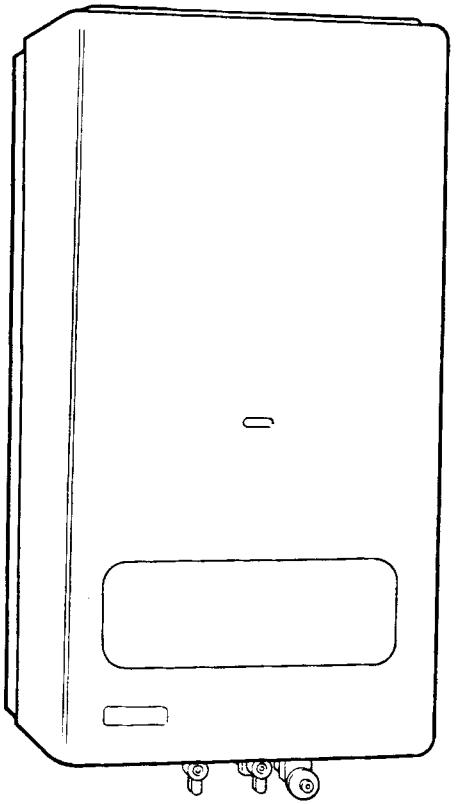
DC

Vokèra

12-48 RS Mynute



Installation and Servicing Instructions

G.C. No. 41 094 04
British Gas Tested and Certified

HAND THESE
INSTRUCTIONS
TO THE USER.

This Appliance is for use
with Natural Gas only.

SECTION 1 INTRODUCTION

The Vokèra 12-48 RS Mynute is a central heating boiler which by design incorporates a circulating pump, expansion vessel, safety valve, temperature gauge, pressure gauge, automatic by-pass and permanent pilot.

It is produced as a room sealed category 1N appliance suitable for wall mounting applications only. It is provided with a fan powered flue outlet with an annular co-axial combustion air intake which can be rotated through 360 degrees.

The appliance is designed for use with a sealed system only and is not intended for use on an open vented system.

The provision of stored domestic hot water is possible by the addition of an indirect cylinder with 'Y' or 'S' plan controls.

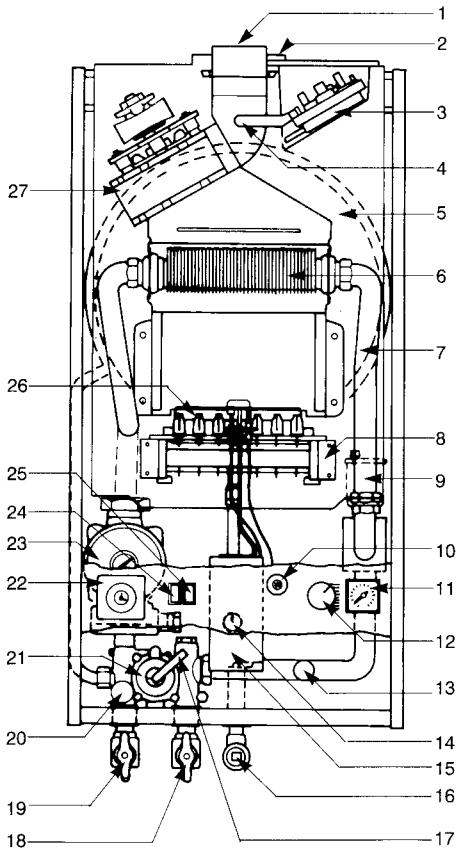
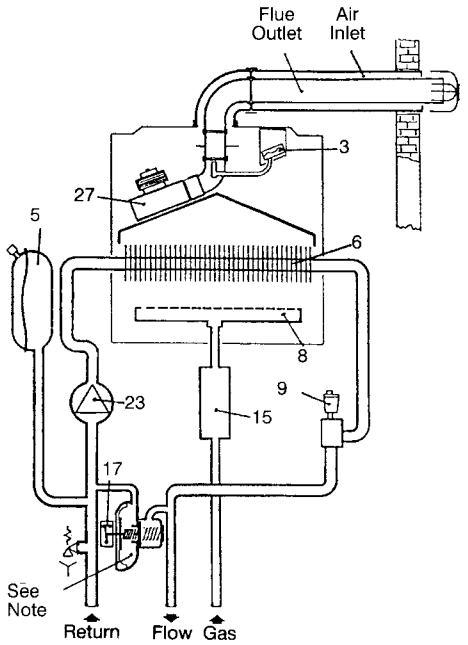


Fig.1 General Layout

1 Flue Outlet
2 Air Intake
3 Pressure Differential Switch
4 Silicone Pressure Tube
5 Expansion Vessel
6 Main Heat Exchanger
7 High Limit Thermostat
8 Main Burner
9 Automatic Air Release Valve
10 Piezo Igniter
11 Pressure Gauge
12 Boiler Thermostat
13 Safety Thermostat
14 Gas Valve Knob
15 Gas Valve
16 Gas Cock
17 Boiler Flow Switch
18 Flow Valve
19 Return Valve
20 Safety Valve
22 Time Clock (optional)
23 Pump
24 ON/OFF Switch
25 Mode Selector Switch
26 Pilot/Electrode/Thermocouple
27 Fan

Fig. 2



Notes
Differential pressure unit. Senses water flow rate to pump & main heat exchanger and operates flow switch (17)

SECTION 2 DESIGN AND OPERATING SEQUENCE

2.1 Fig 1 illustrates the general layout of components. Fig 2 illustrates the operating principles described below.

2.2 CENTRAL HEATING

2.2.1 With the pilot lit and the various switches and controls imposing a demand for heat, the pump is switched on, and the flow of water operates a flow switch at the same time the relay is energised via the control thermostat and pressure differential switch energising the fan. The pressure differential switch changes over energising the gas valve permitting gas to flow and be ignited by the permanent pilot flame.

2.2.2 As water temperature increases this is sensed by the thermostat (12) which eventually operates to switch the burner off.

2.3 SAFETY DEVICES

2.3.1 (A) Differential pressure unit in the circuit which prevents burner operation if the water flow rate is too low.

(B) A high limit thermostat, which interrupts the control circuit shutting off the gas valve.

(C) At the same time the fan will still run.

2.3.2 A safety valve is provided to relieve excess pressure.

SECTION 3 TECHNICAL DATA

3.1 UNITS
Dimensions and values are given in the preferred SI Units with Imperial units in brackets where applicable.

3.2 DIMENSIONS AND CONTENTS
Height: 880mm (34.5in)overall
(690 casing)
Width: 360mm (14.2in)
Depth: 345mm(13.6in)
Weight (empty 32.5kg) (full 33.0kg)
Water content 0.8 litres (0.2 gals)

3.3 CONNECTION SIZES
Heating flow and return: Nut & olive for 22mm o.d.
Gas Service Rc 1/2(1/2in BSP int)
Safety valve outlet: Rc 1/2 (1/2 BSP int)
Flue outlet: nom. dia. 100mm specially supplied with boiler

3.4 INSTALLATION REQUIREMENTS

3.4.1 CLEARANCES
Minimum-above 50mm (2in)(above flue)
Minimum-below 200mm (8in)(from casing)
Minimum-in front 600mm (24in) (from casing)
Minimum-at sides 25mm (1 in)(from casing)

3.4.2 Maximum heating system contents approx. 63 litres (14 gals) Acceptance capacity of expansion vessel 6 litres (1.3 gals)

3.4.3 Air supply/ventilation: To requirements of BS 5440 Part 2 1989.

3.4.4 Means of filling sealed system: To accord with BS and/or local Water Authority requirements.

3.4.5 The standard flue duct assembly allows a maximum length of duct as follows:

Rear flue: 700mm (wall thickness)
Side flue: 890mm (to centre line of boiler)

Using extension tubes the flue may be extended to a maximum of 4.5 metres in a straight line. A maximum of two extra 90 degree bends may be used (Section 5.5.20) but for each bend used the maximum length of straight flue is reduced by .75 metres. e.g. 1 extra bend plus 3.75 metres of straight flue.

3.5 ELECTRICAL DETAIL
Mains supply 240/250v ~ 50Hz Fused 3A
Power consumption: 190w

3.6 PERFORMANCE
Central Heating
Nominal Heat Input
Max. 17.6kW (60,000Btu/h)
Min 9.2kW (31,400Btu/h)
Designed temperature rise 20°C

Nominal Heat Output
Max. 14kW (48,000 Btu/h)
Min. 6.7kW (22,860 Btu/h)
Max flow temperature 85°C

Max Pressure 10.6 mbar (4.26in wg)
Min Pressure 3.0 mbar (1.20in wg)

Working Pressures Heating System
Maximum 1.5 bar/1 5m.wg/50ft w.g.
Minimum 0.5 bar/5m.wg/16ft w.g
Safety valve setting 3 bar/30m/102ft.

Flow Rates
Minimum central heating flow rate through appliance 350 litres/hour (1.28 gals/min)

Max. Gas Rate 1.68m3J/h 59.4ft³/h
Min. Gas Rate 0.92m3J/h 32.5ft³/h

3.7 BURNER DETAILS
Main Burner: Polidoro type NP7
Main Burner Injectors 7 x 1.35
Pilot Burner: Polidoro
Pilot Injector: 27 (marking) 2 holes

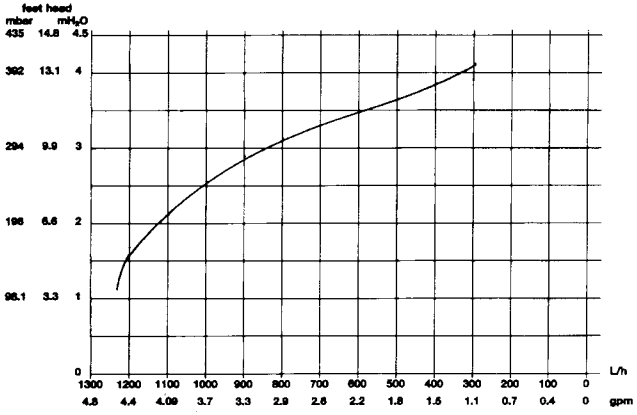


Fig. 3

Fig. 3 shows the residual pump head available for the central heating system after allowing for the pressure loss through the appliance.

4.0 GENERAL REQUIREMENTS

This appliance must be installed by a competent person in acordance with the Gas Safety (Installation and Use) Regulations 1984.

4.1 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, and in Scotland, in accordance with the Building Standards (Scotland) Regulation.

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

BS 6891		1988	Low pressure installation pipes
BS 6798		1987	Boilers of rated input not exceeding 60kW.
BS 5449		1990	Forced circulation hot water systems
BS 5440	Part 1	1990	Flues
BS 5440	Part 2	1989	Ventilation.

4.2 LOCATION OF APPLIANCE

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

Where a room-sealed appliance is installed in a room containing a bath or shower, any electrical switch or appliance control, utitilising mains electricity should be located in such a position that it cannot be touched by a person using the bath or shower.

The location chosen for the boiler must permit the provision of a 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 boiler. Where the installation of the boiler will be in an unusual location special procedures may be necessary and BS 6798:1987 gives detailed guidance on this aspect.

A compartment used to enclose the boiler must be designed and constructed specifically for this purpose. An existing cupboard or compartment may be used provided that it is modified for this purpose.

Details of essential features of cupboard/compartment design including airing cupboard installations are given in BS 6798:1987 and BS 5440 pt 2 1989. This appliance is not suitable for external installation.

4.3 GAS SUPPLY

A gas meter is connected to the service pipe by the local gas region or a local gas region contractor. An existing meter should be checked, preferably by the gas region to ensure that the meter is adequate to deal with the rate of gas supply required for all appliances it serves. Installation pipes should be fitted in accordance with BS 6891.

Pipework from the meter to the boiler must be of adequate size. Pipes of a smaller size than the boiler inlet connection should not be used.

The complete installation must be tested for soundness as described in the above code.

N.B. If the gas supply for the boiler serves other appliances ensure that an adequate supply is available both to the boiler and the other appliance when they are in use at the same time.

4.4 FLUE SYSTEM

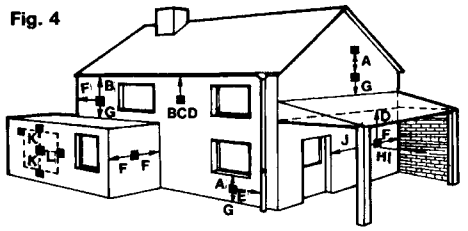
The terminal should be located where dispersal of combustion products is not impeded and with due regard for the damage or discoloration that might occur to building products in the vicinity (see fig 4).

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

The terminal must not be closer than 50mm (2in) to any combustible material. For protection of combustibles, refer to BS 5440:1 where the terminal is less than 2m (6.6ft) above a pavement or platform to which people have access (including any balcony or flat roof) the terminal must be protected by a guard of durable material.

A suitable guard is manufactured by G.R. Claudio (Vokèra) Ltd. Part No 018, (GC No 301 106). This guard must be fitted centrally over the terminal.

Fig. 4



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

4.5 AIR SUPPLY

Recommendations for air supply are detailed in BS5440;2;1989. The following notes are intended for general guidance.

The roomsealed fan flued boiler does not require a permanent air vent for combustion air supply.

Where installed in a cupboard or compartment ventilation is required for cooling.

The table below gives the recommended minimum effective areas of such air vents

POSITION OF AIR VENTS	AIR VENT AREAS	
	AIR FROM ROOM OR INTERNAL OUTSIDE	AIR DIRECT FROM OUTSIDE
high level	159cm² (24.5in²)	80cm² (12.3in²)
low level	159cm² (24.5in²)	80cm² (12.3in²)

N.B. 1. Both vents must either communicate with the same room or space or be on the same outside wall.

2. Where vents communicate with an adjacent internal space, it is suggested that the space is adequately ventilated.

4.6 WATER CIRCULATION

4.6.1 Detailed recommendations are given in BS 6798:1987 and BS 5449:1990 (for smallbore and microbore central heating systems). The following notes are given for general guidance.

4.6.2 PIPEWORK

Copper tubing to BS 2871:1:1971 is recommended for water pipe. Jointing should be either by capillary soldered or with compression fittings.

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

It should be ensured as far as possible that the appliance heat exchanger is not a natural collecting point for air.

Except where providing useful heat, pipes should be insulated to prevent heat loss and to avoid freezing. Particular attention should be paid to pipes passing through ventilated spaces in roofs and under floors.

4.6.3 BY-PASS

An automatic by-pass is incorporated in the boiler and systems should be designed to ensure that with only one radiator turned on a flow rate of at least 350 litres/hour (1.28 gals/min) is achieved through the boiler.

4.6.4 SYSTEM DESIGN

Figs 5&6 illustrate typical heating only layouts, but the boiler is also suitable for installation with a 'Y'or'S' plan system.

Figures 7 & 8 illustrate layouts.

Section 10 appendix D gives wiring details.

4.6.5 DRAINING TAPS

These must be located in accessible positions to permit the draining of the whole systems. The taps must be least 15mm nominal size and manufactured in accordance with BS 2879:1980.

