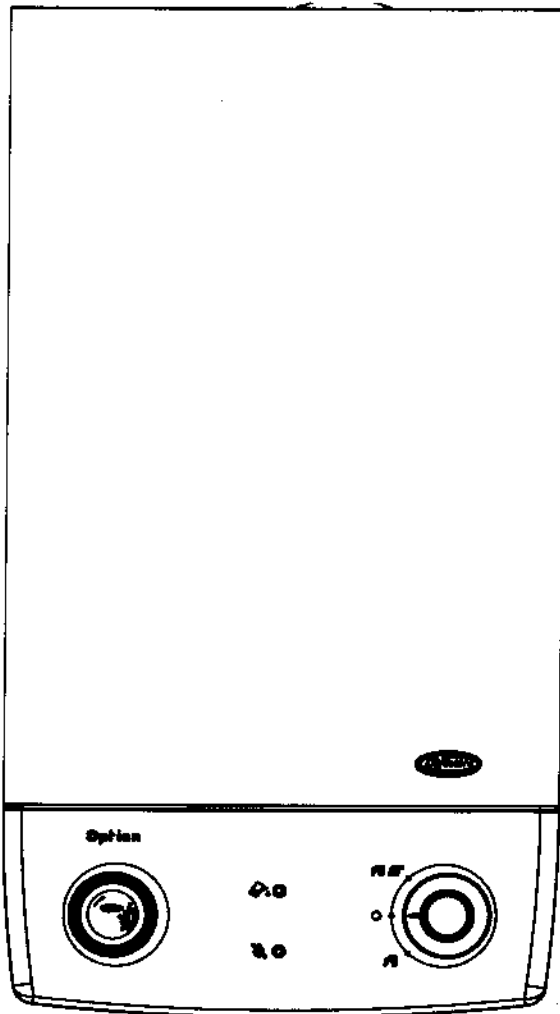




Option



Installation & Servicing Instructions

CE

THESE INSTRUCTIONS
TO BE RETAINED
BY USER

benchmark

The code of practice for the installation,
commissioning & servicing of central heating systems

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INTRODUCTION

The Vokera Option is a combined central heating and domestic hot water appliance. By design, it incorporates full sequence electronic ignition, circulating pump, expansion vessel, safety valve, pressure gauge, and mechanical timeclock.

The appliance is produced as a room sealed boiler, suitable for wall mounted applications only. It is provided with a fan powered flue outlet with an annular co-axial combustion air intake located on the top rear of the appliance.

The appliance has been designed for use with a sealed heating system, consequently it is not intended for use with an open vented system.

The appliance can be used in conjunction with an 'Y' or 'S' Plan system when stored hot water via an in-direct cylinder is required.

An automatic range-rating facility is incorporated in the boiler, which automatically adjusts boiler output to match the current demand.

Domestic hot water is provided directly, via the bi-thermic heat exchanger

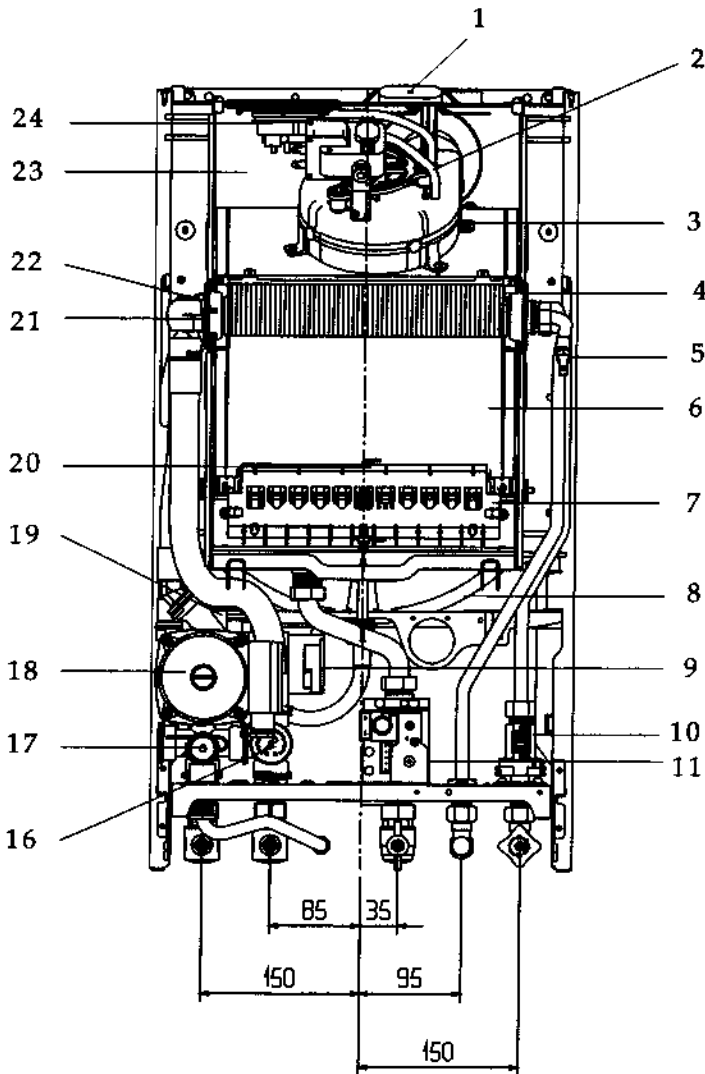


Fig.1 General Layout

- 1 Flue Analysis Test Point
- 2 Pressure Tube Negative
- 3 Fan Assembly
- 4 Heat Exchanger
- 5 Secondary thermistor
- 6 Combustion chamber
- 7 Burner
- 8 Expansion vessel
- 9 Water pressure switch
- 10 Domestic Hot Water Flow Switch
- 11 Gas Valve
- 12 Mode selector switch
- 13 Fault indicator led
- 14 Timeclock
- 15 Low pressure indicator led
- 16 Pressure gauge
- 17 Safety valve
- 18 Pump
- 19 Auto air vent
- 20 Electrode
- 21 High limit thermistor
- 22 Primary thermistor
- 23 Air chamber (with cover removed)
- 24 Air pressure switch
- 25 Auto by pass (fig. 2)
- 26 Water flow restrictor (fig. 2)

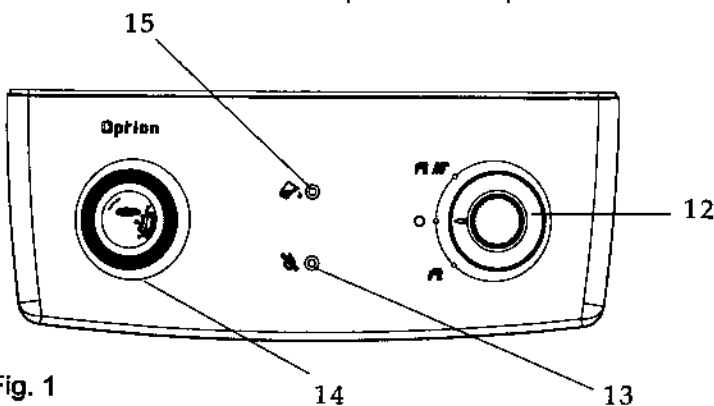


Fig. 1

1.1 PRINCIPLE COMPONENTS

- A fully integrated, electronic control board featuring mode selection switch, full sequence-electronic ignition, temperature control system, and appliance status indicator.
- A BI-thermal gas to water heat exchanger.
- A multi-functional gas valve.
- Two-stage, primary water pressure switch. Integral pump, expansion vessel, pressure relief valve, pressure gauge, domestic water flow switch, fan, differential air pressure switch, and time clock.

MODES OF OPERATION

1.2 CENTRAL HEATING MODE

When there is a request for central heating via the time-clock and/or any external controls, the pump and fan are started, the fan proves the differential air pressure switch which in-turn, allows an ignition sequence to begin. Ignition is sensed by the electronic circuitry to ensure flame stability at the burner. Once successful ignition has been achieved the appliance operates at 75% of maximum for a fifteen-minute period, and thereafter the appliance operates on maximum output until the desired temperature setting is reached.

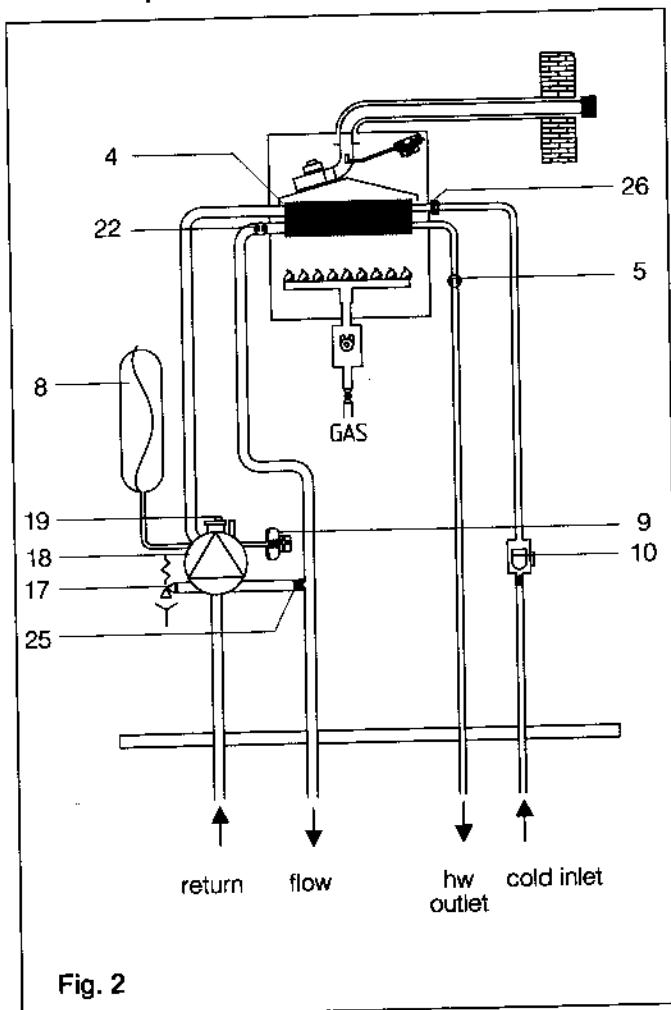


Fig. 2

Once the desired temperature is reached, the burner will modulate to maintain that temperature, however should the temperature within the appliance continue to rise, the burner will shut down and the boiler will perform a three-minute anti-cycle (timer delay).

1.3 HOT WATER MODE

When there is a demand for domestic hot water the domestic hot water flow switch is proved by the flow of water through the appliance, this allows the fan to run, the fan proves the differential air pressure switch which in-turn, allows an ignition sequence to begin.

Ignition is sensed by the electronic circuitry to ensure flame stability at the burner. Once successful ignition has been achieved the appliance will modulate burner gas pressure to maintain the desired water temperature, should the temperature of the domestic hot water exceed the temperature setting by 5°C the burner will shut down until the water temperature drops below the required setting.

1.4 SAFETY DEVICES

In both central heating and domestic hot water modes, safe operation is ensured by.

- A water pressure switch that monitors the system pressure and will deactivate the pump and prevent burner ignition should the pressure or primary flow rate fall below the rated tolerance.
- Differential air pressure switch that checks the correct operation of the fan and flue thereby preventing or interrupting burner operation.
- A high limit thermostat that overrides the control circuit to prevent or interrupt burner ignition.
- A safety valve which releases excess pressure from the primary circuit.

1.5 FROST PROTECTION

The appliance has built-in frost protection that allows the pump to operate if the appliance temperature drops to 7°C, should the temperature continue to drop the burner will light until the primary circuit temperature exceeds 30°C

SECTION 2 TECHNICAL DATA

2.1 Central heating		
Heat input	28.86 kW	98,464 BTU
Heat output (max)	23.65	80,006 BTU
Heat output (min)	9,3 kW	31,700 BTU
Maximum working pressure	3.0 bar	
Minimum flow rate	350 l/h	
Max temperature	90 °C	
Minimum working pressure	0,5 bar	
2.2 Domestic hot water		
Heat input	28.86 kW	98,464 BTU
Heat output (max)	23.65	80,006 BTU
Heat output (min)	8.1 kW	27,600 BTU
Flow rate (35°C) rise	9.7 l/min	
Maximum inlet pressure	6.0 bar	
Minimum inlet pressure to operate	0.15 bar	
Minimum flow rate to operate	2 l/min.	
2.3 Gas pressure		
	Maximum	
Inlet pressure (G20)	20.0 mbar	
Max burner pressure	9.8 mbar	
Gross rate	2.75 m³/h	
Injectors	1.35 mm x 12	
2.4 Expansion vessel		
Capacity	8 litres	
Max system volume	76 litres	
Pre-charge pressure	0.8 bar	
2.5 Dimensions		
Height	750mm	
Width	400mm	
Depth	328mm	
Dry weight	33 kg	
2.6 Clearances		
	Rear flue outlet	Top flue outlet
Left hand side	50 mm	50 mm
Right hand side	12 mm	12 mm
Top	150 mm	180 mm
Bottom	150 mm	150 mm
Front	600 mm	600 mm
2.7 Connections		
Flow & return	22 mm compression	
Hot & cold water	15 mm compression	
Gas	15 mm compression	
Safety valve	15 mm compression	
2.8 Electrical		
Voltage	230V/~ 50hz	
Power consumption	125 W	
Internal fuse	2 A	
External fuse	3 A	
Appliance type	C12	
Maximum flue length	1 m	
Category	II2H3F	
NOx class	3	

Ref. Condition 15 °C , 1013,25 mbar, dry gas
NOTE: L.P.G. data refer to section 10

2.10 PUMP DUTY

Fig. 3 shows the flow rate available – after allowing for pressure loss through the appliance – against system pressure loss. When using this graph apply only the pressure loss of the system. The graph is based on a 20°C temperature differential.

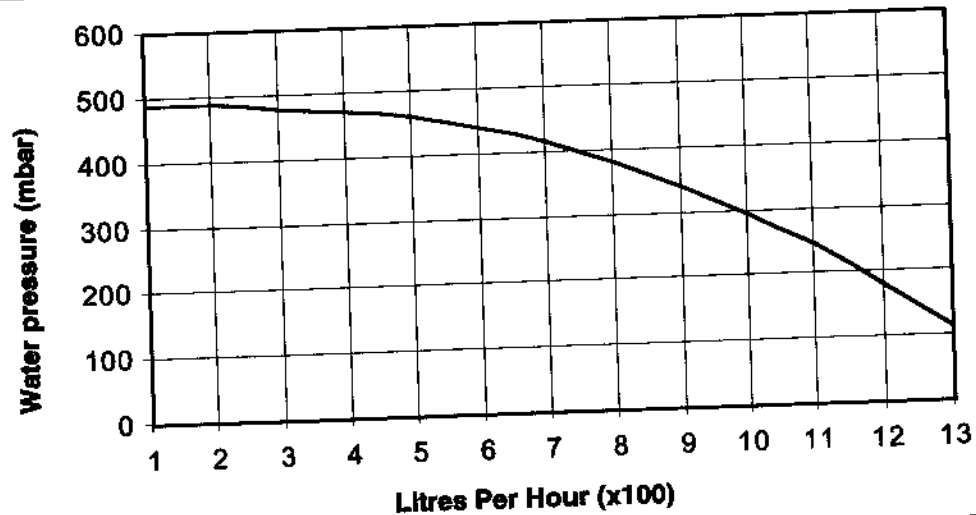
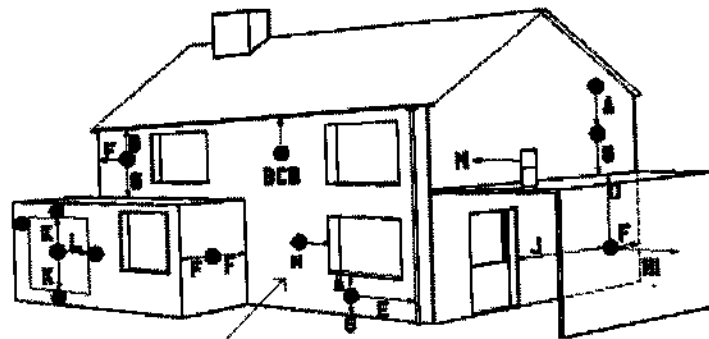


Fig. 3



New Minimum Distance

Terminal position for fan assisted boiler (minimum distance)	mm
A - Directly below an open window or other opening (e.g. air brick)	300
B - Below gutters, soil pipes or drain pipes	25
C - Below eaves	25
D - Below balconies or car port roof	25
E - From vertical drain pipes and soil pipes	75
F - From internal or external corners	25
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 on the same wall	1500
L - Horizontally from a terminal on the same wall	300
M - Horizontally from a vertical terminal to a wall	300
N - Horizontally from an opening, airbrick, openable window, etc.	300

Fig. 4

NOTE: The flue must be terminated in a place not likely to cause a nuisance.

SECTION 3 GENERAL REQUIREMENTS

This appliance must be installed by a competent person in accordance with the Gas Safety (Installation And Use) Regulations.

3.1 RELATED DOCUMENTS

The installation of this boiler must be in accordance with the relevant requirements of the Gas Safety (Installation and Use) Regulations, the Local Building Regulations, the current I.E.E. wiring regulations, the bylaws of the local water undertaking, the Building Standards (Scotland) Regulation and building standards (Ireland) regulations.

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

BS 5440	PART 1	FLUES
BS 5440	PART 2	FLUES AND VENTILATION
BS 5449	PART 1	FORCED CIRCULATION HOT WATER SYSTEMS
BS5546		INSTALLATION OF GAS HOT WATER SUPPLIES FOR DOMESTIC PURPOSES (2 ND FAMILY GASES)
BS 6798		BOILERS OF RATED INPUT NOT EXCEEDING 60kW
BS 6891		LOW PRESSURE INSTALLATION PIPES
BS 7074	PART 1	APPLICATION, SELECTION, AND INSTALLATION OF EXPANSION VESSELS AND ANCILLARY EQUIPMENT FOR SEALED WATER SYSTEMS

3.2 LOCATION OF APPLIANCE

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

When an appliance is installed in a room or internal space containing a bath or shower, the appliance or any control pertaining to it must not be within reach of a person using the bath or shower.

The location chosen for the appliance must permit the provision of a safe and satisfactory flue and termination. The location must also permit an adequate air supply for combustion purposes and an adequate space for servicing and air circulation around the appliance.

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

A compartment used to enclose the appliance must be designed and constructed specifically for this purpose.

An existing compartment/cupboard may be utilised provided that it is modified to suit.

Details of essential features of compartment/cupboard design including airing cupboard installations, are given in BS 6798. This appliance is not suitable for external installation.

3.3 GAS SUPPLY

The gas meter – as supplied by the gas supplier – must be checked to ensure that it is of adequate size to deal with the maximum rated input of all the appliances that it serves. Installation pipes must be fitted in accordance with BS 6891.

Pipe-work from the meter to the appliance

must be of adequate size. Pipes of a smaller size than the appliance gas inlet connection must not be used.

The installation must be tested for soundness in accordance with BS 6891.

If the gas supply serves more than one appliance, it must be ensured that an adequate supply is maintained to each appliance when they are in use at the same time.

3.4 FLUE SYSTEM

The terminal should be located where the dispersal of combustion products is not impeded and with due regard for the damage and discoloration that may occur to building products located nearby. The terminal must not be located in a place where it is likely to cause a nuisance (see fig. 4).

In cold and/or humid weather, water vapour may condense on leaving the flue terminal, the effect of such plumbing must be considered.

Above a pavement or platform to which people have access (including balconies or flat roofs) the terminal must be protected by a guard of durable material. (A suitable guard is available from Vokera Ltd. Part no. 018). The guard must be fitted centrally over the terminal. Refer to BS5440 part 1, where the terminal is less than 1.0 metres below plastic guttering or 1 metre below painted eaves.

3.5 AIR SUPPLY

The following notes are intended for general guidance only.

This appliance is a room sealed, fan-flued boiler, consequently it does not require a permanent air vent for combustion air supply.

When installed in a cupboard or compartment, ventilation for cooling purposes is also not required.

3.6 WATER CIRCULATION

Detailed recommendations are given in BS 5449 part 1 and BS 6798. The following notes are for general guidance only.

3.6.1 PIPEWORK

It is recommended that copper tubing to BS2871 part 1 used in conjunction with soldered capillary joints is used.

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

Except where providing useful heat, pipes should be insulated to avoid heat loss and in particular to avoid the possibility of freezing. Particular attention should be paid to pipes passing through ventilated areas such as under floors, loft-space, and void areas.

3.6.2 AUTOMATIC BY-PASS

The appliance has a built-in automatic by-pass, consequently there is no requirement for an external by-pass, however the design of the system should be such that it prevents boiler 'cycling'.

3.6.3 DRAIN COCKS

These must be located in accessible positions to facilitate draining of the appliance and all water pipes connected to the appliance. The drain cocks must be manufactured in accordance with BS 2879.

3.6.4 AIR RELEASE POINTS

These must be positioned at the highest points in the system where air is likely to be trapped. They should be used to expel trapped air and allow complete filling of the system.

3.6.5 EXPANSION VESSEL

The appliance has an integral expansion vessel to accommodate the increased volume of water when the system is heated. It can accept up to 8 litres of expansion from within the system, generally for a modern system this is sufficient, however if the system has an unusually high water content, it may be necessary to add additional expansion capacity (see 6.21).

3.6.6 FILLING POINT

A method for initial filling of the system and replacing water lost during servicing etc. must be provided. This method of filling must comply with local water authority regulations. Figure 5 shows a widely accepted method.

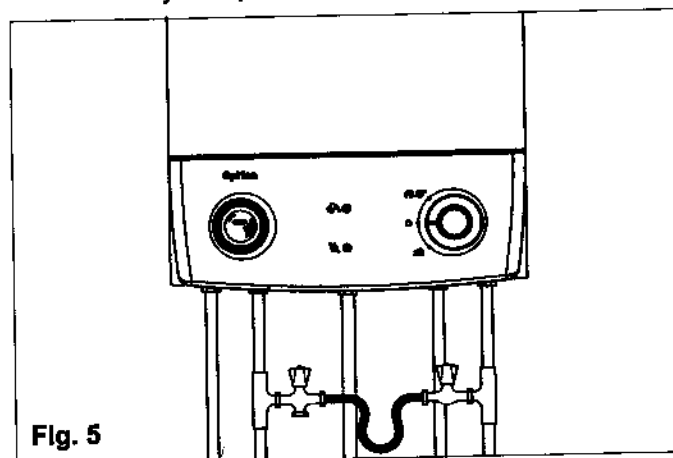


Fig. 5

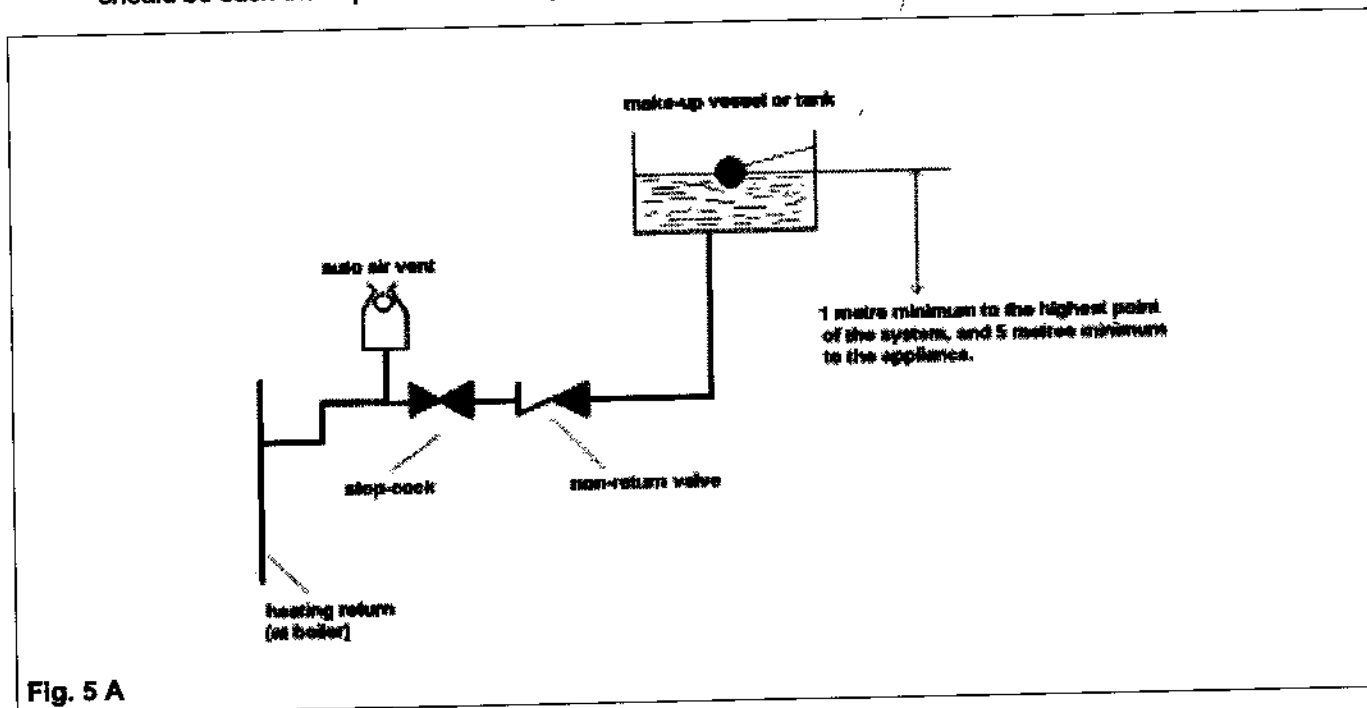


Fig. 5 A

3.6.7 LOW PRESSURE SEALED SYSTEM

An alternative method of filling the system would be from an independent make up vessel or tank mounted in a position at least 1 metre above the highest point in the system and at least 5 metres above the boiler. (see fig.5a) The cold feed from the make-up vessel or tank must be fitted with an approved non-return valve and stopcock for isolation purposes. The feed pipe should be connected to the central heating return pipe as close to the boiler as possible.

