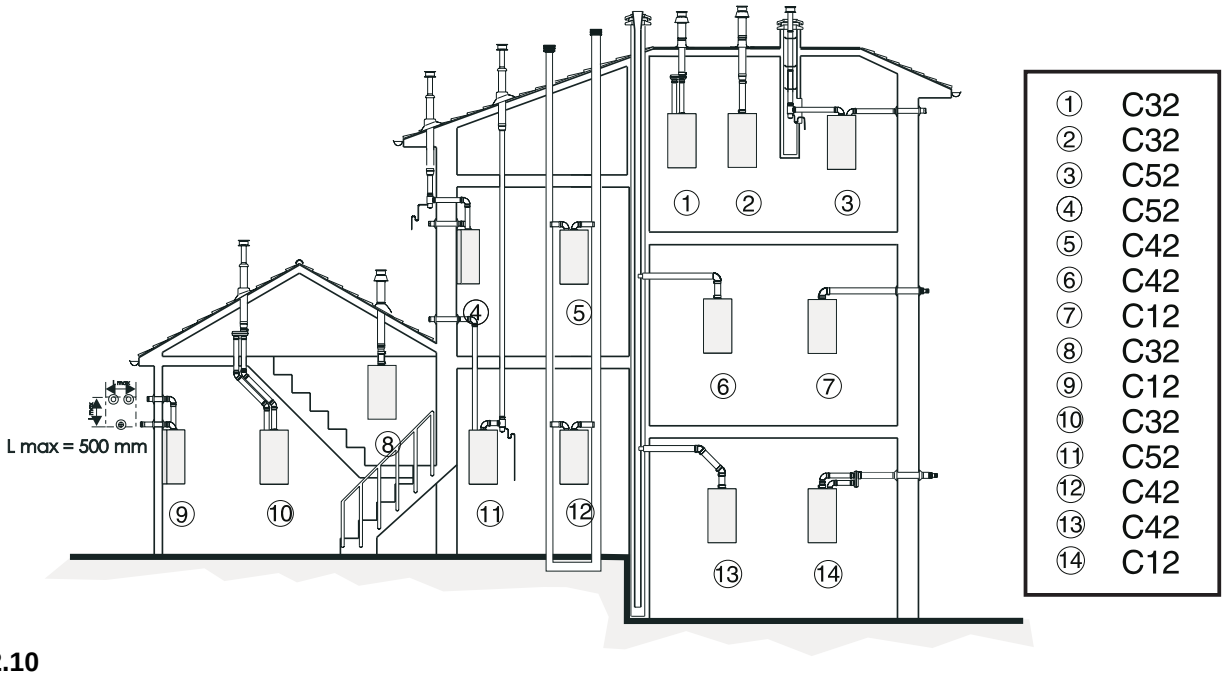


Fig. 2.10

	Exhaust Type	Maximum Extension Exhaust/Air		Diameter of Pipes (mm)	Use of a Restrictor on the Discharge Side	Risk of Condensation Forming
Coaxial System	C12 (xx)	4 m		ø 60 /100	L* < 0.5 m	
	C32 (xx)	4 m		ø 60 /100	L* < 0.5 m	
	C42 (xx)	4 m		ø 60 /100	L* < 0.5 m	
Twin Pipe Systems		**23 kW**	**27 kW**			
	C12 (xy)	54 m	46 m	ø 80	L < 7 m (23 kW) L < 5 m (27 kW)	L > 4 9 m (23 kW) L > 6.5 m (27 kW)
	C32 (xy)	54 m	46 m	ø 80	L < 7 m (23 kW) L < 5 m (27 kW)	L > 4.9 m (23 kW) L > 6.5m (27 kW)
	C42 (xy)	54 m	46 m	ø 80	L < 7 m (23 kW) L < 5 m (27 kW)	L > 4.9m (23 kW) L > 6.5m (27 kW)
	C52 (xy)	17 m	17 m	ø 80	L < 7 m (23 kW) L < 5 m (27 kW)	L > 4.9m (23 kW) L > 5.3m (27 kW)

(*) L = Length of Piping

In calculating the lengths of the pipes, the maximum length must also take into consideration the values for the exhaust/air intake end terminals, as well as 90° elbows for coaxial systems.

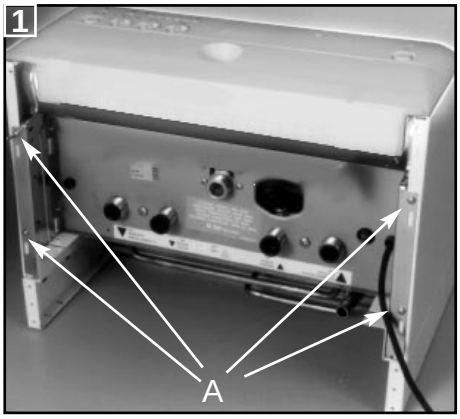
The C52 types must comply with the following requirements:

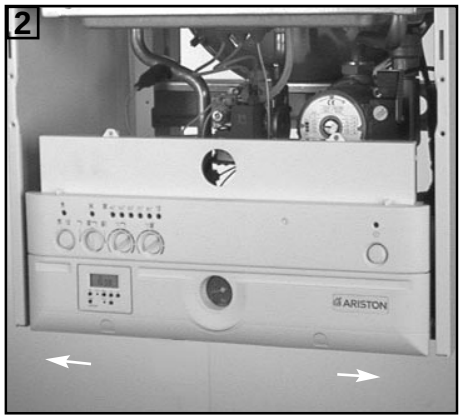
1. The discharge/intake vent pipes must have the same diameter of ø 80 mm.
2. The maximum combined flue length is 17 m. In this case the minimum length for the air intake pipe is 1 meter; the maximum length of vertical exhaust pipe must be a maximum of 12 m.
3. If an elbow is inserted into the discharge/ventilation system, the calculation of the overall extension must take into consideration the values for each curve, as indicated in the table.
4. The exhaust pipe must extend at least 0.5 m above the ridge of the roof if it is located on a side other than that for the air intake (this is not obligatory if the exhaust and air intake pipes are located on the same side of the building).

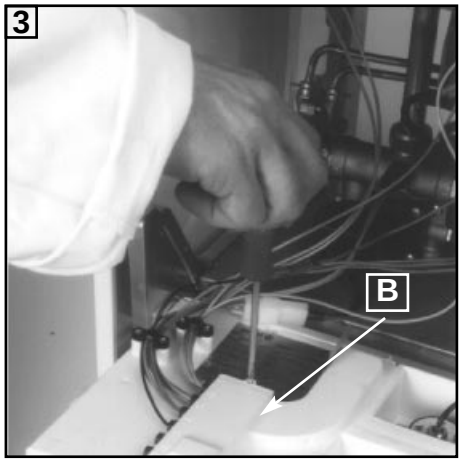
2.10 Room Thermostat Connection

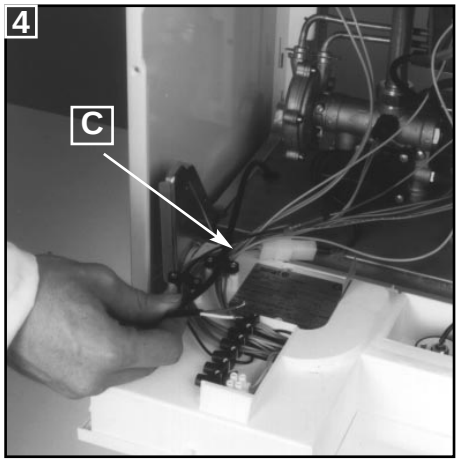
In order to perform this procedure, remove boiler cover as indicated in section 3.2. Then proceed as follows:

1 Remove the screws “A” located on the bottom part of the boiler;
2 Widen the sides so that the control panel can be rotated.
3 Open the cover “B” on the left hand side of the compartment.
4 Insert the wire for the connection of the room thermostat into the wire holder “C”, as indicated in photo 3.



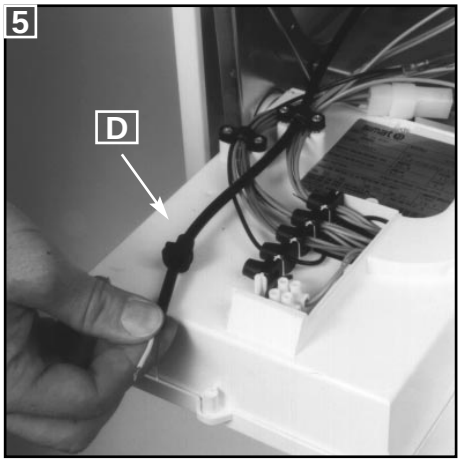


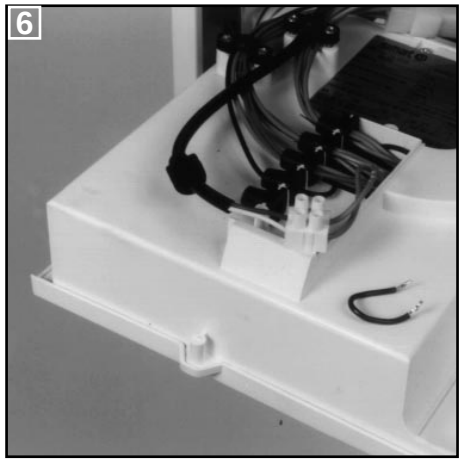


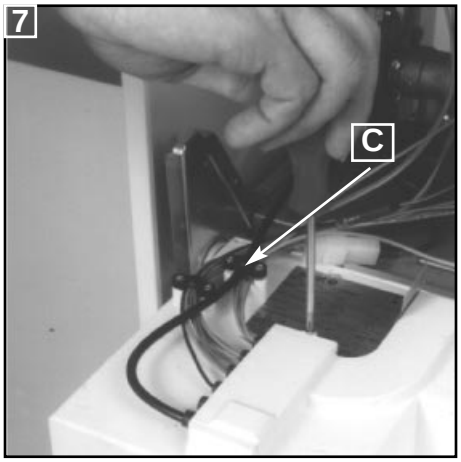


5 Remove the grommet “D” shown in photo 5, make a hole in it and pass the room thermostat wire through.
6 Remove the link located on the terminal and connect the wire.
7 Replace the grommet and the terminal to their original positions, close the cover on the grommet compartment and fasten the wire-clamp “C” in place.
8 If a remote time clock is to be fitted, disconnect the integral time clock plug from the P.C.B.
9 Using a volt-free switching time clock, connect the switching wires from the time clock following points 1-7 above.
10 If using a time clock and room thermostat, these must be connected in series as per points 1-9 above.

Note: Only a two-wire type room thermostat can be used.







2.11 Electrical Diagram

Legend:

AT = High Voltage P.C.B.
BT = Low Voltage P.C.B.
B = Flame Failure L.E.D.
C = Insufficient Water Pressure L.E.D.
D = Water Temperature Indicator L.E.D.s
E = Overheat Thermostat Warning L.E.D.
F = System Reset Button
G = Selector Knob for Operating Mode
H = Domestic Hot Water Temp. Adjustment
I = Central Heating Temp. Adjustment
J = Wire Connector for Room Thermostat
K = Connector for Total Check System
M = Anti-cycling Device Adjustment for Heating
N = Soft-light Adjustment
O = Max Heating Temperature Adjustment
P = Time Clock Connection
Q = On/Off L.E.D.
R = On/Off Switch
S = Interface Wire for P.C.B.s
T = Relay Motorised Valve
U = Ignitor Relay
V = Gas Valve Relay
W = Fan Relay
X = Circulation Pump Relay
Aa = Adaptor (British Gas use only)
Y = Selector TCS2

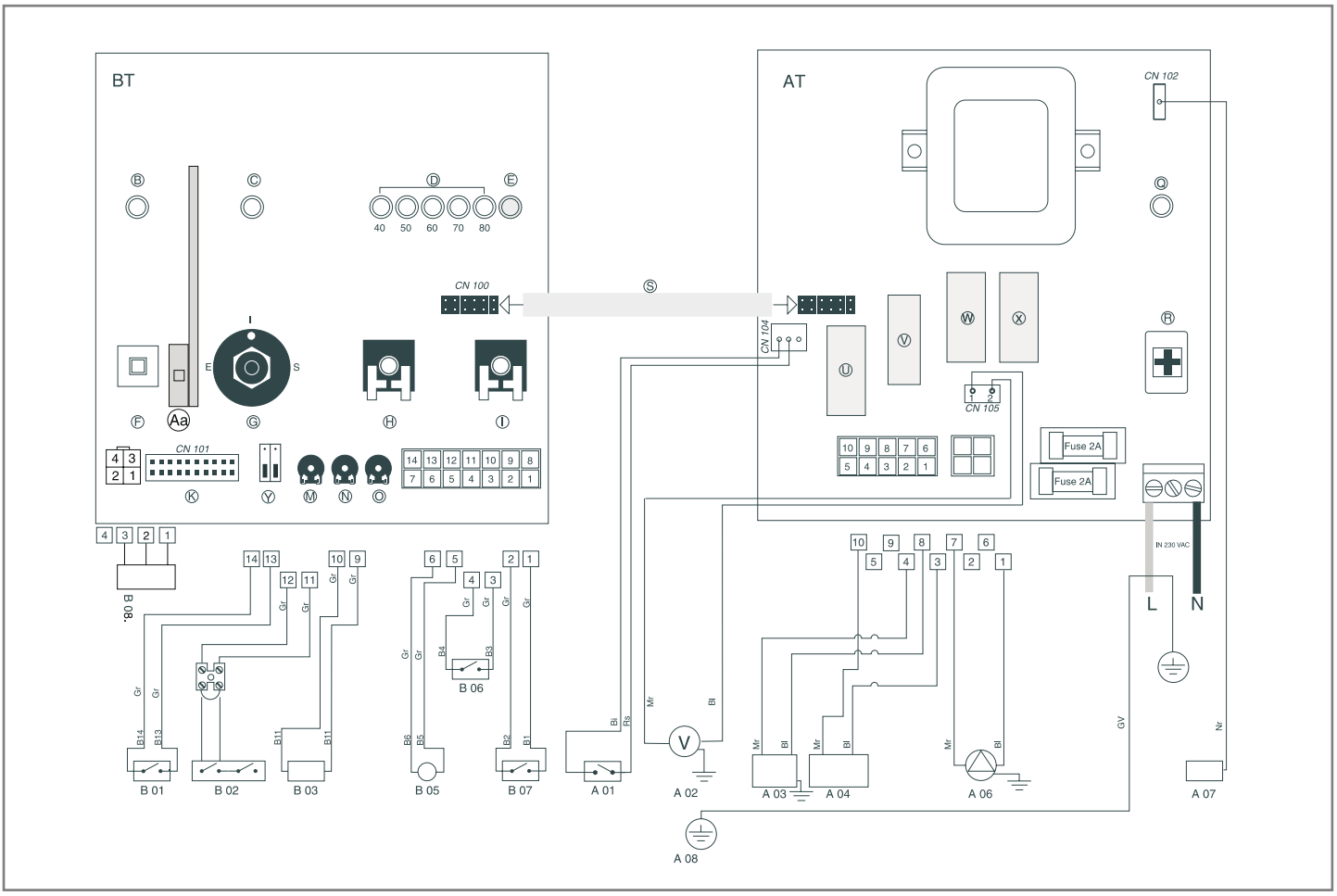
A01 = Air Pressure Switch
A02 = Fan
A03 = Gas Valve
A04 = Ignitor
A05 = Motorised Valve
A06 = Circulation Pump
A07 = Flame Detector
A08 = Earth Terminal
A09 = Flame Detection Circuit
A10 = Flame Indicator L.E.D.
A11 = Transformer
A12 = Filter

B01 = Over Heat Thermostat
B02 = Room Thermostat
B03 = Gas Valve Modulator
B05 = Heating Sensor
B06 = Pressure Switch for Heating Circuit
B07 = Microswitch for Diverter Valve

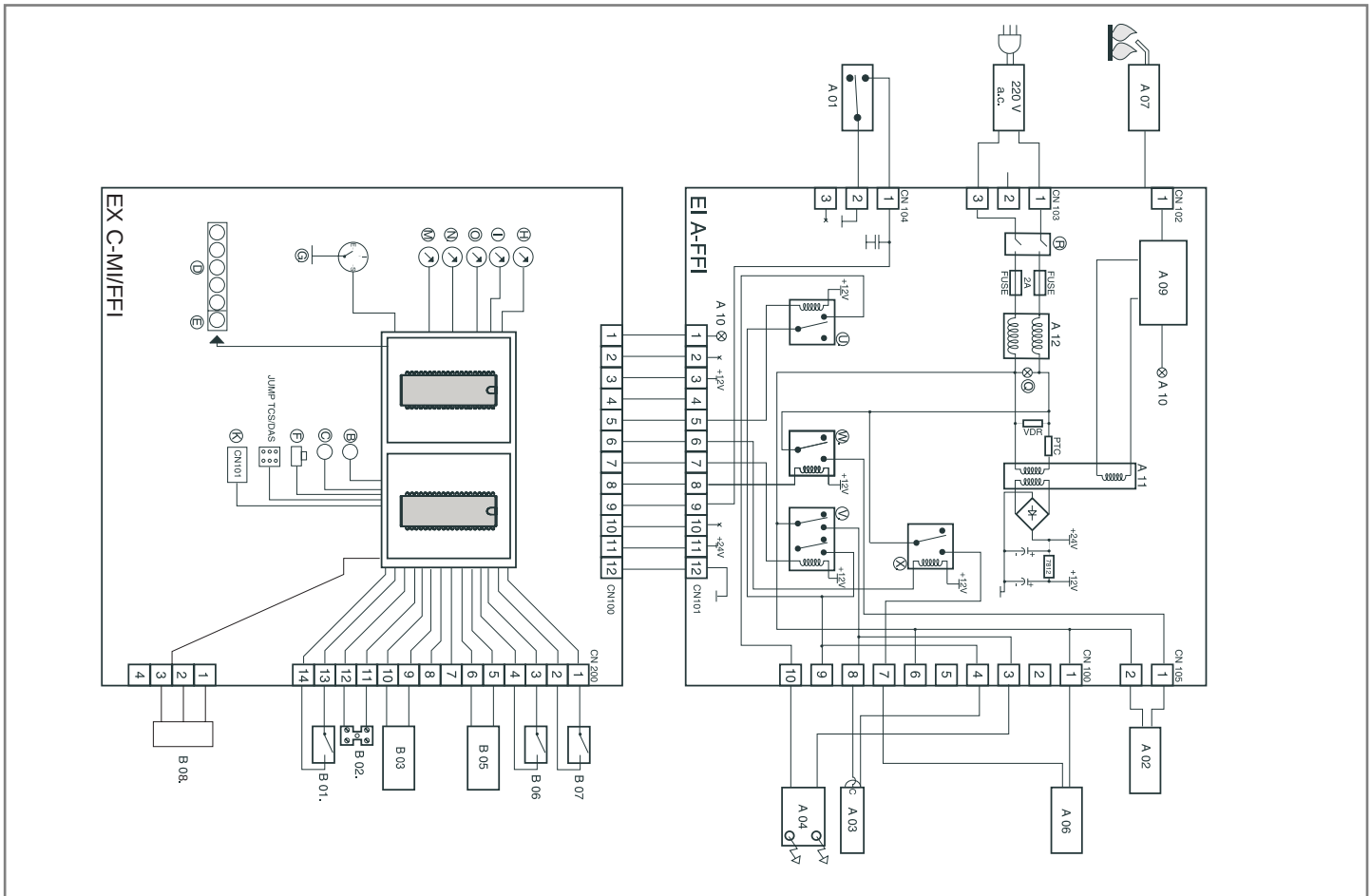
Colours

Gry = Grey
Rd = Red
Bl = Blue
Grn/Yll = Yellow/Green
Wh = White
Brn = Brown
Blk = Black
Wh/Rd = White/Red

A/23 MFFI - A/27 MFFI

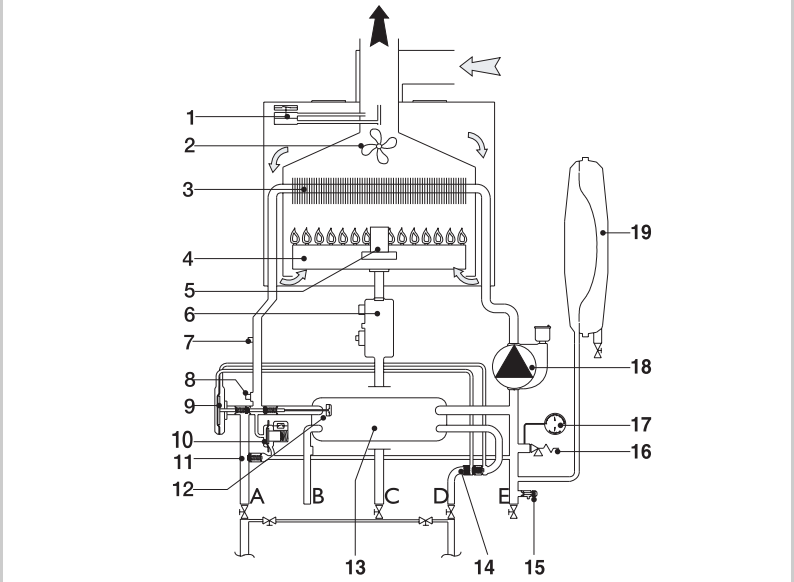


A/23 MFFI - A/27 MFFI



2.12 Water Circuit Diagram

A/23 MFFI - A/27 MFFI



Legend

1. Air Pressure Switch
2. Fan
3. Main Heat Exchanger
4. Main Burner
5. Ignition Electrodes
   Detection Electrode
6. Gas Valve
7. Overheat Thermostat
8. Main Circuit Temperature Probe
9. Diverter Valve
10. Main Circuit Flow Switch including
    Safety Pressure Switch for
    Primary Circuit
11. Automatic By-pass
12. Microswitch for Diverter Valve
13. Secondary Heat Exchanger
14. Domestic Water Inlet Filter
15. Boiler Drain Valve
16. Safety Valve
17. Water Pressure Gauge
18. Circulation Pump with Automatic
    Air Release Valve
19. Expansion Vessel

3 COMMISSIONING

3.1 Initial Preparation

Preliminary electrical system checks to ensure electrical safety must be carried out by a competent person i.e. polarity, earth continuity, resistance to earth and short circuit.

Filling the Heating System:

Remove the panels of the case and lower the control panel (see point 3.2. for further information).
Open the central heating flow and return cocks supplied with the connection kit.
Unscrew the cap on the automatic air release valve one full turn and leave open permanently.
Close all air release valves on the central heating system.
Gradually open valve(s) at the filling point (filling-loop) connection to the central heating system until water is heard to flow, do not open fully.
Open each air release tap starting with the lower point and close it only when clear water, free of air, is visible.
Purge the air from the pump by unscrewing anticlockwise the pump plug and also manually rotate the pump shaft in the direction indicated by the pump label to ensure the pump is free.
Close the pump plug.
Continue filling the system until at least 1 bar registers on the pressure gauge.
Inspect the system for water soundness and remedy any leaks discovered.

Filling of the D.H.W. System:

Close all hot water draw-off taps.
Open the cold water inlet cock supplied with the connection kit.
Open slowly each draw-off tap and close it only when clear water, free of bubbles, is visible

Gas Supply:

Inspect the entire installation including the gas meter, test for soundness and purge, all as described in BS 6891:1988.
Open the gas cock (supplied with the connection kit) to the appliance and check the gas connector on the appliance for leaks.

When the installation and filling are completed turn on the central heating

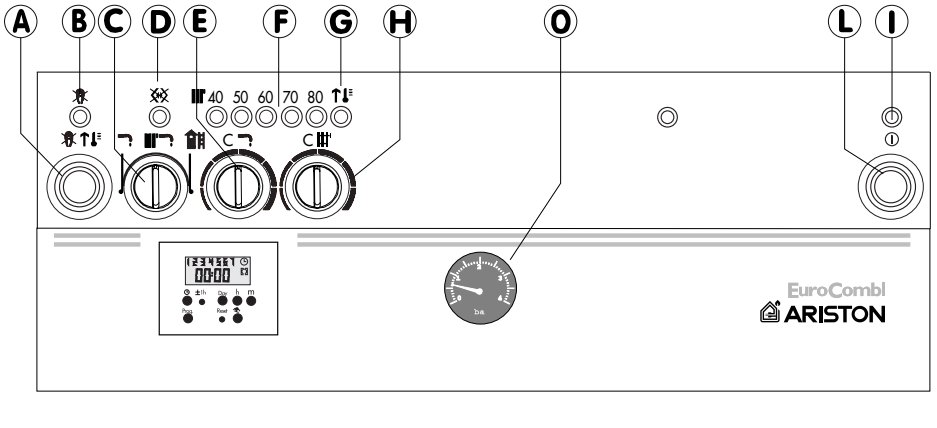
system (sect. 3.4) and run it until the temperature has reached the boiler operating temperature. The system must then be immediately flushed through.
The flushing procedure must be in line with BS 7593:1992 Code of practice for treatment of water in domestic hot water central heating systems.
During this operation, we highly recommend the use of a central heating flushing detergent (Fernox Superfloc or equivalent), whose function is to dissolve any foreign matter that may be in the system.
Substances different from these could create serious problems to the pump or other components.
The use of an inhibitor in system such as Fernox MB-1 or equivalent is strongly recommended to prevent corrosion (sludge) damaging the boiler and system.
Failure to carry out this procedure may invalidate the appliance warranty.

3.2 Removing the Front Panel

To remove the front panel of the casing, proceed as follows:
1. Remove the screw “F” located on the top edge of the panel.
2. Lift and unhook the panel.

3.3 Control Panel

A/23 MFFI - A/27 MFFI



A - Ignition Lockout Reset Button/Safety (Overheat)Thermostat Reset
B - Ignition Lockout L.E.D.
C - Selector Knob for *Summer/Winter/Flue Analysis Modes**
D - Low System Water Level L.E.D.
E - Temperature Adjustment Knob for Domestic Hot Water
F - Heating System Thermometer
G - Safety (Overheat)Thermostat Intervention L.E.D.
H - Adjustment Knob for Heating Temperature
I - On/Off L.E.D.
L - On/Off Switch
O - System Pressure Gauge

** Warning the flue analysis mode must only be selected by a qualified service engineer.*

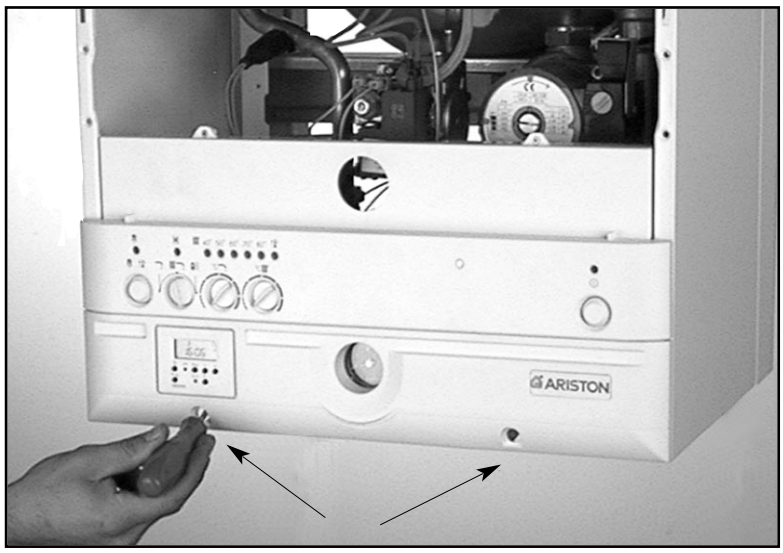
3.4 Initial Start-up

The checks to be run before initial start-up are as follows:

1. Make sure that:
   - the screw on the automatic air valve has been loosened when the system is full;
   - If the water pressure in the system is below 1 bar, bring it up to the appropriate level;
   - Check to see whether the gas cock is closed;
   - Make sure that the electrical connection has been made properly and that the earth wire is connected to an efficient earthing system;
   - Supply power to the boiler by pressing the On/Off switch <L> - the L.E.D. "I" will turn on - turn the selector knob "C" to the <*winter*> setting. This will start the circulation pump. After 7 seconds, the boiler will signal a shut-down due to failure ignition. Leave the boiler as it is until all of the air has been bled from the lines.
   - Loosen the cap on the head of the pump to eliminate any air pockets;
   - Repeat the procedure for bleeding the radiators of air;
   - Open the taps for a brief period;
   - Check the system pressure and, if it has dropped, open the filling-loop again to bring the pressure back up to 1 bar.
2. Check the exhaust flue for the fumes produced by combustion.
3. Make sure that all gate valves are open;
4. Turn on the gas cock and check the seals on the connections, including the one for the burner, making sure that the meter does not signal the passage of gas. Check the connections with a soap solution and eliminate any leaks.
5. Press the reset button "A" for the lighting system; the spark will light the main burner. If the burner does not light the first time, repeat the procedure.
6. Check the minimum and maximum pressure values for the gas going to the burner; adjust it if needed using the values indicated in the table in section 4.
   (See the relative section for burner pressure adjustment within the servicing manual).

3.5 Operational Adjustments

The boiler was designed to make it easy to regulate and check the various features. To access the areas where the adjustment and control devices are located, simply remove the plugs by pressing from the inside, unscrew the screws "A" and remove the bottom part of the instrument panel, rotating it upward.



Right hand side service panel also provides access to:
- the power supply cord connector;
- the fuses.

Left hand side:
- the potentiometer for regulating the ignition delay (anti-cycling) feature, which can be set from 0 to 2 minutes (factory set at 1 minute);
- the potentiometer for regulating the soft-light feature, the setting for which can range from the minimum thermal power to the maximum:

G20	5.5 mm c.a.
G25	4.5 mm c.a.
G30-31	1.8 mm c.a.

- the potentiometer for the maximum thermal power for the heating system, maximum thermal power setting (factory set at the maximum value, unless indicated otherwise on the adhesive sticker located in proximity to the potentiometer);
- The connection for the diagnostic device (TCS-TCS2).

3.6 Combustion Analysis

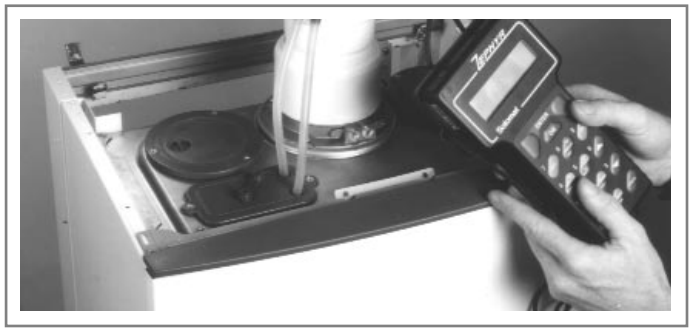
The boiler is designed to make it easy to analyse the combustion by-products.

Using the especially designed apertures, readings can be taken on the temperature of the combustion by-products and of the combustion air, as well as of the concentrations of O_2 and CO_2, etc.

The best maximum-power test conditions for the heating system are when the selector “C” is turned to the flue analysis setting.

3.7 Fume Discharge Monitoring

The discharge/ventilation of the exhaust fumes can be monitored to check for losses in general pressure in the system. This is done to eliminate the cause of lighting failure with the main burner not indicated by a shutdown status.
With a differential manometer connected to the test socket on the combustion chamber, the DP value for the air pressure switch can be taken. The measured value should not be less than 10 mbar under maximum thermal power conditions (with the knob “C” on the flue test setting) in order for the unit to function properly and without interruption.



3.8 Boiler Safety Systems

The boiler is equipped with the following safety systems (see section 3.3 for references):

1 - Ignition Failure

This control signals an ignition failure on the burner 7 seconds after a lighting failure. The L.E.D. “B”.will turn on to signal the shutdown status.
The system can be reset by pressing and releasing the button “A” after checking to make sure that the gas valve is open. Repeat this process until the burner lights.

2 - Circulation Failure

This control signals that the safety pressure switch on the primary circuit has not sensed a pressure of at least 1 bar within 40 seconds of the activation of the circulation pump, it shuts off the boiler and lights the L.E.D. “D”. The system can be reset (after the pressure has been brought up to the proper level) by using the On/Off switch “L”.

3 - Overheating

This control shuts off the boiler in the case where the primary circuit reaches a temperature in excess of 110°C. The L.E.D. “G” will come on to signal this shut

off status. After the system has been allowed to cool, the system can be reset by pressing the button “A”.

4 - Limescale Build-up

This is an indirect control (actuated through the regulation of the temperature in the primary heat exchanger) on the formation of limescale in the secondary heat exchanger. Regardless of the flow rate and the temperature in the circuit for the domestic hot water, the temperature is limited to 62°C.

5 - Safety Shut-off

At the start of every lighting phase, the P.C.B. performs a series of internal controls. If a malfunction occurs, the boiler will shutdown until the problem has been resolved.

3.9 Draining the System

Draining the heating system.

The heating system must be emptied as follows:

- Turn off the boiler;
- Open the drain valve for the system and place a container below to catch the water that comes out;
- Empty the system at the lowest points (where present). If you plan on not using the heating system for an extended period of time, it is recommended that you add antifreeze with an ethylene glycol base to the water in the heating lines and radiators if the ambient temperature drops below 0°C during the winter.
  This makes repeated draining of the entire system unnecessary.

Draining the domestic hot water system.

Whenever there is the danger of the temperature dropping below the freezing point, the domestic hot water system must be drained as follows:

- Turn off the general water valve for the household plumbing system;
- Turn on all the hot and cold water taps;
- Empty the remaining water from the lowest points in the system (where present).

4. GAS ADJUSTMENTS

CATEGORY II2H3+		**Methane Gas G20**	**Liquid Butane Gas G30**	**Liquid Propane Gas G31**
Lower Wobbe Index (15°C;1013mbar)	MJ/m^3h	45.67	80.58	70.69
Nominal Delivery Pressure	mbar	20	30	37
Minimum Delivery Pressure	mbar	17	20	25
A/23 MFFI				
Main Burner: n. 13 jets (ø)	mm	1.,25	0.72	0.72
Consumption (15°C; 1013mbar)	mc/h	2.72	----	----
Consumption (15°C; 1013mbar)	Kg/h	----	2.02	2.02
Gas Cock Outlet Pressure min - max	mbar	11.4- 2.0	27.5 (*) - 5.2	35.0 (*) - 7.0
A/27 MFFI				
Main Burner: n. 15 jets (ø)		1.25	0.72	0.72
Consumption (15°C; 1013mbar)	mc/h	3.16	----	----
Consumption (15°C; 1013mbar)	Kg/h	----	2.35	2.32
Gas Cock Outlet Pressure: max - min	mbar	11.6-2.2	(*) - 4.8	(*) - 6.0

(1mbar = 10,197 column of water)

The outlet pressure of the gas cock is obtained by completely loosening the screw on the solenoid. The maximum pressure of the gas to the burner will be equal to the nominal delivery pressure minus the head loss within the gas valve.

4.1 Changing the Type of Gas

The boiler can be converted to use either methane (natural) gas (G20) or LPG (G30 - G31) by an Authorised Service Centre.

The operations that must be performed are the following:

1. Replace the jets on the main burner (see table in section 4);
2. Adjust the maximum and minimum thermal capacity values for the boiler (see table in section 4);
3. Replace the gas rating plate;
4. Adjust the maximum thermal power setting;

CATEGORY II2H3+	Methane Gas G20	Liquid Butane Gas G30	Liquid Propane Gas G31
Recommended Soft-Light Pressure (mbar)	5-5.5	17 - 18	18 - 19

5. Adjust the soft-light feature;
6. Adjust the ignition delay feature for the heating system (can be set from 0 to 2 mins.).

5. MAINTENANCE

It is recommended that the following checks be made on the boiler at least once a year:

1 - Check the seals for the water connections; replacement of any faulty seals.
2 - Check the gas seals; replacement of any faulty gas seals.
3 - Visual check of the entire unit.
4 - Visual check of the combustion process and cleaning of the burners if needed.
5 - If called for by check no. 3, dismantling and cleaning of the combustion chamber.
6 - If called for by check no. 4, dismantling and cleaning of the injectors.
7 - Visual check of the primary heat exchanger:
- check for overheating in the blade assembly;
- clean the exhaust fan if needed.

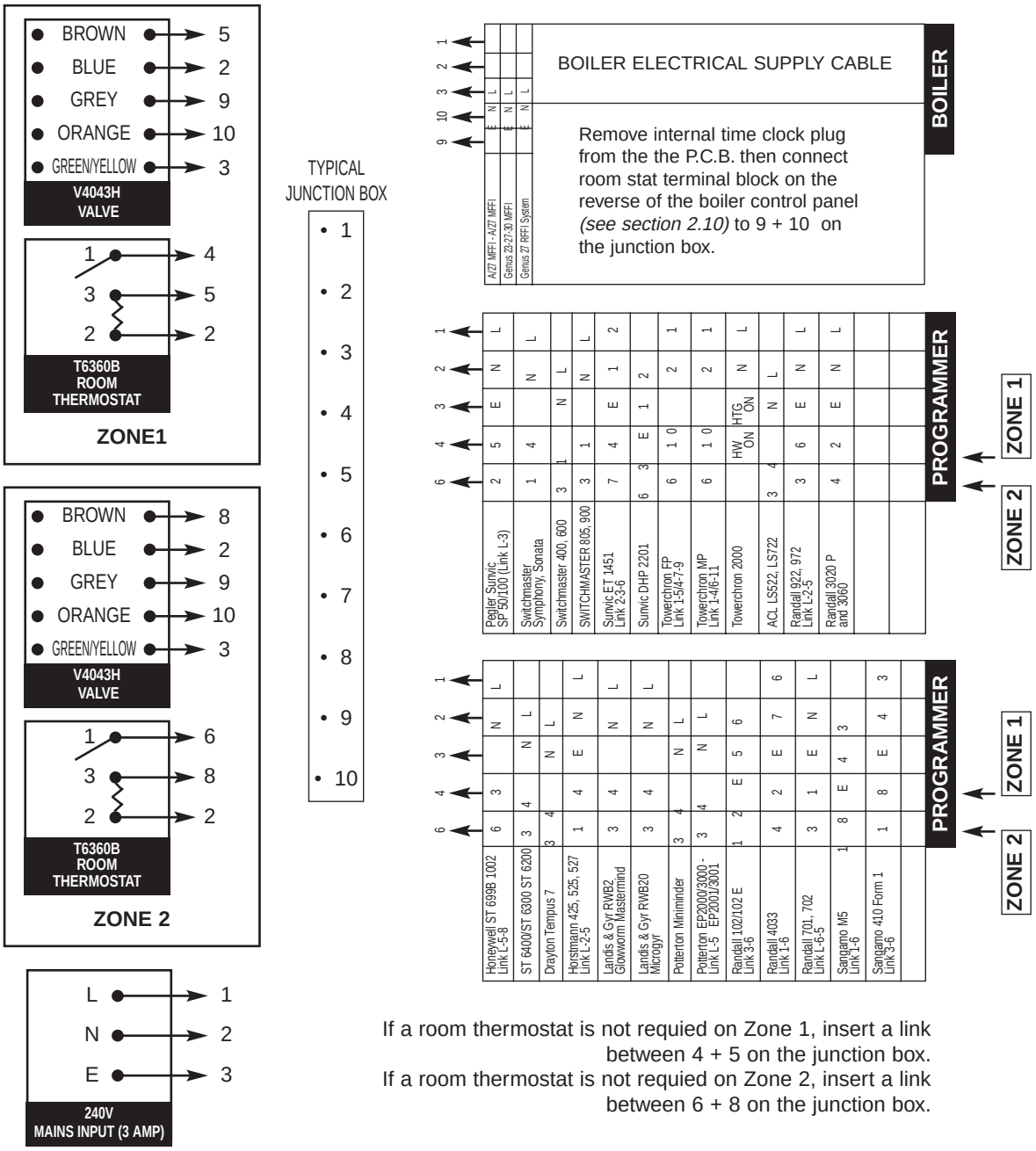
8 - Adjustment of the flow rate of the gas: flow rate for lighting, partial load and full load.
9 - Check of the heating safety systems:
- safety device for maximum temperature;
- safety device for maximum pressure.

10 - Check of the gas safety systems:
- safety device for lack of gas or flame (detection electrode);
- safety device for gas cock.

11 - Check of the electrical connection (make sure it complies with the instructions in the manual).
12 - Check of domestic hot water production efficiency (delivery rate and temperature)
13 - Check of the general performance of the unit.
14 - General check of the discharge/ventilation of the combustion by-products.

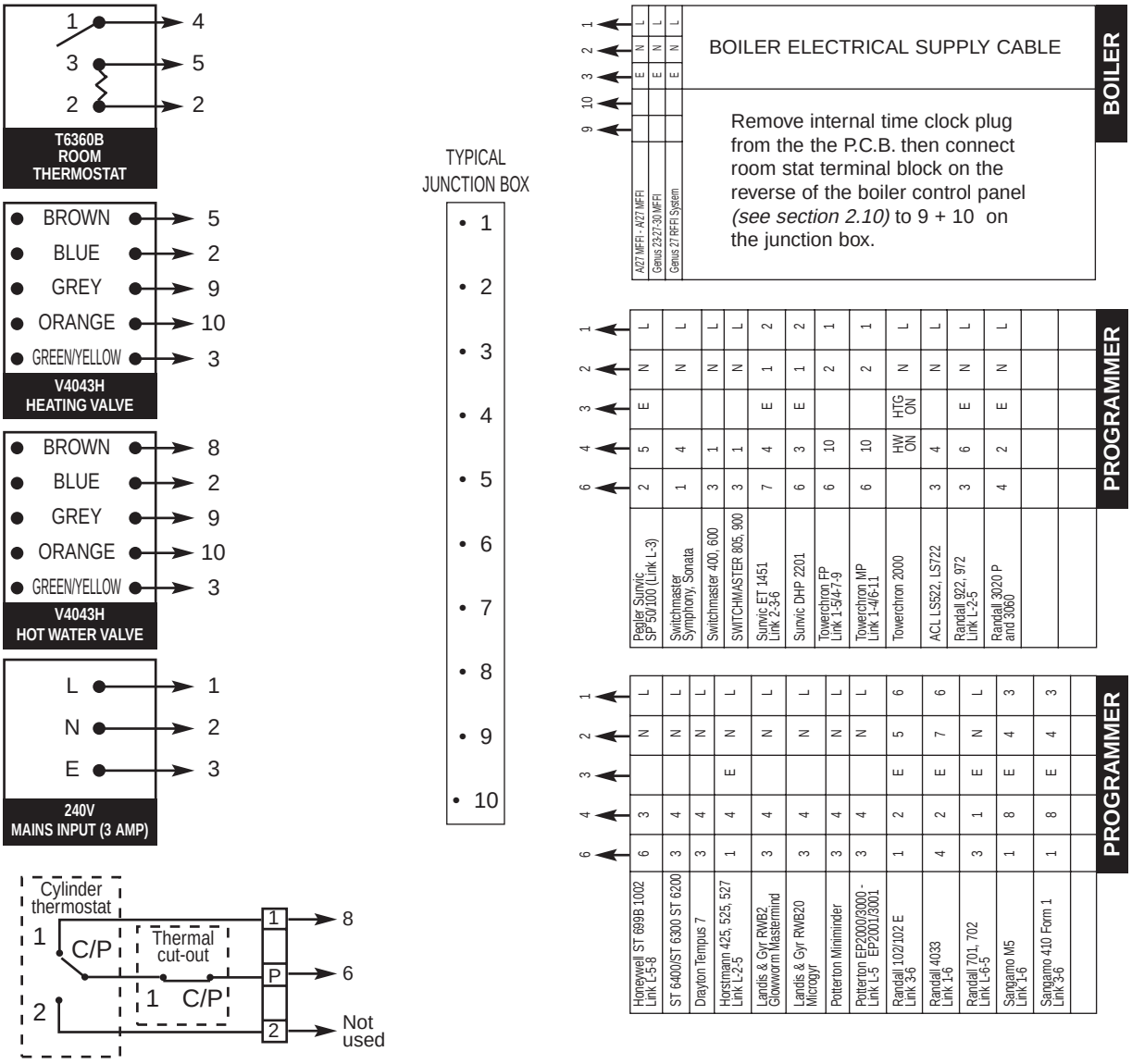
6. MISCELLANEOUS

6.1 Wiring Diagram for Two Heating Zones



If a room thermostat is not requied on Zone 1, insert a link between 4 + 5 on the junction box.
If a room thermostat is not requied on Zone 2, insert a link between 6 + 8 on the junction box.

6.2 *Wiring Diagram for Connection to Ariston Unvented Cylinder*



Based on Honeywell controls

NOTES

NOTES

Manufacturer: **Merloni TermoSanitari SpA - Italy**

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STAMPA: Azienda Grafica BIEFFE srl - Recanati

Cod. 23 99 84 1260 112 - B023

EuroCombi

ARISTON

A/23 MFFI - A/27 MFFI

G.C.N. **47-116-10 / 47-116-12**

Servicing Instructions

Type C Boilers

LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER

TABLE OF CONTENTS

1. SERVICING INSTRUCTIONS

To ensure efficient safe operation, it is recommended that the boiler is serviced annually by a competent person.

Before starting any servicing work, ensure both the gas and electrical supplies to the boiler are isolated and the boiler is cool.
Before and after servicing, a combustion analysis should be made via the flue sampling point (please refer to the Installation Manual for further details).

After servicing, preliminary electrical system checks must be carried out to ensure electrical safety (i.e. polarity, earth continuity, resistance to earth and short circuit).

1.1 Replacement of Parts

The life of individual components vary and they will need servicing or replacing as and when faults develop.
The fault finding sequence chart in chapter 2 will help to locate which component is the cause of any malfunction, and instructions for removal, inspection and replacement of the individual parts are given in the following pages.

1.2 To Gain General Access

All testing and maintenance operations on the boiler require the control panel to be lowered. This will also require the removal of the casing.