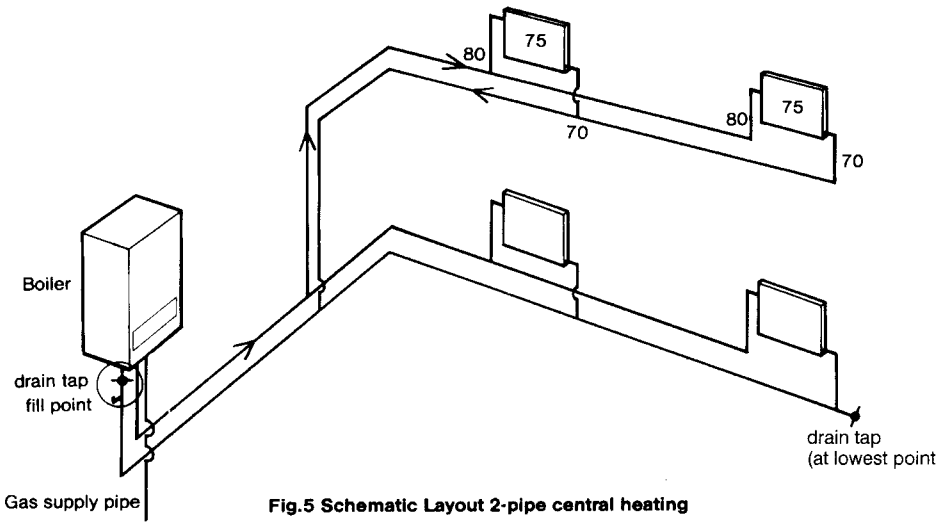


Fig.5 Schematic Layout 2-pipe central heating

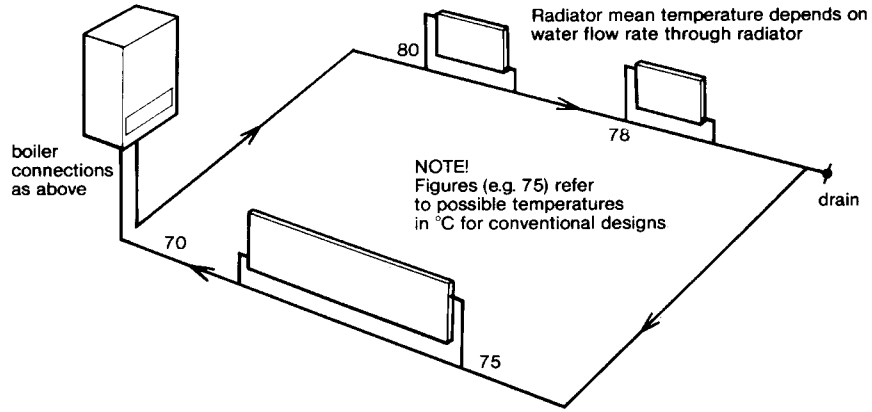


Fig.6 Schematic single pipe central heating

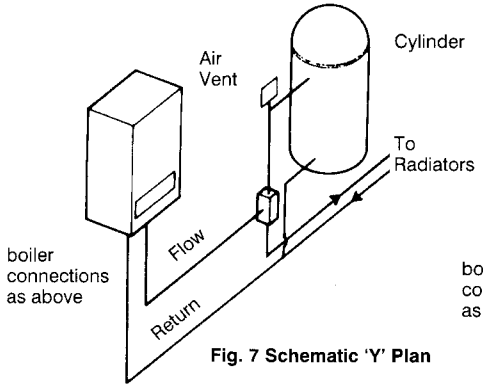


Fig. 7 Schematic 'Y' Plan

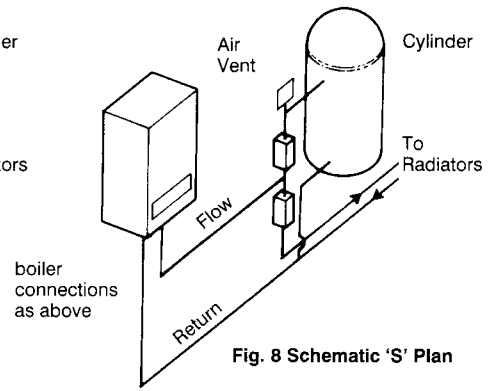


Fig. 8 Schematic 'S' Plan

SALIENT FEATURES OF EACH SYSTEM

2 PIPE

- Radiators connected in parallel
- Water flow to each directly affected by pump
- Shutting off radiators affects total flow in system
- Radiators have approx. same mean temperature
- Low flow rate affects all radiators equally

1 PIPE

- Each radiator is on individual circuit off main pipe Water flow not directly affected by pump. Flow in each radiator depends on thermosyphon + pressure differential between connection to main circuit.
- Shutting off individual radiators hardly affect total flow in system.
- Radiator mean temperature progressively drops around systems.
- Low flow rate seriously affects last radiators on circuit.

N.B. Vokèra Ltd recommend a 2-pipe system. Single pipe systems are more liable to be troublesome unless carefully designed and installed.

4.6.6 AIR RELEASE POINTS

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

4.6.7 The appliance has an integral sealed expansion vessel to accommodate the increase of water volume when the system is heated. it can accept up to 6 litres (1.3gals) of expansion water. If the appliance is connected to a system with an unusually high water content, calculate the total expansion and add additional sealed expansion capacity as appropriate.

In general, modern systems will present no problem.

4.6.8 FILLING POINT

A method for initially filling the system and replacing water lost during servicing must be provided, and it must comply with local water authority regulations. A method is shown in fig.9 using the Vokèra filling loop which is acceptable in most areas. In the event that this method is not suitable in a particular area, contact the local authority for preferred methods.

N.B. The installer should ensure that no leaks exist as frequent filling of the system could cause premature scaling of the main heat exchanger

4.7 ELECTRICAL SUPPLY

The appliance is supplied for operation on 240/250V ~50Hz electricity supply. It should be protected with a 3-amp fuse.

THIS APPLIANCE MUST BE EARTHED.

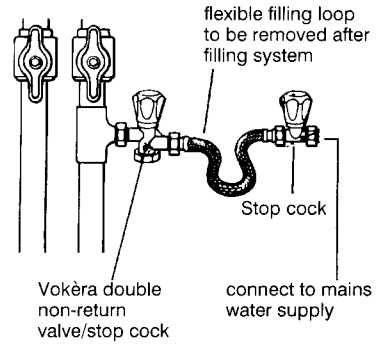
The method of connection to the mains electricity must allow complete isolation from the supply.

The preferred method is by using a fused double pole switch with a contact separation of at least 3mm.

The switch must supply ONLY the appliance and immediate electrical control circuits (e.g. programmer/room thermostat)

Alternatively, use an unswitched shuttered socket outlet with a fused 3- pin plug both complying with BS 1363.

Fig. 9



SECTION 5 INSTALLATION

5.1 DELIVERY

The appliance is delivered in a heavy duty cardboard carton. A template is printed on one side of the carton. This should be carefully cut out and used prior to installation to mark the locations for fixing holes for the upper bracket and the flue.

Packed with the boiler are:
1 - Wall Bracket
1 - Fittings pack containing central heating valves (2)
Gas service tap (1)
Fibre washers (2)
1 - Installation Manual.
1 - Users Instructions

5.2 UNPACKING

5.2.1 Open the top of the carton and remove accessories and top packing.

5.2.2 Lay the carton with the words 'truck here' on the floor, restrain the carton, grip the black frame (not the flue or casing) and withdraw the appliance.

5.3 PREPARING FOR MOUNTING

5.3.1 Remove 4 screws securing the lower part of the casing to the base frame.

5.3.2 Slightly lift the casing, flex outwards at base,and slide it gently towards the top of the appliance to disengage the case from the top suspension hooks.

5.3.3 Ensure the casing and screws are put to one side in a safe place.

5.3.4 Loosely fit (hand tight) the valves and fittings using the washers supplied (fig 10)

5.4 MOUNTING THE APPLIANCE

Refer to fig 11

5.4.1 Place the template on a smooth, vertical, non-combustible surface and use it to locate the bracket base and the flue pipe hole.

Alternatively, position bracket and hole to dimensions in fig 11.

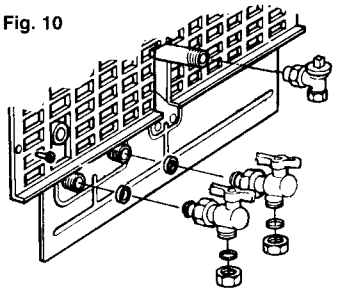
5.4.2 Drill and plug the wall for 2-2" No 10 screws for upper bracket and screw the bracket firmly into position using rust proof countersunk screws.

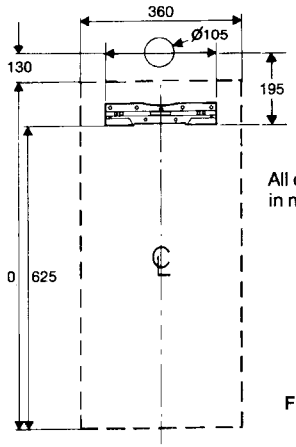
5.4.3 Hang the boiler on the bracket and adjust to final position.

5.4.4. Drill a 105mm hole through the wall to allow passage of the flue pipe

Refer to fig. 11 and figs. 12-15 for relevant dimensions for locating the hole. Where it is remote from the boiler take special care to ensure hole is at the correct level so that the finished flue is horizontal.

Fig. 10





All dimensions in mm.

Fig. 11

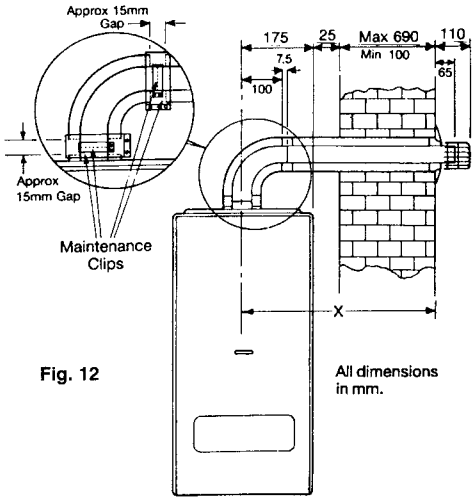


Fig. 12

All dimensions in mm.

5.5 FITTING THE FLUE

5.5.1 Refer to figures 12 - 15.

5.5.2 The flue outlet elbow may be rotated 360 degrees on its vertical axis. The flue may be extended from this in the horizontal plane.

The standard flue pipe supplied may be used for lengths up to 890mm - from the outside of wall to centre of the flue elbow. Extension kits are available to order for flue extensions of up to 4.5 metres total length, In a straight line.

5.5.3 Hang the boiler on the bracket. Adjust the boiler sideways to its correct position. Locate the small maintenance clip on to the flue elbow ffig 12) and assemble onto the flue outlet on the top of the boiler. Twist the flue bend to the outlet direction required, and tighten the maintenance clip to secure the flue bend in place. Carefully level across to check that the hole through the wall is at the same level as the flue bend.

5.5.4 Measure carefully from the actual face of the outside wall to the centre of the flue bend. (Dimension X on Figs 12 & 13.)

5.5.5 The flue kit supplied is suitable for an exact dimension of 890mm.

5.5.6 Where X is less than 890mm, the supplied flue must be shortened as follows:- Subtract the measured length from 890mm. The difference is the precise length to be removed from the inner flue tube (890 – X = length to be cut off)

NOTE: The two tubes must be separated by removing screw G (fig 14) before cutting. The outer air tube should also be shortened by the same amount to allow a gap for easy working (see inset on fig 12)

EXAMPLE
X is measured as 630mm. Amount to be cut off inner tube is 890 – 630 =260

5.5.7 Where X is more than 890mm an extension kit (or kits) is needed. The standard uncut lengths with extension(s) is as follows:-

Supplied flue plus one extension 1 690mm
Supplied flue plus two extension 2490mm

The same procedure is followed:
1. Measure X
2. Subtract X from appropriate figure and shorten the tubes accordingly.

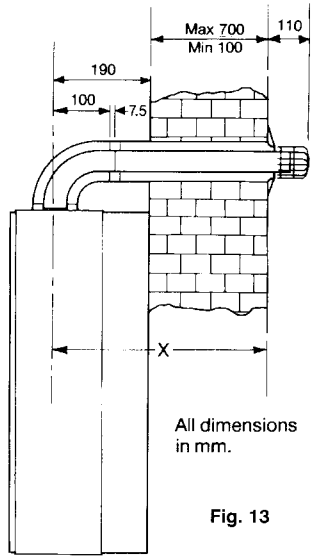
EXAMPLES
X = 1295
1690 – 1295 = 395

Shorten inner and outer tubes of last extension by 395mm

X = 1920 so 2490 – 1920 = 570

Shorten inner and outer tubes of last extension 570mm

CUT CLEAN AND SQUARE WITH FINE TOOTH SAW AND REMOVE BURRS.



All dimensions in mm.

Fig. 13

Fig. 14

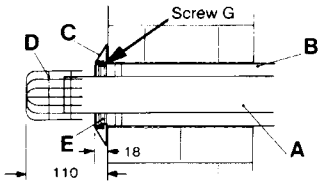


Fig. 15

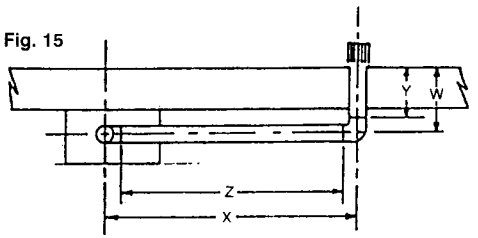
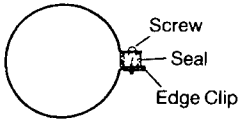


Fig. 15A



5.5.8 Loosen the small maintenance clip and lift off the flue bend

5.5.9 Ensure inner and outer terminal tubes are firmly fitted together with screw G (flg 14) Push the terminal tubes through the wall until the face of the outer tube protrudes 1 8mm from the face of the wall (flg 14). The terminal grill (D) will then protrude 110mm from the wall) face.

5.5.10 If extension pieces are used assemble these using the maintenance clips provided.

5.5.11 Make sure the entire length of the flue is truly horizontal and adequately supported. Use at least one bracket for each extension. (Conventional adjustable strap supports suffflce, Vokèra stockist can supply if necessary. Part No 03 (GC No 301 105)

5.5.12 Assemble the second small maintenance clip on the end of the inner flue tube.

5.5.13 Refit the flue elbow onto the boiler. Align the flue elbow with the flue pipe and tighten the maintenance clip between the flue elbow and the boiler.

5.5.14 Draw the flue pipe towards the boiler and tighten the second clip over the joint between the inner flue pipe and the flue elbow.

5.5.15 There must now be a gap of approximately 15mm from the elbow to the end of the outer tube.

5.5.16 Check also that the outer end of the flue projects as indicated in fig 14.

5.5.17 Referring to fig 10 fit the large maintenance clips into position and secure the clip screws.

5.5.18 Check adjust and tighten all supports.

5.5.19 Seal the peripheral gap around the outer tube with cement or mastic and slip the cosmetic flexible plastic collar (fig 14) item C) into groove on the pipe.

This operation can only be carried out with external access.

N.B. Absence of the collar will not affect operation of the appliance.

5.5.20 **INSTALLING OPTIONAL 90° FLUE BEND** Part No 02 (GC No 301 104)

5.5.21 Assemble the large and small maintenance clips as show in fig 15A

5.5.22 Carry out steps 5.5.2-5.5.3

5.5.23 Ensure when siting the flue hole position that the total length of the straight flue pipe used does not exceed the maximum permissable. 1 extra 90° bend and a maximum of 3.75 metres of straight flue. 2 extra 90° bends and a maximum of 3.0 metres of straight flue.

5.5.24 Measure carefully the distance between the centre of the flue bend on the boiler to the centre of the hole through the wall (dimension X flg 15).

NOTE: Extension kits (Part No 026) will be required if the distance measured is greater than 780mm.

5.5.25 Subtract 230mm from the measured dimension, separate the two tubes and cut the outer tube to this dimension.

5.5.26 Cut the inner tube 15mm longer than the outer tube.

5.5.27 Referring to fig 12 assemble a small maintenance clip on the outlet of the boiler flue bend. Push the inner flue tube into clip and tighten clip screws.