3.6.8 FREQUENT FILLING

Frequent filling or venting of the system may be indicative of a leak. Care should be taken during the installation of the appliance to ensure all aspects of the system are capable of withstanding pressures up to at least 3 bar.

3.7 ELECTRICAL SUPPLY

The appliance is supplied for operation on 230V @ 50Hz electrical supply, it must be protected with a 3-amp fuse. The method of connection to the mains electricity supply must allow for complete isolation from the supply. The preferred method is by using a fused, double pole switch with a contact separation of at least 3mm. The switch must only supply the appliance and its corresponding controls, i.e. time clock, room thermostat, etc. Alternatively an un-switched shuttered socket outlet with a fused 3-pin plug both complying with BS 1363 is acceptable.

3.8 SHOWERS

If the appliance is intended for use with a shower, the shower must be thermostatically controlled and be suitable for use with a combination boiler.

3.9 MOUNTING ON A COMBUSTIBLE SURFACE

If the appliance is to be fitted on a wall of combustible material, a sheet of fireproof material must protect the wall.

3.10 TIMBER FRAMED BUILDING

If the appliance is to be fitted in a timber framed building, it should be fitted in accordance with the Institute of Gas Engineers publication (IGE/UP/7) "Guide for Gas Installations in Timber Frame Buildings".

3.11 SCALE REDUCER

Although the appliance has been designed to reduce the possibility of scaling, it is recommended that in hard water areas (above 18 Clarke degrees), a scale reducer be fitted on the main supply to the appliance.

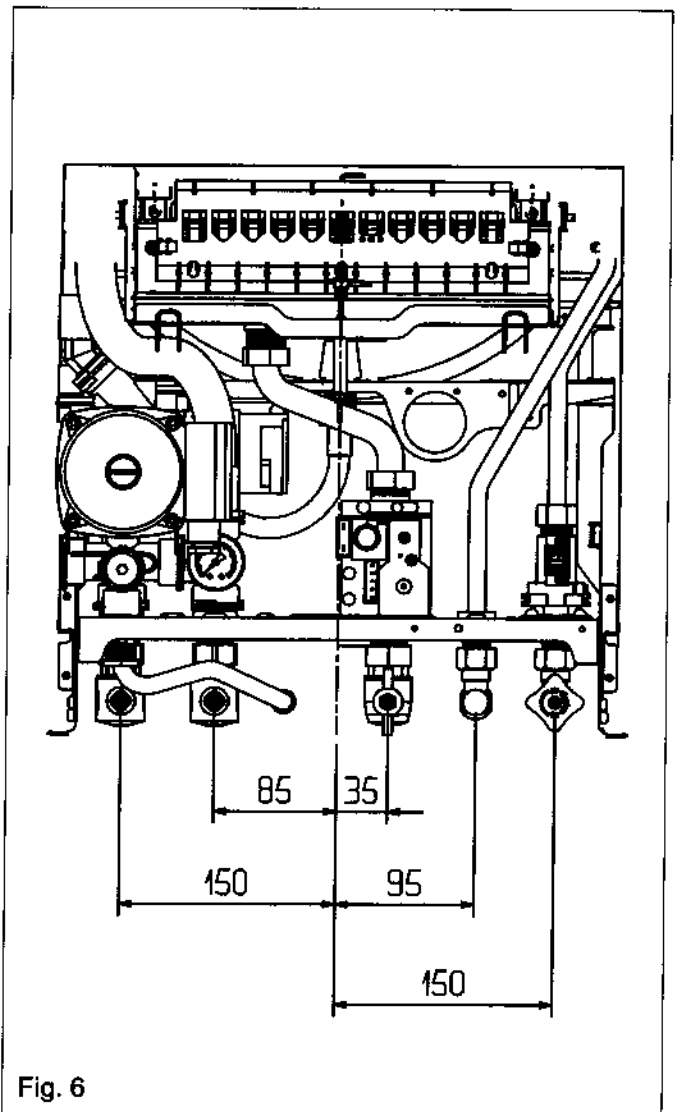


Fig. 6

SECTION 4 INSTALLATION

4.1 DELIVERY

The appliance is delivered in a heavy-duty cardboard carton. Lay the carton on the floor with the writing the correct way up.

4.2 CONTENTS

Contained within the carton is.

- The boiler.
- The wall mounting bracket.
- An accessories pack containing service valves, and sealing washers.
- The instructions pack containing installation & servicing instructions, appliance logbook, user instructions, guarantee registration card, 3amp fuse and flue restrictor ring.

4.3 UNPACKING

At the top of the carton pull both sides open – do not use a knife – unfold the rest of the carton from around the appliance, carefully remove all protective packaging from the appliance, and lay the accessories etc. to one side.

4.4 PREPARATION FOR MOUNTING THE APPLIANCE

The appliance should be mounted on a smooth, non-combustible, vertical surface, which must be capable of supporting the full weight of the appliance. Care should be exercised when determining the position of the appliance with respect to hidden obstructions such as pipes, cables, etc.

When the position of the appliance has been decided – using the template supplied – carefully mark the position of the wall bracket (see fig. 7) and flue-hole (if applicable).

4.4.1 IMPORTANT

There are two holes on the template. The lower hole should be used with the telescopic flue kit (part no. 0225705 & 0225710). The upper hole is for use with all other horizontal flue kits.

4.4.2 MAXIMUM FLUE LENGTHS

Flue system	Option 24
Concentric Horizontal	4.5m
Concentric Vertical	5.25m
Twin flue	14m/14m + terminal

4.5 FITTING THE FLUE

The top flue outlet permits both horizontal and vertical flue applications to be considered, alternatively, the Vokera twin flue system can be utilised if longer flue runs are required.

4.5.1 CONCENTRIC HORIZONTAL FLUE

(For concentric vertical flue, see 4.5.2)
(For twin flue applications, see 4.5.3)

The appliance flue outlet elbow can be rotated through 360° on its vertical axis. In addition the flue may be extended from the outlet elbow in the horizontal plane (see 4.4.2), however if the flue is to be extended or additional bends are to be

fitted, the standard horizontal flue kit (part no. 2359029) must be used. A reduction must also be made to the maximum length (see table) when additional bends are used.

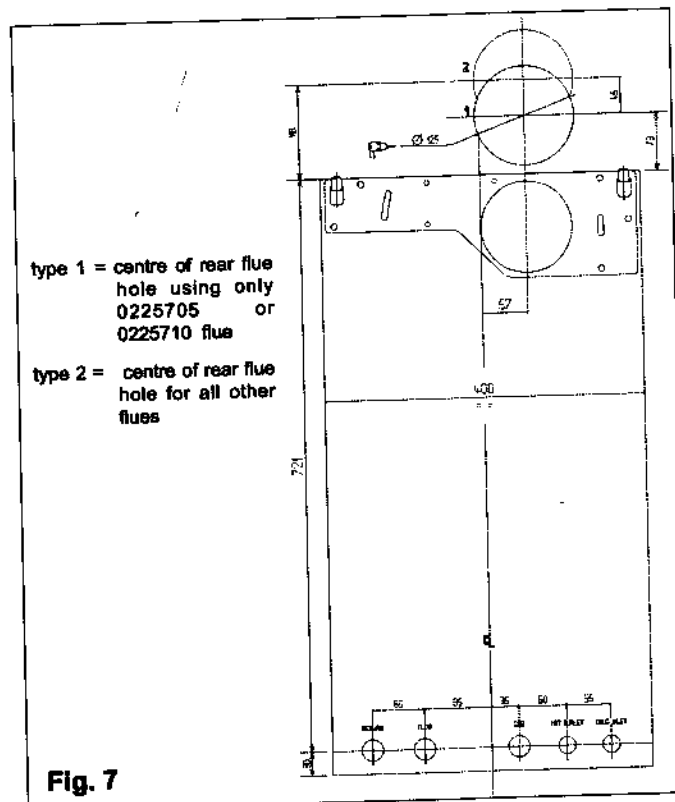
Bend	Reduction in maximum flue length for each bend
45° bend	0.5 Metre
90° bend	1.0 Metre

Horizontal flue terminals and accessories

Part No.	Description	Min-Max Length
0225705	Standard telescopic flue	380mm – 600mm (Dimension 'X')
0225710	Extended telescopic flue	600mm – 920mm (Dimension 'X')
2359029	Horizontal flue kit	
	For use with add. Bends & extensions	833mm (dimension 'X')
2359069	750mm extension	750mm
2359079	1500mm extension	1500mm
2359049	45° bend (pair)	N/A
2359059	90° bend	N/A
0225760	Wall bracket (5)	N/A

Using the template provided (see 4.4.1), mark and drill a 125mm hole for the passage of the flue pipe. The hole should have a 1° drop from the boiler to outside, to eliminate the possibility of rainwater entering the appliance via the flue.

The fixing holes for the wall-mounting bracket should now be drilled and plugged, an appropriate type and quantity of fixing should be used to ensure that the bracket is mounted securely. Once the bracket has been secured to the wall, mount the appliance onto the bracket.



FITTING THE TELESCOPIC FLUE KIT (0225705 & 0225710)

Carefully measure the distance from the centre of the appliance flue outlet to the face of the outside wall (dimension 'X' see fig. 8). Add 50mm to dimension 'X' to give the overall flue length (dimension 'Y'). Using the complete telescopic flue assembly adjust the length to suit dimension 'Y'. Once the telescopic flue terminal has been adjusted to the correct length, secure the flue assembly with the screw supplied.

Insert the flue restrictor ring (supplied in the instruction pack) into the appliance flue gas outlet. Slide the flue assembly into the previously drilled flue hole and locate the flue bend over the appliance flue outlet. Push the flue bend down over the appliance flue outlet and ensure the correct seal is made. Pull the flue assembly towards and over the flue bend – using a twisting action – ensuring the correct seal is made. Check that the terminal protrudes past the finished outside wall by the correct length (115mm).

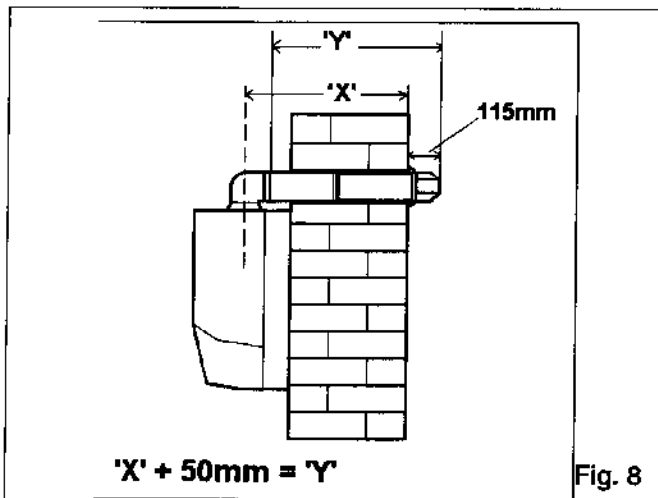


Fig. 8

NOTE

You must ensure that the entire flue system is properly supported and connected.

Seal the flue assembly to the wall using cement or a suitable alternative that will provide satisfactory weatherproofing. The interior and exterior trim can now be fitted.

FITTING THE STANDARD (2359029) HORIZONTAL FLUE KIT (see 4.4.1)

Carefully measure the distance from the centre of the appliance flue outlet to the face of the outside wall (dimension 'X' see fig. 8A). Ensure the inner (60mm) pipe is fully inserted into the outer (100mm) pipe (when the inner pipe is fully inserted, it stands proud of the outer pipe by 7.5mm). Add 32mm to dimension 'X' to give the overall flue length (dimension 'Y'). The standard horizontal flue kit (part no. 2359029) is suitable for a distance (dimension 'Y') of up to 865mm.

NOTE

Dimension 'Y' is measured from the end of the terminal to the end of the outer (100mm) pipe.

The internal trim should be fitted to the flue pipe before connection of the 90° bend.

Insert the flue restrictor ring (supplied with instruction pack) into the appliance flue gas outlet if the total flue length is less than 1.0 metre.

If the horizontal flue kit (2359029) requires to be cut to the correct size (dimension 'Y'), you must ensure that the inner (60mm) pipe stands proud of the outer (100mm) pipe by 7.5mm (see fig. 8B). Ensure any burrs are filed or removed and that any seals are located properly before assembly.

Connect the inner (60mm) pipe of the terminal assembly to the push-fit end of the 90° bend (supplied) using a twisting action. Insert the assembled flue into the previously drilled hole. Using the clips & screws supplied, connect the flue assembly to the boiler, ensuring that the terminal protrudes past the finished outside wall by the correct length (135mm).

You must ensure that the entire flue system is properly supported and connected.

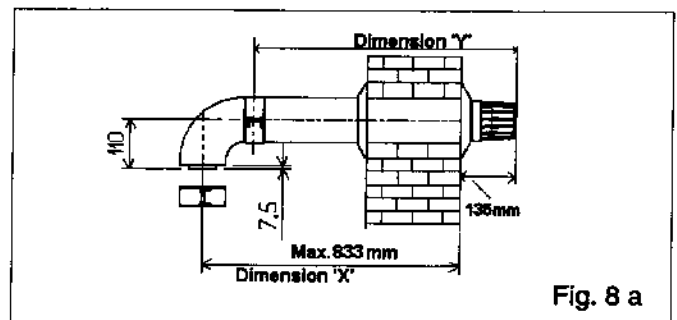


Fig. 8 a

Seal the flue assembly to the wall using cement or a suitable alternative that will provide satisfactory weatherproofing. The exterior trim can now be fitted.

EXTENDING THE HORIZONTAL FLUE

If the horizontal flue requires extension/s or additional bend/s, the standard horizontal flue terminal (2359029) must be used. Connect the bend – supplied with the terminal kit – to the top of the boiler using the clips, screws, & gaskets supplied. The additional bends & extensions have an internal push-fit connection, care should be taken to ensure that the correct seal is made when assembling the flue system. Connect the required number of flue extensions or bends (up to the maximum equivalent flue length) to the flue terminal using the clips, screws, & gaskets supplied (see fig. 8A & 8B).

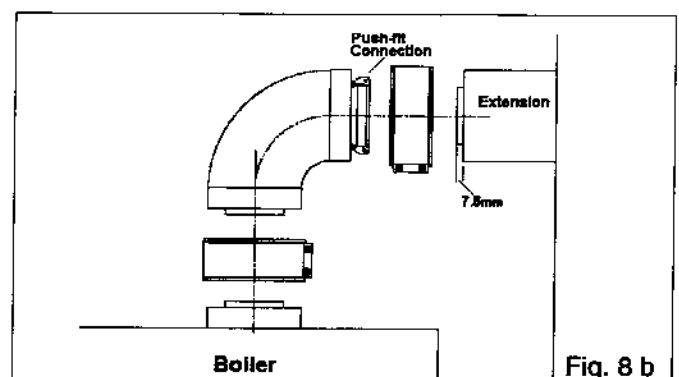


Fig. 8 b

NOTE

When cutting the horizontal flue terminal or an extension to the required length, you must ensure that the excess is cut from the plain end of the terminal or extension, and that the inner (60mm) pipe is 7.5mm longer than outer (100mm) pipe (see fig. 8A & 8B). Remove any burrs, and check that any seals are located properly.

You must ensure that the entire flue system is properly supported and connected.

Seal the flue assembly to the wall using cement or a suitable alternative that will provide satisfactory weatherproofing. The interior and exterior trim can now be fitted.

4.5.2 CONCENTRIC VERTICAL FLUE

The vertical flue terminal can be connected directly to the appliance flue outlet. Alternatively, an extension or bend can be connected to the appliance flue outlet if desired (see 4.4.2), however if additional bends are fitted, a reduction must be made to the maximum flue length (see table below).

Reduction for bends

Bend	Reduction in maximum flue length for each bend
45° bend	0.5 metre
90° bend	1.0 metre

Vertical flue terminal and accessories

Part No.	Description	Length
2359039	Vertical flue terminal	1.0 metre
0225770	Pitched roof flashing plate	N/A
0225765	Flat roof flashing plate	N/A
2359069	750mm extension	750mm
2359079	1500mm extension	1500mm
2359049	45° bend (pair)	N/A
2359059	90° bend	N/A
0225760	Wall bracket (5)	N/A

Using the dimensions given in fig. 9 as a reference, mark and cut a 105mm hole in the ceiling and/or roof.

Fit the appropriate flashing plate to the roof and insert the vertical flue terminal through the flashing plate from the outside, ensuring that the collar on the flue terminal fits over the flashing.

The fixing holes for the wall-mounting bracket should now be drilled and plugged, an appropriate type and quantity of fixing should be used to ensure that the bracket is mounted securely. Once the bracket has been secured to the wall, mount the appliance onto the bracket.

IMPORTANT

The vertical flue terminal is 1.0 metre in length and cannot be cut; therefore it may be necessary to adjust the height of the appliance to suit or use a suitable extension.

Insert the flue restrictor ring into the appliance flue outlet (see fig. 1), if the total flue length – including the allowance for any additional bends – does not exceed 1.0 metre.

Connect the vertical flue assembly to the boiler flue spigot using the 60mm & 100mm clips, gaskets, & screws (supplied), ensuring the correct seal is made. The flue support bracket (supplied with the vertical flue kit) can now be fitted.

If the vertical flue requires extension/s or additional bend/s, connect the required number of flue extensions or bends (up to the maximum equivalent flue length) between the boiler and vertical flue assembly (see fig. 8B).

NOTE

When cutting an extension to the required length, you must ensure that the excess is cut from the plain end of the extension and that the inner (60mm) pipe is 7.5mm longer than outer (100mm) pipe (see fig. 8B). Remove any burrs, and check that any seals are located properly.

You must ensure that the entire flue system is properly supported and connected.

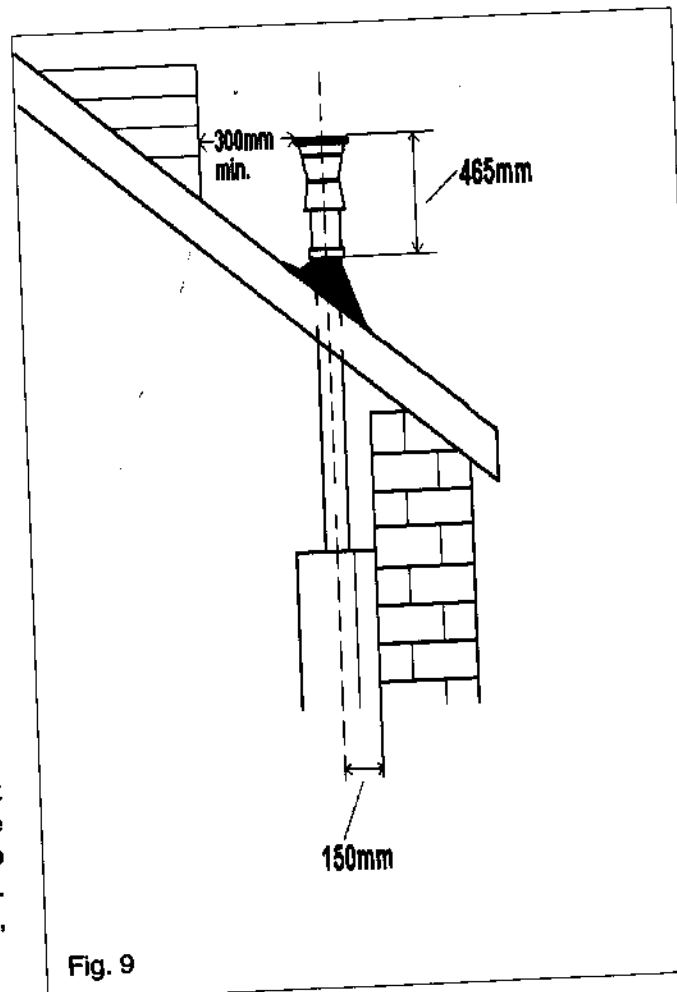


Fig. 9

4.5.3 TWIN FLUE SYSTEM

The Vokera twin flue system enables greater flue distances to be achieved (see 2.8) than that of the standard concentric flue system. It can be used for horizontal or vertical applications, however the twin flue system must be converted to the dedicated concentric flue kit for termination. It is essential that the installation of the twin flue system be carried out in strict accordance with these instructions.

GUIDANCE NOTES ON TWIN FLUE INSTALLATION

- The flue must have a fall back of 1° back to the appliance to allow any condensate that may form in the flue system to drain via the condensate drain. Consideration must also be given to the fact that there is the possibility of a small amount of condensate dripping from the terminal.
- Ensure that the entire flue system is adequately supported, use at least one bracket for each extension.
- The entire flue system must be adequately insulated to maintain heat within the flue system thereby reducing the possibility of condensate production.
- As the exhaust outlet pipe can reach very high temperatures it must be protected to prevent persons touching the hot surface.

Bend	Reduction in maximum flue length for each bend
45° bend	1.0 metre
90° bend	1.0 metre

Twin flue accessories

Part No.	Description	Length
0225805	Horizontal flue terminal	1.0 metre
0225810	Vertical flue terminal	1.0 metre
300	Twin adaptor kit	N/A
0225770	Pitched roof flashing plate	N/A
0225765	Flat roof flashing plate	N/A
0225815	Condensate drain kit	N/A
0225820	0.25m extension (pair)	250mm
0225825	0.5m extension (pair)	500mm
0225830	1.0m extension (pair)	1000mm
0225835	2.0m extension (pair)	2000mm
0225840	45° bend (pair)	N/A
0225845	90° bend (pair)	N/A
0225850	Twin bracket (5)	N/A
0225855	Single bracket (5)	N/A

MOUNTING THE BOILER

The fixing holes for the wall-mounting bracket should now be drilled and plugged, an appropriate type and quantity of fixing should be used to ensure that the bracket is mounted securely. Once the bracket has been secured to the wall, mount the appliance onto the bracket.

4.5.3.1 INSTALLATION OF TWIN ADAPTOR KIT (fig. 10)

- Insert the restrictor ring (supplied with the instruction pack) if the total flue length – including the allowance for any bends – is less than 7.5 m (20e) and 5 m (14e & 10e).
- Insert the exhaust connection manifold onto the appliance flue outlet.
- Place the silicone seal (supplied with twin adaptor kit) over the rim of the exhaust connection manifold.
- Remove the blanking plate (located to the left of the appliance flue outlet) and – using the same screws – install the air baffle.

