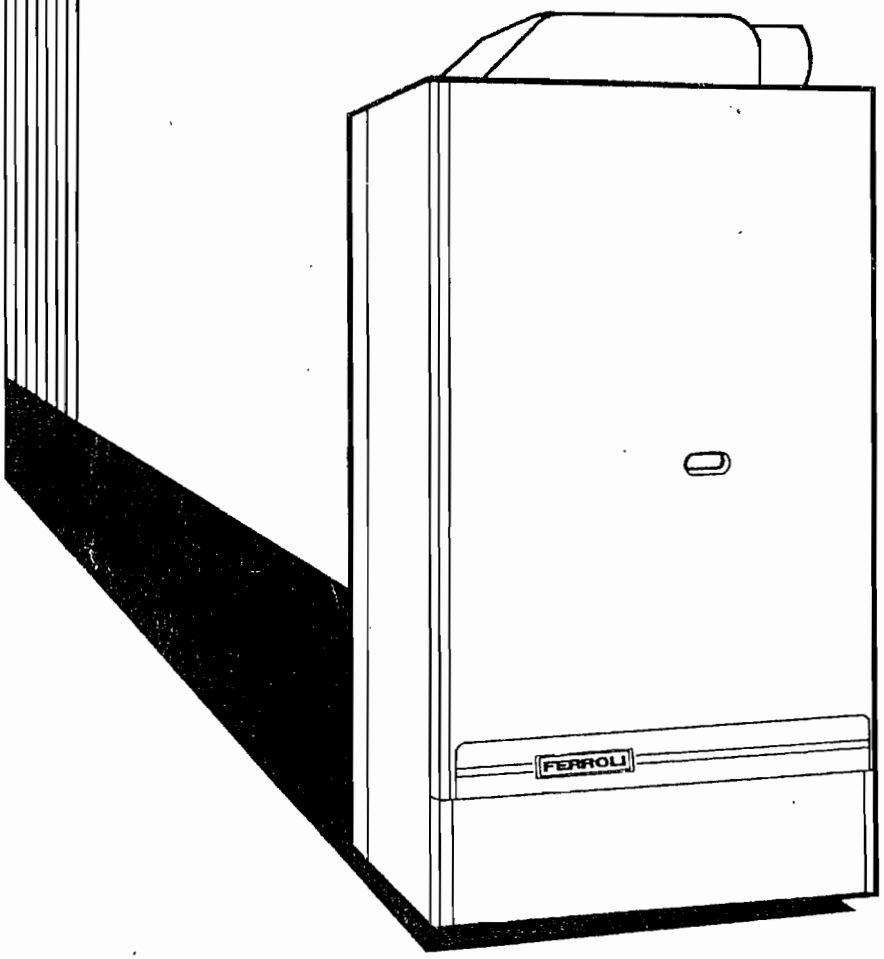
FERROLI COMBI 77 FF / POPULAR

04.93
VMF6.1

WALL MOUNTED, ROOM SEALED, FAN ASSISTED, GAS COMBINATION BOILER



TECHNICAL INFORMATION INSTALLATION and SERVICE INSTRUCTIONS

This Appliance has been Tested
and Certified by British Gas Plc
G.C. Appliance No. 4726706
W.R.C. No. 8902029

Read these Instructions thoroughly
before using the appliance

Phone numbers:

Installer _____

Service Engineer _____

Serial No. _____

FÉRROLI HELPLINE
FOR SERVICE INFORMATION OR HELP PLEASE TELEPHONE 08707 282 885

FERROLI

ALL SPECIFICATIONS SUBJECT TO CHANGE

Stockton Close, Minworth Industrial Park, Minworth, Sutton Coldfield, West Midlands B76 8DH
Sales: 021/3132030 Service: 021/3131030 Fax 021/3132319

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General Description

The **Ferroli COMBI 77 FF / POPULAR** is a wall mounted, room sealed, fan assisted, combination boiler for Central Heating (C.H.) and domestic Hot Water (D.H.W.).

The boiler is of light weight construction and the heat exchanger provides Central Heating and Domestic Hot Water from an integrally designed unit. The boiler contains its own expansion vessel for sealed systems. A carton containing an upper bracket for fixing is supplied with Gas Cock and water valves as standard, however, if requested an optional alternative carton is available containing an upper bracket plus a lower bracket pre-fitted with the Gas Cock and water valves. The Flue can either be left hand, right hand or rear. There are three flue lengths available and these are 0,75 metres (wall thickness up to 565 mm), 2 metre (wall thickness up to 1815 mm) and 3 metres (for wall thickness up to 2815 mm). These wall thicknesses assume a rear flue outlet. For side flue outlet the effective wall thickness for each flue length is reduced by 91 mm plus the distance of the Appliance from the side wall. The Central Heating and the Domestic Hot Water temperature is controlled by the Honeywell Modureg Valve in conjunction with the P.C.B. There is a limit thermostat on the Central Heating circuit which operates at 85°C and a limit thermostat in the Domestic Hot Water circuit which operates at 70°C. There is also an overheat cut off Thermostat which will shut the Boiler down completely and this Thermostat operates at 96°C. The Boiler is fitted with its own Central Heating pump. The pump is switched on/off by the external time clock (if fitted) or a 24 Volt Room Thermostat. The pump circuit also has a six minute over run time, there is a Domestic Hot Water flow switch fitted and when there is a demand for Domestic Hot Water (flow of more than 0,5 gallon/minute, 2,5 litre/minute) the Central Heating pump is switched off making available the maximum output of the Gas Burner for Domestic Hot Water. On the P.C.B. the maximum output for Central Heating can be set. This does not influence the maximum output for Domestic Hot Water. At the Factory the Central Heating output is preset to minimum. The Appliance is not suitable for external installation.

Related Documents

This appliance must be installed strictly in accordance with these instructions:

The Gas Safety Regulations (Installations & Use) 1984.

The Local Building Regulations.

The Building Regulations.

The Buildings Standards (Scotland - Consolidated) Regulations.

British Standards Codes of Practice:

B.S. 5546 1990
B.S. 5440 Part 1
B.S. 5440 Part 2
B.S. 5449
B.S. 6798
B.S. 6891 1988

Model Water Bye Laws.

Current I.E.E. Regulations.
Healt and safety document 635 "The electricity at work regs 1989".

Technical Data

	Metric	Imperial
Nominal Heat Input D.H.W. & C.H.	27.8 kW	94,800 Btu/h
Minimum Heat Input D.H.W. & C.H.	11.0 kW	37,500 Btu/h
Nominal Heat Output D.H.W. & C.H.	22.3 kW	76,000 Btu/h
Minimum Heat Output D.H.W. & C.H. (See section 8.6 for range setting of Central Heating - D.H.W. is preset and not adjustable)	8.1 kW	27,600 Btu/h
Maximum Gas Rate	2.65 m^3/h	9.36 ft^3/h
Burner Setting Pressure	15.3 mbar (maximum)	6.1 in wg
Minimum Burner Pressure	2.5 mbar	1.0 in wg
Injector Marking (Main Burners)	210	
Injector Size (4 off)	2.10 mm	0.082 in
Pilot Injector Marking	38/33A	
Dimensions (overall):		
Height	1020 mm	40.16 in
Width	480 mm	18.90 mm
Depth	360 mm	14.16 in
Weight (nett)	51 kg	112 lb
Weight (gross)	53 kg	117 lb
Electricity supply:	240 V ~ 50 Hz	
External fuse	3 A	
Internal fuses on P.C.B.	F2A to BS4265 - (2 Amp. Fast)	
Electrical Input	150 W	
Central Heating:		
Max. Flow Temperature	85°C	185°F
Temperature Rise Across Boiler	20°C	68°F
Domestic Hot Water Flow:		
30°C Rise	10.7 litres/min.	2.35 gal./min.
32°C Rise	10.0 litres/min.	2.20 gal./min.
35°C Rise	9.2 litres/min.	2.03 gal./min.
40°C Rise	8.0 litres/min.	1.76 gal./min.

Technical Data Sheet (Cont.)

	Metric	Imperial
Minimum Domestic Hot Water Flow	2.5 litres/min.	0.42 gal/min.
Maximum Domestic Cold Water Inlet press.	10 bar	145.14 lbf/in² (P.S.I.)
Minimum Heating Circuit Pressure	0.8 bar	11.61 lbf/in² (P.S.I.)
Maximum Heating Circuit Pressure	3.0 bar	43.5 lbf/in² (P.S.I.)
Boiler Water Capacity: Heating	1.5 litres	0.3 gal
Domestic Hot Water	0.5 litres	0.1 gal
Connections:		
Gas	3/4 in B.S.P.	
Domestic Hot Water Outlet	15 mm Copper O.D.	
Domestic Cold Water Inlet	15 mm Copper O.D.	
Pressure Relief Valve Drain	15 mm Copper O.D.	
Central Heating Flow	22 mm Copper O.D.	
Central Heating Return	22 mm Copper O.D.	
Minimum Installation Clearances:		
Sides - Left hand	5 mm*	1/4 in
Right hand	5 mm*	1/4 in
Front	50 mm**	2 in
Minimum Clearance below	200 mm	8 in
Minimum Clearance above	100 mm	4 in

Notes:

* **If using a side outlet flue then the minimum clearance on the flue outlet side of the appliance must be increased to 75 mm (3 in).**

** **Access to the front of the boiler must be available for maintenance (min. 600 mm)**

Appliance Dimensions

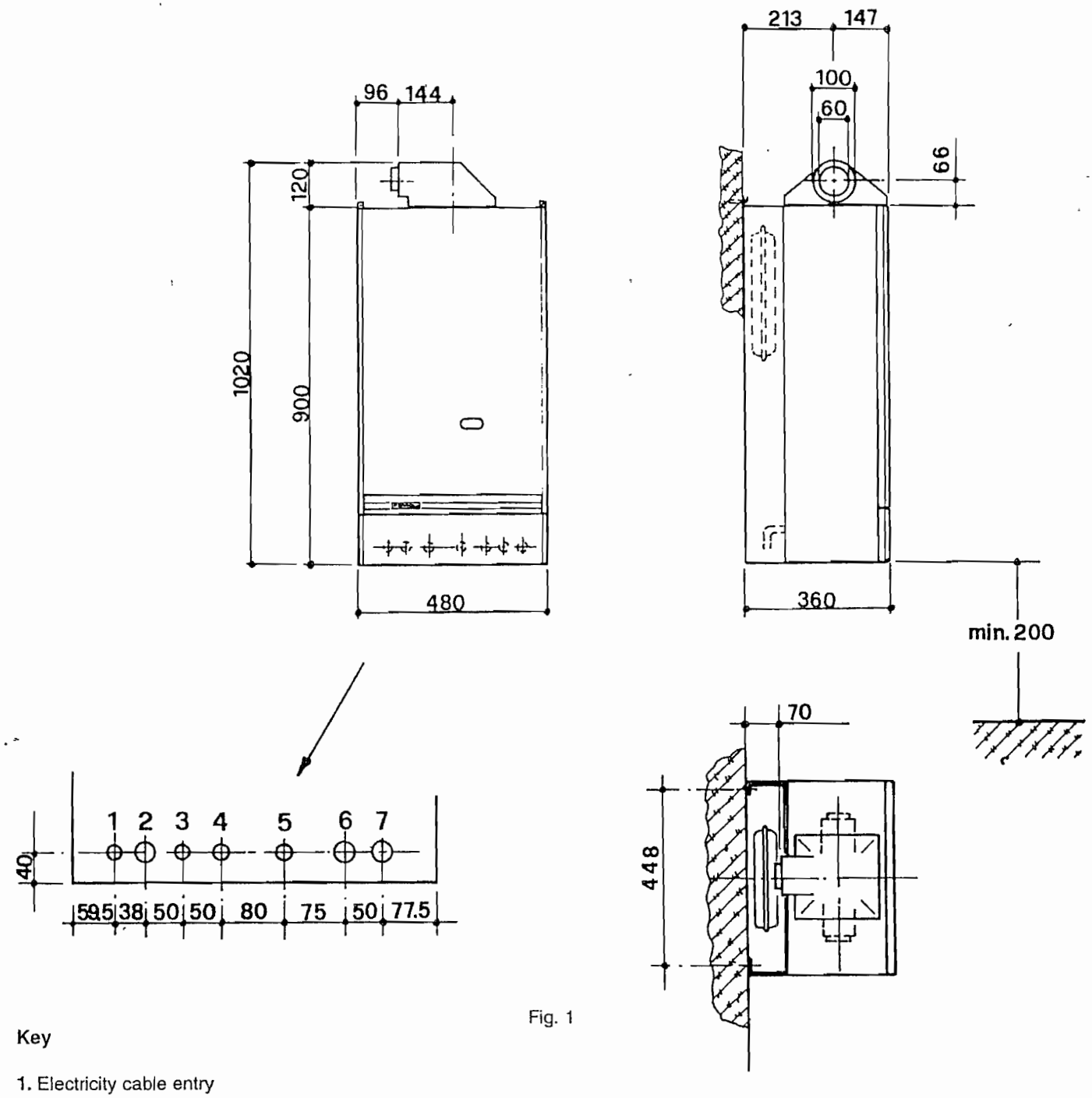


Fig. 1

Key

1. Electricity cable entry
2. Gas supply
3. Domestic Hot Water outlet
4. Domestic Cold Water inlet
5. Central Heating Pressure relief valve
6. Central Heating Flow outlet
7. Central Heating Return inlet

Boiler Flow Diagram

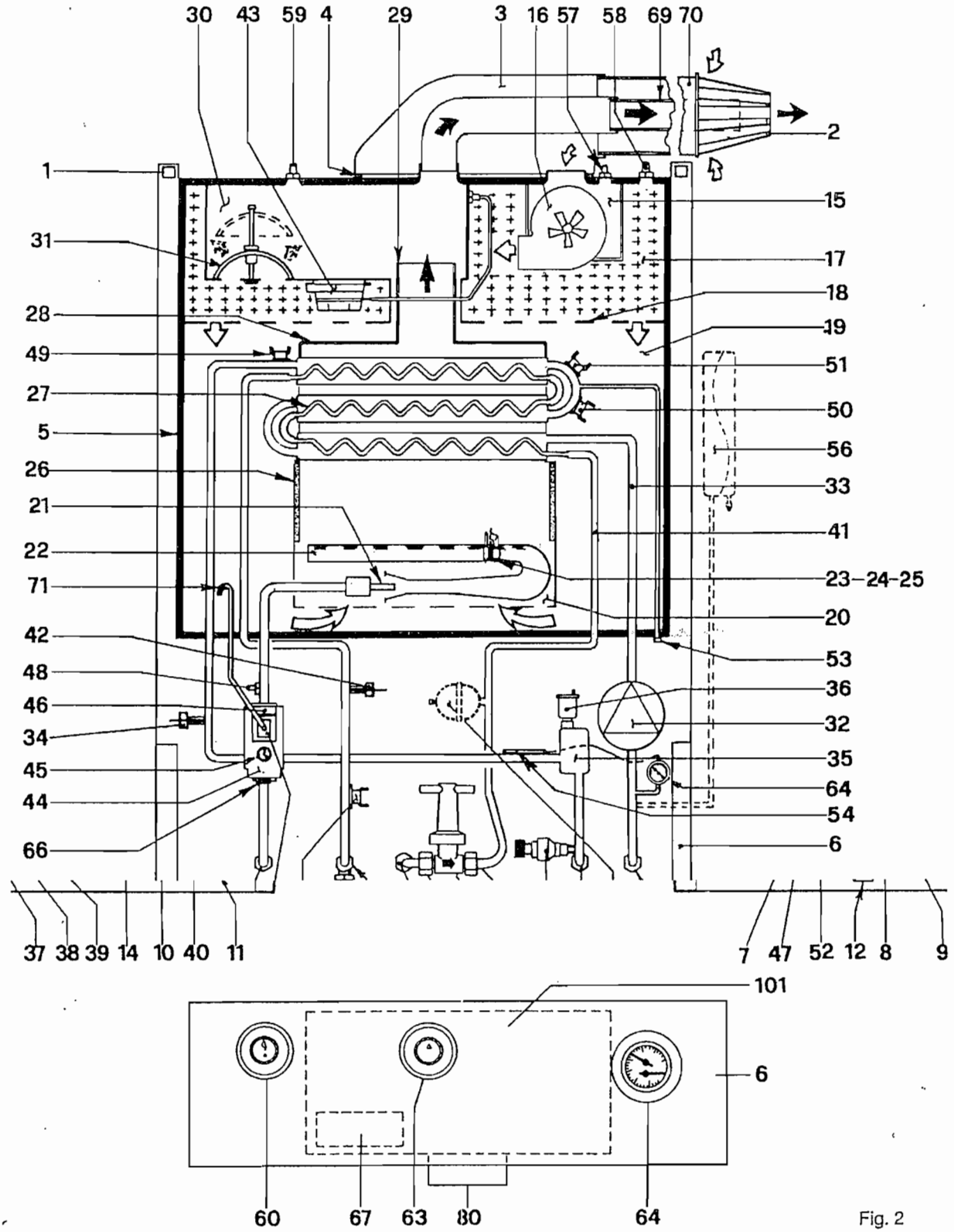


Fig. 2

Key

1. Fixing point
2. Flue terminal
3. Flue/air intake hood
4. Sealing gasket
5. Room sealed compartment
6. Control panel
7. Gas inlet
8. Domestic hot water outlet
9. Cold water inlet
10. Central heating flow outlet
11. Central heating return inlet
12. D.H.W. draining point
14. Central heating safety valve
15. Air inlet to fan
16. Fan
17. Air outlet from fan (+++)
18. Air distribution screen
19. Combustion - heat exchanging compartment
20. Burner assembly
21. Main injector (4)
22. Burner (4)
23. Thermocouple
24. Spark electrode
25. Pilot
26. Combustion chamber insulation
27. Copper heat exchanger for C.H. + D.H.W.
28. Flue collector from heat exchanger
29. Internal flue exit
30. Flue/surplus air collector
31. Air pressure control damper
32. Central heating pump
33. C.H. waterway of the heat exchanger
34. C.H. flow temperature sensor
35. Air separator
36. Automatic air vent
37. Cold water inlet filter
38. Cold water flow switch
39. Cold water flow limiter
40. Domestic hot water expansion vessel (optional)
41. D.H.W. waterway of the heat exchanger
42. D.H.W. temperature sensor
43. Air pressure switch
44. Combination gas valve
45. Knob gas valve
46. Operator gas valve
47. Modulating regulator (Modureg) gas valve
48. Burner pressure test point
49. Overheat cut-off thermostat
50. Central heating limit thermostat
51. Central heating frost thermostat
52. D.H.W. limit thermostat
53. Heat exchanger venting point
54. Temperature sensing bulb
56. Expansion vessel
57. Fan air inlet pressure test point
58. Fan air outlet pressure test point
59. Flue outlet pressure test point
60. Extended control knob to gas valve
63. C.H. boiler thermostat
64. C.H. temperature/pressure gauges
66. Microswitch combination gas valve
67. Ignition transformer
68. Control box with P.C.B.
69. Inner flue duct
70. Outer air intake duct
71. Modulating balance tube
80. 240 V + 24 V roomstat terminal blocks
101. P.C.B. (printed circuit board)

Installation Details

Gas Safety (Installation & Use) Regulations: 1984
In the interest of safety, it is the law that all gas appliances are installed by a competent person in accordance with the above Regulations, Building Regulations/Building Standards Scotland, Codes of Practice, current I.E.E. Regulations and the byelaws of the Local Water Undertaking. Failure to comply with the Regulations may lead to prosecution; it is in your interest and that of safety to ensure that the law is complied with.

Important - If the boiler is to be fitted in a timber framed buiding it should be fitted in accordance with the British Gas publication; Guide for Gas Installation in Timber Frame Housing: Reference DM2. If in doubt advice must be sought from the Local Gas Region of British Gas Plc.

Location of Boiler
The installation of the COMBI 77 FF must be on a suitable non-combustible load bearing wall which will provide an adequate fixing for the boiler mounting bracket assembly. The location should be in an area where the water pipers will not be subjected to frost conditions. In siting the combination boiler the following limitations **must** be observed:

The combination boiler may be installed in any room or internal space, although particular attention is draw to the requirements of the current, i.e. wiring regulations and in Scotland the electrical provisions of the building regulations applicable in Scotland, with respect to the installation of the combination boiler in a room or internal space containing a bath or shower.

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

Terminal Position

POSITION	MINIMUM SPACING (fig. 3)	mm
A	Directly below an openable window, air vent, or any other ventilation opening	300
B	Below gutters, soil pipes or drainpipes	75
C	Below Eaves	100
D	Below a Balcony	100
E	From vertical drinpipes or soilpipes	75
F	From internal or external corners	100
G	Above adjacent ground or balcony level	100
H	From a surface facing the terminal	600
I	Facing another terminal	1,200
J	From opening (door/window) in carport into dwelling	1,200
K	Vertically from a terminal on the same wall	300
L	Horizontally from a terminal on the same wall	300
M	Adjacent to an opening (door or window)	300
N	Below carport	600

A Quinnel Barrat and Quinnel guard (part. No. C2) should be screwed to the wall centrally over the terminal, when the distance is less than 2 m from the outside floor.

Air Supply
The room in which the boiler is installed does not require a purpose provided vent. If the boiler is installed in a cupboard or compartment, permanent air vent are required in the cupboard or compartment, one at high level one at low level, either direct to the outside air to a room. Both high and low level air vents must communicate with the same space.

Minimum effective area requirements of compartment air vents (for cooling purposes only) (fig. 4).

Terminal Position

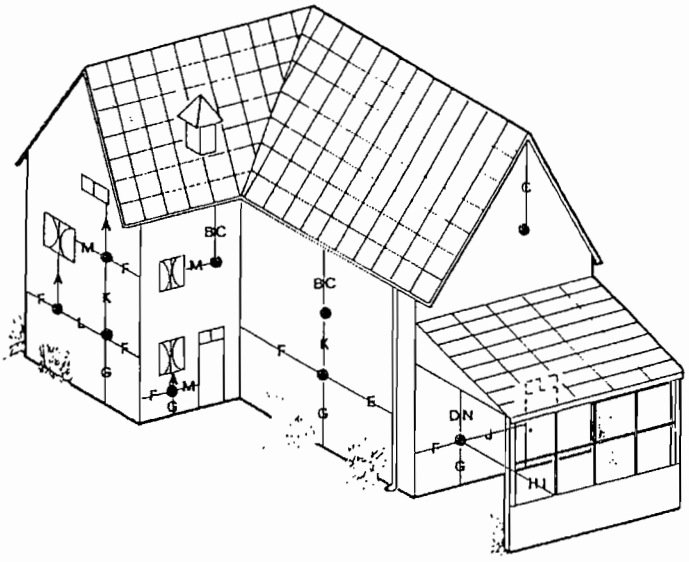


Fig. 3

Air supply

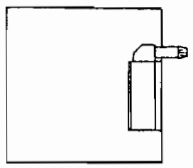
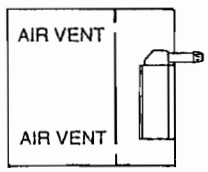
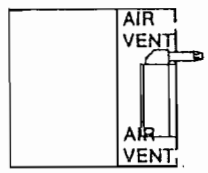
APPLIANCE FLUE SYSTEM / APPLIANCE LOCATION	ROOM-SEALED	AIR VENT AREAS
IN ROOM		NIL
IN COMPARTMENT OPEN TO ROOM		HIGH LEVEL: 252 cm² (38 in.²) LOW LEVEL: 252 cm² (38 in.²)
IN COMPARTMENT OPEN TO OUTSIDE		HIGH LEVEL: 126 cm² (19 in.²) LOW LEVEL: 126 cm² (19 in.²)

Fig. 4

Minimum Clearance mm

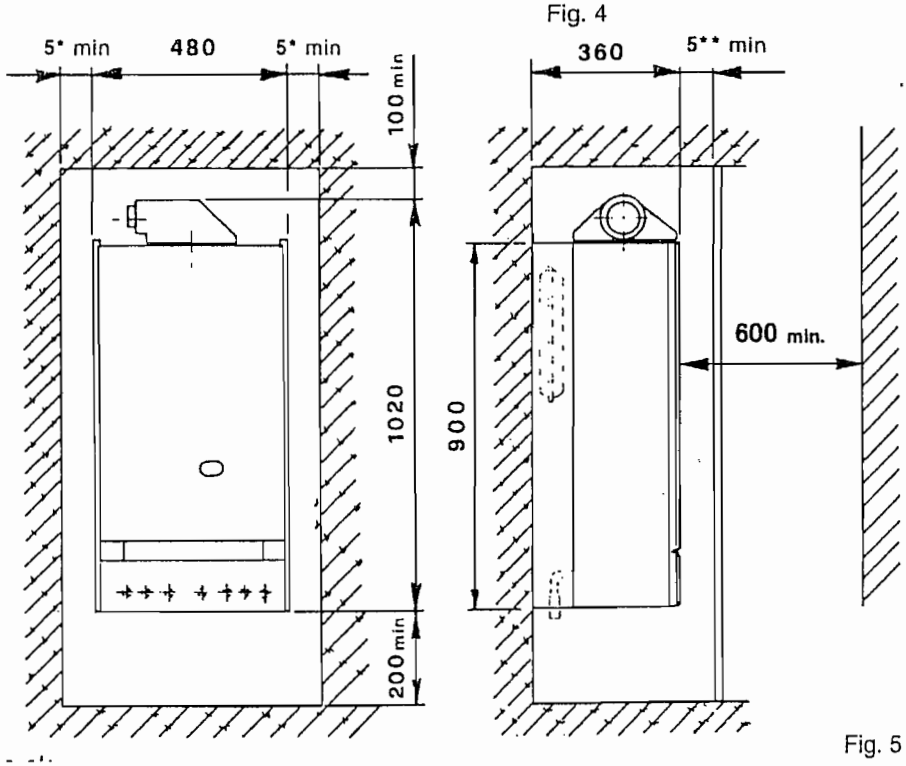


Fig. 5

NOTES

* If a side outlet flue is to be used, a clearance of 75 mm will be needed on the flue outlet side of the boiler.