5.5.28 Slide the outer flue tube into place leaving approx. 15mm between the bend and the flue tube.

5.5.29 Referring to fig 12 fit the large maintenance clip into position and tighten clip screws.

5.5.30 Connect the flue tube to the extra bend using the same method ensuring that the bend outlet is in line with the hole through the wall.

5.5.31 Ensure that the flue pipe runs parallel to the wall then carefully measure the distance from the outside face of the wall to the centre of the extra bend (dimension W fig 15).

5.5.32 Subtract 97mm from the dimension and cut the outer tube to this length.
NOTE: The two tubes must be separated by removing screw G fig 14 before cutting.

5.5.33 Ensure that any shortening of the tube is done from the plain end.

5.5.34 Reassemble the inner and outer flue tubes and refix screw G.

5.5.35 Mark the inner tube 7mm longer than the outer and cut off the inner tube at this point.

5.5.36 Remove the large maintenance clip, loosen the small clip and remove the bend.

5.5.37 Push the flue tubes through the wall, loosely refit the extra flue bend.

5.5.38 Assemble a small maintenance clip onto the inner flue tube, draw the flue tube towards the flue bend until the inner tubes butt. Tighten the screws on the small clip.

5.5.39 Referring to fig 12 fit the large maintenance clip into position and secure clip screws.

5.5.40 Check and adjust if necessary so that the outer flue tube protrudes 18mm from the outside face of the wall.

5.5.41 Tighten all maintenance clips, make sure that the entire flue is horizontal and adequately supported. Use at least one bracket (Part No 03, G.C. No 301 105) for each extension.

5.6 **CONNECTING THE GAS AND WATER**

5.6.1 Figs 10 and 14 show the locations of the flttings.

5.6.2 Do not over tighten nuts and use another spanner to apply counter force to avoid damaging the appliance.

5.6.3 **GAS SUPPLY**

Connecting the gas supply.

Connect a 15mm gas pipe to the gas service tap and tighten the union nut securing the tap to the appliance.

5.6.4 **CENTRAL HEATING**

Connect the central heating pipework (22mm o.d) to the respective valves, right hand = flow, left hand = return, and tighten the nuts.

5.6.5 **SAFETY VALVE DISCHARGE**

The safety valve is located beneath the pump. It has a threaded outlet (Rc 1/2" BSP Int) to permit a discharge pipe to be connected .

When connecting, ensure the discharge pipe does not restrict access to or operation of the central heating valves. The discharge should terminate facing downwards exterior to the building in a position where discharging (possible boiling) water will not create danger or nuisance; but in an easily visible position.

5.7 **ELECTRICAL CONNECTIONS**

5.7.1 The electricity supply must be as specified in clause 4.7. If controls external to the appliance are required design of the external electrical circuits should be undertaken by a competent person.

See section 10 for further electrical wiring details.

Factory fitted internal wiring must not be disturbed when wiring external controls

N.B. IT IS ESSENTIAL THAT ALL EXTERNAL CONTROL CIRCUITS AND WIRING IS WIRED FROM THE SAME ELECTRICAL ISOLATOR AS SERVES THE APPLIANCE.

5.7.2 To gain access to the terminals release the 2 screws securing the outer control fascia (top corners)

Note these 2 screws and associated cup washers are not captive. Ensure they are not lost.

The panel is bottom hinged. Pull it forwards and downwards until it rests in an approximately horizontal position.

The terminal block is easily visible on the left hand side.

5.7.3 The electricity supply cable from the isolator and the Appliance terminal block must be 3 core flexible sized 0.75mm2 (24x0.2mm) to table 15-16 BS 6500.

Wiring to the Appliance should be rated for operation in contact with surfaces up to 90°C.

5.7.4 Pass the cable through the cord anchorage and connect the wires Brown to L Blue to N and Green/Yellow to the earth screw arrange the wires so that should the cable slip the anchorage the current carrying conductors become taut before the earthing conductor.

5.7.5 Securely tighten all terminal screws and arrange the cable with slack between the anchor and the terminal block. Tighten the cord anchorage.

5.7.6 Neatly arrange the external cable in such a way that unrestricted opening of the controls fascia is possible without strain on the cable.

5.7.7 External controls may be wired from terminals 2 and 3 (after removing the factory fitted link). If a neutral is needed use terminal N.

If required pass this cable through the same cord anchorage.

The conductors should be so connected that the conductor to terminal 2 becomes taut before those to 3 or Earth (I) should the cable be strained.

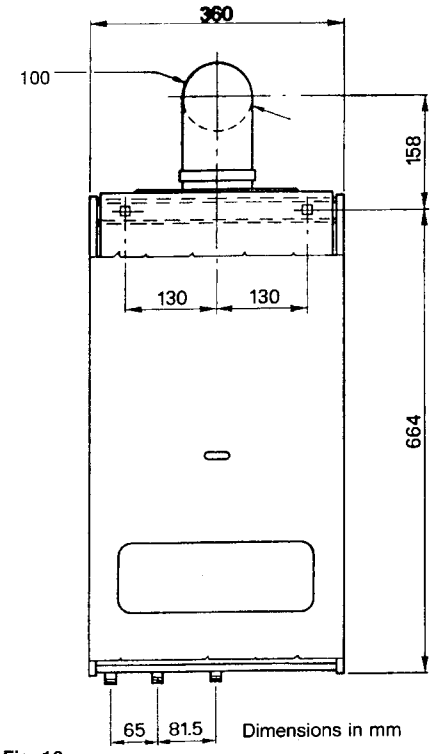


Fig. 16

SECTION 6 COMMISSIONING

6.1 Where the text bears identifying numbers in brackets, refer to figs. 1 and 2 unless otherwise instructed.

6.2 GAS SUPPLY INSTALLATION
Inspect the entire installation including the meter, test for soundness and purge, all as described in BS 6891.

6.3 CENTRAL HEATING SYSTEM

6.3.1 IMPORTANT
Do not release air from the red sealed expansion tank. It is charged with air at the factory to 1 bar (15psig).

6.3.2 INITIAL FLUSHING OF THE PIPEWORK

6.3.2.1 The appliance contains components likely to be damaged or blocked by grease and dirt from the system. It is recommended therefore that the appliance be disconnected from the system for the initial flush.

6.3.2.2. Close the appliance central heating valves and disconnect from the appliance.

Connect a temporary water supply to the return and a drain pipe to the flow and flush the entire system until the drain discharges clean water (for at least five minutes).

Drain the system by opening the drain taps at all low points. Close the drain taps and reconnect the flow and return pipes to the appliance.

6.3.3 INITIAL FILLING OF THE SYSTEM

6.3.3.1 See Clause 3.4.4. and 4.6.8

6.3.3.2 Open central heating flow and return valves (red handle vertical indicates open, horizontal indicates closed). Unscrew black cap on automatic air release valve (9) one full turn (leave open permanently).

6.3.3.3 Close all air release taps on central heating system.

6.3.3.4 Gradually open stopcock at the filling point connection to the central heating system until water is heard to flow. Do not open fully.

6.3.3.5 Starting with the lowest radiator open each air release tap in turn closing it when clear water, free of bubbles, flows out. In the same way release air from any high points in the pipework.

6.3.3.6 Continue filling the system until at least 1.5bar registers on the gauge (11) then turn off the filling stopcock.

6.3.3.7 Inspect the system for water soundness and remedy any leaks discovered.

6.3.4 SETTING THE SYSTEM DESIGN PRESSURE

6.3.4.1 The design pressure must be a minimum 1.0bar and a maximum of 1.5bar.

6.3.4.2 The actual reading should ideally be 1.0bar plus the height in metres to the highest point of the system above the base of the appliance (up to the maximum of 1.5bar total).

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

6.3.4.3 To lower the system pressure to the required value turn the red knob of the safety valve (19) a quarter turn to release water until the required figure registers on the gauge (11).

6.4 CHECKING ELECTRICITY SUPPLY

6.4.1 Carry out preliminary checks for earth continuity, polarity, short circuit and resistance to earth. Gaining access as required according to clause 5.7.2 in this manual.

6.4.2 Leave the appliance with the control fascia closed and secured and with the mains electricity switched OFF.

6.5 ESTABLISHING THE PILOT FLAME

6.5.1 The main electricity supply is switched OFF (6.4.2).

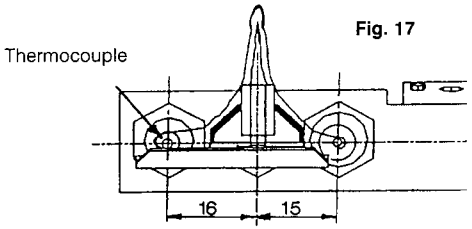
6.5.2 Ensure main gas supply is ON.

6.5.3 Turn on the appliance gas service tap.

6.5.4 Press the gas control knob (14) and hold it in. At the same time, repeatedly press the Piezo button (10) to light the pilot burner. Once a flame is seen through the viewing window, hold in the gas control knob for a further 15 seconds then release the knob slowly.

6.5.5 The pilot flame should remain alight and envelope the thermocouple (see fig. 17). If it goes out, wait 3 minutes and repeat from 6.5.4
N.B. Thermocouple output 12-15 mV

Fig. 17



6.5.6 When the pilot flame is established, turn on the mains electricity and switch on the appliance on/off switch. This permits slow speed operation of the flue fan to maintain the pilot.

6.5.7 Refer to fig. 17 and check that the pilot flame is correct. If it is necessary to adjust the flame refer to cl. 5.7.2 for access instructions. Fig. 19 shows the location of the adjustment screw. Turning clockwise decreases flame and vice versa.

6.6 LIGHTING THE BOILER

6.6.1 Before lighting, open flow and return valves (Cl 6.3.3.2).

If external controls are fitted (e.g. timeclock and thermostat) ensure they 'call for heat'. The commissioning of the appliance may be easier if the external controls are temporarily disconnected and terminals 1 and 3 linked. (For access procedure turn off electricity and refer to clause 5.7.2 for instructions).

6.6.2 Ensure that the mains electricity and the appliance 'on/off' switch (24) are turned on.

6.6.3 Set the control thermostat (12) at its highest setting.

6.6.4 Set the Mode Selector switch (25) to constant.

6.6.5 The main burner should now light.

6.6.6 N.B. The most common cause of failure to light is insufficient water flow. See cl. 4.6.3.

6.7 CHECK BURNER PRESSURE

6.7.1 The heat input is factory set to the maximum value given in section 3.6 but it is necessary to check/adjust this when commissioning.

The maximum heat input may be reduced by a simple adjustment to suit the system load. Refer to fig 18 to determine the pressure for the heating output you need (e.g. for 40,000 Btu/h a pressure of 8 mbar is needed).

6.7.2 Turn off the main electricity supply. Gain access to the interior as instructed in clause 5.7.2.

6.7.3 Locate the main burner pressure test point (Fig 19) and slacken the screw half a turn in an anti clockwise direction. Attach a suitable pressure gauge. Turn on the boiler for central heating .

6.7.4 The pressure reading for maximum output should be. 10.6 mbar/4.26in wg (plus or minus 1.0mbar/0.42in wg). If the pressure is wrong or if it is required lower it should be adjusted by removing regulator cover screw (fig 19) and adjust regulating screw underneath. Once this pressure has been fixed it should be indelibly recorded on the data badge. This is to ensure that the burner can be reset when any service operation involves alteration of burner settings.

6.8 CHECKING THE FLUE SYSTEM

6.8.1 The flue system should be visually checked for soundness. Check all clamps and fixings are secure and tight.

6.9 CHECKING THE HEATING THERMOSTAT

6.9.1 Allow the system to warm up and manipulate the control thermostat to ensure the burner switches from 'on' to 'off' and vice versa (scale range covers approx. 45°C - 85°C)

6.10 REGULATING THE CENTRAL HEATING SYSTEM

6.10.1 Fully open all radiators 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.

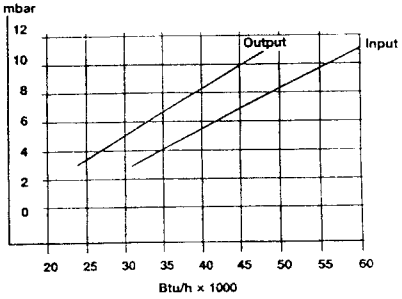
6.10.2 If the burner will not light, ensure that water is in fact circulating. See cl 4.6.3

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

6.10.4 When all is adjusted, progressively close all radiator valves to ensure that the appliance still operates when flow through the system is limited

If the burner cuts out prematurely due to lack of water flow through the appliance, the system should be regulated to ensure a flow rate of at least 350 litres/hour (1.28 gals/min).

Fig. 18



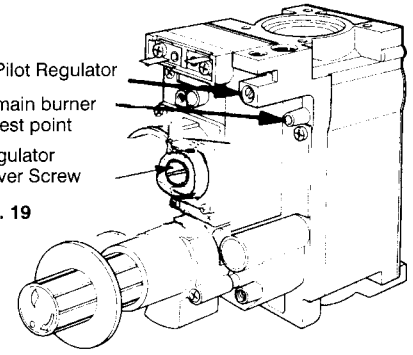


Fig. 19

6.11 FINAL FLUSHING OF THE HEATING SYSTEM

6.11.1 After the system has been thoroughly heated to about 60°C (140°F) or above, and hot water has circulated to all parts any residual grease, flux and other foreign material will have been dislodged.

6.11.2 Inspect the system for soundness. Turn the appliance off and turn off the on/off switch (fig 1, 24).

Open all drain taps and quickly drain the system whilst still hot to remove offending substances. Refill as instructed in clause 6.3.3.

6.12 FINAL CHECK FOR OPERATIONS

6.12.1 Disconnect pressure gauge, retighten screw. Relight boiler.

6.12.2 Re-check for gas soundness.

6.12.3 Re examine heating and hot water systems and cold water supply for water soundness.

6.12.4 Check the appearance of the gas flame to assess adequacy of combustion air supply.

6.12.5 Re-check the flue system for soundness and adequacy of supports.

6.13 CONCLUDING OPERATIONS

6.13.1 If external **controls have been** disconnected and terminals 2 and 3 temporarily linked remove the link and reconnect the external control circuit, check the operation of the external controls.

6.13.2 Hinge up and resecure the control fascia.

6.14 REFIXING THE FRONT CASING.

6.14.1 Offer up the front casing to the back frame in a near vertical attitude and locate the hooks on the casing over the hooks on the frame. Slide the casing downwards to fully engage the hooks and flex the bottom of the case outwards and push home to align the bottom fixing holes. Replace the four case retaining screws.

SECTION 7 INSTRUCTING THE USER

7.1 Hand over the copy of the Users Instructions supplied together with this Installation book and explain how to operate the boiler correctly. Explain how to use the Timeclock and Room Thermostat if fitted.

7.2 Show the user how to switch off the appliance quickly and indicate the position of the electric supply isolator.

7.3 Explain that air supply grilles must not be blocked in any way.

7.4 Inform the user of the location of all drain cocks and air vents.

7.5 Explain how to turn the appliance off for both short and long periods and advise on the precautions necessary to prevent damage should the appliance be inoperative when freezing conditions may occur.

7.6 Finally, advise the User that, for continued safe and effective operation, the appliance must be serviced by a competent person at least once a year.

N.B. EXPLAIN TO THE USER THAT MANUAL RELIGHTING OF THE PILOT MAY BE NECESSARY FOLLOWING INTERRUPTION OF THE ELECTRICITY SUPPLY.

SECTION 8 SERVICING INSTRUCTIONS

8.1 GENERAL

To ensure efficient safe operation of the appliance it is necessary to carry out routine servicing at regular intervals.