To dismantle the front part of the casing, proceed as follows:
1. Remove screw “A” *(see fig. 1.1)*;
2. Lift the front panel up and forward *(see fig. 1.2)*.

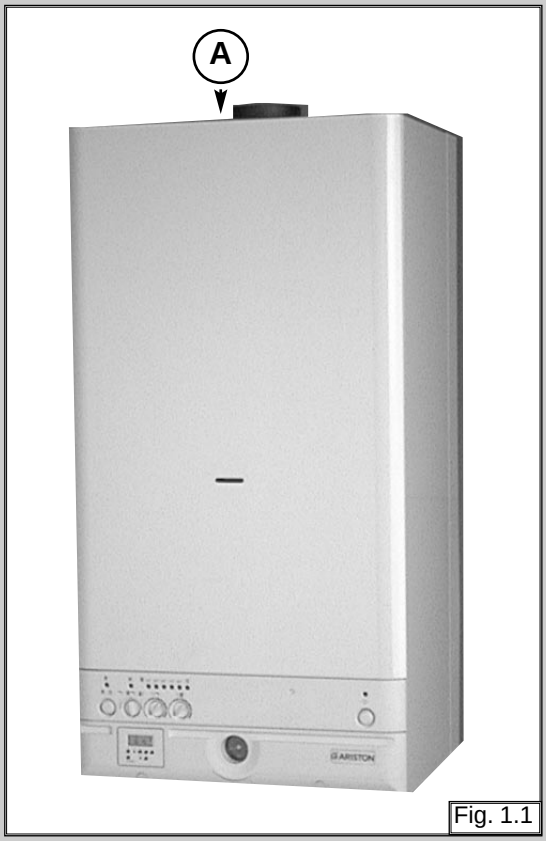


Fig. 1.1

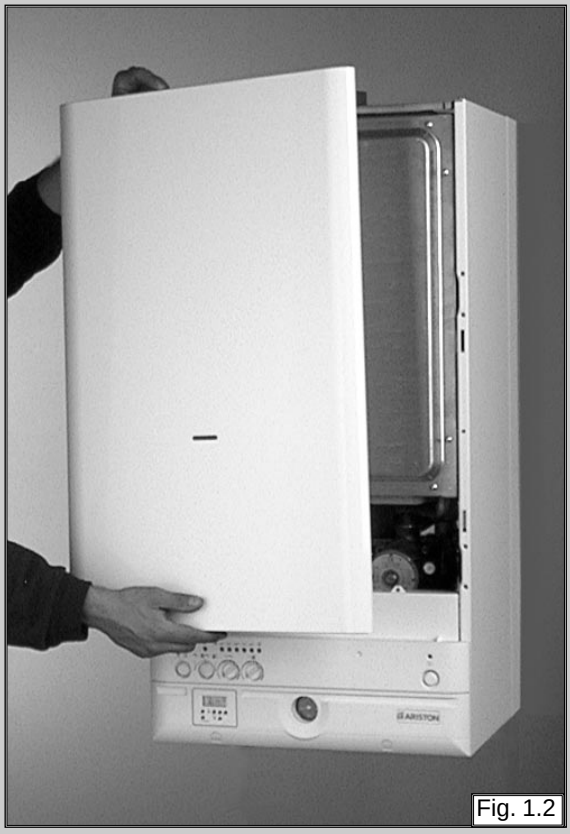


Fig. 1.2

Fig. 1.3

Removing the side panels

1. Remove the screws “B”;

2. Pull the panel away from the boiler, then lift the panel up and away from the boiler *(see fig. 1.2).*

To lower control panel

1. Remove the screws “B”

2. Push the two side panels outward slightly *(fig. 1.5)*;

3. Rotate the control panel forward and down.

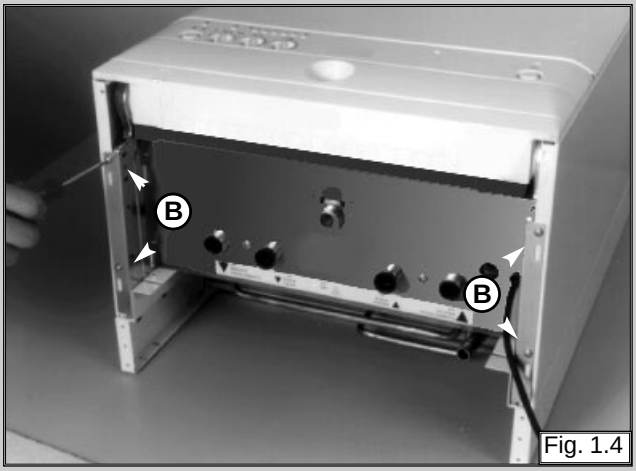


Fig. 1.4

Fig. 1.5

To access the areas where the adjustment and control devices are located, simply remove the plugs by pressing from the inside, unscrew the screws “C” and remove the bottom part of the instrument panel, rotating it upwards.

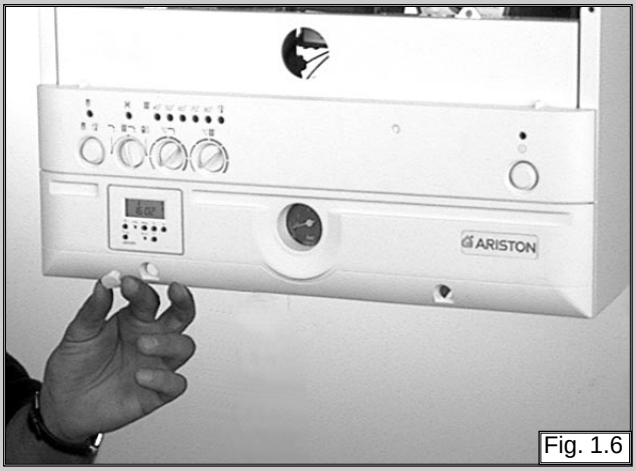


Fig. 1.6

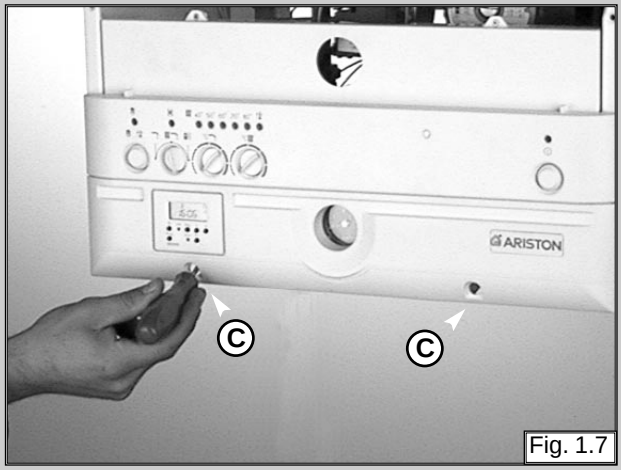


Fig. 1.7

1.3 *Access to the Combustion Chamber*

Removing the sealed chamber frontal cover

Fig. 1.8

Removing the combustion cover

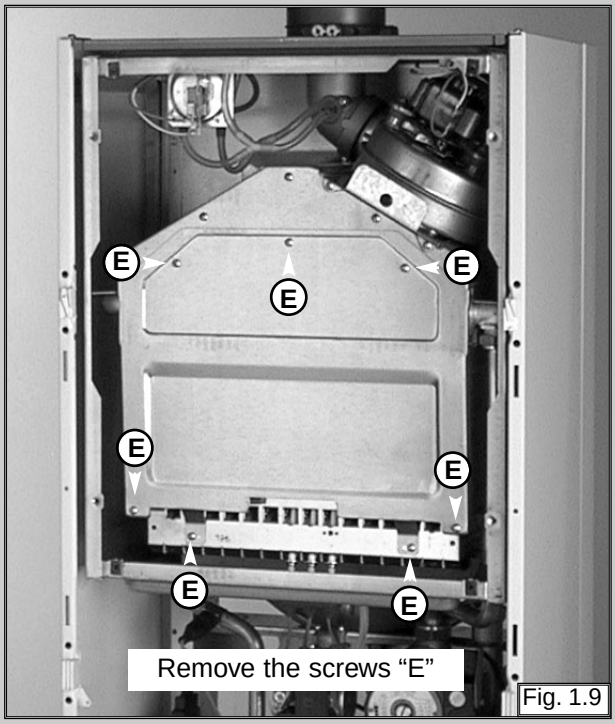


Fig. 1.9

Removing the burner and the injectors

1. Remove the side panels of sealed chamber *(fig. 1.10)*;
2. Remove the screws “F” of the burner *(see fig. 1.11)*;
3. Remove the burner *(see fig. 1.12)*;
4. Remove the injectors using a No. 7 socket spanner;
5. Replace in reverse order.

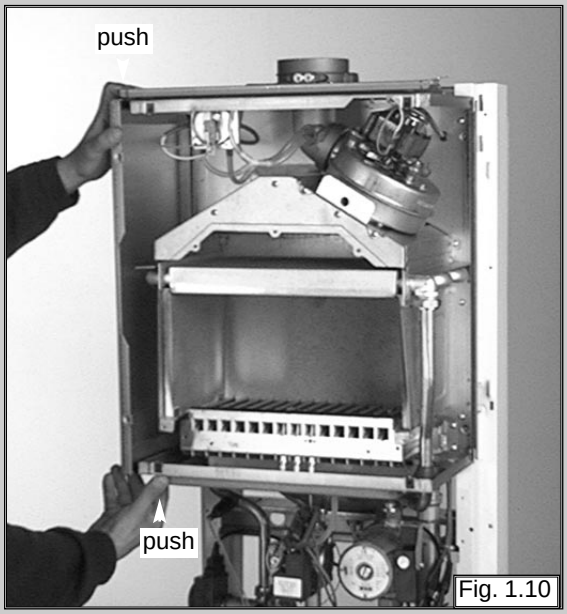


Fig. 1.10

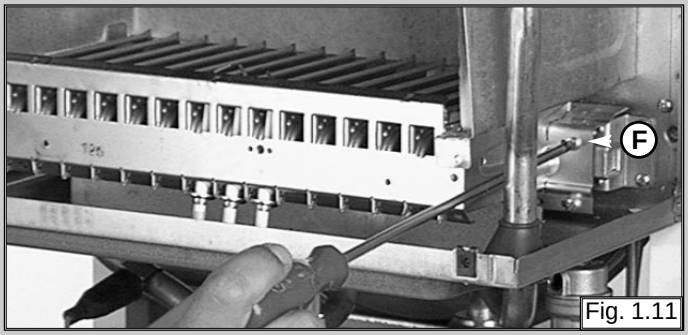


Fig. 1.11

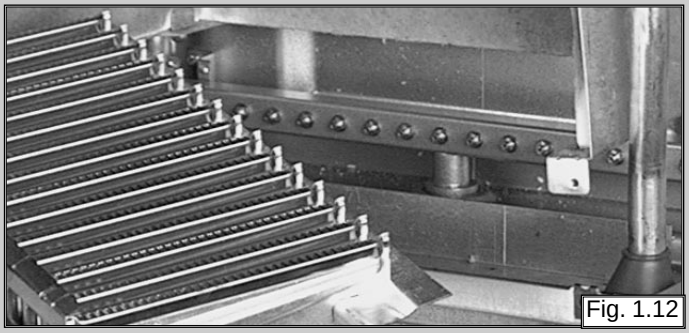


Fig. 1.12

Removing the electrodes

1. Remove rubber gasket “G” *(see fig. 1.13)*;
2. Disconnect ignition leads by pulling downward *(see fig. 1.14)*;
3. To remove the flame sensor, disconnect the cable at its only connection point close to the P.C.B. *(see fig. 1.15)*;

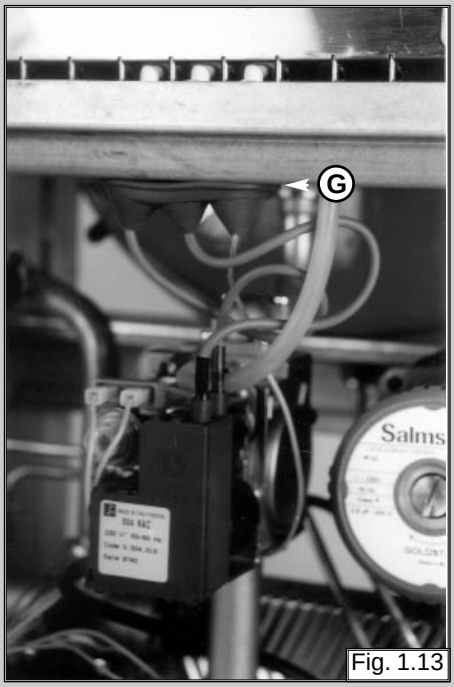


Fig. 1.13


Fig. 1.14

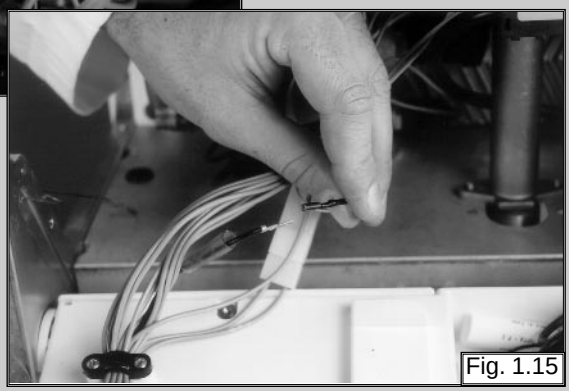


Fig. 1.15

5. Remove screw “H” using a Philips No. 2 star tip screwdriver *(see fig. 1.16)*;
6. Slide the electrode gently downward *(see fig. 1.17).*

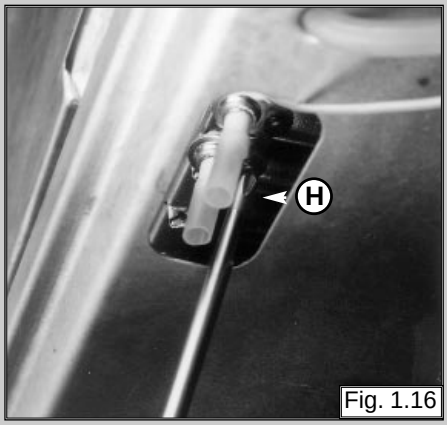


Fig. 1.16

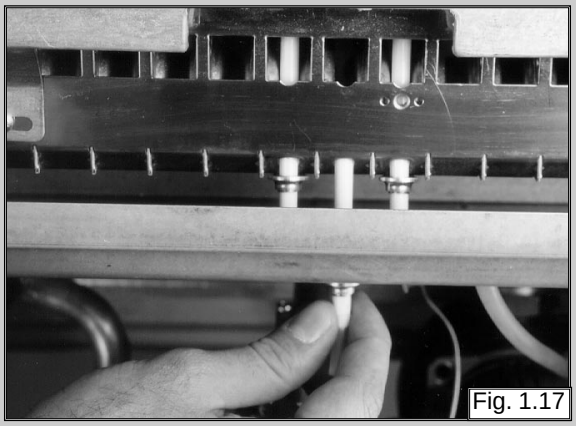


Fig. 1.17

To replace, repeat the steps in reverse order, paying particular attention to the following:

a - Centre the electrode in the positioning hole carefully, otherwise the electrode may break;
b - Check that the cables have been connected correctly;
c - Check that the rubber gasket covers the cable/electrode connection point completely.

Removing the main heat exchanger

1. Drain the boiler of water;
2. Release the two connection nuts “I” connecting the exchanger to the flow and return pipes *(see fig. 1.18)*;
3. Pull it straight out *(see fig. 1.19).*

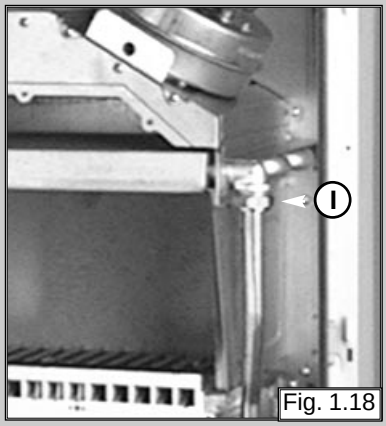


Fig. 1.18

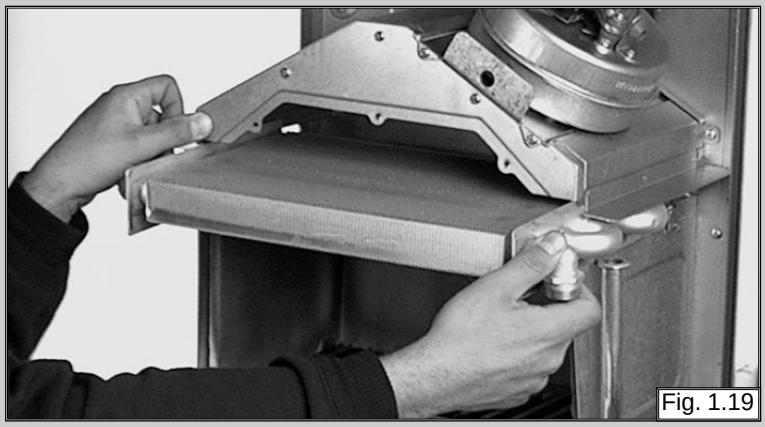


Fig. 1.19

Removing the air pressure switch

1. Disconnect the electrical connections “K” and silicone pipes “L” from their connection points *(see fig. 1.20)*;
2. Remove screws “J” on the top of the sealed chamber *(see fig. 1.21)*; Use a No. 2 star tip screwdriver to remove the switch from the plate.

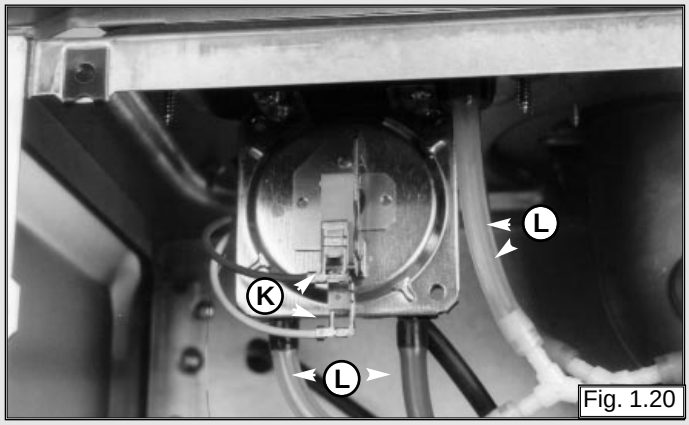


Fig. 1.20

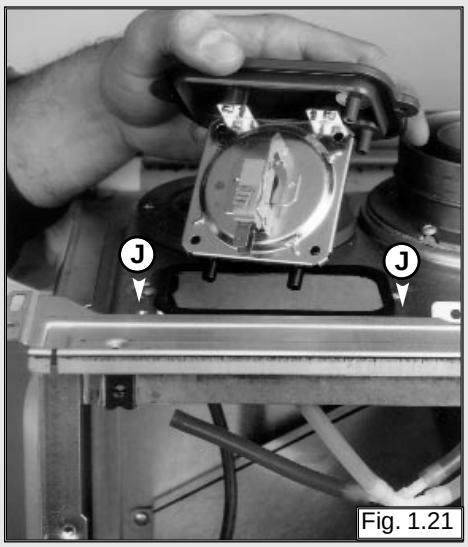


Fig. 1.21

Removing the venturi device

1. Disconnect the silicone pipes “M” and remove the screw “N” *(see fig. 1.22)*;
2. Extract the venturi *(see fig. 1.23)*.

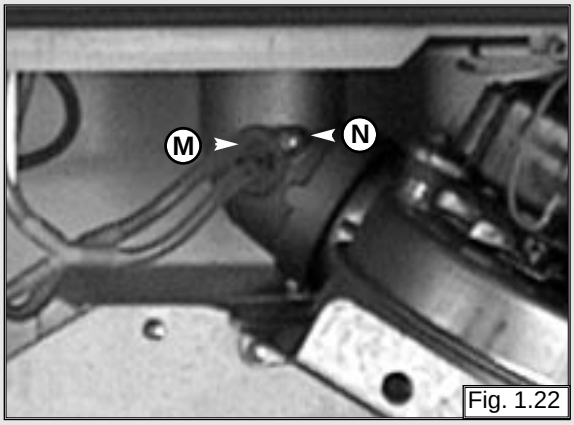


Fig. 1.22

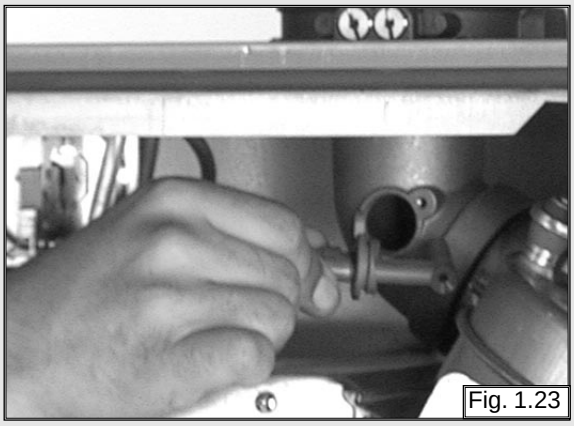


Fig. 1.23

Removing the fan

1. Disconnect electrical connections and remove screws “O” using a No. 2 star tipped screwdriver *(see fig.1.24)*;
2. Pull fan to the right, forward and remove (*see fig.1.25)*;
3. Remove fan from mounting plate;
4. Remove screws “P” *(see fig.1.26)*.

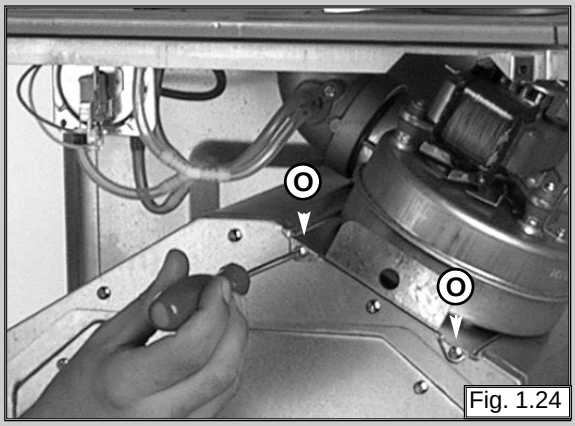


Fig. 1.24

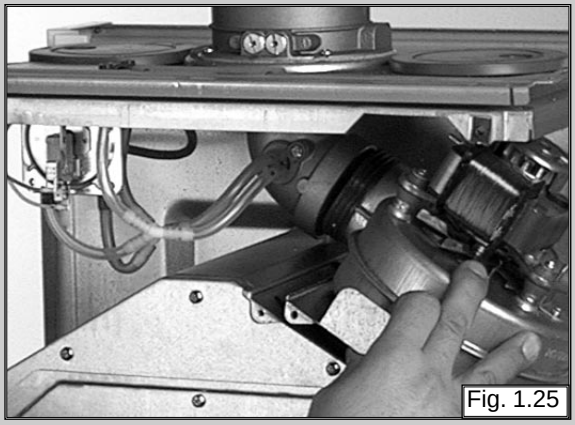


Fig. 1.25

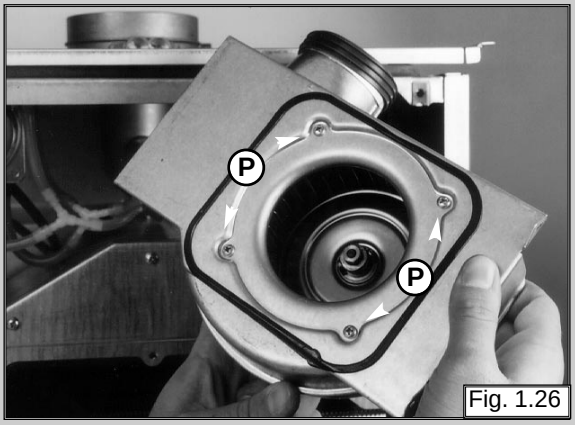
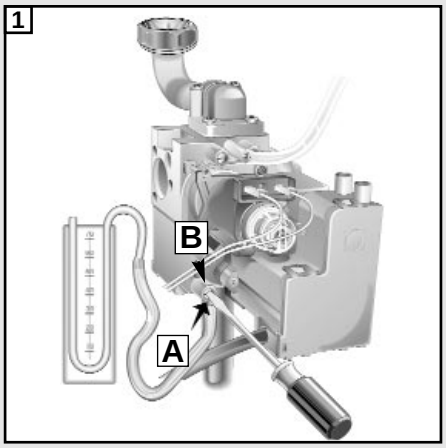
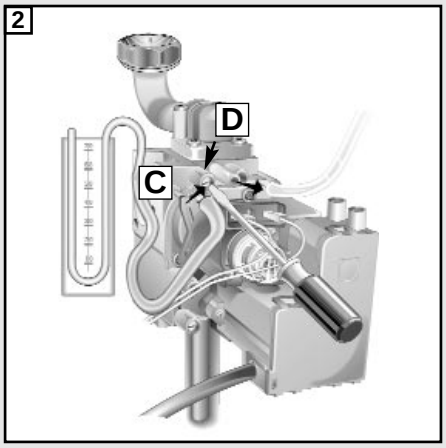


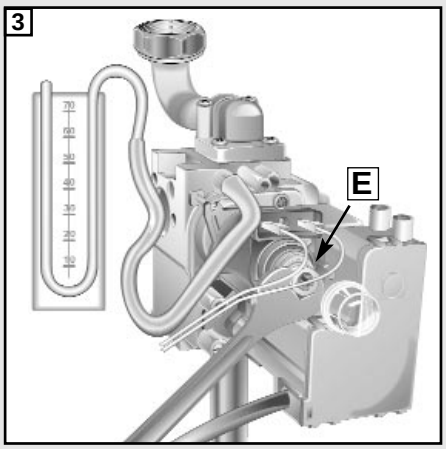
Fig. 1.26

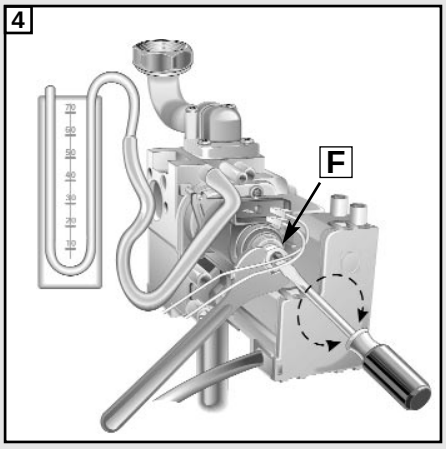
1.4 *Servicing and Removal of the Gas Valve*

SIT SIGMA

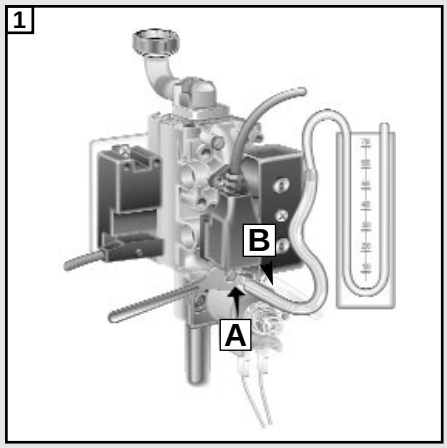


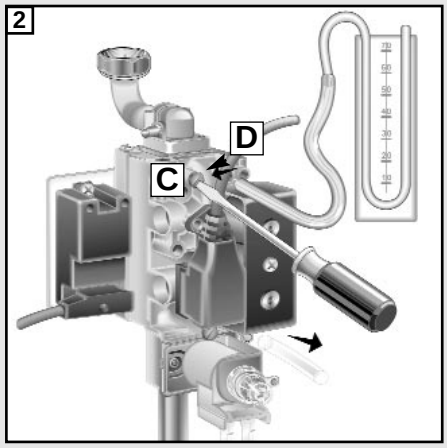


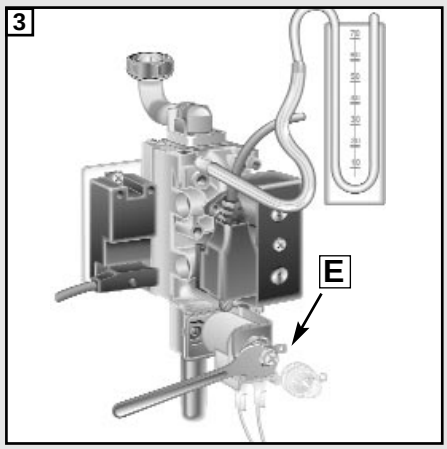


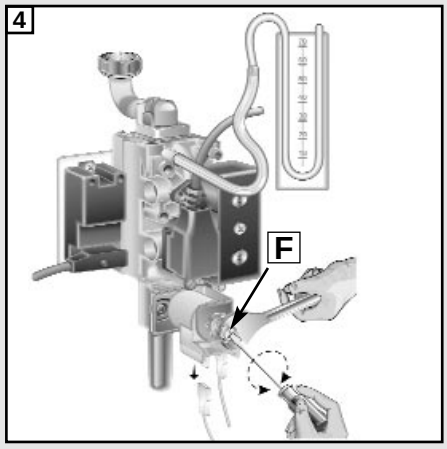


SIT TANDEM









Setting the minimum and the maximum power of the boiler

1. Check that the supply pressure to the gas valve is a minimum of 20 mbar for natural gas.
2. To do this, remove the screw **"A"**.
   Fit the pipe of the pressure gauge to the pressure connection of the gas valve **"B"**.
   When you have completed this operation, replace the screw **"A"** securely into its housing to seal off the gas.
3. To check the pressure supplied by the gas valve to the burner, remove the screw **"C"**. Fit the pipe of the pressure gauge to the pressure outlet of the gas valve **"D"**.
   Disconnect the compensation pipe either from the gas valve or from the sealed chamber.
4. Set the On/Off button to position < ⏽ > and the "summer/winter" switch to the winter position.
   To set the maximum power, turn on the hot water tap and allow the hot water tap to run at a rate of about 8 litres/minute so that the main burner lights.
   Adjust nut **"E"** on the modureg to set the gas pressure (displayed on the pressure gauge) corresponding to the maximum power (see table "A" page 11).
5. To set the minimum power, disconnect a supply terminal from the modureg and adjust screw **"F"**.
   Turn the screw clockwise to increase the pressure and counter-clockwise to decrease the pressure (displayed on the pressure gauge) corresponding to the minimum power (see table "A" page 11).
6. When you have completed the above operations, turn off the hot water tap, re-connect the supply terminal to the modureg on the gas valve and replace the cap on the screw of the modureg.

Setting the maximum heating circuit power

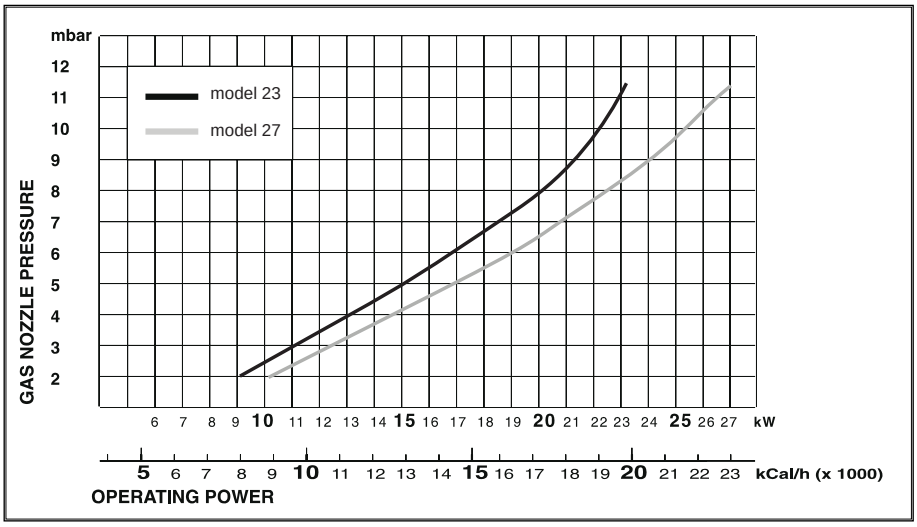
7. To set the maximum heating circuit power, place the On/Off button to position < ⏽ > and the "summer/winter" switch to winter position.
   Turn the knob of the heating thermostat clockwise to maximum;
8. Remove the left hand inspection panel of the P.C.B. and fit a small cross-head screwdriver in to the right hand potentiometer. Turn clockwise to increase the pressure or counter-clockwise to reduce the pressure. Adjust the setting to the required heating pressure value (displayed on the pressure gauge), as indicated in the diagrams shown in page 11.
9. Turn off the boiler by placing the main switch to the "Off" position.

Setting pressure for soft ignition.

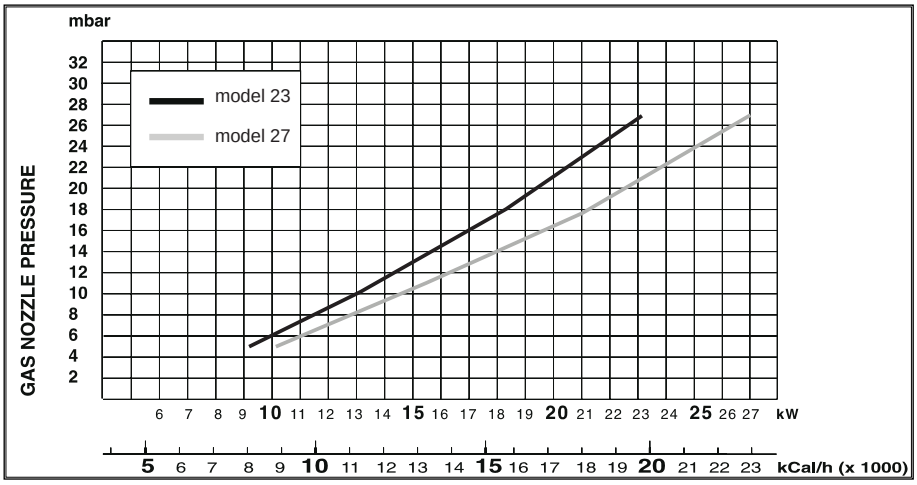
Disconnect the detection electrode connection from the P.C.B. (see fig. 1.13).
Start the boiler and during the ignition sequence adjust the centre potentiometer until the gas pressure reads the required gas pressure as per the table below.
Once the gas pressure is set turn off the boiler and reconnect the connection to the P.C.B.
NB.: It may be necessary to reset the flame failure reset a number of times during this operation.

	NATURAL GAS (G20)	BUTANE GAS (G30)	PROPANE GAS (G31)
Recommended pressure for slow ignition	5 mbar - 1.95 in w.g.	18 mbar - 7.0 in w.g.	19 mbar - 7.4 in w.g.

Regulating the heating power for natural gas (G20)



Regulating the heating power for butane gas (G30)



Regulating the heating power for propane gas (G31)

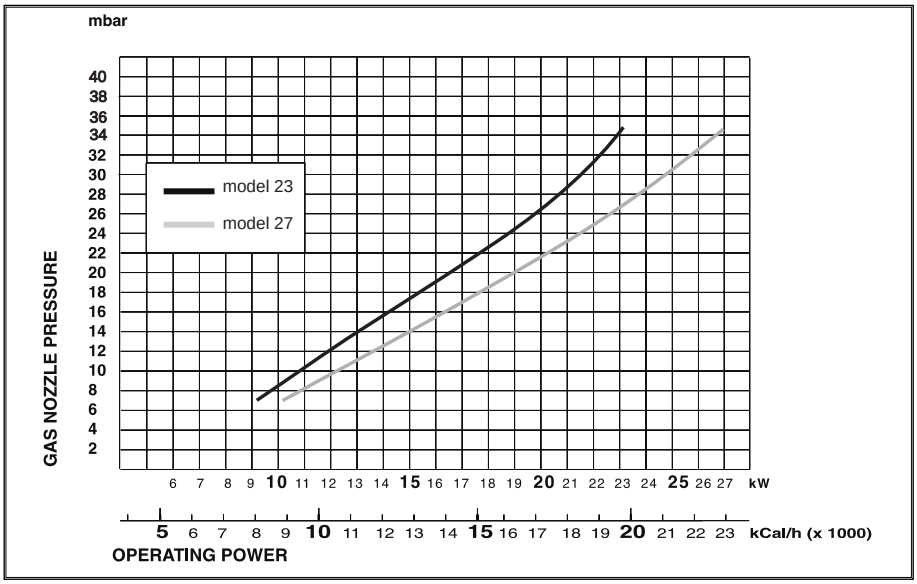
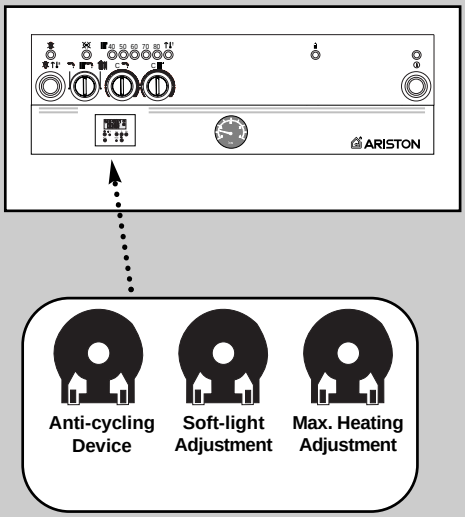


TABLE "A"

GAS REQUIREMENTS		NATURAL GAS (G20)		BUTANE GAS (G30)		PROPANE GAS (G31)	
Gas rate	max	3.0 m^3/h	106.0 ft^3/h	0.88 m^3/h	31.1 ft^3/h	1.15 m^3/h	40.6 ft^3/h
Gas rate	min	1.2 m^3/h	42.3 ft^3/h	0.35 m^3/h	12.3 ft^3/h	0.46 m^3/h	16.2 ft^3/h
Inlet pressure		20 mbar	7.8 in w.g.	28 mbar	10.9 in w.g.	37 mbar	14.4 in w .g.
Burner pressure	max	12.3 mbar	4.8 in w.g.	28 mbar	10.9 in w.g.	37 mbar	14.4 in w .g.
Burner pressure	min	2.0 mbar	0.8 in w.g.	5.1 mbar	2.0 in w.g.	7.0 mbar	2.7 in w.g.
Burner injectors		13 x 1.25		13 x 0.72		13 x 0.72	



10. Remove the pipe from the pressure gauge and connect screw "**C**" to the pressure outlet in order to seal off the gas.

11. Carefully check the pressure outlets for gas leaks (valve inlet and outlet).

IMPORTANT!

Whenever you disassemble and reassemble the gas connections, always check for leaks using a soap and water solution.

Setting the anti-cycling device

This appliance is equipped with a potentiometer which delays the ignition of the heating control and is situated on the P.C.B. (see the electrical diagrams). By adjusting the potentiometer, it is possible to change the time interval between the burner shutting down and its next ignition.

It is preset at 1 minute and can be adjusted from 0 to 2 minutes.

Use this control in particular situations where continuous shutting down and ignition of the main burner occurs.

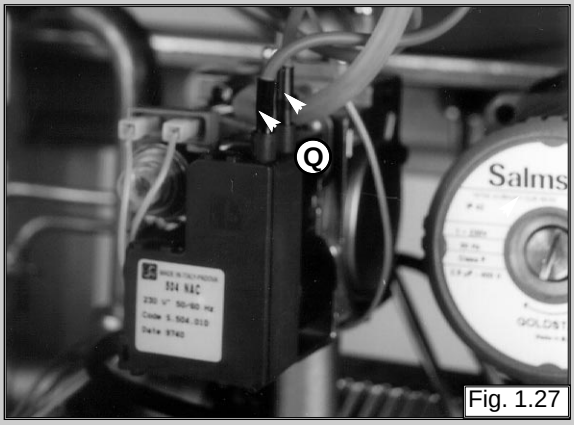


Fig. 1.27

Removing the spark generator (SIT Sigma gas valve)

1. Disconnect ignition leads "Q" by pulling upwards *(see fig. 1.27)*;

2. Remove the screws "R" *(see fig. 1.28)* with a Pozidrive No. 2 star tip screwdriver;

3. Remove the spark generator.

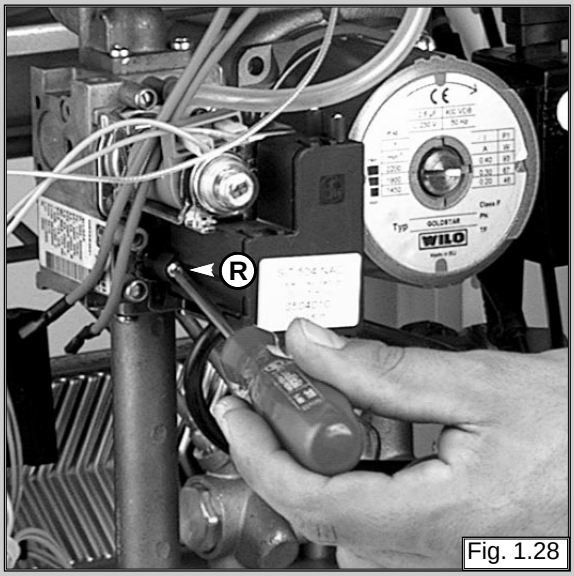


Fig. 1.28

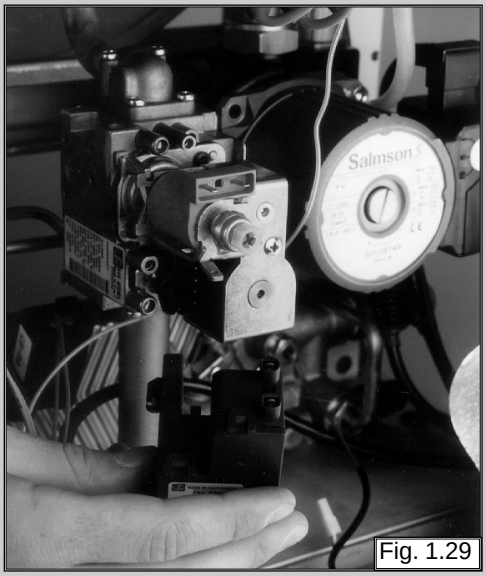


Fig. 1.29

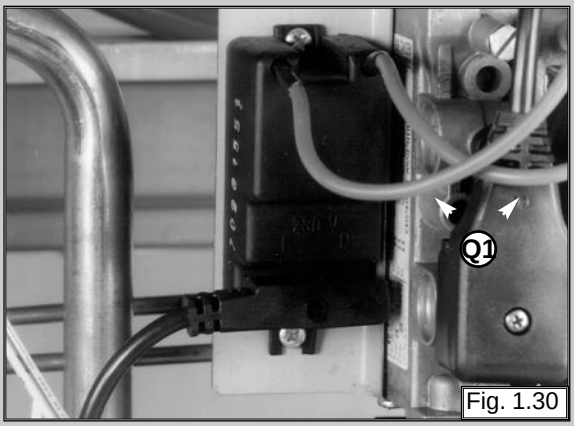


Fig. 1.30

Removing the spark generator (SIT Tandem gas valve)

1. Disconnect ignition leads “Q1” by pulling upwards *(see fig. 1.30)*;
2. Remove the screws “R1” *(see fig. 1.31)* with a Pozidrive No. 2 star tip screwdriver;
3. Remove the spark generator.

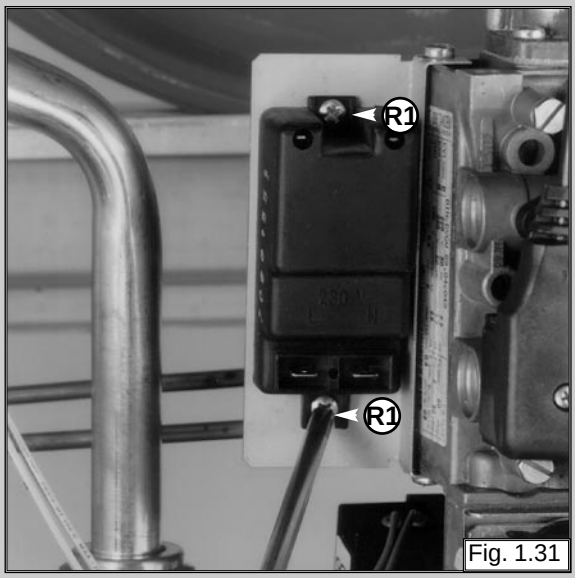


Fig. 1.31

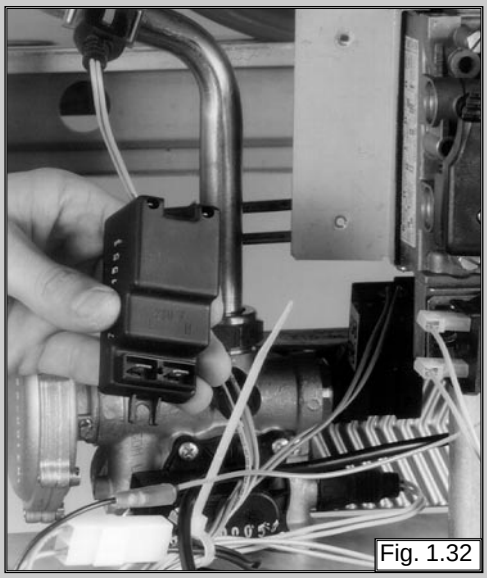


Fig. 1.32

Removing the gas valve

1. Disconnect all the cables from the solenoid and modureg;

2. Remove the spark generator;

3. Release the top nut “S” using a 30 mm open ended spanner *(see fig. 1.31)*;

4. Remove the screws “T” from the bottom of the gas valve pipe *(see fig. 1.32)*.

Attention!! The gas valve is connected with the two pipes (as shown) with an O-ring connection.