** Acces to the front of the boiler must be available for maintenance (min. 600 mm).

Flue system

The boiler allows the flue outlet to be taken from the rear of the boiler or from either side.

A standard flue length of 0.75 metres is provided. Alternative lengths of two or three metres can be supplied (equivalent to wall thicknesses of up to 565, 1815 and 2815 mm for rear flues and deduct 91 mm plus distance from side wall for side outlet flues).

It is absolutely **essential**, to ensure that products of combustion discharging from the terminal cannot re-enter the building, or enter any adjacent building, through ventilators, windows, doors, natural air infiltration, or forced ventilation/air conditioning.

Gas Supply

If necessary the local Gas Region should be consulted, at the installation planning stage, in order to establish the availability of an adequate supply of gas.

An existing service pipe must **not** be used without prior consultation with the Local Gas Region.

A gas meter can only be connected by the Local Gas Region, or by a Local Gas Region's Contractor.

Installation pipes should be fitted in accordance with BS6891-1988.

Appliance inlet working pressure must be 20 mbar MINIMUM.

Pipework from the meter to the combination boiler must be of an adequate size.

The boiler requires 2.65 m^3/h (936 ft^3/h) of natural gas.

Do not use pipes of a smaller size than the combination boiler inlet gas connetion.

We would recommend 22 mm pipe from the meter.

The complete installation must be tested for gas soundness and purged as described in BS6981-1988. All pipework must be adequately supported. An isolating gas valve is provided and should be fitted on the manifold assembly.

Water System

Central Heating

It must be a sealed system. Detailed recommendations are given in BS6798, BS5449, BS6700 and CP342 Part. 2. Pipework not forming part of the useful heating surface should be insulated to prevent any heat losses or possible freezing (i.e. in roof spaces or ventilated underfloor spaces). Drain taps should be positioned at the lowest point of the system in accessible locations to permit the whole system to be drained down. The drain taps should be in accordance with BS2879. Copper tubing to BS2871, Part. 1 is recommended for water carrying pipework. Pipework in horizontal runs should have a gradient where possible to facilitate the removal of air. It should be ensured that the boiler heat exchanger is not a natural point for collecting air. A typical heating system with domestic hot water circuit is illustrated in fig. 6.

Important - A bypass must be fitted to ensure a minimum flow rate through the boiler of 6 l/min. The bypass should be fitted as far as possible from the boiler if thermostatic radiator valves are fitted throughout.

Make up Water

Provision must be made for replacing water lost from sealed system. Reference should be made to BS6798, for methods of filling and making up sealed systems. There must be no direct connection between the boiler's central heating system and the mains water supply. The use of mains water to charge and pressurise the system directly, is conditional upon the Local Water Byelaw. Again any such connection must be disconnected after use.

Domestic Hot Water

Always fir a water softener or scale reducer in "hard water areas". The maximum Domestic Water pressure for the inlet supply is 10 bar (145 P.S.I.). If the cold mains syupply exceeds 5 bar (72 P.S.I.), a water governor or pressure reducing valve must be fitted by the installer onto the mains supply in an accessible position preferably between 3 and 5 metre (10 - 16 ft.) before the Appliance. Such a valve must be Approved by the Water Research Council.

Domestic Hot Water Expansion Vessel

Where preblems with "water hammer" are experionced a Domestic Hot Water expansion vessel can be fitted within the Appliance on the supplied connection point. (see Fig. 20, page 24).

Attention - Is drawn to the Model Water Byelaws.

Fittings manufactured from duplex (alpha-beta) brass are not acceptable for underground use and certain water undertakers will not accept their use above ground.

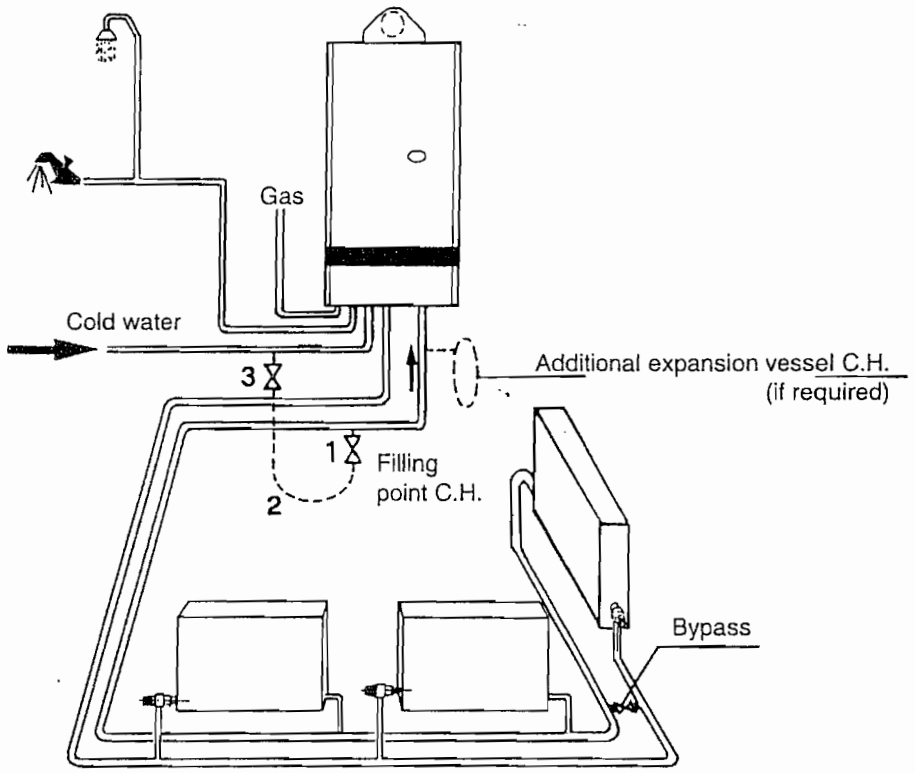
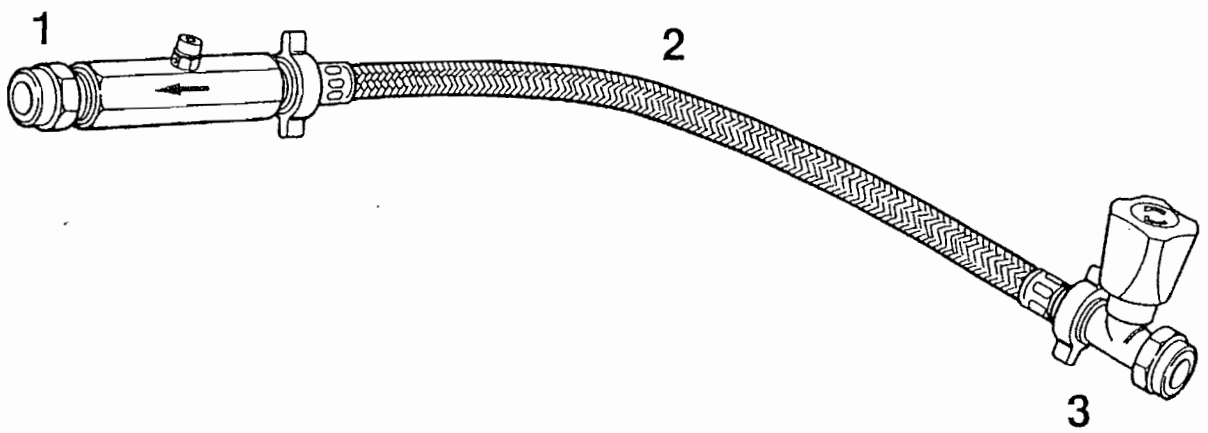


Fig. 6

NOTE: A bypass must be fitted as far as possible from the boiler if thermostatic radiator valves are fitted throughout.



Key
1. Filling point C.H.
2. Temporary connection
3. Cold water supply

Fig. 7

Flue system

The boiler allows the flue outlet to be taken from the rear of the boiler or from either side.

A standard flue length of 0.75 metres is provided. Alternative lengths of two or three metres can be supplied (equivalent to wall thicknesses of up to 565, 1815 and 2815 mm for rear flues and deduct 91 mm plus distance from side wall for side outlet flues).

It is absolutely **essential**, to ensure that products of combustion discharging from the terminal cannot re-enter the building, or enter any adjacent building, through ventilators, windows, doors, natural air infiltration, or forced ventilation/air conditioning.

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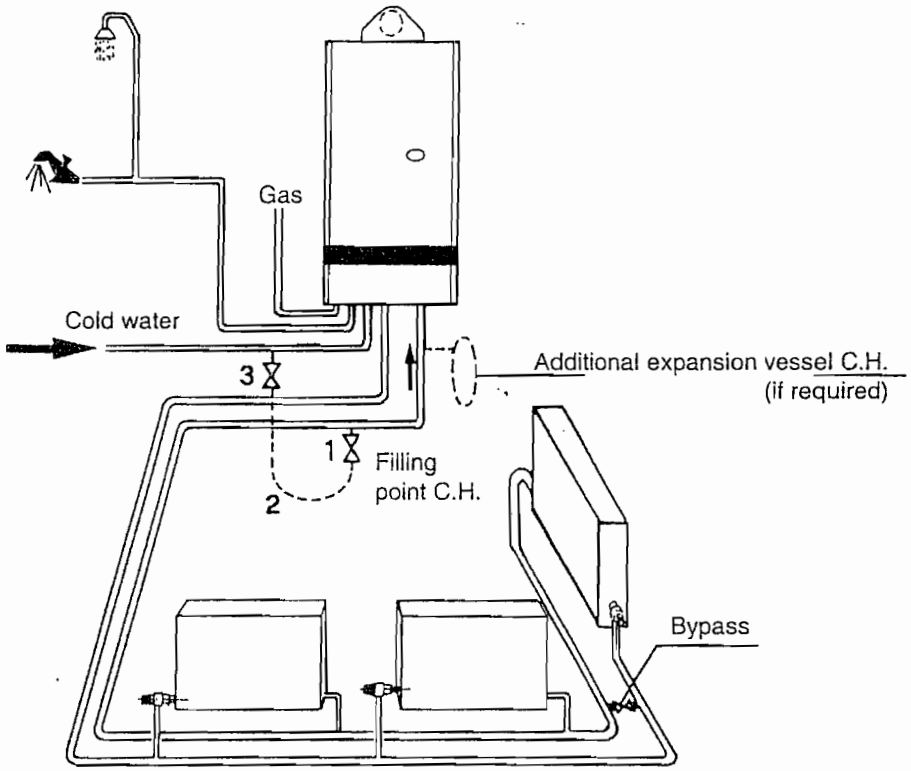

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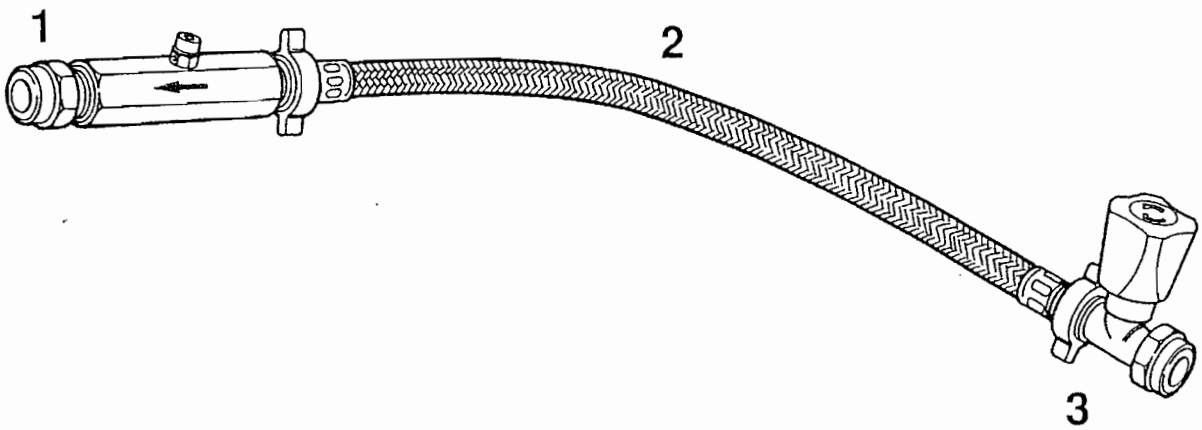


Key
1. Filling point C.H.
2. Temporary connection
3. Cold water supply

Fig. 7

Built-in Central Heating Water Circulating Pump

The pump head available for circulating the water is given in fig. 8.

N.B. - The pump is factory set at position 3. The pump is a Grundfos type 15-50 UPS series.

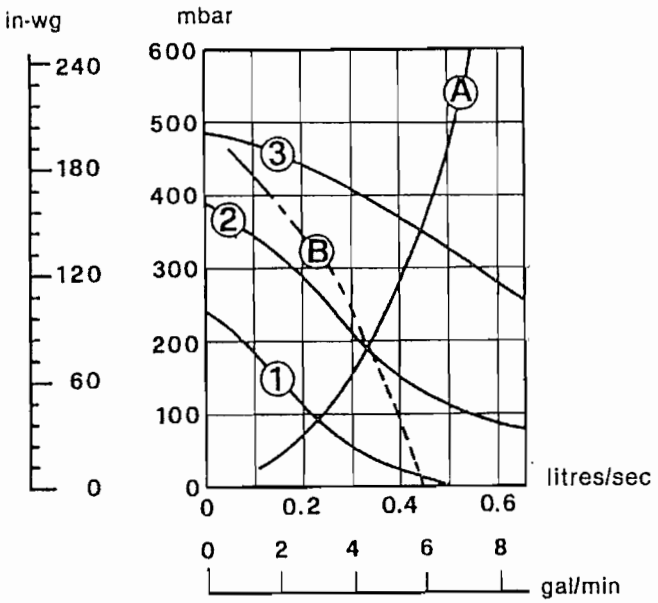
Grunfos Pump performance graph

Note - Minimum flow through boiler heat exchanger at any time should not fall below 6 litres per minute.

If required an additional expansion vessel may be fitted to the central heating return inlet.

If the total volume of water in the system exceeds 40 litres an additional expansion vessel must be fitted to the central heating return inlet.

Pump performance curve Grundfos UPS 15-50



1 2 3 Speed settings
A Boiler pressure drop
B Max. available pump head C.H.

Fig. 8

SAFETY VALVE SETTING (bar)	3.0					
VESSEL CHARGE PRESSURE (bar)	0.5			1.0		1.5
INITIAL SYSTEM PRESSURE (bar)	1.0	1.5	2.0	1.5	2.0	2.0
TOTAL WATER CONTENT of SYSTEM	EXPANSION VESSEL VOLUME (litres)					
LITRES						
25	3.5	6.5	13.7	4.7	10.3	8.3
50	7.0	12.9	27.5	9.5	20.6	16.5
75	10.5	19.4	41.3	14.2	30.9	24.8
100	14.0	25.9	55.1	19.0	41.2	33.1
125	17.5	32.4	68.9	23.7	51.5	41.3
150	21.0	38.8	82.6	28.5	61.8	49.6
175	24.5	45.3	96.4	33.2	72.1	57.9
200	28.0	51.8	110.2	38.0	82.4	66.2
For syst. volumes other than those given above, mult. the syst. volume by the factor across	0.140	0.259	0.551	0.190	0.412	0.33

SIZING OF ADDITIONAL EXPANSION VESSELS:
Deduct from the value given in the table the 7 litre vessel supplied.

Note

1. Fill C.H. installation to min. 1.5 bar.
2. Select by preference the expansion vessel for increased system pressure of 2.0 bar
3. Expansion vessel must be fitted to Central Heating Return Inlet
4. The standard 7 litres expansion vessel is charged to 1 bar

Fig. 9

Note - To mount the boiler on the wall, a two person lift will be needed.

1.0 UNPACKING

The appliance is delivered in three cartons.

1.1 The large carton contains the boiler, and the Installation/Servicing and Users Instructions, the flue assembly fixing screw and air inlet seal.

1.2 One carton contains the mountingupper bracket, the gas cock and water valves, the upper bracket fixing screws and wall plugs (X2), the boiler mounting nuts and washers (X2) and the drilling template.

1.3 The third carton contains the flue assembly.

If optional alternative carton ordered this will contain also the lower bracket with gas cock and valves attached, in addition two extra screws and wall plugs.

When the cartons are unpacked examine for any signs of damage in transit. All protective plastic should be left in place until installation is complete.

2.0 PREPARING APPLIANCE FIXING (Rear Flue Applications)

2.1 Select the boiler location carefully ensuring that all requirements given in previous text are satisfied. Fig. 10 will give guidance to fixing dimensions.

2.2 Locate template on wall, mark the positions of the flue opening. (If optional lower bracket carton is being used also mark position fo the fixing holes for this)

2.3 Carefully cut the circulat hole (115 mm minimum diameter) for the flue assembly.

2.4 Using a 10 mm drill, drill 70 mm deep holes to accept the wall plugs, and insert wall plugs (2 holes for standard carton, 4 holes for optional alternative carton).

2.5 Fit the upper bracket usein screws provided. (With optional alternative carton also fit the lower bracket ensuring the gas cock and water valves are in the "Off" position).

3.0 PREPARING APPLIANCE FIXING (Side Flue Applications)

3.1 Select the boiler location carefully ensuring that all the requirements given in previous text are satisfied. Fig. 10 will give guidance.

3.2 Locate the template on wall and mark the position of the two upper bracket fixing holes (if optional lower bracket carton is being used also mark position of the fixing holes for this).

3.3 Using a 10 mm drill, drill 70 mm deep holes to accept the wall plugs, and insert wall plugs (2 holes for standard carton, 4 holes for optional alternative carton).

3.4 Fit the the upper bracket using screws provided. (With optional alternative carton also fit the lower bracket ensuring the gas cock and water valves are in the "Off" position).

3.5 Extend a horizontal line from the centre of the rear flue outlet to the side wall.

3.6 Mark the centre line (vertically) for the flue assembly hole, and mark the centre of the hole.

3.7 Carefully cut the circular hole (115 mm minimum diameter) for the flue assembly.

4.0 PREPARING BOILER (standard carton)

4.1 Place the boiler on its back.

4.2 Remove the boiler base plate, four screws (fig. 16). Remove the plugs fitted to the boiler water connections. Remove the bag of sealing washers from the boiler pipe work.

4.3 From left to right fit gas cock and water valves as follows (fig. 11) using appropriate washer.
3/4 Gas Cock (Yellow handle) Position 2
15 mm Domestic Hot Water Outlet (Red handle) Position 3
15 mm Domestic Cold Water Inlet (Blue handle) Position 4
22 mm Central Heating flow (Red handle) Position 6
22 mm Central Heating Return (Blue handle) Position 7
for 15 mm Safety Valve connection (see 5.0)

N.B.: if using optional lower bracket the above is not required, all pipe work can be run from the valves fitted on the lower bracket. (Before the gas inlet to the boiler there must be at least 100 mm of straight before any bends).

Drilling template (Lower Bracket Optional)

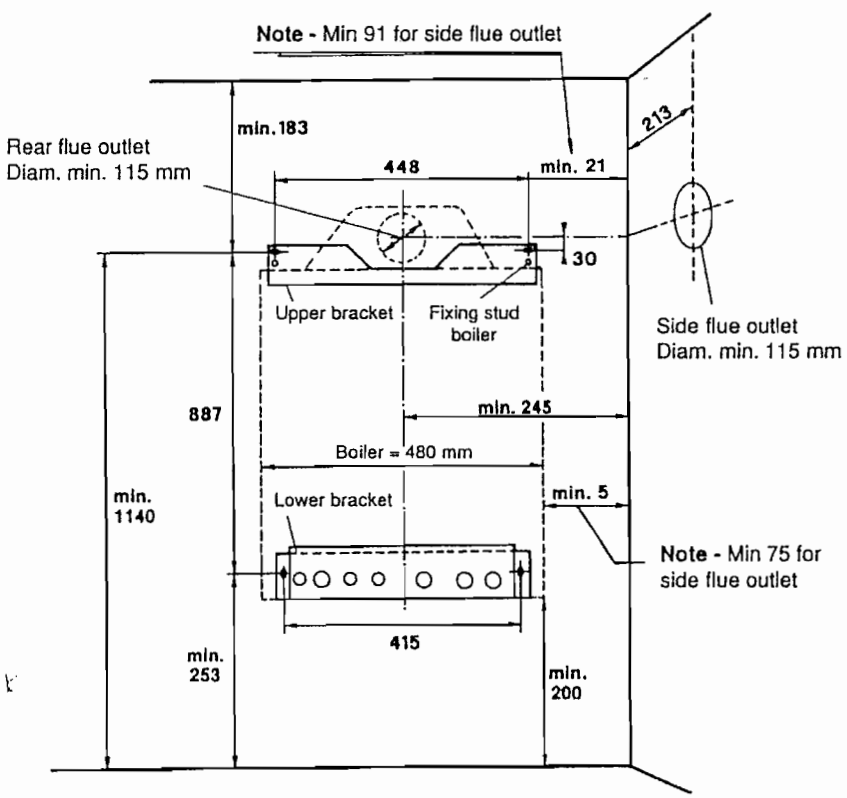
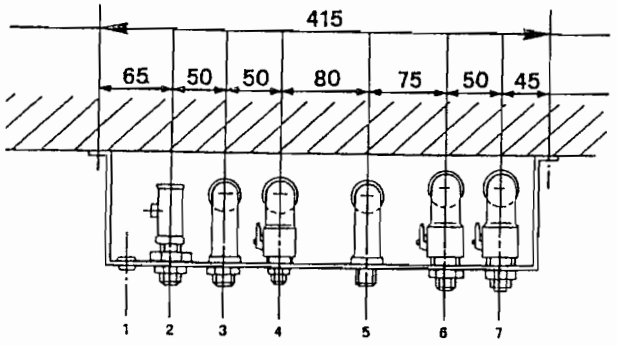


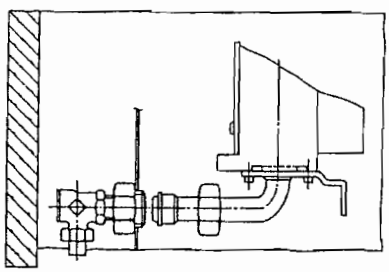
Fig. 10



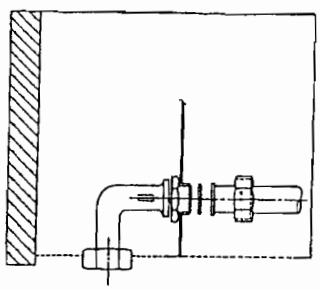
1 = Electrical cable entry
2 = Gas supply
3 = Domestic Hot Water outlet
4 = Domestic Cold Water Inlet
5 = Outlet Central Heating safety valve
6 = Central Heating flow outlet
7 = Central Heating return inlet

2 = 3/4"
3-4-5 = 15 mm
6-7 = 22 mm

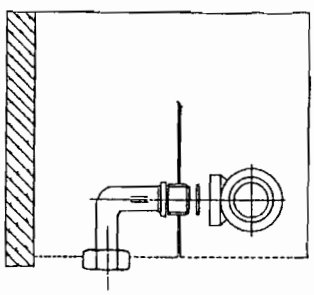
Note - 5 To be connected **after** installation of the boiler.



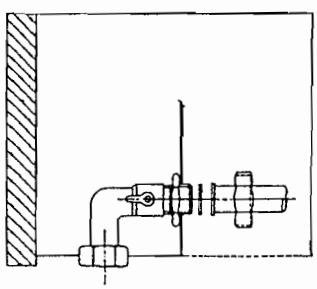
2 Gas 3/4" B.S.P.



3 Domestic Hot Water outlet 15 mm



5 Outlet central heating safety valve 15 mm



4 Domestic Cold Water inlet 15 mm
6 Central Heating flow outlet 22 mm
7 Central Heating return inlet 22 mm

Fig. 11

Important Note - Always use two spanners to prevent twisting of soft copper pipework.

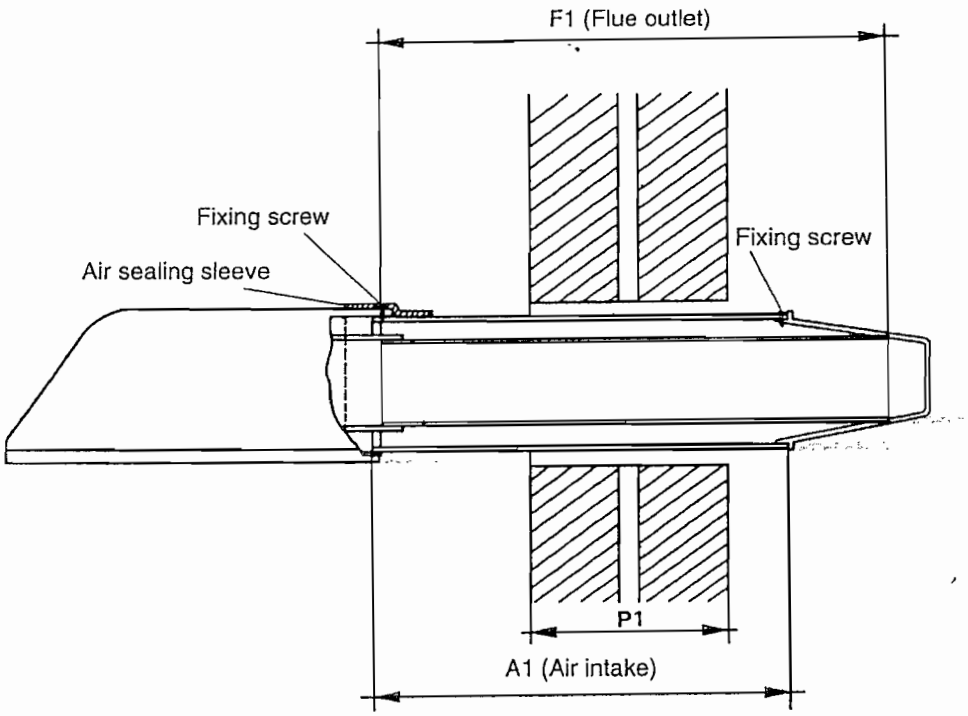
Note - The central heating safety valve (5) shoul be piped 15 mm to discharge safety outside the property.