The frequency of servicing will depend upon the particular installation conditions and the use to which the boiler is put; but, in general, once per year should be adequate. It is the law that any service work must be carried out by a competent person such as British Gas or other recognised companies.

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

8.2 IMPORTANT NOTES

WARNING: Having carried out preliminary flame checks and before starting any servicing work, switch OFF the mains electricity supply and disconnect the plug at the main isolating switch and socket. (If a switch is used remove the fuse.)

Turn off gas supply at the gas service tap fitted to the appliance.

Always test for gas soundness after any service wo.rk and after exchanging any gas carrying component.

8.3 RECOMMENDED ROUTINE SERVICING

8.3.1 ANNUAL SERVICING

The following procedures should be carried out at least once per year.

1. Inspect exterior for signs of damage and deterioration particularly of flue pipework and electrical connections.
2. Inspect air supply and ventilation arrangements comparing them with the requirements laid down in clauses 4.5 to ensure no alterations have been made since installation.
3. Turn off mains electricity and remove front casing (see clause 8.4).
4. Replace fuse if previously removed (8.2 above) and turn on electricity, run the boiler for a few minutes to permit inspection of its operation, inspect the burner for yellowing of flame tip, flame lift off or sooting.
5. Ensure central heating valves ffig 1) are open. Note these are 1/4 turn valves which are open when handle is vertical, closed when handle is horizontal. Observe pressure gauge reading ffig 1 no. 11) which should be approximately 1 bar when the system is cold (see clause 6.3.4)
6. Turn off mains electricity and turn off gas service tap on the appliance.
7. Gain general access as described below in clause 8.4.
8. Remove pilot burner assembly and brush clean. Inspect pilot injector and blow clean (see clause 8.6.3).
9. Remove main burner. cl 8.7.1 to 8.7.6 Lightly clean with a soft brush and inspect for damage. If during initial inspection, any combustion irregularity was suspected, remove injectors and clean or replace (see clauses 8.8).
10. Place cloth below combustion chamber to catch debris. Clean heat exchanger using suitable brushes and rods if necessary.
11. Inspect combustion chamber lining. The insulating material is easily damaged. Do not scrape, but clean off lightly.

    If any panels are damaged these should be replaced (see Clause 8.12).
12. Replace all parts in reverse order but leave the controls fascia open and outer casing off.
13. Undertake a complete commissioning check as detailed in section 6.
14. Close up control fascia and refix front casing .
15. Clean off casing using soft cloth and dilute detergent.

8.3.2 REPLACEMENT OF PARTS

The life of individual components varies and they will need servicing as and when faults develop. The fault finding sequence charts in section 9 will serve to locate which component is the cause of any malfunction, and instructions for removal, inspection and replacement of the individual parts are given in the following pages.

8.4 TO GAIN GENERAL ACCESS/REASSEMBLY

To remove components access to the interior is essential.

Refer to figs 20 & 21

Ensure gas and electricity supplies are isolated before carrying out any servicing.

8.4.1 To remove front casing

Release 4 retaining screws (fig 20). Flex out base of casing and pull bottom of case slightly forward and push case upwards to disengage top hooks from the main frame and withdraw the case from the appliance.

8.4.2 To open control fascia release 2 screws (fig 20) at the top of the fascia and swing down (fig 21)

8.4.3 Reassembly is always carried out in reverse order to dismantling, unless otherwise stated. Electrical connections must be remade in accordance with the wiring diagram fig.39.

8.4.4 Wherever gas control components are replaced, check the burner pressures and adjust if necessary (section 8.24)

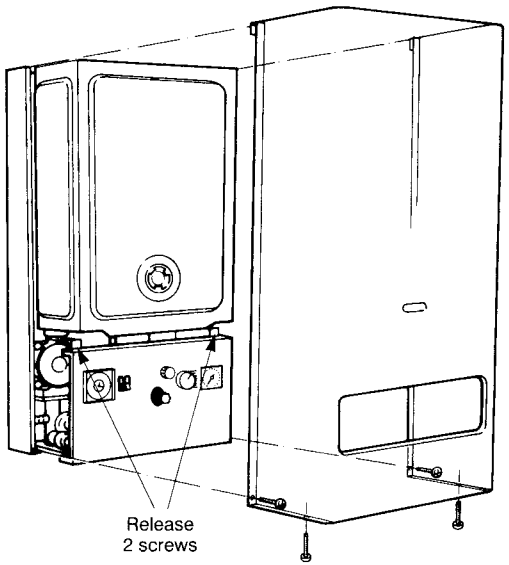
8.4.5 If required remove lower plastic grill by removing 2 vertical screws and pull grill downwards.

8.5 ROOM SEALED CHAMBER FRONT COVER (including viewing window)
Part No 5957
Refer to fig 22

8.5.1 Gain general access as 8.4

8.5.2 Remove roomsealed front cover plate by releasing six screws (fig 19) and easing cover off. The screws are not captive. inspect gasket for damage. If damaged, replace.

Fig. 20



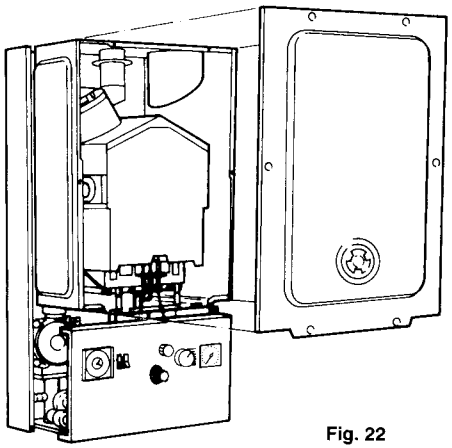


Fig. 22

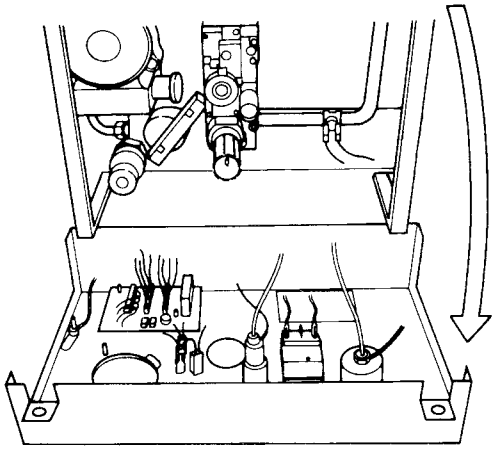


Fig. 21

8.6 TO REMOVE/REPLACE ELECTRODE, THERMOCOUPLE AND PILOT BURNER
Refer to Fig 24

8.6.1 Refer to 8.4

8.6.2 Remove room-sealed chamber front cover plate as 8.5.2

8.6.3 Remove front of combustion chamber by releasing five screws ffig 23)

8.6.4 TO REMOVE PILOT BURNER ASSEMBLY

8.6.4.1 Pull off electrode lead.

8.6.4.2 Disconnect pilot pipe and thermocouple at gas valve end.

8.6.4.3 Release screw securing pilot burner asembly. (fig. 24).

Ease pilot burner assembly and pipe forward, sliding rubber gasket from frame. Remove electrode, thermocouple and pilot pipe.

8.6.5 REMOVE ELECTRODE

8.6.5.1 Pull off electrode lead.

8.6.5.2 Unscrew electrode retaining nut.

8.6.5.3 Remove electrode.

8.6.6 TO REMOVE/REPLACE THERMOCOUPLE

8.6.6.1 Remove pilot burner assembly (8.6.4). Unscrew retaining nut at burner end and pull out probe. Ease it through the rubber gasket.

(N.B. Retaining nut is compression fit and slides off the probe in an upward direction.)

8.6.6.2 If a new thermocouple is to be fitted, bend it to approximate shape of old one and replace in reverse order.

N.B. Make sure rubber gasket is intact and properly fitted to boiler case so as to be air tight.

8.6.7 TO REMOVE/REPLACE PILOT BURNER AND/OR INJECTOR

8.6.7.1 Remove pilot assembly (8.6.4).

8.6.7.2 Remove electrode and thermocouple.

8.6.7.3 Unscrew pilot supply pipe union, and withdraw pipe.

N.B. Pilot injector is held captive by bush on the end of the connecting pipe. It will drop out as pipe is removed.

8.7 MAIN BURNER
Part No 5812
Refer to fig 25

8.7.1 Refer to 8.4

8.7.2 Remove room-sealed front cover plate and combustion chamber front (8.5.2 & 8.6.3).

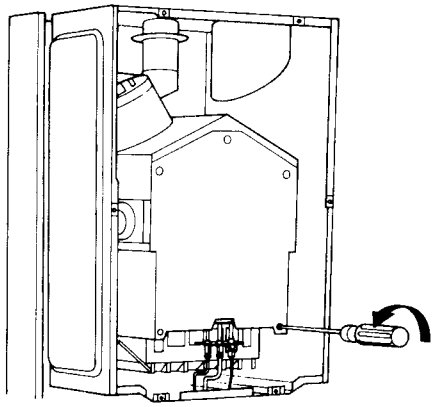
8.7.3 Remove pilot burner assembly as 8.6.4.

8.7.4 Remove four burner retaining screws (see fig 25).

8.7.5 Remove main burner.

8.7.6 If required unscrew injector(s).

Fig. 23



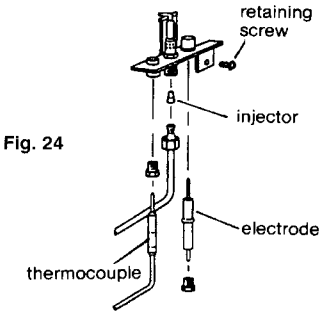
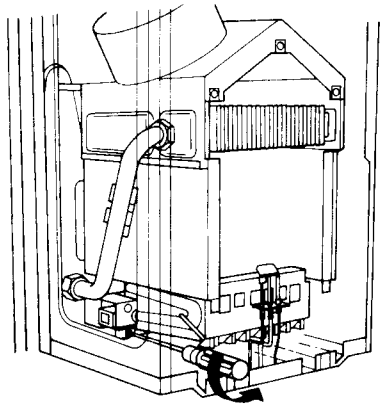


Fig. 24

Fig. 25



8.8 MAIN HEAT EXCHANGER
Part No 5388
Refer to fig 26

8.8.1 Refer to 8.4

8.8.2 Remove room-sealed front cover plate as 8.5.2

8.8.3 Remove front of combustion chamber as 8.6.3

8.8.4 Close heating valves (1/4 turn until handle is horizontal). Turn safety valve 1/4 turn to drain primary circuit of boiler.

8.8.5 Unscrew unions on both sides.

8.8.6 Carefully slide out heat exchanger avoid spillage of water on boiler electric's.

8.8.7 Reassemble in reverse order using new fibre washers on both unions.

8.9 FLUE FAN
Part No 5963

8.9.1 Refer to 8.4

8.9.2 Remove room-sealed front cover plate as 8.5.2

8.9.3 Remove front of combustion chamber as 8.6.3

8.9.4 Unscrew maintenance clip securing screws and remove clip (fig 27)

8.9.5 Remove silicone pipe from nozzle on inner flue bend.

8.9.6 Remove 3 flue hood retaining screws (fig 27)

8.9.7 Carefully slide flue hood forward disconnecting electrical leads on fan in the process.

8.9.8 Unscrew 3 screws retaining fan to flue hood and remove fan. Transfer aluminium manifold (2 screws) to new fan.

8.9.9 Reassemble in reverse order,replacing centre screw first.

8.10 FLUE PRESSURE DIFFERENTIAL SWITCH
Part No 5926
Refer to fig 27

8.10.1 Refer to 8.4

8.10.2 Remove room-sealed front cover plate as 8.5.2

8.10.3 Remove 3 screws holding pressure differential switch cover (fig 24) and remove cover.

8.10.4 Pull air tube from nozzle on inner flue bend.

8.10.5 Pull off tab connectors and ease pressure switch upwards, disconnecting air pressure pipe in the process.

8.10.6 Reassemble in reverse order. See fig 39 for correct fitting of electrical connections. The air pipe must be reconnected to the upper nozzle on the pressure switch.

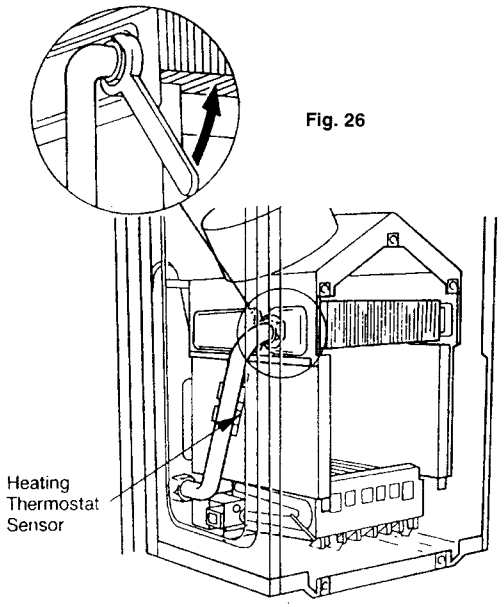


Fig. 26

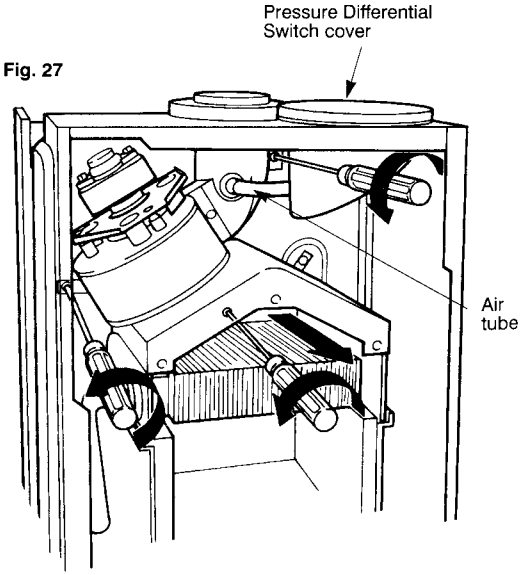


Fig. 27

8.11 COMBUSTION CHAMBER INSULATION BOARDS

8.11.1 Refer to 8.4

8.11.2 Remove room-sealed front cover 8.5.2. Remove front of combustion chamber 8.6.3 Remove main heat exchanger 8.8

8.11.3 To remove side combustion chamber insulation boards, gently prise upwards and pull out.

8.11.4 To remove rear board,gently prise upwards and pull out.

8.11.5 Fourth board (front) is replaced complete with combustion chamber front panel.

8.12 TO REMOVE/REPLACE GAS CONTROL VALVE OPERATOR
Refer to fig 28

8.12.1 Pull off all electrical leads from operator tab connectors. Disconnect earth lead.

8.12.2 Release 4 screws securing operator to gas valve body (2 at top below tab connectors 2 at bottom extreme corners).

8.12.3 Remove operator, exposing gasket.

8.12.4 Replace in reverse order using new gasket (see fig 39 for electrical connections).

8.12.5 Check burner pressures (cl. 6.7).

8.13 GAS CONTROL VALVE (COMPLETE)
Refer to fig 28

8.13.1 Disconnect thermocouple and pilot supply pipe connections. Pull interruptor lead from valve.

8.13.2 Remove screws securing bracket to base frame.

8.13.3 Remove 4 flange securing screws at each end, and withdraw valve (this may be easier with gas pipe disconnected from main burner), disconnecting second interruptor lead in the process.

8.13.4 Replace in reverse order using new gaskets.

8.13.5 Test all disturbed joints for gas soundness. Check burner pressures (cl 6.7). If incorrect, adjust as instructed in cl 8.24).