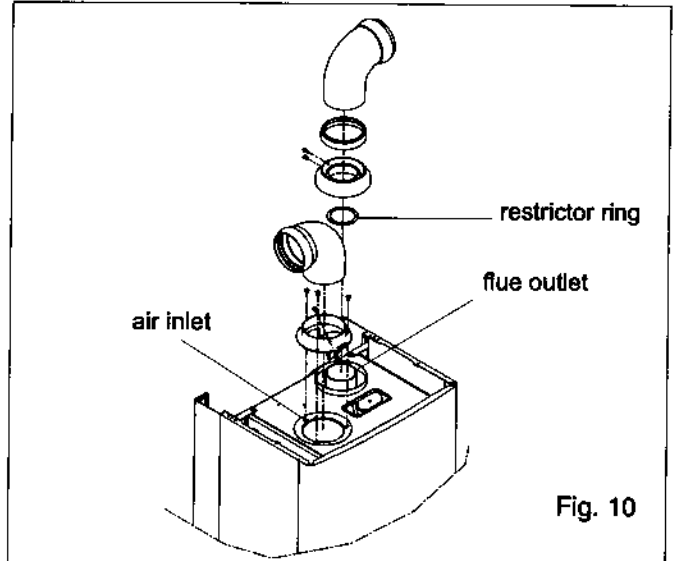


Fig. 10

4.5.3.2 INSTALLATION OF CONDENSATE DRAIN KIT (fig. 10a)

The condensate drain kit must be fitted within 1 metre of the appliance flue outlet. It is recommended that the condensate drain kit should be fitted in the vertical plane, however it can be fitted horizontally with care.

- Fit the first bend to the condensate drain kit or exhaust connection manifold by firmly pushing in to position.
 - Using the two holes in the exhaust connection manifold as a guide, drill a 3mm hole in each and secure using the screws provided.
 - Connect the air inlet pipe to the air baffle as above.
 - The twin flue pipes extensions and accessories can now be installed by pushing together (the plain end of each extension or bend should be pushed approximately 50mm into the female socket of the previous piece).
- The condensate drain trap must be connected to the drain in accordance with building Regulations or other rules in force.

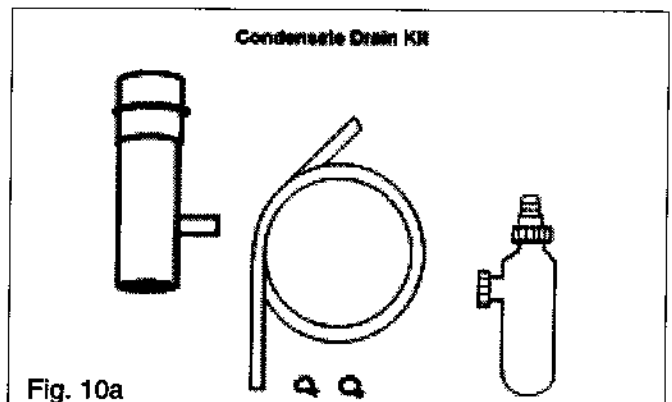


Fig. 10a

4.5.3.3 HORIZONTAL TERMINATION

(See fig. 10b)

The twin flue system must be converted to the dedicated concentric flue kit for termination.

- The horizontal terminal is supplied with a built-in converter box and cannot be shortened.
- A 130mm hole is required for the passage of the concentric terminal through the wall.

Depending on site conditions it may be preferable to install the terminal assembly prior to fitting the twin flue pipes.

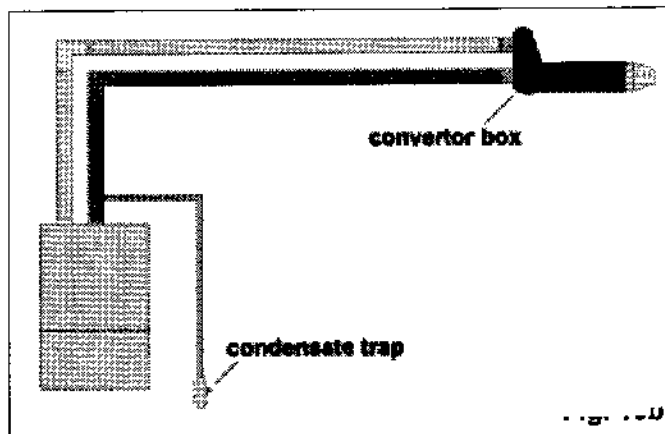
Mark and drill a 130mm hole for the passage of the horizontal flue terminal, ensuring that there is a 1° fall back to the boiler (17mm per 1000mm). Insert the terminal assembly into the flue hole.

Push-fit the twin flue pipes onto the concentric to twin converter box ensuring that the exhaust pipe connects to the exhaust connection on the concentric to twin converter.

If necessary cut the plain ends (male) of the twin flue pipes to allow connection to the concentric to twin converter.

NOTE

Before cutting twin flue pipes ensure allowances have been made for connection onto the previous piece and onto the concentric to twin converter. The last twin flue pipes must be pushed 50mm onto the male sockets of the concentric to twin converter.



NOTE

You must ensure that the entire flue system is properly supported and connected.

When cutting an extension to the required length, you should ensure that the excess is cut from the plain end of the extension. Remove any burrs, and check that both seals are located properly.

Seal the flue terminal assembly to the wall using cement or a suitable alternative that will provide satisfactory weatherproofing. The interior and exterior trim can now be fitted.

4.5.3.4 VERTICAL TERMINATION

(See fig. 10c)

The twin flue system must be converted to the dedicated concentric flue kit for termination.

- The vertical terminal is supplied with a built-in converter box and cannot be shortened.
- A 130mm hole is required for the passage of the concentric terminal through the ceiling and/or roof.

Depending on site conditions it may be preferable to install the terminal assembly prior to fitting the twin flue pipes.

Fit the appropriate flashing plate to the roof and insert the vertical flue terminal through the flashing plate from the outside, ensuring that the collar on the flue terminal fits over the flashing.

Push-fit the twin flue pipes onto the concentric to twin converter ensuring that the exhaust pipe connects to the exhaust connection on the concentric to twin converter.

If necessary cut the plain ends (male) of the twin flue pipes to allow connection to the concentric to twin converter.

NOTE

- Before cutting twin flue pipes ensure allowances have been made for connection onto the previous piece and onto the concentric to twin converter. The last twin flue pipes must be pushed 50mm onto the male spigots of the concentric to twin converter.
- You must ensure that the entire flue system is properly supported and connected.
- Ensure that any horizontal sections of pipe have a 1° fall towards the appliance (17mm per 1000mm).
- The converter box on the vertical terminal will have to be temporarily removed when inserting the terminal through the flashing.
- The condensate trap must be primed with water prior to commissioning the boiler.

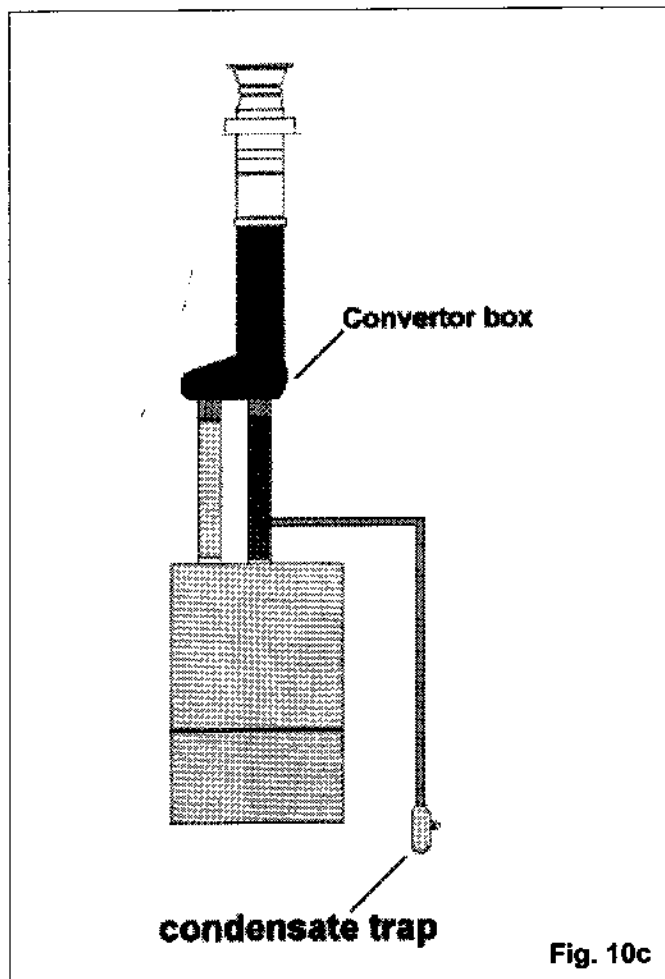


Fig. 10c

4.6 CONNECTING THE GAS AND WATER (fig. 6)

The appliance is supplied with an accessories pack that contains large and small sealing washers, service valves, and pipe connections.

The service valves are of the compression type, the pipe connections have plain copper ends. When connecting pipework to the valves or connections, tighten the compression end first, then insert the sealing washers before tightening the valve or connection to the appliance. It will be necessary to hold the valve or connection with one spanner whilst tightening with another.

4.6.1 GAS (fig. 6)

The appliance is supplied with a 15mm service valve, connect a 15mm pipe to the inlet of the valve, and tighten both nuts.

Note; It will be necessary to calculate the diameter of the gas pipe to ensure the appliance has an adequate supply of gas.

4.6.2 HEATING (FLOW & RETURN) fig. 6

The appliance is supplied with 22mm service valves for the heating connections, connect 22mm pipe to the inlet of each valve and tighten both nuts.

4.6.3 HOT WATER OUTLET fig. 6

The appliance is supplied with a 15mm compression coupling. Connect a 15mm pipe to the coupling and tighten. It may be necessary to fit a non-return valve if the installation is subject to mains knock, in order to eliminate false activation of the domestic hot water flow switch.

4.6.4 COLD WATER INLET (fig. 6)

The appliance is supplied with a 15mm stopcock, connect a 15mm service pipe to the inlet of the service valve and tighten both nuts. It may be necessary to fit a pressure reducing valve if the installation is subject high-pressure fluctuations or high pressure surges.

4.6.5 SAFETY VALVE DISCHARGE PIPE (fig. 6)

The appliance is supplied with a 15mm copper tail, connect a 15mm pipe and suitable coupling to the tail and tighten. The discharge pipe must have a continuous fall away from the boiler to outside and allow any water to drain away thereby eliminating the possibility of freezing. The discharge pipe must terminate in a position where any water – possibly boiling – discharges safely without causing damage or injury, but is still visible.

4.7 ELECTRICAL CONNECTIONS figs. (12, 13, 14.)

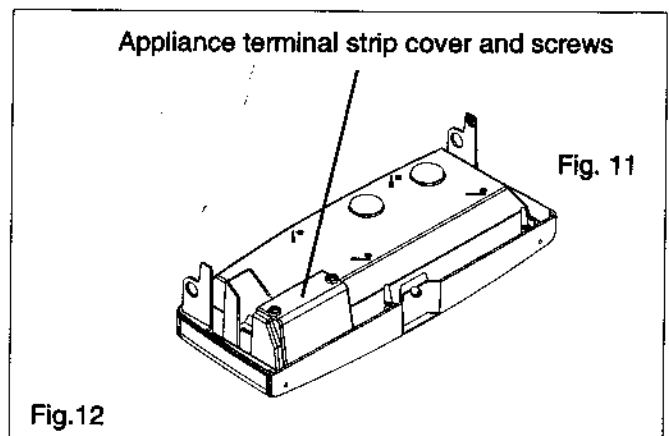
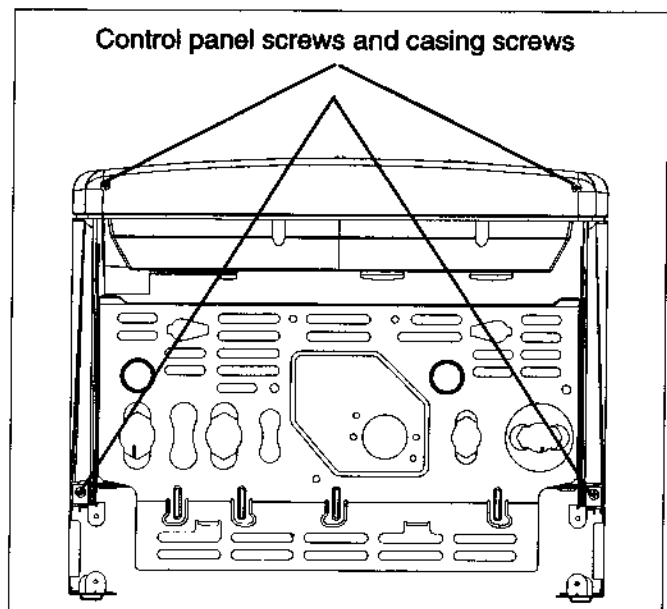
The appliance is supplied with a factory fitted timeclock. Should additional controls be required, please refer to the detailed wiring diagrams in section 8 for detailed instructions.

A qualified electrician should connect the electrical supply to the appliance. A competent person must undertake the design of any external electrical circuits. **ANY EXTERNAL CONTROL OR WIRING MUST BE SERVED FROM THE SAME ISOLATOR AS THAT OF THE APLIANCE.** The supply cable from the isolator to the appliance

must be 3-core flexible sized 0.75mm to BS 6500. Wiring to the appliance must be rated for operation in contact with surfaces up to 90°C.

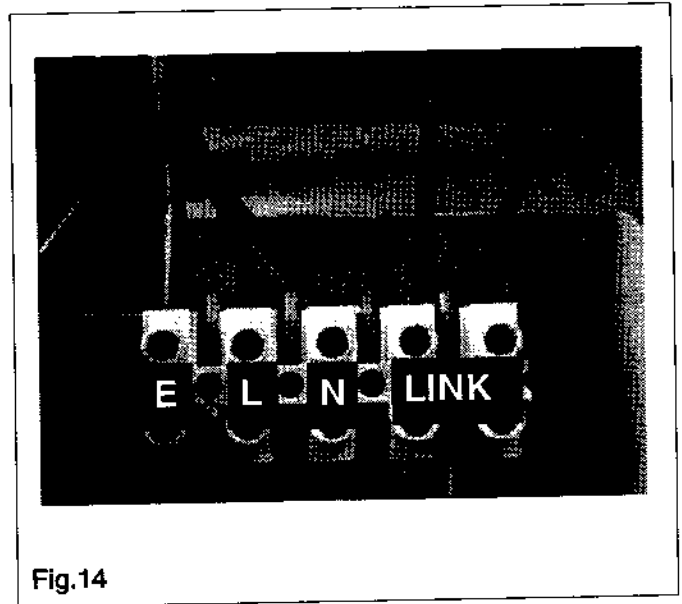
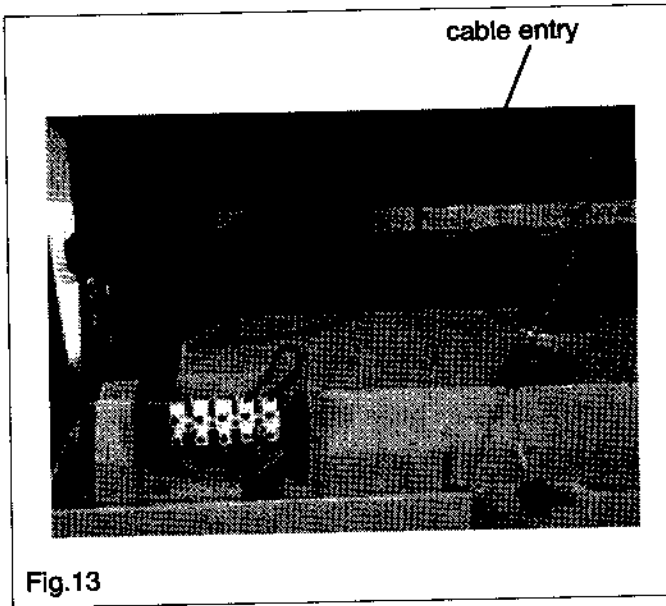
To gain access to the appliance electrical connections you must first remove the casing, proceed as follows.

- Unscrew the two brass slot head screws located left and right, beneath the grey control panel – please note these screws are captive and will only drop down approximately 10mm –
- Gently lower the control panel ensuring the **ensuring the electrode lead does not snag on the appliance casing.**
- Unscrew the two-crosshead screws located left and right at the base of the white casing.
- Gently ease the casing towards you and then lift upward to disengage the casing from the top hooks.
- Ensure the casing and screws are stored in a safe place until required.

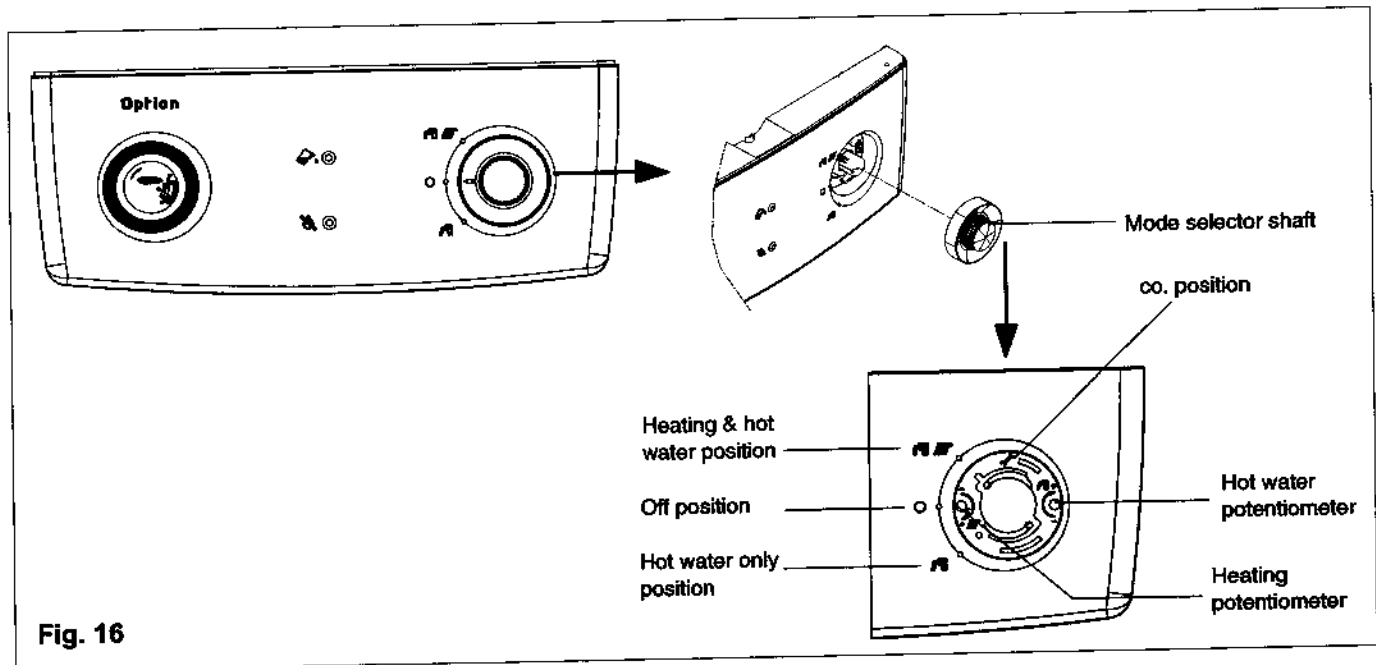
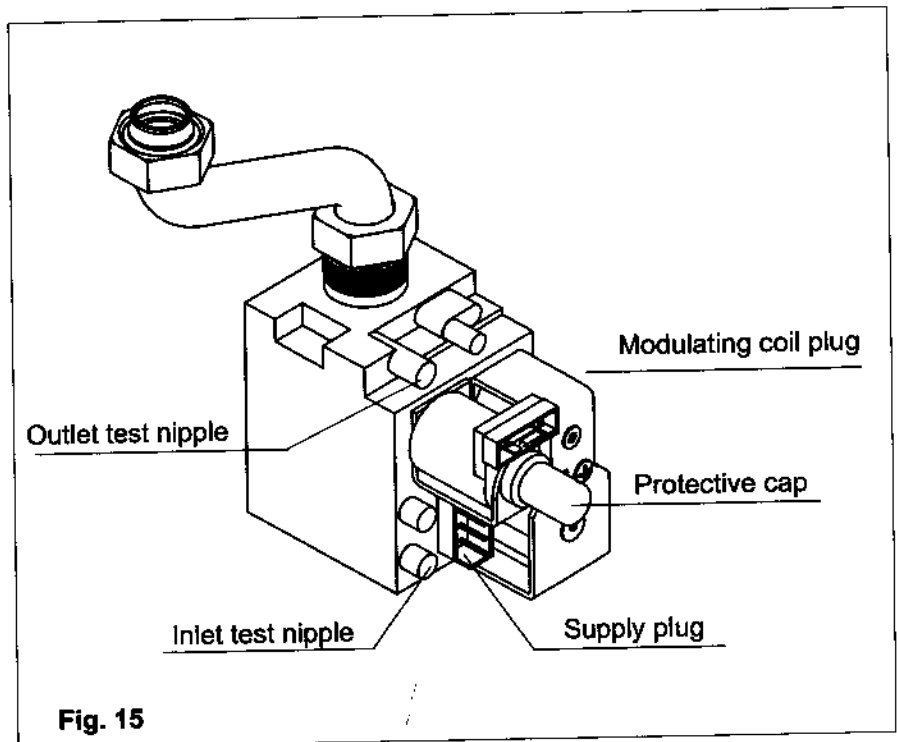


Locate the appliance terminal cover (fig.12) and remove both screws, lift off cover and place to one side, locate the cable entry on the appliance (fig.13) and pass the cable through. On the appliance terminal strip there are five connectors, from left to right they are.

- Earth (green & yellow),
- Live (brown),
- Neutral (blue),
- Room thermostat terminals (black).



Connect the supply cable wires (earth, live, & neutral) to their corresponding terminals on the appliance terminal strip, ensuring the Earth wire is slightly longer than the Live and Neutral, this prevents strain on the earth wire should the cable become taut. Do not remove the link wire that connects the room thermostat terminals unless you are intending to fit a room thermostat. Once all connections have been made, re-fit the appliance terminal cover. At this point it is essential that the securing screw on the cable entry is now tightened, this must be done before the control panel is re-fitted in its upright position. Re-fit appliance casing and screws.



SECTION 5 COMMISSIONING

5.1 GAS SUPPLY INSTALLATION

Inspect the entire installation including the gas meter, test for soundness and purge. Refer to BS 6891 for specific instruction.

5.2 THE HEATING SYSTEM

The appliance contains components that may become damaged or rendered inoperable by oils and/or debris that are residual from the installation of the system, consequently it is essential that the appliance is flushed in accordance with the following instructions.

5.3 INITIAL FILLING OF THE SYSTEM

Ensure both flow and return service valves are open, remove appliance casing as described in 4.7.1, identify the automatic air release valve, and loosen the dust cap by turning cap anti-clockwise one full turn. **IMPORTANT, THERE ARE NO MANUAL AIR RELEASE VALVES LOCATED ON THE APPLIANCE.** Ensure all manual air release valves located on the heating system are closed. Using the method of filling as described in fig. 5, slowly proceed to fill the system, as water enters the system the pressure gauge will begin to rise, once the gauge has reached 1BAR close the filling valve and begin venting all manual air release valves, starting at the lowest first. It may be necessary to go back and top-up the pressure until the entire system has been filled. Inspect the system for water soundness, rectifying any leaks.

5.4 INITIAL FLUSHING

The whole of the heating system must be flushed both cold and hot as detailed in 5.9. open all radiator or heating valves and the appliance central heating valves. Drain the boiler and system from the lowest points. Open the drain valve full bore to remove any installation debris from the boiler prior to lighting. Refill the boiler and heating system as described in 5.3.

5.5 FILLING THE HOT WATER SYSTEM

Close all hot water outlets, turn appliance stop-cock on (anti-clockwise), slowly open each outlet until all air has been expelled and clear water is discharged. Check pipe-work etc. for water soundness.

5.6 PRE-OPERATION CHECKS

Before attempting to initial lighting of the appliance, the following checks must be carried out.

- Ensure all gas service valves from the meter to the appliance are open and the supply pipe has been properly purged.
- Ensure the proper electrical checks have been carried out, (7.11) particularly. continuity, polarity, and resistance to earth.
- Ensure the 3amp fuse – supplied with the appliance – has been fitted.
- Ensure the system has been filled, aired, and the pressure set to 1bar.
- Ensure the flue has been fitted properly and in accordance with the instructions.
- Ensure all appliance service valves are open.