4.0 PREPARING THE FLUE ASSEMBLY

4.1 Rear Flue Outlet (fig. 12)

Important - The aluminium flue pipe must protrude into the outside grill by 2 in (50 mm), never cut it to the same lenght as the plastic air pipe (aluminium flue pipe = plastic air inlet pipe + 50 mm !).

Aluminium flue pipe lenght = Plastic air inlet pipe length plus 50 mm (2") longer.



Rear flue Outlet

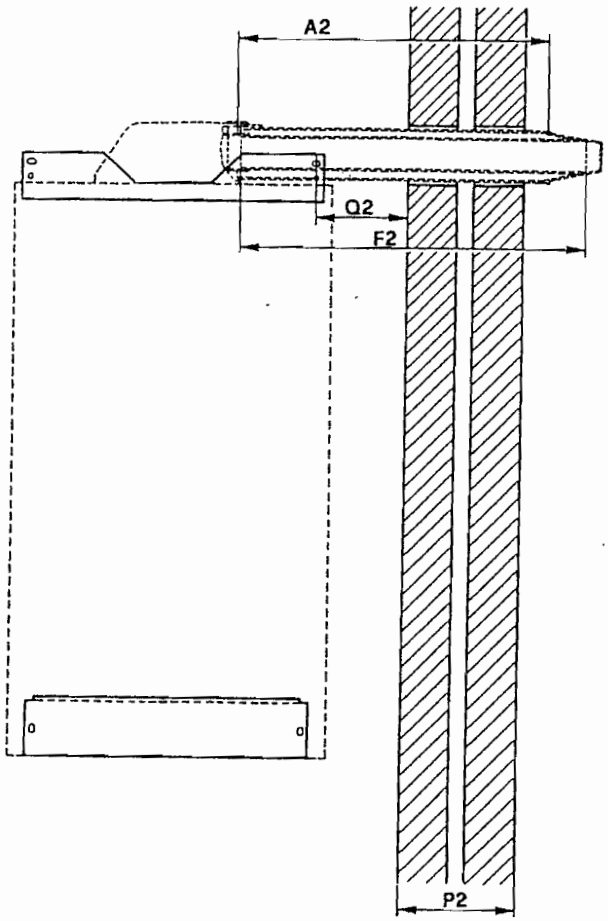
Fig. 12

4.1.1 Accurately measure the Wall thickness (P1)
4.1.2 From the end opposite to the terminal, cut the plastic air duct (dimension A1) to length (P1 + 105 mm).
Note - That the terminal is **not** included in A1.
4.1.3 Cut the metal flue duct to length (P1 + 155 mm) (dimensions F1).
Note - The metal flue pipe must be 50 mm (2 inches) longer than the plastic air inlet pipe.
4.1.4 Drill a 3 mm hole 15 mm from the plain end of plastic air duct.
4.1.5 Place flue components to one side to be used later.

4.2 Side Flue Outlet (fig. 13).

Important - The aluminium flue pipe must protrude into the outside grill by 2 in (50 mm), never cut it to the same length as the plastic air pipe.

Aluminium flue pipe length = Plastic air inlet pipe length plus 50 mm (2") longer.



Side Flue Outlet

Fig. 13

4.2.1 Accurately measure the Wall thickness (P2).
4.2.2 Accurately measure the distance from the centre of the stud fixing of the mounting jig assembly to the side wall (Q2).
4.2.3 From the end opposite to the terminal, cut the plastic air duct (dimension A2) to length (P2 + Q2 + 125 mm).
Note - That the terminal is **not** included in length A2.
4.2.4 Cut the metal flue duct to length (P2 + Q2 + 175 mm) (dimension F2).
Note - The metal flue pipe must be 50 mm (2 inches) longer than the plastic air inlet pipe.
4.2.5 Drill a 3 mm hole 15 mm from the plain end of plastic air duct.
4.2.6 Place flue components to one side to be used later.

5.0 CONNECTING THE BOILER

5.1 The boiler is supplied suitable for the right hand side flue. Remove the turret (fig. 14), four screws and place to one side.

5.2 Place the boiler on its back.

5.3 Remove the boiler base plate, four screws (fig. 16). Remove the plugs fitted to the boiler water connections. Remove the bag of sealing washers from the boiler pipework. Remove the front panel by gripping on both sides and pulling away from the main boiler.

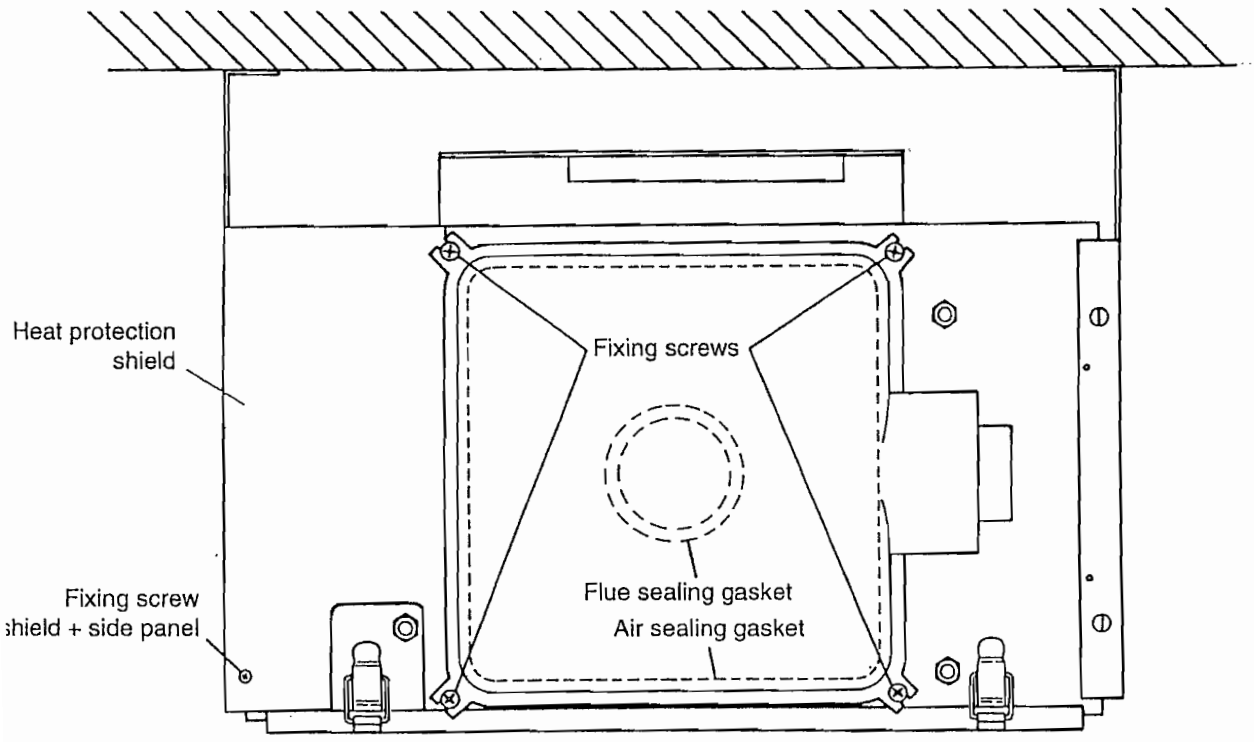
5.4 Lift boiler as shown in fig. 15 onto the top studs and fit supplied nuts and washers hand tight.

5.5 Lift at bottom to engage the water and gas connections. Tighten central heating flow and return, and the domestic hot water inlet and outlet, using appropriate sealing washers. Tighten the gas union.

5.6 Screw the pressure relief valve adaptor provided, through the jig bracket into the valve, using the remaining washer (fig. 17).

5.7 Connect the pressure relief valve discharge pipe (15 mm) to the outside of the building, where possible over a drain. The discharge must be such that it will not be hazardous to occupants or passers-by cause damage to extend electric components or wiring. The pipe should be directed towards the wall.

t must not discharge above an entrance or window, or any type of public access. The installer must consider hat the overflow could discharge boiling water.



TOP VIEW BOILER SIDE OUTLET

Fig. 14

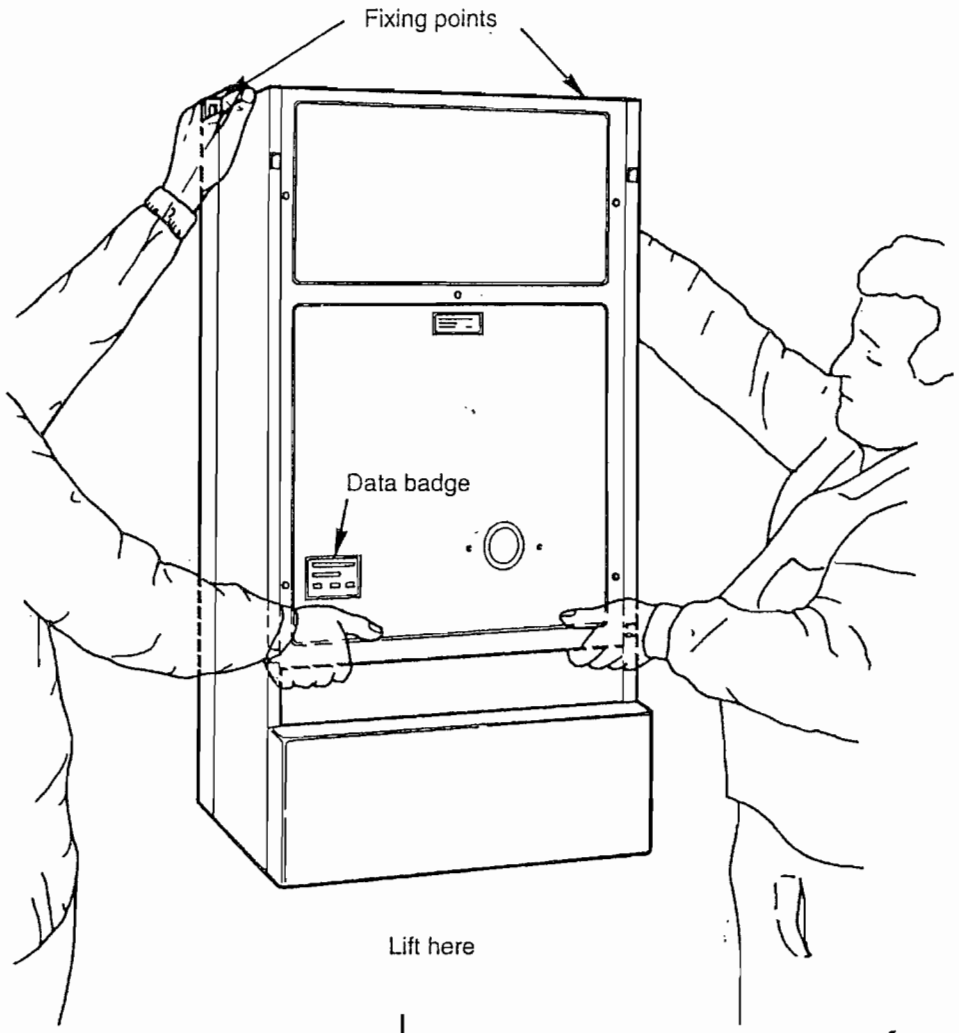


Fig. 15

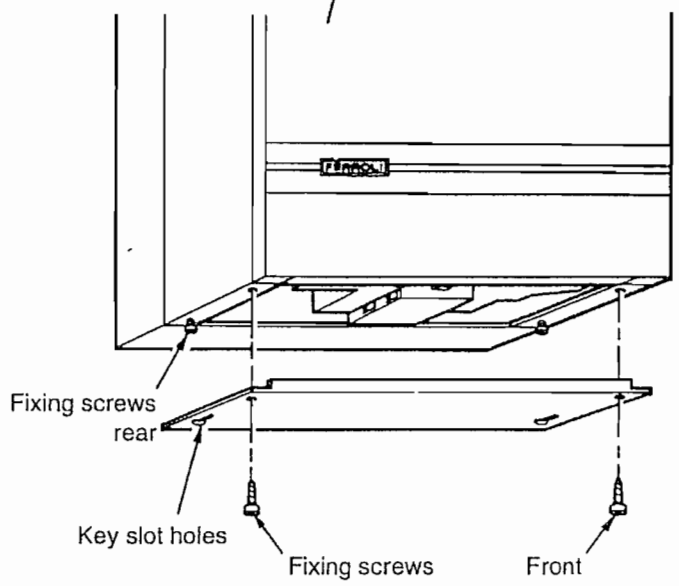


Fig. 16

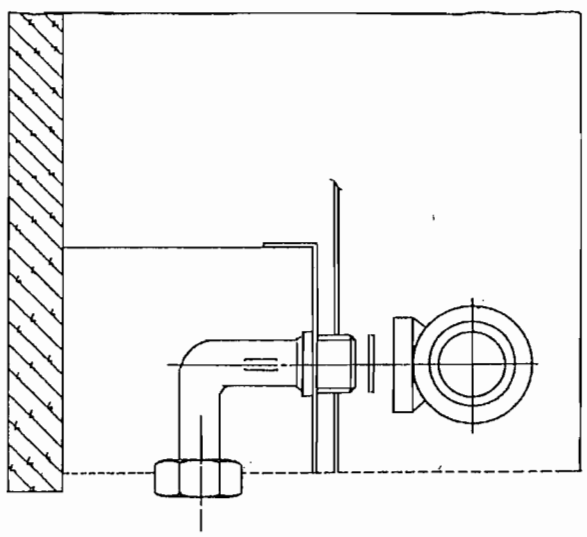


Fig. 17

6.0 FITTING THE FLUE ASSEMBLY

6.1 With Sufficient Clearance To Insert Assembly From Inside

6.1.1 Push the air duct seal onto the air duct at the cut end.

6.1.2 Insert the flue assembly into the wall.

6.1.3 Make good internal wall face.

6.1.4 Fully insert the flue assembly into the turret spigot. Insert the self tapping screw supplied. Fully tighten.

6.1.5 Secure the turret.

6.1.6 Slide the air duct seal over the joint.

6.1.7 Check the terminal relationship with the wall as shown in fig. 12.

6.1.8 Make good the outside wall face, re-weatherproof.

6.2 With insufficient Clearance To Insert Assembly From Inside

6.2.1 From outside, push flue duct, then the air duct through the wall.

6.2.2 Push the air duct seal over the air duct.

6.2.3 Fully insert the flue duct into the turret, then the air duct. Slide, back the seal and secure the air duct with the self tapping screw provided.

6.2.4 Slide the seal over the joint and secure the turret.

6.2.5 Continue as detailed in 6.1.8 above.

7.0 ELECTRICAL INSTALLATION

Electrical installation must be carried out by a competent electrician. The appliance is to be connected to a 240 V ~ 50 Hz supply (see fig. 18). The supply fuse rating is 3A. The terminals are accessible after removing the white base plate and single screw securing the terminal cover (see fig. 18).

External controls: room stat or remote time clock in the place of loop terminals 4 and 5. Please note 24 V only.

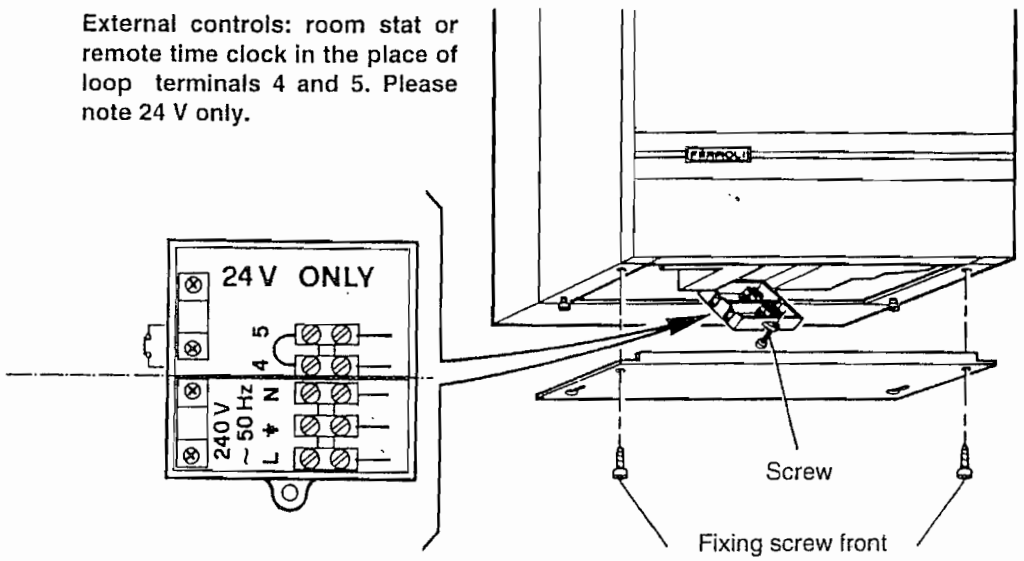


Fig. 18

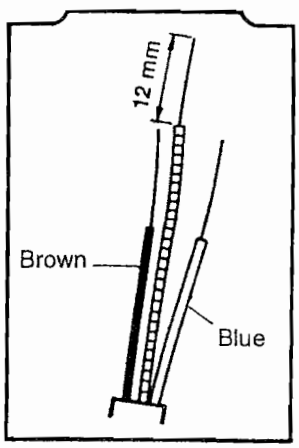


Fig. 19

7.1 Procedure

7.1.1 The supply cable must not be no less than 0.75 mm (24x0.2 mm) to BS6500 table 16.

7.1.2 The earth conductor must be cut longer than the live and neutral (fig. 19).
Connect the Supply Cable to the terminal block marked 240 V ~ 50 Hz, L, N, the supply cable is to be connected as follows:

i) Connect the brown wire to the L (live) terminal).

ii) The blue wire to the N (neutral) terminal.

iii) The green/yellow wire to the (earth) terminal.

7.1.3 Secure the cable with the cable clamp.
The supply cable can be connect to the mains supply by the use of an unswitched shuttered socket-outlet in conjunction with the 3A fused 3 pin plug both in accordance with BS 1363. This provides complete isolation.
Alternatively, a fused double pole switch having a contact separation of at least 3 mm, in all poles and provided just for the boiler and its external controls can be used.
A wiring diagram is provided on the appliance, attached to the rear of the front panel. In addition, there is one in this manual (fig. 25).
Attention is drawn to the requirements of the current I.E.E. Regulation and in Scotland, the electrical provisions of the Building regulations.

7.2 Room Thermostat (fig. 18) (or remote time clock connection)

7.2.1 Please note that the room thermostat, clock switch connection is 24 V.
To connect mains voltage to these terminals will seriously damage the printed circuit board.
The room thermostat and clock switch connector block is situated within the connector box. Twin core cable should be used for this connection (terminals 4 and 5).

7.2.2 If using a remote 240 Volt time clock ensure that the motore and switch connections are totally separate in the clock and that the switch connections are independent for the 24 Volt terminals (4 and 5) on the boiler.

8.0 COMMISSIONING AND TESTING

8.1 Filling the Central Heating System

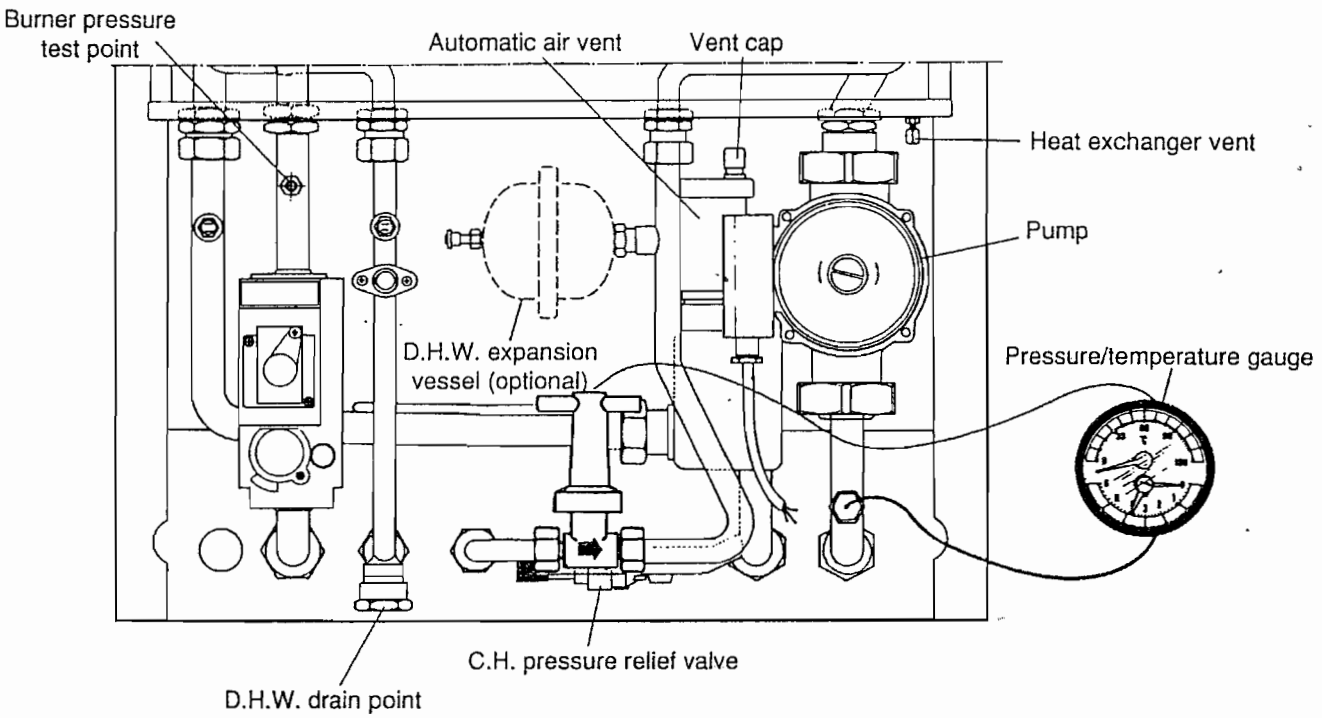


Fig. 20

Remove the top front panel by gripping both sides and pulling forward away from main boiler assembly.
Loosen the cap of the automatic air vent (fig. 20) and leave it loose.
Open the central heating flow and return cocks (fig. 11).
Gradually fill the system as detailed in Make up Water.
While filling, vent the heat exchanger at venting point by loosening cap (fig. 20) and ventil each radiator.
Tighten cap on heat exchanger air vent.
Ensure the working pressure, when filled, is between 2 an 1.5 bar on the pressure gauge (see technical data).
Check the system for leaks.

8.2 Filling the Domestic Hot Water System

Close all hot water draw off points. Open main cold water stop cock and ensure the cold water inlet cock is open at the boiler jig bracket (fig. 11). Slowly open each hot tap in turn until clean water, free from air pockets, is seen.
Check system for leaks.

8.3 Electricity Supply

Carry out preliminary checks (i.e. earth continuity, polarily short circuit and resistance to earth using a suitable multimeter).

8.4 The Gas Installation

The whole of the gas installation including the meter, should be inspected and tested for soundness, and purged in accordance with the recommendations of BS6891-1988.

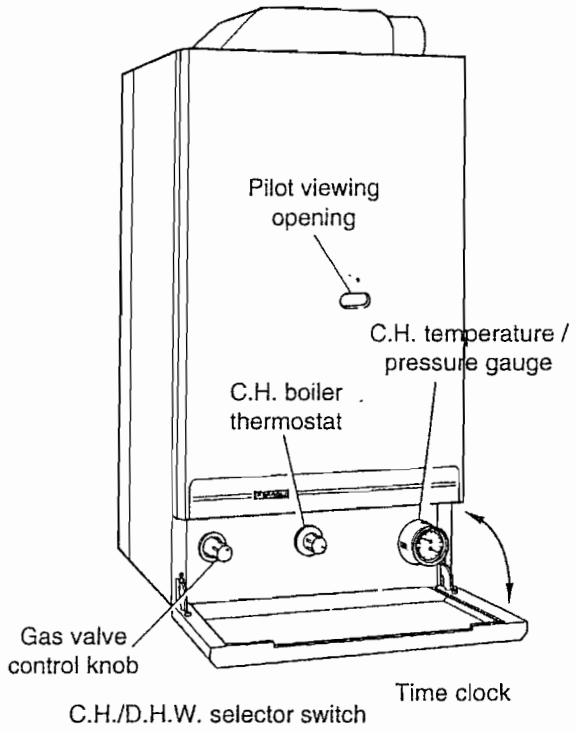


fig. 21

8.5 **To Light the Boiler** (fig. 21)

a. Open controls panel door.
b. Switch on electricity supply.
c. Adjust room thermostat and all external controls to «ON». Check operation of pump.
d. Turn the boiler thermostat to maximum. Fan will run (A waiting time of max 3 minutes before fan will run is possible!). Wait 20 seconds.
e. Depress the gas control knob fully (this should operate the electronic ignitor). When the pilot flame is seen to light through the pilot viewing window, keep the control knob fully depressed for a further 15 seconds, then release. Should the pilot fail to remain alight (or goes out on any other occasion i.e. if electricity supply as been turned off) wait 3 minutes and repeat. Should the pilot still fail to remain alight, refer to the fault finding section.
f. With the pilot burner established, observe that the main burners cross-light smoothly.
g. Temporarily turn off by switching off electricity supply.

Important Note: If the burner stops for C.H. only after a waiting time of 3 minutes the boiler will light again!

Burner Pressure C.H. and D.H.W.

8.6 **To Range Rate the Boiler C.H.**

The boiler can be range rated for an output from 8,1 kW (27.645 btu/h) up to 22.3 kW (76,000 Btu/h). When the boiler is supplied it is factory set at the maximum output 22,3 kW (76.000 Btu/h).

Procedure

a. Release the control panel fixing screws (fig. 30) and lower panel.

b. Loosen the screw in the burner pressure test point (fig. 22) and attach a gauge.

c. Switch on the electricity supply to relight the main burner.