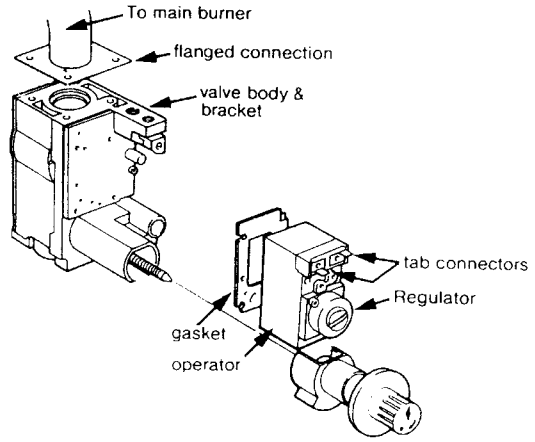


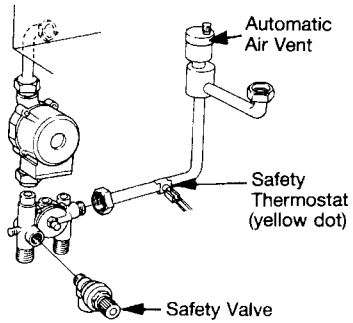
Fig. 28

8.14 PUMP
Part No 6090
Refer fig 29

8.14.1 Refer to 8.4

8.14.2 Close heating valves (fig 1, 18 & 19) by turning 1/4 turn until handles are horizontal.

8.14.3 Drain appliance via safety valve by 1/4 turn of safety valve knob.



(A) COMPLETE PUMP

8.14.4 Disconnect pipe union connection at rear left corner of combustion chamber. Pull pipe upwards with a slight twisting movement to remove from pump union. (Access to connection is around right hand side of gas valve using flat jaw adjustable spanner - 30mm across flats).

8.14.5 Grasp pump and pull upwards with a slight twisting movement to disconnect at inlet.

8.14.6 Disconnect electrical leads from pump.

(B) PUMP HEAD ONLY

8.14.7 Unscrew four Allen screws, withdraw head, disconnect electrical leads.

Reassemble in reverse order. Reconnect electrical leads. Brown to L, Blue to N, Yellow/green to E.

8.15 HEATING MANIFOLD
Part No 3175
Refer to fig 30

8.15.1 Remove pump as 8.14.

8.15.2 Disconnect safety valve discharge pipe and heating valve unions.

8.15.3 Remove retaining screw (securing manifold to frame).

8.15.4 Disconnect expansion vessel pipe union, pressure gauge connection and heating flow pipe union.

8.15.5 Unscrew and remove retaining nut and remove micro switch.

8.15.6 Remove manifold

MANIFOLD ASSEMBLY

Release cover retaining screws and ease off with a screwdriver.

Refer to fig 30 for location of components.

Replace in reverse order, ensuring that washers are replaced in all union connections.

8.16 CHECKING/REPLACING MAIN EXPANSION VESSEL

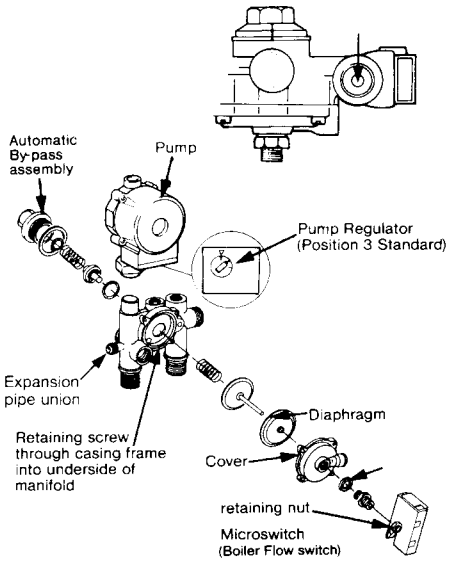
8.16.1 The expansion vessel is factory pressurised to 1 bar (14.7psi) and should be checked during servicing. Should it have lost pressure it can be repressurised in situ. Drain the boiler. Fit a suitable pump and gauge (ie car foot pump and gauge) to the nipple at the top right-hand side of the expansion vessel, and pressurise to 1 bar (14.7psi) and remove the pump.

NOTE: Access to the nipple can be improved by loosening the upper vessel retaining screw and rocking the vessel forwards.

If the vessel cannot be repressurised or if pressure loss is very frequent the expansion vessel will require changing. Alternatively, a new vessel can be fitted in the return to the appliance, and the old vessel isolated in situ.

N.B. If the boiler is installed with a clearance above of 343mm (13.5in) or more and with a side exit flue it is possible to remove the expansion vessel in situ. follow steps 8.16.10 – 8.16.11

If the clearance above is less than 343 mm (13.5in) or with a back exit flue it is not possible to remove the expansion vessel in situ, follow steps 8.16.2 – 8.16.11



8.16.2 Refer to 8.4

8.16.3 Close central heating valves (valve head is horizontal when closed).

8.16.4 Drain appliance via safety valve by 1/4 turn of knob.

8.16.5 Remove screws on large maintenance clips (fig 32) and remove clips, loosen screws on the small clips and remove flue elbow.

8.16.6 Disconnect all pipe unions at the appliance base.

8.16.7 Switch OFF mains electricity and gain general access 8.4.

8.16.8 Disconnect electricity supply at p.c.b. (read cl. 5.7)

8.16.9 Remove clip securing vessel at top. Disconnect expansion pipe at heating manifold, lift vessel & pipe out of appliance.(fig 31)

8.17 SAFETY VALVE

8.17.1 Refer to 8.4.

8.17.2 Drain down primary side of boiler by closing heating valves (1/4 turn until handle is horizontal). Turn safety valve 1/4 turn to drain appliance.

8.17.3 Remove Heating Microswitch as 8.19.2.

8.17.4 Unscrew safety valve discharge pipe.

8.17.5 Unscrew complete valve from Heating Manifold.

8.17.6 Replace in reverse order.

8.18.1 PRESSURE GAUGE
Part No 5263

8.18.2 Close central heating flow and return valves, by 1/4 turn to horizontal position, drain appliance through the safety valve by 1/4 turn of the knob.

8.18.3 Trace capillary from back of gauge to connecting point on heating manifold (fig 29).

8.18.4 Unscrew union on manifold.

8.18.5 Squeeze plastic locking lugs behind fascia and press gauge from aperture.

8.18.6 Reassemble in reverse order following original route for capillary.

8.19 REMOVAL OF ELECTRICAL COMPONENTS

8.19.1 Refer to 8.4

8.19.2 HEATING MICRO SWITCH
Part No 4302
Refer to fig 30

8.19.3 Hold switch and unscrew retaining nut.

8.19.4 Remove switch and remove cover.

8.19.5 Pull off electrical tab connections.

8.19.6 HIGH LIMIT THERMOSTAT
Part No 4888

8.19.7 Refer to 8.4

8.19.8 Remove room-sealed front cover 8.5.2

8.19.9 Disconnect 2 electrical connections at Gas Control Valve.

8.19.10 Trace wires to sensor, withdraw sensor from pocket on main flow tube and carefully pull sensor through the seal in the combustion chamber.

8.19.11 Reassemble in reverse order. Ensuring the sensor is fully located in the pocket from the top.

8.19.12 SAFETY THERMOSTAT
Part number 5441
Refer to fig 29

8.19.13 Pull off two electrical tab connectors on safety thermostat (marked with a yellow spot)

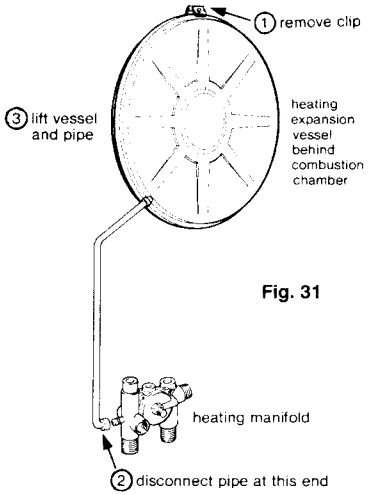


Fig. 31

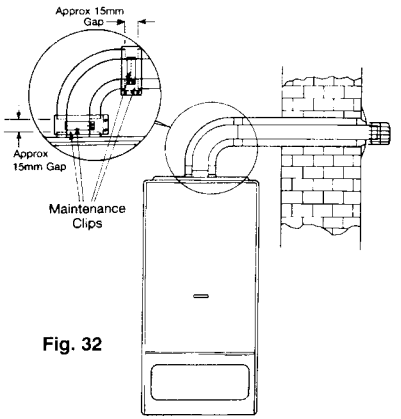


Fig. 32

8.19.14 Ease off thermostat retaining clip.

8.19.15 **HEATING THERMOSTAT**
Part No 3267
Refer to figs 33 & 34

8.19.16 Gain general access as 8.4

8.19.17 Remove room-sealed front cover 8.5.2

8.19.18 Trace capillary tube to sensor, remove sensor retaining clip, remove sensor from pocket and carefully pull sensor through rubber seal in combustion chamber.

8.19.20 Pull electrical tabs off back of thermostat.

8.19.21 Pull knob off front revealing 2 retaining screws.

8.19.22 Remove screws to release thermostat.

8.19.23 Reassemble in reverse order referring to figs 33 & 34 to ensure correction location of thermostat and push-on wiring tabs.

8.19.24 **REMOVAL OF PRINTED CIRCUIT BOARD**
Part No 6398

8.19.25 Refer to 8.4

8.19.26 Disconnect external incoming live and neutral and any control wiring from terminal strip.

8.19.27 Remove 2 plugs from p.c.b.

8.19.28 Pull tab connectors off both rocker switches.

8.19.29 Release p.c.b. retaining lugs from front panel and remove p.c.b.

8.19.30 Replace in reverse order.

8.19.31 Replace electrical connections. Refer to fig. 35 to ensure correct locations of switch wires.

8.19.32 **SWITCHES ON/OFF and TIMED/ REST/CONSTANT or MODE SELECTOR**
Part No's 5284 & 4981
Refer to fig 35

8.19.33 Pull off tab connectors, squeeze spring latching tabs at the back of the panel and push switch outwards to remove.

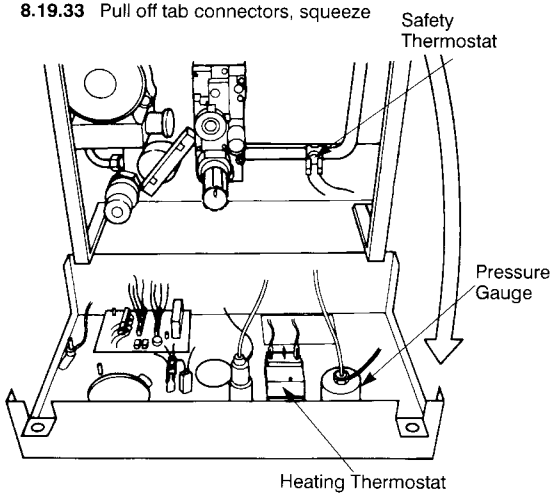


Fig. 33

8.19.34 To replace refer to fig 35 to ensure switch is in correct attitude and press into hole from the front until spring tabs latch. Refer to fig 35 for correct wiring details.

8.19.35 **FAN SLOW SPEED RESISTOR**

8.19.36 Unplug inline connector below fan resistor.

8.19.37 Remove 2 retaining screws from resistor.

8.20 END OF SERVICING

Run through the general commissioning as described in Section 6 as far as they apply.

Refit casings and clean up.

Fig. 34

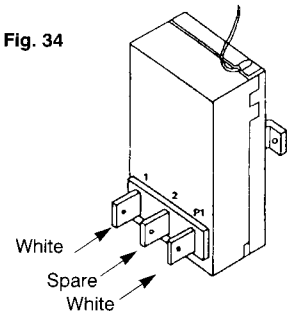
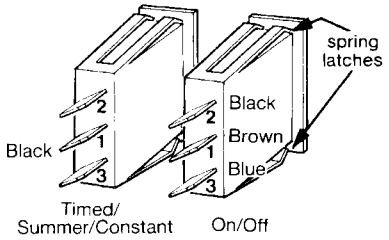


Fig. 35



SECTION 9 OPERATIONAL CHECKS, WIRING DIAGRAMS & FAULT FINDING

9.1 On completion of any service/fault finding task which has required the breaking and remaking of electrical connections the checks Earth Continuity, polarity and Resistance to Earth must be repeated.

The following flow diagrams suggest the logical sequence of steps for fault finding.

They are not exhaustive but cover all that can reasonably be carried out on site by the installer or service engineer.

Acquaintance with the functional sequence will prove helpful for some, and this is included for reference. As further help, the role of each part is briefly described.

Also included in this section are wiring diagrams and schematics to assist in fault location and servicing as described in the text.

9.2 SEQUENCE OF FUNCTIONS

When following this sequence, refer to figs 37 & 39. It is assumed that the on/off switch and gas supply are ON and the pilot flame is alight.

9.2.1 AT REST

No call for Heating or Domestic Hot Water. Current flows via the normally closed contacts of R1, through the 560Ω resistor then through the normally closed contacts of the boiler flow switch to the fan which runs at slow speed to scavange the combustion chamber and provide air for the pilot flame.

N.B. If the electricity supply is switched off or fails the fan will cease to operate and there may be insufficient air to maintain the pilot. A relighting of the pilot would be necessary.

9.2.2 DEMAND FOR HEAT

In this mode the timed/rest/constant switch must be in the closed position i.e. constant position fig 1.

With all the controls calling for heat the pump will start changing over the boiler flow switch, at the same time a supply through the boiler thermostat will energise terminals 3 (common) and in turn 1 (normally closed) on the pressure differential switch.

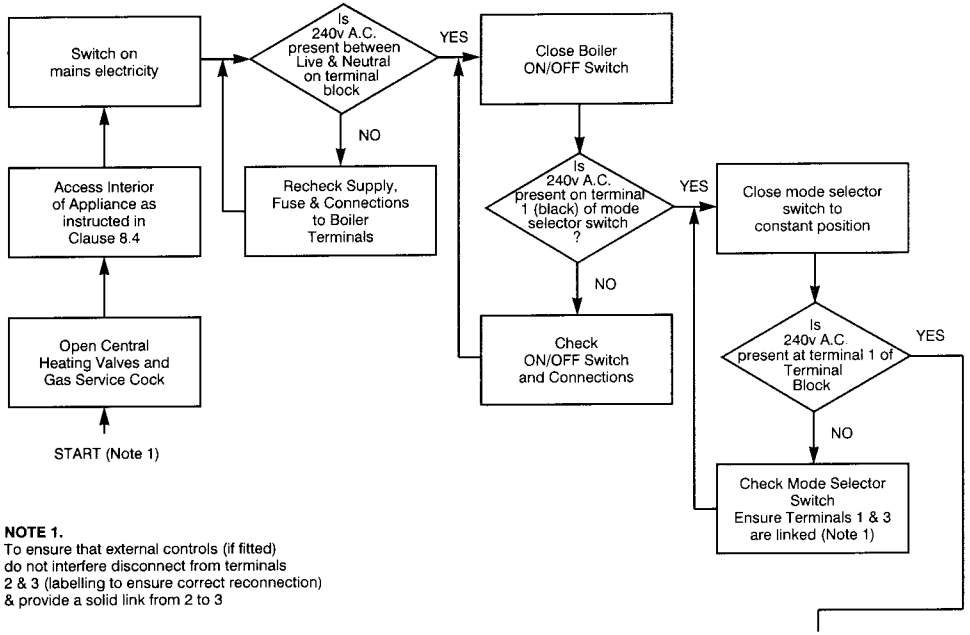
The transformer is energised causing the contact of R1 to be made. The fan will start and the pressure differential switch will change over energising the gas valve. The gas will flow and be lit by the permanent pilot.

