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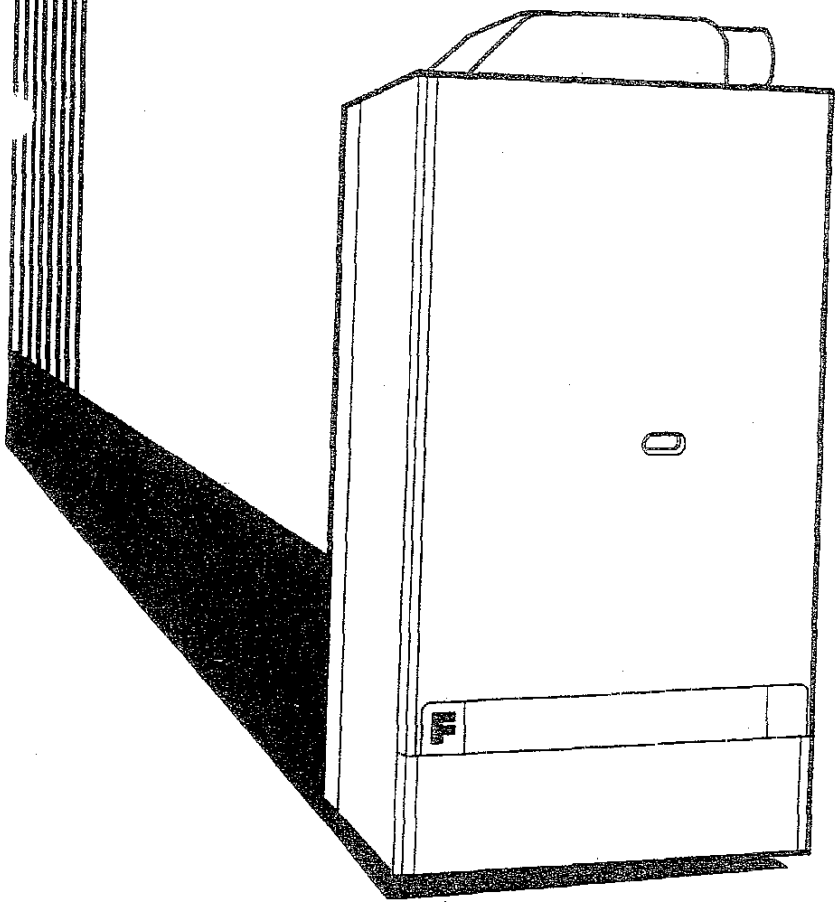
FERROLI S.p.A.

FERROLI COMBI 100 FF

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



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TECHNICAL
INFORMATION
INSTALLATION
and
SERVICE
INSTRUCTIONS

Phone numbers:

Installer _____

Service Engineer_____

LEAVE THESE INSTRUCTIONS
ADJACENT TO THE GAS METER

ALL SPECIFICATIONS SUBJECT TO CHANGE

NOTE - Technical details involving gas compositions refer to standard gas only

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FERROLI COMBI 100 FF

General Description

The Ferroli COMBI 100 FF 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. The wall mounting jig contains all the isolating cocks for the water and gas supplies which can be fined to the wall and provided with all the necessary gas and water connections prior to the boiler being attached. The flue can either be left hand, right hand or rear. There are three flue lenghts available and they are 0.75 metres for wall thickness up to 565 mm), 1,5 metres (for wall thickness up to 1315 mm) for side flue outlet applications the wall thichkness (for wall thickness for each flue lenght 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 his thermostat operates at 96°C. The boiler is fitted with its own Central Heating pump. The pump is switched ON/OFF by the time clock and/or a 24 Volt room thermostat. The pump circuit also has a 6 minute over-run ime. 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 or Central Heating can be set. This does not influence the maximum output for domestic hot water. At the actory the central heating output is pre-set to minimum The appliance is not suitable for external installation.

Related Documents

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

he Gas Safety Regulations (Installations & Use) 1984.

he Local Building Regulations.

he Building Regulations.

he Buildings Standards (Scotland - Consolidated) Regulations.
ritish Standards Codes of Practice:
.S. 5546 1990
S. 5440 Part 1
S. 5440 Part 2
S. 5449
S. 6798
S. 6891 1988

odel Water Bye Laws.

urrent I.E.E. Regulations.