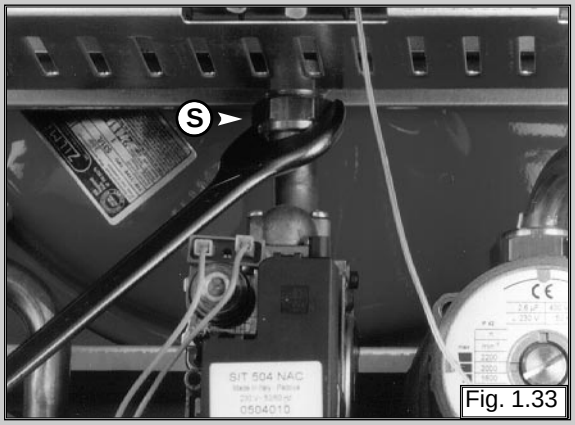


Fig. 1.33

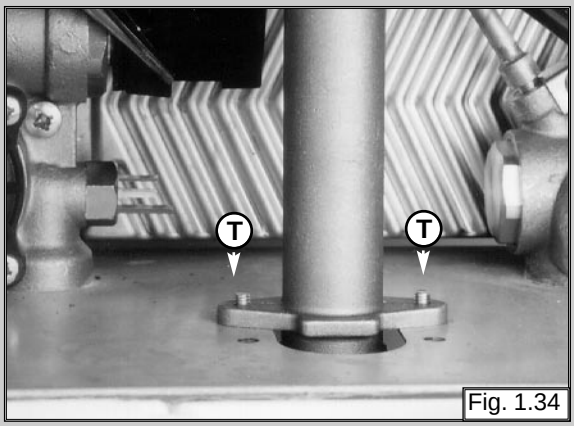


Fig. 1.34

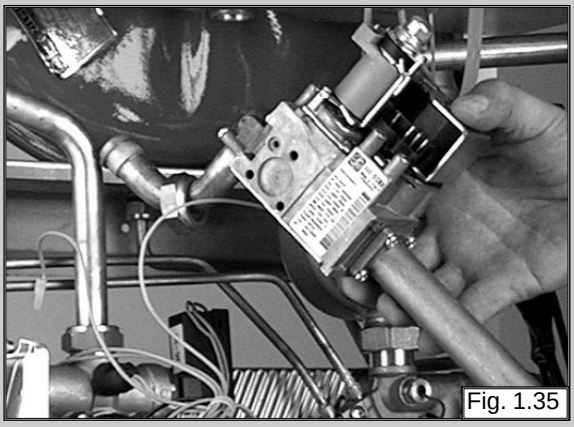


Fig. 1.35


Fig. 1.36

1.5 *Access to the Hydraulic Circuits*

Important! Before any component is removed, the boiler must be drained of all water.

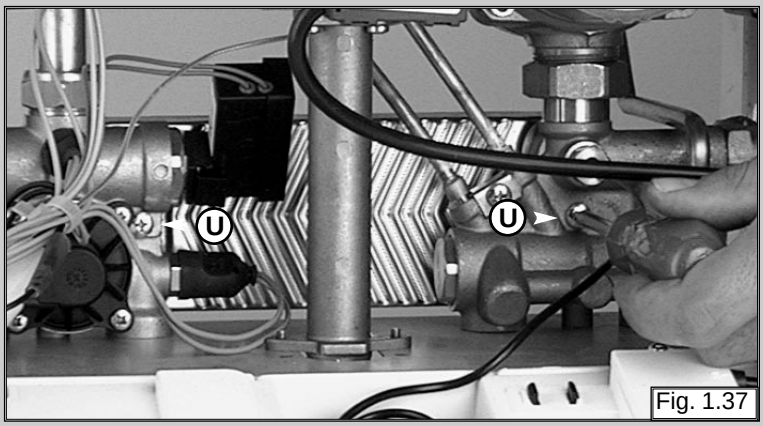


Fig. 1.37

Removing the D.H.W. (secondary) exchanger

1. Remove the screw “U” *(see fig. 1.37)*;

2. Push the exchanger towards the rear of the boiler, lift upwards and remove out of the front of the boiler;

3. Before replacing the exchanger ensure that the O-rings are in good condition and replace if necessary.

Removing the safety valve
1. Loosen nut “V” *(see fig. 1.38);*
2. Remove the valve.

Fig. 1.38

Removing the automatic air vent
1. Unscrew valve “W” *(see fig. 1.39)*.

Fig. 1.39

Removing the main circuit flow switch
1. Remove the cable of the main circuit flow switch “Y”;
2. Remove the screws “Y1” *(see fig. 1.40);*
3. Remove the main circuit flow switch.

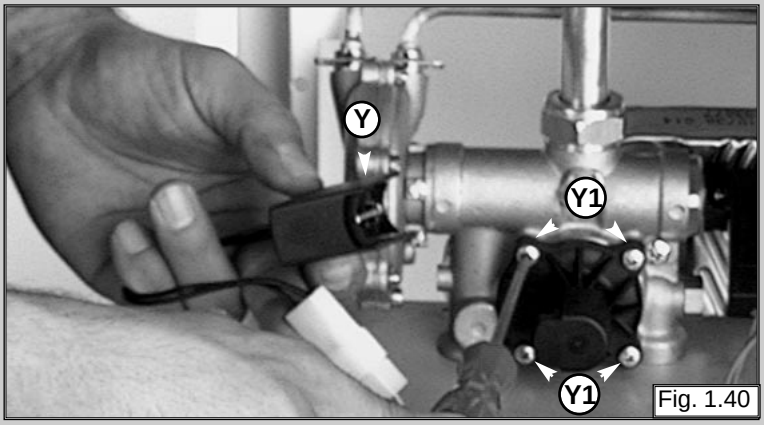


Fig. 1.40

Removing the pump

1. Unscrew “Z” and remove the electrical connection *(see fig. 1.41)*;

2. Release the nuts “A1” and remove the pump *(see fig. 1.42)*.

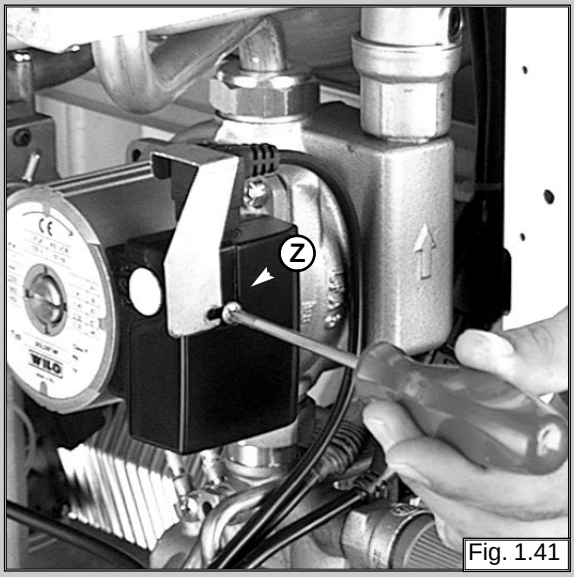


Fig. 1.41

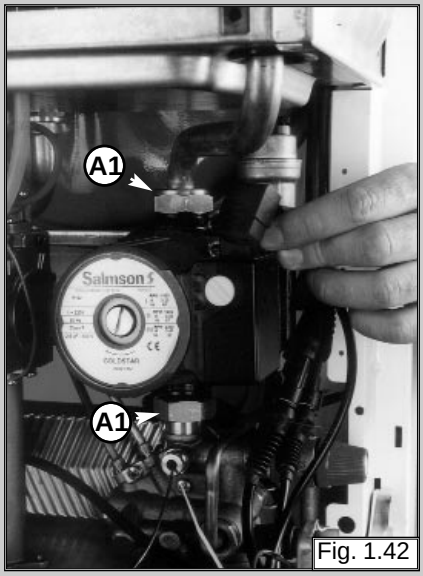


Fig. 1.42

Removing the pressure gauge

1. Remove the inspection panel *(see fig. 1.6 - 1.7)*;

2. Release coupling “A2” using a 14 mm open ended spanner *(see fig. 1.43)*;

3. Push the pressure gauge through the control panel from the rear *(see fig. 1.44)*.

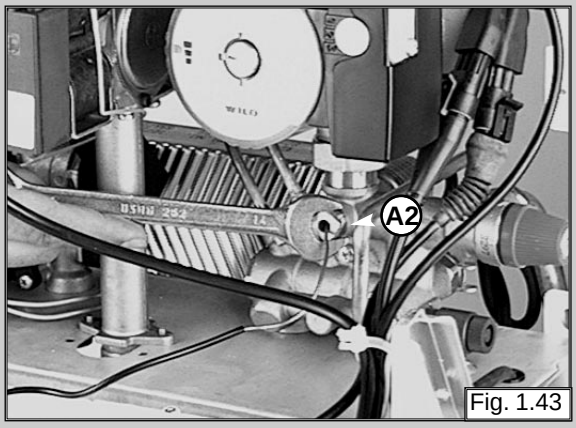


Fig. 1.43

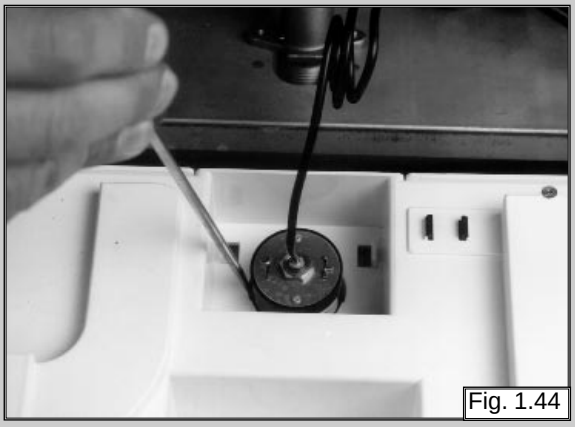


Fig. 1.44

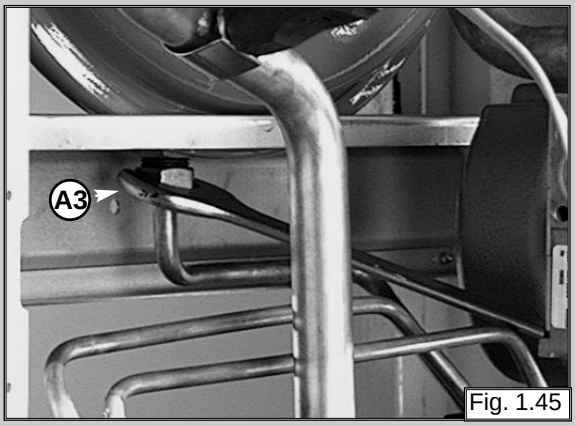


Fig. 1.45

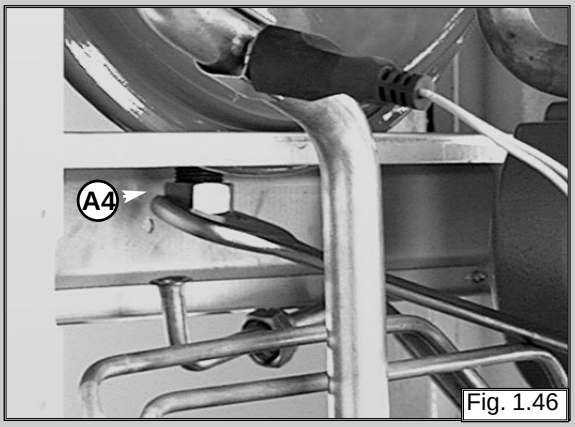


Fig. 1.46

Removing the expansion vessel

1. Remove nut “A3” away from the expansion vessel *(see fig. 1.45)*;

2. Remove nut “A4” *(see fig. 1.46)*;

3. Remove expansion vessel *(see fig. 1.47)*.

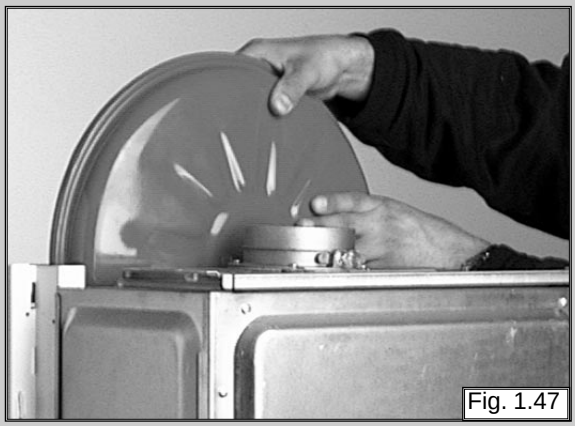


Fig. 1.47

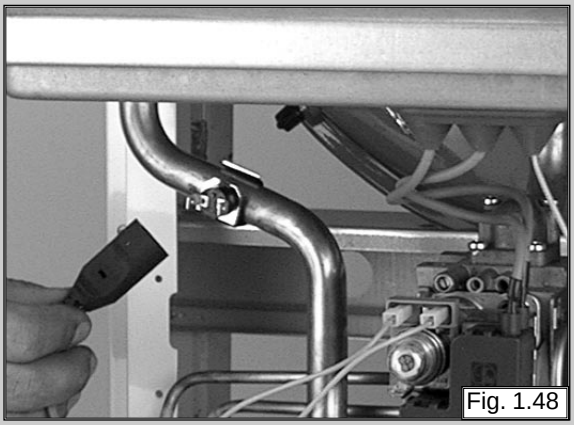


Fig. 1.48

Removing the overheat thermostat

1. Remove the electrical connection from the overheat thermostat *(see fig. 1.48)*;

2. Then remove the thermostat from the pipe by releasing its securing clip.

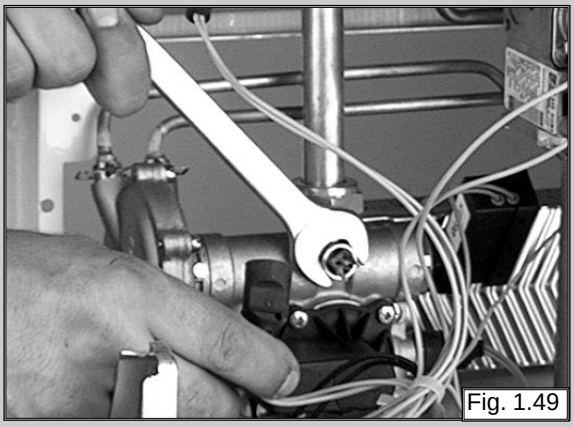


Fig. 1.49

Removing the heating temperature sensor (N.T.C.)

1. Remove the electrical connector by pulling off the thermostat connections and unscrewing the sensor probe with a 14 mm open ended spanner *(see fig. 1.49)*.

1.6 *Access to the Control System*

Checking fuse

1. Remove the inspection panel *(see fig. 1.6 - 1.7)*;

2. Remove fuse *(see fig. 1.50)*.

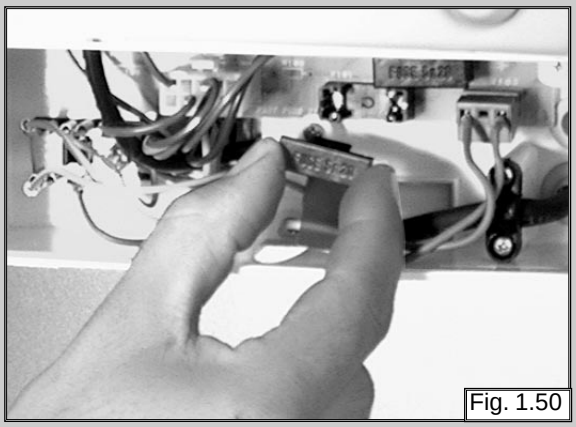


Fig. 1.50

Removing the time clock

1. Remove the inspection panel *(see fig. 1.6 - 1.7)*;

2. Remove electrical connection of the clock “A5” *(see fig. 1.51)*;

3. Unclip the clock from the panel and remove *(see fig. 1.52)*.

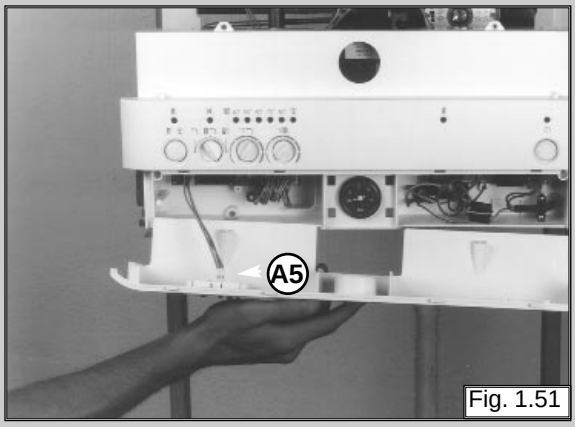


Fig. 1.51

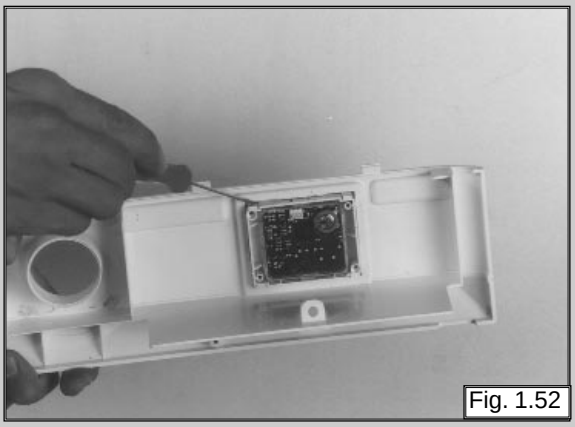


Fig. 1.52

N.B.
It is possible to by-pass the time clock in the event of failure by simply unplugging the electrical connection from the P.C.B. *(see fig. 1.48*). This will revert control of the central heating to the room stat connection on the reverse of the control panel.

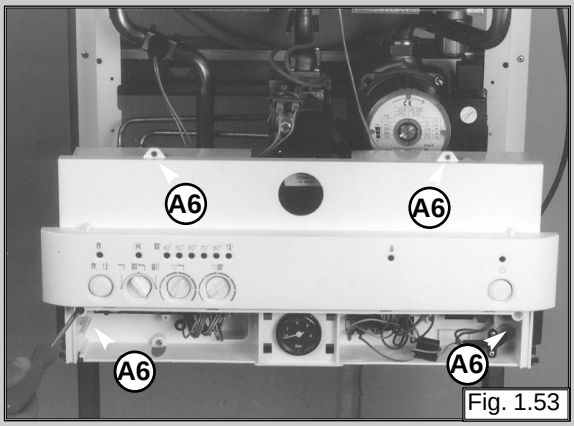


Fig. 1.53

Removing the P.C.B.s

1. Isolate electricity;
2. Remove the front cover of the boiler;
3. Remove the inspection panel *(see fig. 1.6-1.7*);
5. Remove the mounting screws “A6’ *(see fig. 1.53)*;
6. Disconnect the connection cable”A7” *(see fig. 1.54)*;
7. To remove the 24V P.C.B.: remove the electrical plug connectors and screws “A8” *(see fig. 1.55)*;
8. To remove the 240V P.C.B.: remove the electrical plug connectors and screws “A9” *(see fig. 1.56)*;
9. Replace either P.C.B. in reverse order.

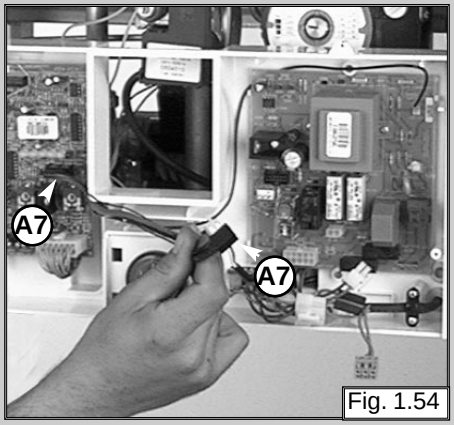


Fig. 1.54

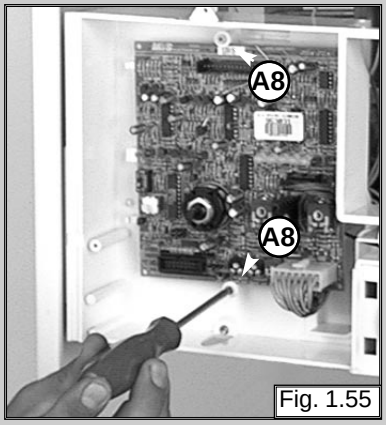


Fig. 1.55

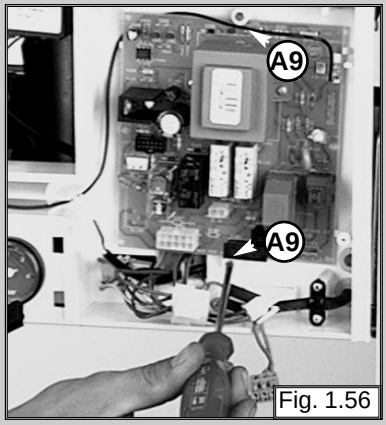
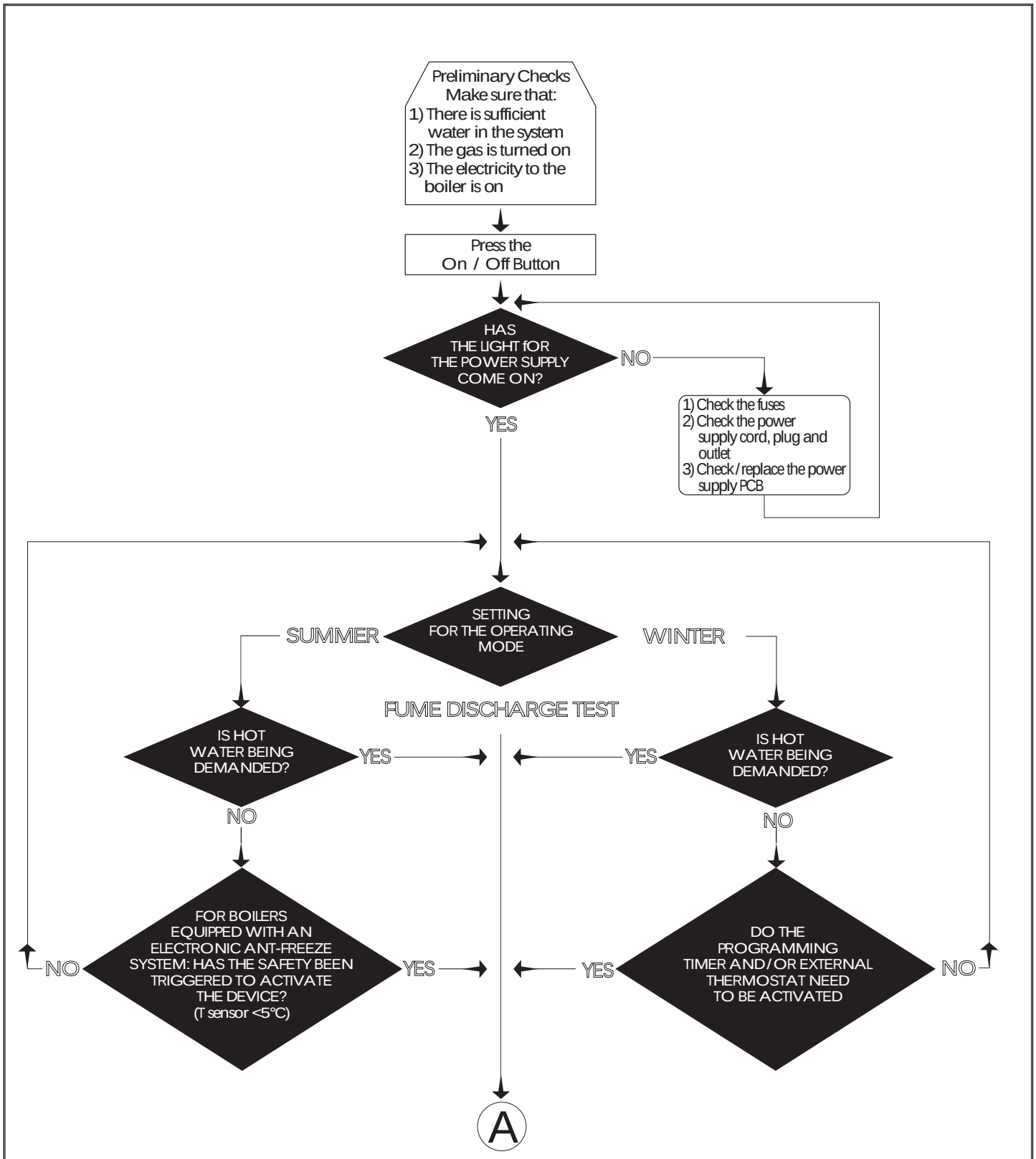


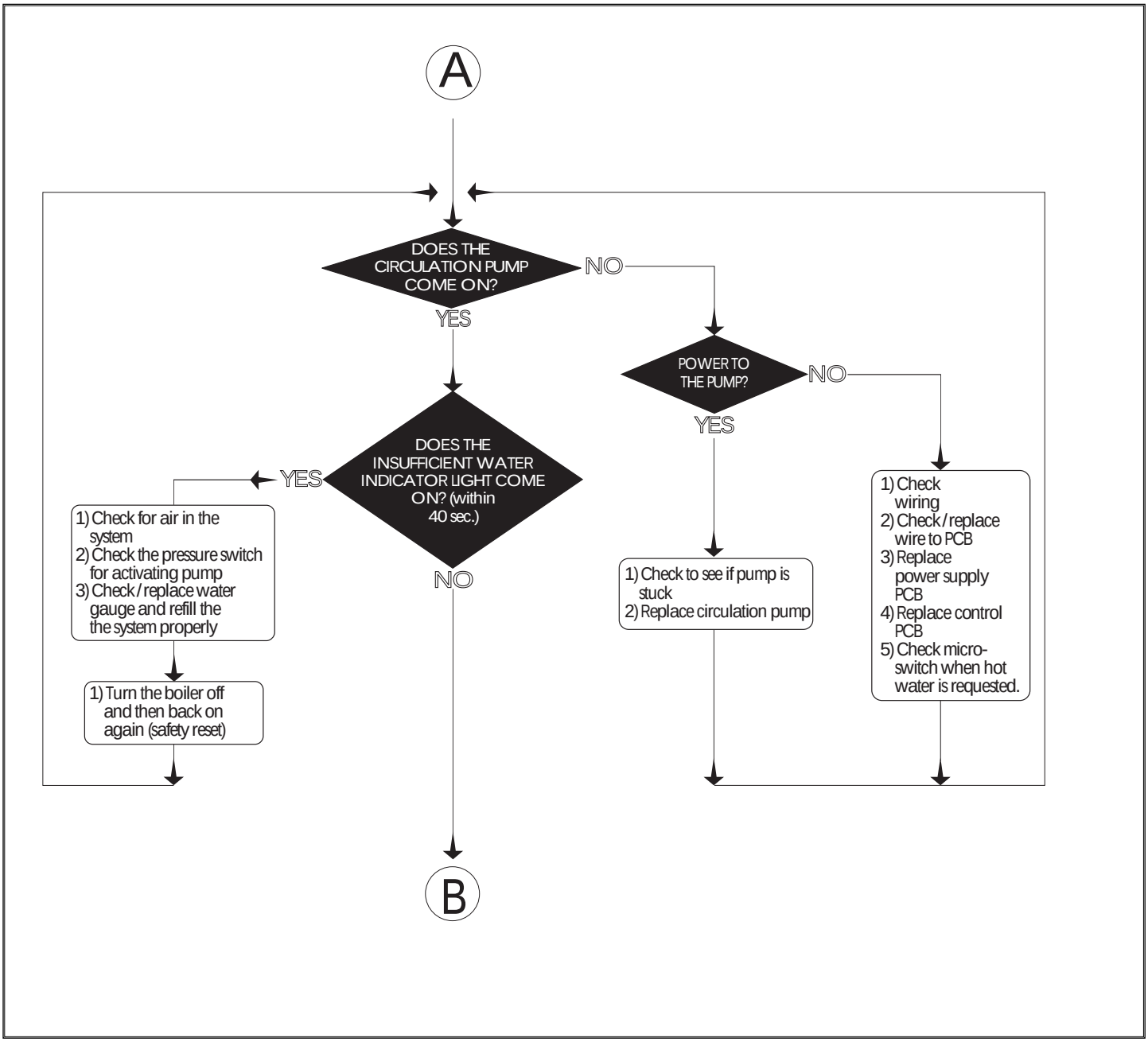
Fig. 1.56

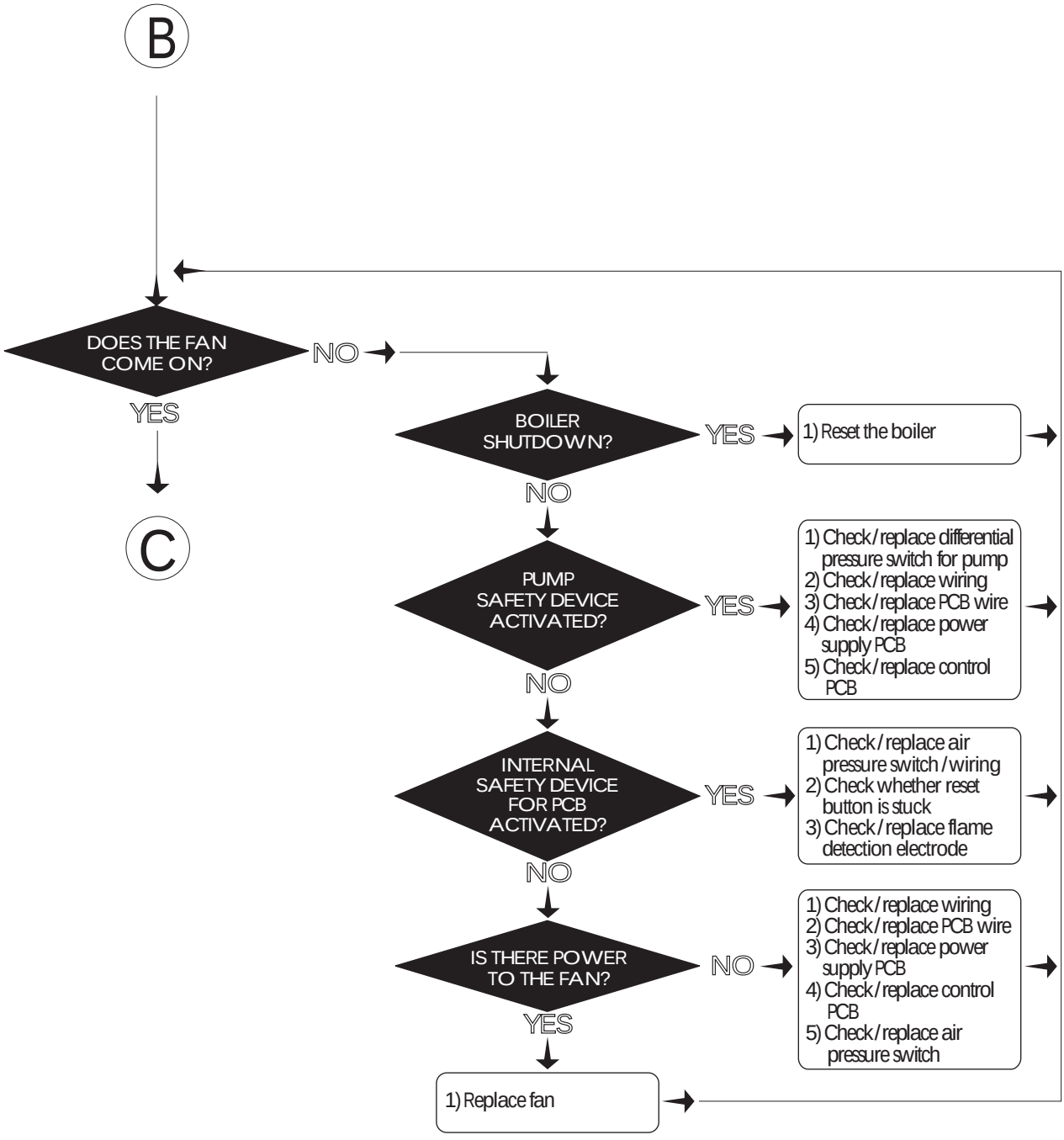
2. FAULT FINDING

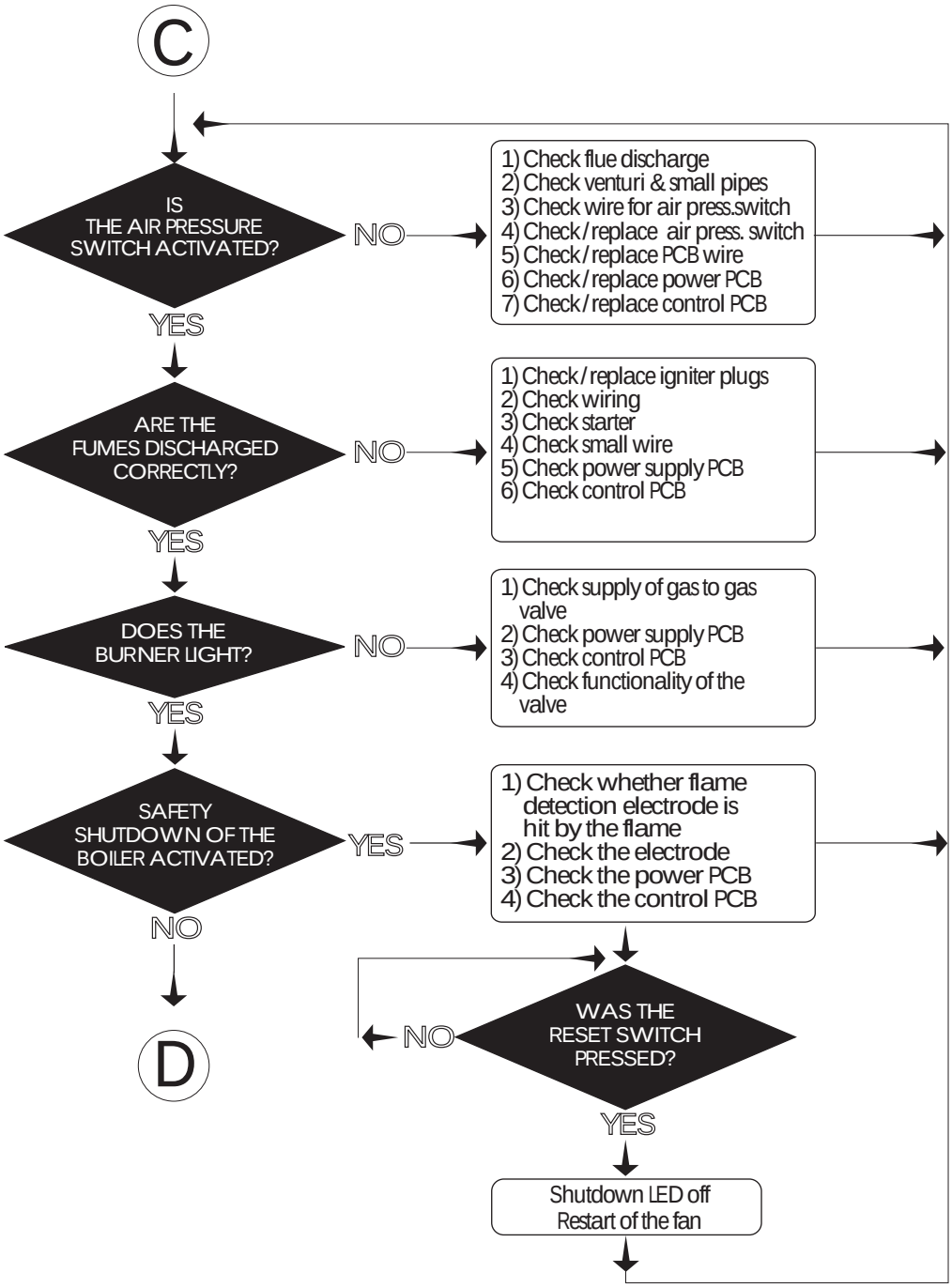
2.1 *Fault Finding Guide (Flow-chart)*

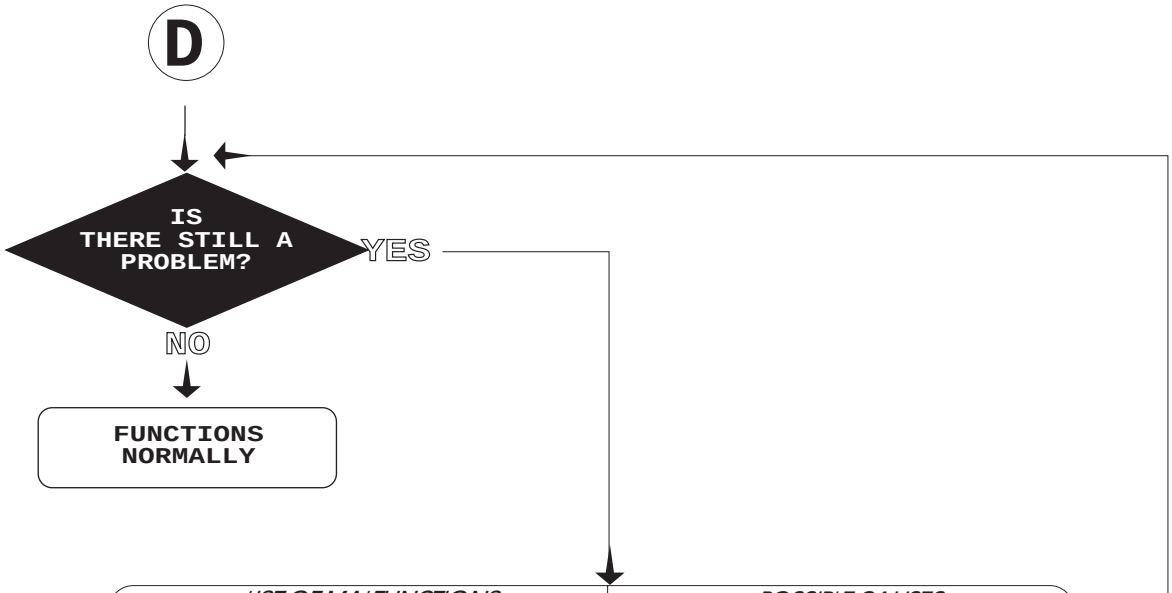
It is possible to detect and correct any defect by using the standard fault finding diagrams described in this chapter.




A
DOES THE CIRCULATION PUMP COME ON?
NO
YES
POWER TO THE PUMP?
NO
YES
DOES THE INSUFFICIENT WATER INDICATOR LIGHT COME ON? (within 40 sec.)
YES
NO
1) Check for air in the system
2) Check the pressure switch for activating pump
3) Check / replace water gauge and refill the the system properly
1) Turn the boiler off and then back on again (safety reset)
1) Check to see if pump is stuck
2) Replace circulation pump
1) Check wiring
2) Check / replace wire to PCB
3) Replace power supply PCB
4) Replace control PCB
5) Check micro-switch when hot water is requested.
B


B
DOES THE FAN COME ON?
NO
YES
C
BOILER SHUTDOWN?
YES
1) Reset the boiler
NO
PUMP SAFETY DEVICE ACTIVATED?
YES
1) Check/replace differential pressure switch for pump
2) Check/replace wiring
3) Check/replace PCB wire
4) Check/replace power supply PCB
5) Check/replace control PCB
NO
INTERNAL SAFETY DEVICE FOR PCB ACTIVATED?
YES
1) Check/replace air pressure switch/wiring
2) Check whether reset button is stuck
3) Check/replace flame detection electrode
NO
IS THERE POWER TO THE FAN?
NO
1) Check/replace wiring
2) Check/replace PCB wire
3) Check/replace power supply PCB
4) Check/replace control PCB
5) Check/replace air pressure switch
YES
1) Replace fan


C
IS THE AIR PRESSURE SWITCH ACTIVATED?
NO
1) Check flue discharge
2) Check venturi & small pipes
3) Check wire for air press.switch
4) Check / replace air press. switch
5) Check / replace PCB wire
6) Check / replace power PCB
7) Check / replace control PCB
YES
ARE THE FUMES DISCHARGED CORRECTLY?
NO
1) Check / replace igniter plugs
2) Check wiring
3) Check starter
4) Check small wire
5) Check power supply PCB
6) Check control PCB
YES
DOES THE BURNER LIGHT?
NO
1) Check supply of gas to gas valve
2) Check power supply PCB
3) Check control PCB
4) Check functionality of the valve
YES
SAFETY SHUTDOWN OF THE BOILER ACTIVATED?
YES
1) Check whether flame detection electrode is hit by the flame
2) Check the electrode
3) Check the power PCB
4) Check the control PCB
NO
D
WAS THE RESET SWITCH PRESSED?
NO
YES
Shutdown LED off
Restart of the fan

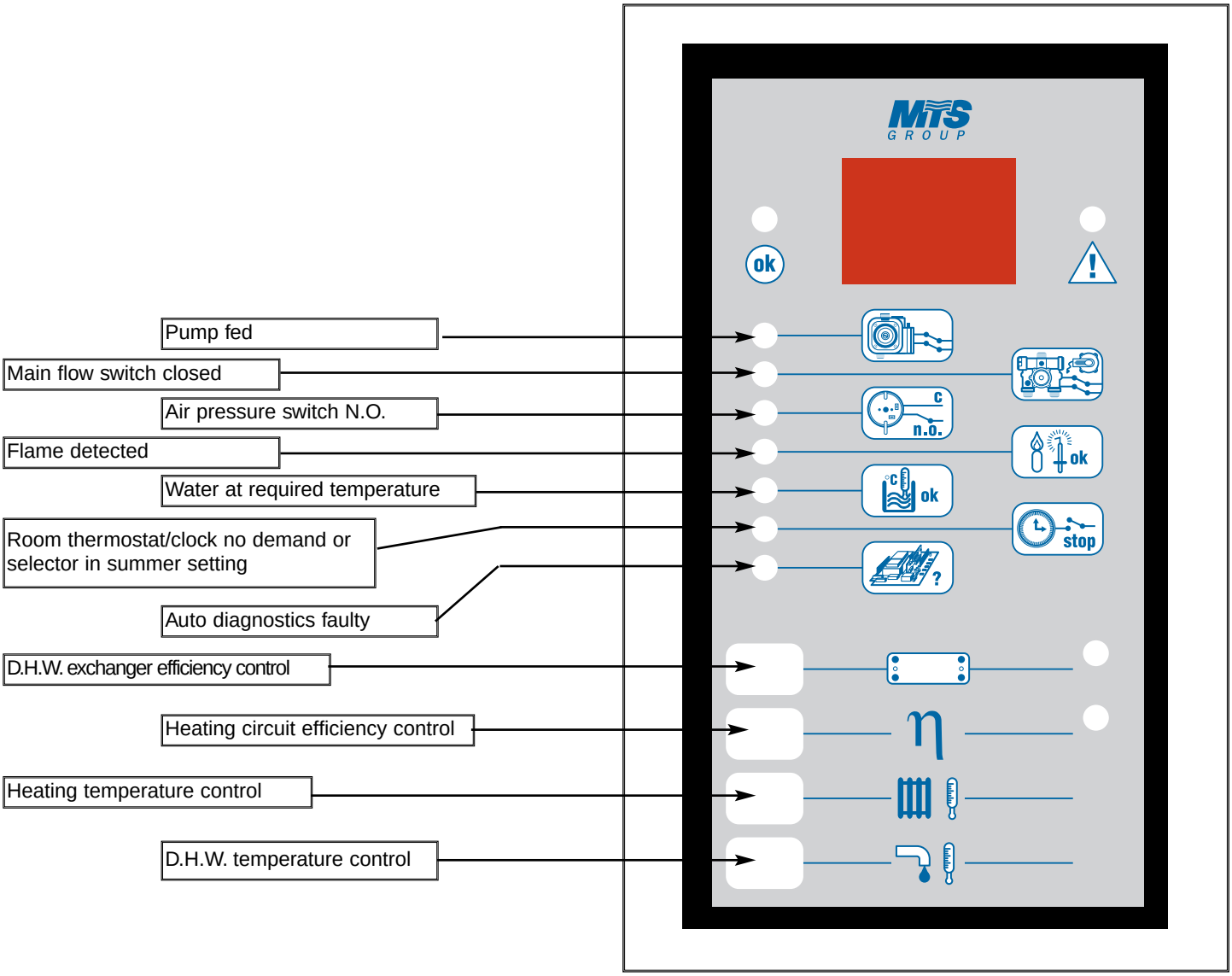


	LIST OF MALFUNCTIONS	POSSIBLE CAUSES
1	Delivery of hot water for domestic use: when the tap is turned on, the burner goes out.	- Air in the secondary exchanger - Hot water pressure switch is defective - 3-way valve is defective
2	Delivery of hot water for domestic use: the radiatores are heated in summer mode.	- 3-way valve is defective
3	Delivery of hot water for domestic use: water temperature is not satisfactory.	- Check heating sensors - Check gas settings and regulation - Check water flow rate - Check exchanger for domestic hot water
4	Delivery of hot water for domestic use: noisy operation.	- Primary exchanger is defective - Low water pressure in heating system - Check gas settings and regulation
5	Drop / increase in pressure in primary circuit.	- Check for leaks in heating circuit - Defective water supply inlet valve - Secondary exchanger is defective - Expansion vessal is empty
6	Repeated shutdowns.	- Detection electrodes are defective - Check gas settings and regulation - Check electrical circuit for flame detection
7	Safety thermostat is triggered repeatedly.	- Faulty (contacts) ntc heating sensors- - Defective (poorly calibrated) safety thermostat - Presence of air in the primary water circuit
8	When the cold water tap is turned off, the boiler comes on.	- Drop in pressure in the water mains, resulting in water hammering
9	Temperature of radiators not satisfactory.	- Check ntc heating sensor - Check by-pass - Check gas settings and regulation

2.2 *Fault Finding Using the Total Check System*

	Signalling
	Boiler Off
1	Auto diagnostic state
2	Spark ignition state
3	Boiler functioning normally
4	Lockout
5	Boiler thermostat satisfied
6	Room thermostat/clock no demand or selector in summer setting

	Malfunction
A	Faulty ventilation system
b	Air pressure switch stuck in N.O. position
C	Faulty reset switch
d	Faulty main circuit flow switch
E	Faulty flame detection
F	Faulty overheat thermostat
G	Faulty exhaust fumes sensor
I	Faulty heating sensor (N.T.C.)
m	Faulty D.H.W. sensor (N.T.C.)