5.7 INITIAL LIGHTING

Ensure electrical supply to the appliance is switched off, remove mode selector switch and gently rotate the heating and hot water potentiometers to their lowest positions (anti-clockwise) (see fig. 16), refit mode selector switch. Turn on electrical supply to the appliance, switch time-clock to an 'on' position, ensure any external controls (if fitted) are calling for heat, turn mode selector switch to the heating and hot water position.

The appliance will now go through an ignition sequence as described in 1.2. Should the appliance fail to ignite, refer to pre-operation checks. Once the appliance has ignited it will remain on minimum output for two minutes. At this point a hot water outlet should be opened to check appliance operation in hot water mode should the appliance fail to ignite, refer to pre-operation checks.

5.8 CHECKING BURNER PRESSURES

MAXIMUM (10.1mbar)

Although burner pressure settings are factory set, it is necessary to check them during commissioning. Isolate boiler from the electrical supply, turn the mode selector switch to the hot water only position, remove the mode selector switch and adjust the hot water potentiometer to maximum (clockwise), attach a suitable manometer to the gas valve outlet test nipple. (see fig.

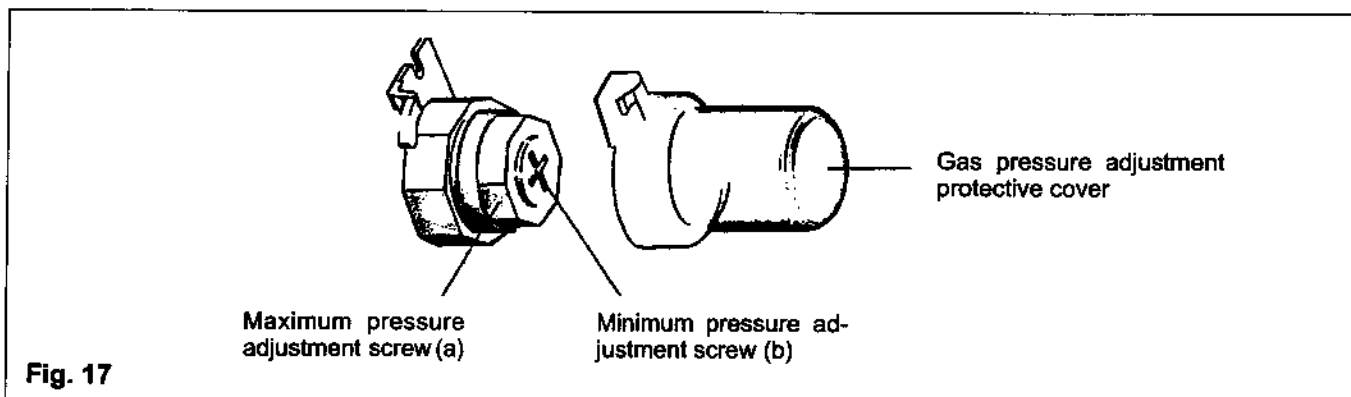


Fig. 17

15,17) Restore the electrical supply to the appliance and open a hot water outlet – preferably the bath-tap – ensuring a high flow rate. The appliance will now fire and go to maximum gas rate (10.1mbar), if the pressure is wrong it should be adjusted as instructed in 7.6. Once the check has been concluded, close hot water outlet, isolate appliance from electrical supply, remove manometer and tighten test nipple screw.

MINIMUM (1.5mbar)

Although burner pressure settings are factory set, it is necessary to check them during commissioning. Isolate boiler from the electrical supply, attach a suitable manometer to the gas valve outlet test nipple, (see fig. 15,17) and remove the black plug connected to the modulating coil on the gas valve. Restore the electrical supply to the appliance and open a hot water outlet. The appliance will now fire and go to minimum gas rate (1.5mbar), if the pressure is wrong it should be adjusted as instructed in 7.6. Once the check has been concluded, close hot water outlet, isolate appliance from electrical supply, refit plug to modulating coil, remove manometer and tighten test nipple screw.

HEATING MINIMUM (1.9mbar)

Although burner pressure settings are factory set, it is necessary to check them during commissioning. Isolate boiler from the electrical supply, attach a suitable manometer to the gas valve outlet test nipple (see fig. 15 & 17). Restore the electrical supply to the appliance and ensure all controls are calling for heat, turn the appliance mode selector switch to heating and hot water, the appliance will now fire. Once the burner has lit, open – for a few seconds only – a hot water outlet, the burner will now remain on minimum output (1.9mbar) for 30 seconds. If the pressure is wrong it should be adjusted as instructed in 7.6. Once the check has been concluded, isolate appliance from electrical supply, remove manometer and tighten test nipple screw.

HEATING MAXIMUM

There is no range rating facility on the appliance. The appliance automatically adjusts its output to optimise efficiency. After adjustment to the gas valve, the protective cap should be re-sealed.

5.9 FINAL FLUSHING OF THE HEATING SYSTEM

The system should be flushed in accordance with BS7593. Turn on the boiler for central heating and allow the boiler and system to reach temperature. Turn off the boiler and drain the system whilst still hot.

Refill the boiler and heating system as described in 5.3.

Although not necessary for correct operation of the boiler, an inhibitor may be added at this point. Contact the inhibitor manufacturer for further information concerning application and dosage.

5.10 SETTING THE BOILER OPERATING TEMPERATURE

The flow outlet temperature can be adjusted from 40°C. - 80°C. via the potentiometer located behind the mode selector switch, the potentiometer has three temperatures sectors.

- Sector 1. 40°C - 55°C
- Sector 2. 55°C - 65°C
- Sector 3. 65°C - 80°C

When the potentiometer is set within sector 2 the appliance will automatically raise the outlet temperature to maintain comfort levels during cold weather conditions. To adjust the heating potentiometer proceed as follows.

SECTOR 1

Ensure the appliance has been set to hot water and heating mode, remove the mode selector switch, and gently rotate the potentiometer clockwise, until the green LED on the appliance fascia flashes, now rotate the potentiometer anti-clockwise by a few degrees, the potentiometer is now in sector 1. Replace mode selector switch.

SECTOR 2

Ensure the appliance has been set to hot water and heating mode, remove the mode selector switch, and gently rotate the potentiometer clockwise, until the green LED on the appliance fascia flashes, the potentiometer is now in sector 2. Replace mode selector switch.

SECTOR 3

Ensure the appliance has been set to hot water and heating mode, remove the mode selector switch, and gently rotate the potentiometer fully clockwise until the stop is reached, the potentiometer is now in sector 3. Replace mode selector switch.

NOTE :

When the potentiometer moves from sector 1 to sector 2, the green LED will flash for 4 seconds. When the potentiometer moves from sector 3 to sector 2, the green LED will flash for 4 seconds.

5.11 SETTING THE SYSTEM DESIGN PRESSURE

The design pressure should be a minimum of 1 bar and a maximum of 1.5 bar.

The actual reading should ideally be 1 bar plus the equivalent height in metres to the highest point in the system above the base of the appliance. (Up to the maximum of 1.5 bar total).

N.B. The safety valve is set to lift at 3 bar/ 30m/ 45psig.

To lower the system pressure to the required value, pull lever on head of safety valve to release water until the required figure registers on the pressure gauge (see fig.1).

INSTRUCTING THE USER

5.12 REGULATING THE CENTRAL HEATING SYSTEM

Fully open all radiator and circuit valves and run the appliance in the central heating mode until heated water is circulating. If conditions are warm remove any thermostatic valve heads.

Adjust radiator return valves and any branch circuit return valves until the individual return temperatures are correct and are approximately equal.

5.13 REGULATING THE DOMESTIC HOT WATER

The appliance will ignite in hot water mode when the domestic hot water flow switch senses a flow rate through the appliance of 2 litres or more, the appliance has a built-in flow restrictor, which limits the maximum flow rate to 10 litres.

If the mains supply suffers from an unusually high or low pressure, adjustment of the hot water output may be necessary.

Once the pre-operation checks – as described in 5.6 – have been carried out, the domestic hot water can be regulated if required.

Ensure the appliance is switched to hot water only, remove the mode selector switch, rotate the hot water potentiometer to its maximum position, and turn on the bath tap fully.

The appliance will now fire in domestic hot water mode. Allow the temperature to stabilise.

The hot water can now be regulated to set the temperature.

To reduce the hot water temperature, slowly rotate the hot water potentiometer anti-clockwise until a satisfactory temperature is obtained. Please note that it is prudent to set the hot water temperature at the lowest acceptable temperature as higher temperatures can be realised by reducing the flow-rate at the hot water outlet. Re-fit mode selector switch.

To increase the hot water temperature, slowly turn the adjustable stopcock clockwise until a satisfactory temperature is obtained. Please note that it is prudent to set the hot water temperature at the lowest acceptable temperature as higher temperatures can be realised by reducing the flow-rate at the hot water outlet. Re-fit mode selector switch.

5.14 FINAL CHECKS

- ENSURE OUTLET TEST NIPPLES ON THE APPLIANCE GAS VALVE HAVE BEEN TIGHTENED AND CHECKED FOR SOUNDNESS.
- ENSURE THE APPLIANCE FLUE SYSTEM IS FITTED CORRECTLY AND IS SECURED.
- ENSURE ALL PIPE-WORK IS RE-CHECKED FOR SOUNDNESS.
- REFIT APPLIANCE CASING.
- COMPLETE APPLIANCE LOGBOOK.

Complete details of the boiler, controls, installation and commissioning in the log book supplied with the boiler. This is an important document which must be correctly completed and handed to the user. Failure to install and commission the appliance to the manufacturers instructions may invalidate the warranty.

Hand over all documentation supplied with this appliance – including these instructions – and explain the importance of keeping them in a safe place.

Explain to the user how to isolate the appliance from the gas, water, and electricity supplies, and the locations of all drain points.

Show the user how to operate the appliance and its associated controls correctly.

Show the user the position of the filling valve and how to top-up the system pressure correctly, and show the location of all manual air release points.

Explain to the user how to turn off the appliance for both long and short periods, and advise on the necessary precautions to prevent frost damage.

Explain to the user that for continued safe and efficient operation, the appliance must be serviced annually by a competent person.

SECTION 6 SERVICING INSTRUCTIONS

6.1 GENERAL

To ensure the continued safe and efficient operation of the appliance, it is recommended that it is checked and serviced at regular intervals.

The frequency of servicing will depend upon the particular installation conditions, but in general, once per year should be adequate.

It is the law that any servicing work is carried out by a competent person such as a Vokera service engineer, approved service agent, British Gas, or other CORGI registered personnel.

The following instructions apply to the boiler and its controls, but it should be remembered that the central heating and the domestic hot water systems will also require attention from time to time.

6.2 ROUTINE ANNUAL SERVICING

Check the operation of the appliance in both 'hot water only' and 'heating and hot water' modes. Ensure the appliance functions as described in section 7. Compare the performance of the appliance with its design specification. The cause of any noticeable deterioration should be identified and rectified without delay.

Thoroughly inspect the appliance for signs of damage or deterioration especially the flue system and the electrical apparatus.

Check and adjust – if necessary – all burner pressure settings. (see 7.6)

Check and adjust – if necessary – the system design pressure. (see 5.11)

Carry out an analysis of the flue gases (see section 7.7), and visually check the condition of the entire flue assembly. Compare the results with the appliance design specification. Any deterioration in performance must be identified and rectified without delay.

Ensure both flue venturis are clean and free from any debris or obstruction.

Ensure both the burner and heat exchanger are clean and free from any debris or obstruction.

Inspect all joints for signs of leakage and repair if necessary.

Refer to the commissioning section and/or replacement of parts section for detailed instruction if required.

6.3 REPLACEMENT OF COMPONENTS

Although it is anticipated that this appliance will give years of reliable, trouble free service, the life span of components will be determined by factors such as operating conditions and usage.

Should the appliance develop a fault, the fault finding section will assist in determining which component is malfunctioning.

6.4 MAIN HEAT EXCHANGER (de-scaling)

The main heat exchanger may – when operating under certain conditions – become affected by scaling. Evidence of this will be a deterioration of the hot water performance. The heat exchanger can be de-scaled using a proprietary de-scalant without having to remove it from the appliance. However the appliance must be disconnected from the hot and cold service pipes, the de-scalant should be administered with strict adherence to the manufacturers instructions. Re-connect the hot and cold services only after thorough flushing with clean water has taken place.

6.5 COMPONENT REMOVAL PROCEDURE

To remove a component, access to the interior of the appliance is essential. Isolate the appliance from the electrical supply and remove the fuse. And when necessary, close all service valves on the appliance, remove the appliance casing as described in section 4.7.1, drain the primary water content from the appliance via the safety valve, and drain off secondary water content from the appliance via a hot water outlet. Ensure some water absorbent cloths are available to catch any residual water that may drip from the appliance or removed component. Undertake a complete commissioning check as detailed in section 5, after replacing any component. ALWAYS TEST FOR GAS SOUNDNESS IF ANY GAS CARRYING COMPONENTS HAVE BEEN REMOVED OR DISTURBED.

6.6 PUMP HEAD fig. 18

Carry out component removal procedure as described in 6.5.

Using a 4mm Allen key or 'T' bar, unscrew and remove the four Allen screws that hold the pump in position, pull firmly on the pump head to release it from the base. Disconnect the electrical leads. Replace in the reverse order.

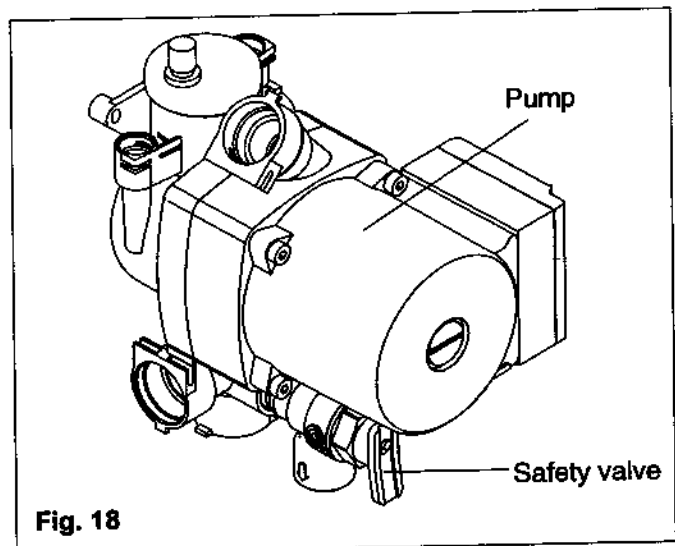


Fig. 18

6.7 SAFETY VALVE fig. 18

Carry out component removal procedure as described in 6.5.

Disconnect the outlet pipe from the safety valve, unscrew and remove the hex bush from the safety valve outlet, remove safety valve locking pin from appliance manifold. Replace in the reverse order

6.8 AUTOMATIC AIR RELEASE VALVE (AAV) fig. 19

Carry out component removal procedure as described in 6.5.

Remove the locking pins at the pump outlet, and the flow & return connection of the heat exchanger, disconnect both pipes from the heat exchanger, and remove the return pipe from the pump outlet. Remove the locking pin and expansion pipe from the pump base. Using a suitable pair of pliers, unscrew the AAV from the pump base. Replace in the reverse order.

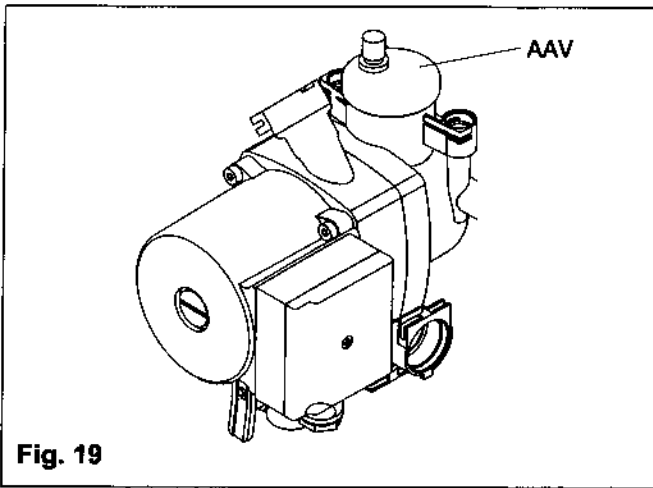


Fig. 19

6.9 WATER PRESSURE SWITCH fig. 20

Carry out component removal procedure as described in 6.5.

Remove locking pin from heating flow pipe at the heating manifold and withdraw the pipe from the manifold. Remove locking pin and the water pressure switch from the heating manifold, pull back protective cover – and after taking note of the electrical connections – disconnect the wiring. Replace in the reverse order.

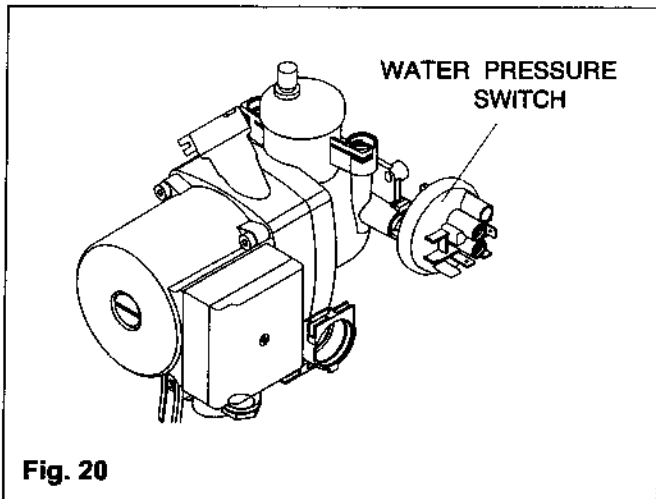


Fig. 20

6.10 DOMESTIC WATER FLOW SWITCH fig. 21

Carry out component removal procedure as described in 6.5.

Remove black electrical plug from the domestic water flow switch, disconnect and remove inlet pipe between the domestic water flow switch and the heat exchanger, remove locking pin from the domestic water flow switch, the switch can now be removed from the appliance. Replace in the reverse order.

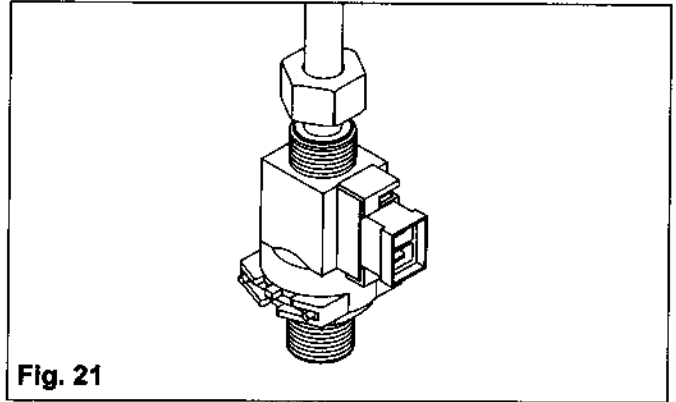


Fig. 21

6.11 PRESSURE GAUGE fig. 1

Carry out component removal procedure as described in 6.5.

Remove pressure gauge locking pin, located on pump base, and withdraw the pressure gauge pipe, locate the spring tabs on the pressure gauge body, push and hold tabs in, to enable extraction of the gauge from its location. Replace in the reverse order.

6.12 PRIMARY AND SECONDARY THERMISTORS fig. 22-23

Carry out component removal procedure as described in 6.5.

Pull back protective rubber cover from the thermistor, disconnect thermistor electrical plug, using a 13mm spanner slacken and remove the thermistor and sealing washer. Replace in the reverse order.

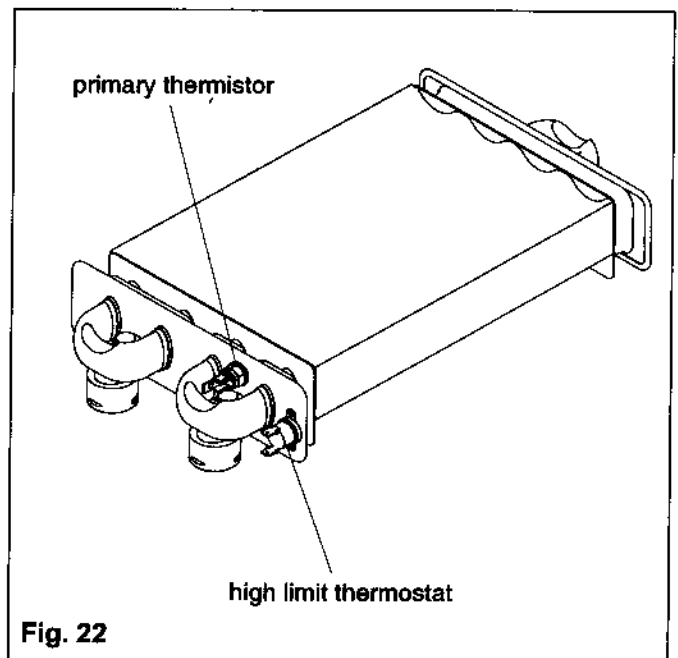


Fig. 22

6.13 HIGH LIMIT THERMOSTAT fig. 22

Carry out component removal procedure as described in 6.5.

Pull off electrical plug from the high limit thermostat, slacken and remove retaining screws. Replace in reverse order.

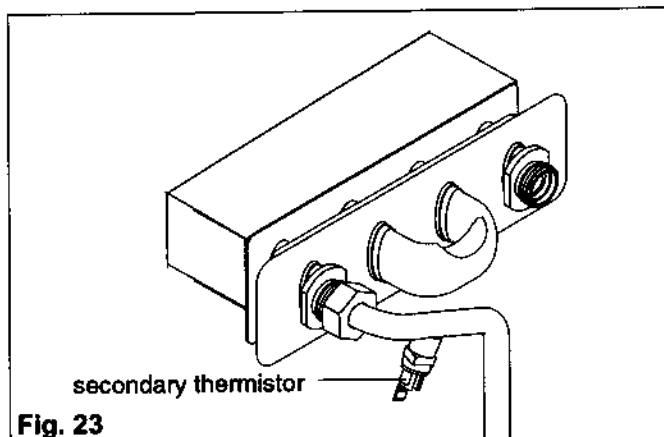


Fig. 23

6.14 PRINTED CIRCUIT BOARD (PCB) fig. 12

Carry out component removal procedure as described in 6.5.

Remove mode selector switch, locate and remove the five screws which secure the PCB cover, then remove cover, after carefully taking note off all wiring connections, disconnect all wiring from the PCB, locate and remove the PCB securing screws, remove PCB. Replace in the reverse order.

6.15 GAS VALVE fig. 15

Carry out component removal procedure as described in 6.5.

The gas valve must be changed as complete unit. Disconnect both electrical plugs from the gas valve, disconnect silicone tube from gas valve regulator, slacken and unscrew gas valve inlet and outlet connections, please note, the sealing washers must be discarded and replaced with new sealing washers, locate and remove gas valve retaining screws on the underside of the boiler, the gas valve can now be removed. Replace in the reverse order. Check and adjust burner pressure settings. **WARNING, A GAS SOUNDNESS CHECK MUST BE CARRIED OUT.**

6.16 INTEGRAL TIME SWITCH fig. 12

Carry out component removal procedure as described in 6.5.

Locate and remove the five screws which secure the PCB cover, then remove cover, locate and remove the time clock retaining screws, remove time clock after carefully taking note off all wiring connections. Replace in the reverse order.

6.17 BURNER, INJECTORS, AND SPARK/SENSE ELECTRODE fig. 24 & 25

Carry out component removal procedure as described in 6.5.

Remove outer combustion cover by un-clipping the two retaining clips located at the base of the combustion cover, gently pull the cover towards you before lifting and disengaging it from the top retaining lugs. Locate and remove the two screws at the base of the inner combustion cover, pull the cover towards you before lifting and disengaging it from the top retaining lugs.

Disconnect both the electrode lead from its connector at the top of the control fascia, and the electrode earth lead from the spade connector on the appliance frame. Locate and remove the four screws which secure the burner in position, gently ease the burner out of its location whilst also easing the electrode sealing grommet from its location.

Once the burner has been removed, locate the burner injectors – located to the rear of the combustion chamber – and remove. Replace in the reverse order. Please note, the injector sealing washers must be replaced if the injectors have been removed, ensure all seals are in good condition, taking care to ensure they are replaced correctly.