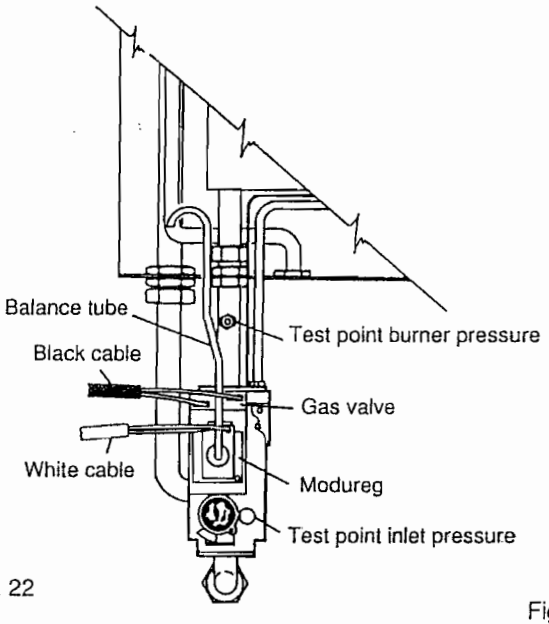


Fig. 22

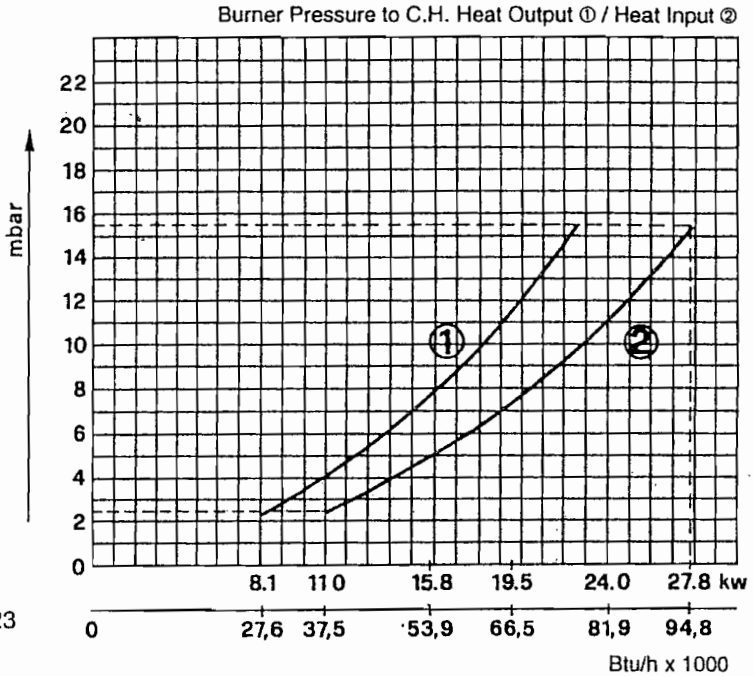
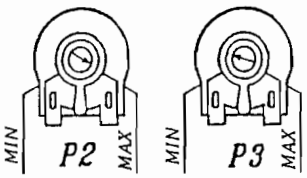
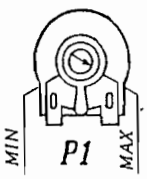


Fig. 23





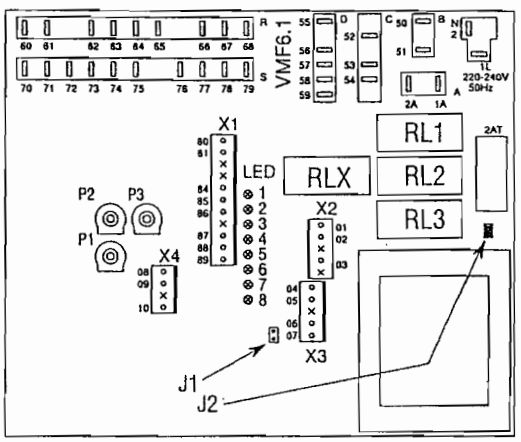


Fig. 24

Note 1 - Modulation is available on central heating, so the procedures must be carried out while the system is relatively cold. Recheck boiler thermostat is set to maximum.

d. Adjust the potentiometer P1 on the PCB (fig. 24) in the control panel until the required burner pressure is obtained (Anticlockwise to reduce the pressure).

Note 2 - Short circuit 04-05 only on connector X3 on the P.C.B.
- Boiler starts for C.H.
- Waiting time is excluded
- Max burner pressure C.H. can be checked/set with potentiometer P1

Note 3 - The range of inputs with corresponding burner pressure is given on the Data badge which is situated behind the top front panel. Further informations is on (fig. 23).

e. With the pressure set, turn off the electrical supply and mark the set input on the Data badge (with sticker supplied).

Burner Pressure C.H. and D.H.W.

P1 = C.H. range rating to be set on site

P2 = Max outoput D.H.W. (factory set, not to be adjusted)

P3 = D.H.W. temperature (factory set, not be adjusted)

P1 Adjust with screwdriver!

8.7 **D.H.W. Burner Pressure**

The domestic hot water burner pressure in not range rateable and not adjustable but the maximum and minimum burner pressure should be checked as follows:

a. Check electricity supply is still off.
b. Open a D.H.W. tap at high flow until the water runs cool and leave running.
c. Switch on the electricity supply.
d. The pressure should be 15.3 mbar -/+ 0.5 mbar.
e. Disconnect one of the wires from the «Modureg» (fig. 22), this will reduce the burner to minimum which should read 2.5 mbar +/- 0.5 mbar. If the burner pressure are not as stated check the inlet pressure (fig. 22) which should be minimum 20 mbar. If that is correct, consult Ferroli. No attempt should be made to alter D.H.W. burner pressure.
f. Switch off electrical supply and close hot tap.
g. Reconnect the wire to the «Modureg». Remove pressure gauge, tighten the test screws.
h. Replace control panel (2 screws).
i. Turn on electricity supply, open a hot tap to full flow and when the burner lights, test for gas soundness with a leak detection fluid around the gas valve and connections indluding the pressure test point screws.

Note - The cutting of the electricity supply may result in the pilot being extinguished - re-light if need be, after waiting three minutes at least.

9.0 SYSTEM OPERATION

Let the boiler operate normally on central heating for about 30 minutes.

I) Vent radiators.
II) Vent heat exchanger.
III) Examine all pipework for leakage.
IV) Turn on a D.H.W. tap and check that the C.H. pump stops running.
V) As the D.H.W. temperature reaches 60°C check the burner for modulation.

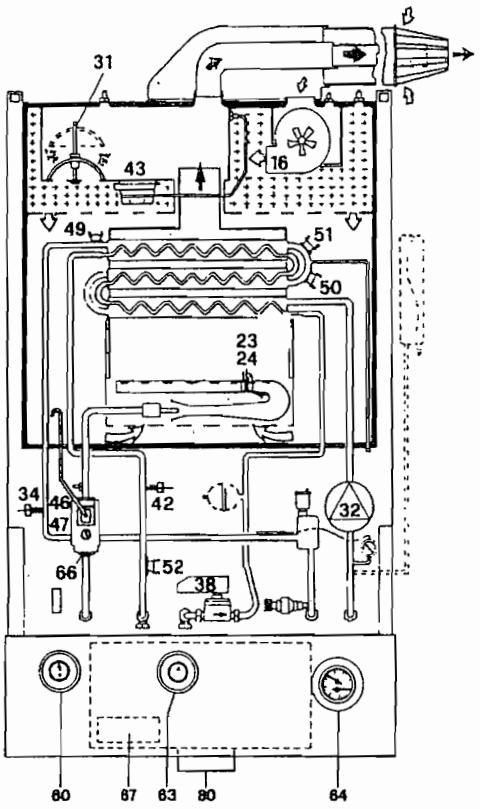
Turn the gas valve «off», (twist left hand white button 1/12th turn clockwise and release), and isolate electricity supply.
Drain down the central heating system fully, when hot.
Refill the system as previously instructed. Repeat the venting.
Examine the system's water pressure and topo up as necessary.
Replace the casing front panel and close the control panel cover.

10.0 HANDING OVER TO THE USER

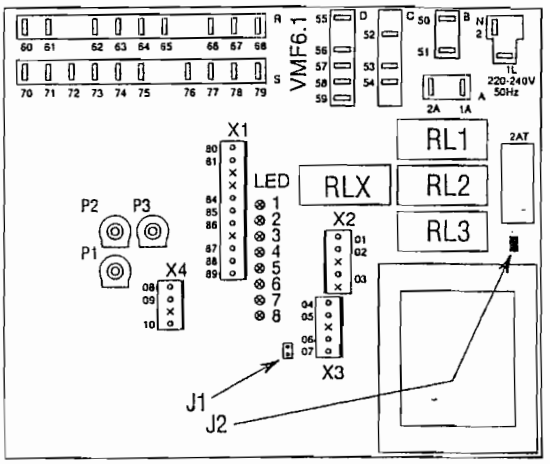
After completion of installation and commissioning of the system:

a. Hand over the User's Instructions' to the Householder and explain His/Her responsability under the Gas safety (Installation and Use) Regulations 1984.
b. Explain and demonstrate the lighting and shutting down procedure.
c. Explain the operation of the boiler including the use and adjustment of ALL system controls.
Advise the User of the precautions necessary to prevent damage to the system and to the building, in the event of the system remaining inoperative during frost conditions.
d. Stress the importance of regular servicing by a qualified Heating Engineer and that a comprehensive service should be carried out at LEAST ONCE A YEAR.

General Wiring Diagram



Key
16 Fan
23 Thermocouple
24 Spark electrode
32 Central heating pump
34 C.H. flow temperature sensor
38 Cold water flow switch
42 D.H.W. temperature sensor
43 Air pressure switch
46 Operatore gas valve
47 Modulating regulator (Modureg) gas valve
49 Overheat cut-off thermostat
50 Heat exchan. limit thermostat
51 Heat exchan. frost thermostat
52 D.H.W. limit thermostat
63 C.H. boiler thermostat
66 Microswitch combination gas valve
67 Ignition transformer
68 Control box with P.C.B.
72 Room thermostat (not fitted)
80 240V - 24V roomstat/time switch terminal blocks
101 P.C.B.



J1-J2 = Jumper links on P.C.B.
J1 = Is not required
J2 = Must be fitted!

P1 = C.H. max output (to be set on site)
P2 = D.H.W. max. output (factory set)
P3 = D.H.W. temperature (factory set)

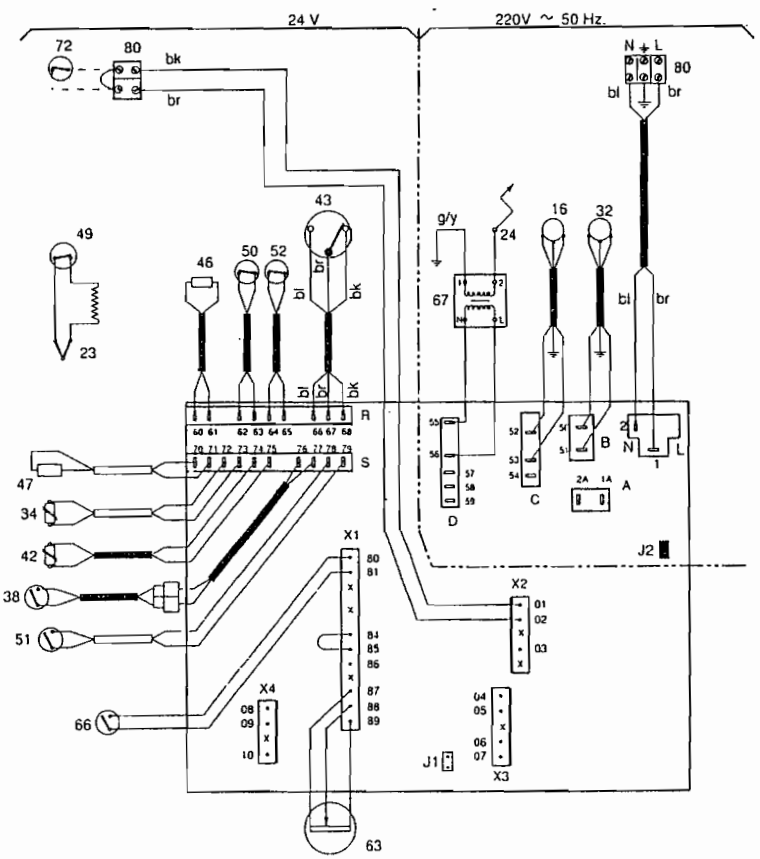


Fig. 25

Electrical Functional Flow Wiring Diagram

Note
All Contact shown in following condition:
- No electrical mains
- No domestic hot water flow
- Temperature too low
  (all mechanical thermostats closed)

Notes:
1. C.H. pump will be switched on if temperature of 50 (Heat exchanger limit thermostat) is too high.
2. C.H. pump will be switched on for 1 sec. after D.H.W. tap has been closed.

(34)-(42) Temperature sensors

25°C = 1000 Ohm
60°C = 1300 Ohm
80°C = 1490 Ohm

Key
16. Fan
24. Spark electrode
32. Central heating pump
34. C.H. flow temperature sensor
38. Cold water flow switch
42. D.H.W. temperature sensor
43. Air pressure switch
46. Operatore gas valve
47. Modulating regulatore (Modureg) gas valve
50. Heat exchanger limit thermostat
51. Heat exchanger frost thermostat
52. D.H.W. limit thermostat
63. C.H. boiler thermostat
66. Microswitch combination gas valve
67. Ignition transformer
72. Room thermostat time clock (not fitted)

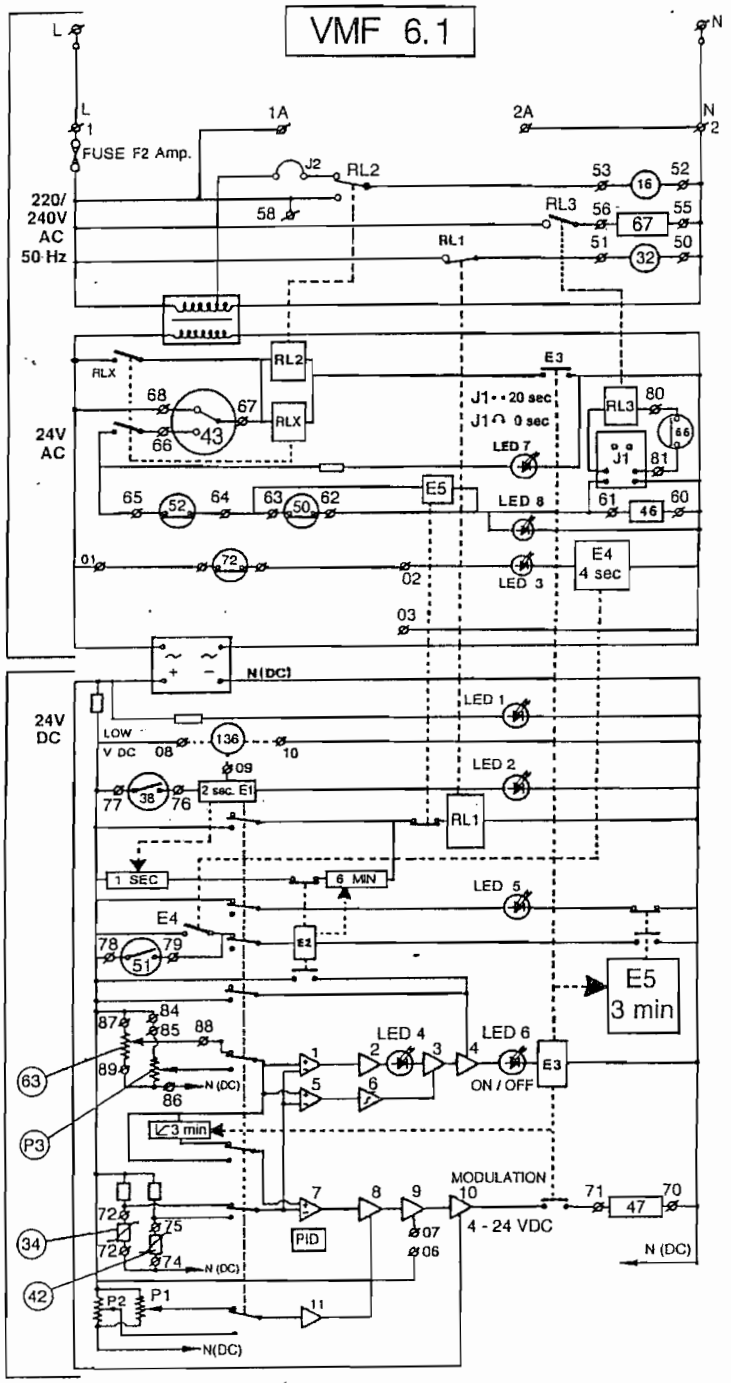


Fig. 26

LED n°	colour	signification:
1	green	Mains on/low voltage on
2	yellow	Domestic hot water flow switch (38) on
3	yellow	Central heating room thermostat (72) /
		clock (62) calling for heat
4	green	Sensor (34) or (42) calling for heat
5	red	Central Heating waiting time, a max. 3 minutes delay following
		shut off Boilerstat (63), Clock (62), Roomstat (72) or use of Hot Water
6	yellow	Demand for heat - fan relay (RL2) will be energised
7	green	Air pressure switch (43) on
8	yellow	Gas valve (46) energised

Short explanation on electrical functional drawing VMF6.1
240 V AC - 24 V AC - 24 V DC

1.0 All contacts shown in following condition.
No electrical mains voltage - Temperature too low (alla mechanical thermostats closed).
1.1 The electrical systems can be devided on 4 main areas.
1.2 240 V AC With fan, C.H. pump, sparkigniter and fuses.
1.3 24 V AC With 4 relays, on/off operator of combination gas valve, 24 V AC is available from a 240V/24V transformer.
1.4 24 V DC For power supply to the modulating coli (Modureg) of combination gas valve.
1.5 Low V DC For electronic control system.

2.0 **240 V AC** Fuses F 2 Amp. (Fast)
2.1 RL2 contact of relay 2 controls directly the fan speed between low speed (low voltage from transformer) and full speed if coil of relay 2 is energised.
2.2 Pump controlled by Relay 1.
2.3 Spark igniter generates high voltage as soon as contact RL3 of relay 3 is energised by the microswitch on the combination gas valve (microswitch will close with control knob of combination gas control fully depressed).

Attention - Relay 3 has a 20 sec. electronic delay! (pre-purge time!).

3.0 **24 V AC**
3.1 Electronic Relay E3 on P.C.B. will be switched «on» as soon as there is any heat demand for heat from central heating.
3.2 In stand-by situation the air pressure switch should be in shown position (68-67 closed) and the fan should be at low speed.
3.3 If 68-67 is not closed, relays (RLX) and (RL2) cannot be activated. This is a safety check on the correct function of the air pressure switch (no air pressure with fan at low speed).
3.4 With 24 V AC between 68 and 60 and air pressure switch in the shown position, relay RLX will be activated.
3.5 The Relay RLX links the N.C. position of the air pressure switch, Relay RL2 will switch the fan to full speed.
3.6 The switch in the air pressure switch will change position if air flow is high enough for safe combustion and LED7 will be energised.
3.7 The on/off operator in the gas valve will be activated if the high limit thermostat (heat exchanger) demand heat.
3.9 If during a period of at least 20 seconds after starting the fan at full speed, the air pressure switch was switched in the safe position (67-66 closed) relay RL3 can be energised (20 sec. time delay relay RL3).
3.10 Depressing fully the knob of the combination gas valve, the microswitch will close and a spark will be generated (for ignition of the pilot).

4.0 **24 V DC**
4.1 24 V DC is necessary for the power supply amplifier 9, which drives the modulating coil (Modureg) on the combination gas control. Operating voltage on the coil is between 4 Volt and 25 Volt DC.
4.2 **Attention -** Never link the modulating coil with a wire or amper tester. Part of the P.C.B. will be destroyed.
Testing can only be done with a voltage tester!

Short explanation on electrical functional drawing Low V DC

5.0 **Low V DC Electronic Control System**
5.1 On the Low V DC output is a Green LED (Light Emitting Diode - Mini Lamp.) to indicate if Low V DC is available, if not replace fuse.
5.2 Domestic water flow switch; contact closed if water is running (minimum 2.5 L/min.).

5.3 Electronic relay E1 (if activated by the water flow switch) switches the control system from the central heating to domestic hot water and gives priority to Domestic Hot Water (Time delay of 2 seconds).

5.4 .Central Heating Flow temperature sensor and Domestic Hot Water temperature sensor are electrical resistors with a positive temperature coefficient (P.T.C.).
1000 Ohm at 25 degr. C. - 1300 Ohm at 60 degr. C. - 1490 Ohm at 80 degr. C.
(These must not be looped for testing purposes at that will indicate «no heat required»).

5.5 **Function of Low V DC circuit**

5.5.1 **Domestic Hot Water Taps Closed: Contacts of electronic relay E1 as shown.** Central heating continuous (selector switch turned to the right, Time Clock contact will be linked).

5.5.1.1 Electronic relay E2 is activated and will switch off the Relay RL1. The pump will be switched on! After switching off E2 Relay RL1 will remain deenergised for 6 minutes.

5.5.1.2 **Attention -** The C.H. pump will be switched off immediately if Relay 2 is activated (for example on activation of relay E1 through the water flow switch).

5.5.1.3 Amplifier 1 compares the Set Point of the central heating boiler thermostat (potentiometer on front panel) with the actual temperature of the C.H. sensor. If set point is higher as actual value, amplifier 2 and 3 will be activated and if relay E3 is switched on, the fan starts at full speed through relay RL2.

5.5.1.4 Amplifier 2 is a differential on/off amplifier on the P.C.B. This amplifier controls electronically the on/off differential of the flow temperature C.H.

5.5.1.5 Amplifiers 5 and 6 are security amplifiers which check if there is not abnormal situation on the temperature sensors.
For example with an abnormal low electrical resistance (sensor linked) the amplifier 5 will switch off amplifiers 6,3 and 4. So the fan will be switched to low speed and the burner will be closed down.

5.5.1.6 Amplifier 7 is the real modulating amplifier (PID) which controls the power amplifier 9 and so the voltage on the Modureg modulating coil of the combination gas valve. Amplifier 7 compares continuosly the set value of the potentiometer 63 whith the actual value of the sensor and will control the voltage on the Modureg coil to keep the flow temperature at the set value. If flow temperature is too high (min output burner higher then C.H. absorption) the burner will be on/off controlled by amplifier 1 (see 5.5.1.3). The Modureg can only control the gas flow to the burner within the preset minimum and maximum settings for safe ignition reasons. Min and max. pressure of Modureg is mechanically set.

5.5.1.7 With potentiometer P1 on the P.C.B. the max. output of the power amplifier 9 can be limited; throug amplifier 8.
On delivery from factory this potentiometer is set to max., giving max. C.H. output.

5.5.2 **Domestic Hot Water tap open**
Water flow minimum 0,5 Gallon/min. (2,5 L/min.). The contact in the water flow switch closes and relay E1 will be activated. Several contacts of E1 are switched over:

5.5.2.1 A contact breaks and the central heating pump will be switched off immediately.

5.5.2.2 A contact bypasses central heating (the contact of Relay E2 is bridged).

5.5.2.3 A contact switches from the central heating boiler thermostat 63 to the Hot Water temperature set point potentiometer P3 on the P.C.B.

5.5.2.4 A contact switches from the central heating temperature sensor to the domestic hot water temperature sensor.

5.5.2.5 A contact switches from max. output C.H. potentiometer P1 to max. output D.H.W. P2.

Illustrated Wiring Diagram

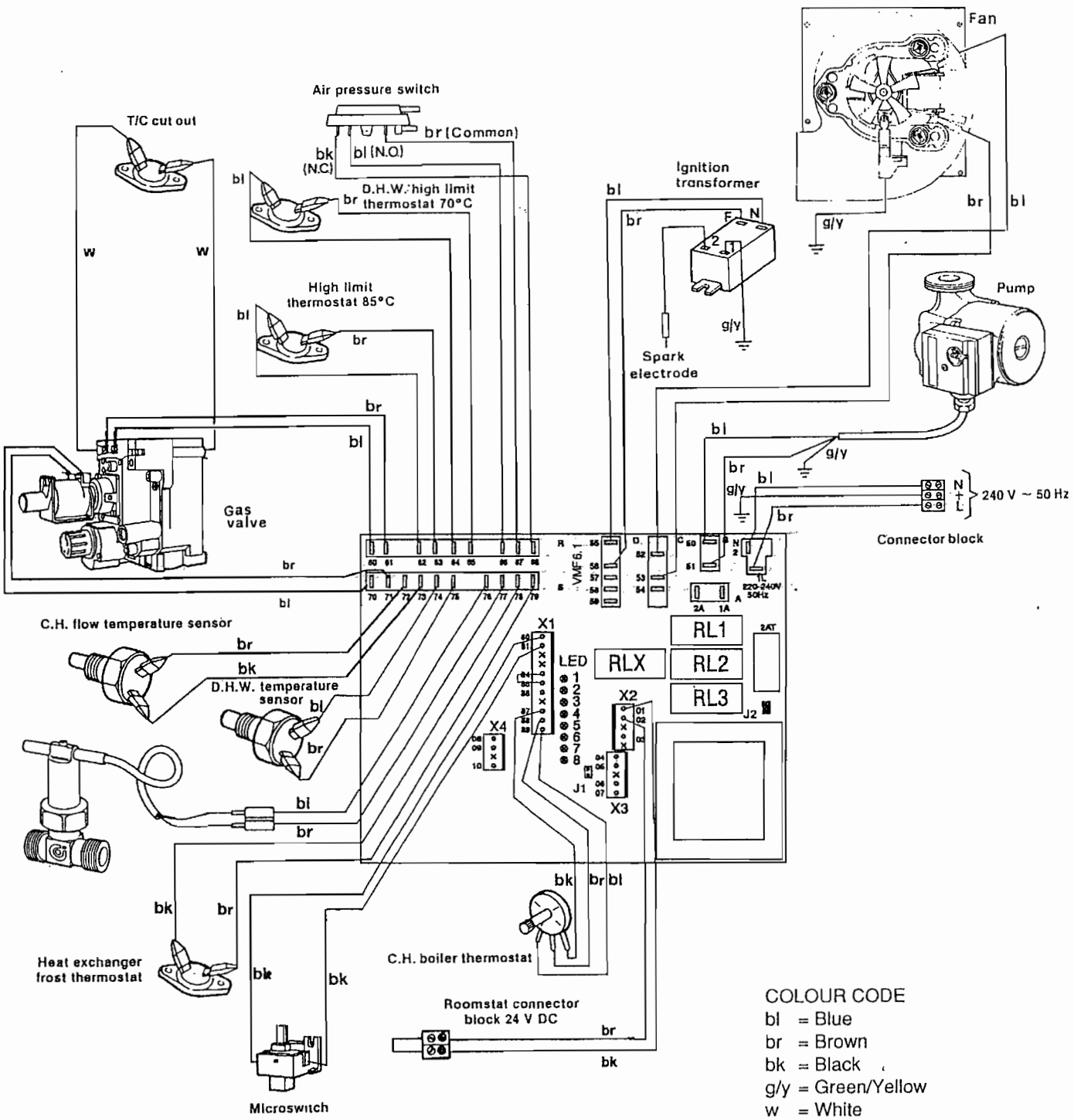


Fig. 27

General fault finding

For "Fast" Fault Finding see separate instructions inside the electrical control box or page 60-61

Engineer Please Check

1. Gas available (check kitchen and gascocks)
2. Electrical mains is on.
3. Water pressure Central Heating System (min. 1 bar on pressure gauge)
4. Water flow domestic hot water (min. 0.5 Gal/min - 2.5 L/min.) (fills a 1 pint milk bottle max. 15 seconds).
5. Is central heating pump running.
6. Air inlet/flue outlet free from obstacles.
7. Are all service cocks open?
8. Is at least one radiatore valve or bypass in Central Heating system open?