The boiler will produce heat while there is a demand, or until the boiler thermostat is satisfied and P1-1 breaks.

The boiler circuitry will go to rest, but the pump will remain running to circulate water around the circuit.

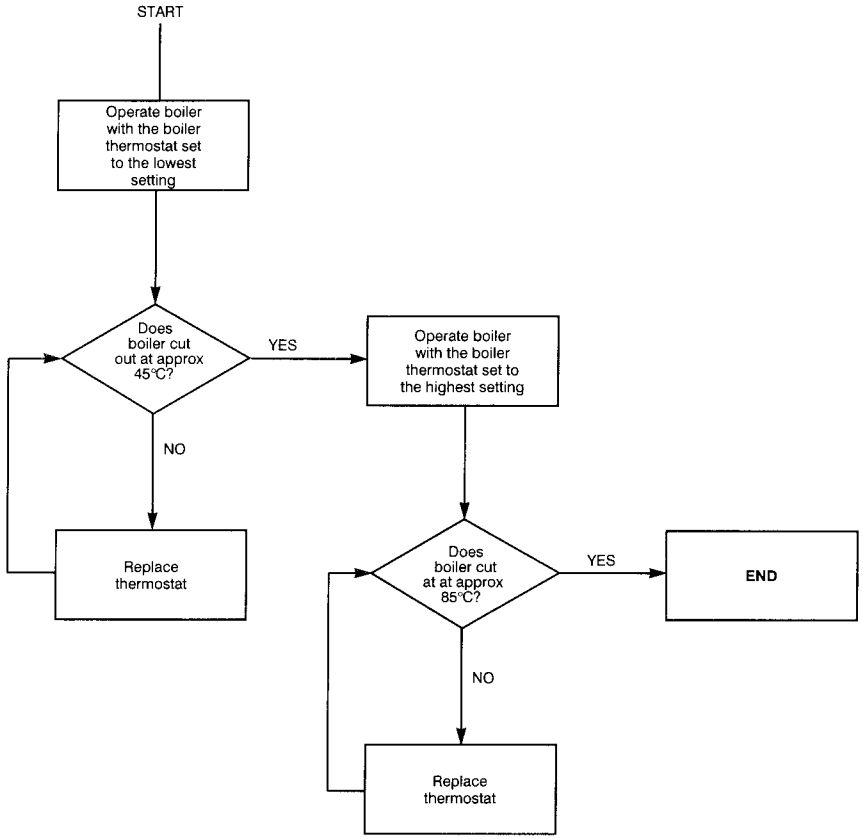
If the supply to P1 is broken (e.g. by a room thermostat) both the boiler and pump are switched off.

FAULT FINDING STEP 1
CHECK ELECTRICAL SUPPLIES, SWITCHES & CONNECTIONS



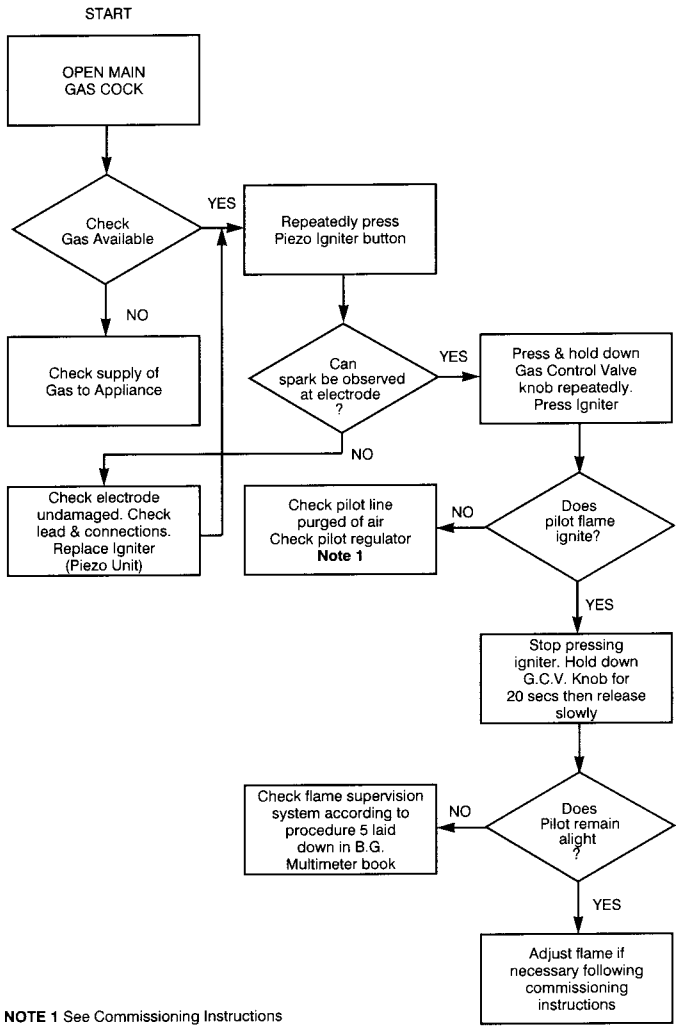
NOTE 1.
To ensure that external controls (if fitted) do not interfere disconnect from terminals 2 & 3 (labelling to ensure correct reconnection) & provide a solid link from 2 to 3

FAULT FINDING STEP 2
CHECKING C/H THERMOSTAT CIRCUITS



NOTE
1 Reduce number of radiators on to give quick response

FAULT FINDING STEP 3
CHECK GAS CONTROL PILOT BURNER FLAME SUPERVISING SYSTEM



NOTE 1 See Commissioning Instructions

SECTION 10 APPENDIX

Instructions for (A) Fitting Vokera 24 Hour Time Switch *(Part No. 032 GC No. 301 110)*
and Fitting Vokera Digital 7 Day Time Switch *(Part No. 05 GC No. 301 109)*
(B) Wiring to external Time Switches, Room Thermostats and Frost Thermostats
(C) Wiring to 'Y' plan or 'S' plan installations

A. Installation of the Vokèra Time Switches (24 Hr and 7 Day)

Remove the clock aperture blanking plate (1) (fig 1) by squeezing the two lugs on the rear of the plate together and push the plate out.

Remove the clock from its box.

Wire the clock as shown in fig 4.

Insert the clock into the aperture from the back of the control panel. Push the mounting bezel (2) through the front panel and secure to the clock using the four screws provided. (fig 2)

Connect the other ends of the wires to the main terminal block as detailed below. (fig 3)

Red/White: Cut off spade connector, strip end of wire and connect to terminal 1.

Blue: Connect to terminal marked 'N'.

Red/Black: Connect to spare terminal on rear of timed/rest/constant switch.

White: Connect to terminal 2 on main terminal block, (leave link 2-3 connected if no room thermostat is used).

Remove the loop between terminals 2 & 3 on the boiler terminal strip if a room stat is also fitted.

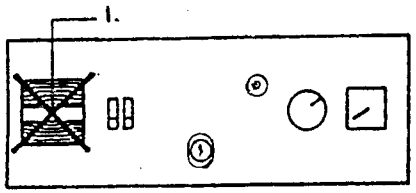


Fig. 1

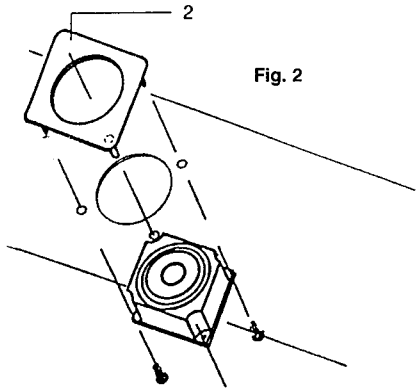


Fig. 2

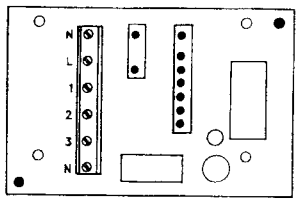
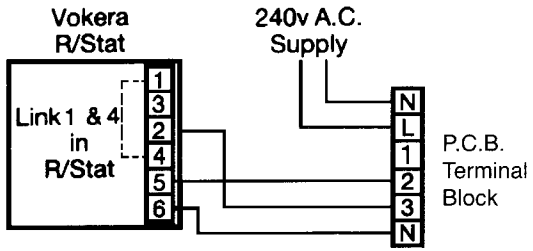


Fig. 3



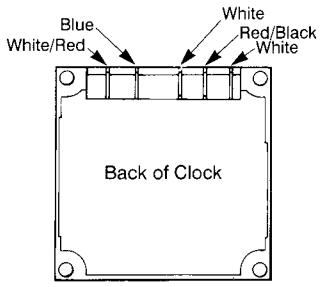
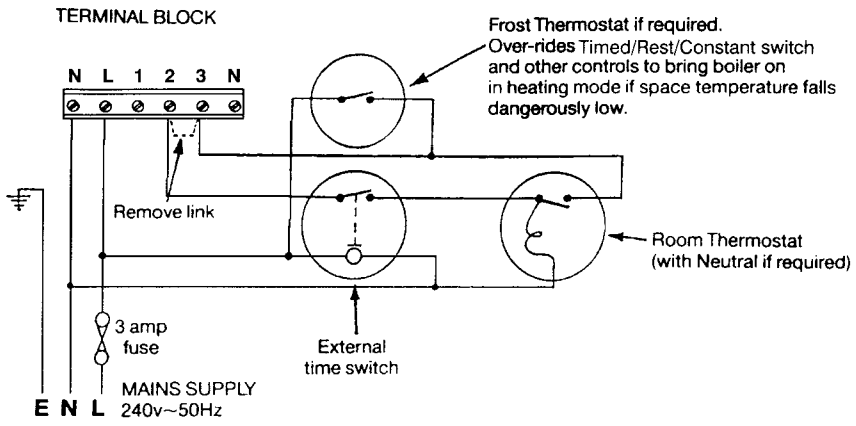


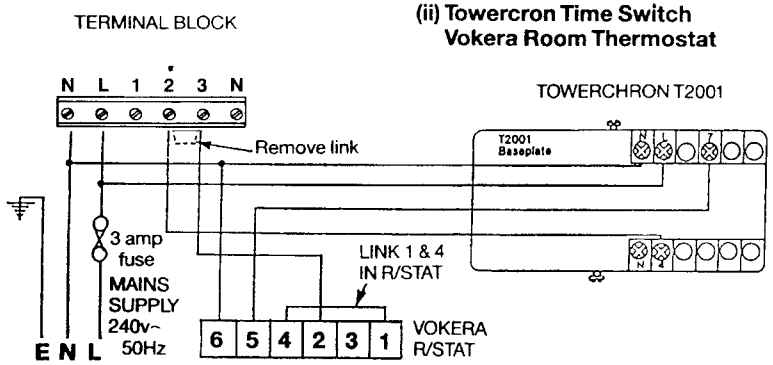
Fig. 4

B. Wiring to External Time Switches and Thermostats

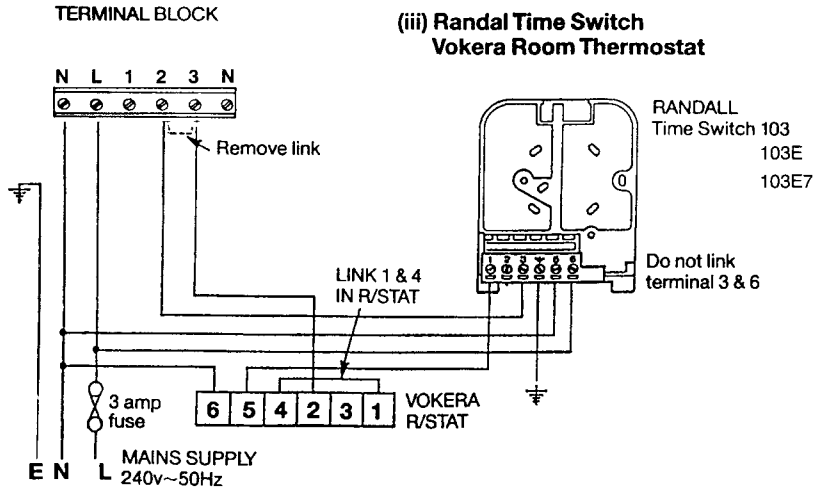
(i) General Schematic Diagram.