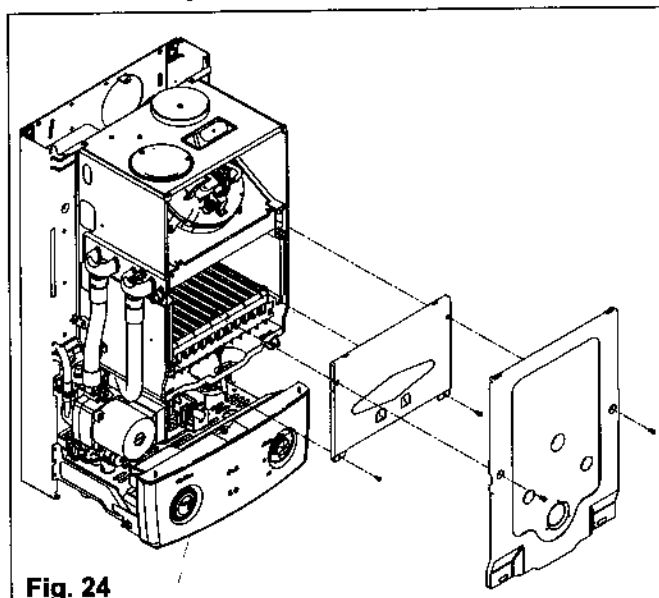


Fig. 24

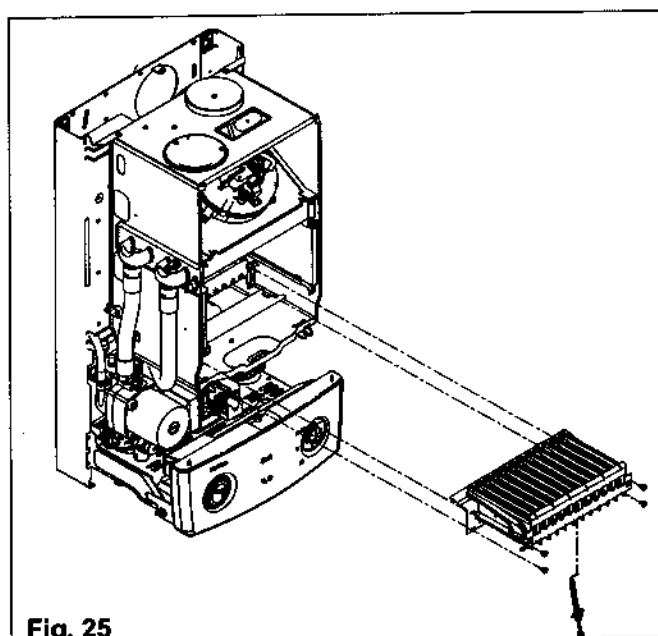


Fig. 25

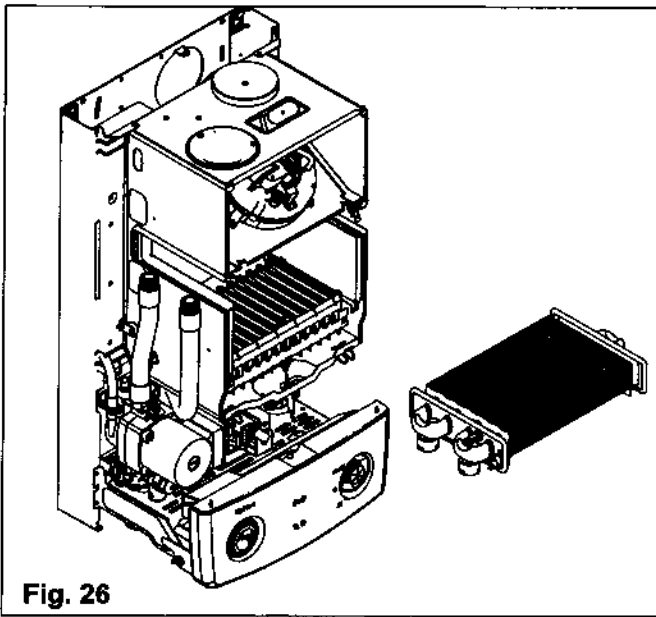


Fig. 26

6.19 HEAT EXCHANGER fig. 24 & 26

Carry out component removal procedure as described in 6.5.

Remove outer combustion cover by un-clipping the two retaining clips located at the base of the combustion cover, gently pull the cover towards you before lifting and disengaging it from the top retaining lugs. Locate and remove the two screws at the base of the inner combustion cover, pull the cover towards you before lifting and disengaging it from the top retaining lugs. Remove locking pins and disconnect the hoses, from the flow and return connections on the heat exchanger. Disconnect the hot and cold connections on the heat exchanger. Disconnect the electrical plugs from the primary thermistor and high limit thermostat at the heat exchanger, the heat exchanger can now be withdrawn from the appliance. Replace in the reverse order. Ensure all seals are in good condition, taking care to ensure they are replaced correctly.

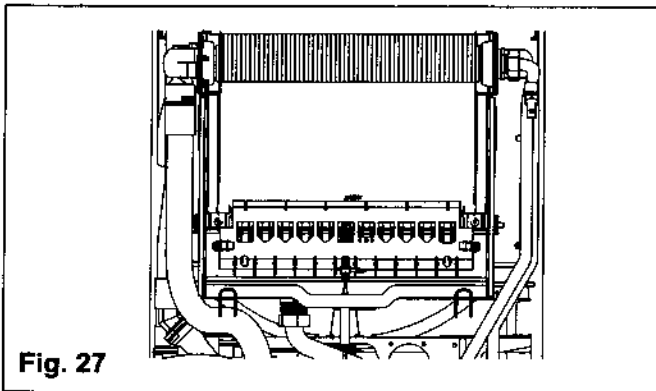


Fig. 27

6.20 AIR PRESSURE SWITCH fig. 1, 24 & 25

Carry out component removal procedure as described in 6.5.

Remove outer combustion cover by un-clipping the two retaining clips located at the base of the combustion cover, gently pull the cover towards you before lifting and disengaging it from the top retaining lugs. Locate and remove the two screws holding the air pressure switch to the combustion chamber. Disconnect the electrical connections and silicone tubes attached to the air pressure switch, noting their positions. Replace in the reverse order. Ensure all seals are in good condition, taking care to ensure they are replaced correctly.

6.18 FLUE FAN fig. 24 & 28

Carry out component removal procedure as described in 6.5.

Remove outer combustion cover by un-clipping the two retaining clips located at the base of the combustion cover, gently pull the cover towards you before lifting and disengaging it from the top retaining lugs. Disconnect the electrical connections and silicone tubes attached to the fan, noting their positions. Locate and remove the combustion test point screws and the cross head screw which retains the combustion analysis test point assembly, push the test point into the fan housing, locate and remove the three screws which secure the fan to the flue hood, ease the fan from its location. Replace in the reverse order. Ensure all seals are in good condition, taking care to ensure they are replaced correctly.

6.21 EXPANSION VESSEL

Due to the compact design of this appliance, removal and/or replacement of the expansion vessel requires the appliance to be removed from the wall, if this is deemed impractical, an external expansion vessel may be fitted to the return pipe as close to the appliance as possible.

6.22 EXPANSION VESSEL (removal) fig. 1

Carry out component removal procedure as described in 6.5.

Isolate gas, water and electrical supplies from the appliance. Disconnect and remove the electrical supply cable from the appliance. Disconnect all service valves and connections from the appliance. Disconnect the flue from the appliance.

The appliance can now be lifted from its mounting bracket. Lay the appliance on its side and disconnect the expansion pipe from the vessel, slacken and remove the locknut that secures the lower part of the vessel to the appliance frame. Locate and remove the six screws that secure the vessel top holding plate, remove the plate. The expansion vessel can now be removed. Replace in the reverse order. Ensure all seals are in good condition, taking care to ensure they are replaced correctly. **GAS AND WATER SOUNDNESS CHECKS MUST BE CARRIED OUT.**

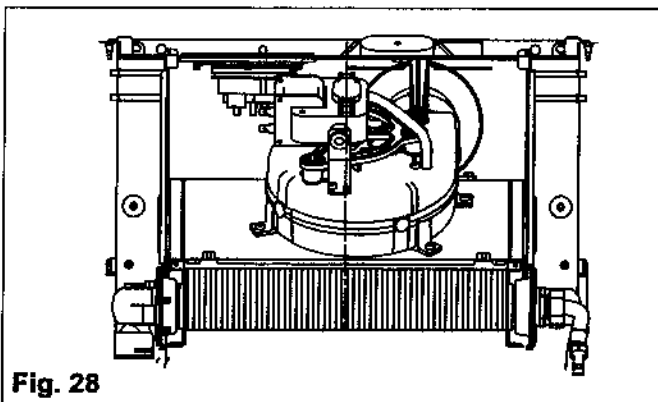


Fig. 28

7.1 CHECKING APPLIANCE OPERATION

When carrying out any repairs or servicing to the appliance the relevant commissioning procedure must be undertaken to ensure the continued safe operation of the appliance. Particular attention should be made to ensure gas soundness, water soundness, and the electrical integrity of the appliance.

7.2 AT REST MODE

when the appliance is at rest, (no demand for heat or water) the green LED will be illuminated to indicate there are no faults, if the appliance has been inactive for approximately 24 hours, it will energise the pump for a short period to ensure the pump does not seize due to inactivity. The appliance also has built-in frost protection, which will operate even if the mode selector switch is in the 'off' position.

7.3 HOT WATER MODE

Opening a hot water outlet and enabling a flow rate of 2 litres or more, causes the domestic water flow switch to activate. Activation of the domestic hot water flow switch allows the fan to run. When the fan is running it proves (switches) the air pressure switch. The air pressure switch delivers current to the PCB and enables an ignition sequence to begin. The ignition sequence begins with the energising of the gas valve and a simultaneous sparking at the spark/sense electrode. This will continue for approximately 10 seconds or until successful ignition has been established. (If no ignition has been established within the ten seconds, the ignition attempt will be terminated and the appliance will go to lockout) When ignition has been established, the appliance will quickly achieve and maintain the desired hot water temperature (see 5.13). The appliance monitors the setting of the hot water potentiometer against the temperature of the secondary thermistor, and increases or decreases current to the modulating coil, this in turn adjusts the burner pressure, thus enabling the temperature to be maintained to within a few degrees. When the temperature of the secondary thermistor exceeds the setting of the hot water potentiometer, ignition will be terminated until the temperature drops.

NOTE;

The primary thermistor will override the secondary thermistor if the temperature of the primary thermistor exceeds 80°C.

When the mode selector switch is set to heating and hot water, the pump will over-run for 30 seconds after any demand for heating or water has been satisfied.

When the mode selector switch is set to hot water only, the fan will over-run for one minute if the temperature of the primary thermistor exceeds 55°C.

7.4 HEATING MODE

With all controls calling for heat, the pump and fan will run. When the fan runs it proves the air pressure switch. The air pressure switch delivers current to the PCB and enables an ignition sequence to begin. The ignition sequence begins with the energising of the gas valve and a simultaneous sparking at the spark/sense electrode. This will continue for approximately 10 seconds or until successful ignition has been established. (If no ignition has been established within the ten seconds, the ignition attempt will be terminated and the appliance will go to lockout) When ignition has been established, the appliance output will be increased to 75% of the maximum for a period of fifteen minutes, whereby output will be increased to maximum.

The appliance monitors the setting of the heating potentiometer against the temperature of the primary thermistor, and increases or decreases current to the modulating coil, this in turn adjusts the burner pressure, thus enabling the temperature to be maintained to within a few degrees. (see 5.10) When the temperature of the primary thermistor exceeds the setting of the heating potentiometer, ignition will be terminated and the appliance will anti-cycle for three minutes (timer delay). When a new ignition sequence begins the output of the appliance is set at minimum for two minutes.

NOTE;

Any demand for hot water has the priority. If there is a demand for hot water whilst the appliance is anti-cycling, the timing will be cancelled once the demand for hot water has been satisfied.

If a jumper tag has been inserted at CM1 on the PCB, the operation at minimum is reduced from two minutes to 30 seconds, the 15 minute operation at 75% output is cancelled, and the three minute anti-cycle is also cancelled.

7.5 FROST PROTECTION MODE

The built-in frost protection system will operate the appliance in the OFF, HOT WATER ONLY MODE, AND HEATING AND HOT WATER MODE. Should the temperature of the appliance fall to 7°C. the pump will run for fifteen minutes, this will be repeated every two hours. Should the temperature rise above 10°C. the fifteen minutes will be cancelled. Should the temperature fall below 5°C. the boiler will fire at minimum output until the temperature of the appliance exceeds 30°C.

NOTE;

If the appliance is at lockout the frost protection mode is disabled.

Although the frost protection mode is active even when the appliance is switched off. The electrical supply to the appliance must be maintained for it to function.

Any demand for hot water or heating will reset any frost protection settings.

7.6 BURNER PRESSURE SETTINGS

There are three burner pressure settings, which require to be checked – and/or adjusted – during commissioning, or if the printed circuit board or gas valve have been removed and/or replaced. The three settings must be checked and adjusted in the following order.

MAXIMUM (10.1 mbar)

Remove casing as described in 4.7.1. Isolate the appliance from the electrical supply, turn the mode selector switch to the hot water only position, remove the mode selector switch and adjust the hot water potentiometer to maximum (clockwise), attach a suitable manometer to the gas valve outlet test nipple. Remove silicone compensation tube from gas valve regulator. Restore the electrical supply to the appliance and open a hot water outlet – preferably the bath-tap – ensuring a high flow rate. The appliance will now fire and go to maximum gas rate (10.1mbar), if the pressure is wrong it should be adjusted as follows, remove the protective cap from the gas valve modulator coil, slowly adjust the outer nut (see fig. 17) clockwise to increase the pressure or anti-clockwise to decrease. Close hot water outlet. The minimum pressure can now be checked/adjusted.

MINIMUM (1.5 mbar)

Isolate the appliance from the electrical supply. Remove the black plug from the gas valve modulating coil. Restore the electrical supply to the appliance and open a hot water outlet – preferably the bath-tap – ensuring a high flow rate. The appliance will now fire and go to minimum gas rate (1.5mbar), if the pressure is wrong it should be adjusted as follows, slowly adjust the inner screw on the gas valve modulating coil, (see fig. 17) clockwise to increase the pressure or anti-clockwise to decrease. Close hot water outlet. Isolate the appliance from the electrical supply. Replace black plug to modulating coil, and replace protective cap on modulating coil. The minimum heating pressure can now be checked/adjusted.

HEATING MINIMUM (1.9 mbar)

Restore the electrical supply to the appliance and ensure all controls are calling for heat, turn the appliance mode selector switch to heating and hot water, the appliance will now fire. Once the appliance has ignited, open – for a few seconds only – a hot water outlet, the burner will now remain on minimum output (1.9mbar) for 30 seconds. Any checks or adjustments to the 'minimum heating pressure' must be done during this period. If the pressure is wrong it should be adjusted as follows, remove the protective cap located on the right hand side of the printed circuit board cover (fig.17a). Locate the minimum

heating potentiometer (fig.17b), and – with the aid of a small screwdriver – gently rotate the potentiometer clockwise to increase the pressure or anti-clockwise to decrease. Once the checks/adjustments has been concluded, isolate the appliance from the electrical supply, replace the protective cap, remove manometer, tighten test nipple screw, check for soundness, refit compensation tube, and refit casing.

7.7 COMBUSTION ANALYSIS TEST

The appliance has a built-in facility which enables combustion analysis checks to be carried out. To activate the combustion analysis mode, proceed as follows.

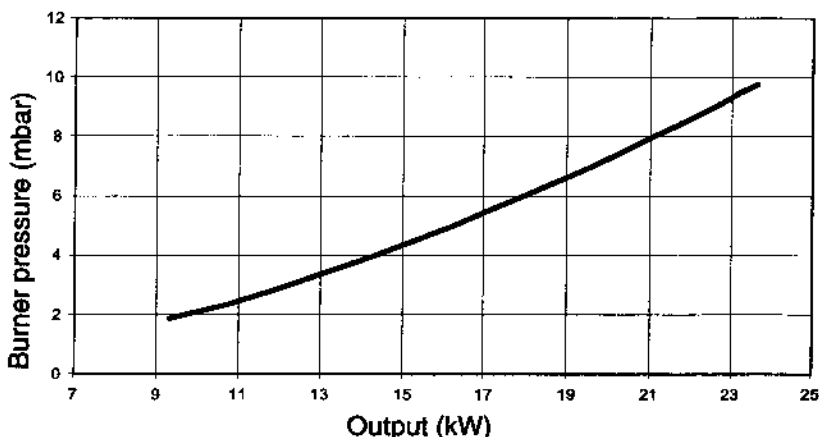
Locate and remove combustion test point screw, (see fig. 1&16) insert flue gas analyser probe into combustion test point, remove mode selector switch and rotate selector shaft clockwise until it can go no further, wait until the yellow LED begins to flash, turn the selector shaft back to the heating position. The appliance will now enter its combustion analysis mode whereby it will fire at maximum output in the heating mode for fifteen minutes, without modulating until the maximum operating temperature is realised. To gain accurate information, ensure the flue gas analyser has been set properly, and that the analysis is carried out when the appliance is on maximum output. Once the analysis has been completed, re-fit the mode selector switch, remove the flue gas analyser probe and replace the test point screw.

7.8 CHECKING THE EXPANSION VESSEL

Carry out procedure as described in 6.5. Using a suitable pressure gauge, remove dust cap on expansion vessel and check the charge pressure. The charge pressure should be between 0.7 – 0.8 BAR. If the charge pressure is less, use a suitable pump to increase the charge. Please note, you must ensure the safety valve is in the open position whilst re-charging takes place. Replace dust cap and carry out the relevant commissioning procedures as detailed in section.

7.9 ELECTRO-MECHANICAL FAULTS

Before carrying out any fault finding or component replacement, ensure the fault is not attributable to any aspect of the installation, for example, external wiring fault, hot & cold services reversed, service valves closed, gas supply turned off, etc.



7.10 POSSIBLE INSTALLATION FAULTS

FAULT	POSSIBLE CAUSES	REMEDY
APPLIANCE FIRES THEN LOCKOUTS	INCORRECT GAS PRESSURE FLUE BLOCKED OR BROKEN	CHECK INCOMING PRESSURE AND/OR BURNER PRESSURES CHECK FLUE ASSEMBLY
APPLIANCE WON'T FIRE FOR HOT WATER	HOT & COLD PIPES REVERSED FLOW REGULATOR BLOCKED INSUFFICIENT FLOW RATE	CHECK EXTERNAL PLUMBING REMOVE AND CLEAN INCREASE FLOW RATE
APPLIANCE WON'T FIRE FOR HEATING	EXTERNAL CONTROL OR WIRING FAULT OR WIRING	CHECK EXTERNAL CONTROLS
APPLIANCE FIRES FOR HEATING BUT NO CIRCULATION AROUND SYSTEM	FLOW & RETURN SERVICE VALVES CLOSED AIR IN APPLIANCE PUMP STUCK DEBRIS IN SYSTEM	OPEN SERVICE VALVES OPEN DUSTCAP ON 'AAV' OPEN VENT PLUG ON PUMP AND ROTATE SHAFT FLUSH SYSTEM
APPLIANCE INACTIVE NO 'LED's SHOWING	ELECTRICAL SUPPLY FAULT BLOWN FUSE	CHECK SUPPLY TO APPLIANCE FOR 240V BETWEEN 'L' & 'N' CHECK AND REPLACE

7.11 ELECTRICAL CHECKS

Any electrical checks must be carried out by a suitably qualified person.

7.11.1 EARTH CONTINUITY TEST

Isolate the appliance from the electrical supply, and using a suitable multi-meter carry out a resistance test. Connect test leads between an appliance earth point and the earth wire of the appliance supply cable. The resistance should be less than 1 OHM. If the resistance is greater than 1 OHM check all earth wires and connectors for continuity and integrity.

7.11.2 SHORT CIRCUIT CHECK

Isolate the appliance from the electrical supply, and using a suitable multi-meter, carry out a short circuit test between the Live & Neutral connections at the appliance terminal strip. (fig. 14)

Repeat above test on the Live & Earth connections at the appliance terminal strip. (fig. 14)

NOTE

Should it be found that the fuse has failed but no fault is indicated, a detailed continuity check will be required to trace the fault. A visual inspection of components may also assist in locating the fault.

7.11.3 POLARITY CHECK

With the appliance connected to the electrical supply and using a suitable multimeter, carry out the following voltage tests. Connect test leads between the Live & Neutral connections at the appliance terminal strip. (fig.14) the meter should read approximately 230V ac. If so proceed to next stage. If not, see 7.11.4.

connect test leads between the Live & Earth connections at the appliance terminal strip. (fig.14) the meter should read approximately 230V ac. If so proceed to next stage. If not, see 7.11.4.

connect test leads between the Neutral & Earth connections at the appliance terminal strip. (fig.14) the meter should read approximately 0 – 15Vac. If so polarity is correct. If not, see 7.11.4

7.11.4 REVERSED POLARITY OR SUPPLY FAULT

Repeat the above tests at the appliance isolator, if testing reveals correct polarity and/or supply at the isolator, re-check wiring and connections between the isolator and the appliance.

If tests on the isolator also reveal reversed polarity or a supply fault, consult the local electricity supplier for advice.

7.11.5 RESISTANCE TO EARTH CHECK

Isolate the appliance from the electrical supply, and using a suitable multi-meter carry out a resistance test. Connect test leads between the Live & Earth connections at the appliance terminal strip. (fig.14) if the meter reads other than infinity there is a fault which must be isolated, carry out a detailed continuity check to identify the location of the fault.

IMPORTANT

These series of checks must be carried out before attempting any fault finding procedures on the appliance. On completion of any task which required the disconnection and re-connection of any electrical wiring or component, these checks must be repeated.