Always follow the complete General test Procedure to make sure that no fault remains unnoticed.

Never disconnect any wire without previous testing. It is possible that a fault disappears after disconnecting and rewiring the electrical connections, this fault will come back later.

Never pull on the wires in the terminals.
To disconnect the terminal pull on the insulation cover, keeping the terminal pushed back.

The relays on the P.C.B. can be checked. The relays have transparent covers and the position of the contacts can be verified (to see if a realy is energised or not see fig. 28).

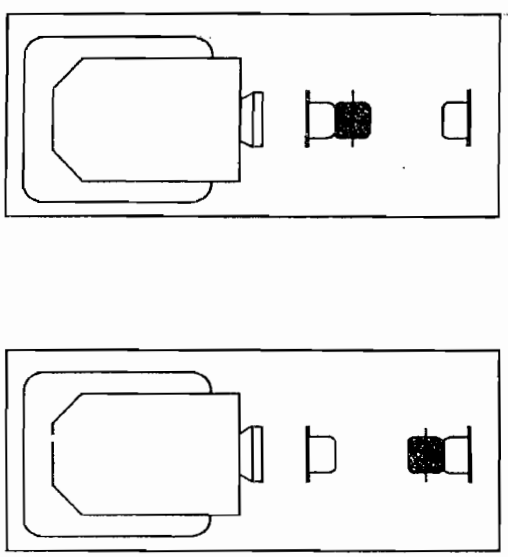


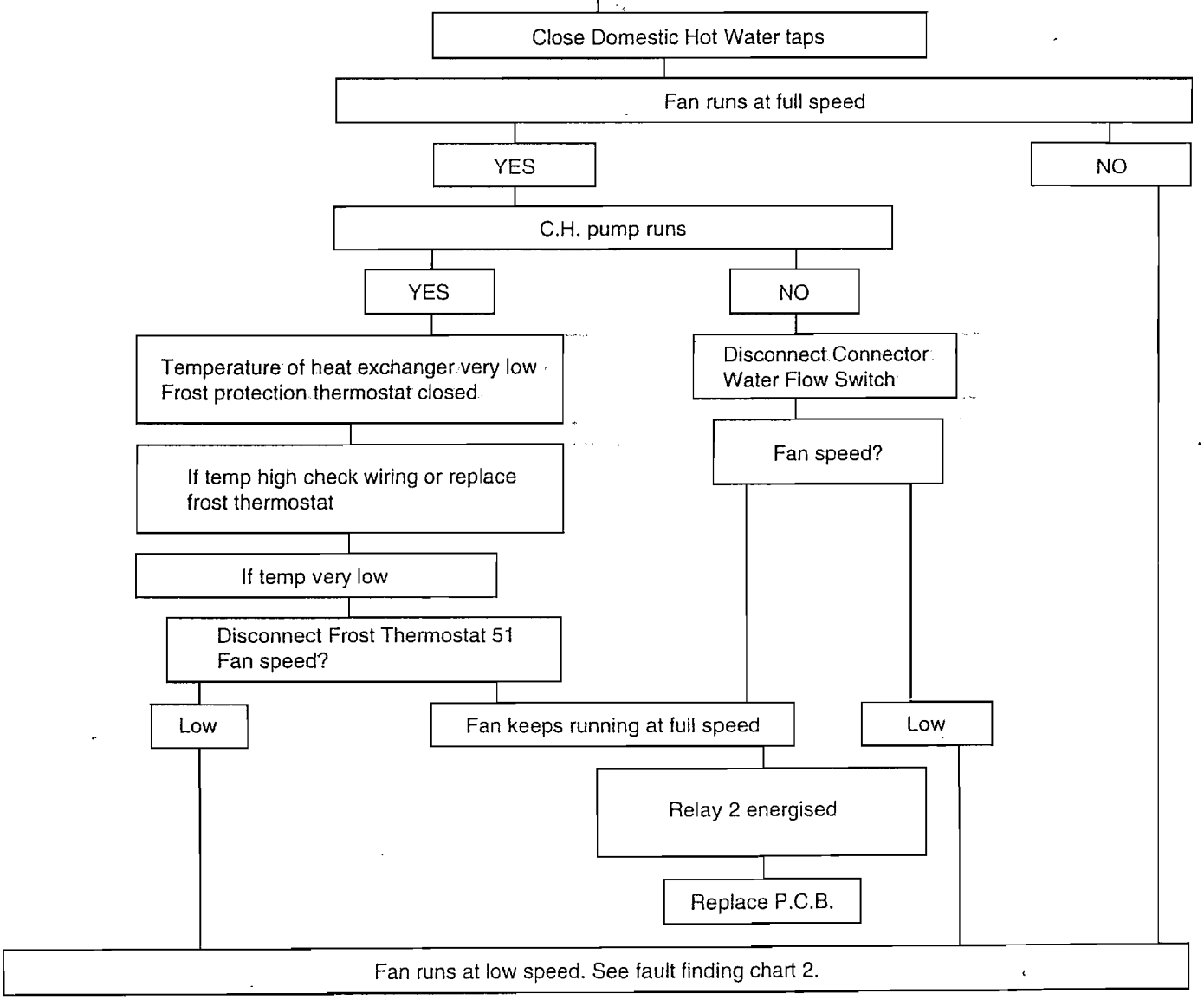
Fig. 28

F.A.O. Cimarelli

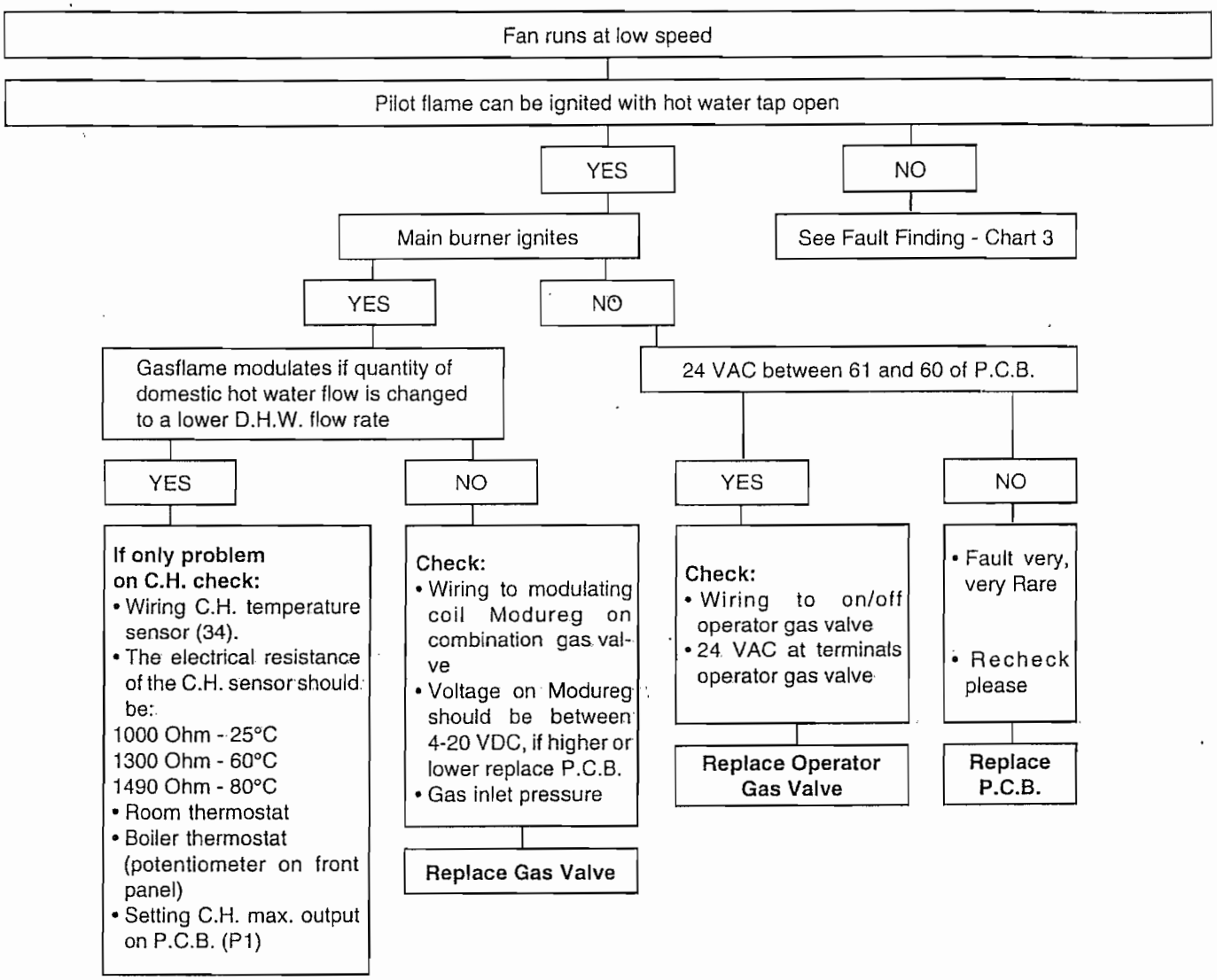
FERROLI COMBI 77 FF / POPULAR

General Test + Fault Finding - Chart 1

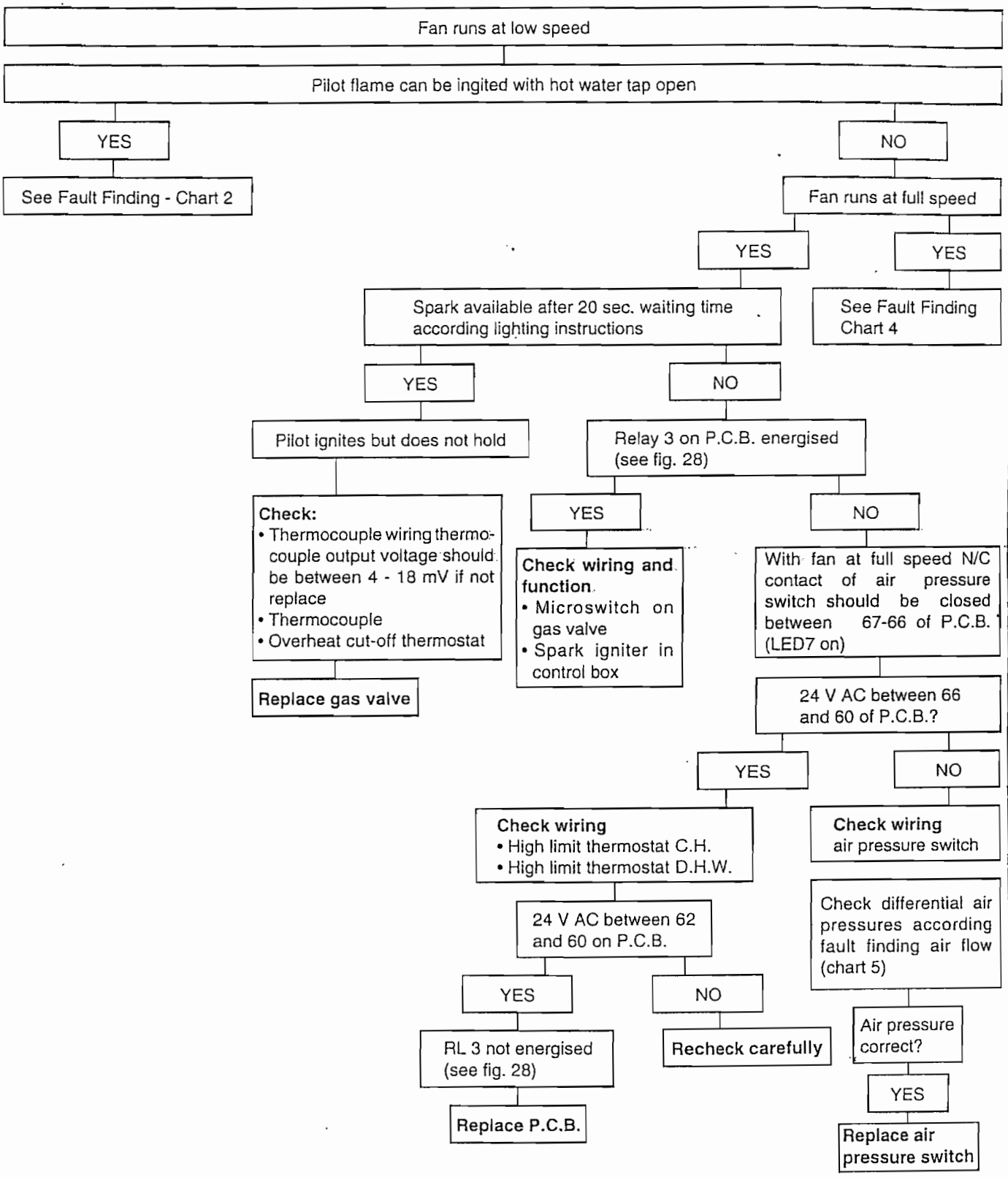
Check carefully before starting fault finding
- Gas
- Electric mains
- Central heating pressure min. 1 bar.
- Central heating pump spins free
- Heat exchanger air vented
- Green LED 1 on P.C.B. alight, if not check fuse F 2 Amp. on P.C.B. and external fuses
- Waterflow D.H.W. min. 0.5 Gallon/min. (2.5 Litres/min.)



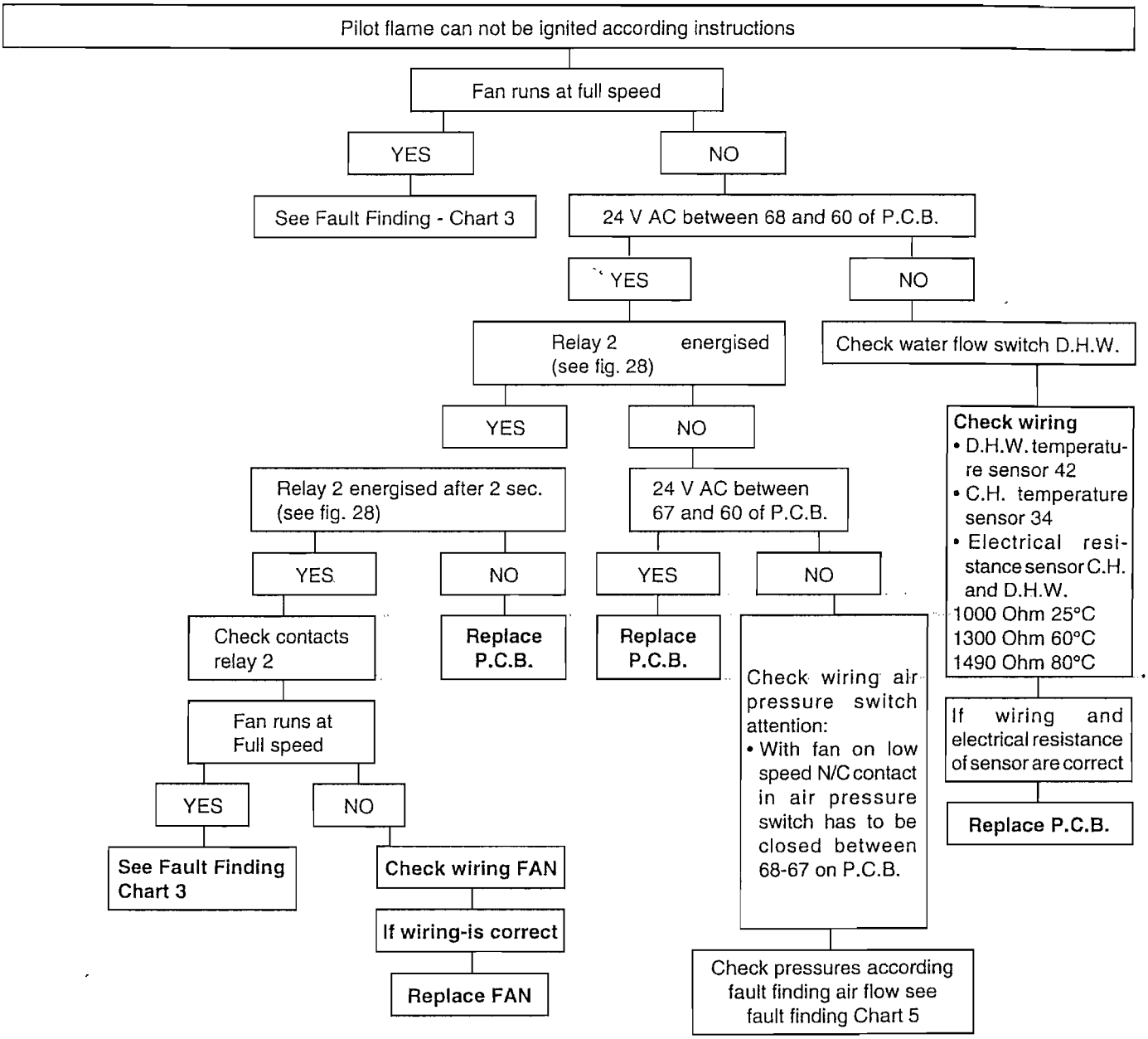
General Test + Fault Finding - Chart 2



General Test + Fault Finding - Chart 3



General Test + Fault Finding - Chart 4



General Test + Fault Finding - Chart 5

On top of the boiler are 3 air pressure test points
see technical information page check of air flow through boiler - Chart 6

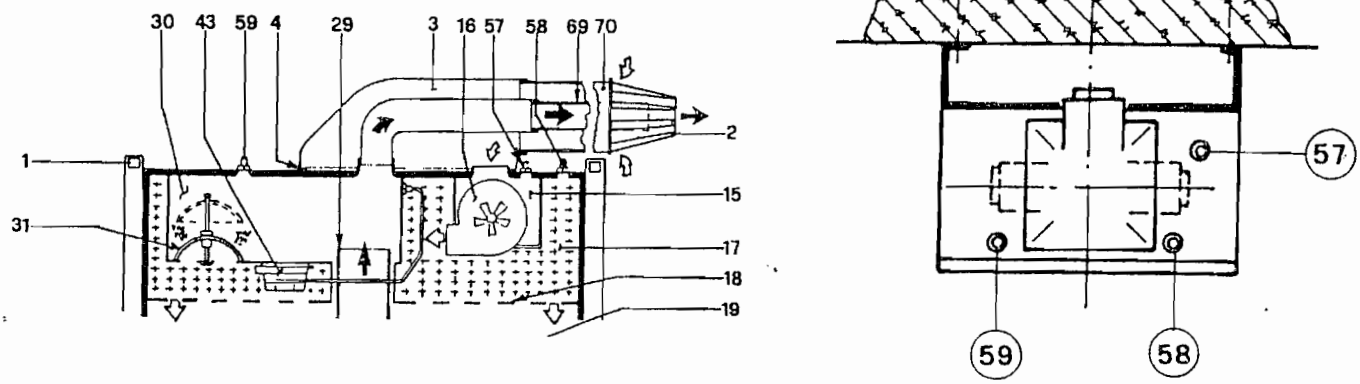
Start boiler and check differential pressure 58 and 59: see Chart 6

- Fan low speed
  - Less than 0,3 mbar 3 mm WG 30 Pa = correct
    - N/C contact of air pressure switch should close between 68 - 67 on P.C.B. If not replace air pressure switch
  - More than 0,3 mbar 3 mm WG 30 Pa Fan too fast
    - Check voltage on fan should be lower as 100 Volt AC
- Fan full speed
  - Less than 0,55 mbar 5,50 mm WG 55 Pa Fan too slow
    - Check if damper (31) is fully closed (remove air pressure switch)
  - More than 0,55 mbar 5,50 mm WG 55 Pa = correct
    - N/O contact of air pressure switch should close between 67 - 66 on P.C.B. If not replace air pressure switch

Check differential pressure 59 and 57: see Chart 6

- Less than 1,0 mbar 10 mm WG 100 Pa
  - **Check FAN**
- More than 1,0 mbar 10 mm WG 100 Pa
  - **Check air/flue system**

General Test + Check of Air Flow through boiler - Chart 6



Top view of boiler

Pressure Test Points
57 - Fan air inlet pressure test point
58 - Fan air outlet pressure test point
59 - Flue outlet pressure test point

Fig. 29

Top View Boiler
On top of the boiler are three pressure test points with which the correct pressure and air flow of the air can be checked.

Attention - It is always necessary to measure **differential** pressure because the boiler is a room sealed appliance.

58 - 59 Differential pressure on damper **31** and air pressure switch **43.**
59 - 57 Differential pressure on external air/flue duct.
58 - 57 Differential pressure fan **16.**

Checks:
1. On low speed the **differential pressure** between points 58 and 59 should be no more than 0.3 mbar - 3 mm WG - 30 Pa.
2. On full speed **differential pressure** between 58 and 59 should be no less than 0.55 mbar - 5.5 mm WG - 55 Pa.
3. If less than 0.55 mbar: check differential pressure between **59** and **57.** ON full speed **differential pressure** between **59** and **57** should be to no more than 1.0 mbar - 10 mm Wg - 100 Pa. If more check flue ducting.
4. If differential pressure **58** and **59** less than 0.55 mbar **and** differential pressure **59** and **57** less than 1.0 mbar check air pressure damper **31** and fan **16.**

Replacement of Parts

1.0 INITIAL PROCEDURE

Before work commences ensure that:

a) The boiler is cold, electricity supply is isolated, and the gas supply is turned off at the inlet of the boiler (fig. 1).

b) For replacement of parts where water connections are broken, it will be necessary to isolate and drain either or both the central heating or domestic hot water circuits of the boiler only. The cold water mains inlet is isolated at the inlet cock (fig. 1). The D.H.W. is drained via two caps (fig. 37).
The C.H. flow and return cocks are turned off at the isolation cocks (fig. 1). The C.H. is drained via the pressure relief valve (twist about 1/2 of a turn). Also the drain point located pipe below the pump (fig. 37).

Important

c) Upon completion of the work the following (details of which are included in the commissioning section):

I) Gas soundness of all joints.
II) Water soundness of all joints.
III) The electricity supply.
IV) The pressure of th sealed system and top up where necessary.

d) Replace all components in reverse order, observing any special notes given.

e) **Removal of Outer Casing**

Note - It may not be necessary to remove all the outer casing. Refer to individual sections for the extent to which the outer case needs to be removed.

f) **Front Panel**
Grip on both sides and pull it forward away from the main boiler assembly.

g) **Base Plate**
Remove the four fixing screws (fig. 16).

h) **Side Panels**
For each panel, remove two fixing screws at base of appliance and single fixing screw at top of appliance (fig. 30).
Also remove hinged control panel cover.

Note - The panels are located in keyhole slots, push panels upwards and pull away. The left hand panel also has the heat protection shield secured by the fixing screw (fig. 14).

i) **Removal of Combustion Chamber Outer Cover**
Remove the five combustion chamber outer cover fixing screws and undo four buckle clips (fig. 30) to remove cover.

j) **To Release Control Panel**
Hinge control panel cover downwards.
The two control panel securing screws can now be removed (fig. 30), hinge control panel forwards.

k) **To lower control box frame**
Remove screw securing gas control valve to from.
Remove the base plate (g) above.
Remove the two screws securing the frame to the back panel.