3. ELECTRICAL DIAGRAMS

Legend:

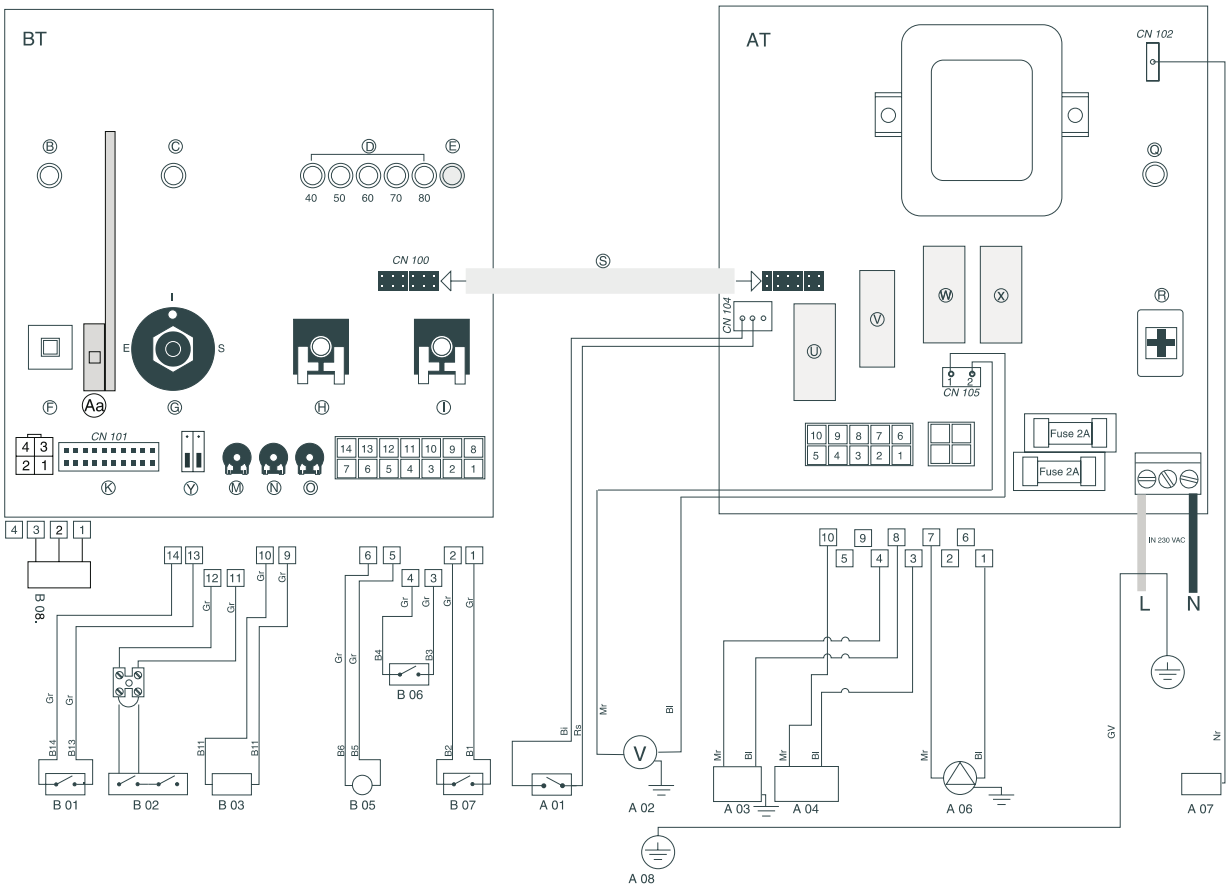
AT = High Voltage P.C.B.
BT = Low Voltage P.C.B.
B = Flame Failure L.E.D.
C = Insufficient Water Pressure L.E.D.
D = Water Temperature Indicator L.E.D.s
E = Overheat Thermostat Warning L.E.D.
F = System Reset Button
G = Selector Knob for Operating Mode
H = Domestic Hot Water Temp. Adjustment
I = Central Heating Temp. Adjustment
J = Wire Connector for Room Thermostat
K = Connector for Total Check System
M = Anti-cycling Device Adjustment for Heating
N = Soft-light Adjustment
O = Max Heating Temperature Adjustment
P = Time Clock Connection
Q = On/Off L.E.D.
R = On/Off Switch
S = Interface Wire for P.C.B.s
T = Relay Motorised Valve
U = Ignitor Relay
V = Gas Valve Relay
W = Fan Relay
X = Circulation Pump Relay
Y = Selector TCS2
Aa = Adaptor (British Gas use only)

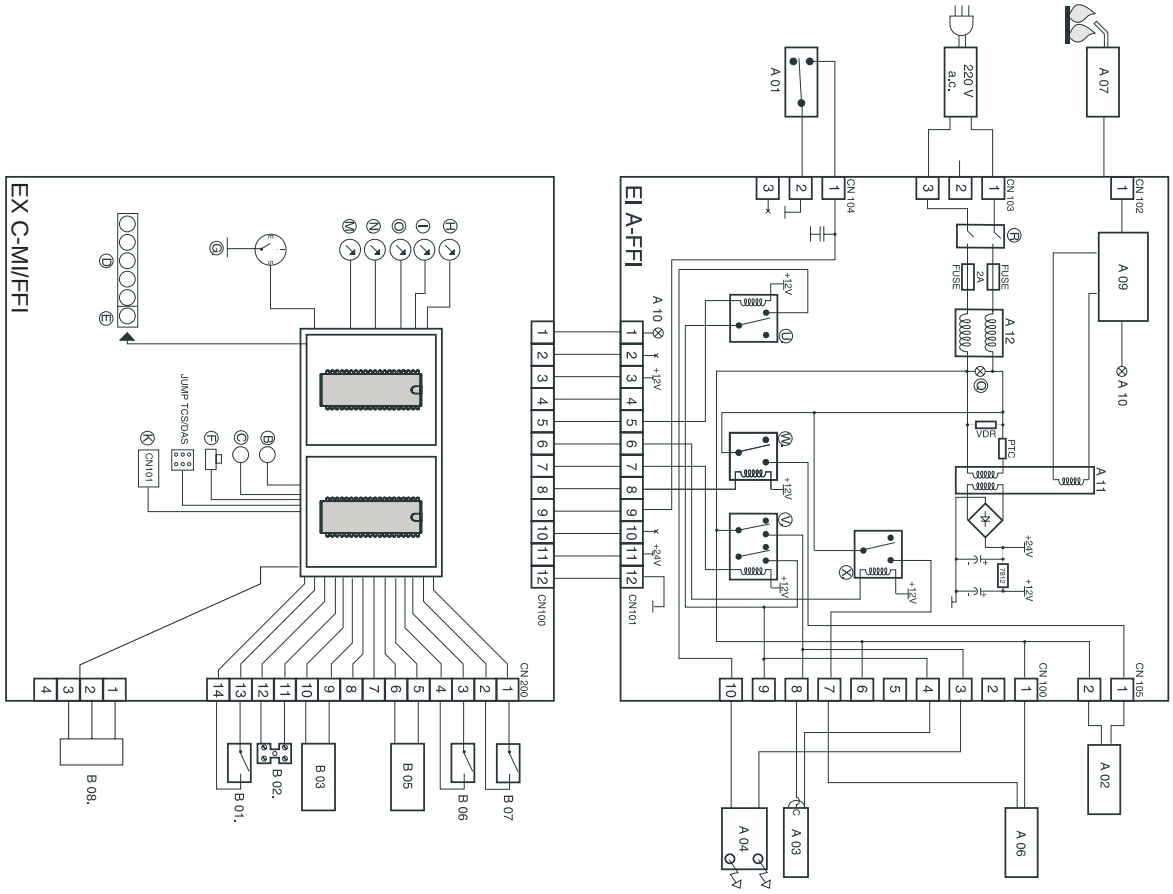
A01 = Air Pressure Switch
A02 = Fan
A03 = Gas Valve
A04 = Ignitor
A05 = Motorised Valve
A06 = Circulation Pump
A07 = Flame Detector
A08 = Earth Terminal
A09 = Flame Detection Circuit
A10 = Flame Indicator L.E.D.
A11 = Transformer
A12 = Filter

B01 = Over Heat Thermostat
B02 = Room Thermostat
B03 = Gas Valve Modulator
B05 = Heating Sensor
B06 = Pressure Switch for Heating Circuit
B07 = Microswitch for Diverter Valve
B08 = Time Clock

Colours

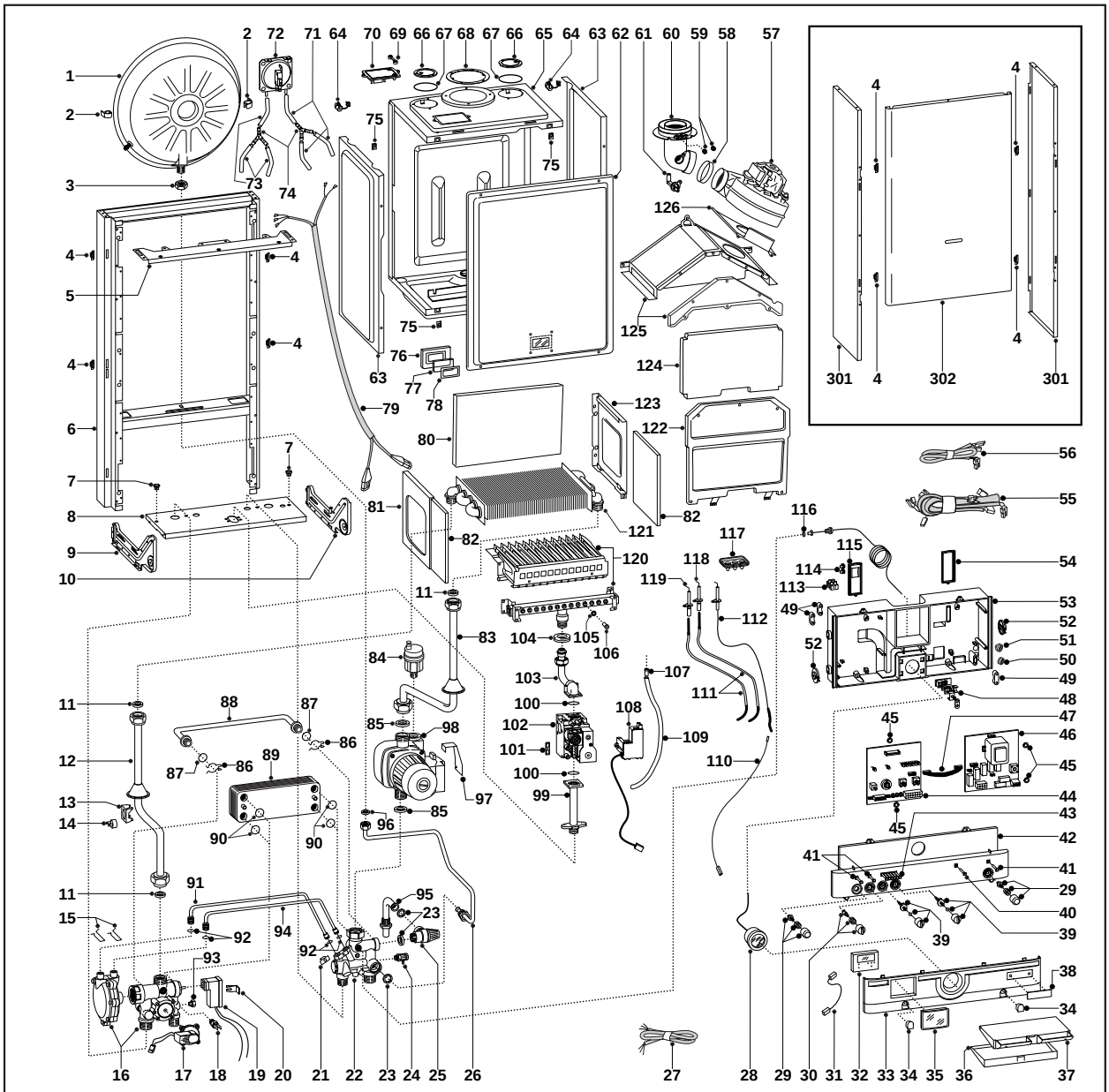
Gry = Grey
Rd = Red
Bl = Blue
Grn/Yll = Yellow/Green
Wh = White
Brn = Brown
Blk = Black
Wh/Rd = White/Red

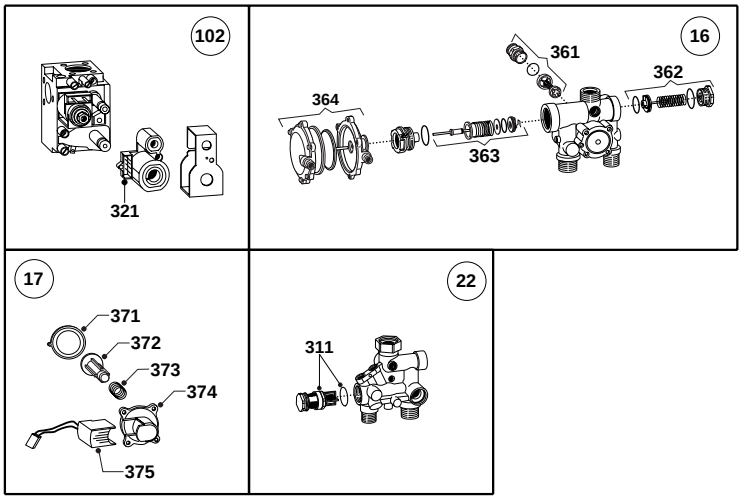

BT
AT
CN 100
CN 101
CN 102
CN 103
CN 104
CN 105
Fuse 2A
Fuse 2A
IN 230 VAC
L
N
B 01
B 02
B 03
B 05
B 06
B 07
A 01
A 02
A 03
A 04
A 06
A 07
A 08


EX C-MI/FFI
EI A-FFI
220 V a.c.
A 01
A 07
A 09
A 10
A 11
A 12
CN100
CN101
CN 200
CN 100
CN 102
CN 103
CN 104
CN 105
JUMP TCS/DAS
VDR
PTC
FUSE
FUSE
B 01.
B 02.
B 03
B 05
B 06
B 07
B 08.
A 02
A 03
A 04
A 06

4. SHORT SPARE PARTS LIST

A/23 MFFI - A/27 MFFI (SIT Sigma Gas Valve)





ARISTON

A 23/27 MFFI

A/23 MFFI - A/27 MFFI (SIT Sigma Gas Valve)

Key no.	G.C. part no.	Description		ARISTON Part No.
1		Expansion vessel		573294
11	164 225	Gasket 3/4"		573520
14		Overheat thermostat		997206
17		Main flow Switch		573224
18	164 338	Temp probe (C.H.W.)		569236
19		Microswitch for 3-way/main flow group		573340
23	164 229	Gasket 1/2"		573528
24	378 814	Manual vent cock		573727
25		Safety valve 3 bar 1/2"		573172
28		Pressure gauge		571649
32		Time clock		997208
45		P.C.B. EX C-MI/FFI		953730
46		P.C.B. EI A-MFFI		952981
47		P.C.B. cable		952610
57AB		Fan		572989
57CD		Fan		572990
58		Fan inlet gasket		573343
61		Venturi (exhaust manifold/header)		573314
72AB	E03 818	Air pressure switch		571651
72CD	E02 071	Air pressure switch		571652
75		Fastening spring		570717
84	379 079	Automatic air release valve		564254
85	164 230	Gasket 1"		569387
87		O-ring		571449
89AB		Secondary exchanger (plate-type) exchanger 23kW		571646
89CD		Secondary exchanger (plate-type) exchanger 27kW		573295
90		O-ring (secondary exchanger)		573825
92		20-18 O-ring		571807
96	164 282	Gasket 3/8"		573521
98AB		Pump		997150
98CD		Pump		997151
100		O-ring (13)		571965
101		Gasket		574279
102		Gas valve (SIT Sigma)		574232
108		Spark generator		574233
112	379 981	Detection electrode		573441
116	164 261	Gasket 1/4"		569390
118	379 979	Ignition electrode (R.H.)		569560
119	379 980	Ignition electrode (L.H.)		569561
120A	E02 026	Main burner		572271
120B		Main burner		572277
120C	E02 078	Main burner		572343
120D		Main burner		572372
121AB		Main exchanger		572749
121CD		Main exchanger		572835
301		Front panel runner kit		571993
311		D.H.W. actuator kit		571444
321		SIT Sigma gas valve operator coils		997029
361		Heating by-pass kit		571443
362		D.H.W. pressure switch kit		571442
363		3-way spring kit		571447
364		D.H.W. diaphram valve		571446
371		Main flow switch diaphram		571547
372		Main flow switch magnet		571772
373		Main flow switch spring		571771
374		Main flow switch top cap		571770
375		Main flow switch reed system		573138
381	164 311	Burner jet 1.25 full kit (Natural gas)		569281
382		Burner jet 0.72 full kit (LPG)		569282

A/23 MFFI - A/27 MFFI (SIT Tandem Gas Valve)

Key no.	G.C. part no.	Description		ARISTON Part No.
1		Expansion vessel		573294
11	164 225	Gasket 3/4"		573520
14		Overheat thermostat		997206
17		Main flow Switch		573224
18	164 338	Temp probe (C.H.W.)		569236
19		Microswitch for 3-way/main flow group		573340
23	164 229	Gasket 1/2"		573528
24	378 814	Manual vent cock		573727
25		Safety valve 3 bar 1/2"		573172
28		Pressure gauge		571649
31		Time clock		997207
44		P.C.B. EX C-MI/FFI		953730
46		P.C.B. EI A-MFFI		952981
47		P.C.B. cable		952610
57AB		Fan		572989
57CD		Fan		572990
58		Fan inlet gasket		573343
61		Venturi (exhaust manifold/header)		573314
72AB	E03 818	Air pressure switch		571651
72CD	E02 071	Air pressure switch		571652
75		Fastening spring		570717
84	379 079	Automatic air release valve		564254
85	164 230	Gasket 1"		569387
87		O-ring		571449
89AB		Secondary exchanger (plate-type) exchanger 23kW		571646
89CD		Secondary exchanger (plate-type) exchanger 27kW		573295
90		O-ring (secondary exchanger)		573825
92		O-ring (20-18)		571807
96	164 282	Gasket 3/8"		573521
98AB		Pump		997150
98CD		Pump		997151
101	379 976	Gas valve (SIT Tandem)		570732
103		Spark generator		573023
106		O-ring (13)		571965
114	379 981	Detection electrode		573441
118	164 261	Gasket 1/4"		569390
120	379 979	Ignition electrode (R.H.)		569560
121	379 980	Ignition electrode (L.H.)		569561
122A	E02 026	Main burner		572271
122B		Main burner		572277
122C	E02 078	Main burner		572343
122D		Main burner		572372
123AB		Main exchanger		572749
123CD		Main exchanger		572835
311		D.H.W. actuator kit		571444
321	378 978	SIT Tandem gas valve operator coils		570712
322	378 815	SIT Tandem modureg coil		573740
323	164 303	Gas modulator cartridge		573745
361		Heating by-pass kit		571443
362		D.H.W. pressure switch kit		571442
363		3-way spring kit		571447
364		D.H.W. diaphram valve		571446
371		Main flow switch diaphram		571547
372		Main flow switch magnet		571772
373		Main flow switch spring		571771
374		Main flow switch top cap		571770
375		Main flow switch reed system		573138
381	164 311	Burner jet 1.25 full kit (Natural gas)		569281
382		Burner jet 0.72 full kit (LPG)		569282

A 23/27 MFFI (SIT Tandem Gas Valve)

Key no.	G.C. part no.	Description		ARISTON Part No.
1		Expansion vessel		573294
11	164 225	Gasket 3/4"		573520
14		Overheat thermostat		997206
17		Main flow Switch		573224
18	164 338	Temp probe (C.H.W.)		569236
19		Microswitch for 3-way/main flow group		573340
23	164 229	Gasket 1/2"		573528
24	378 814	Manual vent cock		573727
25		Safety valve 3 bar 1/2"		573172
28		Pressure gauge		571649
31		Time clock		997207
44		P.C.B. EX C-MI/FFI		953730
46		P.C.B. EI A-MFFI		952981
47		P.C.B. cable		952610
57AB		Fan		572989
57CD		Fan		572990
58		Fan inlet gasket		573343
61		Venturi (exhaust manifold/header)		573314
72AB	E03 818	Air pressure switch		571651
72CD	E02 071	Air pressure switch		571652
75		Fastening spring		570717
84	379 079	Automatic air release valve		564254
85	164 230	Gasket 1"		569387
87		O-ring		571449
89AB		Secondary exchanger (plate-type) exchanger 23kW		571646
89CD		Secondary exchanger (plate-type) exchanger 27kW		573295
90		O-ring (secondary exchanger)		573825
92		O-ring (20-18)		571807
96	164 282	Gasket 3/8"		573521
98AB		Pump		997150
98CD		Pump		997151
101	379 976	Gas valve (SIT Tandem)		570732
103		Spark generator		573023
106		O-ring (13)		571965
114	379 981	Detection electrode		573441
118	164 261	Gasket 1/4"		569390
120	379 979	Ignition electrode (R.H.)		569560
121	379 980	Ignition electrode (L.H.)		569561
122A	E02 026	Main burner		572271
122B		Main burner		572277
122C	E02 078	Main burner		572343
122D		Main burner		572372
123AB		Main exchanger		572749
123CD		Main exchanger		572835
311		D.H.W. actuator kit		571444
321	378 978	SIT Tandem gas valve operator coils		570712
322	378 815	SIT Tandem modureg coil		573740
323	164 303	Gas modulator cartridge		573745
361		Heating by-pass kit		571443
362		D.H.W. pressure switch kit		571442
363		3-way spring kit		571447
364		D.H.W. diaphram valve		571446
371		Main flow switch diaphram		571547
372		Main flow switch magnet		571772
373		Main flow switch spring		571771
374		Main flow switch top cap		571770
375		Main flow switch reed system		573138
381	164 311	Burner jet 1.25 full kit (Natural gas)		569281
382		Burner jet 0.72 full kit (LPG)		569282

Manufacturer: **Merloni TermoSanitari SpA - Italy**

Commercial subsidiary: **MTS (GB) LIMITED**
MTS Building
Hughenden Avenue,
High Wycombe
Bucks HP13 5FT
Telephone: (01494) 755600 -
Fax: (01494) 459775
Technical Service Hotline: (01494) 539579

23 99 84 1268 000 *- B029* *Stampa BIEFFE Recanati*

EuroCombi

ARISTON

A/23 MFFI - A/27 MFFI

G.C.N. **47-116-18 / 47-116-19**

Installation Instructions

Type C Boilers

LEAVE THESE INSTRUCTIONS WITH THE END USER

benchmark™ COLLECTIVE MARK

Country of destination: GB

TABLE OF CONTENTS

1. GENERAL INFORMATION

This manual is an integral and essential part of the product. It should be kept with the appliance so that it can be consulted by the user and our authorised personnel.

Please carefully read the instructions and notices about the unit contained in this manual, as they provide important information regarding the safe installation, use and maintenance of the product.

For operating instructions please consult the separate User's Manual.

1.1 General Instructions

Read the instructions and recommendations in these Installation Instructions carefully to ensure proper installation, use and maintenance of the appliance.

Keep this manual in a safe place. You may need it for your own reference while our Servicing Centre technicians or your installer may need to consult it in the future.

This is a combined appliance for the production of central heating (C.H.) and domestic hot water (D.H.W.).

This appliance **must be used only** for the purpose for which it is designed.
The manufacturer declines all liability for damage caused by improper or negligent use.

No asbestos or other hazardous materials have been used in the fabrication of this product.

Before connecting the appliance, check that the information shown on the data plate and the table on pages 4-5 comply with the electric, water and gas mains of the property. You will find the data plate on the reverse of the control panel.
The gas with which this appliance operates is also shown on the label at the bottom of the boiler.

Do not install this appliance in a damp environment or close to equipment which spray water or other liquids.
Do not place objects on the appliance.
Do not allow children or inexperienced persons to use the appliance without supervision.

If you smell gas in the room, **do not turn on** light switches, use the telephone or any other object which might cause sparks.
Open doors and windows immediately to ventilate the room.
Shut the gas mains tap (on the gas meter) or the valve of the gas cylinder and call your Gas Supplier immediately.
If you are going away for a long period of time, remember to shut the mains gas tap or the gas cylinder valve.

Always disconnect the appliance either by unplugging it from the mains or turning off the mains switch before cleaning the appliance or carrying out maintenance.

In the case of faults or failure, switch off the appliance and turn off the gas tap. Do not tamper with the appliance.
For repairs, call your local Authorised Servicing Centre and request the use of original spare parts. For in-guarantee repairs contact MTS (GB) Limited.

Check the following at least once a year:
1 - Check the seal of water connections, replacing the gaskets if necessary.
2 - Check the seal of the gas connections, replacing the gaskets if necessary.
3 - Check the general condition of the appliance and of the combustion chamber visually.
4 - Visual check of the combustion: clean burners if necessary.
5 - With reference to point 3, dismantle and clean the combustion chamber if necessary.
6 - With reference to point 4, dismantle and clean the injectors if necessary.
7 - Visual check of the primary heat exchanger:
- check for overheating of the exchangers fins;
- clean the exhaust side of the exchanger and fan if necessary.

8 - Regulate the gas pressure, ignition pressure, partial flame, maximum flame.
9 - Check proper operation of the heating safety system:
- maximum safety temperature;
- maximum safety pressure.

10 - Check the proper operation of the gas safety system:
- gas or flame safety device;
- gas valve safety device.

11 - Check that the electrical connections have been made in compliance with the instructions shown in the installation instructions.
12 - Check the efficiency of the hot water supply (flow and temperature).
13 - Check general operation of the appliance.
14 - Check the exhaust system for the combustion products.

1.2 Overall View

A/23 MFFI - A/27 MFFI

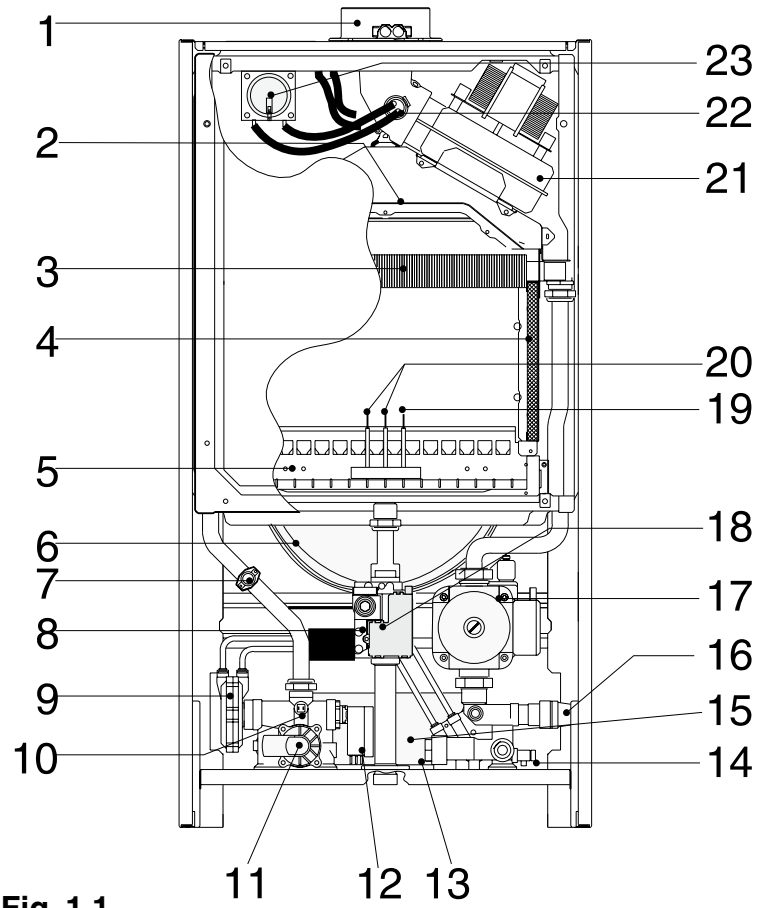


Fig. 1.1

Legend:

1. Flue Connector
2. Combustion Chamber Hood
3. Main Heat Exchanger
4. Combustion Chamber Insulation Panel
5. Burner
6. Expansion Vessel
7. Overheat Thermostat
8. Spark Generator
9. Diverter Valve
10. Main Circuit Temperature Probe
11. Main Circuit Flow Switch
12. Diverter Valve Microswitch
13. Filter Seat
14. Drain Valve
15. Secondary Heat Exchanger
16. Safety Valve (3 bar)
17. Circulation Pump with Automatic Air Release Valve
18. Gas Valve
19. Detection Electrodes
20. Ignition Electrodes
21. Fan
22. Venturi
23. Air Pressure Switch

2. INSTALLATION

The technical information and instructions provided herein below are intended for the installer so that the unit may be installed correctly and safely.

2.1 Reference Standards

The installation and initial start up of the boiler must be by a CORGI Approved Installer in compliance with the installation standards currently in effect, as well as with any and all local health and safety standards i.e. CORGI .

This appliance must be installed by a competent installer in accordance with the 1984 Gas Safety (installation & use) Regulations (as amended)

The installation of this appliance must be in accordance with the relevant requirements of the 1984 Gas Safety (installation & use) Regulations, the Local Building Regulations, the current I.E.E. Wiring Regulations, the byelaws of the local water authority, and in Scotland, in accordance with the Building Standards (Scotland) Regulation and Health and Safety document No. 635 “Electricity at work regs. 1989”.
Installation should also comply with the following British Standard Codes of Practice:

Low pressure pipes	BS 6891	1988
Boilers of rated input not exceeding 60 kW	BS 6798	1987
Forced circulation hot water system	BS 5449	1990
Installation of gas hot water supplies for domestic purposes (2nd family gases)	BS 5546	1990
Flues	BS 5440-1	1990
Air supply	BS 5440-2	1989

2.2 Siting the Appliance

The appliance may be installed in any room or indoor area, 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 combined appliance in a room containing a bath or shower.
Where a room-sealed appliance is installed in a room containing a bath or shower the boiler and any electrical switch or appliance control, utilising mains electricity should be situated so that it cannot be touched by a person using the bath or shower.
The location must permit adequate space for servicing and air circulation around the appliance as indicated in paragraph 2.4.
The location must permit the provision of an adequate flue and termination.
For unusual locations special procedures may be necessary.
BS 6798-1987 gives detailed guidance on this aspect.
A compartment used to enclose the appliance must be designed specifically for this purpose. No specific ventilation requirements are needed for an installation within a cupboard
This appliance is not suitable for outdoor installation.

The type C appliances (in which the combustion circuit, air vent intake and combustion chamber are air-tight with respect to the room in which the appliance is installed) can be installed in any type of room.
There are no limitations with respect to ventilation and the volume of the room itself. The boiler must be installed on a solid, permanent wall to prevent access to the electrical parts (when live) through the aperture on the back frame.

2.3 Overall Dimensions

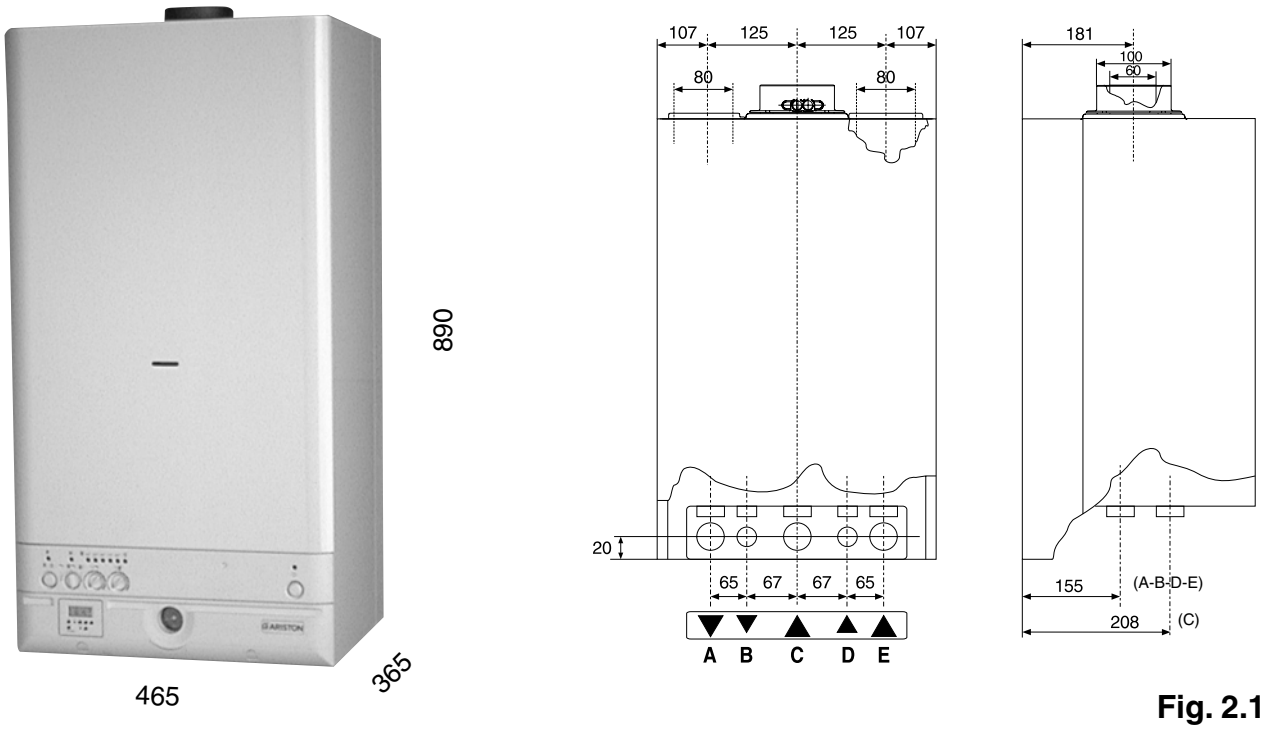


Fig. 2.1

Legend:

A = Central Heating Flow (3/4")
B = Domestic Hot Water Outlet (1/2")
C = Gas Inlet (3/4")
D = Domestic Cold Water Inlet (1/2")
E = Central Heating Return (3/4")

2.4 Clearances

In order to allow for access to the interior of the boiler for maintenance purposes, the boiler must be installed in compliance with the minimum clearances indicated in the diagram below.

A/23 MFFI - A/27 MFFI

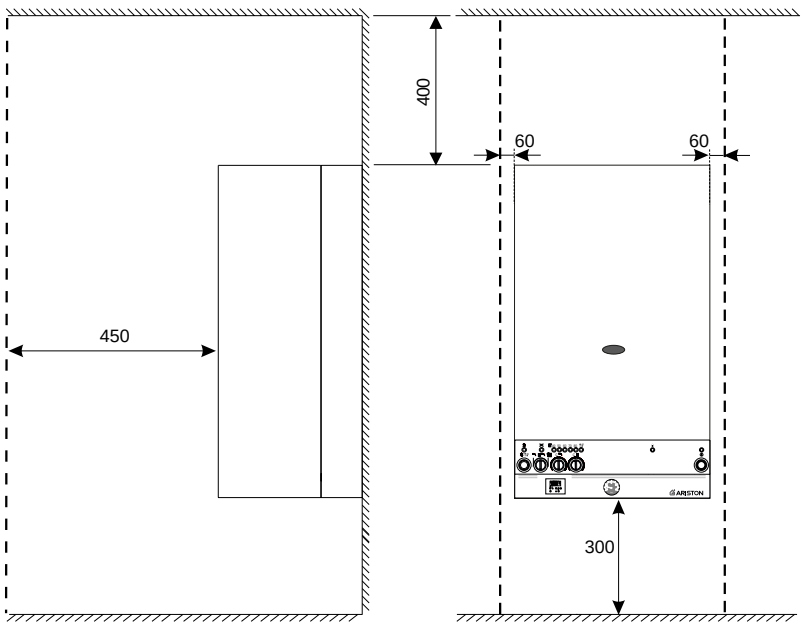


Fig. 2.2

2.5 Mounting the Appliance

Fasten the boiler in place using the template and anchors supplied with the unit. It is highly recommended that a spirit level be used to position the boiler so that it is perfectly level.
For additional information, please consult the instructions contained in the connection kit and the flue kit.

2.6 Electrical Connection

For safety purposes, have a competent person carefully check the electrical system in the property, as the manufacturer will not be held liable for damage caused by the failure to earth the appliance properly or by anomalies in the supply of power. Make sure that the residential electrical system is adequate for the maximum power absorbed by the unit, which is indicated on the rating plate. In addition, check that the section of cabling is appropriate for the power absorbed by the boiler.

The boiler operates with alternating current, as indicated in the technical data table (1.2), where the maximum absorbed power is also indicated. Make sure that the connections for the neutral and live wires correspond to the indications in the diagram. The appliance electrical connections are situated on the reverse of the control panel (see the servicing manual for further information)

Fig. 2.3

Important!
In the event that the power supply cord must be changed, replace it with one with the same specifications. Make the connections to the terminal board located within the control panel, as follows:
- The yellow-green wire should be connected to the terminal marked with the earth symbol; make sure to re-use the ferrule mounted on the other supply cord;
- The blue wire should be connected to the terminal marked “N”;
- The brown wire should be connected to the terminal marked “L”.

Note: The diagrams for the electrical system are indicated in section 2.11.

Warning, this appliance must be earthed.
External wiring to the appliance must be carried out by a qualified technician and be in accordance with the current I.E.E. Regulations and applicable local regulations. The EuroCombi range of boilers are supplied for connection to a 230 V~ 50 Hz supply.
The supply must be fused at 3 A.
The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance, by the use of a fused double pole isolator having a contact separation of at least 3 mm in all poles or alternatively, by **means of a 3 A** fused three pin plug and unswitched shuttered socket outlet both complying with BS 1363.
The point of connection to the electricity supply must be readily accessible and adjacent to the appliance unless the appliance is installed in a bathroom when this must be sited outside the bathroom.

2.7 Gas Connection

The local gas region contractor connects the gas meter to the service pipe.
If the gas supply for the boiler serves other appliances ensure that an adequate supply is available both to the boiler and the other appliances when they are in use at the same time.
Pipe work must be of an adequate size. Pipes of a smaller size than the boiler inlet connection should not be used.

2.9 Water Connections

A/23 MFFI - A/27 MFFI

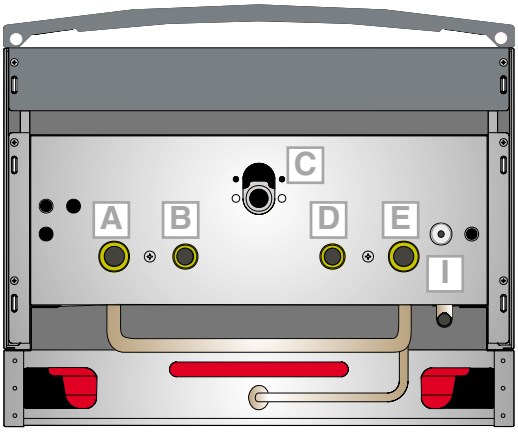


Fig. 2.4

Legend

A = Central Heating Flow
B = Domestic Hot Water Outlet
C = Gas Inlet
D = Domestic Cold Water Inlet
E = Central Heating Return
I = Safety Valve

Central Heating

Detailed recommendations are given in BS 6798:1987 and BS 5449-1:1990, the following notes are given for general guidance.

Pipe Work:

Copper tubing to BS EN 1057:1996 is recommended for water pipes. Jointing should be either with capillary soldered or compression fittings.

Where possible pipes should have a gradient to ensure air is carried naturally to air release points and water flows naturally to drain taps.

The appliance has a built-in automatic air release valve, however it should be ensured as far as possible that the appliance heat exchanger is not a natural collecting point for air.

Except where providing useful heat, pipes should be insulated to prevent heat loss and avoid freezing.

Particular attention should be paid to pipes passing through ventilated spaces in roofs and under floors.

By-pass:

The appliance includes an automatic by-pass valve, which protects the main heat exchanger in case of reduced or interrupted water circulation through the heating system, due to the closing of thermostatic valves or cock-type valves within the system.

System Design:

This boiler is suitable only for sealed systems.

Drain Cocks:

These must be located in accessible positions to permit the draining of the whole system. The taps must be at least 15mm nominal size and manufactured in accordance with BS 2870:1980.

Safety Valve Discharge:

The discharge should terminate facing downwards on the exterior of the building in a position where discharging (possibly boiling water & steam) will not create danger or nuisance, but in an easily visible position, and not cause damage to electrical components and wiring.

The discharge must not be over an entrance or a window or any other type of

public access.

Air Release Points:

These must be fitted at all high points where air naturally collects and must be sited to facilitate complete filling of the system.

The appliance has an integral sealed expansion vessel to accommodate the increase of water value when the system is heated.

It can accept up to 7 l (1.5 gal) of expansion water. If the heating circuit has an unusually high water content, calculate the total expansion and add an additional sealed expansion vessel with adequate capacity.

Mains Water Feed - Central Heating:

There must be no direct connection to the mains water supply even through a non-return valve, without the approval of the Local Water Authority.

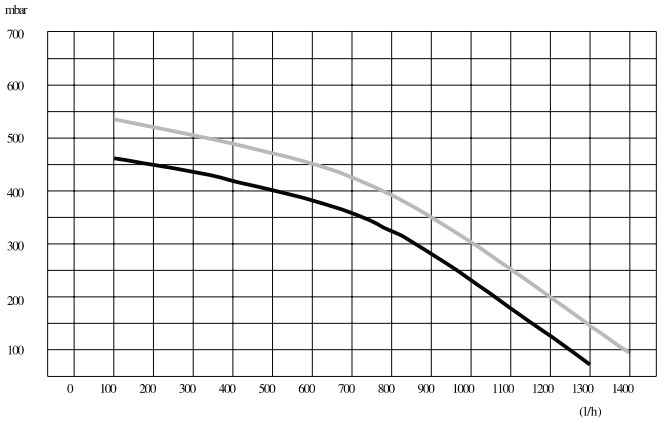
Filling:

A temporary method for initially filling the system and replacing lost water during servicing in accordance with Water Supply Byelaw 14 must be provided.

Domestic Water

The domestic water must be in accordance with the relevant recommendation of BS 5546:1990. Copper tubing to BS EN 1057:1996 is recommended for water carrying pipe work and must be used for pipe work carrying drinking water.

Residual Head of the Boiler



2.9 Flue Connections

Flue System

The provision for satisfactory flue termination must be made as described in BS 5440-1.

The appliance must be installed so that the flue terminal is exposed to outdoor air.

The terminal must not discharge into another room or space such as an out-house or lean-to.

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

The terminal should be located with due regard for the damage or discolouration that might occur on buildings in the vicinity.

In cold or humid weather water vapour may condense on leaving the flue terminal.

The effect of such "steaming" must be considered.

If the terminal is less than 2 metres above a balcony, above ground or above a flat roof to which people have access, then a suitable terminal guard must be fitted. When ordering a terminal guard, quote the appliance model number.

A suitable terminal guard is available from:

TOWER FLUE COMPONENTS
Morley Road
Tonbridge
Kent TN9 1RA

The minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in Fig. 2.5.

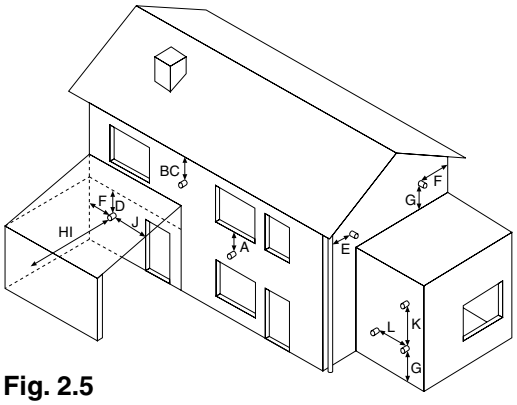


Fig. 2.5

TERMINAL POSITION	mm
A - Directly below an open window or other opening	300
B - Below gutters, solid pipes or drain pipes	75
C - Below eaves	200
D - Below balconies or car-port roof	200
E - From vertical drain pipes and soil pipes	75
F - From internal or external corners	300
G - Above ground or below balcony level	300
H - From a surface facing a terminal	600
I - From a terminal facing a terminal	1200
J - From an opening in the car port (e.g. door, window) into dwelling	1200
K - Vertically from a terminal in the same wall	1500
L - Horizontally from a terminal in the same wall	300

The boiler is designed to be connected to a coaxial flue discharge system.