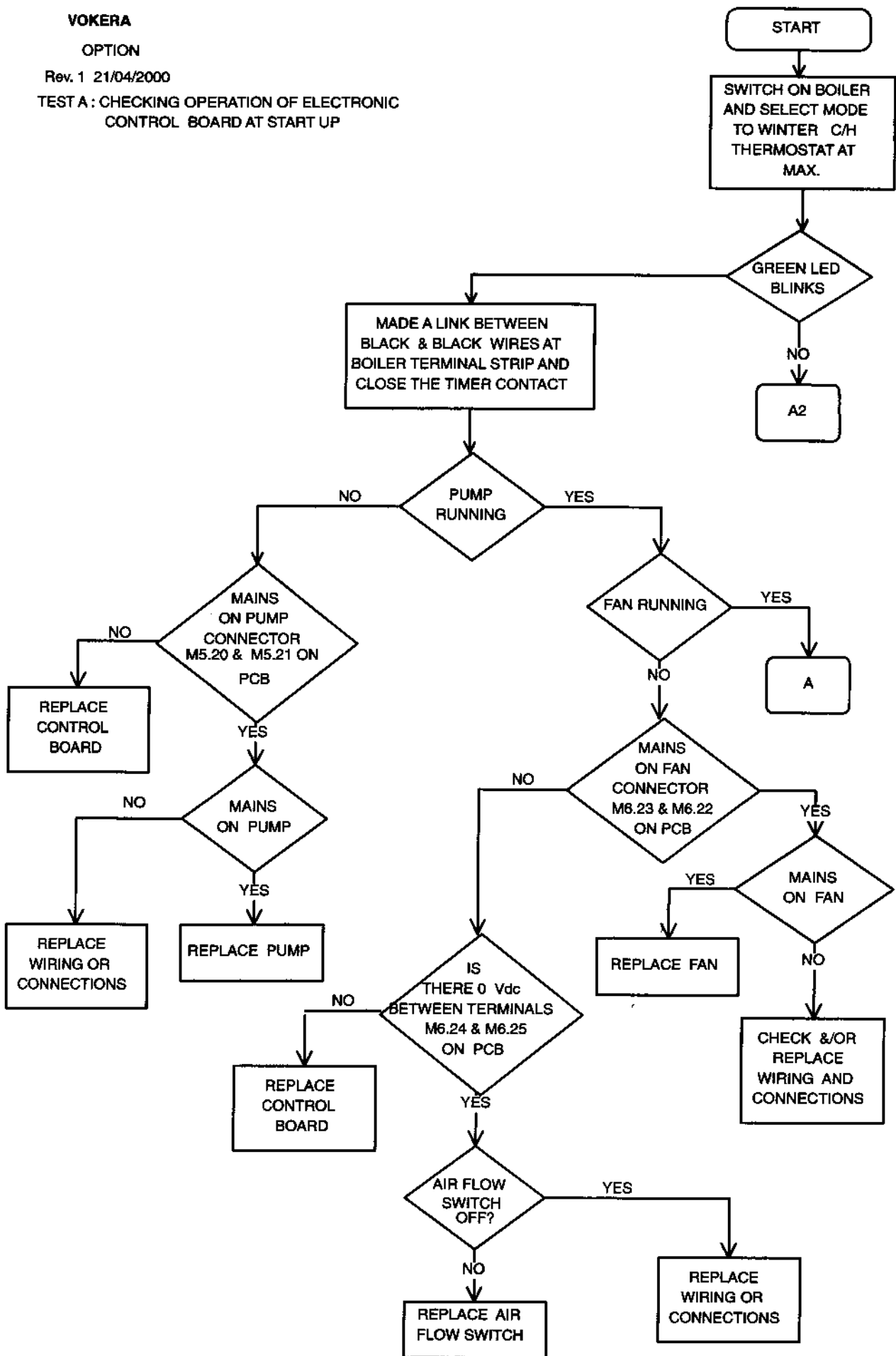
7.12 FAULT FINDING TEST 'A' CHECKING OPERATION OF ELECTRONIC CONTROL BOARD AT START UP

VOKERA

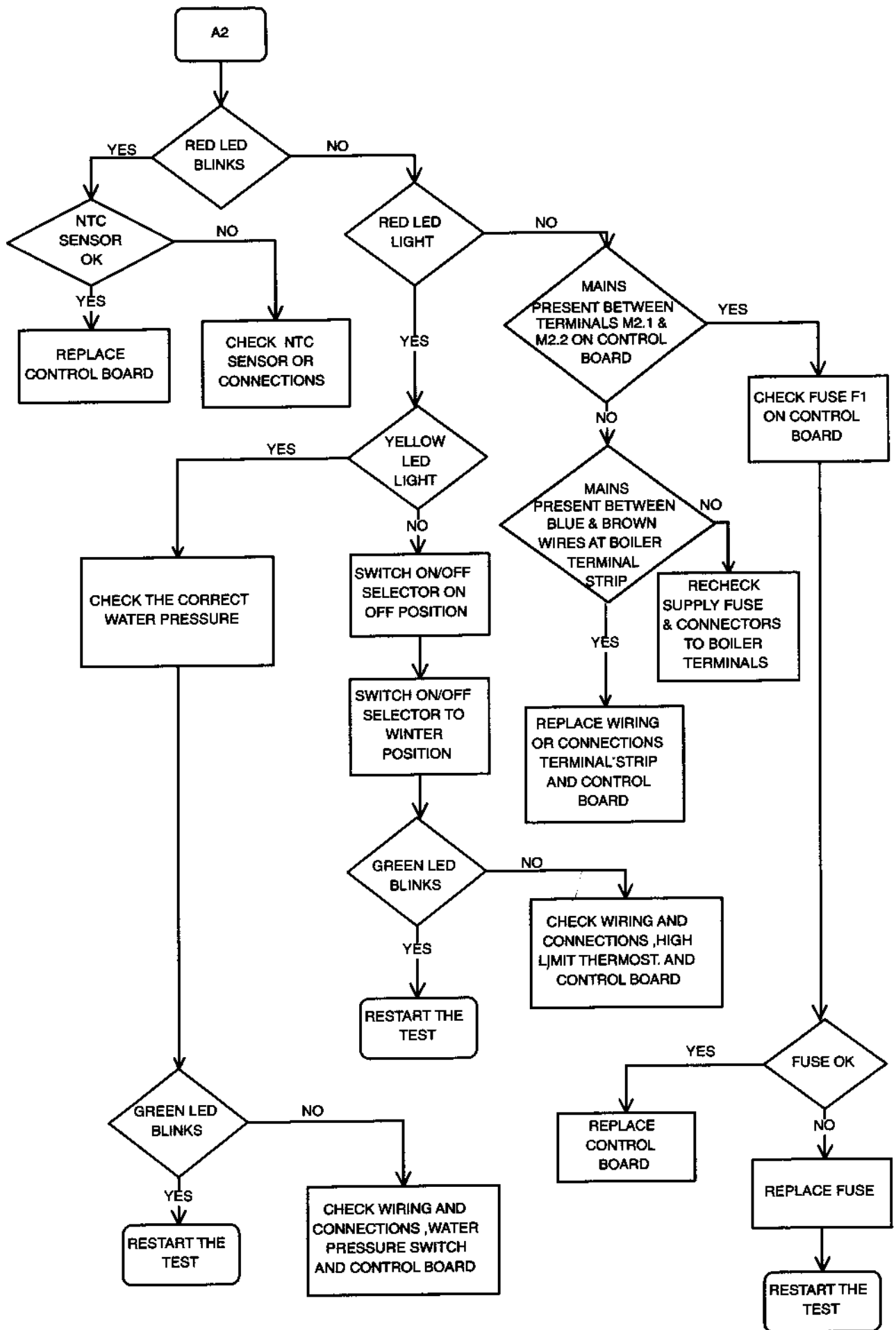
OPTION

Rev. 1 21/04/2000

TEST A : CHECKING OPERATION OF ELECTRONIC CONTROL BOARD AT START UP



7.13 FAULT FINDING TEST 'A'



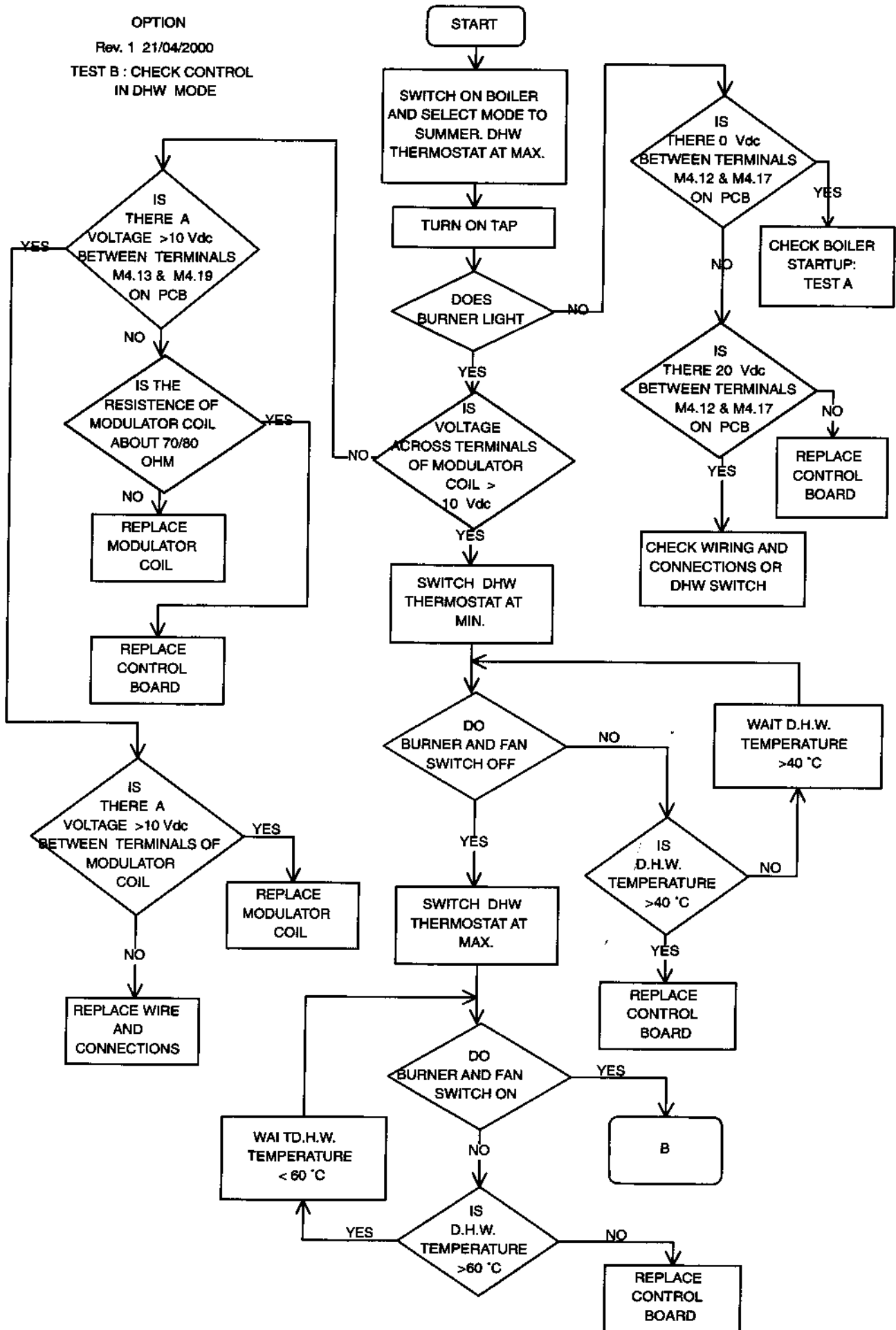
7.14 FAULT FINDING TEST 'A2'

VOKERA

OPTION

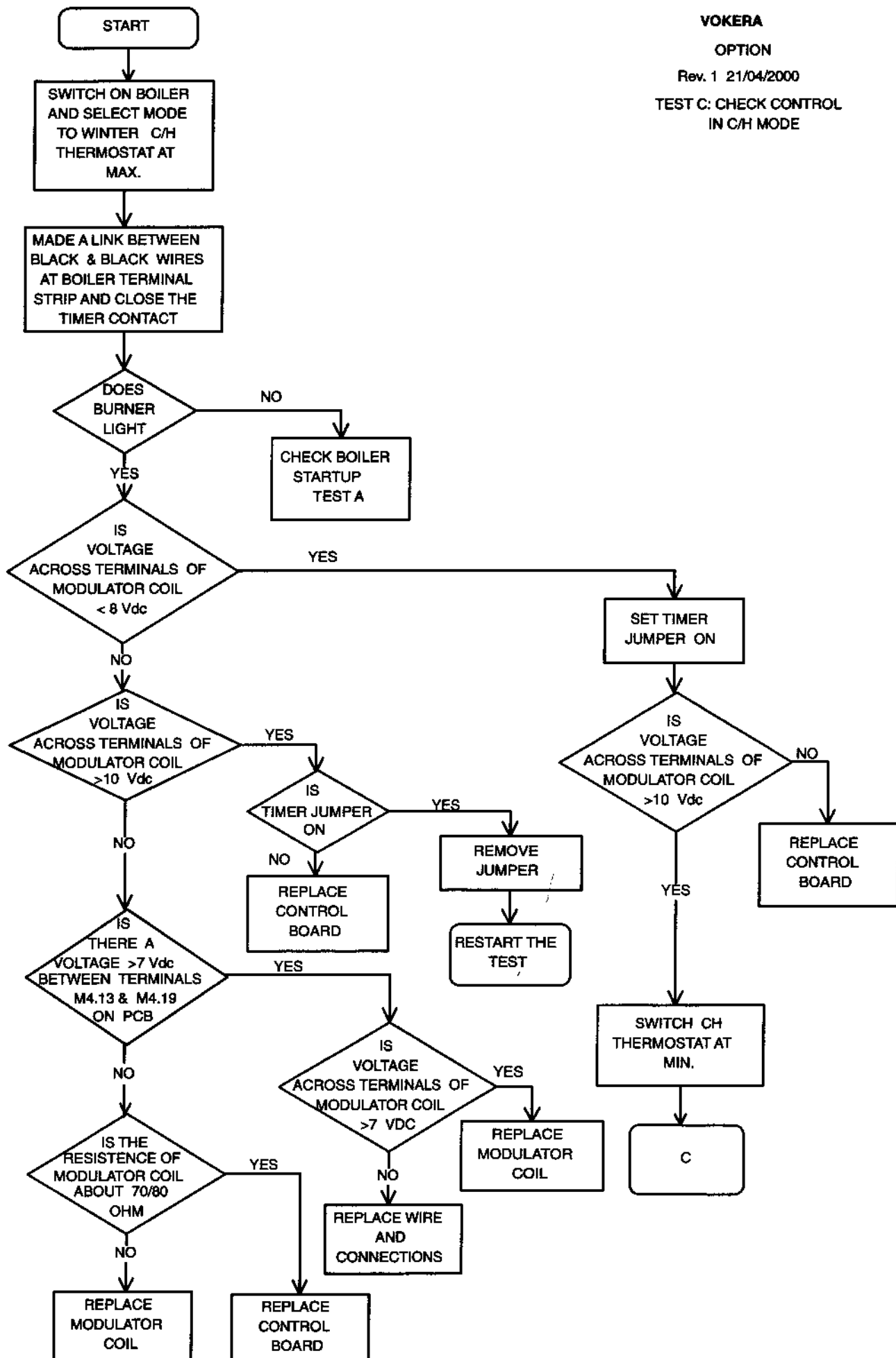
Rev. 1 21/04/2000

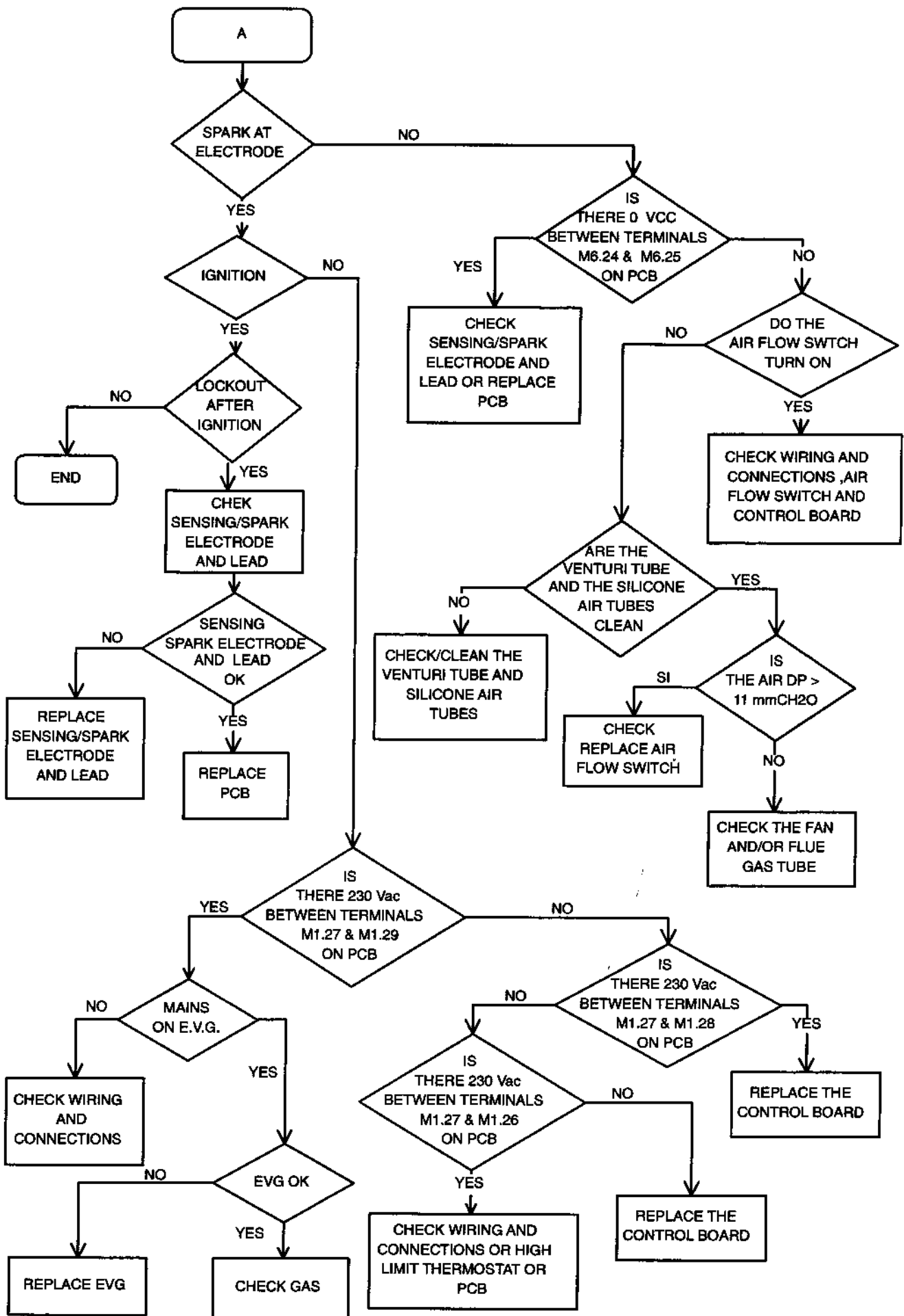
TEST B : CHECK CONTROL
IN DHW MODE



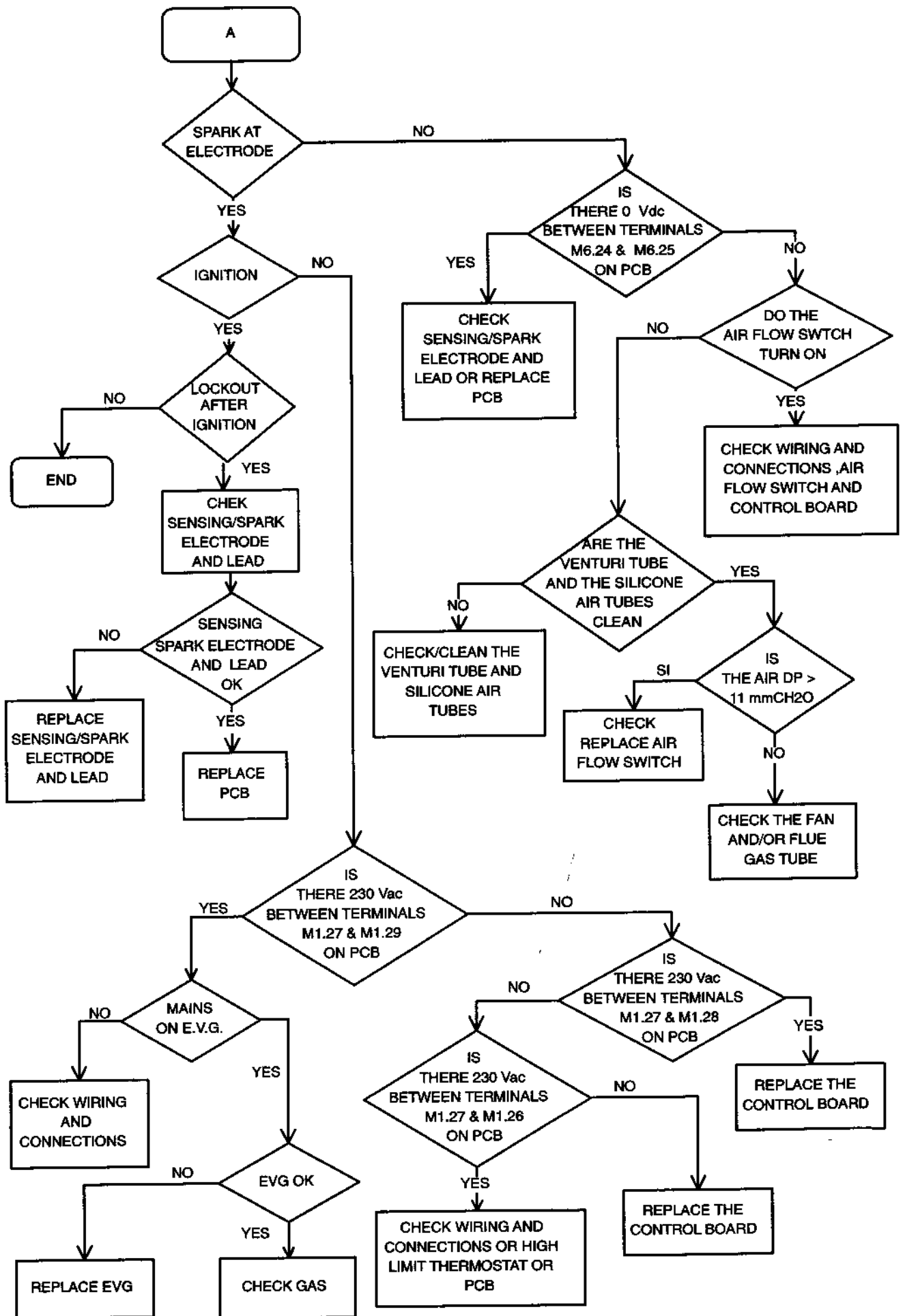
7.15 FAULT FINDING TEST 'B' CHECK CONTROL IN HOT WATER MODE

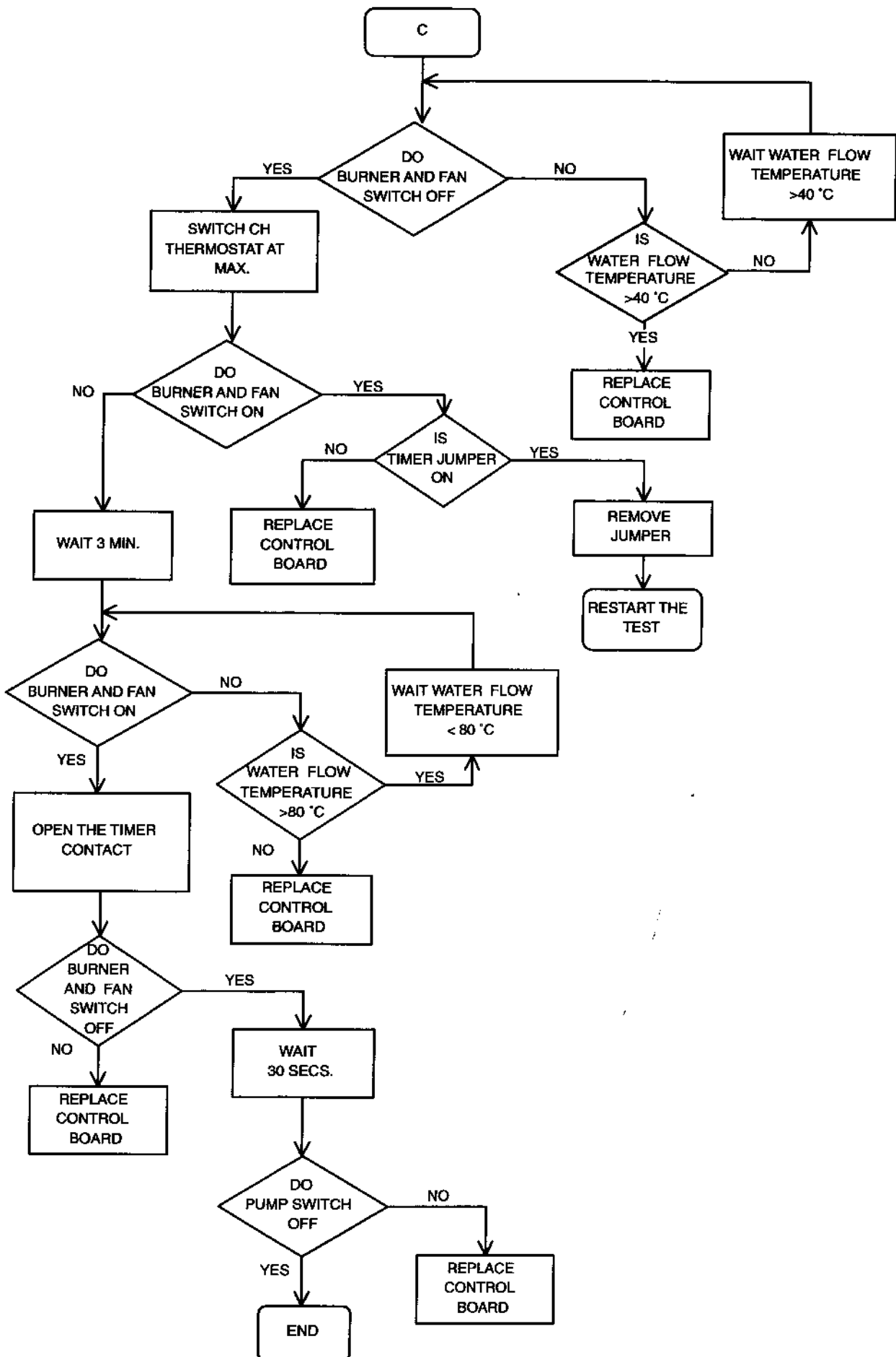
VOKERA
 OPTION
 Rev.1 21/04/2000
 TEST C: CHECK CONTROL
 IN C/H MODE





7.17 TEST 'C' CHECK CONTROL IN HEATING MODE

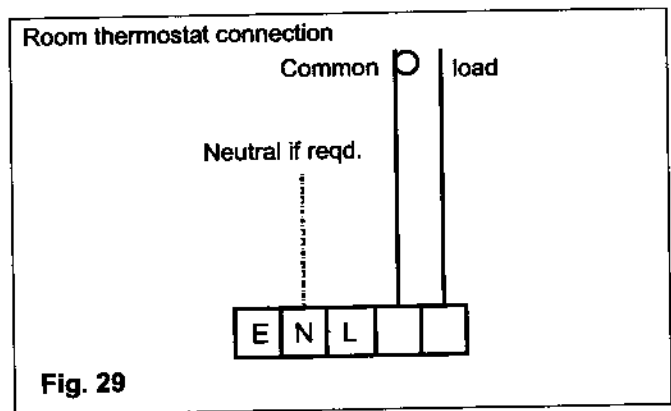




Instructions for installation of room thermostat:

- isolate appliance from electrical supply
- remove casing as described in 4.7.1
- remove electrical cover as described in 4.7.1
- connect common and load wires from room thermostat as shown in fig. 29.