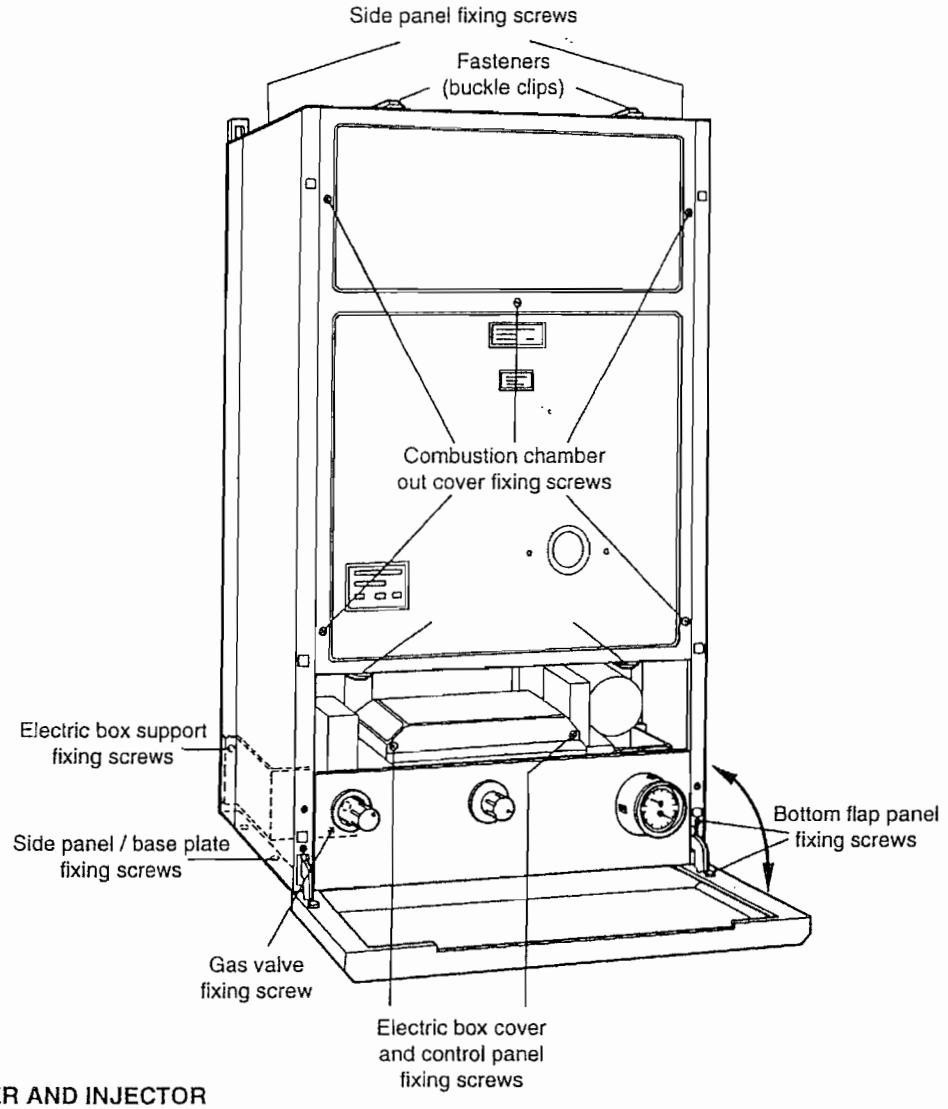


Fig. 30

2.0 PILOT BURNER AND INJECTOR

a) Refer to Section 1, items a, c, d, f and i.
b) Disconnect the thermocouple from the Honeywell valve (use a 10 mm spanner) (fig. 31).

Note - The thermocouple interrupteur is located in a slot below and must be in the correct position when re-connecting the thermocouple.

c) Unscrew the pilot sup ply pipe compression nut from the Honeywell valve (fig. 31).
d) Remove the pilot inspection cover 2 screws (fig. 32).
e) Remove the pilot pipe/thermocouple retaining plate, 2 screws (fig. 32).
f) Remove the single pilot assembly fixing screw (fig. 34). Pull pilot assembly downwards.
g) Disconnect the H.T. lead from the electrode, and withdraw the electrode.
h) Remove pilot burner assembly complete (take care not to lose the seal on the pilot burner supply pipe and thermocouple).
i) Unscrew the pilot burner supply compression nut, and remove the supply pipe and injector. (Injector is a sliding fit to supply pipe) (fig. 36).
j) Re-assemble in reverse order. Esure that the pilot works correctly and that the pilot flame envelopes the electrode tip (fig. 35).

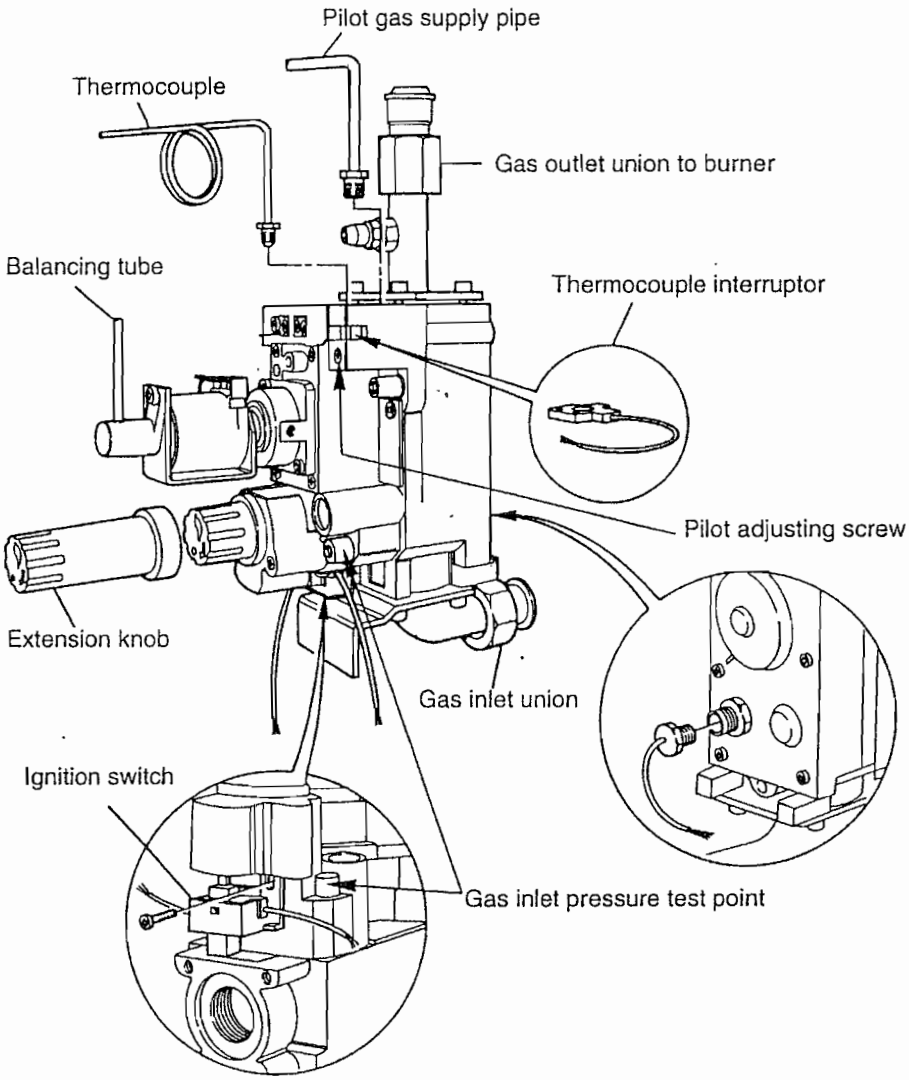

Pilot gas supply pipe
Thermocouple
Gas outlet union to burner
Balancing tube
Thermocouple interruptor
Pilot adjusting screw
Extension knob
Gas inlet union
Ignition switch
Gas inlet pressure test point

Fig. 31

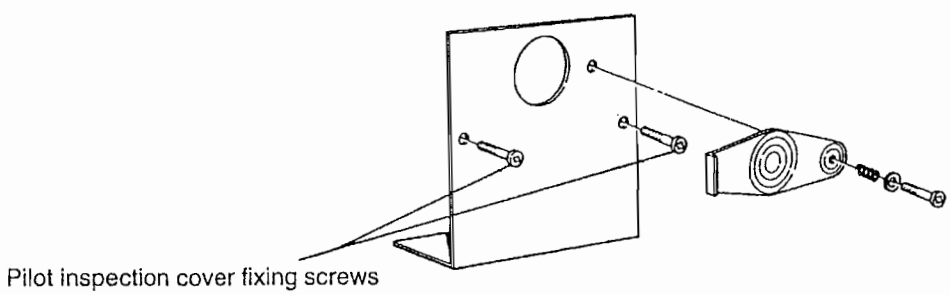

Pilot inspection cover fixing screws

Fig. 32

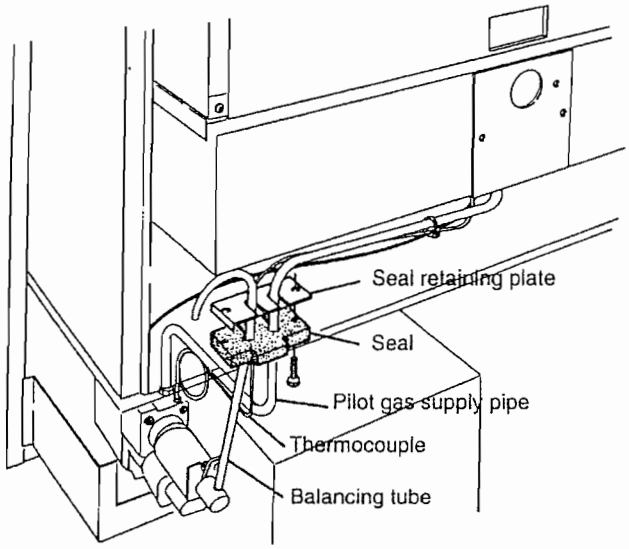


Fig. 33

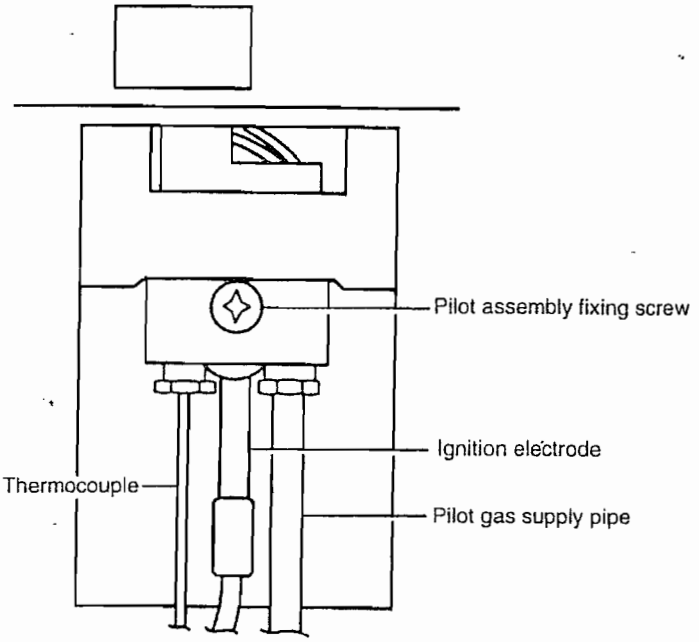


Fig. 34

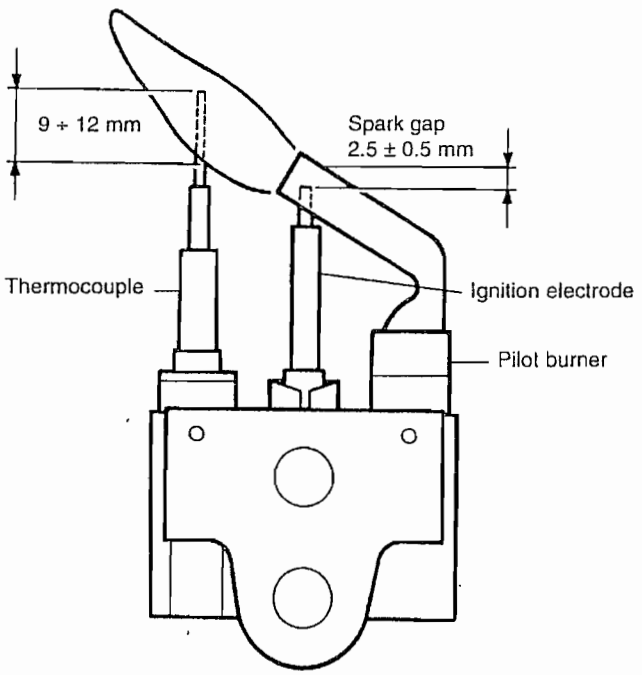


Fig. 35

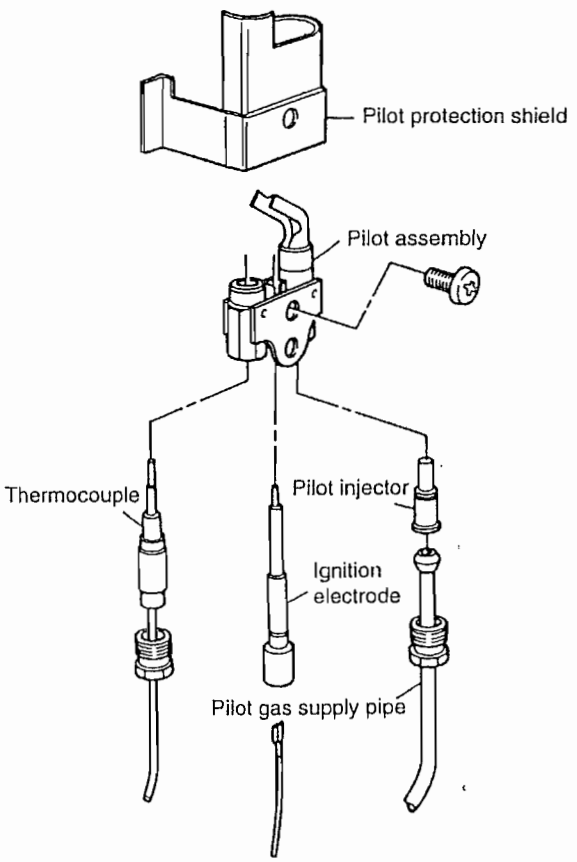


Fig. 36

3.0 IGNITION ELECTRODE

a) Refer to Section 1, items a, d, f, and i.
b) Remove pilot inspection cover, 2 screws (fig.32).
c) Push the electrode downwards to clear spring clip location and remove the lead.
d) Re-assemble in reverse order and ensure ignition is satisfactory. Spark gas should be 2.5 mm +/- 0.5 mm.

4.0 THERMOCOUPLE

a) Refer to section, items a, c, d, f, and i.
b) Remove pilot burner assembly. Refer to section 2, items b, c, d, e, f, g and h.
c) Unscrew the thermocouple from the pilot assembly.
d) Check the operation of the flame failure device. The boiler should operate satisfactorily with a thermocouple output of between 4 and 18 millivolts.

5.0 COLD WATER FLOW SWITCH (Domestic Hot Water) AND FILTER

a) Refer to section 1, items a, b, c, d, f and g (drain D.H.W. only fig. 37).
b) Undo the flow switch unions and carefully lower the flow swith taking care not to lose either the (three) sealing washers, filter or flow restrictor.
c) Disconnect the electrical connections to the flow switch.
d) Re-assemble in reverse order, ensuring that the filter, flow restrictor and sealing washers are in the correct position (fig. 38). The polarity for the electrical wiring is immaterial.

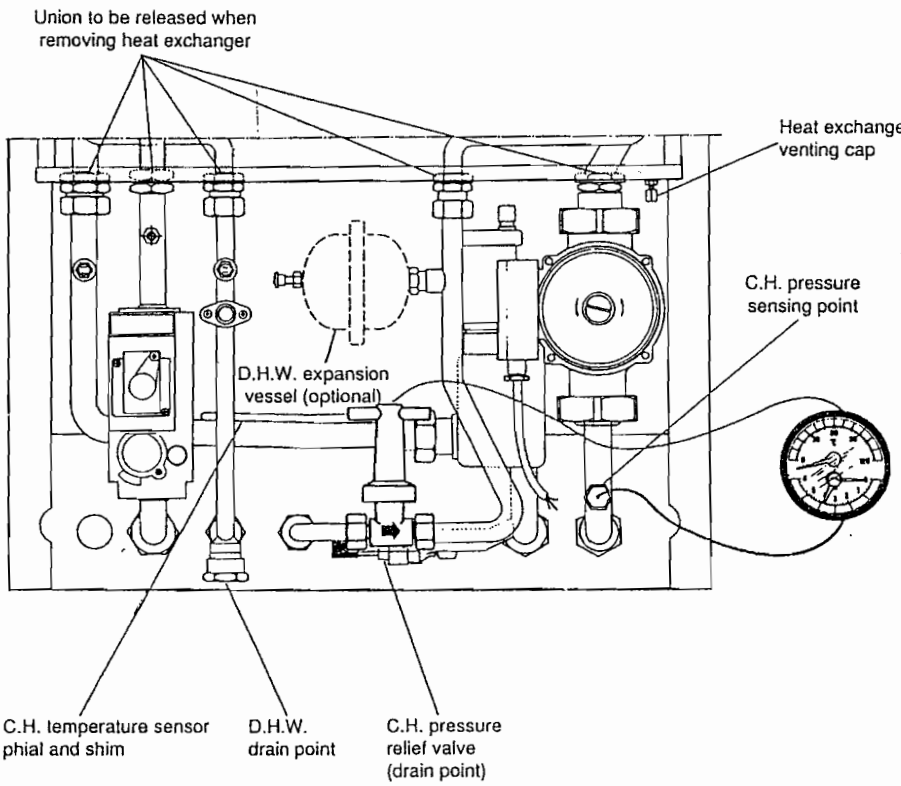


Fig. 37

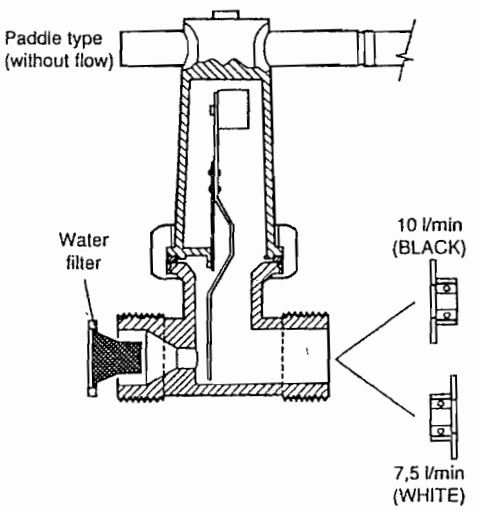


Fig. 38

6.0 HONEYWELL GAS VALVE (fig. 31)

a) Refer to Section 1, items a, c, d, f, g, h (left hand side panel) and j.
b) Remove thermocouple and pilot gas supply from vale.
(Pull out thermocouple interrupteur wire from below thermocouple).
c) Disconnect the four electrical connections from the top of the valve.
d) Disconnect modulating balance tube by removing the fixing screw, and gently pull off from the front of the valve.
e) Disconnect the gas supply to ghe gas valve at the inlet union.
f) Remove the screw securing the base of the gas valve to the control box frame of the appliance.
g) Remove the four Allen screw which secure the inlet supply pipe to the gas valve.
(Take care not to lose the sealing washer).
h) Undo the union which is in the burner supply pipe and withdrawn gas valve towards front.

Note - Ignition wires and thermocouple interrupteur wire are still attached.

i) Remove single screw securing the ignition switch to be bottom of the valve.
j) From the rear of the valve remove the thermocouple interrupteur connection (10 mm spanner).
k) Remove valve, pull off gas control knob extension.
l) Re-assemble in reverse order. Re-connect electrical connection in accordance with the wiring diagram (fig. 25).
m) Fully test the operation of the new gas valve and reset burner pressures as prescribed (see commissioning).

7.0 P.C.B.

a) Refer to section 2, items a, c, d, f and j.
b) Unscrew two fixing screws on the P.C.B. top cover plate, lift and disconnect all connectors from P.C.B. (fig. 39).
c) Unscrew upper fixing screws from P.C.B.
d) Gently pull P.C.B. off mounting studs and remove.
e) Re-assembre in reverse order (Refer to wiring diagram fig. 25).
f) Range rate the boiler C.H. and check the operation of the controls (See commissioning).

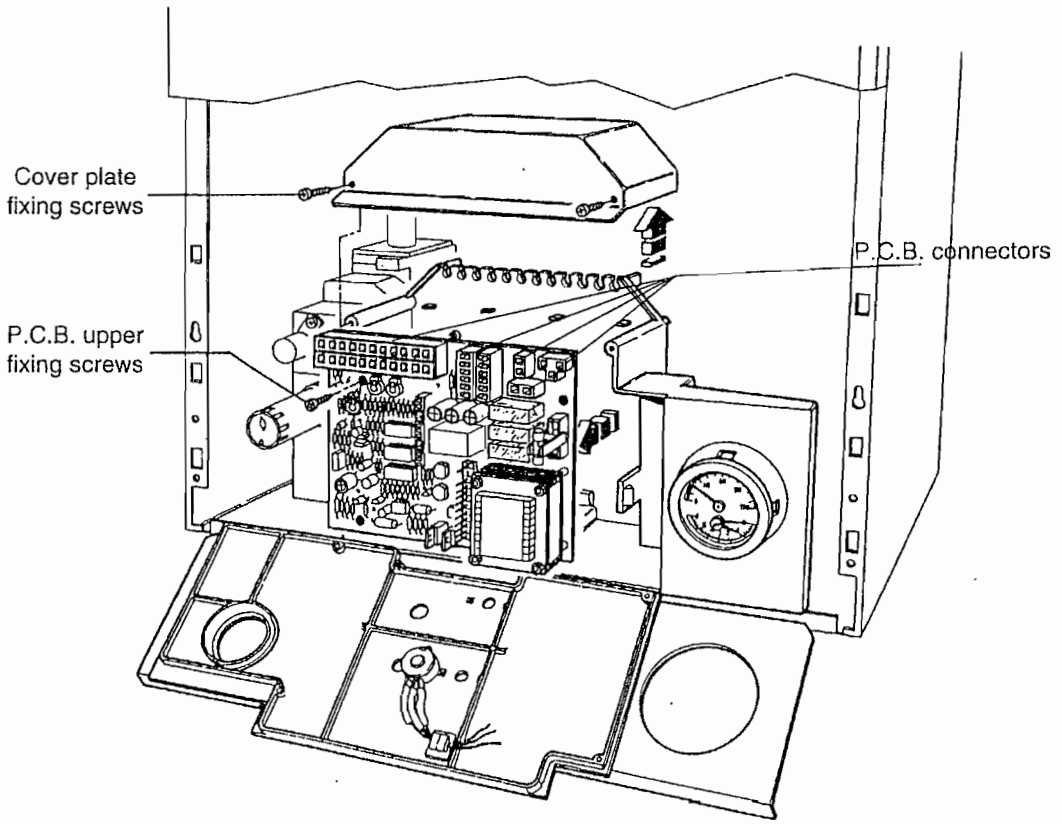


Fig. 39

8.0 CENTRAL HEATING LIMIT THERMOSTAT, OR FROST THERMOSTAT, OR OVERHEAT CUT OFF THERMOSTAT OR D.H.W. LIMIT THERMOSTAT

a) Refer to Section 1, items a, d, f and i.
b) Refer to fig. 2 to identify the location of respective thermostat.
c) Remove two spring clips (with a pair of pliers).
d) Disconnect electrical connections to the thermostat.
e) Re-assemble in reverse order (Polarity Immaterial). Heat sink comound, must be used.

9.0 D.H.W. TEMPERATURE SENSOR OR CENTRAL HEATING TEMPERATURE SENSOR (Control Thermostat)

a) Refer to section 1, items a, b, c, d, f, g, h (left hand side panel) and k.
b) Identify the sensor from fig. 2.
c) Disconnect the electrical connections to the sensor.
d) Unscrew the temperature sensor.
e) Re-assemble in reverse order (Polarity Immaterial).

10.0 PRESSURE RELIEF VALVE

a) Refer to section 1, items a, b, (central heating) c, d, and g.

Note - If this valve is not working correctly then the water can only be drained from the appliance by, removing the pressure relief valve.

b) Release the outlet union to the valve and undo the valve union connection, taking care not to lose the sealing washers.
c) Remove the pressure relief valve outlet fitting.
d) Re-assemble in reverse order, and check the operation of new valve.

11.0 PUMP

a) Refer to section 2, items a, b (central heating), c, d, f, g, h (right hand side panel), j and k.
b) Loosen the two pump union connections.
c) Remove electrical cover on pump, one screw (fig. 40). (Rotate pump to remove cover).
d) Disconnect the live, neutral and earth connection.
e) Release the cable retaining gland and pull the cable clear.
f) Disconnect the two pump union connections. Remove pump (Retain washers if not re-newing).
g) Re-assemble in reverse order (fig. 40).

Note - Ensure the arrow indicating the direction of flow, on the pump housing is pointing upwards, and the speed setting is at 3.

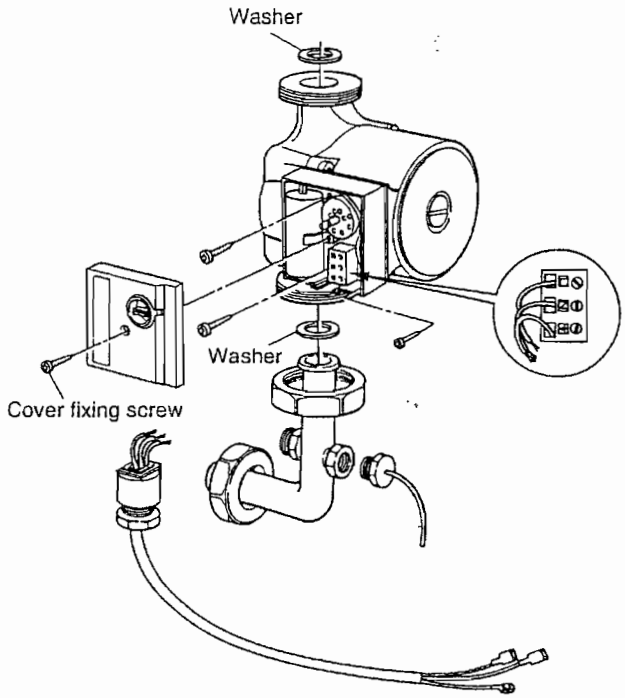


Fig. 40

12.0 AUTOMATIC AIR VENT

a) Refer to Section 1, items a, b (central heating), c, d, f, g, h, (right hand side panel) and k.
b) Loosen the pump union connections and swivel the pump to the right.
c) Unscrew the automatic air vent (fig. 2, item 36).
d) Re-assemble in reverse order ensuring the «O» ring is fitted (fig. 41) and that the venting cap is loose. Replace pump ensuring that the arrow indicating flow points upwards.