(ii) Towercron Time Switch Vokera Room Thermostat

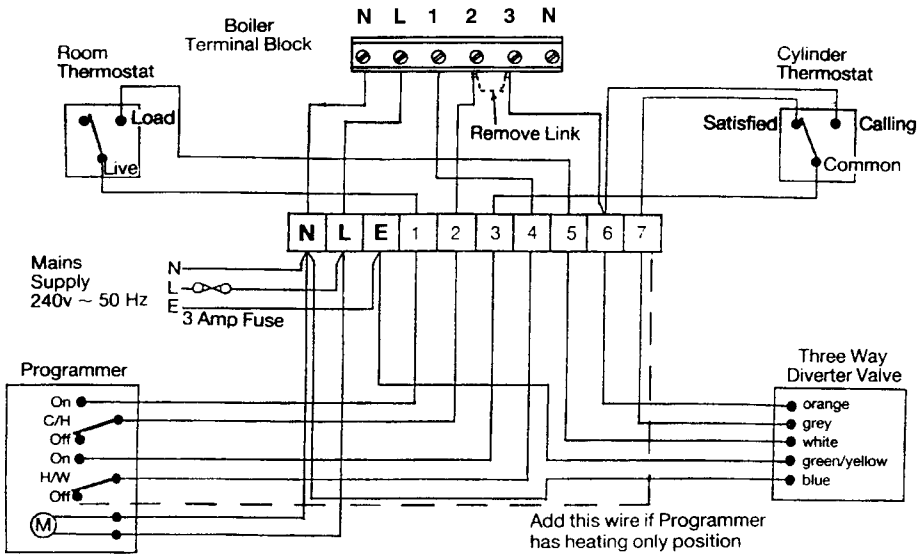


(iii) Randal Time Switch Vokera Room Thermostat



C. Wiring to 'Y' plan or 'S' plan installations

(i) 'Y' Plan



(ii) 'S' Plan

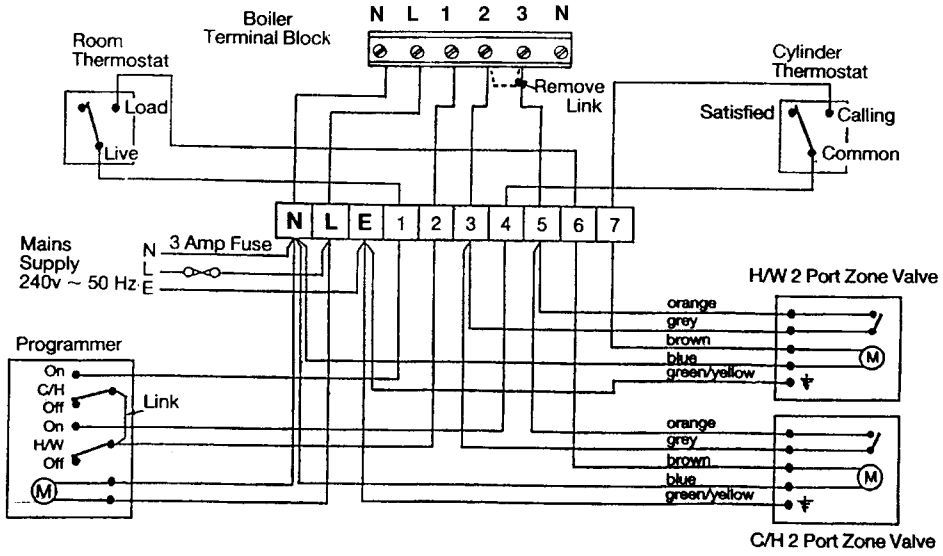
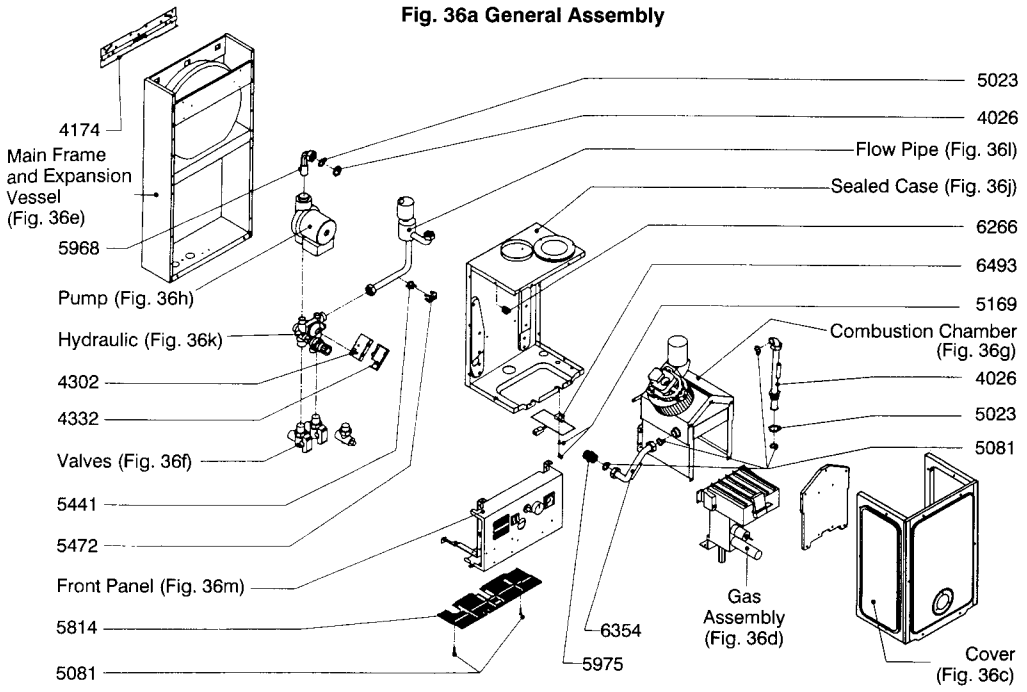


Fig. 36a General Assembly



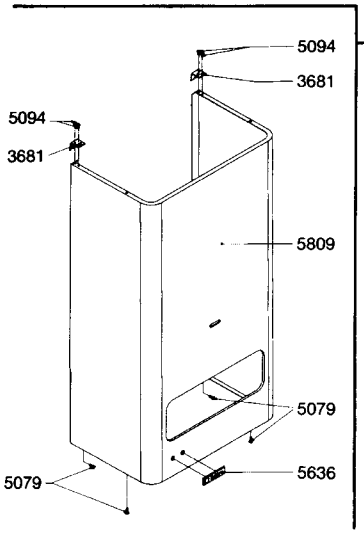


Fig. 36b Outer Casing

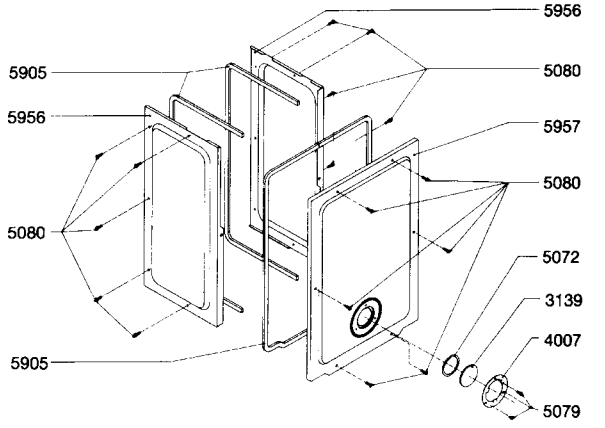


Fig. 36c Cover and Left/Right Sides

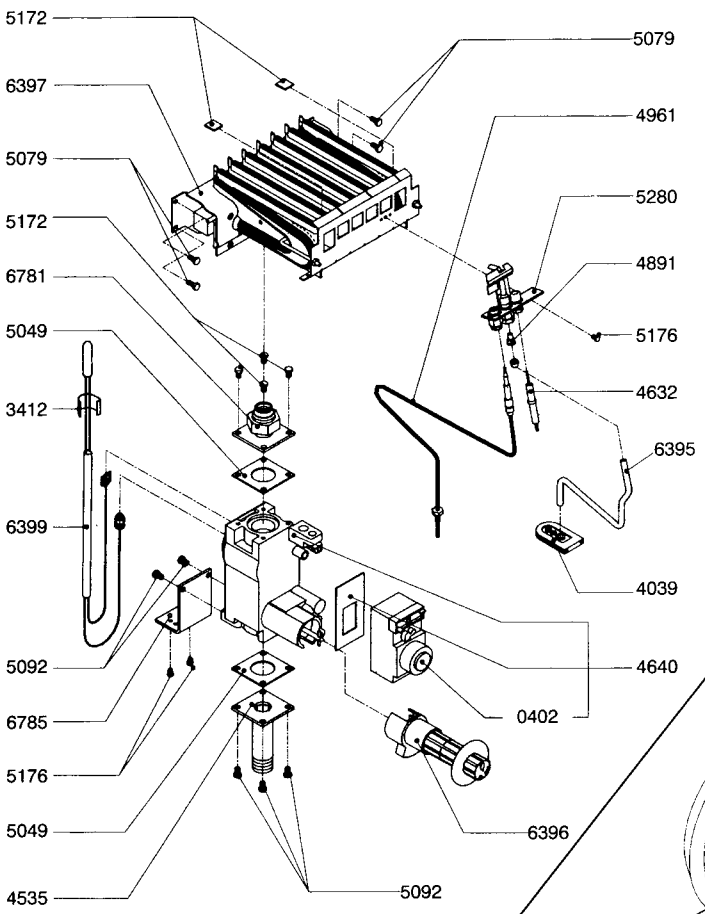


Fig. 36d Gas Assembly

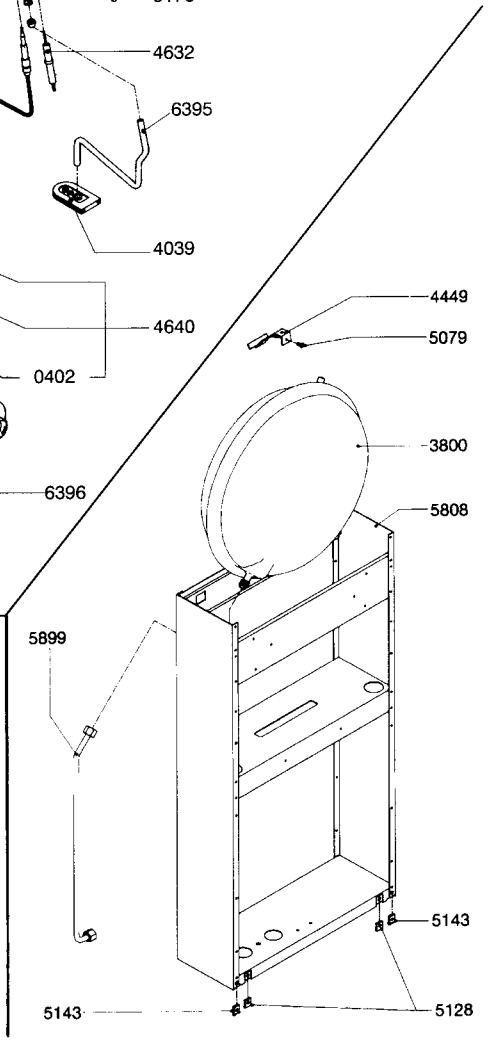


Fig. 36e Expansion Vessel 6 Lt

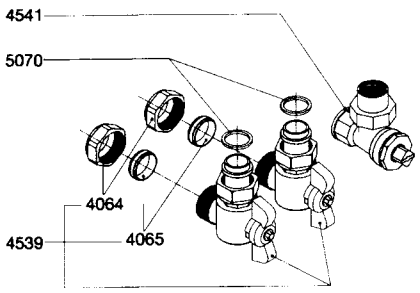
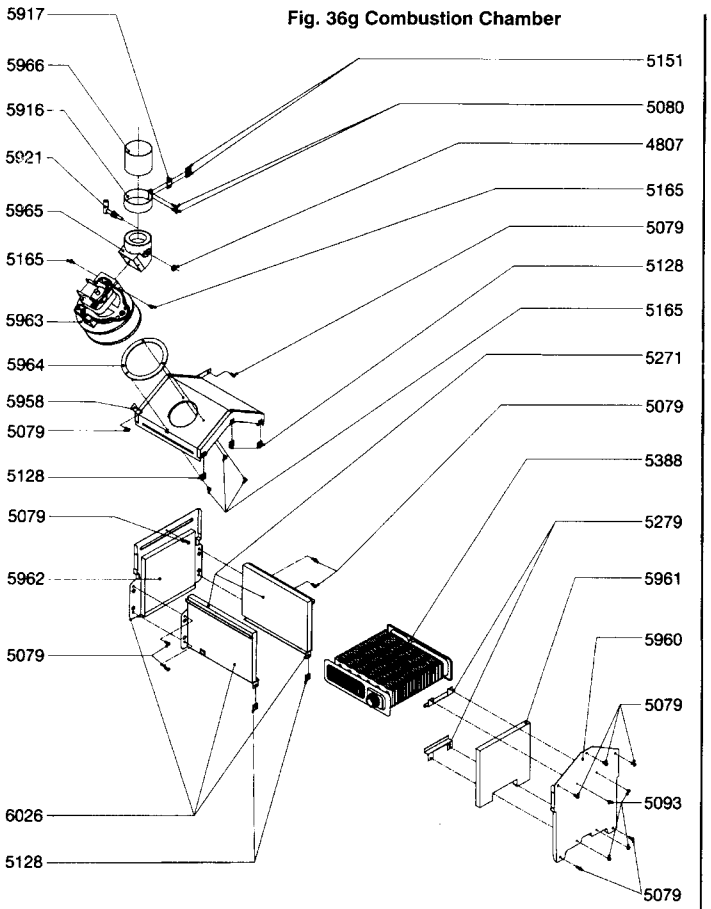