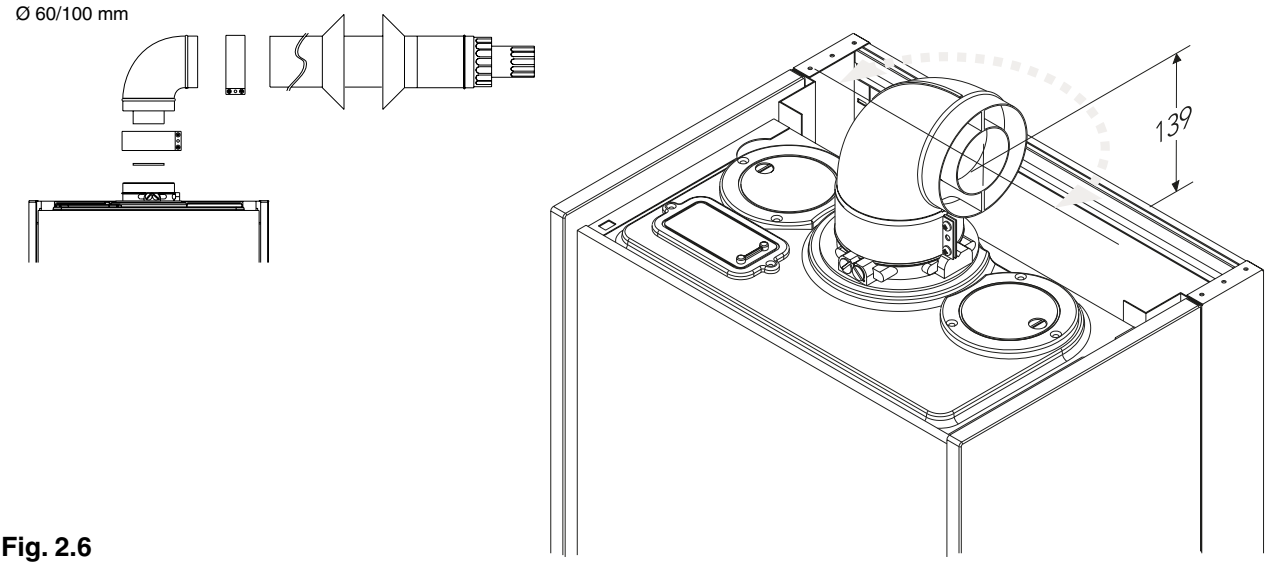
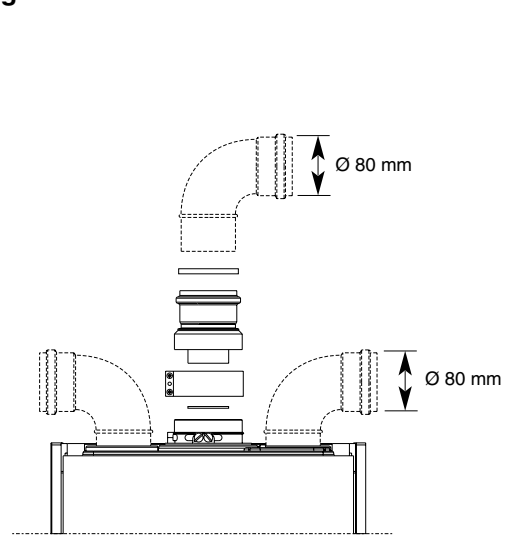
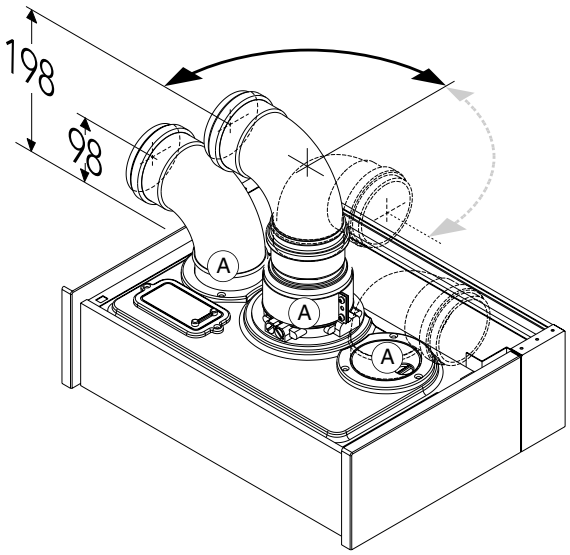


Fig. 2.6

In addition, it is also possible to use a twin-pipe (split) system by fitting a special adaptor to the flue discharge collar and using one of the apertures for the air vent intake located on the top part of the combustion chamber (A).

Fig. 2.7





This procedure must be done as follows:

1 - Remove the air vent intake you want to use, in the area indicated in Fig. 2.8, by breaking the perforated ring.
2 - Use a tool to grasp the lid and remove it completely.
3 - Clean any burrs or sharp edges with a knife or an appropriate tool.

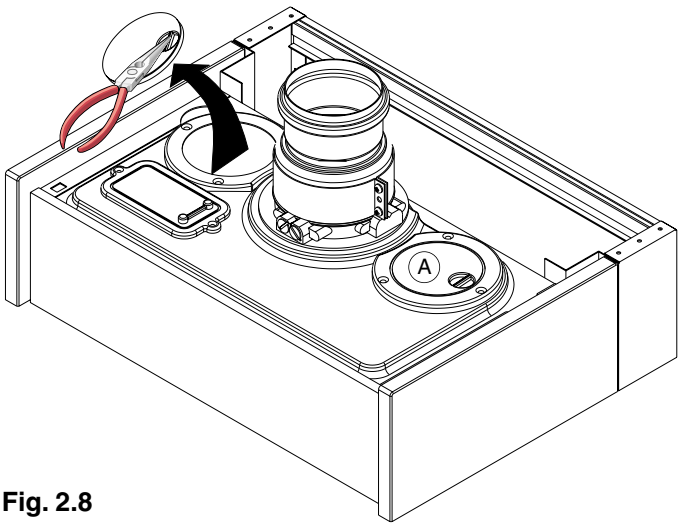


Fig. 2.8

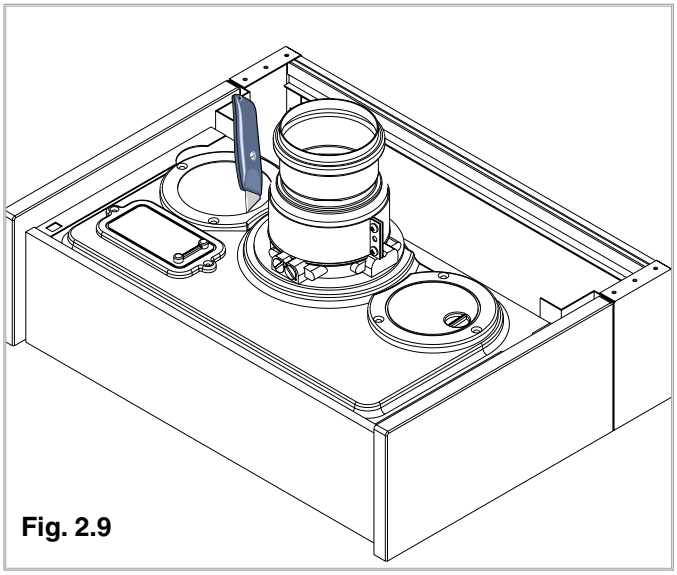


Fig. 2.9

In Fig. 2.10 below, several different types of flue systems are shown.
For additional information regarding the flue accessories, please consult the Flue Pipe Accessories manual.

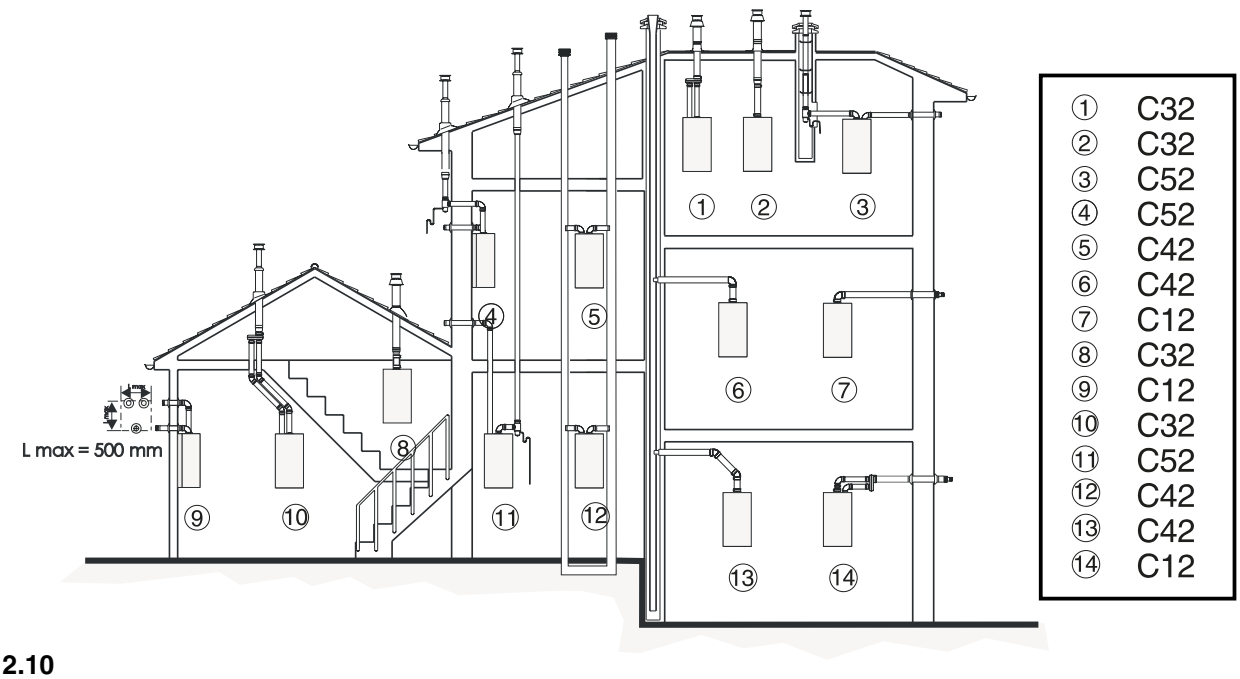


Fig. 2.10

	Exhaust Type	Maximum Extension Exhaust/Air		Diameter of Pipes (mm)	Use of a Restrictor on the Discharge Side	Risk of Condensation Forming
Coaxial System	C12 (xx)	4 m		ø 60 /100	L* < 0.5 m	
	C32 (xx)	4 m		ø 60 /100	L* < 0.5 m	
	C42 (xx)	4 m		ø 60 /100	L* < 0.5 m	
Twin Pipe Systems		**23 kW**	**27 kW**			
	C12 (xy)	54 m	46 m	ø 80	L < 7 m (23 kW) L < 5 m (27 kW)	L > 4 9 m (23 kW) L > 6.5 m (27 kW)
	C32 (xy)	54 m	46 m	ø 80	L < 7 m (23 kW) L < 5 m (27 kW)	L > 4.9 m (23 kW) L > 6.5m (27 kW)
	C42 (xy)	54 m	46 m	ø 80	L < 7 m (23 kW) L < 5 m (27 kW)	L > 4.9m (23 kW) L > 6.5m (27 kW)
	C52 (xy)	17 m	17 m	ø 80	L < 7 m (23 kW) L < 5 m (27 kW)	L > 4.9m (23 kW) L > 5.3m (27 kW)

(*) L = Length of Piping

In calculating the lengths of the pipes, the maximum length must also take into consideration the values for the exhaust/air intake end terminals, as well as 90° elbows for coaxial systems.

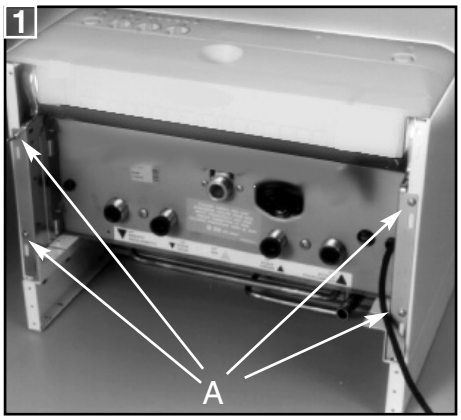
The C52 types must comply with the following requirements:

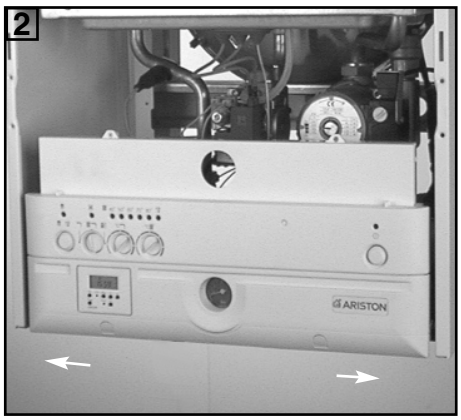
1. The discharge/intake vent pipes must have the same diameter of ø 80 mm.
2. If an elbow is inserted into the discharge/ventilation system, the calculation of the overall extension must take into consideration the values for each curve, as indicated in the table.
3. The exhaust pipe must extend at least 0.5 m above the ridge of the roof if it is located on a side other than that for the air intake (this is not obligatory if the exhaust and air intake pipes are located on the same side of the building).

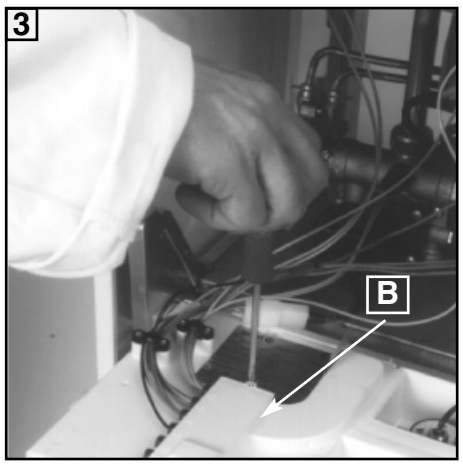
2.10 Room Thermostat Connection

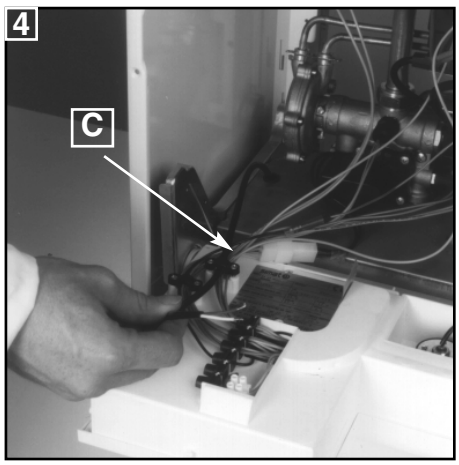
In order to perform this procedure, remove boiler cover as indicated in section 3.2. Then proceed as follows:

1 Remove the screws “A” located on the bottom part of the boiler;
2 Widen the sides so that the control panel can be rotated.
3 Open the cover “B” on the left hand side of the compartment.
4 Insert the wire for the connection of the room thermostat into the wire holder “C”, as indicated in photo 3.



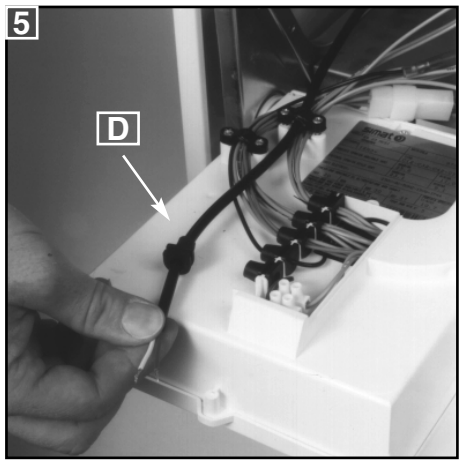


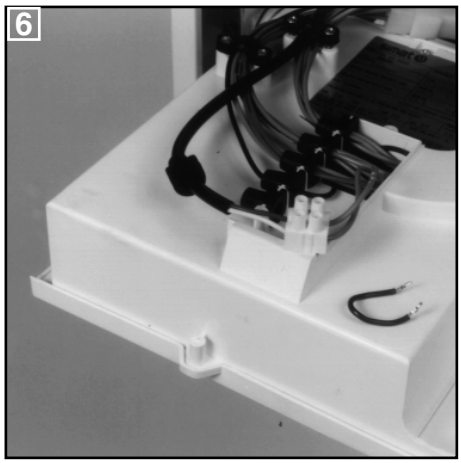


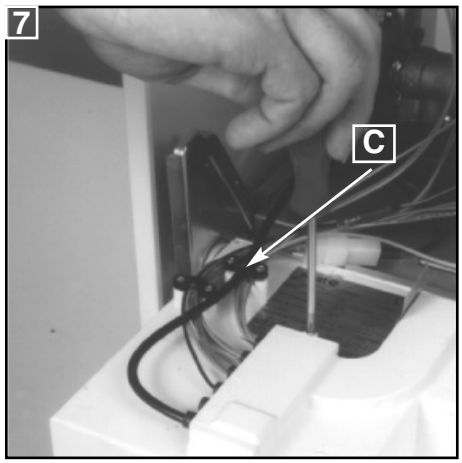


5 Remove the grommet “D” shown in photo 5, make a hole in it and pass the room thermostat wire through.
6 Remove the link located on the terminal and connect the wire.
7 Replace the grommet and the terminal to their original positions, close the cover on the grommet compartment and fasten the wire-clamp “C” in place.
8 If a remote time clock is to be fitted, disconnect the integral time clock plug from the P.C.B.
9 Using a volt-free switching time clock, connect the switching wires from the time clock following points 1-7 above.
10 If using a time clock and room thermostat, these must be connected in series as per points 1-9 above.

Note: Only a two-wire type room thermostat can be used.







2.11 Electrical Diagram

Legend:

AT= High Voltage P.C.B.
BT = Low Voltage P.C.B.
B = Flame Failure L.E.D.
C = Insufficient Water Pressure L.E.D.
D = Water Temperature Indicator L.E.D.s
E = Overheat Thermostat Warning L.E.D.
F = System Reset Button
G = Selector Knob for Operating Mode
H = Domestic Hot Water Temp. Adjustment
I = Central Heating Temp. Adjustment
J = Wire Connector for Room Thermostat
K = Antifreeze feature selector.
L = Connector for Total Check System
M = Anti-cycling Device Adjustment for Heating
N = Soft-light Adjustment
O = Max Heating Temperature Adjustment
Q = On/Off L.E.D.
R = On/Off Switch
S = Interface Wire for P.C.B.s
T = Relay Motorised Valve
U = Ignitor Relay
V = Gas Valve Relay
W = Fan Relay
X = Circulation Pump Relay
Y = Selector TCS

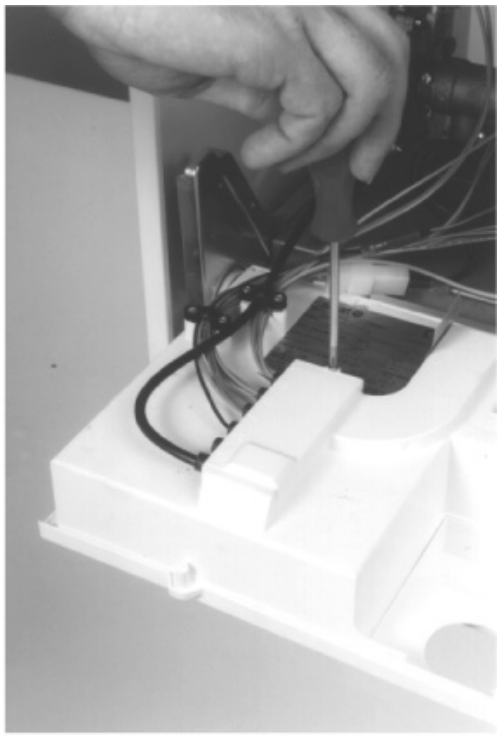
A01 = Air Pressure Switch
A02 = Fan
A03 = Gas Valve
A04 = Ignitor
A05 = Motorised Valve
A06 = Circulation Pump
A07 = Flame Detector
A08 = Earth Terminal
A09 = Flame Detection Circuit
A10 = Flame Indicator L.E.D.
A11 = Transformer
A12 = Filter

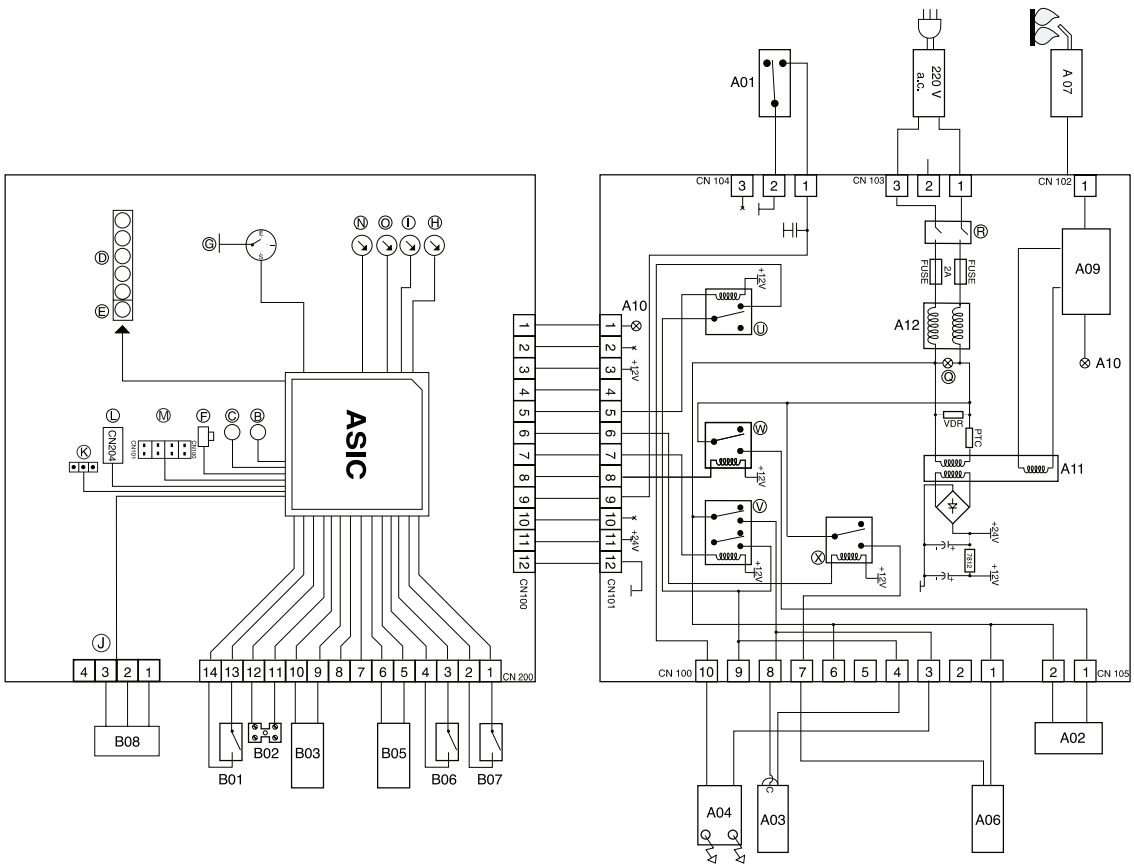
B01 = Over Heat Thermostat
B02 = Room Thermostat
B03 = Gas Valve Modulator
B05 = Heating Sensor
B06 = Pressure Switch for Heating Circuit
B07 = Microswitch for Diverter Valve

Colours

Gry = Grey
Rd = Red
Bl = Blue
Grn/Yll = Yellow/Green
Wh = White
Brn = Brown
Blk = Black
Wh/Rd = White/Red

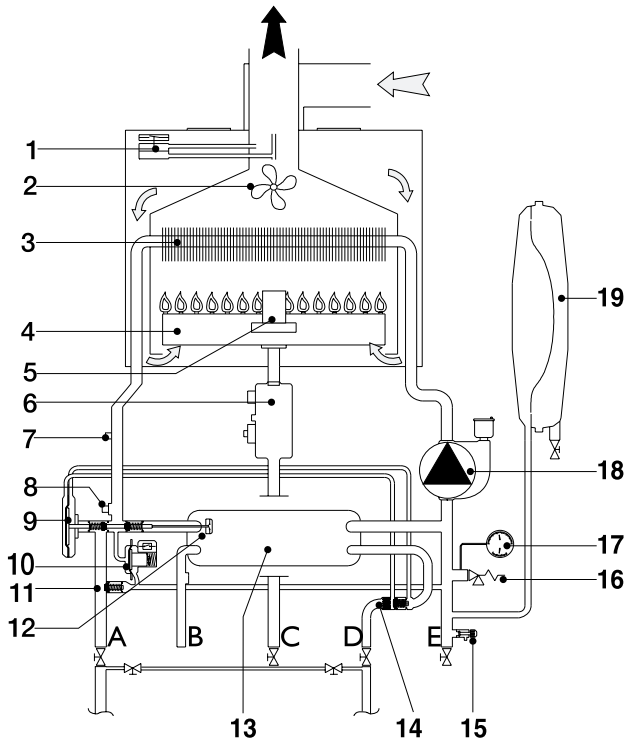
A/23 MFFI - A/27 MFFI





2.12 Water Circuit Diagram

A/23 MFFI - A/27 MFFI



Legend

1. Air Pressure Switch
2. Fan
3. Main Heat Exchanger
4. Main Burner
5. Ignition Electrodes - Detection Electrode
6. Gas Valve
7. Overheat Thermostat
8. Main Circuit Temperature Probe
9. Diverter Valve
10. Main Circuit Flow Switch including Safety Pressure Switch for Primary Circuit
11. Automatic By-pass
12. Microswitch for Diverter Valve
13. Secondary Heat Exchanger
14. Domestic Water Inlet Filter
15. Boiler Drain Valve
16. Safety Valve
17. Water Pressure Gauge
18. Circulation Pump with Automatic Air Release Valve
19. Expansion Vessel

3 COMMISSIONING

3.1 Initial Preparation

MTS (GB) Limited support the benchmark initiative. Within the information pack you will find a copy of the benchmark logbook. It is important that this is completed in the presence of your customer, they are shown how to us it, and it is signed by them. Please instruct your customer that they must have their benchmark logbook with them whenever they contact a service engineer or us.

Preliminary electrical system checks to ensure electrical safety must be carried out by a competent person i.e. polarity, earth continuity, resistance to earth and short circuit.

Filling the Heating System:

Remove the panels of the case and lower the control panel (see point 3.2. for further information).
Open the central heating flow and return cocks supplied with the connection kit.
Unscrew the cap on the automatic air release valve one full turn and leave open permanently.
Close all air release valves on the central heating system.
Gradually open valve(s) at the filling point (filling-loop) connection to the central heating system until water is heard to flow, do not open fully.
Open each air release tap starting with the lower point and close it only when clear water, free of air, is visible.
Purge the air from the pump by unscrewing anticlockwise the pump plug and also manually rotate the pump shaft in the direction indicated by the pump label to ensure the pump is free.
Close the pump plug.
Continue filling the system until at least 1 bar registers on the pressure gauge.
Inspect the system for water soundness and remedy any leaks discovered.

Filling of the D.H.W. System:

Close all hot water draw-off taps.
Open the cold water inlet cock supplied with the connection kit.
Open slowly each draw-off tap and close it only when clear water, free of bubbles, is visible

Gas Supply:

Inspect the entire installation including the gas meter, test for soundness and purge, all as described in BS 6891:1988.
Open the gas cock (supplied with the connection kit) to the appliance and check the gas connector on the appliance for leaks.

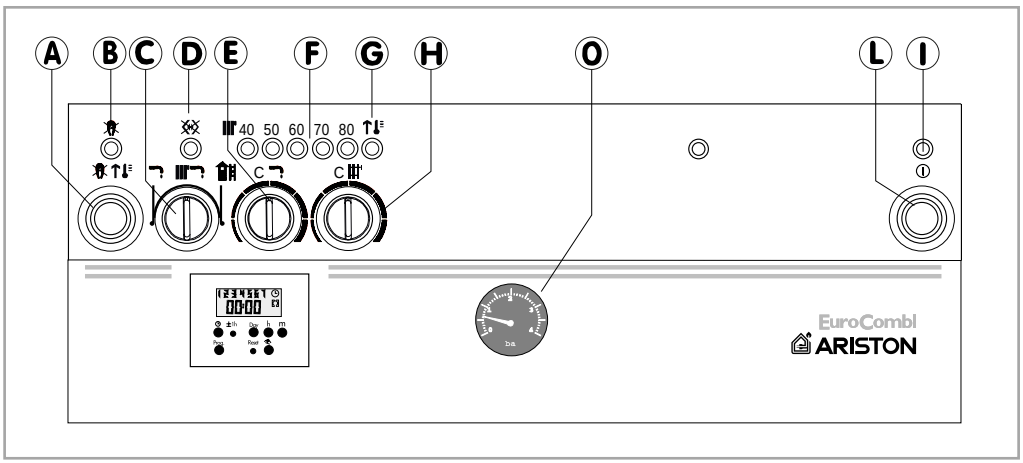
When the installation and filling are completed turn on the central heating system (sect. 3.4) and run it until the temperature has reached the boiler operating temperature. The system must then be immediately flushed through.
The flushing procedure must be in line with BS 7593:1992 Code of practice for treatment of water in domestic hot water central heating systems.
During this operation, we highly recommend the use of a central heating flushing detergent (Fernox Superfloc or equivalent), whose function is to dissolve any foreign matter that may be in the system.
Substances different from these could create serious problems to the pump or other components.
The use of an inhibitor in system such as Fernox MB-1 or equivalent is strongly recommended to prevent corrosion (sludge) damaging the boiler and system.
Failure to carry out this procedure may invalidate the appliance warranty.

3.2 Removing the Front Panel

To remove the front panel of the casing, proceed as follows:
1. Remove the screw “F” located on the top edge of the panel.
2. Lift and unhook the panel.

3.3 Control Panel

A/23 MFFI - A/27 MFFI



A - Ignition Lockout Reset Button/Safety (Overheat)Thermostat Reset
B - Ignition Lockout L.E.D.
C - Selector Knob for *Summer/Winter/Flue Analysis Modes**
D - Low System Water Level L.E.D.
E - Temperature Adjustment Knob for Domestic Hot Water
F - Heating System Thermometer
G - Safety (Overheat)Thermostat Intervention L.E.D.
H - Adjustment Knob for Heating Temperature
I - On/Off L.E.D.
L - On/Off Switch
O - System Pressure Gauge

** Warning the flue analysis mode must only be selected by a qualified service engineer.*

3.4 Initial Start-up

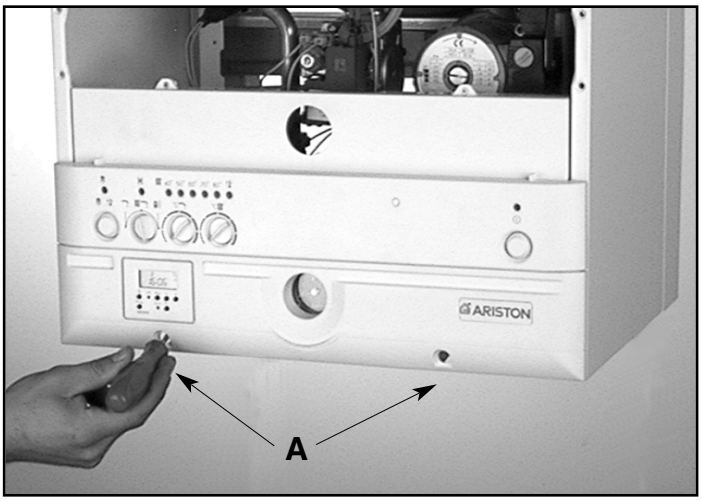
The checks to be run before initial start-up are as follows:
1. Make sure that:
   - the screw on the automatic air valve has been loosened when the system is full;
   - If the water pressure in the system is below 1 bar, bring it up to the appropriate level;
   - Check to see whether the gas cock is closed;
   - Make sure that the electrical connection has been made properly and that the earth wire is connected to an efficient earthing system;
   - Supply power to the boiler by pressing the On/Off switch <L> - the L.E.D. “I” will turn on - turn the selector knob “C” to the <*winter*> setting. This will start the circulation pump. After 7 seconds, the boiler will signal a shut-down due to failure ignition. Leave the boiler as it is until all of the air has been bled from the lines.

- Loosen the cap on the head of the pump to eliminate any air pockets;
- Repeat the procedure for bleeding the radiators of air;
- Open the taps for a brief period;
- Check the system pressure and, if it has dropped, open the filling-loop again to bring the pressure back up to 1 bar.

2. Check the exhaust flue for the fumes produced by combustion.
3. Make sure that all gate valves are open;
4. Turn on the gas cock and check the seals on the connections, including the one for the burner, making sure that the meter does not signal the passage of gas. Check the connections with a soap solution and eliminate any leaks.
5. Press the reset button “A” for the lighting system; the spark will light the main burner. If the burner does not light the first time, repeat the procedure.
6. Check the minimum and maximum pressure values for the gas going to the burner; adjust it if needed using the values indicated in the table in section 4. (See the relative section for burner pressure adjustment within the servicing manual).

3.5 Operational Adjustments

The boiler was designed to make it easy to regulate and check the various features. To access the areas where the adjustment and control devices are located, simply remove the plugs by pressing from the inside, unscrew the screws “A” and remove the bottom part of the instrument panel, rotating it upward.



Right hand side service panel also provides access to:
- the power supply cord connector;
- the fuses.

Left hand side:
- the jumper for regulating the ignition delay (anti-cycling) feature, which can be set from 0 to 2 minutes (factory set at 1 minute);
- the potentiometer for regulating the soft-light feature, the setting for whichcan range from the minimum thermal power to the maximum:

G20	5.5 mm c.a.
G25	4.5 mm c.a.
G30-31	1.8 mm c.a.

- the potentiometer for the maximum thermal power for the heating system, maximum thermal power setting (factory set at the maximum value, unless indicated otherwise on the adhesive sticker located in proximity to the potentiometer);
- The connection for the diagnostic device (TCS).

3.6 Combustion Analysis

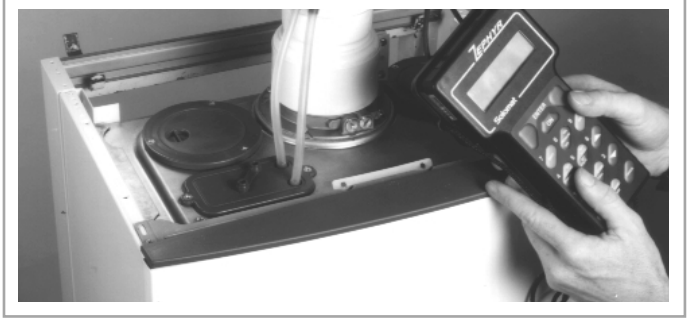
The boiler is designed to make it easy to analyse the combustion by-products.

Using the especially designed apertures, readings can be taken on the temperature of the combustion by-products and of the combustion air, as well as of the concentrations of O_2 and CO_2, etc.

The best maximum-power test conditions for the heating system are when the selector “C” is turned to the flue analysis setting.

3.7 Fume Discharge Monitoring

The discharge/ventilation of the exhaust fumes can be monitored to check for losses in general pressure in the system. This is done to eliminate the cause of lighting failure with the main burner not indicated by a shutdown status.



With a differential manometer connected to the test socket on the combustion chamber, the DP value for the air pressure switch can be taken. The measured value should not be less than 10 mbar under maximum thermal power conditions (with the knob "C" on the flue test setting) in order for the unit to function properly and without interruption.

3.8 Boiler Safety Systems

The boiler is equipped with the following safety systems (see section 3.3 for references):

1 - Ignition Failure

This control signals an ignition failure on the burner 7 seconds after a lighting failure. The L.E.D. "B".will turn on to signal the shutdown status.

The system can be reset by pressing and releasing the button "A" after checking to make sure that the gas valve is open. Repeat this process until the burner lights.

2 - Circulation Failure

This control signals that the safety pressure switch on the primary circuit has not sensed a pressure of at least 1 bar within 40 seconds of the activation of the circulation pump, it shuts off the boiler and lights the L.E.D. "D". The system can be reset (after the pressure has been brought up to the proper level) by using the On/Off switch "L".

3 - Overheating

This control shuts off the boiler in the case where the primary circuit reaches a temperature in excess of 110°C. The L.E.D. "G" will come on to signal this shut off status. After the system has been allowed to cool, the system can be reset by pressing the button "A".

4 - The boiler is provided with a device that, should the temperature of the water for the heating system fall to below 3°C, is activated until a temperature of 55°C is reached (still for heating purposes).

This device can only be activated with a perfectly operating boiler:

- The pressure of the system is sufficient,
- The boiler is well supplied electronically,
- The gas is supplied.

5- Limescale Build-up

This is an indirect control (actuated through the regulation of the temperature in the primary heat exchanger) on the formation of limescale in the secondary heat exchanger. Regardless of the flow rate and the temperature in the circuit for the domestic hot water, the temperature is limited to 62°C.

6- Safety Shut-off

At the start of every lighting phase, the P.C.B. performs a series of internal controls. If a malfunction occurs, the boiler will shutdown until the problem has been resolved.

3.9 Draining the System

Draining the heating system.

The heating system must be emptied as follows:

- Turn off the boiler;
- Open the drain valve for the system and place a container below to catch the water that comes out;
- Empty the system at the lowest points (where present). If you plan on not using the heating system for an extended period of time, it is recommended that you add antifreeze with an ethylene glycol base to the water in the heating lines and radiators if the ambient temperature drops below 0°C during the winter.

  This makes repeated draining of the entire system unnecessary.

Draining the domestic hot water system.

Whenever there is the danger of the temperature dropping below the freezing point, the domestic hot water system must be drained as follows:

- Turn off the general water valve for the household plumbing system;
- Turn on all the hot and cold water taps;
- Empty the remaining water from the lowest points in the system (where present).

4. GAS ADJUSTMENTS

CATEGORY II2H3+		Methane Gas G20	Liquid Butane Gas G30	Liquid Propane Gas G31
Lower Wobbe Index (15°C;1013mbar)	MJ/m^3h	45.67	80.58	70.69
Nominal Delivery Pressure	mbar	20	30	37
Minimum Delivery Pressure	mbar	17	20	25
A/23 MFFI				
Main Burner: n. 13 jets (ø)	mm	1.,25	0.72	0.72
Consumption (15°C; 1013mbar)	mc/h	2.72	----	----
Consumption (15°C; 1013mbar)	Kg/h	----	2.02	2.02
Gas Cock Outlet Pressure min - max	mbar	11.4- 2.0	27.5 (*) - 5.2	35.0 (*) - 7.0
A/27 MFFI				
Main Burner: n. 15 jets (ø)		1.25	0.72	0.72
Consumption (15°C; 1013mbar)	mc/h	3.16	----	----
Consumption (15°C; 1013mbar)	Kg/h	----	2.35	2.32
Gas Cock Outlet Pressure: max - min	mbar	11.6-2.2	(*) - 4.8	(*) - 6.0

(1mbar = 10,197 column of water)

The outlet pressure of the gas cock is obtained by completely loosening the screw on the solenoid. The maximum pressure of the gas to the burner will be equal to the nominal delivery pressure minus the head loss within the gas valve.

4.1 Changing the Type of Gas

The boiler can be converted to use either methane (natural) gas (G20) or LPG (G30 - G31) by an Authorised Service Centre.

The operations that must be performed are the following:

1. Replace the jets on the main burner (see table in section 4);
2. Adjust the maximum and minimum thermal capacity values for the boiler (see table in section 4);
3. Replace the gas rating plate;
4. Adjust the maximum thermal power setting;
5. Adjust the soft-light feature;
6. Adjust the ignition delay feature for the heating system (can be set from 0 to 2 mins.).

CATEGORY II2H3+	Methane Gas G20	Liquid Butane Gas G30	Liquid Propane Gas G31
Recommended Soft-Light Pressure (mbar)	5-5.5	17 - 18	18 - 19

5. MAINTENANCE

It is recommended that the following checks be made on the boiler at least once a year:

1 - Check the seals for the water connections; replacement of any faulty seals.
2 - Check the gas seals; replacement of any faulty gas seals.
3 - Visual check of the entire unit.
4 - Visual check of the combustion process and cleaning of the burners if needed.
5 - If called for by check no. 3, dismantling and cleaning of the combustion chamber.
6 - If called for by check no. 4, dismantling and cleaning of the injectors.
7 - Visual check of the primary heat exchanger:
- check for overheating in the blade assembly;
- clean the exhaust fan if needed.
8 - Adjustment of the flow rate of the gas: flow rate for lighting, partial load and full load.

9 - Check of the heating safety systems:
- safety device for maximum temperature;
- safety device for maximum pressure.

10 - Check of the gas safety systems:
- safety device for lack of gas or flame (detection electrode);
- safety device for gas cock.

11 - Check of the electrical connection (make sure it complies with the instructions in the manual).

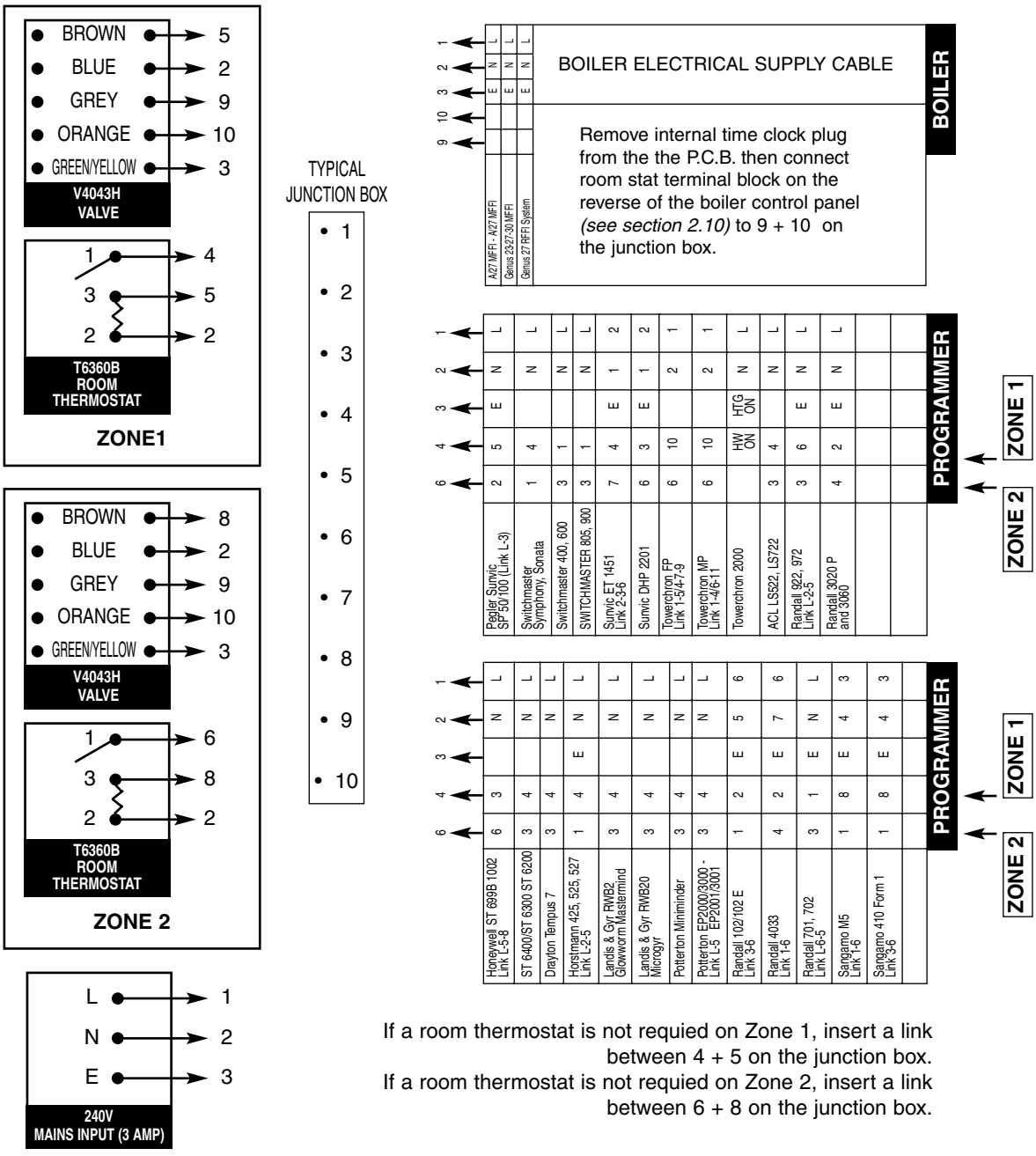
12 - Check of domestic hot water production efficiency (delivery rate and temperature)

13 - Check of the general performance of the unit.

14 - General check of the discharge/ventilation of the combustion by-products.

6. MISCELLANEOUS

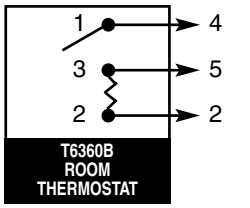
6.1 Wiring Diagram for Two Heating Zones

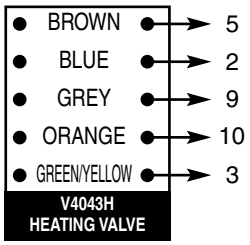


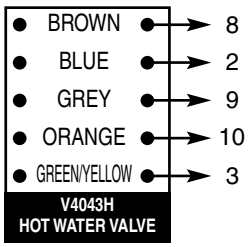
If a room thermostat is not requied on Zone 1, insert a link between 4 + 5 on the junction box.
If a room thermostat is not requied on Zone 2, insert a link between 6 + 8 on the junction box.