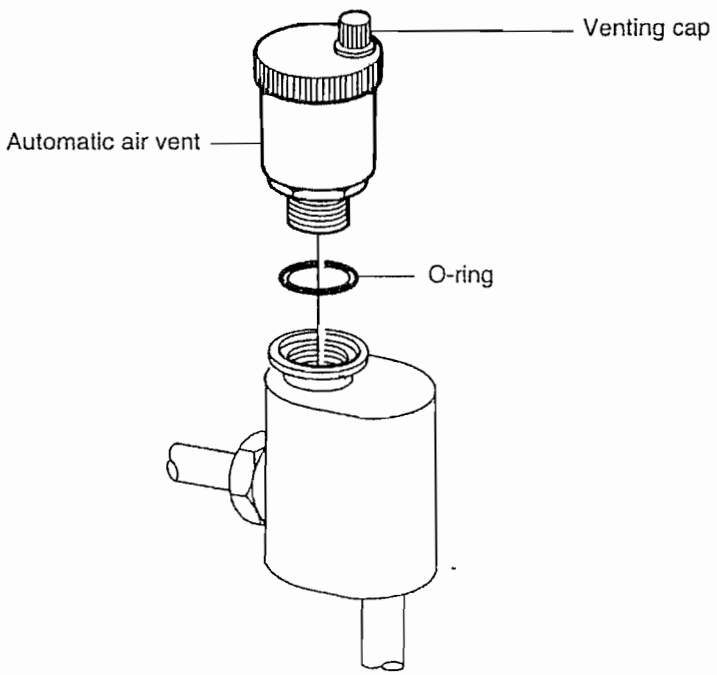


Fig. 41

13.0 PRESSURE/TEMPERATURE GAUGE

a) Refer to Section 1, items a, b, (central heating), c, d, f, g and j.
b) Remove the shim then the temperature sensing phial from its pocket (fig. 37).
c) Unscrew the pressure sensor from its housing (fig. 37). (Access from below).
d) Unscrew the knurled nut from the rear of the gauge, and remove the gauge forwards.

14.0 D.H.W. EXPANSION VESSEL (OPTIONAL)

a) Refer to section 1, items a, b (D.H.W.), c, d, f and g.
b) Unscrew the expansion vessel (fig. 37). (Take care not to loose the sealing washer).
c) Re-assemble in reverse order, ensure the sealing washer is in place.

notes

15.0 REMOVAL OF BOILER THERMOSTAT

a) Refer to Section 1, items a, c, d, f, and j.
b) Remove P.C.B. top cover plate by unscrewing the two fixing screws and pulling away.
c) Disconnect the connector from the P.C.B. (terminals 87 - 88 - 89).
d) Pull off the thermostat knob and lever up the two securing tags revealed (Take care not to lose insulation pad).
e) Re-assemble in reverse order, ensure insulation pad is in place and the wires are pointing downwards. (Refer to fig. 25 for wiring).

16.0 REMOVAL OF IGNITION GENERATOR

a) Refer to Section 1, items a, c, d, f and j.
b) Disconnect electrical connection to the ignition generator.
c) Release the two ignition generator fixing screws, situated at the base. (Refer to fig. 44 for wiring).
d) Re-assemble in reverse order (Refer to fig. 44 for wiring). Check the ignition of the pilot.

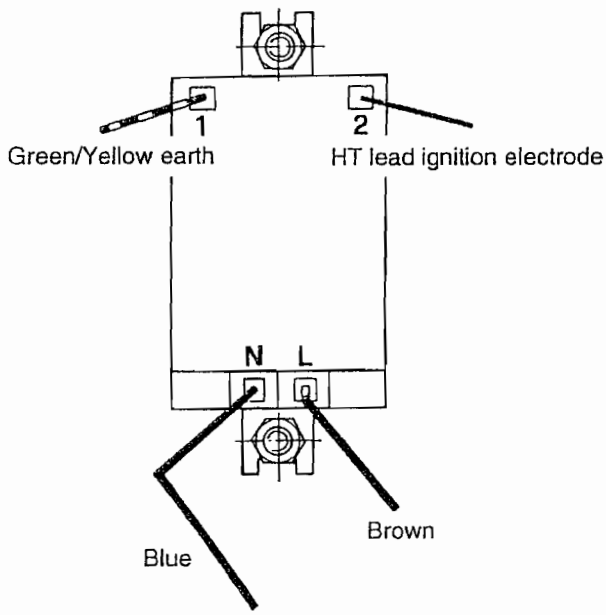


Fig. 44

17.0 AIR PRESSURE SWITCH

a) Refer to Section 1, items a, c, d, f, and i.
b) Remove the five screw securing the air collection plate (fig. 45), and withdraw the plate complete with the air pressure switch (Take care not to lose «P» clip).
c) Disconnect electrical leads to air pressure switch.
d) Remove pressure sensing tube.
e) Remove the pressure switch, 2 screw.
f) Re-assemble in reverse order (refer to fig. 45 for wiring).

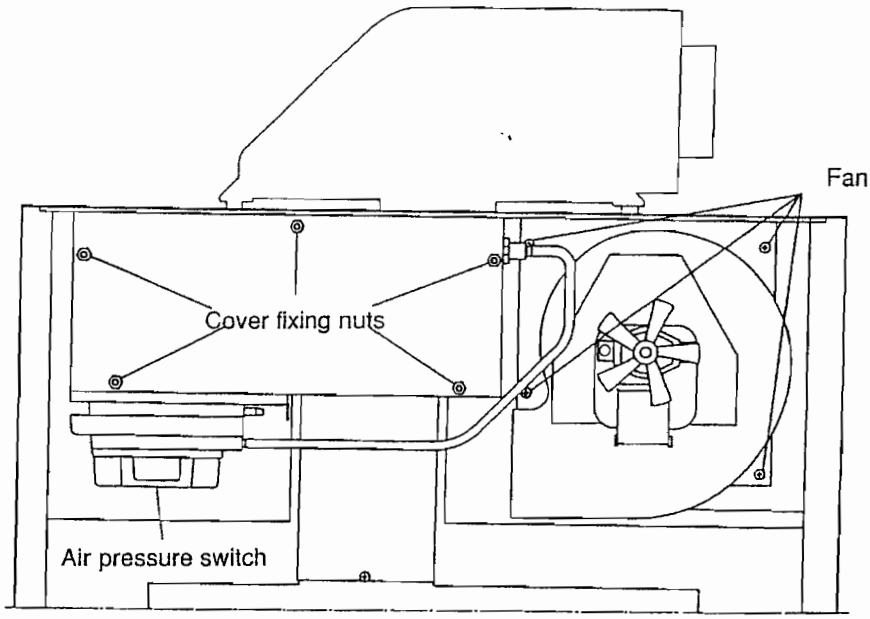


Fig. 45

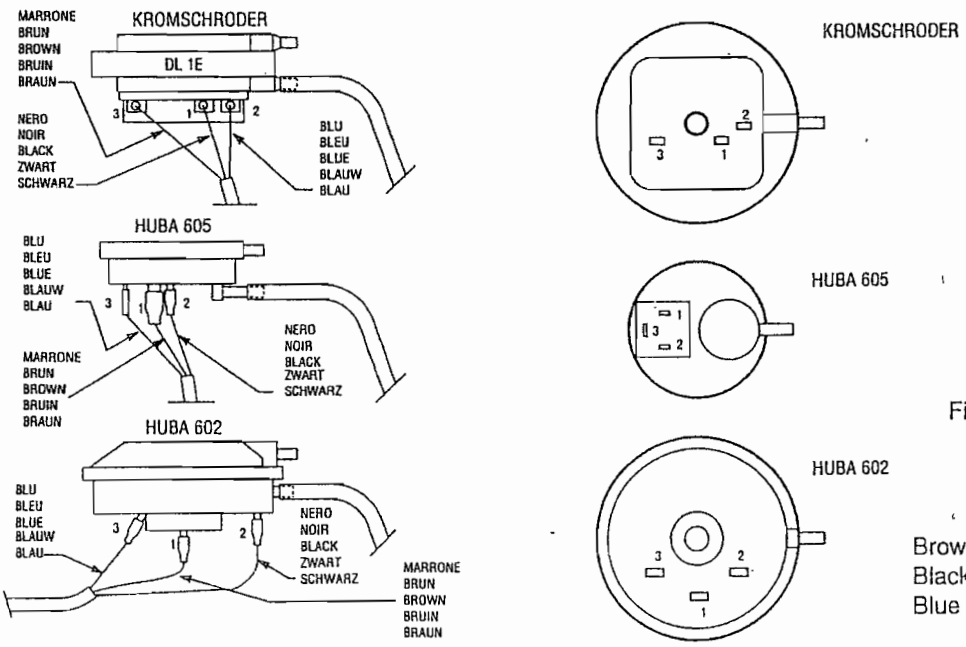
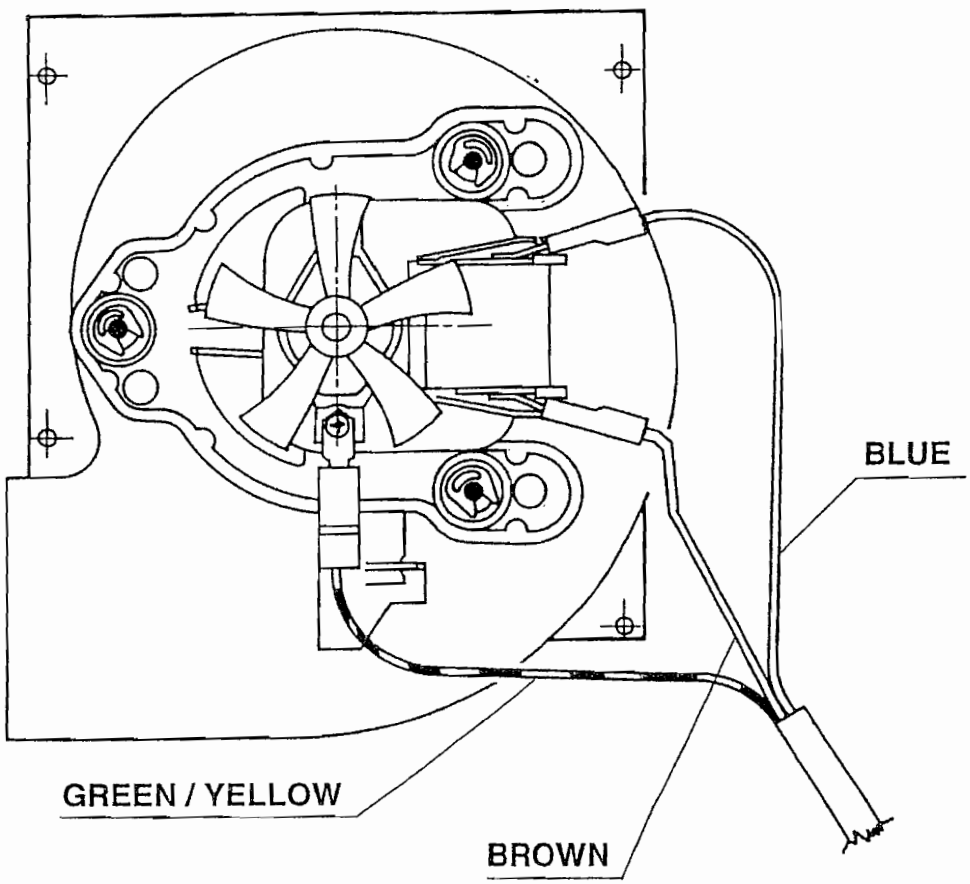


Fig. 46

Brown - Common
Black = N.C.
Blue = N.O.

18.0 REMOVAL OF FAN

a) Refer to Section 1, items a, c, d, f, and i.
b) Disconnect electrical connections (fig. 47).
c) Unscrew the four fixing screws securing the fan remove air sensor tubes and withdraw fan (fig. 45).
d) Re-assemble in reverse order (refer to fig. 47) for wiring.



Note - Remove Blue, Brown and Green/Yellow wires before removing fan.

Fig. 47

19.0 REMOVAL OF MAIN BURNER INJECTORS (x4)

a) Refer to Section 1, items a, c, d, f, and i.
b) Remove pilot burner assembly. Refer to section 2 items b, c, d, e, f, g, and h.
c) Unscrew burner inlet union connection (fig. 48).
d) Remove combustion chamber front panel by unscrewing the two fixing screws (fig. 49).
e) Unscrew the burner assembly fixing screws (fig. 49) and remove complete burner assembly (take care not to loose sealing cap on gas supply pipe).
f) Remove the three screws securing the burner air guide plate (see fig. 48).
g) Remove the two screws securing the injector rail (fig. 48) and remove the injector rail complete with burners.
h) Pull burners off injectors.
i) Remove injectors (Take care not to loose the copper sealing washers).
j) Re-assemble in reverse order (check operation on boiler).
k) Check tightness of sealing cap.
l) Check operation of boiler.

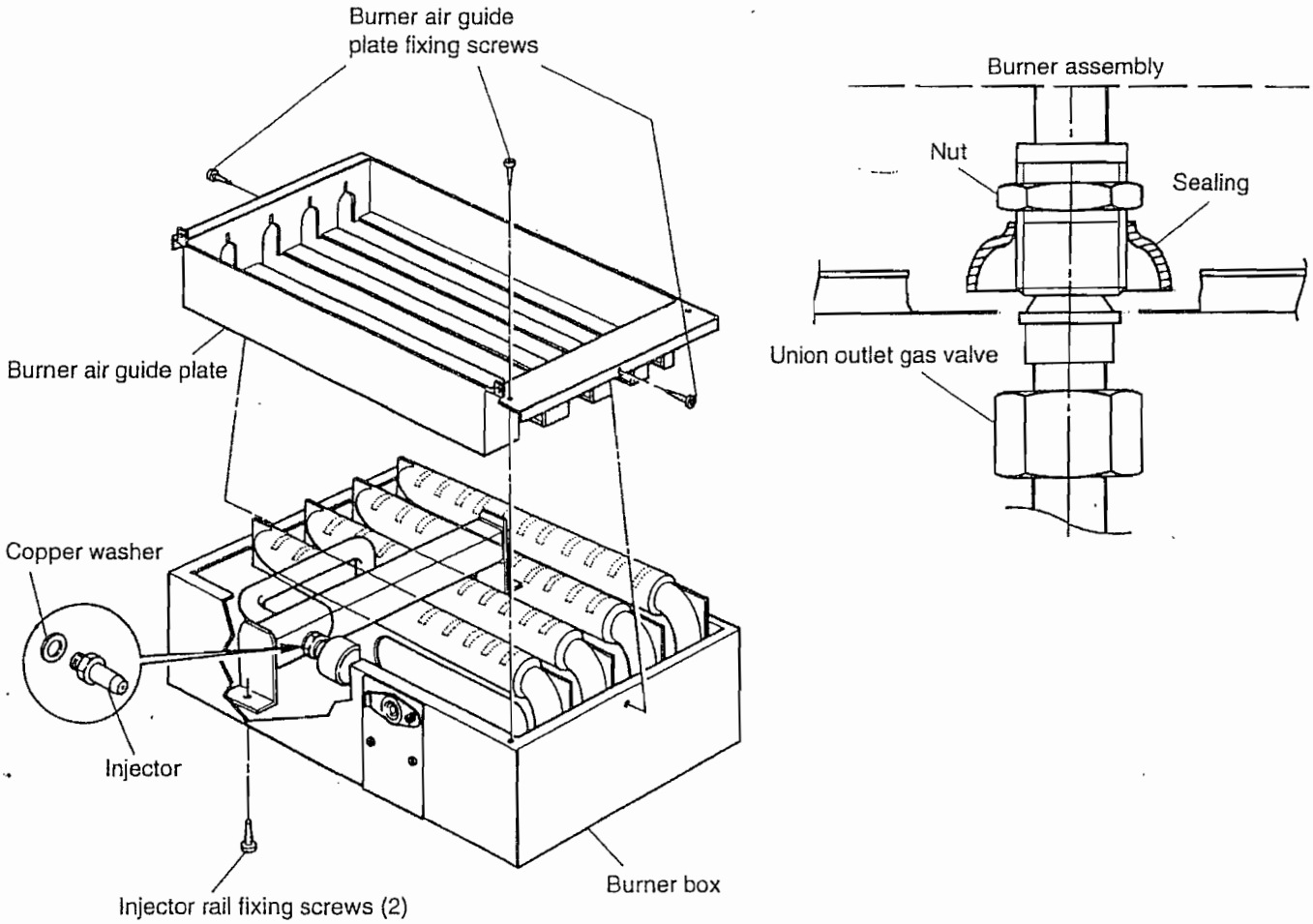


Fig. 48

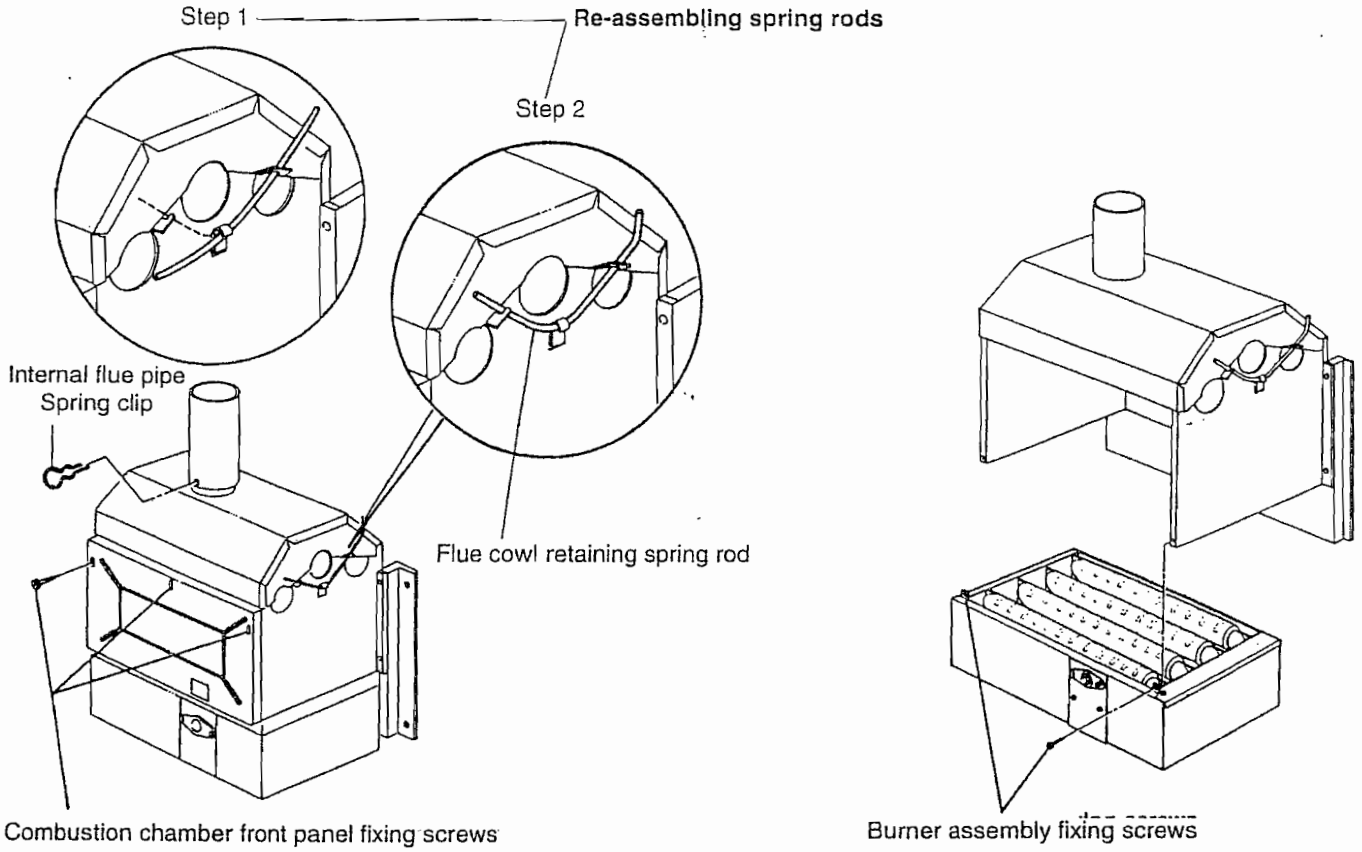


Fig. 49

20.0 REMOVAL OF HEAT EXCHANGER

a) Refer to Section 1, items a, c, d, f, g, h, i and j.
b) Remove pilot burner assembly. Refer to section 2, items b, c, d, e, f, g, h, and k.
c) Remove main burner. Refer to section 21, items c, d, and e.
d) Disconnect the two pump union connections, remove pump and rest in the control panel cover. (Do not loose the pump washers).
e) Remove the other half of the top union pump connection and then remove locking nut (fig. 37).
f) Disconnect the remaining three unions at the base of the combustion chamber (take care not to loose sealing washer and remove locking nuts) (fig. 37).
g) Remove heat exchanger venting cap and locking nut, (take care not to loose ball bearing) (fig. 37).
h) Disconnect the electrical connection from C.H. limit thermostats, frost thermostat and overheat cut-off thermostat, (identify these components from fig. 2).
i) Remove flue cowl retaining spring rods by pushing up and outwards (fig. 49).
j) Remove the spring clip securing the flue cowl to the internal flue pipe and push the flue pipe upwards (fig. 49) and latch it in the flue to keep it out of the way.
k) Carefully lift the flue cowl out.
l) Remove the single screw from the «U» bracket below the combustion chamber (fig. 50) and remove bracket.
m) Slide combustion chamber downwards.
n) Lift the heat exchanger upwards and pull away.
o) Re-assemble in reverse order. Refer to fig. 48 for replacement of spring rods and refer to wiring diagram fig. 25 for re-connection.
p) Fully check the operation of the boiler. (Refer to commissioning).

21.0 REMOVAL OF COMBUSTION CHAMBER INSULATION PANELS

a) Refer to section 1, items a, c, d, f and i.
b) Remove the pilot burner assembly refer to section 2, items b, c, d, e, f, g and h.
c) Remove the main burner refer to section 21, items c, d and e.
d) Remove the single screw from the «U» bracket below the combustion chamber (fig. 50) and remove bracket.
e) Slide combustion chamber downwards.
f) Gently lift out the two side insulation panels and the back insulation panel.
g) Removal of the combustion chamber front insulation panel.
l) Pull up the four metal tags which secure the insulation to the front panel (fig. 51).
II) Gently lift out the insulation, take care not to loose the glass viewing window.
III) Refit the insulation panel and push the metal securing tags back down.
(Take care that the viewing window is in place).
h) Re-assemble in reverse order (refer to fig. 48 for replacement of spring clip and refer to fig. 25 for wiring).
Ensure that the internal flue pipe is fixed to the top of the flue cowl.
i) Fully check operation of the boiler (refer to commissioning).

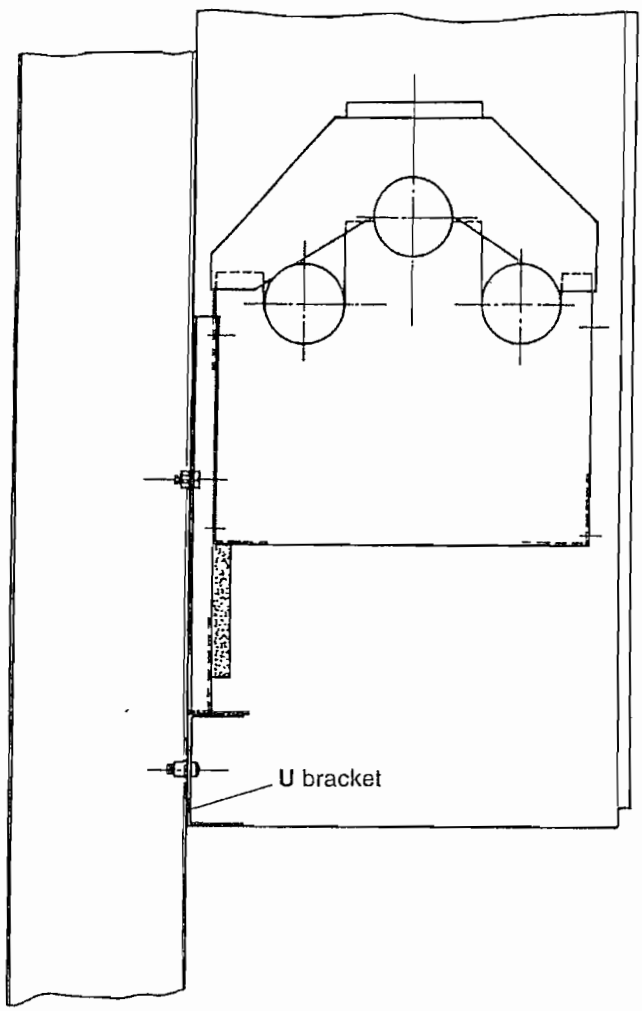


Fig. 50

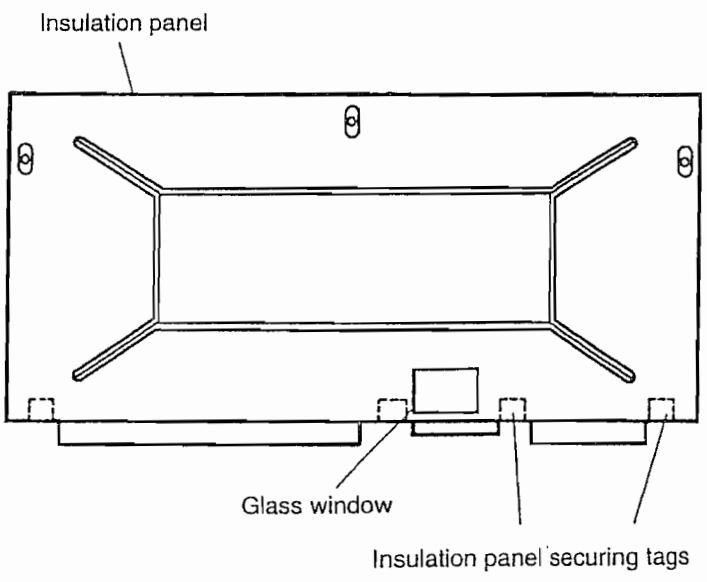


Fig. 51

22.0 REMOVAL AND RE-PRESSURISING OF C.H. EXPANSION VESSEL

Note - If there is less than 500 mm clearance above the boiler or if the boiler has a rear flue outlet then removal of the expansion vessel can only be achieved by first removing the boiler from the wall.