Fig. 36f Heating Flow and Return Valves

Fig. 36g Combustion Chamber



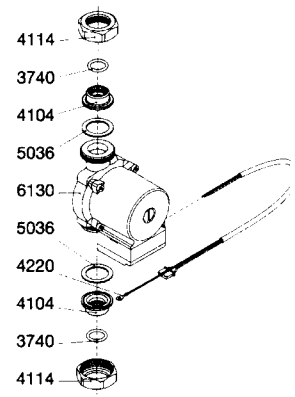


Fig. 36h Circulation Pump

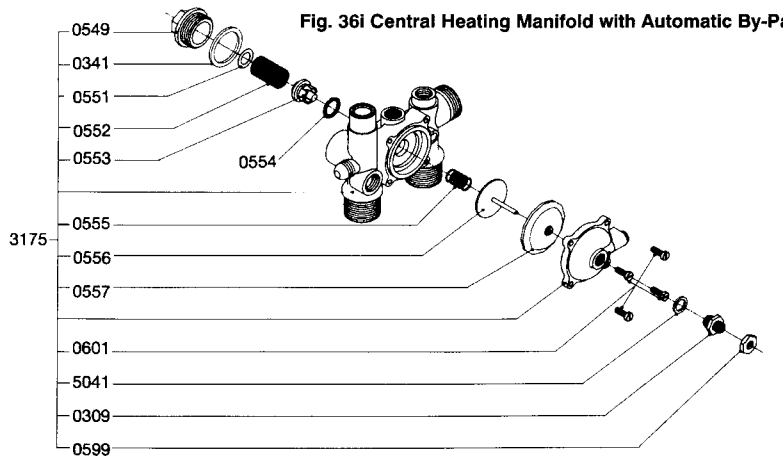


Fig. 36i Central Heating Manifold with Automatic By-Pass

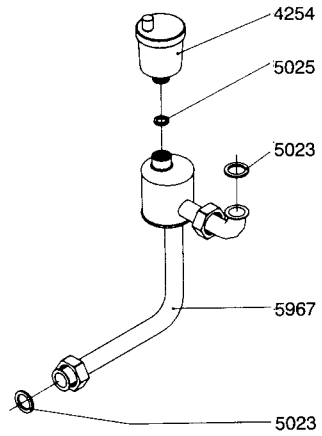


Fig. 36l Flow Pipe with Air Seperator

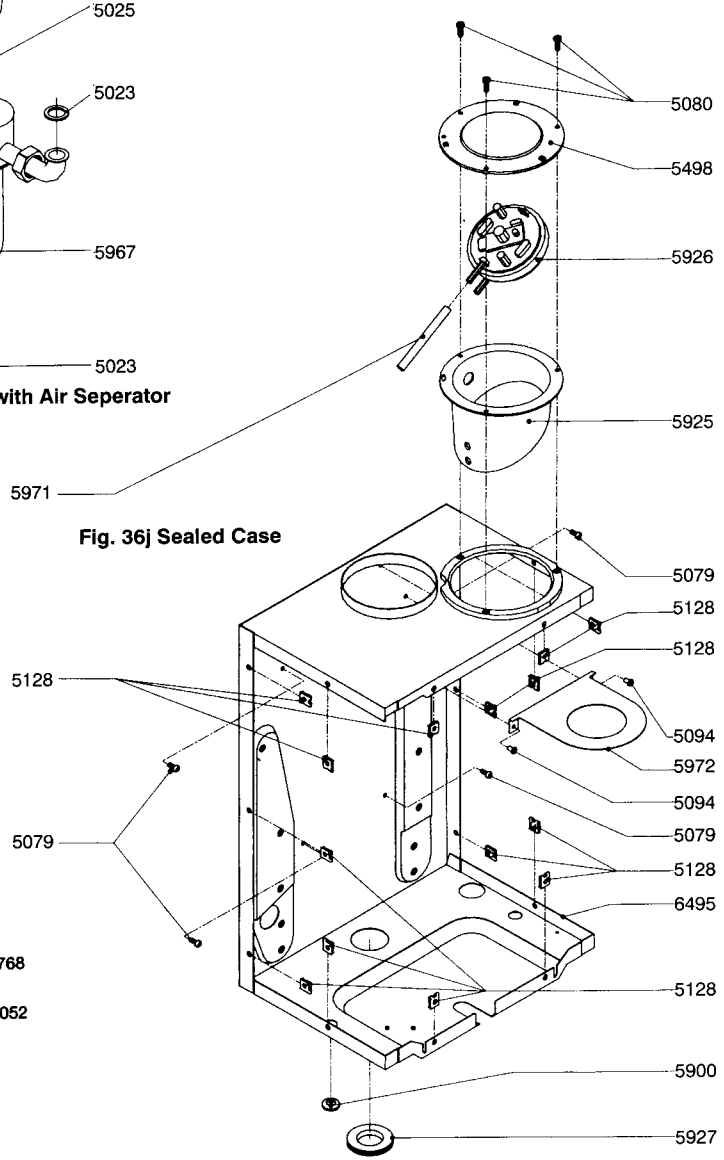


Fig. 36j Sealed Case

Fig. 36k Hydraulic

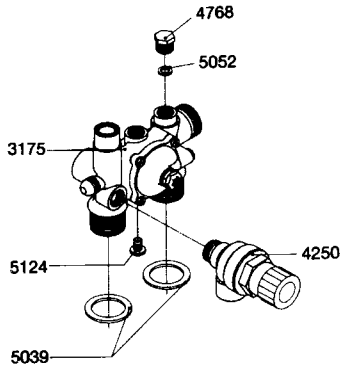
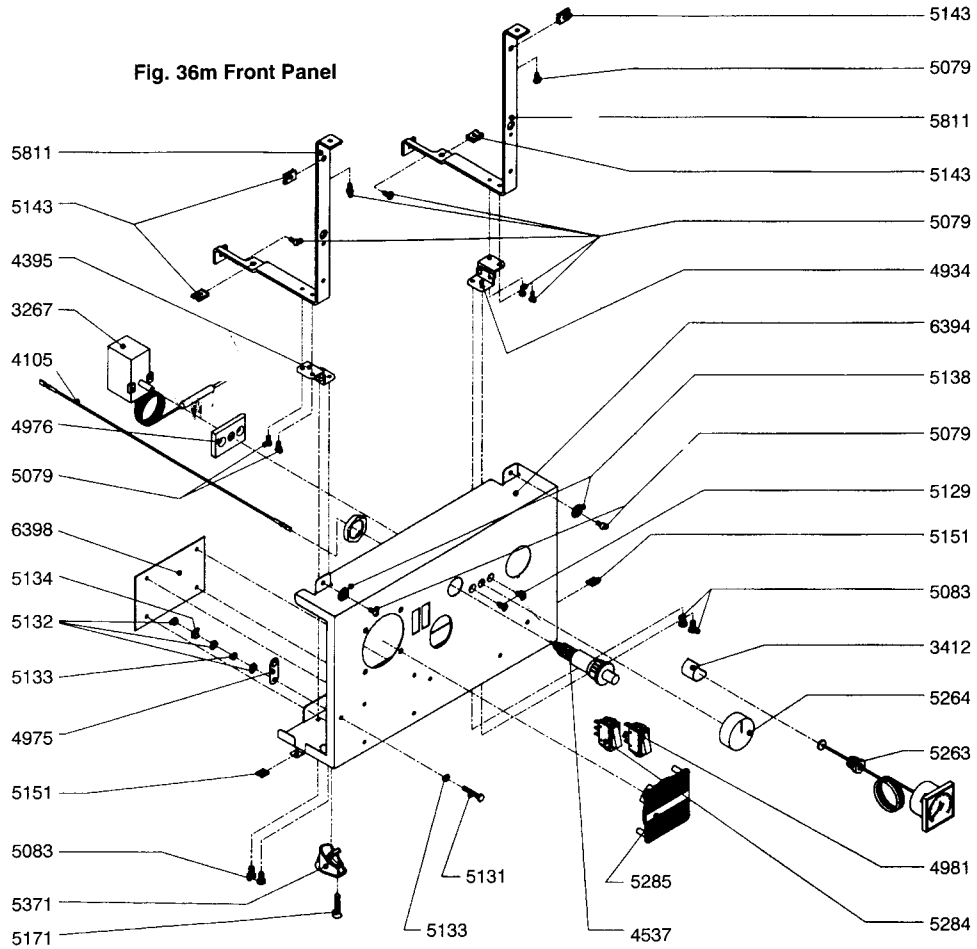


Fig. 36m Front Panel



SHORT SPARE PARTS LIST

Code	G.C. No.	Description	Code	G.C. No.	Description
0402	333 837	Gas Valve Operator	5263	301 004	Pressure gauge
0587	370 348	Main burner injector 1.35mm	5280	301 112	Pilot burner
3175	370 307	Heating manifold	5284	301 009	On/Off switch
3267	370 345	Heating thermostat	5309	301 083	Spark electrode
3800	370 309	Main expansion vessel	5388	370 315	Main heat exchanger
4250	333 772	Safety valve	5441	301 027	Safety thermostat
4302	333 773	Single microswitch	5812	370 321	Main burner
4640	333 888	Gas valve complete	5926	301 063	Pressure differential switch
4888	333 894	High limit thermostat	5963	397 760	Fan
4891	333 789	Pilot injector	6090	384 288	Pump
4961	333 902	Thermocouple	6398	370 360	Printed circuit board
4981	333 961	Timed/Summer/Constant Switch	6493	370 362	Fan slow speed resistor

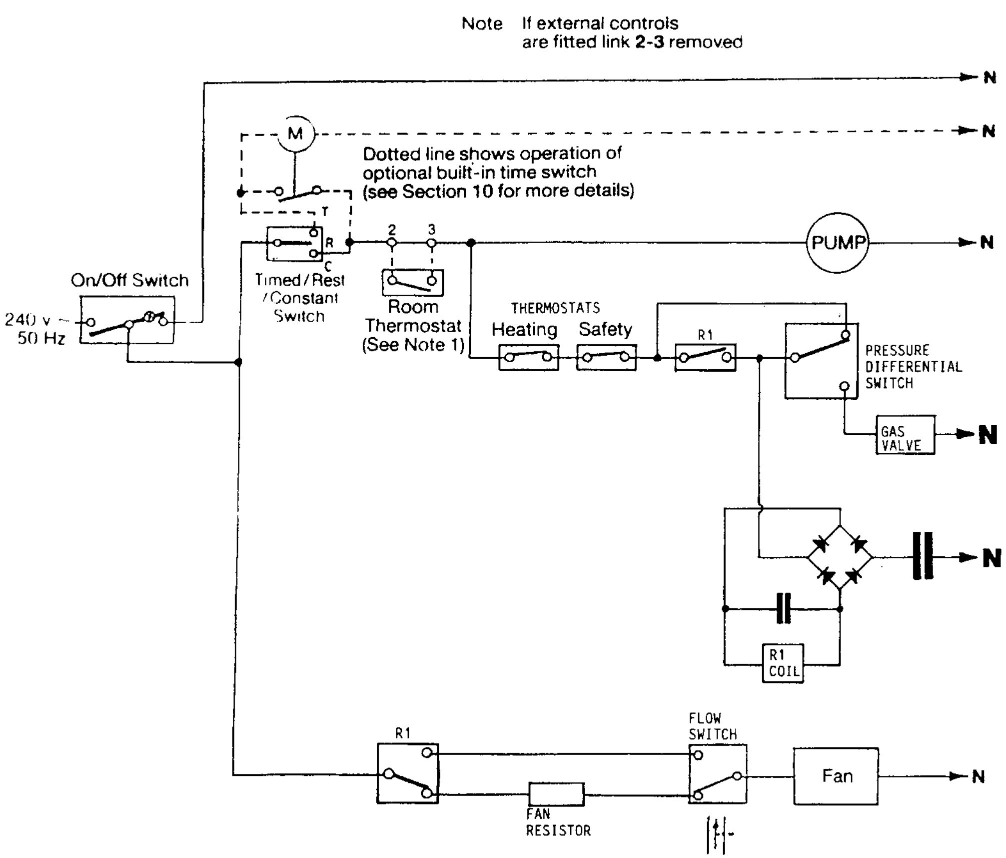

Note If external controls are fitted link 2-3 removed
N
M
Dotted line shows operation of optional built-in time switch (see Section 10 for more details)
T
R
C
2
3
PUMP
On/Off Switch
240 v ~
50 Hz
Timed/Rest /Constant Switch
Room Thermostat (See Note 1)
THERMOSTATS
Heating
Safety
R1
PRESSURE DIFFERENTIAL SWITCH
GAS VALVE
R1 COIL
FLOW SWITCH
FAN RESISTOR
Fan

Fig. 37

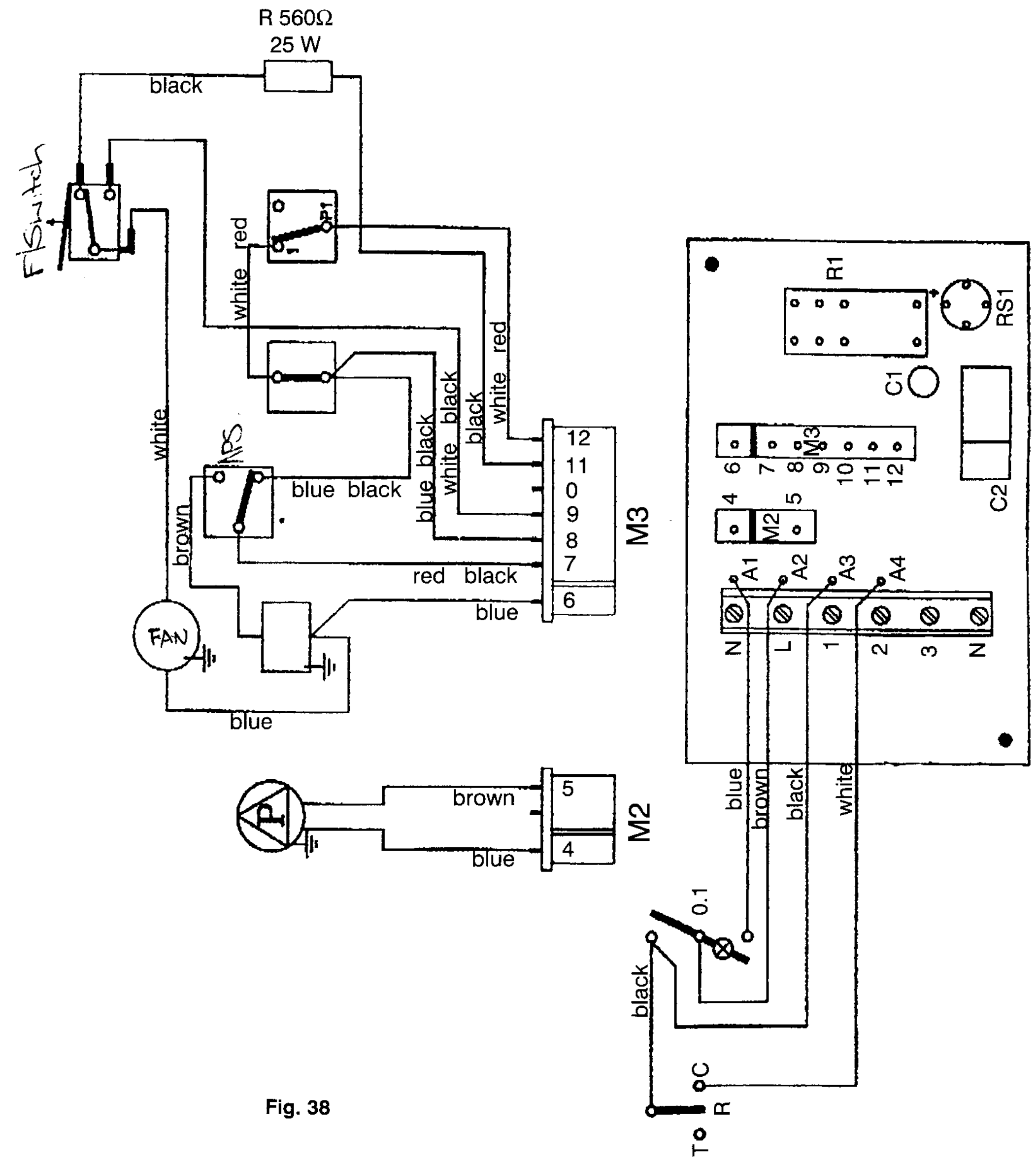

R 560Ω
25 W
black
white
red
blue black
white black
black
white red
brown
red black
blue
12
11
0
9
8
7
6
M3
FAN
5
4
M2
R1
RS1
C1
C2
A1
A2
A3
A4
N
L
1
2
3
0.1
T
R
C

Fig. 38

GENERAL LAYOUT OF WIRING FROM PRINTED CIRCUIT BOARD

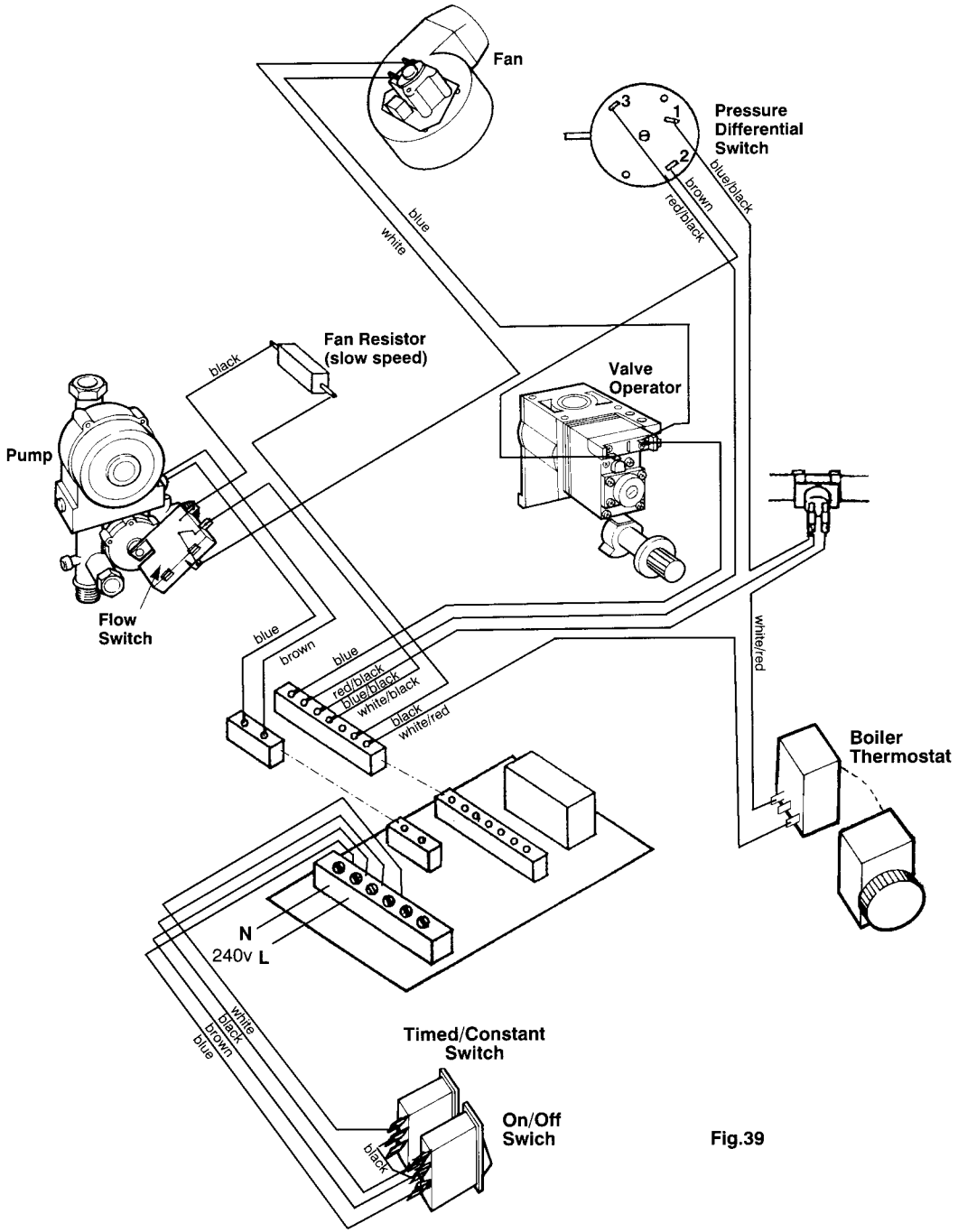


Fig.39