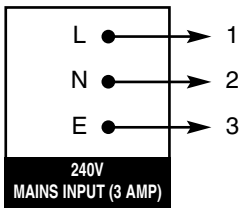
Based on Honeywell controls

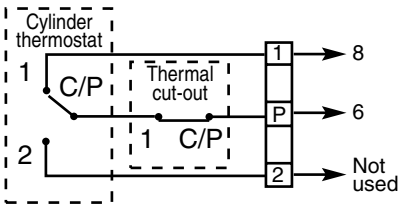
6.2 Wiring Diagram for Connection to Ariston Unvented Cylinder



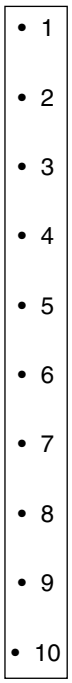


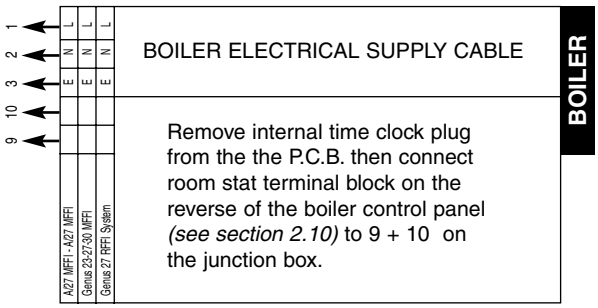


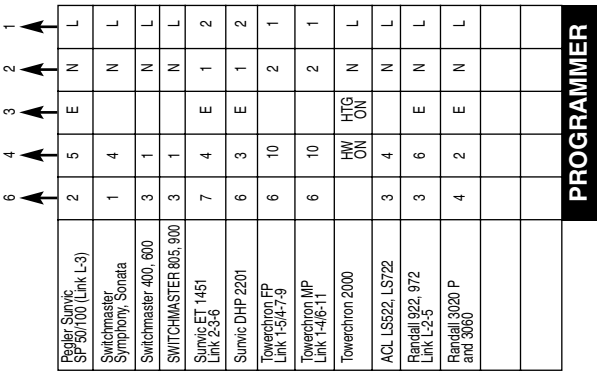


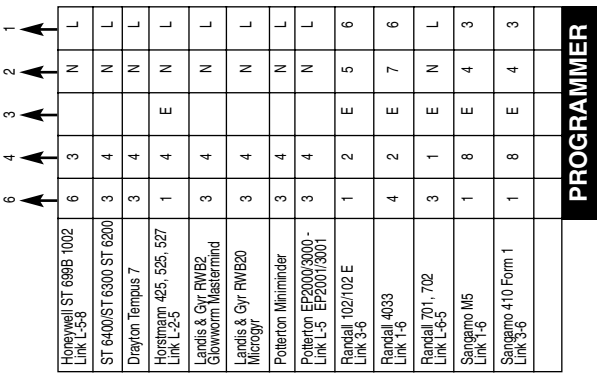


TYPICAL JUNCTION BOX









Based on Honeywell controls

7 TECHNICAL INFORMATION

		A/23 MFFI	A/27 MFFI
CE Certification			
Heat Input	max/min kW	25.6/11.0	29.8/12.0
Heat Output	max/min kW	23.1/9.2	27.3/10.1
Efficiency of Nominal Heat Input	%	90.2	91.6
Efficiency at 30% of Nominal Heat Input	%	87.8	88.3
Heat Loss to the Casing (ΔT=50°C)	%	1.2	1.3
Flue Heat Loss with Burner Operating	%	8.6	7.1
Flue Heat Loss with Burner Off	%	0.4	0.4
Maximum Discharge of Fumes (G20-G25)	Kg/h	59	62
Residual Discharge Head	mbar	1.15	1.4
Consumption at Nominal Capacity (G20-G25)	m^3/h	2.72/3.32	3.16/3.86
Gas Consumption after 10 Minutes*	m^3	0.32/0.39	0.37/0.45
(15°C, 1013 mbar) (G30-G31)	Kg/h	2.02/2.00	2.35/2.32
Temp. of exhaust fumes at nominal capacity (G20-G25)	°C	137	128
CO_2 Content	%	5.8	6.6
O_2 Content	%	10	8.6
CO Content	ppm	32.7	32
Minimum Ambient Temperature	°C	+5	+5
Head Loss on Water Side (max) (ΔT=20°C)	mbar	200	200
Residual Head of System	bar	0.25	0.25
Heating Temperature	max/min °C	82/42	82/42
Domestic Hot Water Temperature	max/min °C	56/36	56/36
D.H.W. Flow Rate ΔT=35°C	l/min	9.5	11.2
D.H.W. Flow Rate ΔT=35°C	gal/min	2.1	2.5
D.H.W. Minimum Flow Rate	l/min	2.6	2.6
Pressure of Domestic Hot Water	max/min bar	6/0.2	6/0.2
Expansion Vessel Capacity	l	7	7
Expansion Vessel Pre-load Pressure	bar	1	1
Maximum Water Content in System	l	145	145
Maximum Heating Pressure	bar	3	3
Nominal Pressure Natural Gas (G20-G25)	mbar	20-25	20-25
LPG (G30-G31)	mbar	30-37	30-37
Electrical Supply	V/Hz	230 / 50	230 / 50
Power Consumption	W	150	190
Protection Grade of Electrical System	IP	44	44
Internal Fuse Rating		FAST 2 AT	FAST 2 AT
Weight	Kg.	47	47
G.C. Number		**47-116-18**	**47-116-19**

*Calculated at 70% maximum output

Manufacturer: **Merloni TermoSanitari SpA - Italy**

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Cod. 23 99 84 1260 311 - B023

EuroCombi

ARISTON

A/23 MFFI - A/27 MFFI

G.C.N. **47-116-18 / 47-116-19**

Servicing Instructions

Type C Boilers

LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER

benchmark

TABLE OF CONTENTS

1. SERVICING INSTRUCTIONS

To ensure efficient safe operation, it is recommended that the boiler is serviced annually by a competent person.

Before starting any servicing work, ensure both the gas and electrical supplies to the boiler are isolated and the boiler is cool.
Before and after servicing, a combustion analysis should be made via the flue sampling point (please refer to the Installation Manual for further details).

After servicing, preliminary electrical system checks must be carried out to ensure electrical safety (i.e. polarity, earth continuity, resistance to earth and short circuit).

1.1 Replacement of Parts

The life of individual components vary and they will need servicing or replacing as and when faults develop.
The fault finding sequence chart in chapter 2 will help to locate which component is the cause of any malfunction, and instructions for removal, inspection and replacement of the individual parts are given in the following pages.

1.2 To Gain General Access

All testing and maintenance operations on the boiler require the control panel to be lowered. This will also require the removal of the casing.

To dismantle the front part of the casing, proceed as follows:
1. Remove screw “A” *(see fig. 1.1)*;
2. Lift the front panel up and forward *(see fig. 1.2)*.

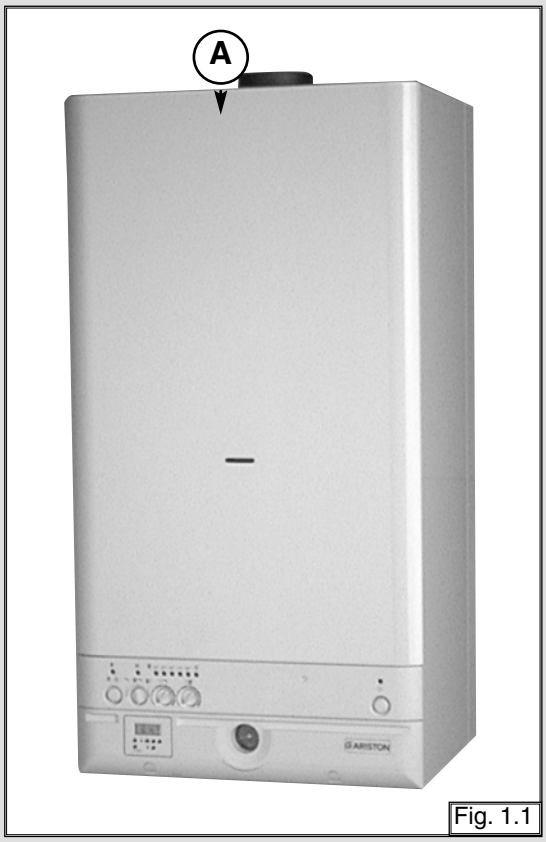


Fig. 1.1


Fig. 1.2

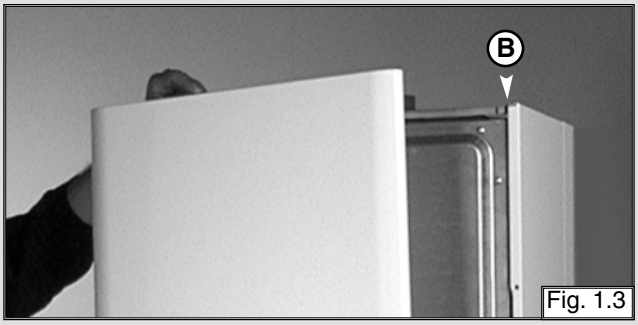


Fig. 1.3

Removing the side panels

1. Remove the screws “B”;

2. Pull the panel away from the boiler, then lift the panel up and away from the boiler *(see fig. 1.2).*

To lower control panel

1. Remove the screws “B”

2. Push the two side panels outward slightly *(fig. 1.5)*;

3. Rotate the control panel forward and down.

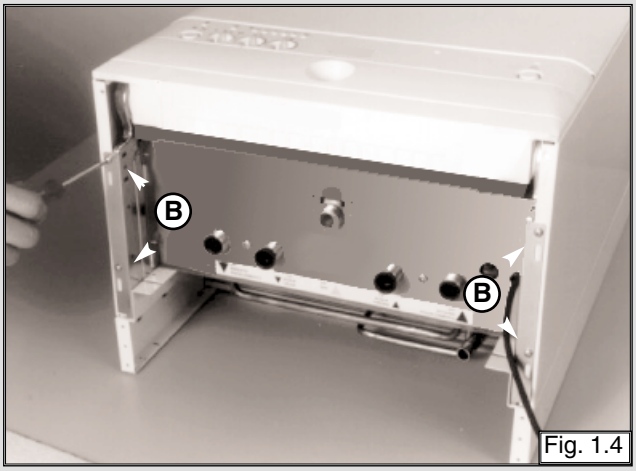


Fig. 1.4

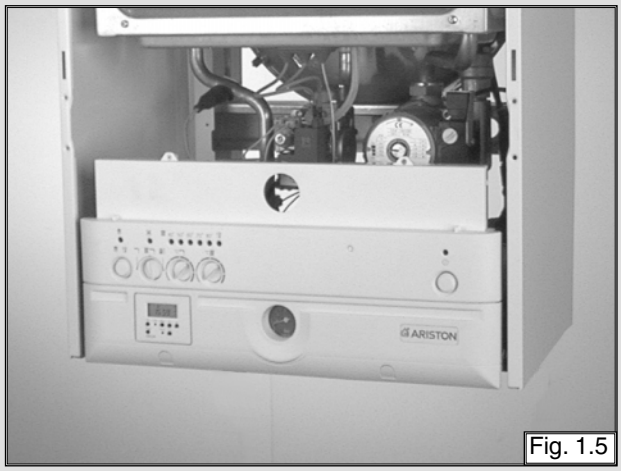


Fig. 1.5

To access the areas where the adjustment and control devices are located, simply remove the plugs by pressing from the inside, unscrew the screws “C” and remove the bottom part of the instrument panel, rotating it upwards.

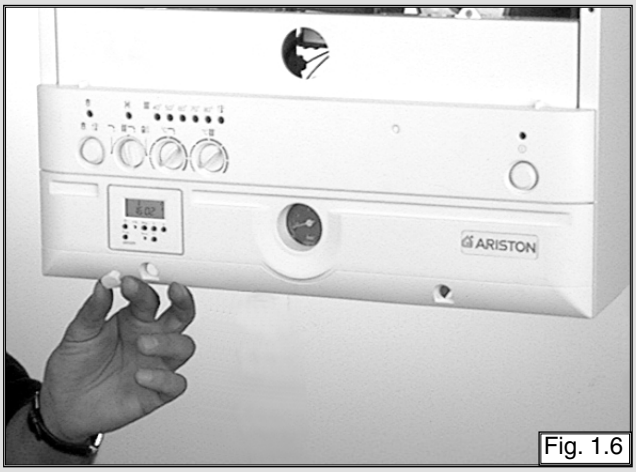


Fig. 1.6

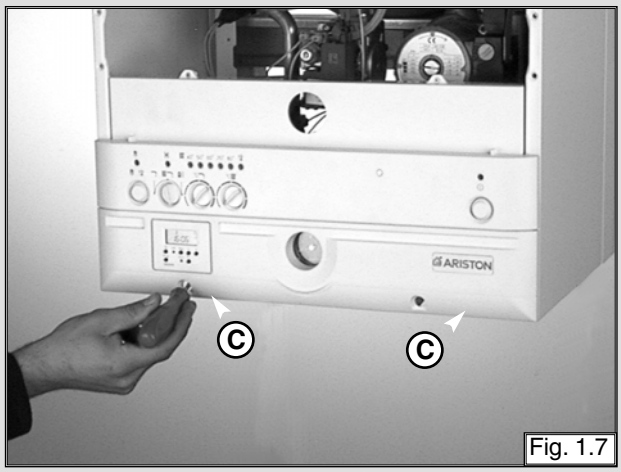


Fig. 1.7

1.3 Access to the Combustion Chamber

A/23 MFFI

Removing the sealed chamber frontal cover

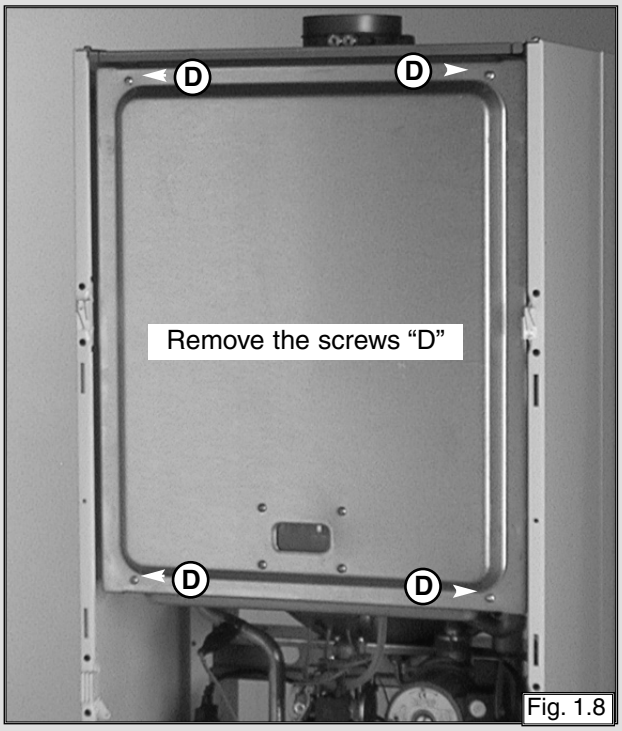


Fig. 1.8

Removing the combustion cover

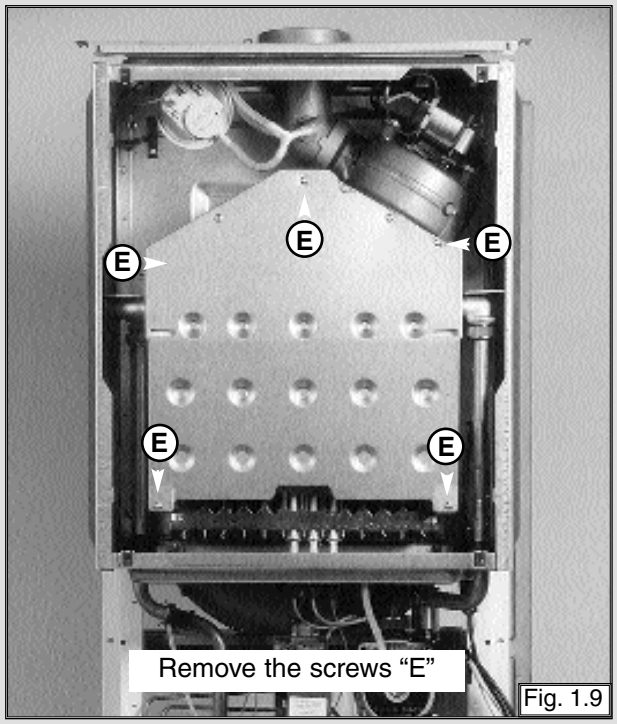


Fig. 1.9

A/27 MFFI

Removing the sealed chamber frontal cover

Fig. 1.08

Removing the combustion cover

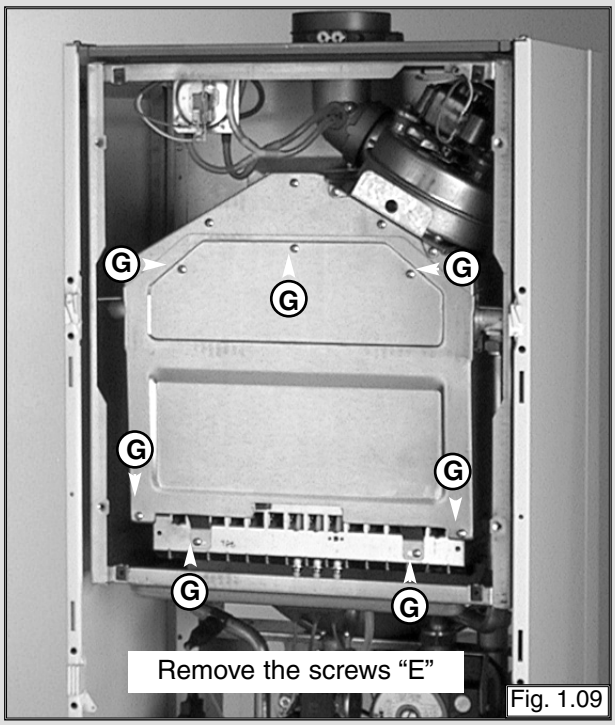


Fig. 1.09

Removing the burner and the injectors

1. Remove the side panels of sealed chamber *(fig. 1.10)*;
2. Remove the screws “H” of the burner *(see fig. 1.11)*;
3. Remove the burner *(see fig. 1.12)*;
4. Remove the injectors using a No. 7 socket spanner;
5. Replace in reverse order.

A/23 MFFI

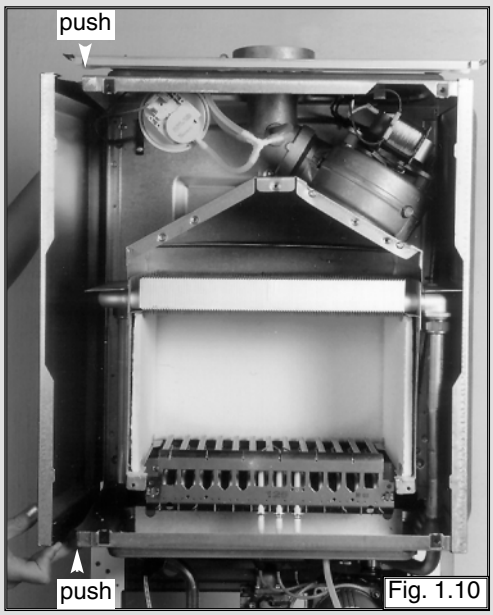


Fig. 1.10

A/27 MFFI

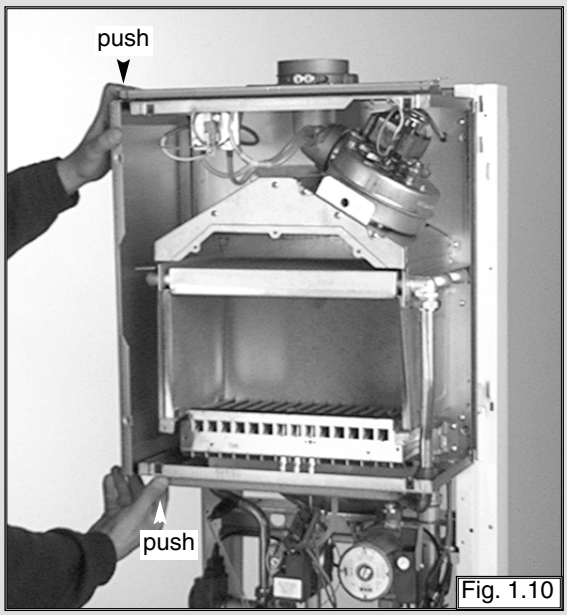


Fig. 1.10

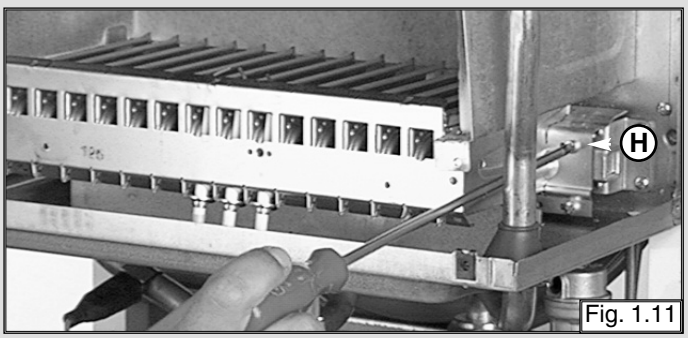


Fig. 1.11

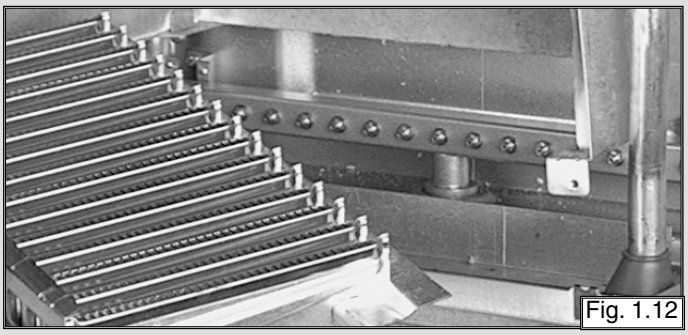


Fig. 1.12

Removing the electrodes

1. Remove rubber gasket “I” *(see fig. 1.13)*;
2. Disconnect ignition leads by pulling downward *(see fig. 1.14)*;
3. To remove the flame sensor, disconnect the cable at its only connection point close to the P.C.B. *(see fig. 1.15)*;

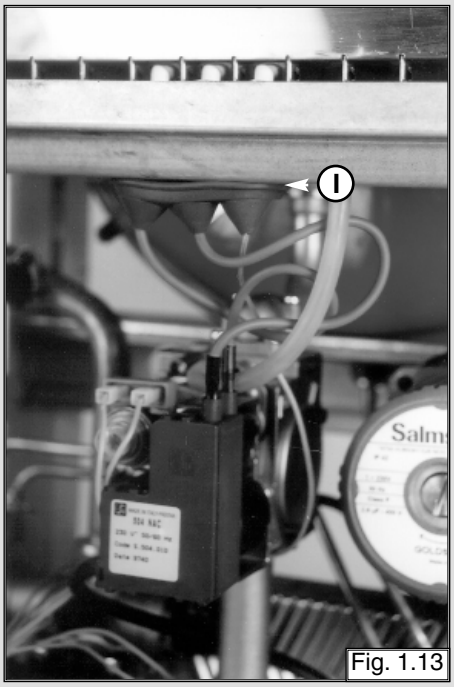


Fig. 1.13

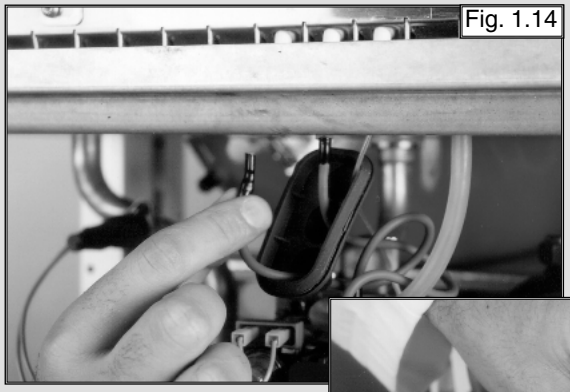


Fig. 1.14

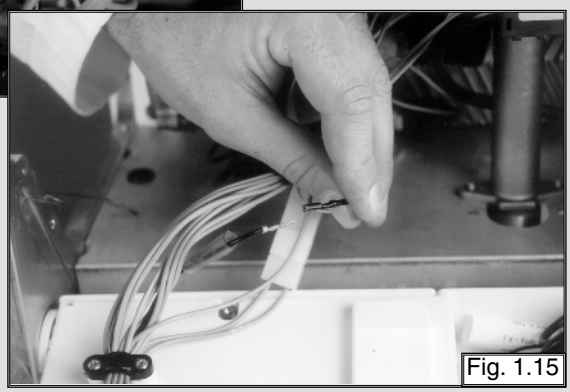


Fig. 1.15

5. Remove screw “J” using a Philips No. 2 star tip screwdriver *(see fig. 1.16)*;
6. Slide the electrode gently downward *(see fig. 1.17).*

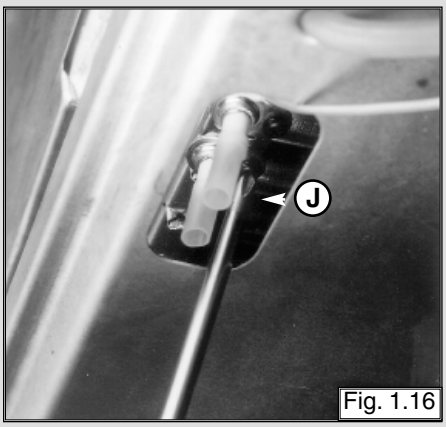


Fig. 1.16

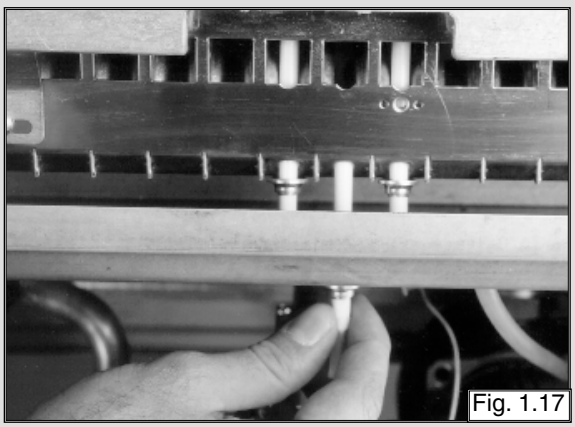


Fig. 1.17

To replace, repeat the steps in reverse order, paying particular attention to the following:

a - Centre the electrode in the positioning hole carefully, otherwise the electrode may break;
b - Check that the cables have been connected correctly;
c - Check that the rubber gasket covers the cable/electrode connection point completely.

Removing the main heat exchanger

1. Drain the boiler of water;
2. Release the two connection nuts “K” connecting the exchanger to the flow and return pipes *(see fig. 1.18*;
3. Pull it straight out *(see fig. 1.19).*

A/23 MFFI

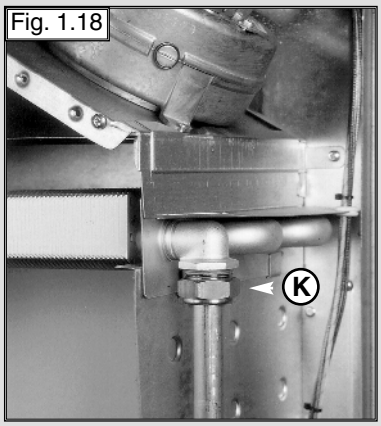


Fig. 1.18


Fig. 1.19

A/27 MFFI

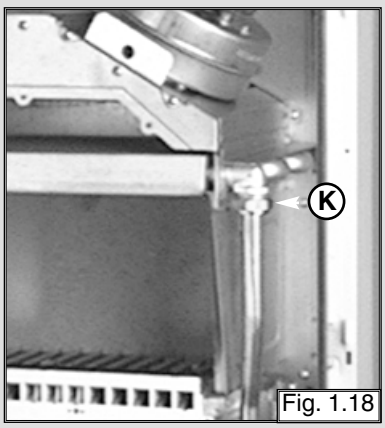


Fig. 1.18


Fig. 1.19

Removing the air pressure switch

1. Disconnect the electrical connections “L” and silicone pipes “M” from their connection points *(see fig. 1.20)*;
2. Remove screws “N” on the top of the sealed chamber *(see fig. 1.21)*; Use a No. 2 star tip screwdriver to remove the switch from the plate.

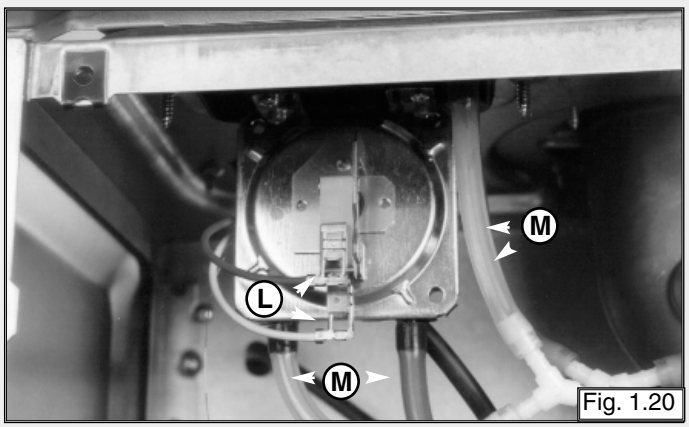


Fig. 1.20

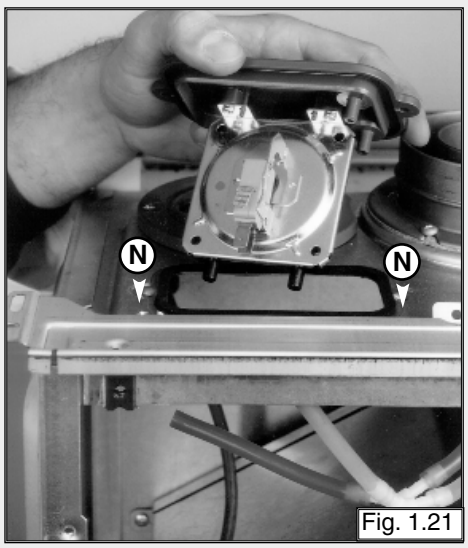


Fig. 1.21

Removing the venturi device

1. Disconnect the silicone pipes “O” and remove the screw “P” *(see fig. 1.22)*;
2. Extract the venturi *(see fig. 1.23)*.

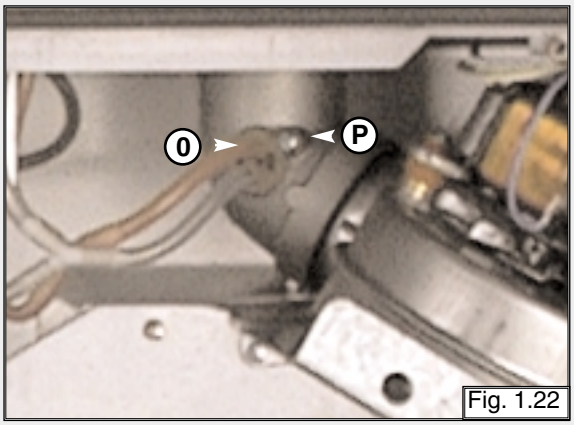


Fig. 1.22

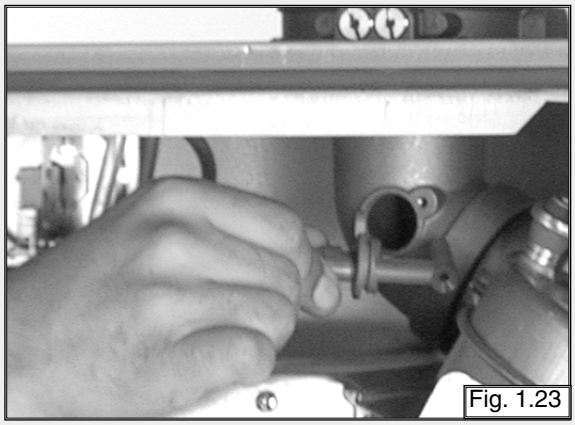


Fig. 1.23

A/23 MFFI

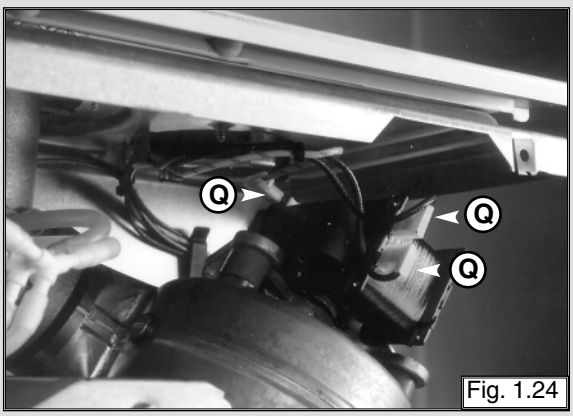


Fig. 1.24

Removing the fan (A/23 MFFI)

1. Disconnect electrical connections “Q” *(see fig.1.24)*;
2. Remove screws “R” *(see fig.1.25)*.
3. Pull fan to the right, forward and remove (see fig. 126)

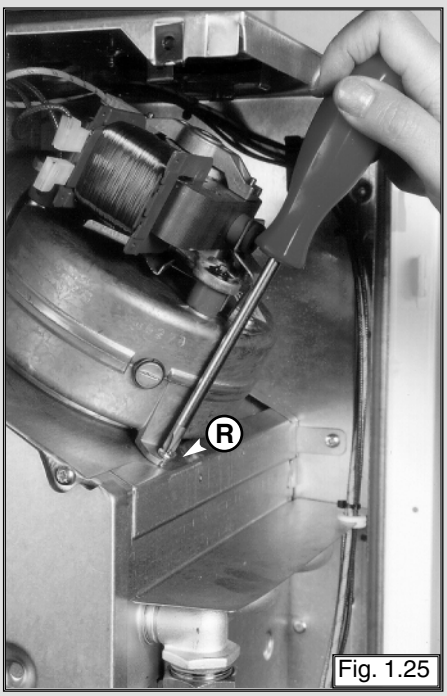


Fig. 1.25

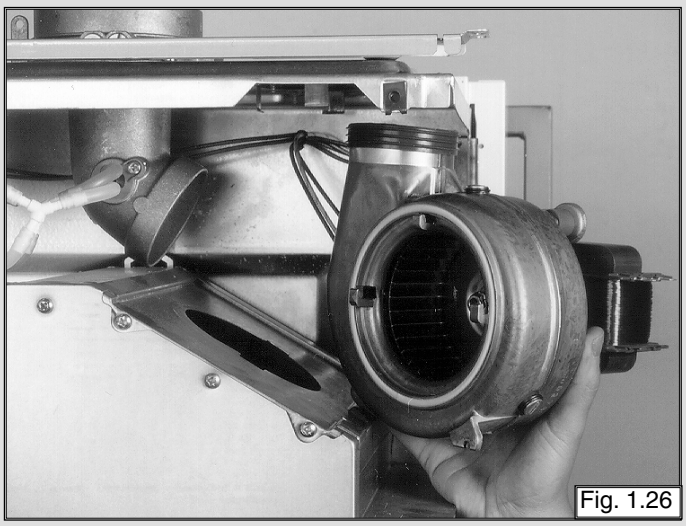


Fig. 1.26

A/27 MFFI

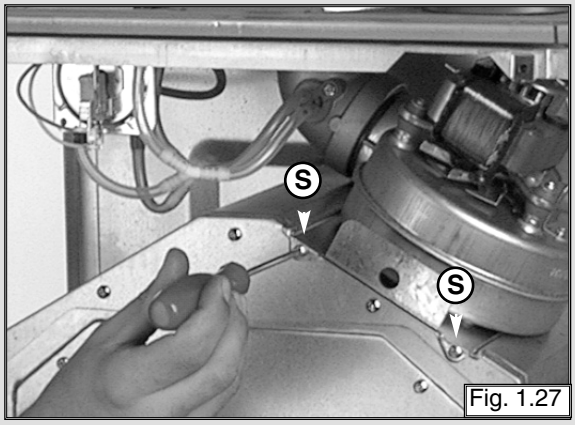


Fig. 1.27

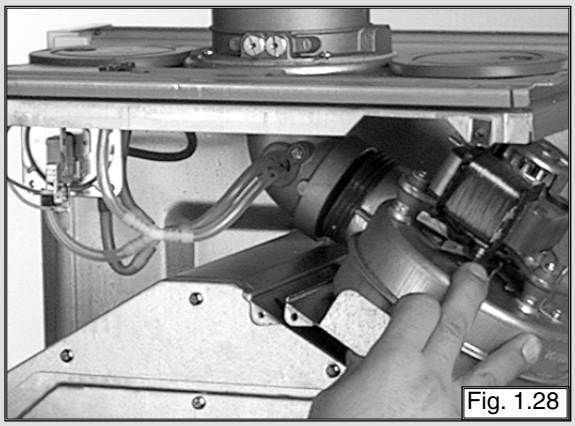


Fig. 1.28

Removing the fan (A/27 MFFI)

1. Disconnect electrical connections and remove screws "S" using a No. 2 star tipped screwdriver *(see fig.1.27)*;
2. Pull fan to the right, forward and remove (*see fig.1.28)*;
3. Remove fan from mounting plate;
4. Remove screws "T" *(see fig.1.29)*.

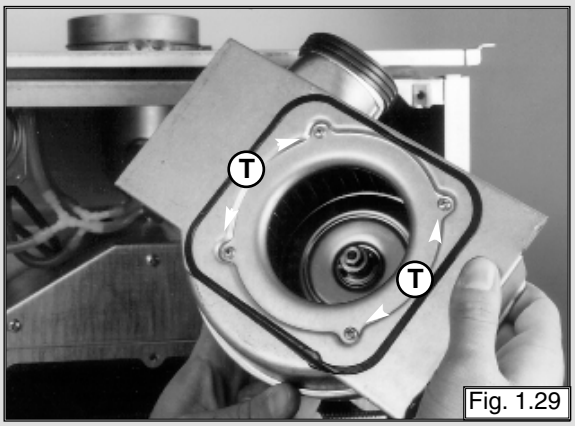
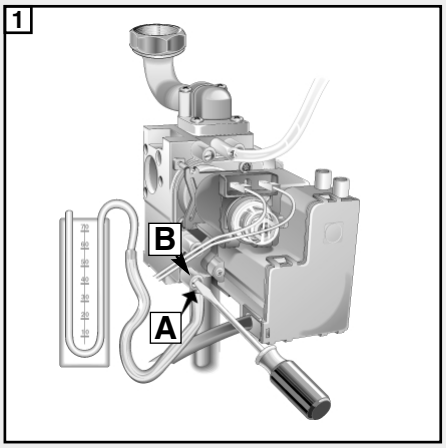
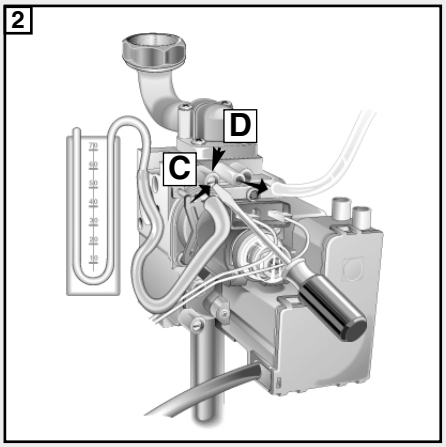
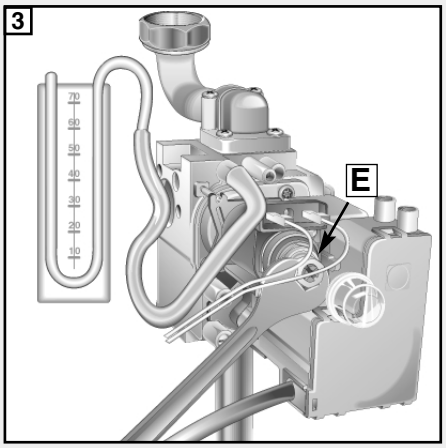


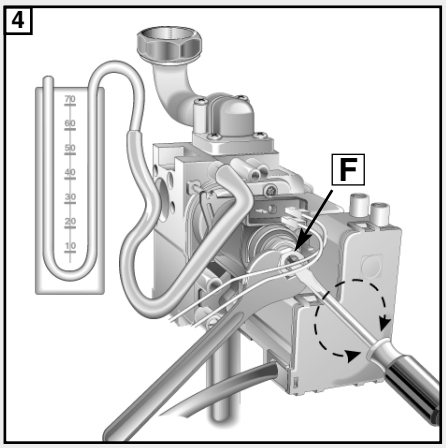
Fig. 1.29

1.4 Servicing and Removal of the Gas Valve









Setting gas pressures

Setting the minimum and the maximum power of the boiler

1. Check that the supply pressure to the gas valve is a minimum of 20 mbar for natural gas.
2. To do this, remove the screw **"A"**.
   Fit the pipe of the pressure gauge to the pressure connection of the gas valve **"B"**.
   When you have completed this operation, replace the screw **"A"** securely into its housing to seal off the gas.
3. To check the pressure supplied by the gas valve to the burner, remove the screw **"C"**. Fit the pipe of the pressure gauge to the pressure outlet of the gas valve **"D"**.
   Disconnect the compensation pipe either from the gas valve or from the sealed chamber.
4. Set the On/Off button to position <⏽> and the "summer/winter" switch to the winter position.
   To set the maximum power, turn on the hot water tap and allow the hot water tap to run at a rate of about 8 litres/minute so that the main burner lights.
   Adjust nut **"E"** on the modureg to set the gas pressure (displayed on the pressure gauge) corresponding to the maximum power (see table "A" page 11).
5. To set the minimum power, disconnect a supply terminal from the modureg and adjust screw **"F"**.
   Turn the screw clockwise to increase the pressure and counter-clockwise to decrease the pressure (displayed on the pressure gauge) corresponding to the minimum power (see table "A" page 11).
6. When you have completed the above operations, turn off the hot water tap, re-connect the supply terminal to the modureg on the gas valve and replace the cap on the screw of the modureg.

Setting the maximum heating circuit power

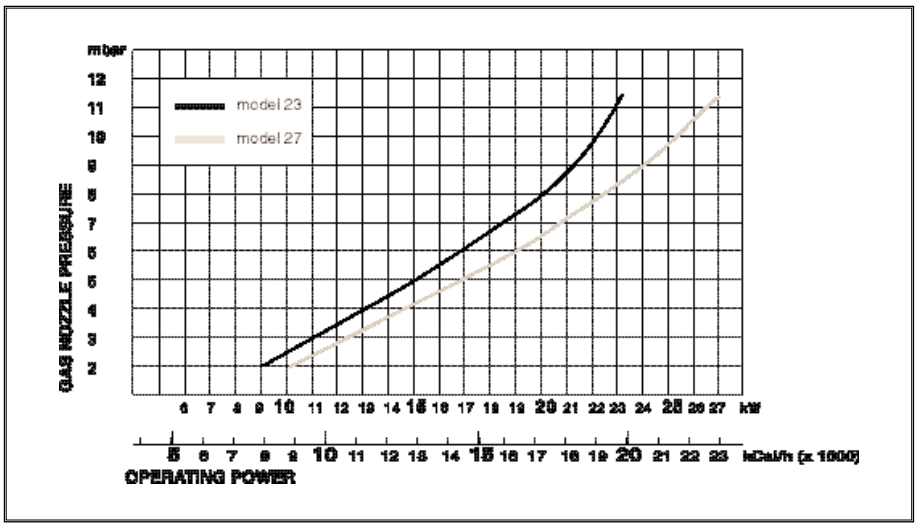
7. To set the maximum heating circuit power, place the On/Off button to position <⏽> and the "summer/winter" switch to winter position.
   Turn the knob of the heating thermostat clockwise to maximum;
8. Remove the left hand inspection panel of the P.C.B. and fit a small cross-head screwdriver in to the right hand potentiometer. Turn clockwise to increase the pressure or counter-clockwise to reduce the pressure. Adjust the setting to the required heating pressure value (displayed on the pressure gauge), as indicated in the diagrams shown in page 11.
9. Turn off the boiler by placing the main switch to the "Off" position.

Setting pressure for soft ignition.

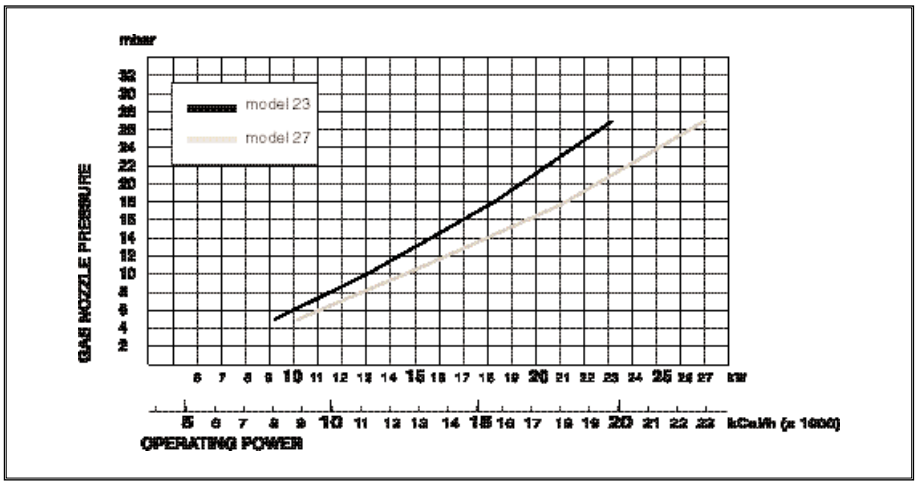
Disconnect the detection electrode connection from the P.C.B. (see fig. 1.13).
Start the boiler and during the ignition sequence adjust the centre potentiometer until the gas pressure reads the required gas pressure as per the table below.
Once the gas pressure is set turn off the boiler and reconnect the connection to the P.C.B.
NB.: It may be necessary to reset the flame failure reset a number of times during this operation.

	NATURAL GAS (G20)	BUTANE GAS (G30)	PROPANE GAS (G31)
Recommended pressure for soft-light ignition	5 mbar - 1.95 in w.g.	18 mbar - 7.0 in w.g.	19 mbar - 7.4 in w.g.