Note - For rear exit flues is not recommended that the flue and air duct be removed from the wall. Either remove the boiler leaving the ducts in place or insert an equivalent vessel in the **return** to the boiler.

a) Removal of expansion vessel.
I) Refer to section 1, items a, b and c (Drain C.H. side of boiler).
II) Remove the two screws from the expansion vessel securing plate, (fig. 52) which can be found at the top back of the boiler.
III) Undo the compression fitting on the top of the expansion vessel (fig. 52).
IV) Remove the expansion vessel.
V) Re-assemble in reverse order.
b) Re-pressuring of expansion vessel. (Charge pressure 0,8 - 1,0 bar).
I) Close the C.H. flow and return cocks on boiler and drain the boiler (fig. 20).
II) The schrade valve is positioned on the top right hand side of the expansion vessel, behind the inlet connection.
III) Re-open C.H. flow and return cocks and re-charge the system to between 1 & 1,5 bar and vent the boiler and radiators.

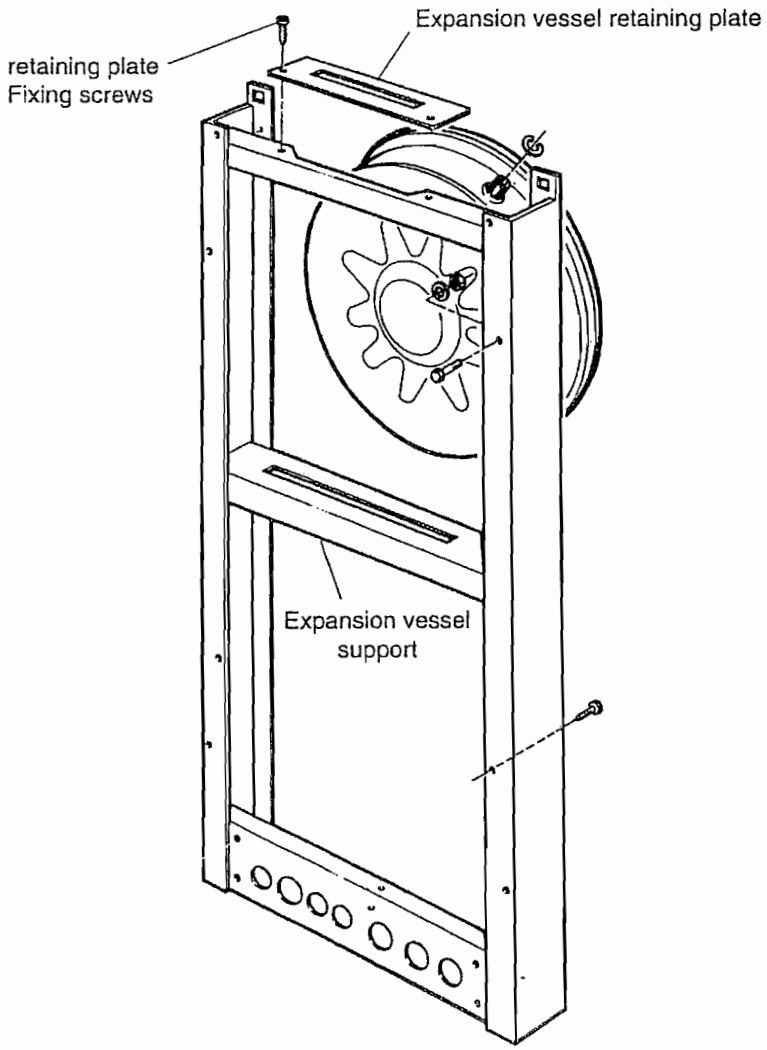


Fig. 52

Annual Servicing Instructions

Certain procedures may not be necessary - check the operation of the pilot, thermostat and main burner before servicing, as well as the domestic hot water flow rates. Note that the heat exchanger must always be cleaned.

Before work commences ensure that:

a) Boiler is cold.
b) Electricity supply to the boiler is isolated.
c) Gas supply to the boiler is isolated, at the cock on the inlet manifold.

1.0 TO REMOVE THE BOILER OUTER CASING

1.1 **Front panel** - Grip firmly on both sides and pull it forward aways from the main boiler assembly.

1.2 **Base Plate** - Unscrew the four screws which secure the base plate (fig. 30).

Note - The panels are located in keyhole slots, push panel upwards and pull away.

1.3 **Combustion Chamber Outer Cover** - Remove the five combustion chamber outer cover screws (fig. 30) and unlatch the four buckle clips and remove cover.

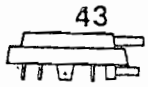
2.0 REMOVAL OF PARTS FOR SERVICING

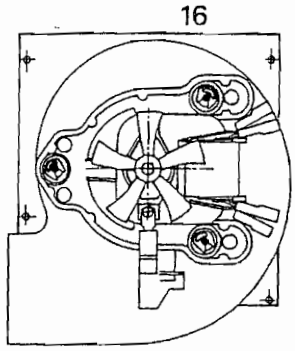
2.1 Remove thermocouple from Honeywell valve (10 mm spanner). Note that the thermocouple interrupteur is located in a slot below and must be in this position before reconnecting the thermocouple (fig. 31).
2.2 Unscrew the pilot gas compression nut from the Honeywell valve (fig. 31).
2.3 Remove the pilot inspection cover 2 screws (fig. 32).
2.4 Pull electrode H.T lead from electrode.
2.5 Unscrew burner inlet union connection.
2.6 Remove the combustion chamber front panel by unscrewing the two fixing screws (fig. 48).
2.7 Remove the two screws securing the burner assembly box (fig. 48).
2.8 Remove the pilot pipe/thermocouple seal retaining plate 2 screws (fig. 33).
2.9 Remove the main burner assembly box and pilot assembly complete.
2.10 Remove the single pilot assembly fixing screw (fig. 34). Pull pilot assembly downwards to withdraw.
2.11 If required pull electrode from location and inspect electrode. Replace if deteriorated or ceramic cracked.
2.12 Inspect the thermocouple tip for signs of deterioration. Replace if necessary.
2.13 If required unscrew the pilot burner supply compression nut and remove supply pipe and injector (injector is a sliding fit in the housing). Examine injector for any blockage. Blow out any deposits (do not use a sharp implement to unblock).
2.14 Remove the three screws securing the burner air guide plate (fig. 49).
2.15 Remove the two fixing screws securing the injector rail (fig. 49) and remove the injector rail complete with burners.
2.16 Pull burners off injectors.
2.17 Clean the burners with a brush.
2.18 Inspect the main injector and clean if necessary.
2.19 Remove the spring clip securing the flue cowl to the flue and push the flue pipe upwards (fig. 48) and latch it in the flue to keep it out of the way.
2.20 Pull out the two fixing rods from the side of the flue cowl (fig. 48). Gently lift the flue cowl out.
2.21 Clean the heat exchanger with a suitable brush and the bar provided (the bar is located on the small heat exchanger air vent pipe, which is situated on the right hand side of the boiler, and is accessible when the combustion chamber outer cover has been removed).
2.22 If the domestic hot water rate is low, from underneath the appliance turn off the domestic water cocks and drain the domestic hot water by opening the drain plug (fig. 37).
From underneath the appliance undo the two unions and remove the flow switch valve (fig. 38) far enough to gain access to the filter which is on filter which is on the inlet to the valve and the flow restrictor which is on the outlet. (Take care not to loose the sealing washer at either connection of the flow control valve).
Clean or replace the filter if necessary.

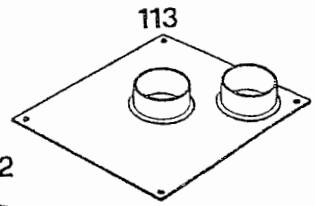
3.0

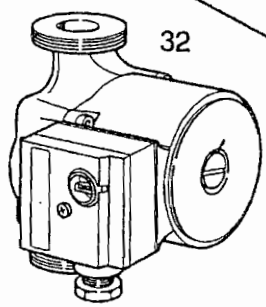
3.1 Re-assemble the appliance in reverse order. Take care that:
a) Flow switch valve filter and restrictor are fitted correctly (fig. 38).
b) Pilot injector is in position (fig. 35).
c) Electrode is fully located (spark gap 2.5 mm +/- 0.5 mm).
d) Thermocouple interrupteur is correctly located in Honeywell valve (fig. 31).

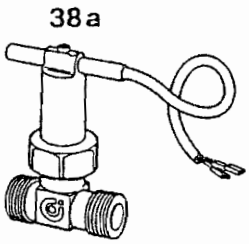
Note - Always check for gas and water soundness of any joints broken during servicing.

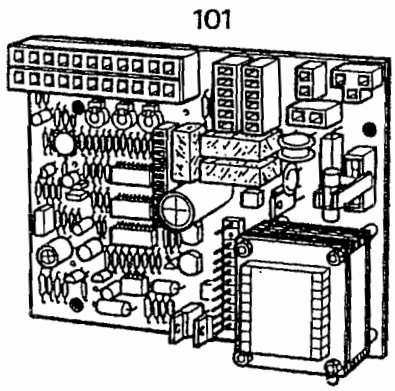


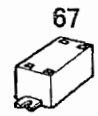


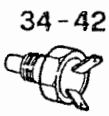


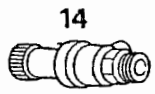


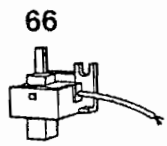






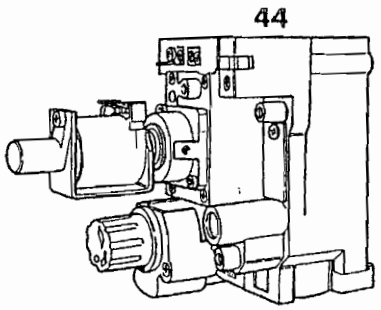


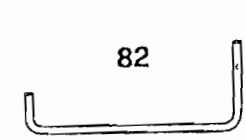




Spare Parts List

Item No.	G.C. Part No.	Makers Part No	No. Off	DESCRIPTION
14	386816	3980013/0	1	C.H. safety valve
16		3980218/0	1	Complete fan
21	372176	3400585/0	4	Main injector (Natural Gas)
21		3400587/0	4	Main injector (L.P.G.)
23	390210	3980117/0	1	Thermocouple
24	386575	3980028/0	1	Spark electrode
25	386586	3980027/0	1	Pilot
32	386814	398006/0	1	Central heating pump
34	386818	3980031/0	2	Temperature sensor
36	394246	3980116/0	1	Automatic air vent
38		3980219/0	1	Cold water flow switch
39	386829	3980122/0	1	Cold water flow limiter
42	386818	3980031/0	2	Temperature sensor
43	381691	3980014/0	1	Air pressure switch
44	386544	3980054/0	1	Combination gas valve
49	386815	3980017/0	1	Overheat cut-off thermostat
50	386577	3980016/0	1	Heat exchanger limit thermostat
51	386828	3980018/0	1	Heat exchanger frost thermostat
52	386576	3980100/0	1	D.H.W. limit thermostat
63	372224	3980126/0	1	C.H. boiler thermostat
64	386580	3980030/0	1	C.H. temperature/pressure gauge
66	372320	3980127/0	1	Microswitch combination gas valve
67	372309	3980115/0	1	Ignition transformer
101		3980254/0	1	P.C.B. VMF6.1
112	386573	3370057/0	1	Pilot injector (Natural Gas)
112		3370066/0	1	Pilot injector (L.P.G.)
113	3980236/0	3980094/0	1	Special two pipe flue/air adapter
-	-	3980092/0	1	Kit injectors (L.P.G)





Domestic Hot Water Performance

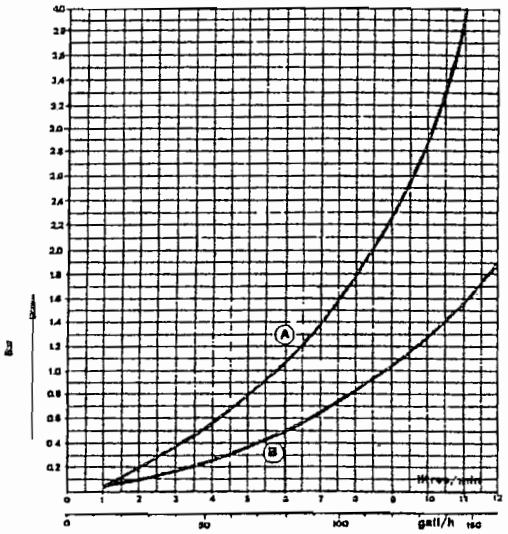


Fig. 1 - D.H.W. Pressure Drop VS. flow
A = Standard with col water Flow Restricter
B = Cold Water Flow Restricter Removed

Fig. 1

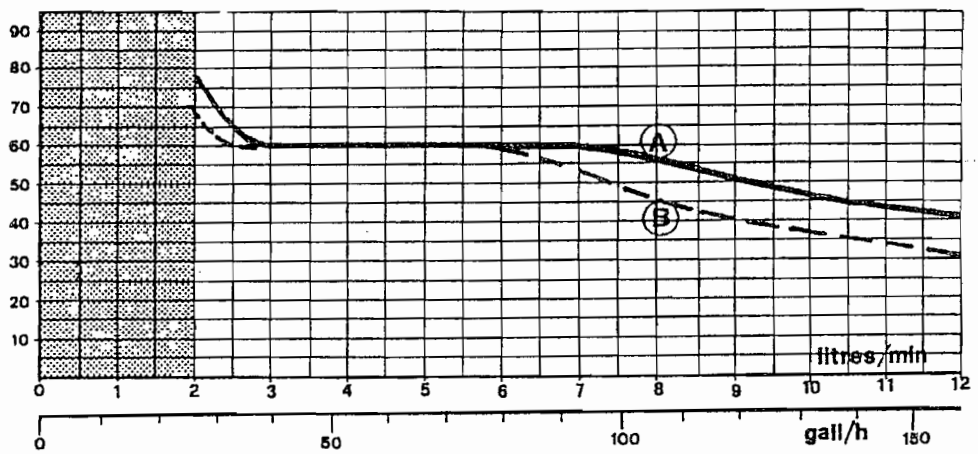
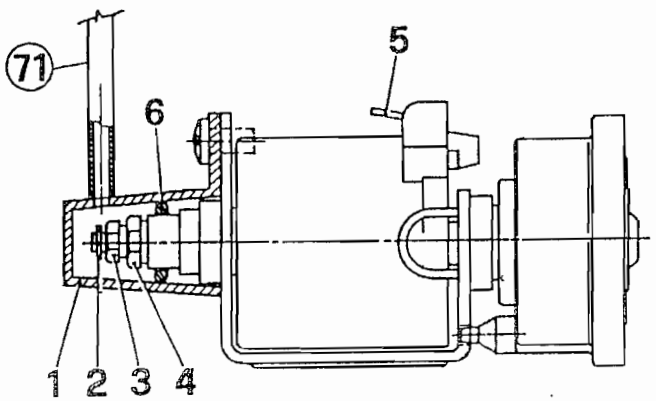


Fig. 2 - D.H.W.
temperature VS. flow
A = Cold Water 15°C
B = Cold Water 5°C

Fig. 2

Modulating regulator (Modureg) of gas valve

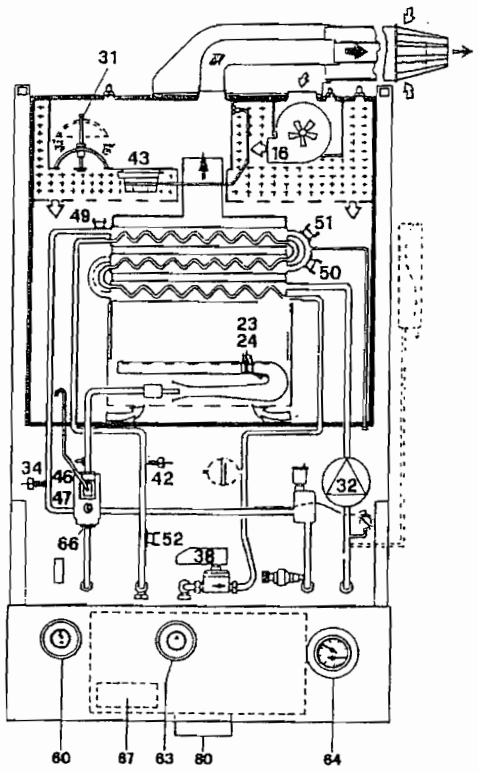
1. Cap (with tube 71)
2. Shaft
3. Adjustment screw for max. pressure setting
4. Adjustment screw for min. pressure setting
5. 6,3 mm APM terminals
6. «O» ring
71. Modulating balance tube



If necessary replace complete MODUREG

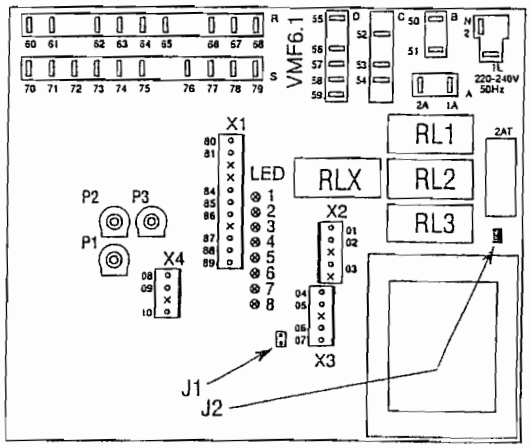
Pressure settings	Minimum		Maximum	
	mbar	inch WG	mbar	WG
Natural Gas	2.5	1.0	15.3	6.1
L.P.G.	7.5	3.0	30.0	12.0

FERROLI COMBI 77 FF / POPULAR



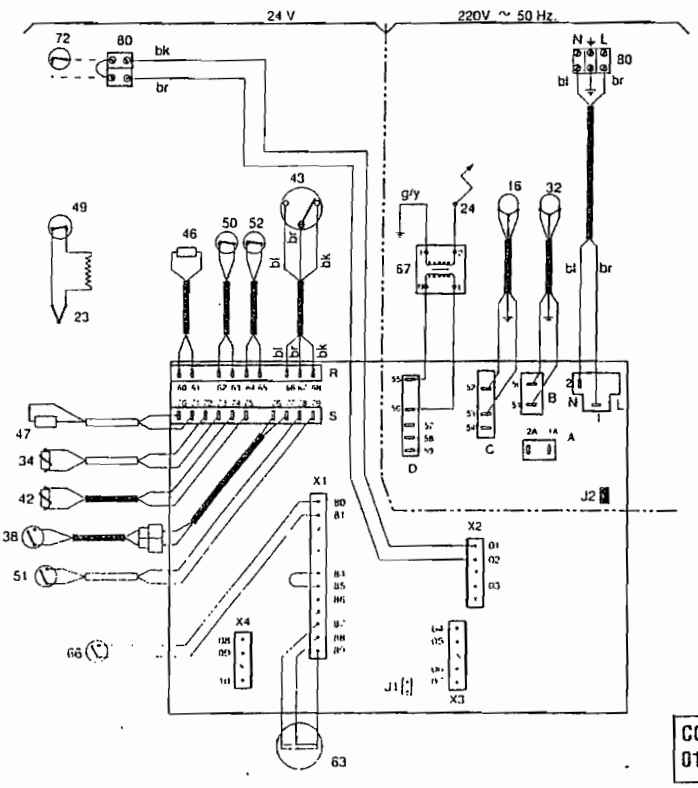
Key

16	Fan
23	Thermocouple
24	spark electrode
31	Air pressure control damper
32	Central heating pump
34	C.H. flow temperature sensor
38	Cold water flow switch
42	D.H.W. temperatuure sensor
43	Air pressure switch
46	Operator gas valve
47	Modulating regulator (Modureg) gas valve
49	Overheat cut-off thermostat
50	Heat exchan. limit thermostat
51	Heat exchan. frost thermostat
52	D.H.W. limit thermostat
60	Extended control knob gas valve
63	C.H. boiler thermostat
64	C.H. temperature pressure gauges
66	Microswitch combination gas valve
67	Ignition transformer
68	Control box with P.C.B.
72	Room thermostat (not fitted)
80	240V + 24V roomstat terminal blocks



J1 - J2 Jumper links on P.C.B.
J1 Is not required
J2 Must be fitted

P1 = C.H. max. output (to be set on site)
P2 = D.H.W. max. output (factory set)
P3 = D.H.W. temperature (factory set)



NOTE:
THE TRANSFORMER ON THE P.C.B. HAS A BUILT-IN OVERHEAT PROTECTION.
IF THIS IS OPEN, ALL LED'S WILL BE OFF BUT THE C.H. PUMP (32) WILL RUN
SWITCH OFF THE BOILER FOR AT LEAST 20 MINUTES

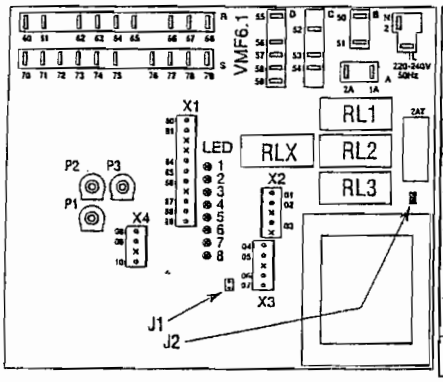
CONNECTOR X2
01-03 = 24V~2VA

X4 a	X3 b	c	d
DON'T CONNECT ANYTHING TO THIS CONNECTOR, THIS COULD DAMAGE THE P.C.B.	TEST CONNECTOR X3 04 TEST 05 06 MODUREG MAX VOLTAGE 07	SHORT CIRCUIT 04-05 AND SHORT CIRCUIT 06-07: - BOILER WILL START FOR C.H. - - WAITING TIME IS EXCLUDED - P1 AND P2 OUT OF OPERATION - - CHECK/SET MECHANICAL MAXIMUM ON MODUREG (47)	SHORT CIRCUIT 04-05 ONLY. - BOILER STARTS FOR C.H. - WAITING TIME IS EXCLUDED - MAX BURNER PRESSION C.H. CAN BE CHECKED/SET WITH P1

FERROLI COMBI 77 FF / POPULAR

General Notes - For use on the 77FF/POPULAR fitted with VMF6.1 Printed Circuit Board

*The pilot light can only be ignited after the Fan (16) has run for at least 20 seconds on full speed.
*The central heating pump (32) will run to disperse heat if the temperature at the heat exchanger limit thermostat (50) is too high
*The frost thermostat (51) will switch on the boiler for central heating if the temperature is too low.



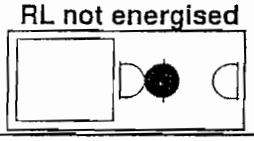
LED n°	colour	signification:
1	green	Mains on/low voltage on
2	yellow	Domestic hot water flow switch (38) on
3	yellow	Central heating room thermostat (72) / clock (62) calling for heat
4	green	Sensor (34) or (42) calling for heat
5	red	Central Heating waiting time, a max. 3 minutes delay following
		shut off Boilerstat (63), Clock (62), Roomstat (72) or use of Hot Water
6	yellow	Demand for heat - fan relay (RL2) will be energised
7	green	Air pressure switch (43) on
8	yellow	Gas valve (46) energised

Jumpers J1 - J2		
	Fitted	Not Fitted
J1	Prepurge time before ignition = 0 second	Prepurge time before ignition = 20 seconds
J2	Fan control High & Low speed	Fan control High speed only/off

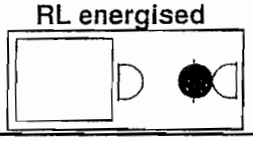
Resistance of Central Heating or Hot Water sensors (34) + (42)	
10°C	890 ohm
25°C	1000 ohm
60°C	1300 ohm

RELAYS
RL1 central heating pump
RL2 fan
RL3 ignition

RL not energised



RL energised



NOTE
If RL1 is not energised the Central Heating pump will run

Check operation using LED's as a fault finding guide. First check section A, then B, then C, then D.
0 = LED off 1 = LED on x = LED either on/off is not important

A

Domestic Hot water tap open			(Flow rate greater than 2,5 l/min)
LED	OK	FAULT	POSSIBLE CAUSE OF FAULT
1	1	0	No mains electricity/switches off/fuse blown.
2	1	0	D.H.W. flow switch (38) not operating.
3	X	X	Not required for D.H.W.
4	1	0	- D.H.W. sensor (42) not connected or D.H.W. temperature too high
5	0	1	- Waiting time operating: replace P.C.B.
6	1	0	Short circuit on D.H.W. sensor (42) or resistance lower than 500 Ohm

B

CENTRAL HEATING ON			Room stat (72) at Max, HW tap closed
LED	OK	FAULT	POSSIBLE CAUSE OF FAULT
1	1	0	No main electricity/switches off, fuse blown.
2	0	1	Hot water tap open - D.H.W. flow switch (38) contact closed
3	1	0	Roomstat (72) or clock (62) not calling for heat
4	1	0	- Central heating sensor (34) not connected or
			- boiler temperature too high or
			- boiler thermostat (63) below CH temperature
5	0	1	Waiting time still operating (max. 3 minutes)
6	1	0	- C.H. sensor (34) short circuit or resistance lower than 500 ohm

C

GENERAL TEST FOR D.H.W. AND CENTRAL HEATING (First check A and B above)			
LED/REL.	OK	FAULT	POSSIBLE CAUSE OF FAULT
RLX/RL2	energised	not energised	Air pressure switch (43) not in NC position or miswired: check wiring
			- fan (16) runs too fast at low speed
7	1	0	- fan (16) not running at full speed or
			- air flow too low: check e. g. air intake/flue outlet or
			- air pressure control damper (31) not fully closed with front cover off
			- air pressure switch (43) faulty
8	1	0	- CH limit thermostat (50) open circuit (pump will run)
			- DHW limit thermostat (52) open circuit

D

	IGNITION OF PILOT		
1	Fan (16) should run at full speed for at least 20 seconds	5	Relay RL3 will energise
	(open hot tap or set controls so boiler is callingfor heat).	6	Ignition transformer (67) will energise
2	Check first A, B and C above	7	Check spark and position of spark electrode (24)
3	Push ignition button (60) fully in		
4	Microwitch (66) will close		