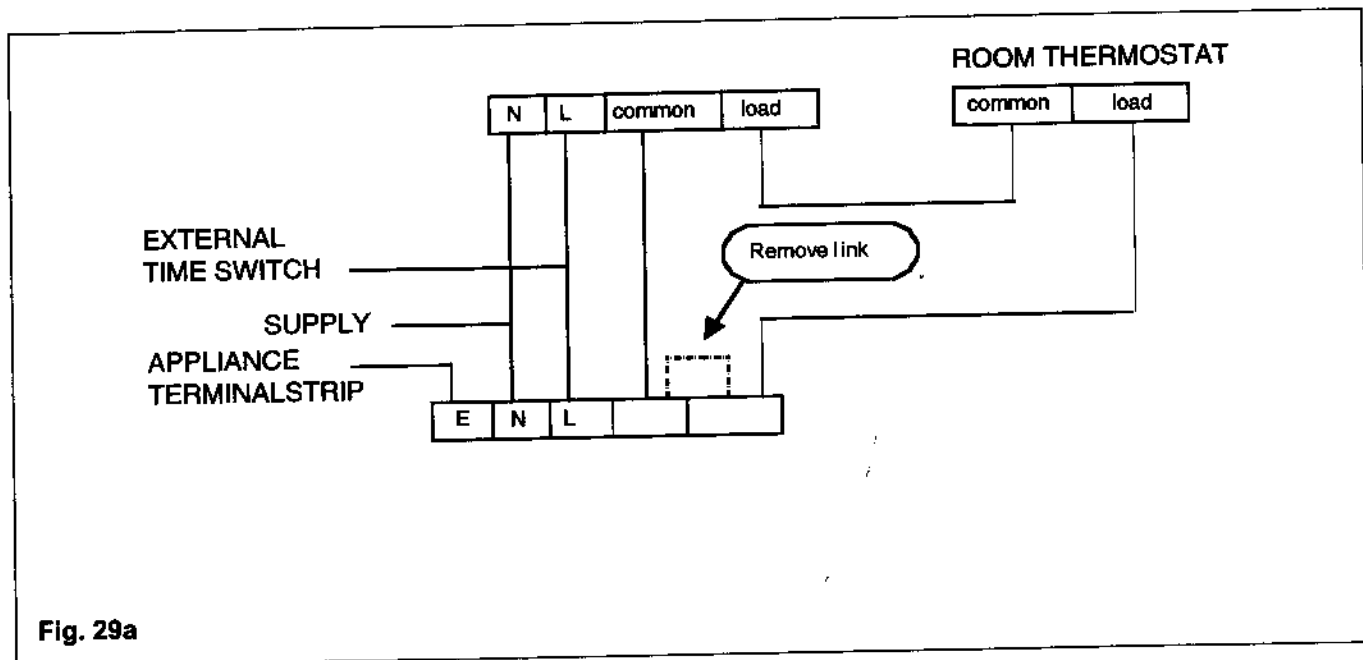
A neutral supply can be taken from the appliance terminal block if required.

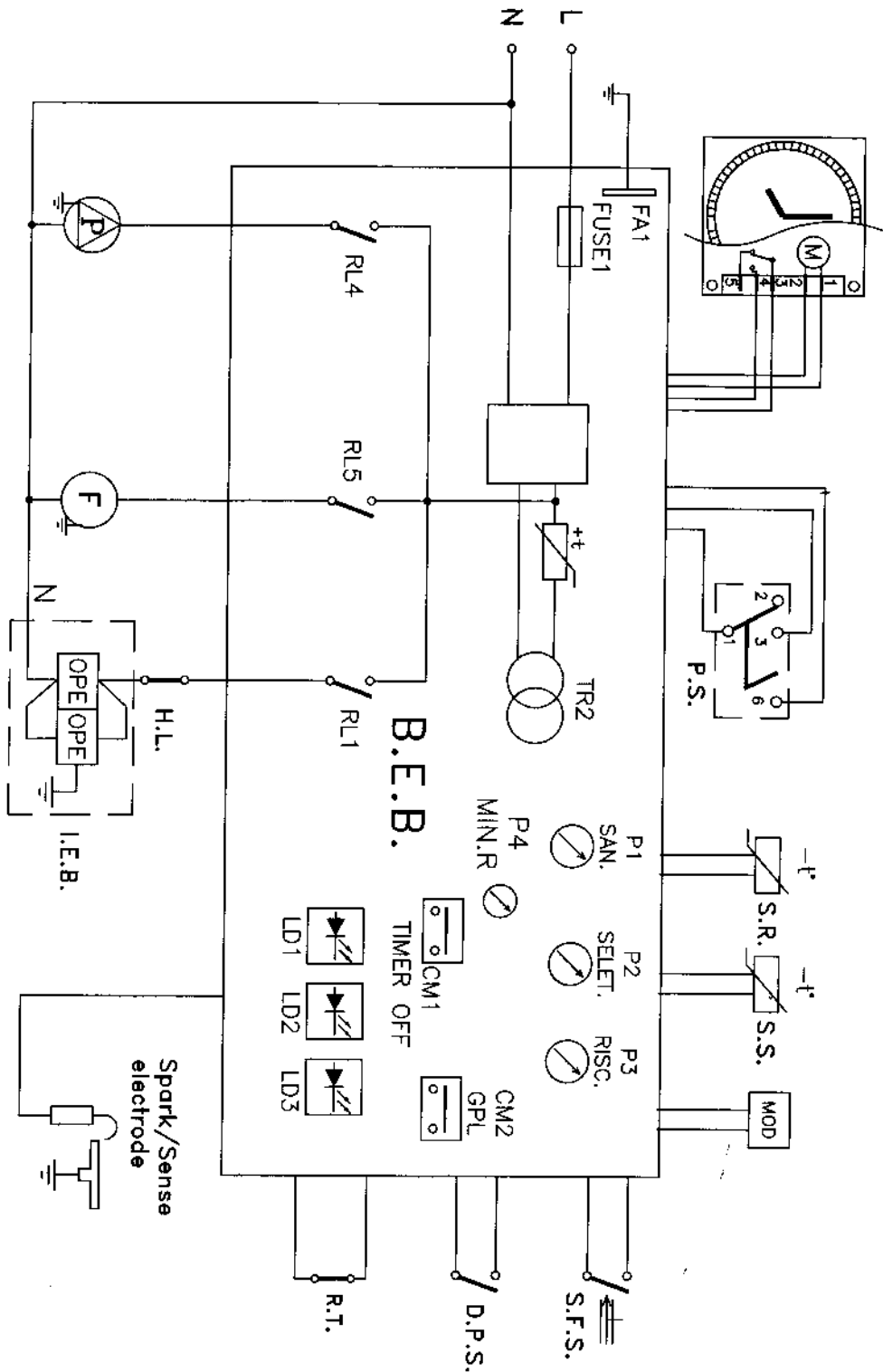


Instruction for installing an external timeswitch

The appliance has a built-in time switch, however an external time switch can be installed if desired. To install an external time switch it is necessary to disconnect the wiring to the integral – built-in – time switch. Isolate the appliance from the electrical supply. Remove the appliance casing as 4.7.1. Remove the PCB cover. Remove the wiring between the integral time switch and plug M3 (see page 31). Remove the black wire from terminal 5 on plug M3 and insert into terminal 6. Refit PCB cover.

Fig. 29a shows a typical wiring diagram using an external time switch

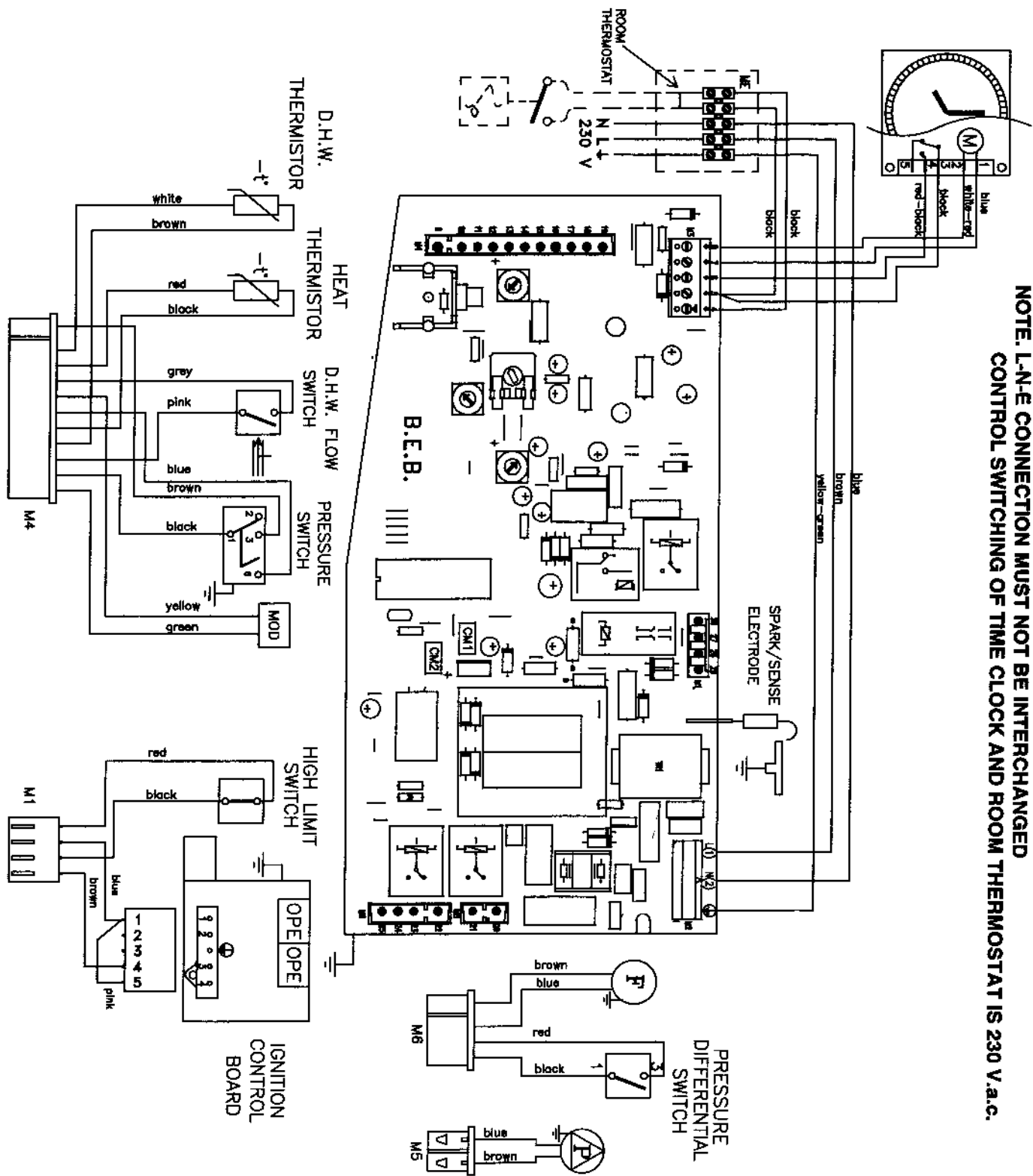




NOTE. L-N-E CONNECTION MUST NOT BE INTERCHANGED

Fig. 32

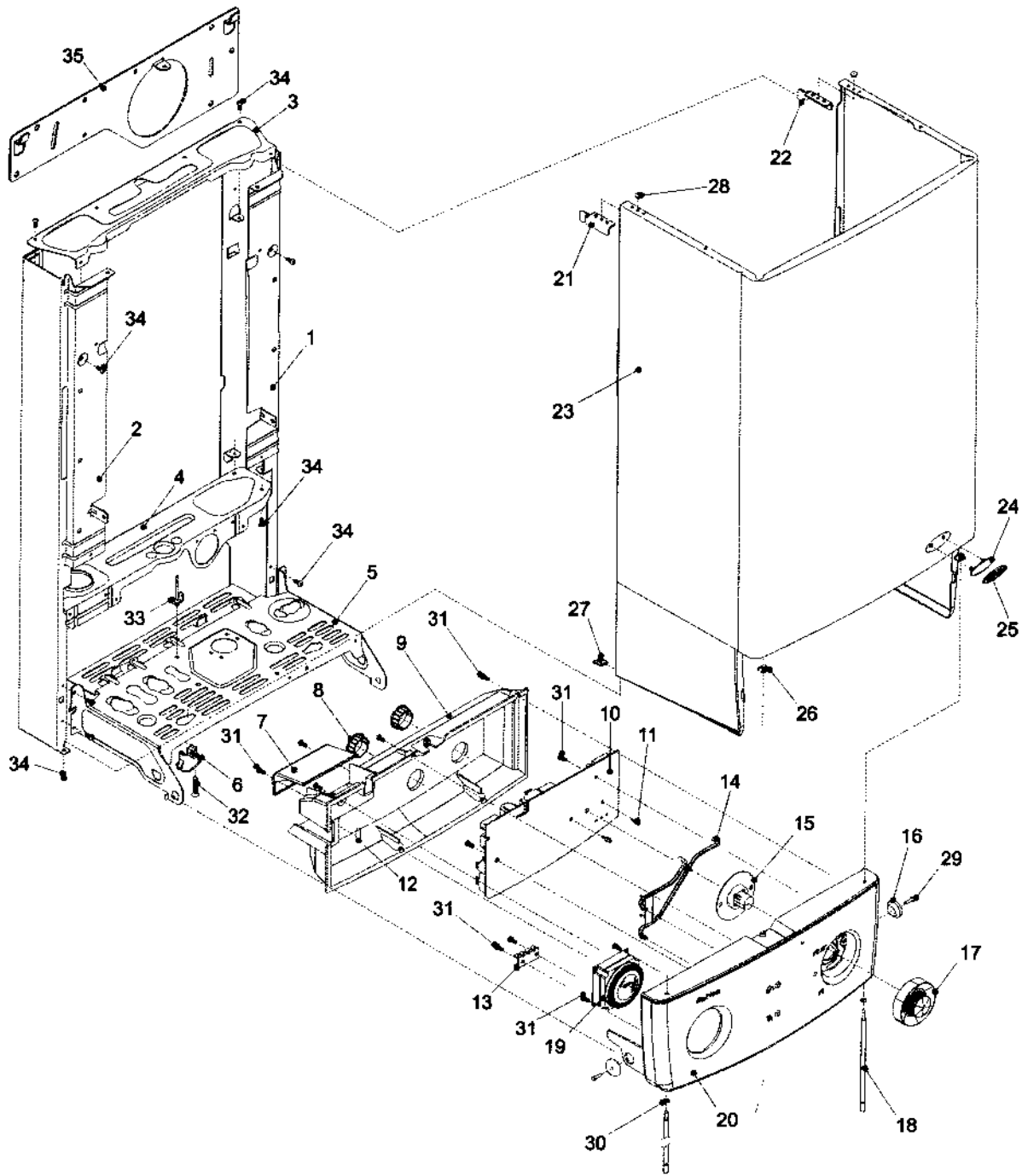
- | | | | |
|------------|-------------------------------|---------------|--|
| Key | | | |
| R.T. | Room thermostat | RL4 | Pump relay |
| S.F.S. | Domestic hot waterflow switch | RL5 | Fan relay |
| P.S. | Pressure switch | LD1 | Led alarm (red) |
| H.L. | High limit thermostat | LD2 | Led ok (green) |
| S.R. | Heat thermistor | LD3 | Led analysis test (blink yellow) |
| S.S. | Domestic hot water thermistor | TR2 | Transformer |
| MOD | Modulator | D.P.S | Differential pressure switch |
| F | Fan | CM2 GPL | Natural gas or L.P.G. selector |
| P | Pump | CM1 TIMER OFF | Timer on off selector |
| SP/SE E. | Spark/Sense electrode | P2 SELECT | Selection of 0 - reset/winter/summer |
| OPE | Gas valve solenoids | P3 RISC. | Central heating temperature control |
| I.E.B. | Ignition control board | P1 SAN | Domestic hot water temperature control |
| B.E.B. | Boiler control board | P4 MIN R. | Central heating minimum adjustment |
| RL1 | Ignition relay | | |



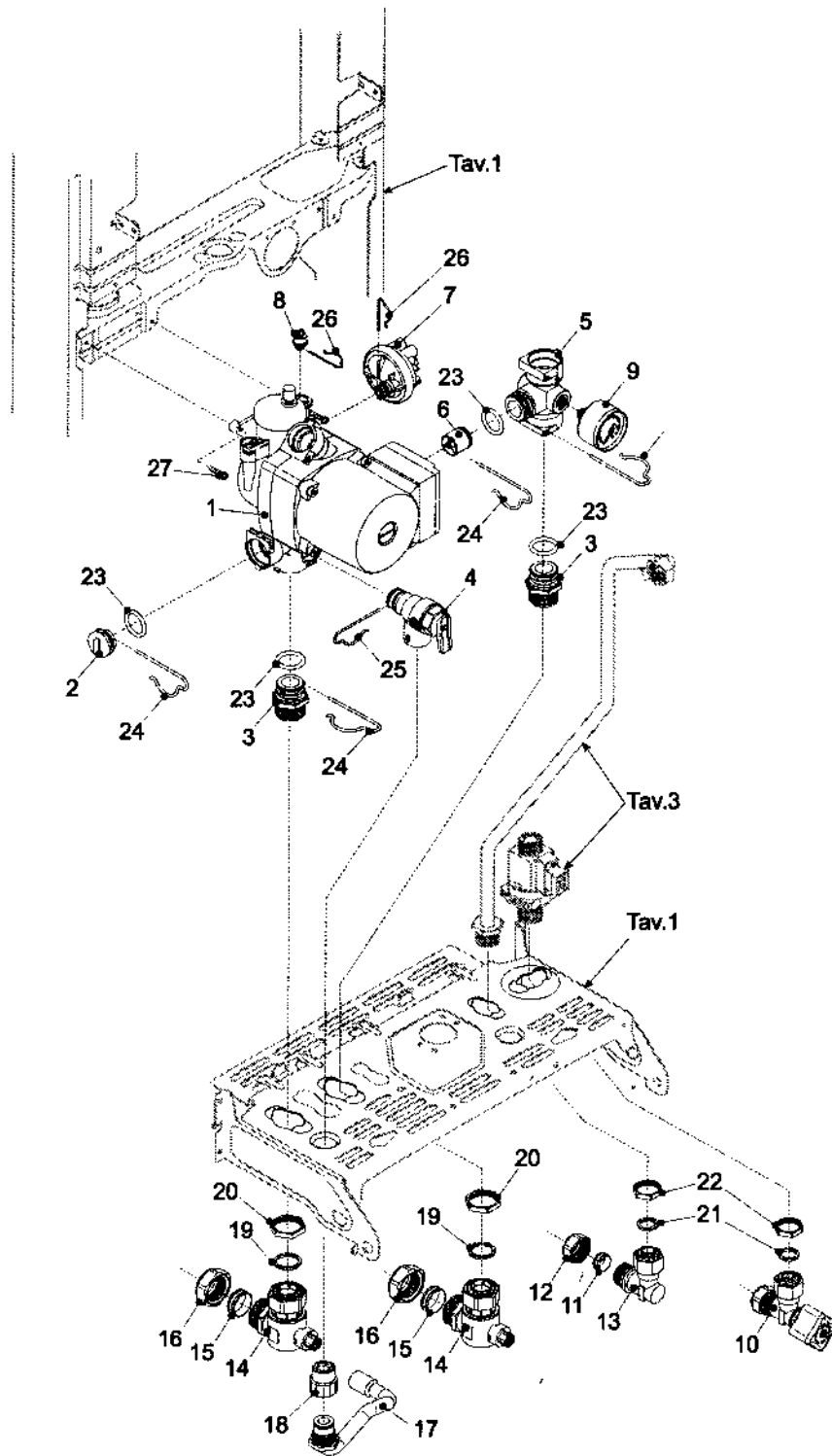
NOTE. L-N-E CONNECTION MUST NOT BE INTERCHANGED
CONTROL SWITCHING OF TIME CLOCK AND ROOM THERMOSTAT IS 230 V.a.c.