Regulating the heating power for natural gas (G20)



Regulating the heating power for butane gas (G30)



Regulating the heating power for propane gas (G31)

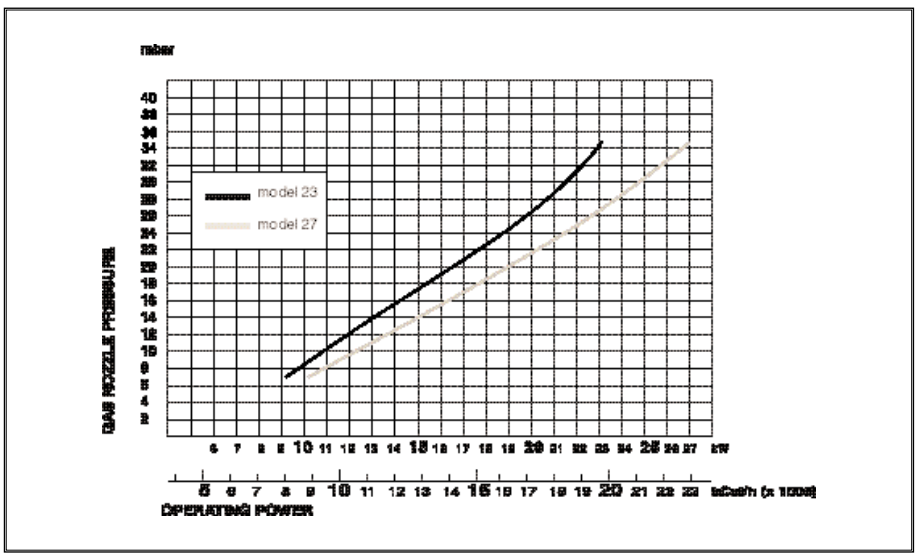
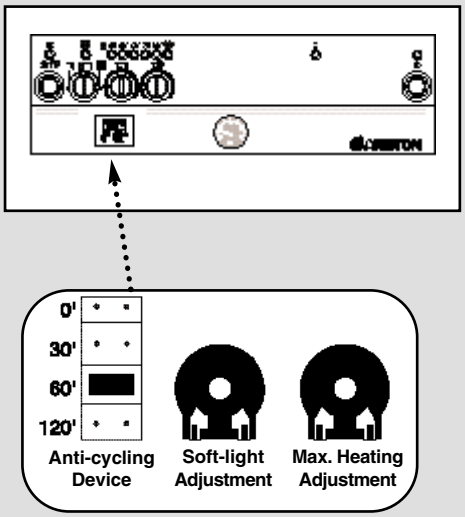


TABLE "A"

GAS REQUIREMENTS		NATURAL GAS (G20)		BUTANE GAS (G30)		PROPANE GAS (G31)	
Gas rate	max	3.0 m³/h	106.0 ft³/h	0.88 m³/h	31.1 ft³/h	1.15 m³/h	40.6 ft³/h
Gas rate	min	1.2 m³/h	42.3 ft³/h	0.35 m³/h	12.3 ft³/h	0.46 m³/h	16.2 ft³/h
Inlet pressure		20 mbar	7.8 in w.g.	28 mbar	10.9 in w.g.	37 mbar	14.4 in w.g.
Burner pressure	max	12.3 mbar	4.8 in w.g.	28 mbar	10.9 in w.g.	37 mbar	14.4 in w.g.
Burner pressure	min	2.0 mbar	0.8 in w.g.	5.1 mbar	2.0 in w.g.	7.0 mbar	2.7 in w.g.
Burner injectors **A.23 MFFI**		13 x 1.25		13 x 0.72		13 x 0.72	
Burner injectors **A.27 MFFI**		15 x 1.25		15 x 0.72		15 x 0.72	



10. Remove the pipe from the pressure gauge and connect screw "**C**" to the pressure outlet in order to seal off the gas.
11. Carefully check the pressure outlets for gas leaks (valve inlet and outlet).

IMPORTANT!
Whenever you disassemble and reassemble the gas connections, always check for leaks using a soap and water solution.

Setting the anti-cycling device
This appliance is equipped with a potentiometer which delays the ignition of the heating control and is situated on the P.C.B. (see the electrical diagrams). By adjusting the potentiometer, it is possible to change the time interval between the burner shutting down and its next ignition.
It is preset at 1 minute and can be adjusted from 0 to 2 minutes.
Use this control in particular situations where continuous shutting down and ignition of the main burner occurs.

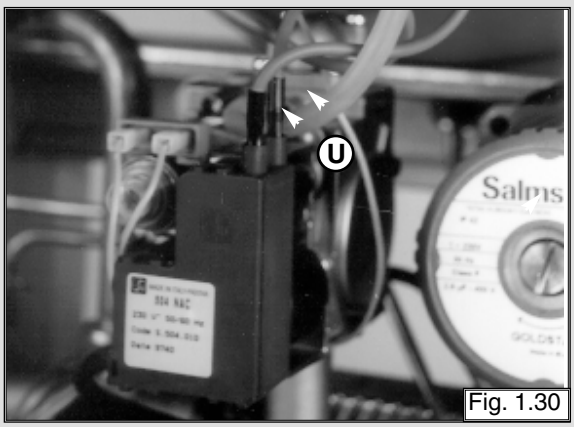


Fig. 1.30

Removing the spark generator (SIT Sigma gas valve)

1. Disconnect ignition leads "U" by pulling upwards *(see fig. 1.30)*;
2. Remove the screws "V" *(see fig. 1.31)* with a Pozidrive No. 2 star tip screwdriver;
3. Remove the spark generator.

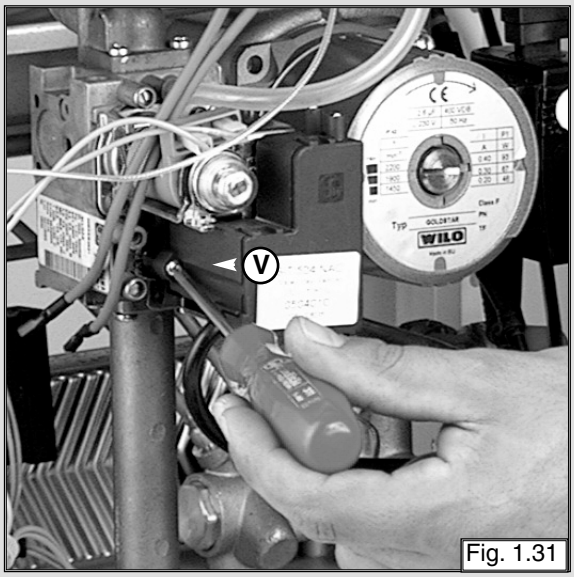


Fig. 1.31

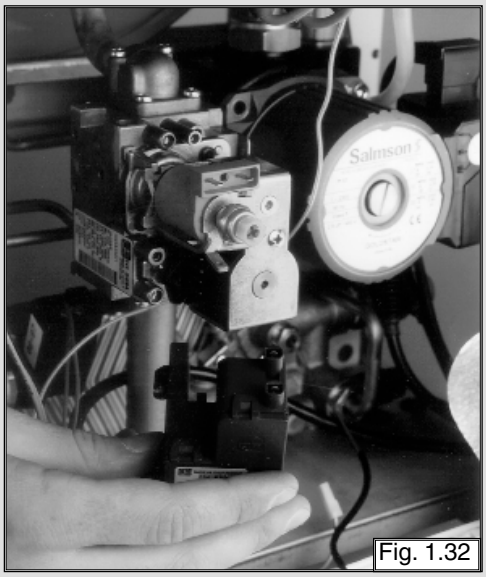


Fig. 1.32

Removing the gas valve

1. Disconnect all the cables from the solenoid and modureg;
2. Remove the spark generator;
3. Release the top nut “W” using a 30 mm open ended spanner *(see fig. 1.33)*;
4. Remove the screws “X” from the bottom of the gas valve pipe *(see fig. 1.34)*.

Attention!! The gas valve is connected with the two pipes (as shown) with an O-ring connection.

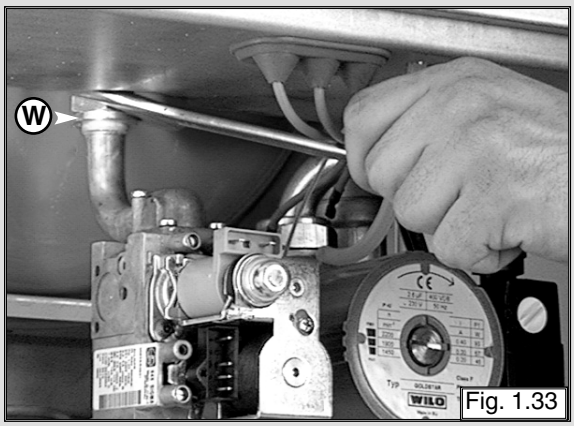


Fig. 1.33

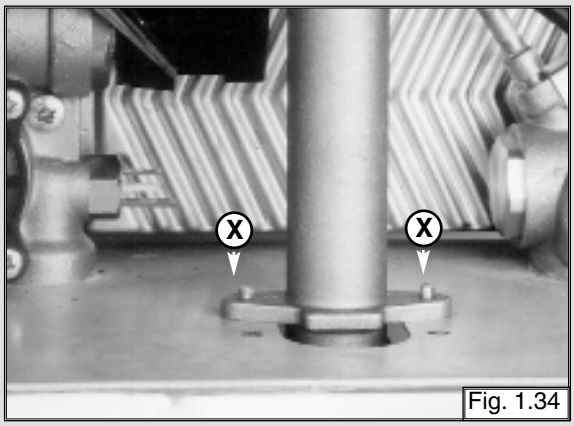


Fig. 1.34

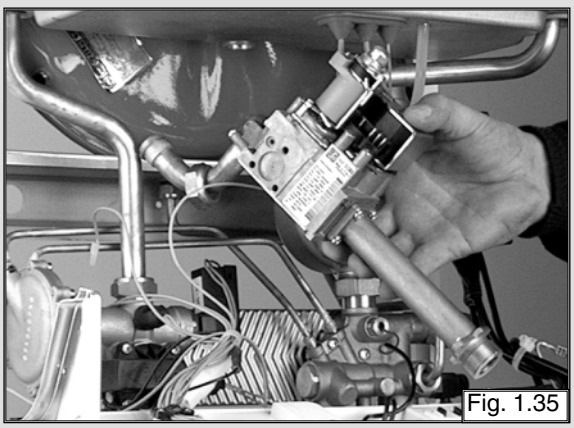


Fig. 1.35

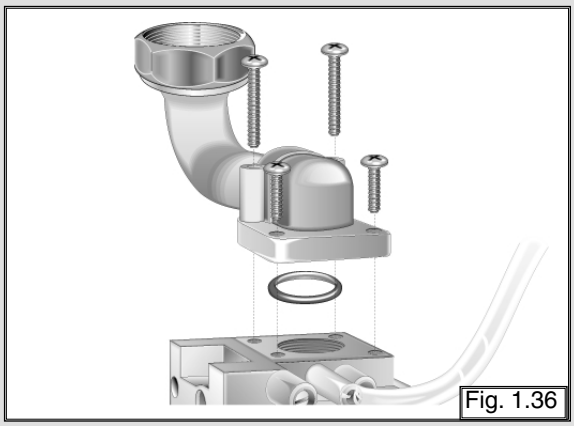


Fig. 1.36

1.5 Access to the Hydraulic Circuits

Important! Before any component is removed, the boiler must be drained of all water.

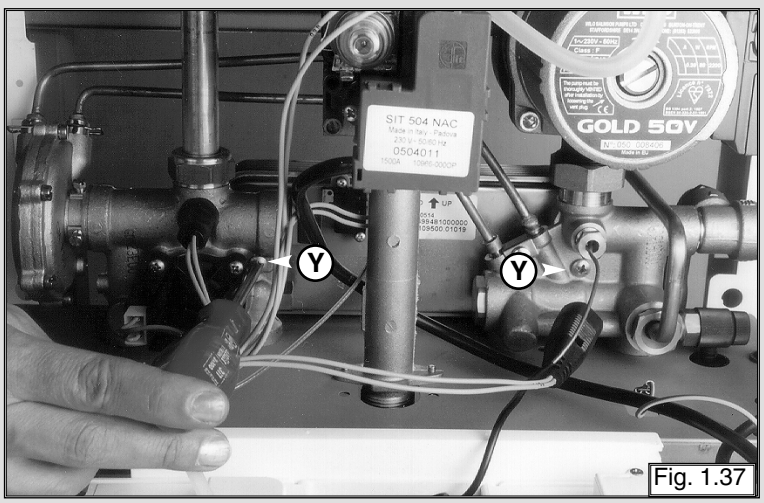


Fig. 1.37

Removing the D.H.W. (secondary) exchanger

1. Remove the screw “Y” *(see fig. 1.37)*;
2. Push the exchanger towards the rear of the boiler, lift upwards and remove out of the front of the boiler;
3. Before replacing the exchanger ensure that the O-rings are in good condition and replace if necessary.

Removing the safety valve

1. Loosen nut “Z” *(see fig. 1.38);*

2. Unscrew and remove the valve (see fig. 139)

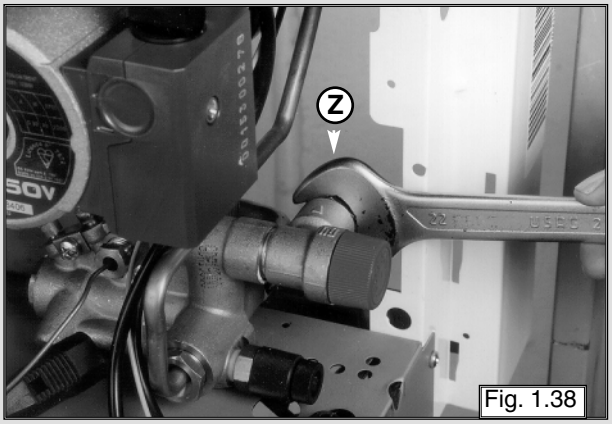


Fig. 1.38

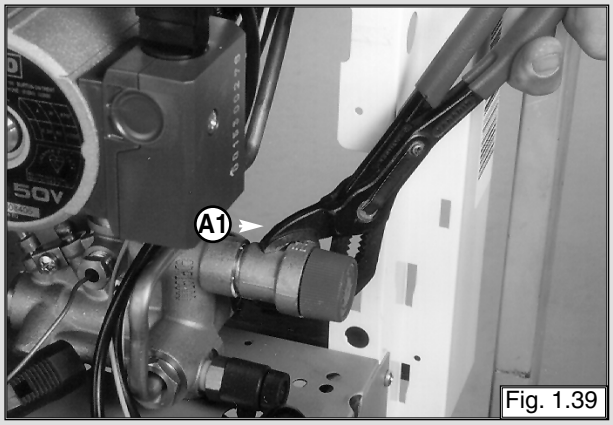


Fig. 1.39

Removing the automatic air vent

1. Unscrew valve “A1” *(see fig. 1.39)*.

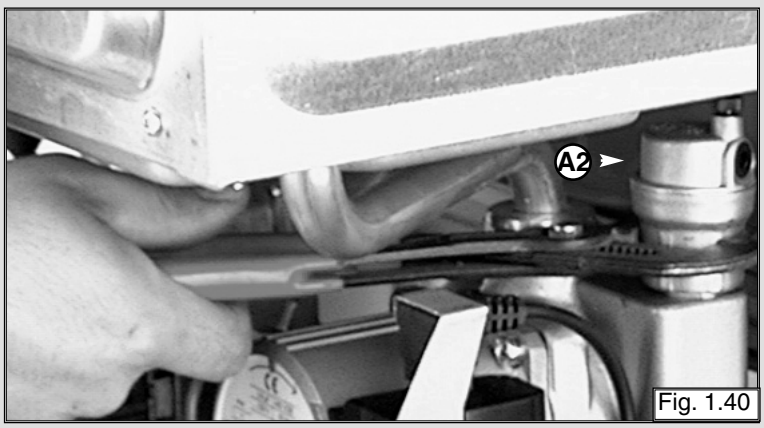


Fig. 1.40

Removing the main circuit flow switch

1. Remove the cable of the main circuit flow switch “A3” *(see fig. 1.41)*;

2. Remove the screws “A4” *(see fig. 1.42);*

3. Remove the main circuit flow switch.

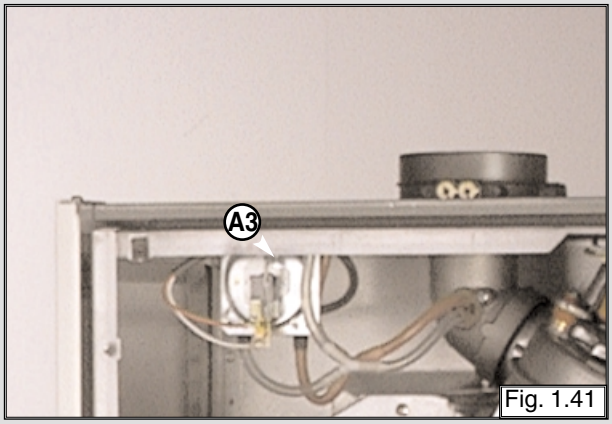


Fig. 1.41

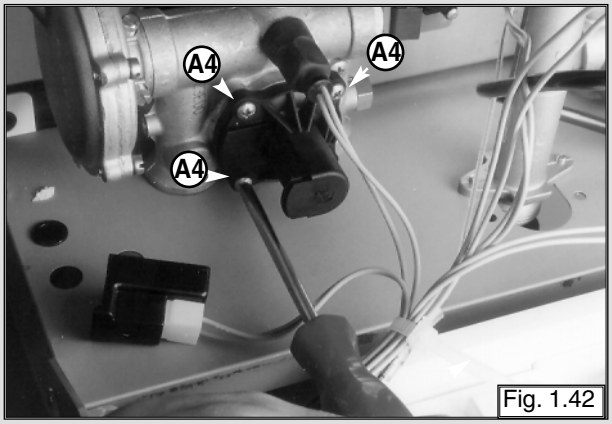


Fig. 1.42

Removing the pump

1. Remove the electrical connection “A5” *(see fig. 1.43)*;
2. Release the nuts “A6” and remove the pump *(see fig. 1.44)*.

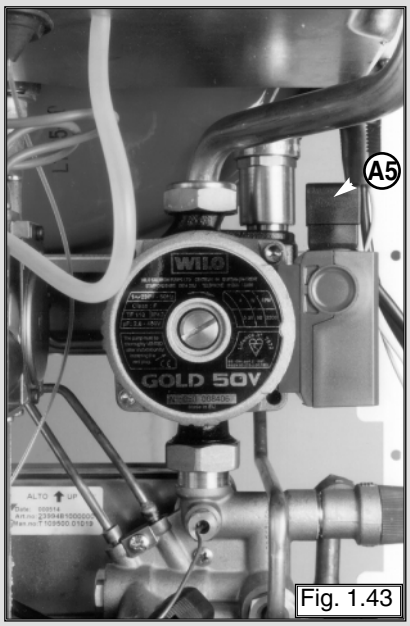


Fig. 1.43

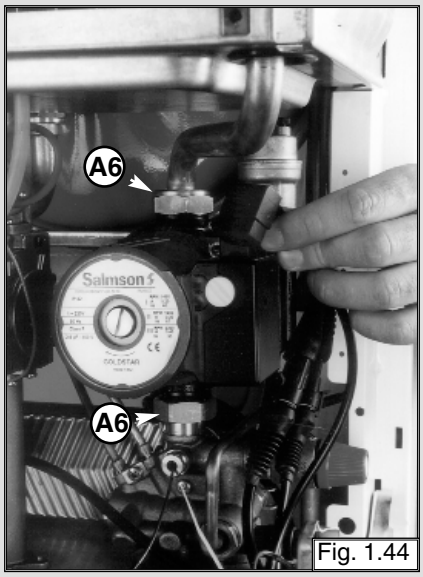


Fig. 1.44

Removing the pressure gauge

1. Remove the inspection panel *(see fig. 1.6 - 1.7)*;
2. Release coupling “A7” using a 14 mm open ended spanner *(see fig. 1.45)*;
3. Push the pressure gauge through the control panel from the rear *(see fig. 1.46)*.

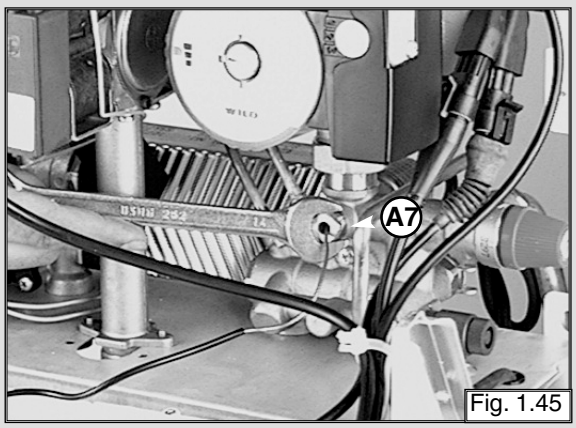


Fig. 1.45

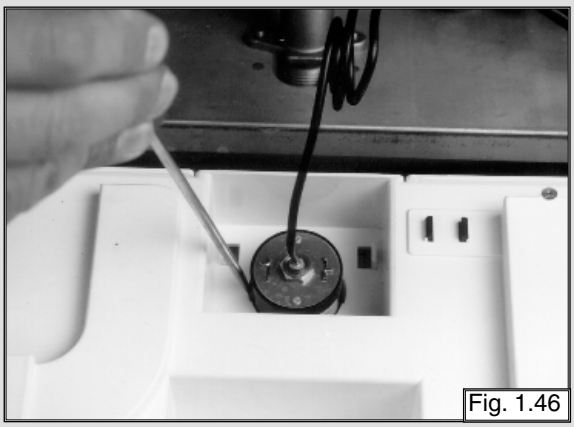


Fig. 1.46

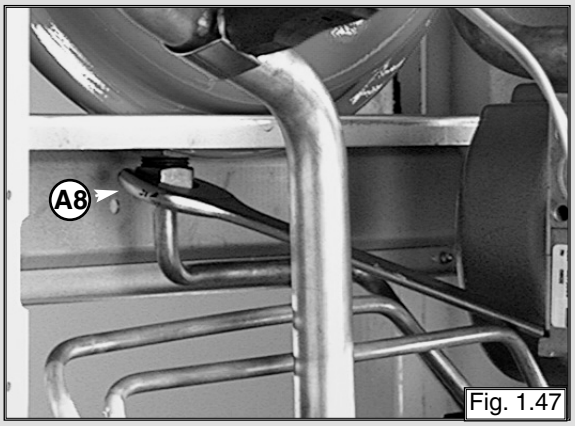


Fig. 1.47

Removing the expansion vessel

1. Remove nut “A8” away from the expansion vessel *(see fig. 1.47)*;
2. Remove nut “A9” *(see fig. 1.48)*;
3. Remove expansion vessel *(see fig. 1.49)*.

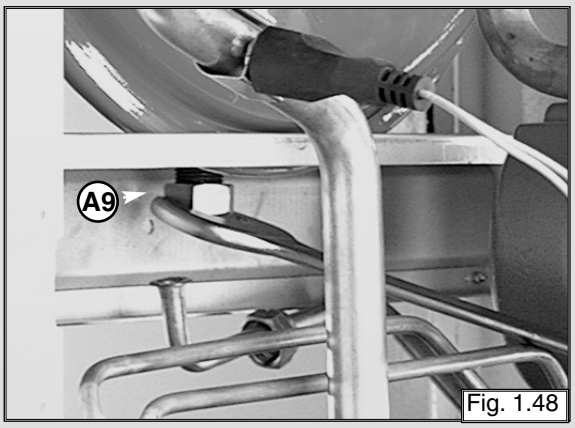


Fig. 1.48

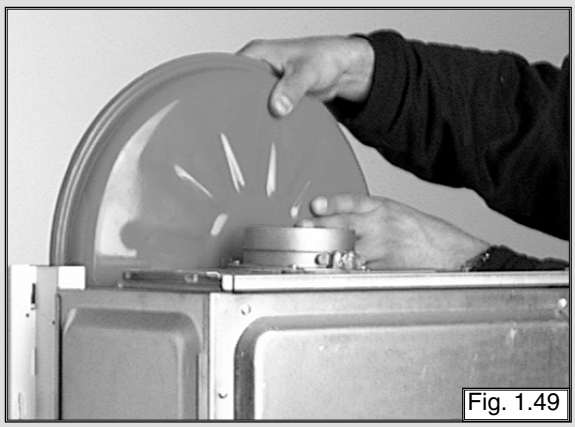


Fig. 1.49

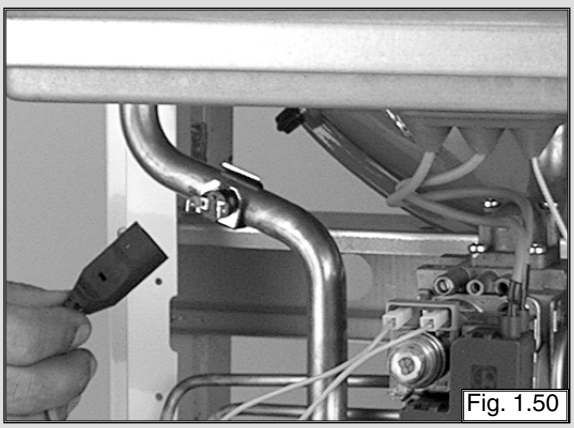


Fig. 1.50

Removing the overheat thermostat

1. Remove the electrical connection from the overheat thermostat *(see fig. 1.50)*;
2. Then remove the thermostat from the pipe by releasing its securing clip.

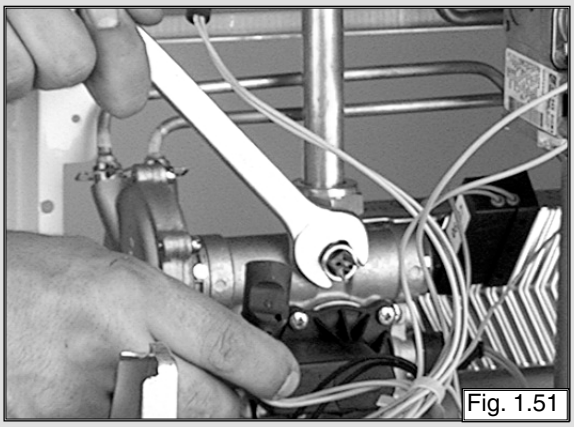


Fig. 1.51

Removing the heating temperature sensor (N.T.C.)

1. Remove the electrical connector by pulling off the thermostat connections and unscrewing the sensor probe with a 14 mm open ended spanner *(see fig. 1.51)*.

1.6 Access to the Control System

Checking fuse

1. Remove the inspection panel *(see fig. 1.6 - 1.7)*;
2. Remove fuse *(see fig. 1.52)*.

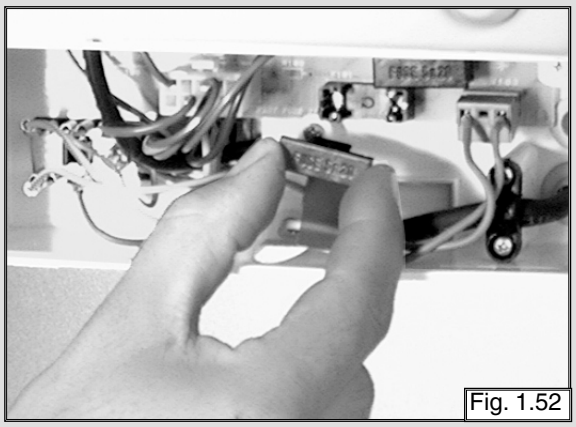


Fig. 1.52

Removing the time clock

1. Remove the inspection panel *(see fig. 1.6 - 1.7)*;
2. Remove electrical connection of the clock “B1” *(see fig. 1.53)*;
3. Unclip the clock from the panel and remove *(see fig. 1.54)*.

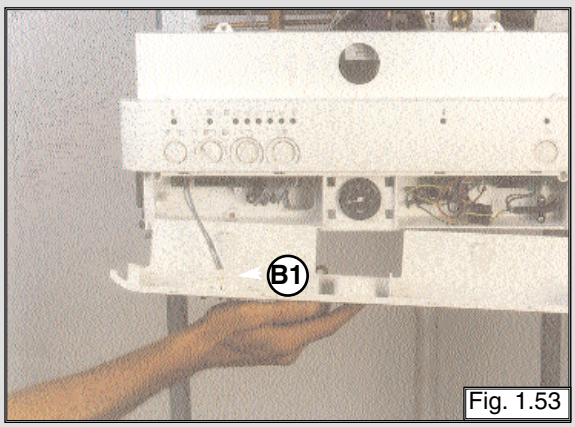


Fig. 1.53

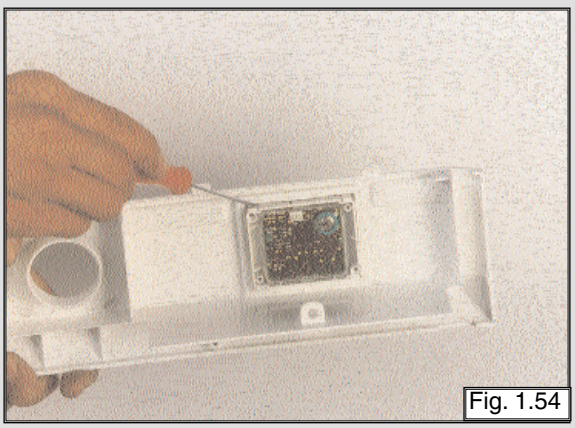


Fig. 1.54

N.B.
It is possible to by-pass the time clock in the event of failure by simply unplugging the electrical connection from the P.C.B. *(see fig. 1.48*). This will revert control of the central heating to the room stat connection on the reverse of the control panel.

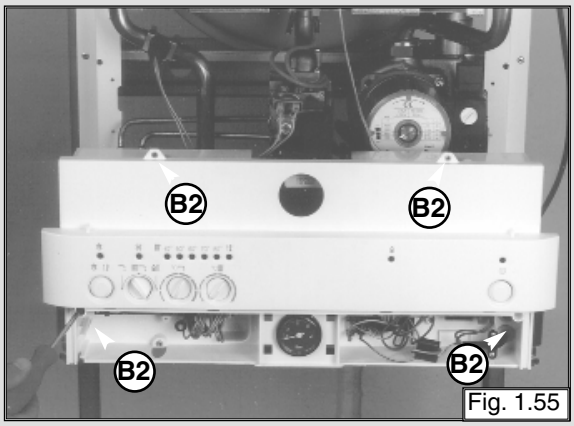


Fig. 1.55

Removing the P.C.B.s

1. Isolate electricity;
2. Remove the front cover of the boiler;
3. Remove the inspection panel *(see fig. 1.6-1.7*);
5. Remove the mounting screws “B2’ *(see fig. 1.55)*;
6. Disconnect the connection cable”B3” *(see fig. 1.56)*;
7. To remove the 24V P.C.B.: remove the electrical plug connectors and screws “B4” *(see fig. 1.57)*;
8. To remove the 240V P.C.B.: remove the electrical plug connectors and screws “B5” *(see fig. 1.58)*;
9. Replace either P.C.B. in reverse order.

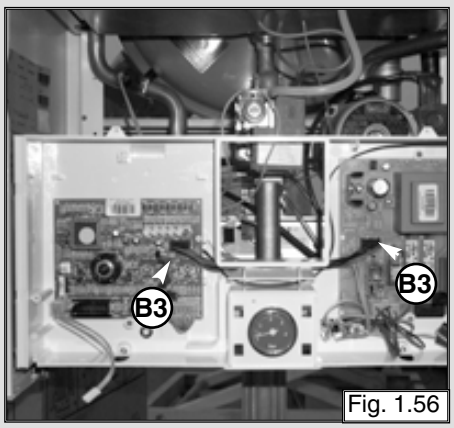


Fig. 1.56

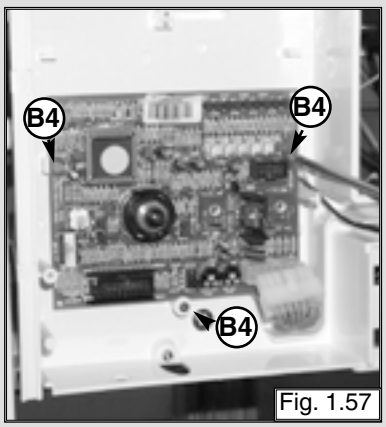


Fig. 1.57

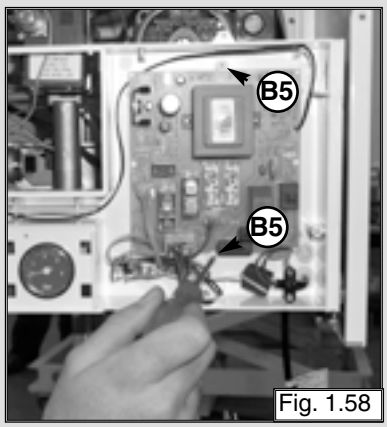
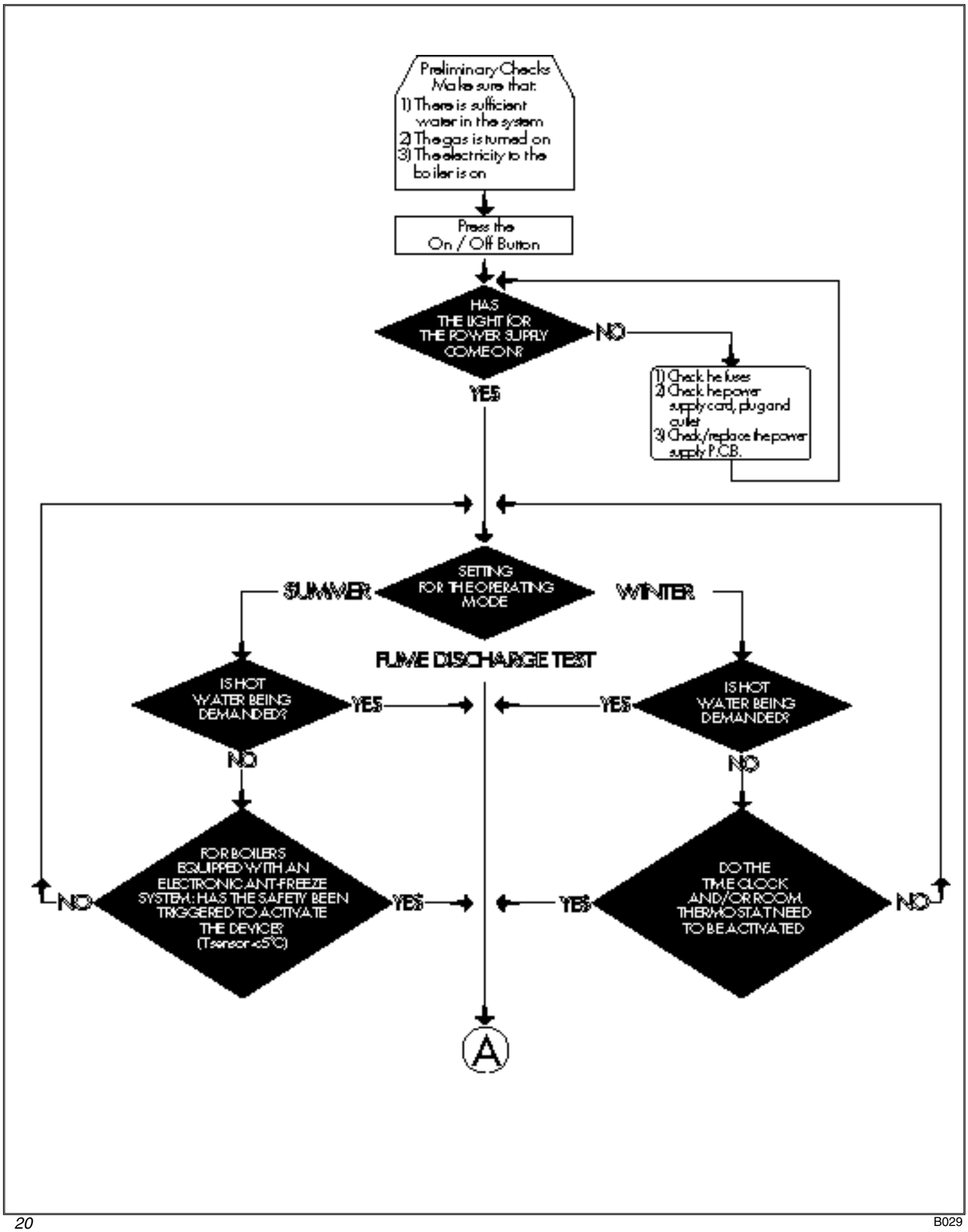


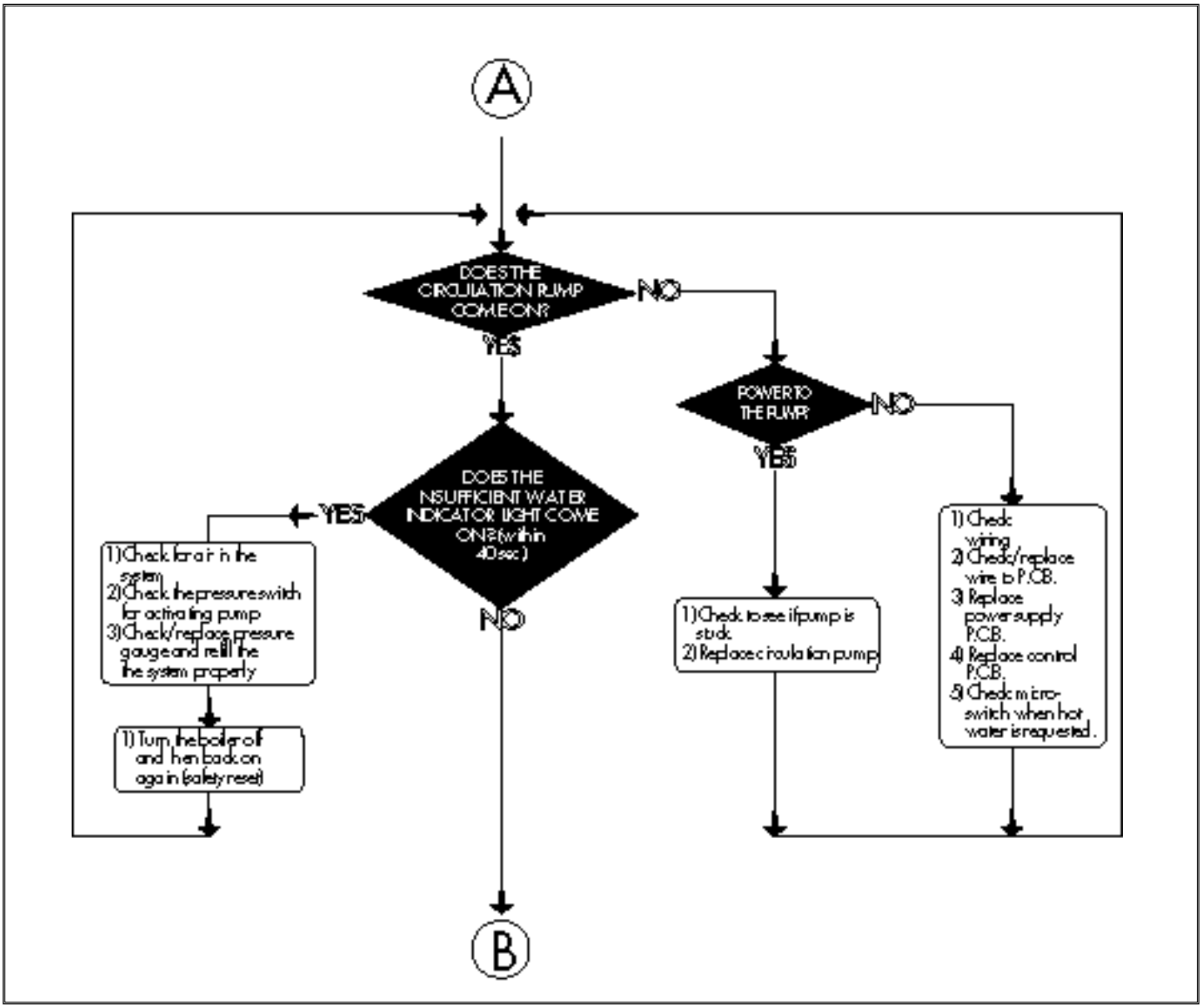
Fig. 1.58

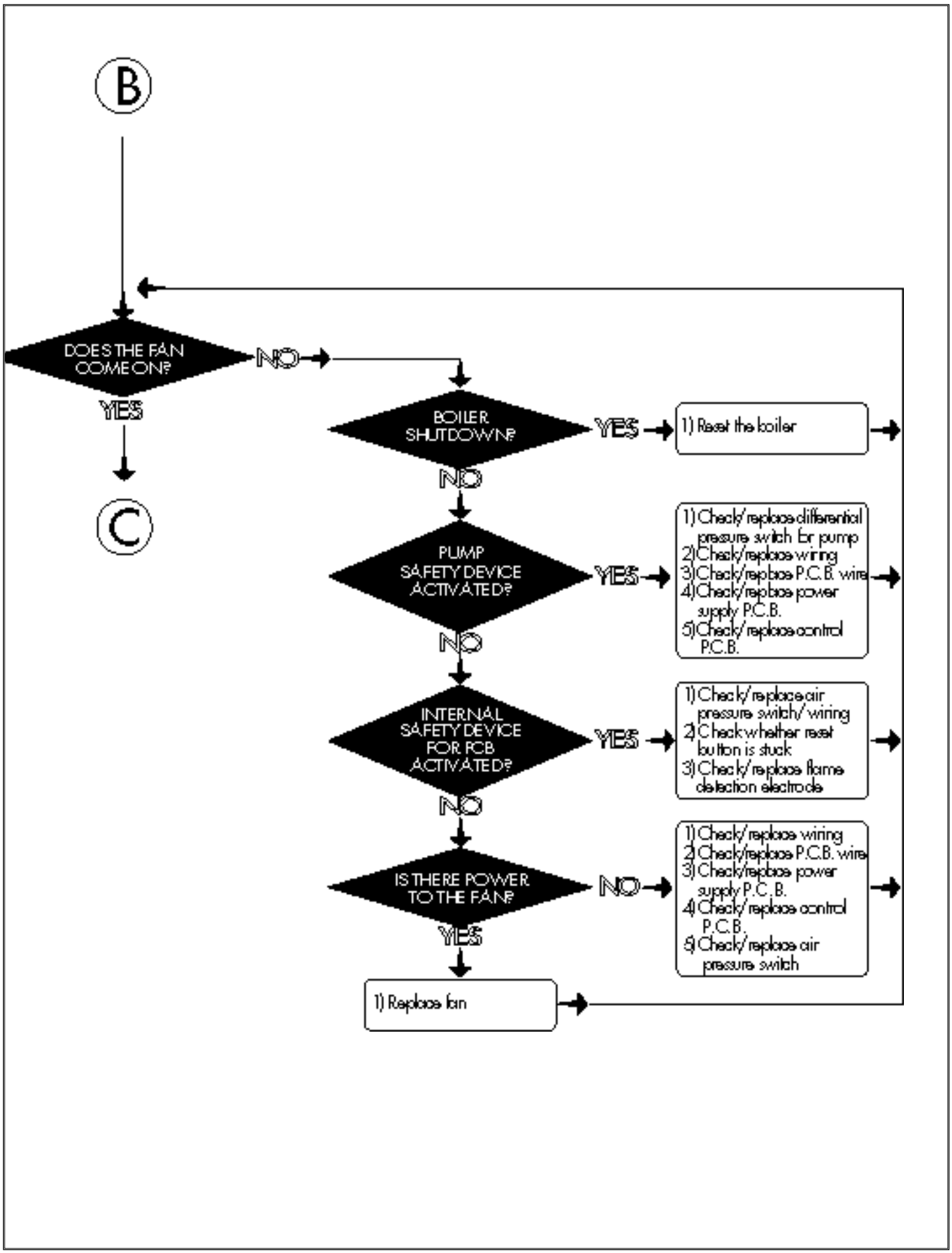
2. FAULT FINDING

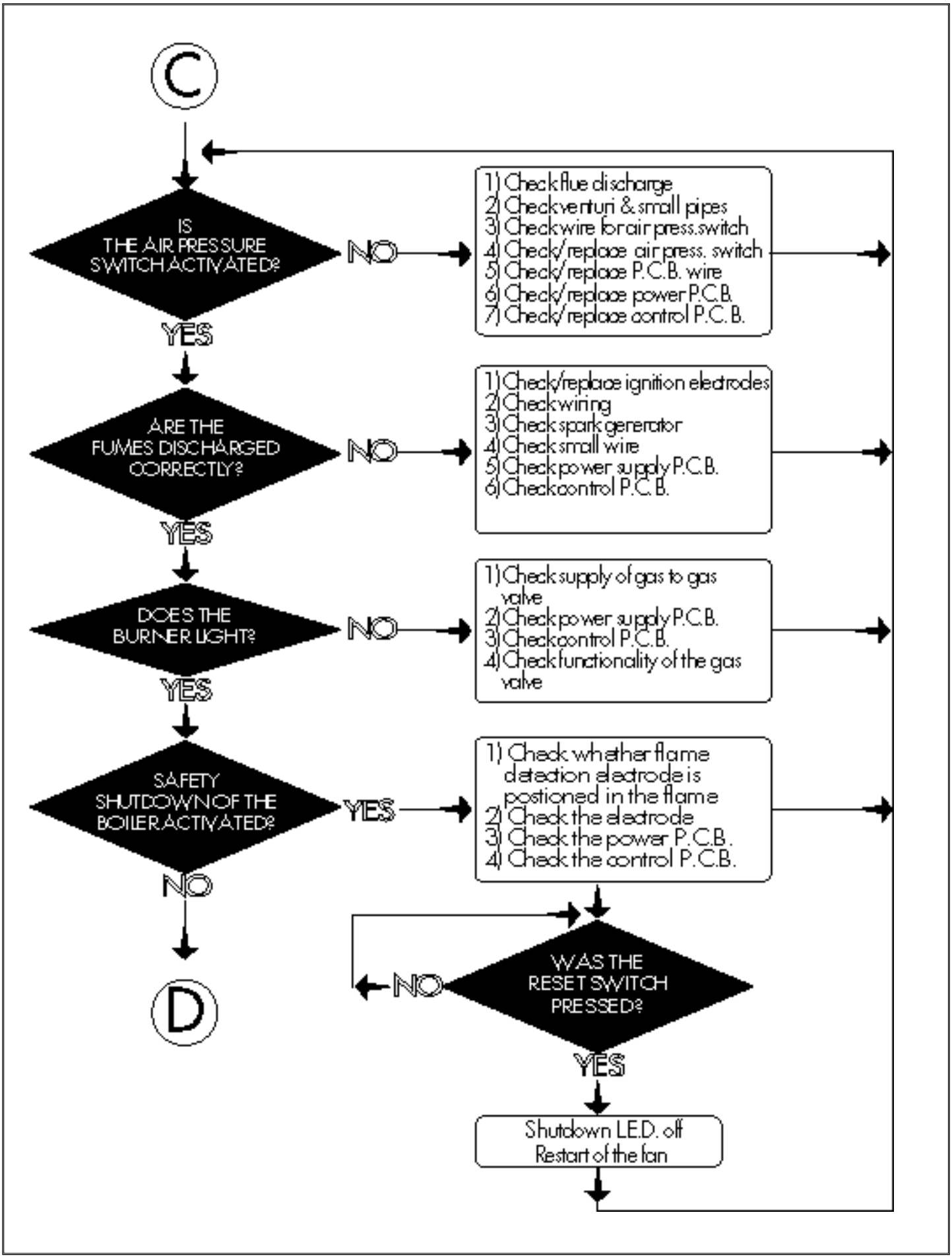
2.1 Fault Finding Guide (Flow-chart)

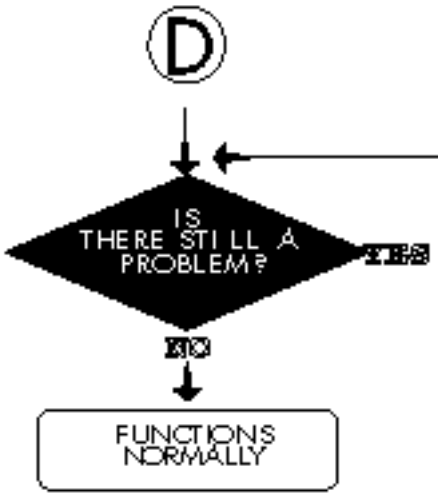
It is possible to detect and correct any defect by using the standard fault finding diagrams described in this chapter.




A
DOES THE CIRCULATION PUMP COME ON?
NO
YES
POWER TO THE PUMP
NO
YES
DOES THE INSUFFICIENT WATER INDICATOR LIGHT COME ON? (within 40 sec)
YES
NO
1) Check for air in the system
2) Check the pressure switch for activating pump
3) Check/replace pressure gauge and refill the the system properly
1) Turn the boiler off and then back on again (safety reset)
1) Check to see if pump is stuck
2) Replace circulation pump
1) Check wiring
2) Check/replace wire to P.C.B.
3) Replace power supply P.C.B.
4) Replace control P.C.B.
5) Check micro-switch when hot water is requested.
B


B
DOES THE FAN COME ON?
NO
YES
C
BOILER SHUTDOWN?
YES
1) Reset the boiler
NO
PUMP SAFETY DEVICE ACTIVATED?
YES
1) Check/replace differential pressure switch for pump
2) Check/replace wiring
3) Check/replace P.C.B. wire
4) Check/replace power supply P.C.B.
5) Check/replace control P.C.B.
NO
INTERNAL SAFETY DEVICE FOR PCB ACTIVATED?
YES
1) Check/replace air pressure switch/ wiring
2) Check whether reset button is stuck
3) Check/replace flame detection electrode
NO
IS THERE POWER TO THE FAN?
NO
1) Check/replace wiring
2) Check/replace P.C.B. wire
3) Check/replace power supply P.C.B.
4) Check/replace control P.C.B.
5) Check/replace air pressure switch
YES
1) Replace fan


C
IS THE AIR PRESSURE SWITCH ACTIVATED?
NO
1) Check flue discharge
2) Check venturi & small pipes
3) Check wire for air press.switch
4) Check/replace air press. switch
5) Check/replace P.C.B. wire
6) Check/replace power P.C.B.
7) Check/replace control P.C.B.
YES
ARE THE FUMES DISCHARGED CORRECTLY?
NO
1) Check/replace ignition electrodes
2) Check wiring
3) Check spark generator
4) Check small wire
5) Check power supply P.C.B.
6) Check control P.C.B.
YES
DOES THE BURNER LIGHT?
NO
1) Check supply of gas to gas valve
2) Check power supply P.C.B.
3) Check control P.C.B.
4) Check functionality of the gas valve
YES
SAFETY SHUTDOWN OF THE BOILER ACTIVATED?
YES
1) Check whether flame detection electrode is postioned in the flame
2) Check the electrode
3) Check the power P.C.B.
4) Check the control P.C.B.
NO
D
WAS THE RESET SWITCH PRESSED?
NO
YES
Shutdown L.E.D. off
Restart of the fan



	LIST OF MALFUNCTIONS	POSSIBLE CAUSES
1	Delivery of hot water for domestic use: when the tap is turned on, the burner goes out.	- Air in the secondary exchanger - Hot water pressure switch is defective - 3-way valve is defective
2	Delivery of hot water for domestic use: the appliance remains locked in reset mode.	- 3-way valve is defective
3	Delivery of hot water for domestic use: water temperature is not satisfactory.	- Check heating sensors - Check gas settings and regulation - Check water flow rate - Check secondary heat exchanger
4	Delivery of hot water for domestic use: noisy operation.	- Primary exchanger is defective - low water pressure in heating system - Check gas settings and regulation
5	Drop/increase in pressure in primary circuit.	- Check for leaks in heating circuit - Defective water supply inlet valve - Secondary exchanger is defective - Expansion vessel is empty
6	Repeated ignition failures.	- Detection electrodes are defective - Check gas settings and regulation - Check electrical circuit for flame detection
7	Safety thermostat is triggered repeatedly.	- Faulty (part cold) N.T.C. heating sensors - Defective (poorly calibrated) safety thermostat - Presence of air in the primary water circuit
8	When the cold water tap is turned off, the boiler remains on.	- Drop in pressure in the water mains, resulting in water hammering
9	Temperature of radiators not satisfactory.	- Check N.T.C. heating sensor - Check by-pass - Check gas settings and regulation

3. ELECTRICAL DIAGRAMS

Legend:

AT = High Voltage P.C.B.
BT = Low Voltage P.C.B.
B = Flame Failure L.E.D.
C = Insufficient Water Pressure L.E.D.
D = Water Temperature Indicator L.E.D.s
E = Overheat Thermostat Warning L.E.D.
F = System Reset Button
G = Selector Knob for Operating Mode
H = Domestic Hot Water Temp. Adjustment
I = Central Heating Temp. Adjustment
J = Wire Connector for Room Thermostat
K = Antifreeze feature selector.
L = Connector for Total Check System
M = Anti-cycling Device Adjustment for Heating
N = Soft-light Adjustment
O = Max Heating Temperature Adjustment
Q = On/Off L.E.D.
R = On/Off Switch
S = Interface Wire for P.C.B.s
T = Relay Motorised Valve
U = Ignitor Relay
V = Gas Valve Relay
W = Fan Relay
X = Circulation Pump Relay
Y = Selector TCS

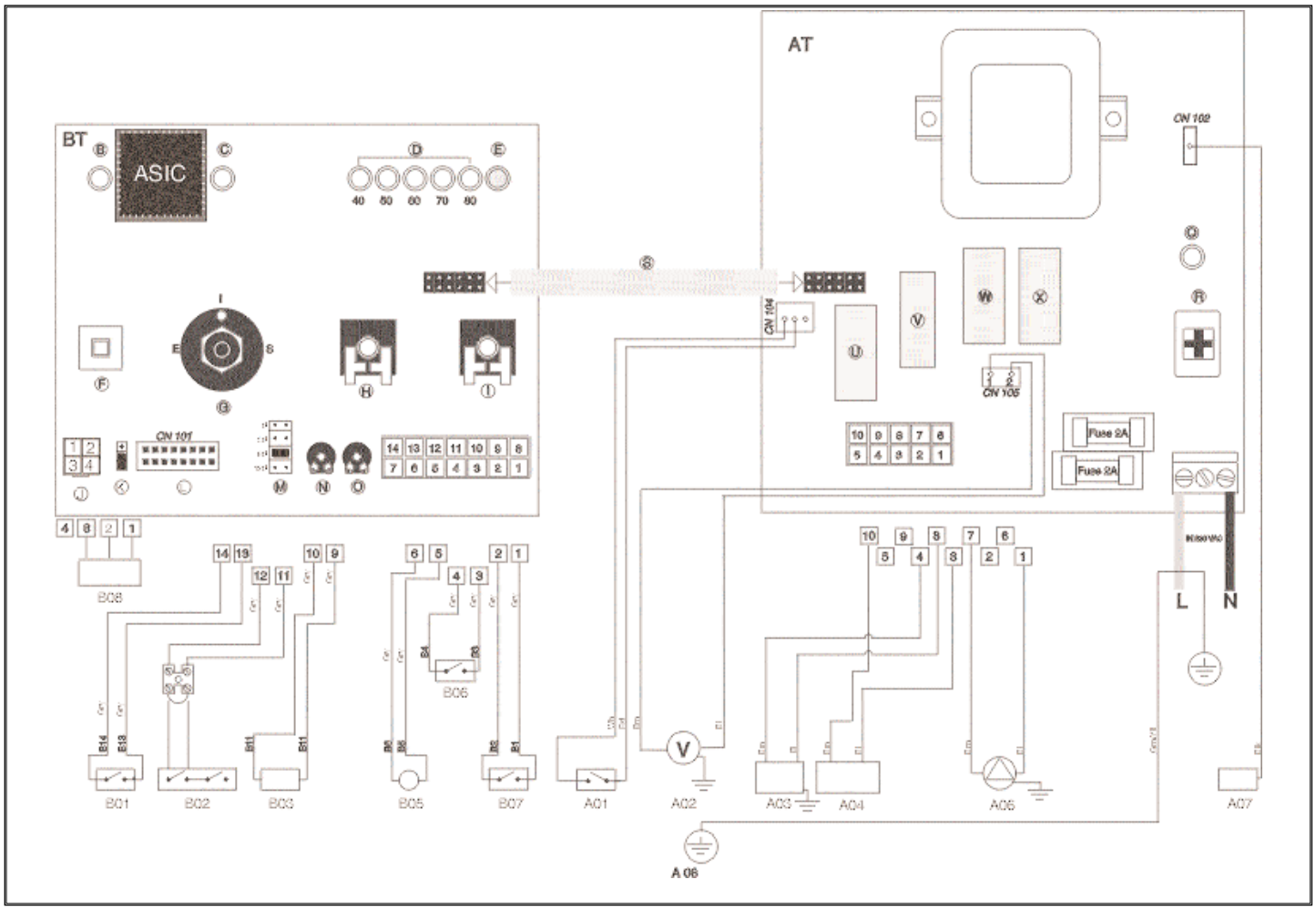
A01 = Air Pressure Switch
A02 = Fan
A03 = Gas Valve
A04 = Ignitor
A05 = Motorised Valve
A06 = Circulation Pump
A07 = Flame Detector
A08 = Earth Terminal
A09 = Flame Detection Circuit
A10 = Flame Indicator L.E.D.
A11 = Transformer
A12 = Filter

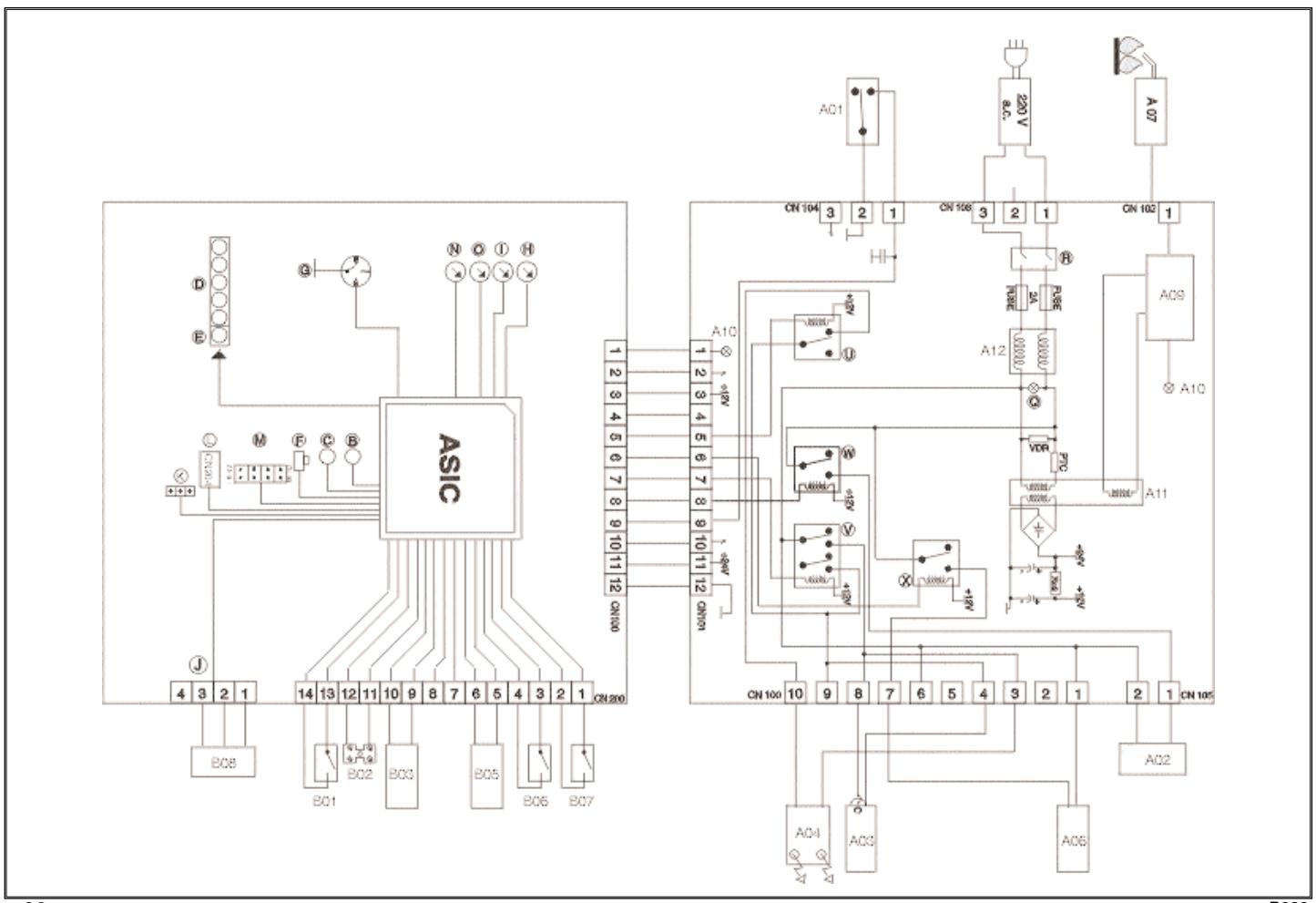
B01 = Over Heat Thermostat
B02 = Room Thermostat
B03 = Gas Valve Modulator
B05 = Heating Sensor
B06 = Pressure Switch for Heating Circuit
B07 = Microswitch for Diverter Valve
B08 = Time Clock

Colours

Gry = Grey
Rd = Red
Bl = Blue
Grn/Yll = Yellow/Green
Wh = White
Brn = Brown
Blk = Black
Wh/Rd = White/Red

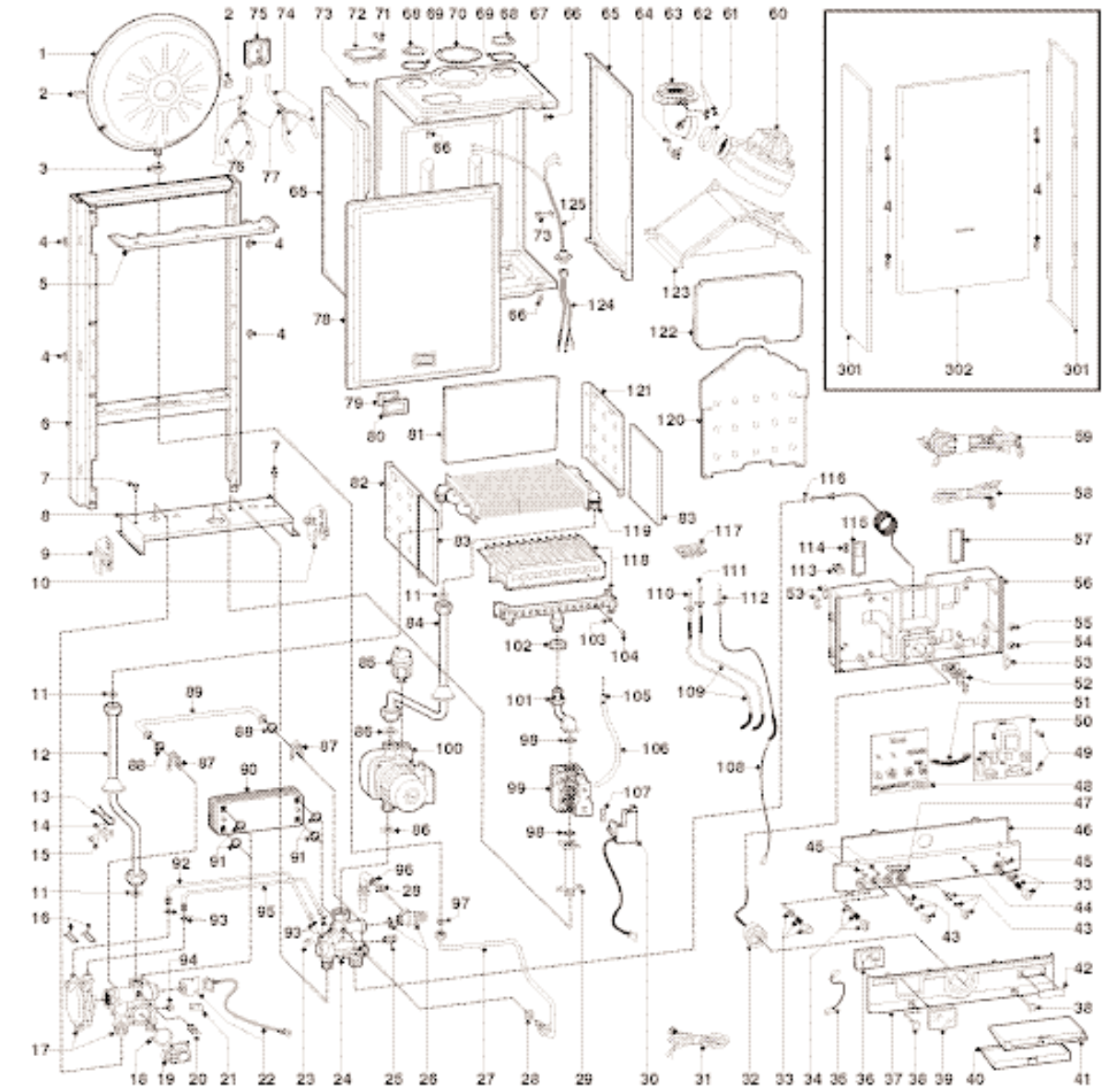
A/23 MFFI - A/27 MFFI

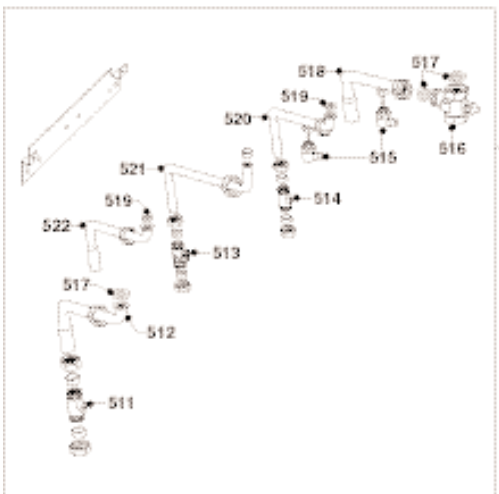




4. SHORT SPARE PARTS LIST

A/23 MFFI



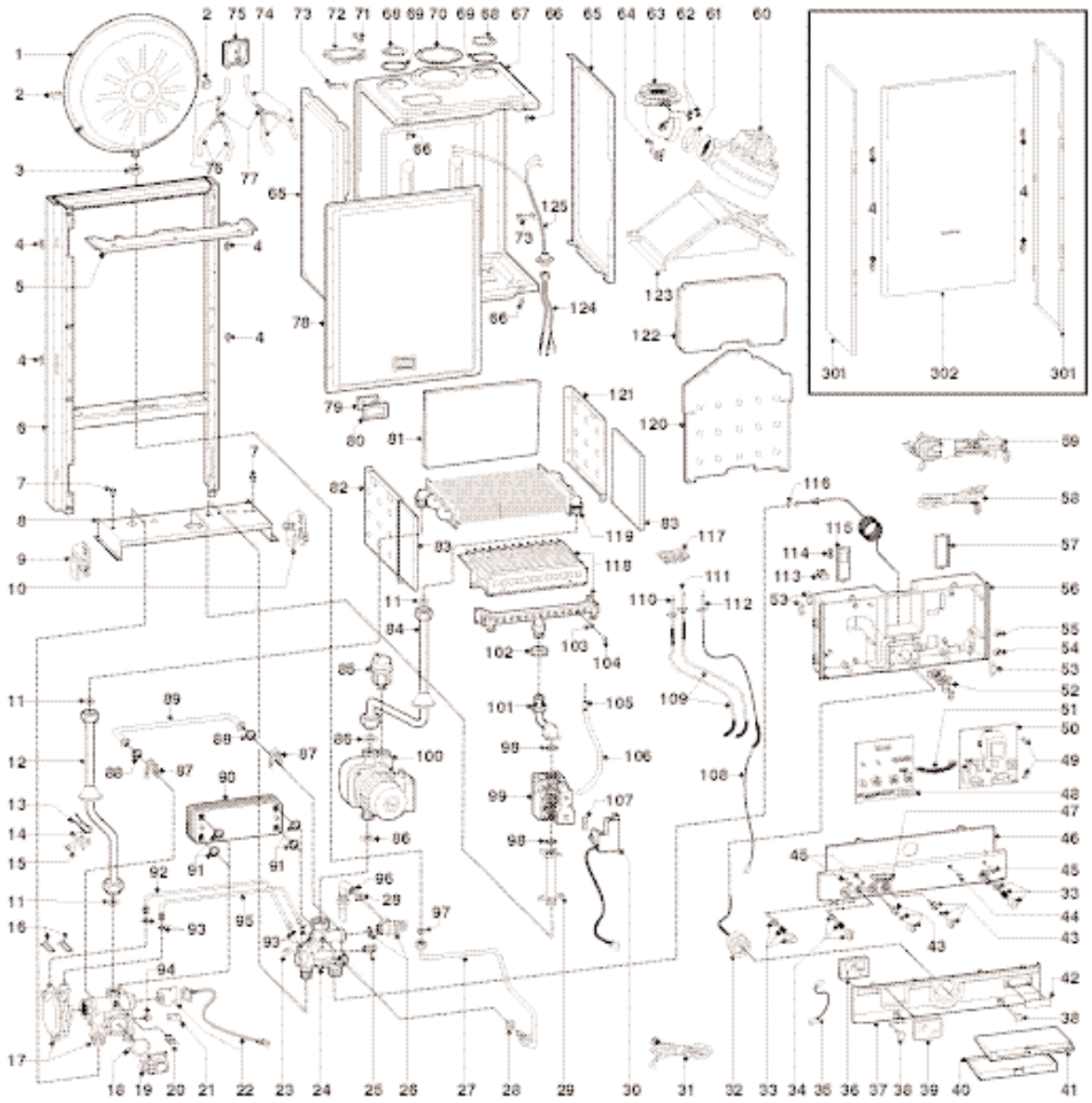


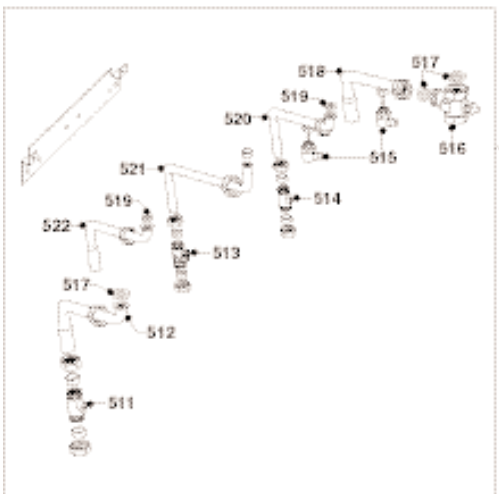
MODELS	CHARACTERISTICS	SERIAL NO: VALIDITY	REF.
A 23 MFFI UK	METHANE	2320015700001	A
A 23 MFFI UK	LPG	2320015700001	B

A/23 MFFI

Key no.	G.C. part no.	Description		ARISTON Part No.
1		Expansion vessel		573294
11	164 225	Gasket 3/4"		573520
15		Overheat thermostat		997206
19		Main flow Switch		998099
20	164 338	Temp probe (C.H.W.)		569236
22		Microswitch for 3-way/main flow group		998921
25		Manual vent cock		573727
26		Safety valve 3 bar 1/2"		573172
28	164 229	Gasket 1/2"		573528
30		Spark generator		999166
32	378 814	Pressure gauge		571649
36		Time clock		997207
48		P.C.B. EX.C-MI/FFI		953770
50		P.C.B. EI.A-MFFI		952975
51		P.C.B. cable		952610
60		Fan		998807
61		Fan inlet gasket		573343
64		Venturi (exhaust manifold/header)		573314
66		Fastening spring		570717
75	E03 818	Air pressure switch		571651
85	379 079	Automatic air release valve		564254
86	164 230	Gasket 1"		569387
88		O-ring		998077
90		Secondary exchanger (plate-type) exchanger 23kW		571646
91		O-ring (secondary exchanger)		573825
93		20-18 O-ring		571807
97	164 282	Gasket 3/8"		573521
98		O-ring (13)		571965
99		Gas valve (SIT Sigma)		999089
100		Pump		997150
107		Gasket		574279
110	379 980	Ignition electrode (L.H.)		569561
111	379 979	Ignition electrode (R.H.)		569560
112	379 981	Detection electrode		573441
116	164 261	Gasket 1/4"		569390
118	E02 026	Main burner		572271
118		Main burner		572277
119		Main exchanger		998138
531		Burner jet 1.25 full kit (Natural gas)		569281
532		Burner jet 0.72 full kit (LPG)		569282

A/27 MFFI





MODELS	CHARACTERISTICS	SERIAL NO: VALIDITY	REF.
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A 23 MFFI UK	LPG	2320015700001	B

A/27 MFFI

Key no.	G.C. part no.	Description		ARISTON Part No.
1		Expansion vessel		573294
11	164 225	Gasket 3/4"		573520
15		Overheat thermostat		997206
19		Main flow Switch		998099
20	164 338	Temp probe (C.H.W.)		569236
22		Microswitch for 3-way/main flow group		998921
25		Manual vent cock		573727
26		Safety valve 3 bar 1/2"		573172
28	164 229	Gasket 1/2"		573528
30		Spark generator		999166
32	378 814	Pressure gauge		571649
36		Time clock		997207
48		P.C.B. EX C-MI/FFI		953770
50		P.C.B. ELA-MFFI		952975
51		P.C.B. cable		952610
60		Fan		572990
61		Fan inlet gasket		573343
64		Venturi (exhaust manifold/header)		573314
66		Fastening spring		570717
75	E03 818	Air pressure switch		571651
85	379 079	Automatic air release valve		564254
86	164 230	Gasket 1"		569387
88		O-ring		998077
90		Secondary exchanger (plate-type) exchanger 27kW		573295
91		O-ring (secondary exchanger)		573825
93		20-18 O-ring		571807
97	164 282	Gasket 3/8"		573521
98		O-ring (13)		571965
99		Gas valve (SIT Sigma)		999089
100		Pump		997151
107		Gasket		574279
110	379 980	Ignition electrode (L.H.)		569561
111	379 979	Ignition electrode (R.H.)		569560
112	379 981	Detection electrode		573441
116	164 261	Gasket 1/4"		569390
118	E02 026	Main burner		572343
118		Main burner		572372
119		Main exchanger		998139
531		Burner jet 1.25 full kit (Natural gas)		569281
532		Burner jet 0.72 full kit (LPG)		569282

Manufacturer: **Merloni TermoSanitari SpA - Italy**

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EuroCombi

ARISTON

benchmark

Users Manual
A/23 MFFI
A/27 MFFI

TABLE OF CONTENTS

IMPORTANT

Please read this manual carefully.

For additional information, please consult the “Installation and Servicing Instructions.”
Please ensure manuals provided are kept with the appliance so that they can be used by the end-user, installer or our authorised engineer.

MTS (GB) Limited support the benchmark initiative. Your installer will give you, and show you how to use, a logbook which will give you important information about your boiler, and heating system. Please have this log-book to hand whenever you contact a service engineer or us.
All CORGI Registered Installers carry a CORGI ID card, and have a registration number. Both should be recorded in your boiler Logbook. You can check your installer is CORGI registered by calling CORGI direct on :- (01256) 372300.

Dear Customer,

Thank you for choosing an ARISTON combination boiler.
We guarantee that your boiler is a reliable and technically sound product.
This User's Manual provides detailed instructions and recommendations for proper use.
Remember to keep this manual in a safe place for future reference.
Your local MTS Servicing Centre is at your complete disposal for all requirements.

MTS (GB) Limited

The guarantee on this appliances is valid for 12 months from the first day of installation.

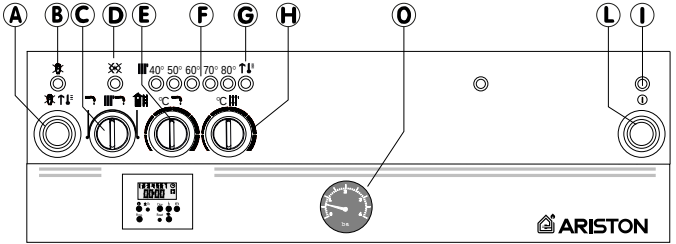
Repairs to the electric, hydraulic or gas circuits may be carried out only by your local authorised MTS Servicing Centre.

Every attempt has been made to avoid errors of any kind in this User's Manual, the Management invites customers to inform of any inaccuracies which they may find.
This will help to improve our service

TECHNICAL INFORMATION

		A/23 MFFI	A/27 MFFI
GENERAL DATA			
Heating input max	*kW(Btu/h)*	25.6 (87364)	29.8 (101707)
Heating input min	*kW(Btu/h)*	11.0 (37539)	12.0 (40956)
Heating output max	*kW(Btu/h)*	23.1 (78491)	27.3 (92492)
Heating output min	*kW(Btu/h)*	9.2 (31396)	10.1 (34471)
Efficiency at Maximum Thermal Capacity (see installation manual)	*%*	90.2	90.6/91.6
Efficiency at Reduced Thermal Capacity (*)	*%*	87.8	88.3
CENTRAL HEATING			
Operating Temperature max	*°C*	82	82
Operating Temperature min	*°C*	42	42
Maximum Heating Pressure	*bar*	3	3
Minimum Heating Pressure	*bar*	1	1
Built-in expansion vessel - Total capacity	*litres*	7	7
DOMESTIC HOT WATER			
Maximum Temperature of Water for Domestic Use	*°C*	56	56
Minimum Temperature of Water for Domestic Use	*°C*	36	36
Working pressure max	*bar*	6	6
Working pressure min	*bar*	0.2	0.2
Flow rate ΔT 25°C	*l/min*	12.8	14.8
Flow rate ΔT 35°C	*l/min*	9.1	10.6
Minimum flow rate	*l/min*	2.6	2.6
ELECTRICAL DATA			
Electrical Supply/ Frequency	*V/Hz*	230/50	230/50
Power Consumption	*W*	150	190
Protection of Electrical System	*IP*	44	44
CATEGORY			
Nominal Pressure/Methane Gas (G20)	*mbar*	20	20
Nominal Pressure/Liquid Gas (G30-G31)	*mbar*	30-37	30-37

MODELS A/23 - A/27 MFFI



LEGEND

A) Ignition Lockout Reset Button/Safety (Overheat)Thermostat Reset
B) Ignition Lockout L.E.D.
C) Selector Knob for Summer/Winter/Flue Analysis Modes
D) Low System Water Level L.E.D.
E) Temperature Adjustment Knob for Domestic Hot Water
F) Heating System Thermometer
G) Safety (Overheat)Thermostat Intervention L.E.D.
H) Adjustment Knob for Heating Temperature
I) On/Off L.E.D.
L) On/Off Switch
O) Heating System Pressure Gauge

OPERATING INSTRUCTIONS

CAUTION

Installation, start-up, adjustments and maintenance must be performed by a competent person only in accordance with the Gas Safety (Installation & Use) Regulations (1984) and the instructions provided. Improper installation may cause damage or injury to individuals, animals and personal property, for which the manufacturer will not be held liable.

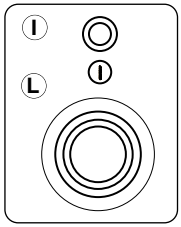
To ensure efficient and safe operation it is recommended that the boiler is serviced annually by a competent person.

If it is known or suspected that a fault exits on the appliance, it must not be used until fault has been corrected by a competent person

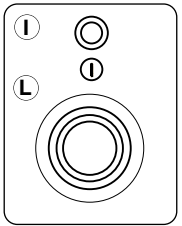
HELPFUL SUGGESTIONS

To get the most out of your boiler, we have provided you with some useful advice on the proper use and maintenance:

- Periodically check the system pressure using the pressure gauge **"O"**, make sure that the pressure is between 1.0 and 1.5 bar (the blue part on the gauge) when the system is off and cool.
  The warning L.E.D. **"D"** will indicate if the pressure is below the minimum recommended value. Consult your installer for checking and refilling the system.
- The outer panels of the unit's case must only be cleaned with a damp cloth. Do not use abrasive cleaners. The Control panel can be wiped with a damp or dry cloth. Spray polishes must not be used on the control panel surface or knobs. Care must be taken in preventing any liquid entering the appliance.
- If the water is exceptionally hard, install a water softener so that the efficiency of the unit remains the same over time, as this will consume less gas.
- To improve comfort and take full advantage of the heat produced by the boiler, it is recommended that an external thermostat be installed.
- If the boiler is not going to be used for an extended period of time, turn off the supply of electricity to the unit by pressing the On/Off switch **"L"**.
  The green L.E.D. **"I"** will turn off. Then turn off the supply of gas to the unit itself.
  It is good practice to clean and service the appliance and central heating system every year.
  Call an Authorised Service Centre.

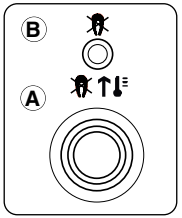


START-UP PROCEDURE LIGHTING

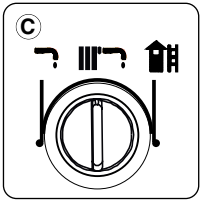


Before starting the unit, check the following:
- The water pressure on the pressure gauge **"O"**;
- That the gas cock and the inlet for domestic water are open.

These models are equipped with electronic ignition which utilises contact ionisation.
To make the boiler operational, simply press the On/Off switch **"L"**.
The green L.E.D. **"I"** will then turn on.
At this point the boiler is ready for use, a centralised electronic control unit will automatically light the main burner when needed. If the burner does not light within the pre-set safety time limit, the red **"B"** L.E.D. will light up. To reset the ignition system, the reset button **"A"** must be pressed. Should the system fail to light a second time, check to make sure that the gas cock is open. If the problem persists, contact one of our Authorised Service Centres for assistance.



WINTER AND SUMMER OPERATING MODES

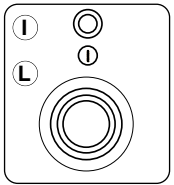


The boiler is fitted with a selector knob **"C"** which allows you to switch between winter < > and summer < > operating modes and vice versa. When the knob is set to < >, the boiler can serve the dual purpose of providing heat and/or hot water for domestic use.
The supply of hot water for domestic use always takes precedence over heating. When the knob is set to < >, the boiler cuts out the heating system and only provides hot water for domestic use (when needed).

TURNING ON THE BOILER

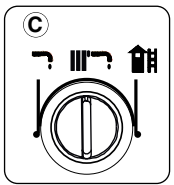
Installation without a room thermostat :

- Turn on the power supply to the boiler by pressing the On/Off switch **"L"**; the green L.E.D. **"I"** will the turn on;

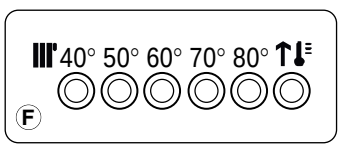


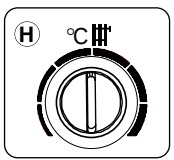
- Turn the **"C"** selector knob to < >;

- Regulate the temperature of the water in the boiler by turning the **"H"** knob. The temperature can vary between 42°C and about 82°C;

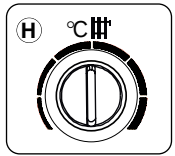


- Check the boiler temperature on the thermometer with the yellow L.E.D.s **"F"**. With this type of installation, the ambient temperature does not influence the operation of the boiler and the circulation pump always remains in operation.





Installation with a room thermostat:

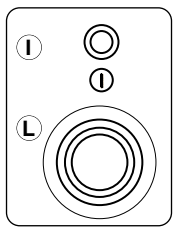


- Turn the **"C"** selector knob to < >;
- Turn on the power supply to the boiler by pressing the On/Off switch **"L"**; the green L.E.D. will then turn on;
- Turn the thermostat knob **"H"** to the highest temperature setting.
- With this type of installation, the boiler is controlled by a room thermostat. Therefore, it runs until the ambient temperature has reached the temperature setting on the thermostat. At that point, the main burner will turn off and the circulation pump will stop.

TURNING OFF THE BOILER

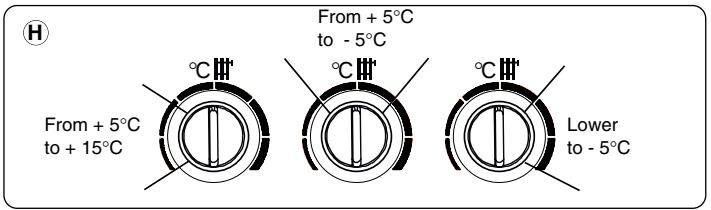
Installation without a room thermostat:

To turn off the heating, turn the **"C"** selector knob to < >. The boiler will still provide hot water for domestic use.

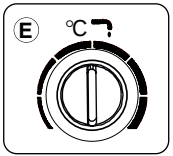


ADJUSTING THE HEATING TEMPERATURE

To economise on consumption while achieving the highest level of comfort, the temperature adjustment knob is designed with three different heating zones based on the temperature outside the home.
Rotate the knob **"H"** as shown below.

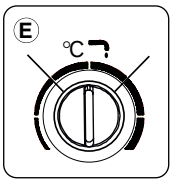


PRODUCTION OF HOT WATER FOR DOMESTIC USE



- Turn on the power to the boiler by pressing the On/Off switch **"L"**;
- With these settings, the boiler is already ready for use, regardless of the position of the **"C"** selector knob.
- Turn the "E" knob to select the temperature for the hot water (between 36°C and about 56°C depending on the flow rate of the water).

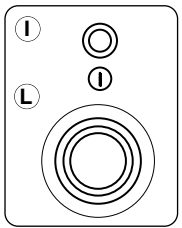
ADJUSTING THE TEMPERATURE OF WATER FOR DOMESTIC USE



It is recommended that the temperature for the hot water should not be set to high temperatures and then mixed with cold water. Setting the thermostat to a medium temperature is preferable *(see figure)*.

SHUTDOWN PROCEDURE

To turn off the main burner, simply press the On/Off switch **"L"**; the green L.E.D. **"I"** will also turn off.
As a precautionary measure, it is recommended that the gas cock located on the bottom of the boiler be turned off as well.

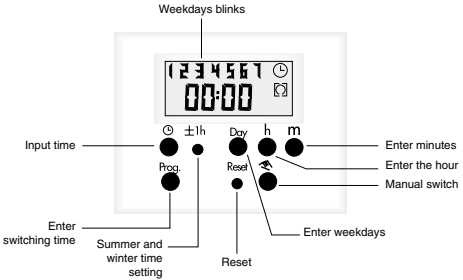


TIME CLOCK

The steps marked with the symbol ▶ are necessary to carry out a switching program.

PREPARING FOR OPERATION
Activate the **"Reset"** switch to reset the time switch to it's default setting (activate using a pencil or similar pointed instrument). Do this:
- every time you wish to "Reset" the time clock;
- to erase all switching times and the current time of day.

After approximately two seconds the following display appears:



ENTER CURRENT TIME AND WEEKDAY

Keep the " ◷ " key pressed down. During the summer time period press the **+/-1h** key once.
Enter the hour using the **"h"** key.
Enter the minutes using the **"m"** key.
Enter the day using the **"Day"** key.
1 = Mon ..... 7 = Sun
Release the " ◷ " key.

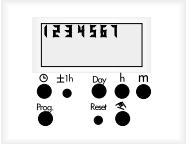
The colon now blinks once a second.

AM/PM TIME DISPLAY

If you press the **"+/-h"** and **"h"** keys as the same time, the time display switches into the AM/PM mode.

Notes: If you keep the **"h"** and **"m"** keys pressed down for more than 2 seconds, the display will enter fast forward scroll mode.

ENTERING THE SWITCHING TIMES



If your entry is incomplete, the segments not yet selected will blink in the display.

You have 20 memory locations available. Each switching time takes up one memory location.

Keep pressing the **"Prog"** key until a free memory location is shown in the display **"-- : --"**.

Program ON or OFF with the " " key:

" ◉ " = ON - " ○ " = OFF.

Enter the hour using **"h"**; enter the minutes using **"m"**.

If a switching command is to be carried out every day (**1 2 3 4 5 6 7**) then store using the " " key, otherwise select the days it is to be carried out on by using the **"Day"** key.

When the day selection is left blank, the programmed switching instruction operates at the same time every day.

1 2 3 4 5 6 7	Monday ..... Sunday
1 2 3 4 5 6	Monday ..... Saturday
1 2 3 4 5	Monday ..... Friday
6 7	Saturday ..... Sunday
1	Monday
.....	(selection of single days)
7	Sunday

Store using the " " key or push **"Prog"** key if you are going to continue programming. The time switch enters the automatic operating mode and displays the current time of day. Begin any further entry of a switching time with the **"Prog"** key.

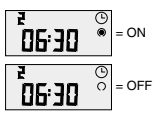
If necessary, once you have finished programming, and have returned to the current time display, by pressing the " "button, the timer will not automatically switch to the current programmed status until the next timed setting. You can put the timer into the correct mode with the " key.

ADDITIONAL FUNCTIONS

Switching from summer time to winter and vice versa.
Press the **"+/-1h"** key once.

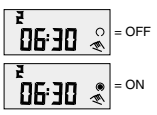
MANUAL OVERRIDE KEY
With the " " you can change the current switching settings at any time. The switching program already entered is not altered.

Automatic Operation



The switching times correspond to the program entered.

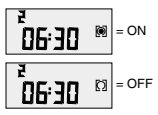
Manual Operation



If the current switching mode is changed manually, the next switching time will be carried out automatically again according to the entered switching program.

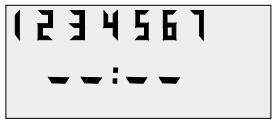
Continuous Operation

[ ]



You can only return to automatic mode from the continuously ON and continously OFF switching modes by pressing the " " key.

READING THE PROGRAMMED SWITCHING TIMES
Pressing the **"Prog"** key displays the programmed switching times until the first free memory location appears in the display **" -- : --"**.



If you now press the **"Prog"** key once again, the number of free memory locations will be displayed, e.g. **"Fr 20"**. If all memory locations are occupied, the display **"Fr 00"** appears.

CHANGING THE PROGRAMMED SWITCHING TIMES
Press the **"Prog"** key repeatedly until the switching time you want to change is displayed. You can now enter the new data. See "*Entering the switching times*".

Notes on storing switching times:
If you end your entry of the switching times by pressing the **"Prog"** key, the switching time you have entered will be stored and the next memory location displayed. Entry of further switching times is also carried out as described in "*Entering the switching times*".
In addition, a complete switching command is stored automatically after around 90 seconds provided no other key is pressed.
The time switch then enters the automatic operating mode and displays the current time again.

DELETING INDIVIDUAL SWITCHING TIMES
Press the **"Prog"** key repeatedly until the switching time you wish to delete is shown in the display.
Then set to **"--"** using the **"h"** or **"m"** key and keep the " ⏲ " key pressed down for around 3 seconds.
The switching time is now erased and the current time is displayed.

TECHNICAL DATA

Ambient temperature:	- 10°C to + 55°C
Running reserve:	5 h (not for 1.5 V DC)
Memory locations:	20
Shortest switching time:	1 minute
Programmable:	Every minute

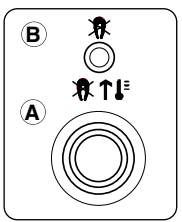
USEFUL INFORMATION AND TROUBLESHOOTING

BOILER SHUTDOWN

The boiler unit is equipped with safety devices which intervene in certain situations to shutdown the boiler.
Some of these situations are signalled by the unit and can be corrected by the user.

SHUTDOWN DUE TO THE FAILURE OF THE BURNER TO LIGHT AUTOMATICALLY

This anomaly is indicated by the red **"B"** L.E.D.
To reset the unit, press and then release the **"A"** button.
At this point, the electronic ignition system will attempt to light the burner again.
Repeat this procedure as needed. If lighting failure occurs repeatedly, it is recommended that you contact one of our Authorised Service Centres.



B022

SHUTDOWN DUE TO OVERHEATING

This anomaly is signalled by the red **"G"** L.E.D.
The boiler shuts off because the safety thermostat detected that the boiler temperature has reached the temperature limit.
To reset the unit, wait until the boiler has cooled and then press the **"A"** button.
If the safety thermostat shuts off the unit on a frequent basis, contact one of our Authorised Service Centres for assistance.

NOTES

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Cod. 23 99 84 1257 311 / B022 - **bieffe** Recanati