Fig. 33

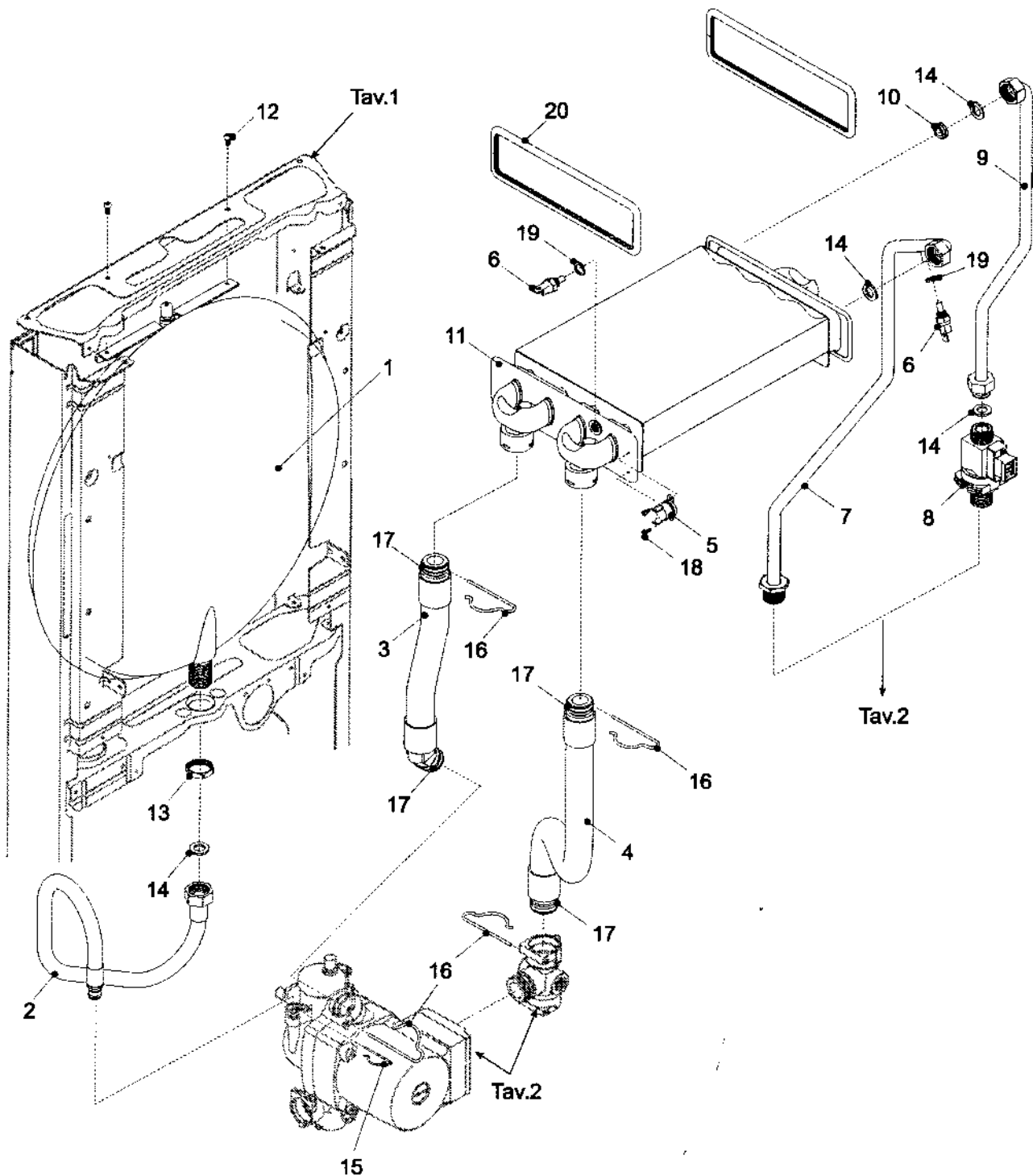
SECTION 9 EXPLODED DIAGRAMS



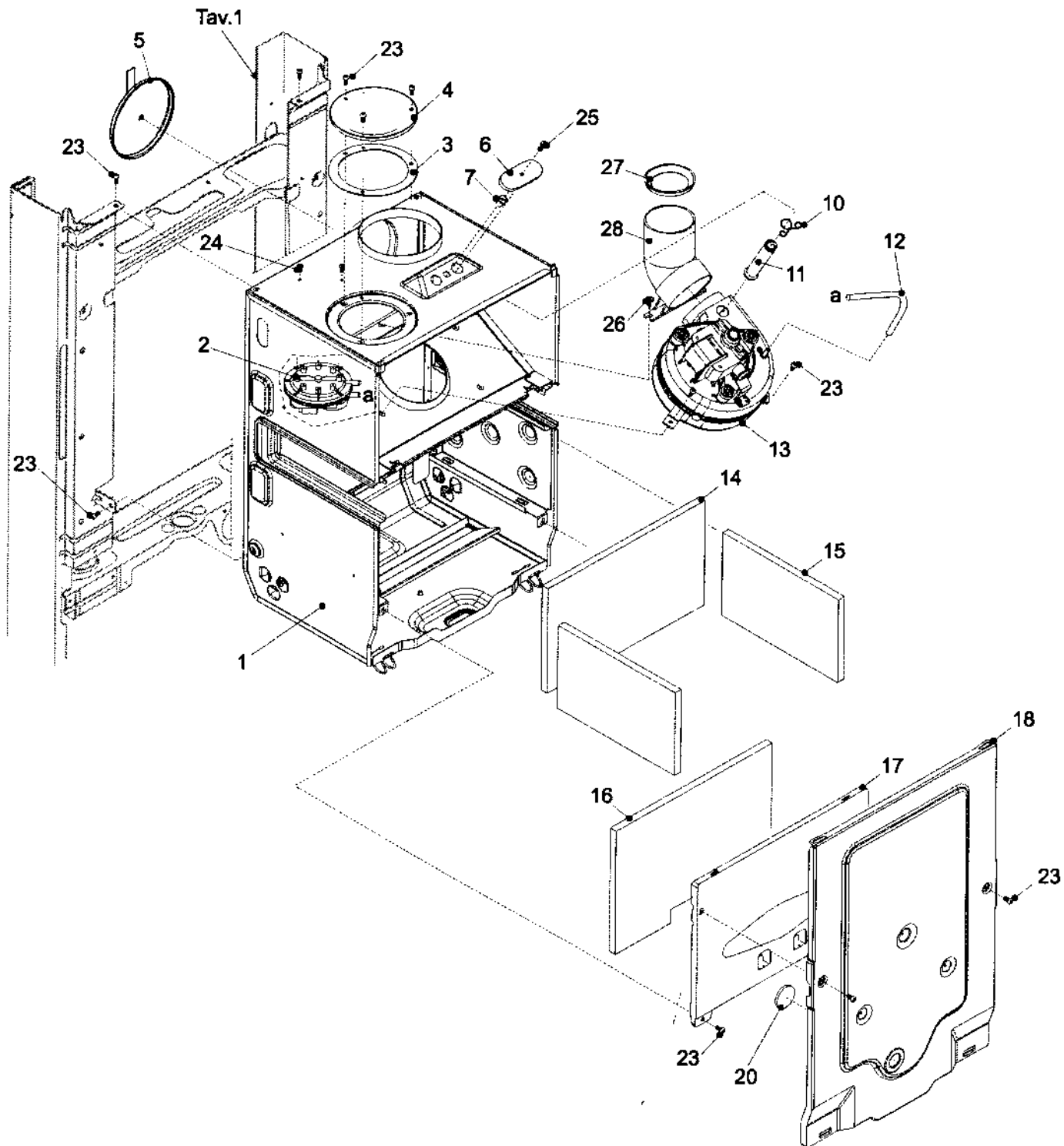
Pos	Description	Code		
1	R.H. PANEL	10020597		
2	L.H. PANEL	10020599	19	TIME SWITCH
3	L.H. PANEL	10020604	20	CONTROL PANEL
4	LOWER TRANVERSE PANEL	10020605	21	LH CASING HOOK
5	DISTRIBUTION PANEL	10020603	22	RH CASING HOOK
6	CABLE ENTRY	61715371	23	APPLIANCE CASING
7	ELECTRICAL COVER	10020608	24	BADGE SUPPORT
8	APERTURE PLUG	10020609	25	BADGE
9	PCB COVER	10020607	26	CAPTIVE NUT
10	PCB	63612201	27	EDGE CLIP
11	POTENTIOMETER SHAFT	63612211	28	3.2MM X 7MM RIVET
12	SPARE FUSE	66018968	29	3.2MM X 12MM RIVET
13	EARTHING STRIP	10020489	30	'O' RING
14	LED LENS TUBE	10020610	31	3.5MM X 12MM SCREW
15	MODE SELECTOR SHAFT	10020893	32	CABLE ENTRY SCREW
16	LOCATING WASHER	63611863	33	EARTH TAG
17	MODE SELECTOR KNOB	10020645	34	3.9MM X 9.5MM SCREW
18	CONTROL PANEL SECURING SCREW	10020611	35	APPLIANCE MOUNTING BRACKET
				10020892
				10020891
				63611882
				63611881
				10020601
				10020308
				62811781
				69915230
				69915128
				69915093
				69915168
				63611869
				69915240
				69915171
				69915037
				69915079
				10020896



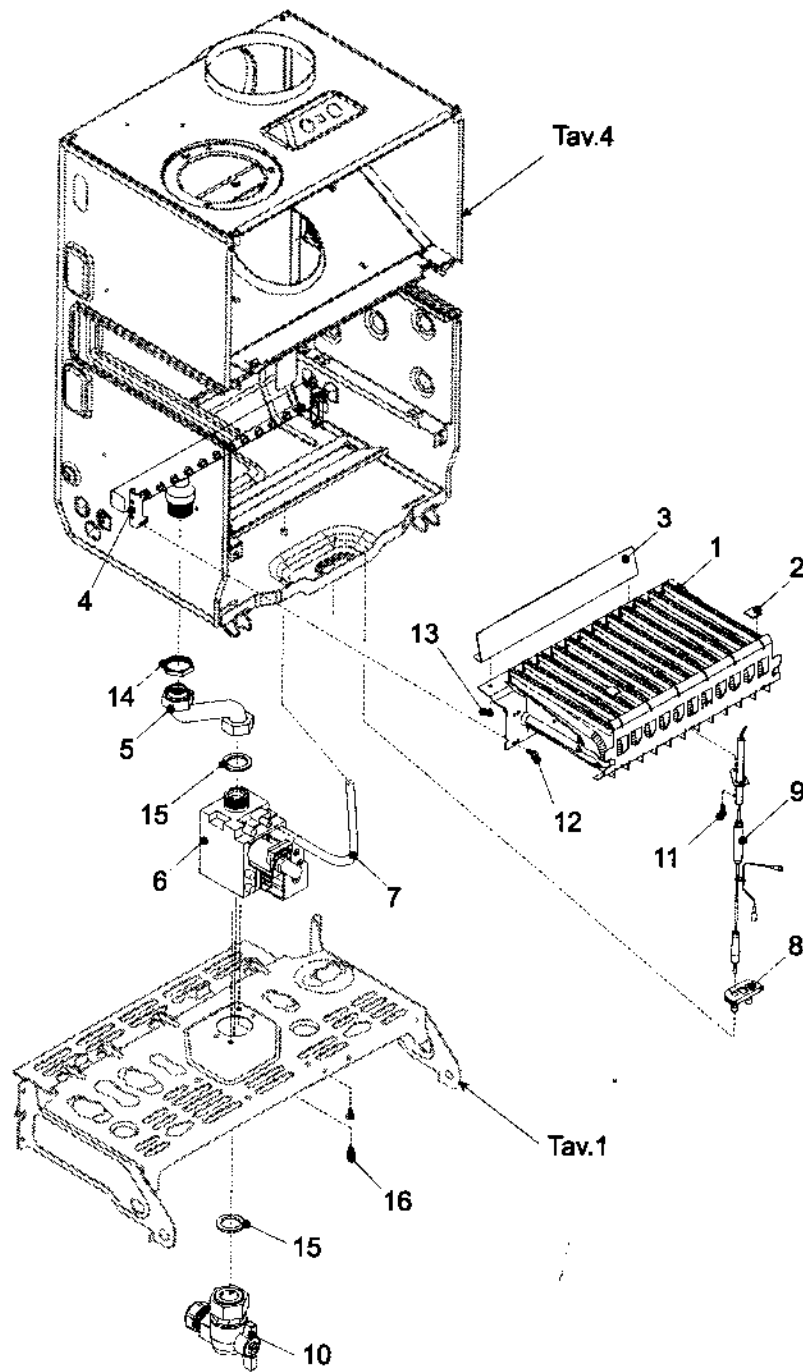
Pos	Description	Code			
1	COMPLETE PUMP	60312225	15	22MM COMPRESSION RING	62811822
2	MANIFOLD PLUG	63612261	16	22MM NUT	62811824
3	SCREWED CONNECTION	63612217	17	SAFETY VALVE OUTLET TAIL	10020898
4	SAFETY VALVE	62811806	18	SAFETY VALVE EXTENSION	63612260
5	FLOW MANIFOLD	10020621	19	FIBRE WASHER	69915237
6	AUTO BYPASS	62912047	20	_IN. LOCK NUT	63114026
7	WATER PRESSURE SWITCH	63612214	21	FIBRE WASHER	69915236
8	MANIFOLD PLUG	63612216	22	_IN. LOCKNUT	67114274
9	PRESSURE GAUGE	10020622	23	O' RING	61716898
10	APPLIANCE STOPCOCK	62817099	24	LOCKING PIN	63612223
11	15MM COMPRESSION RING	62811821	25	LOCKING PIN	63612222
12	15MM NUT	62811823	26	LOCKING PIN	62912165
13	HOT WATER OUTLET TAIL	62811790	27	3.9MM X 19MM SCREW	69915081
14	ISOLATING VALVE	62811789			



Pos	Description	Code			
1	8 LITRE EXPANSION VESSEL	63612204	11	HEAT EXCHANGER	61712310
2	EXPANSION PIPE	62912164	12	3.9MM X 9.5MM SCREW	69915079
3	EXCHANGER RETURN PIPE	63612219	13	_IN. LOCKNUT	67114274
4	EXCHANGER FLOW PIPE	63612218	14	FIBRE WASHER	69915026
5	HIGH LIMIT THERMOSTAT	63612258	15	LOCKING PIN	62912165
6	THERMISTOR	62918484	16	LOCKING PIN	63612223
7	HOT WATER OUTLET PIPE	10020612	17	O' RING	61716898
8	HOT WATER FLOW SWITCH	10020330	18	2.9MM X 6.5MM SCREW	69915243
9	HOT WATER INLET PIPE	10020714	19	ALUMINIUM WASHER	69915041
10	10 LITRE RESTRICTOR	65118009	20	RUBBER SEAL	63612226



Pos	Description	Code		
1	AIR CHAMBER	10020894	15	INSULATION SIDE PANEL 63612231
2	AIR PRESSURE SWITCH	62818195	16	FRONT INSULATION PANEL 63612232
3	SEAL	66018975	17	COMBUSTION COVER 63612228
4	BLANKING PLATE	63118084	18	AIR CHAMBER COVER 10021568
5	BLANKING PLATE	63612233	20	SIGHT GLASS 10021558
6	TEST POINT PLATE	10020624	23	3.9MM X 9.5MM SCREW 69915079
7	CAPTIVE NUT	10020625	24	2.9MM X 6.5MM SCREW 69915077
10	CLIP	10020626	25	3.9MM X 13MM SCREW 69915080
11	TEST POINT	10020627	26	3.9MM X 9.5MM SCREW 69915212
12	SILICONE TUBE	61711457	27	FLANGE 63612586
13	FAN	10020793	28	CONNECTION 63612237
14	REAR INSULATION PANEL	63612230		



Pos	Description	Code			
1	BURNER	63612234	8	GROMMET	63611835
2	CLIP	69915172	9	ELECTRODE LEAD	63612255
3	CROSSLIGHT STRIP	63612238	10	GAS COCK	10020897
4	BURNER BAR	63612235	11	2.9MM X 9.5MM SCREW	69915169
		63612236	12	4.2MM X 9.5MM SCREW	69915082
5	GAS VALVE OUTLET PIPE	63612243	13	3.2MM X 7MM RIVET	69915093
6	GAS VALVE	10021021	14	C3/4IN. LOCKNUT	63114026
7	COMPENSATION TUBE	61711457	15	WASHER	69915023
			16	M4 X 7MM SCREW	69915086

For details of converting appliances to LPG please refer to the instructions supplied with the relevant conversation kit

10.1 TECHNICAL DATA

BURNER PRESSURES	MAXIMUM	MINIMUM
Hot water	37 mbar	5.1 mbar
Heating	37 mbar	6.5 mbar
Gas rate (consumption)	2.02 kg/h	0.76 kg/h
INJECTORS	SIZE	QUANTITY
	0.77mm	12

10.2 RELATED DOCUMENTS

BS 6798		BOILERS OF RATED INPUT NOT EXCEEDING 60 Kw
BS 5449	PART 1	FORCED CIRCULATION HOT WATER SYSTEMS
BS 5546		INSTALLATION OF GAS HOT WATER SUPPLIES FOR DOMESTIC PURPOSES
BS 5440	PART 1	FLUES
BS 5482	PART 1	DOMESTIC BUTANE & PROPANE GAS BURNERS IN PERMAMENT DWELLINGS

10.3 GAS SUPPLY

The gas supply must be connected to the appliance by a competent L.P.G. installer and must be of sufficient size to supply the appliance at its maximum output.

An existing supply must be checked to ensure that it is of adequate size to deal with the maximum rated input of this and any other appliances that it serves.

10.4 GAS SUPPLY INSTALLATION

The entire installation including the meter, must be purged and checked for gas soundness.

10.5 BURNER PRESSURES

Although the burner pressure settings are factory set, it is necessary to check them on completion of the installation. There are three burner pressure settings, which require to be checked – and/or adjusted – during commissioning.

The three settings must be checked and adjusted in the following order:

MAXIMUM (36 mbar)

Remove casing as described in 4.7.1. Isolate the appliance from the electrical supply, turn the mode selector switch to the hot water only position, remove the mode selector switch and adjust the hot water potentiometer to maximum (clockwise), attach a suitable manometer to the gas valve outlet test nipple. Restore the electrical supply to the appliance and open a hot water outlet – preferably the bath-tap – ensuring a high flow rate. The appliance will now fire and go to maximum gas rate (10.1mbar), if the pressure is wrong it should be adjusted as follows, remove the protective cap from the gas valve modulator coil, slowly adjust the outer nut (see fig. 17) clockwise to increase the pressure or anti-clockwise to decrease. Close hot water outlet. The minimum pressure can now be checked/adjusted.

MINIMUM (5.1 mbar)

Isolate the appliance from the electrical supply. Remove the black plug from the gas valve modulating coil. Restore the electrical supply to the appliance and open a hot water outlet – preferably the bath-tap – ensuring a high flow rate. The appliance

will now fire and go to minimum gas rate (1.5mbar), if the pressure is wrong it should be adjusted as follows, slowly adjust the inner screw on the gas valve modulating coil, (see fig. 17) clockwise to increase the pressure or anti-clockwise to decrease. Close hot water outlet. Isolate the appliance from the electrical supply. Replace black plug to modulating coil, and replace protective cap on modulating coil. The minimum heating pressure can now be checked/adjusted.

HEATING MINIMUM (6.5 mbar)

Restore the electrical supply to the appliance and ensure all controls are calling for heat, turn the appliance mode selector switch to heating and hot water, the appliance will now fire. Once the appliance has ignited, open – for a few seconds only – a hot water outlet, the burner will now remain on minimum output (6.5mbar) for 30 seconds. Any checks or adjustments to the 'minimum heating pressure' must be done during this period.

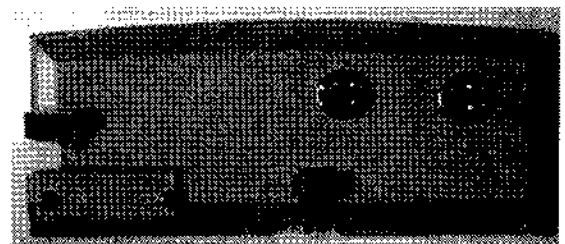


fig. 17a



fig. 17b

SECTION 11 REAR FLUE

11.1 FITTING THE FLUE (see fig. 19)

There are two telescopic flue kits for use with the Option boiler. The standard telescopic flue is suitable for a wall thickness of 200mm – 425mm. The extended telescopic flue is suitable for a wall thickness of 425mm – 760mm. Please ensure the flue kit you have is suitable.

Carefully open the flue pack. Contained within the pack are:

- The outer concentric flue pipe with terminal
- The inner concentric flue pipe
- Exterior trim
- Large rubber gasket
- Locking collar
- Securing screw

Carefully measure the thickness of the wall (dimension x - fig. 19). Take the outer concentric flue pipe (A) and – using a twisting action – ease it over the inner concentric flue pipe (B) (see fig. 20). Add 210 mm to 'x' to give you dimension 'y'. Push both the inner and outer concentric flue pipes together until the total length of the flue assembly is equal to dimension 'y'. Secure the flue assembly in place by using the screw provided (C).

Take the large rubber gasket and secure it firmly over the appliance flue spigot (D). Pass the assembly through the wall mounting bracket and wall leaving 25mm proud of the wall-mounting bracket. Insert the flue restrictor ring into the appliance flue outlet.

The appliance can now be mounted to the wall

bracket.

Pull the flue assembly firmly towards and over the appliance flue spigot (fig. 20 a) and – using a twisting action – ensure the correct seal is made. Insert the locking collar (E) into the groove on the flue assembly as shown in fig. 20 a and rotate to conceal.

Seal the flue assembly to the inside wall using cement or a suitable alternative that will provide satisfactory weatherproofing. The exterior trim can now be fitted.

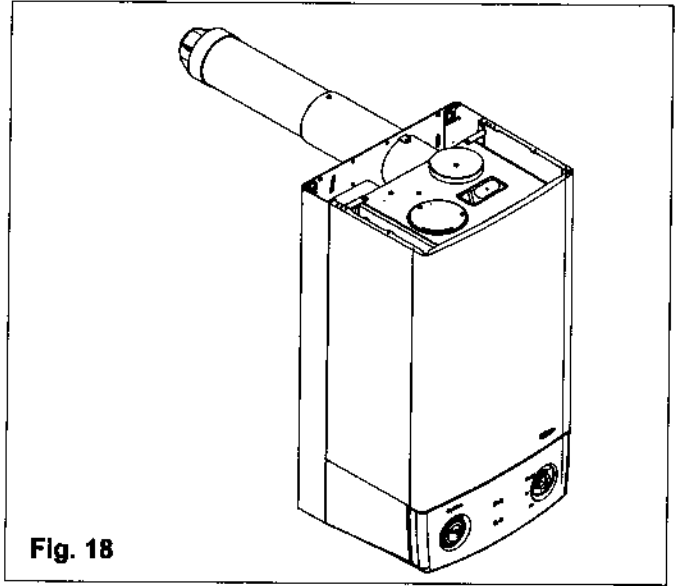


Fig. 18

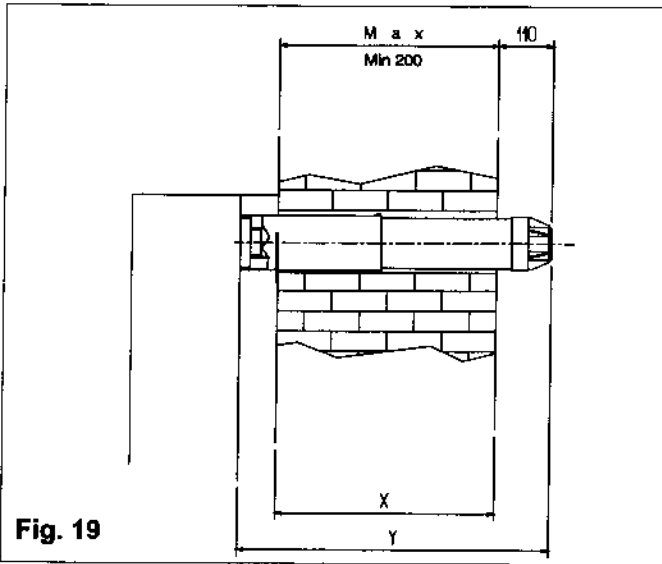


Fig. 19

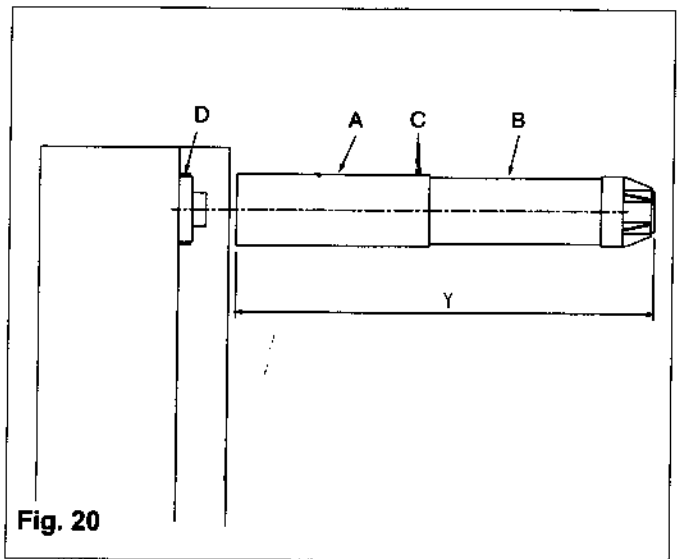


Fig. 20

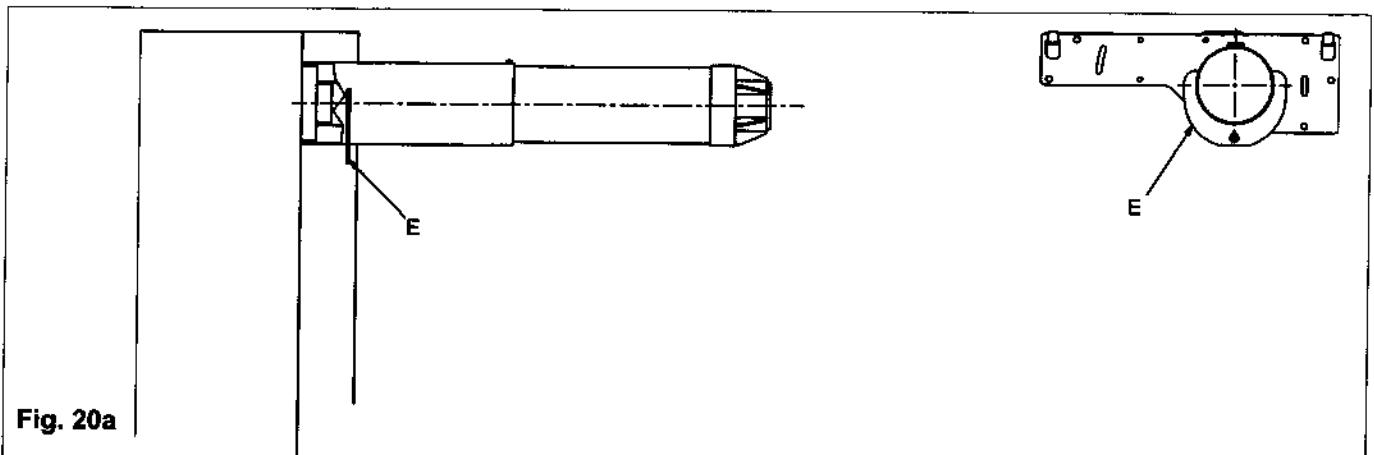


Fig. 20a



PUTTING THE ACCENT ON QUALITY

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