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FERROLI COMBI 100 FF

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

Technical information

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15	Jig assembly (optional)
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17	Preparating flue assembly
18	Filling C.H. - Flushing C.H - Descaling D.H W.
19	Electricity supply
20	General explanation on operation
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22	C.H. output adjustment
23	Burner pressure Natural Gas - LPG - - Town Gas
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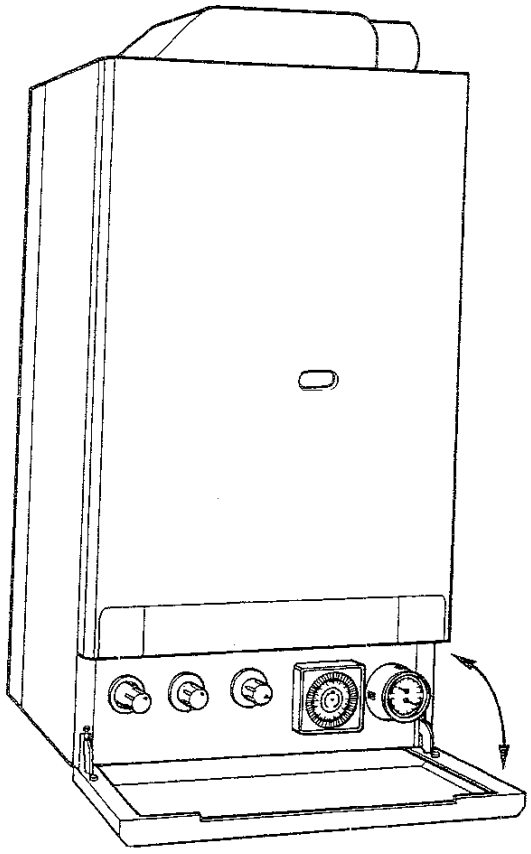
38	General fault finding
39÷51	**Servicing**
39	"Fast" Fault finding
43	Exploded view jacket
44	Exploded view
45	Exploded view gas line, combustion chamber and fraft diverter
46	Exploded view heat exchanger + C.H. and D H W parts
52	Spare parts list



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FERROLI COMBI 100 FF

Technical data

	NATURAL GAS (G20)	NATURAL GAS (G25)	PROPANE LPG (G31)
Nominal heat input (gross caloric value)	32.5 kW	32.5 kW	32 5 kW
Nominal heat input (net caloric value)	29.5 kW	29.5 kW	29.5 kW
Nominal heat output	25.7 kW	25 7 kW	25.7 kW
Minimum heat input (gross caloric value)	13.2 kW	13 2 kW	13.2 kW
Minimum heat input (net caloric value)	11 9 kW	11 9 kW	11.9 kW
Minimum heat output	9.8 kW	9.8 kW	9 8 kW
Gas rate	3.0 m³S/h	3.0 m³S/h	2.24 kg/h
Burner setting pressure	14 mbar (max)	13 mbar (max)	33 mbar (max.)
Minimum burner pressure	2 8 mbar (min.)	2,5 mbar (min.)	6.5 mbar (min.)
Main injector Ø	1 10 mm	1.25 mm	0 72 mm
Dimensions (o/all)			
Height	1020 mm		
Width	480 mm		
Depth	360 mm		
Weight (net)	51 kg		
Weight (gross)	53 kg		
Electricity supply:	240V - 50 Hz		
Fuse rating:			
Mains	3 Amp. (main fuse)		
On P.C.B. in boiler	F2 Amp (Fast)		
Electrical input	160 Watt		
Domestic Hot Water flow:			
(30°C rise)	12,2 l/min.		
Minimum Domestic Hot Water Flow	2,5 l/min		
Maximum domestic cold water inlet pressure:	10,0 bar		
C.H. Safety valve pressure setting	3 bar		
C.H. Expansion vessel capacity	7 litre		
Min. heating circuit pressure	0,8 bar		
Max. heating circuit pressure	3.0 bar		
Boiler water capacity:			
Heating	1.5 litre		
Domestic hot water	0.5 litre		
Pipe connections:			
Gas	1/2 in.		
Domestic cold water inlet	1/2 in.		
Domestic cold water outlet	3/4 in		
Central heating flow	3/4 in		
Central heating return	1/2 in.		
Pressure relief valve drain			
Min. installation clearances Sides:			
Left hand	20 mm		
Right hand	20 mm		
Front	50 mm (plus access for service)		
Min. height from worktop to base	500 mm		

Appliance category
II_2HL_3
Boiler suitable for
G20
G25
G31

Appliance type
C13 - C33

C13 = Room sealed appliance with horizontal air intake and flue outlet

C33 = Room sealed appliance with vertical air intake and flue outlet

Flue System type XX - XY

XX = Fan in flue gases Flue gases surrounded by air.

XY = Fan in flue gases. Flue gases not surrounded by air.

NOTE: UK = G20

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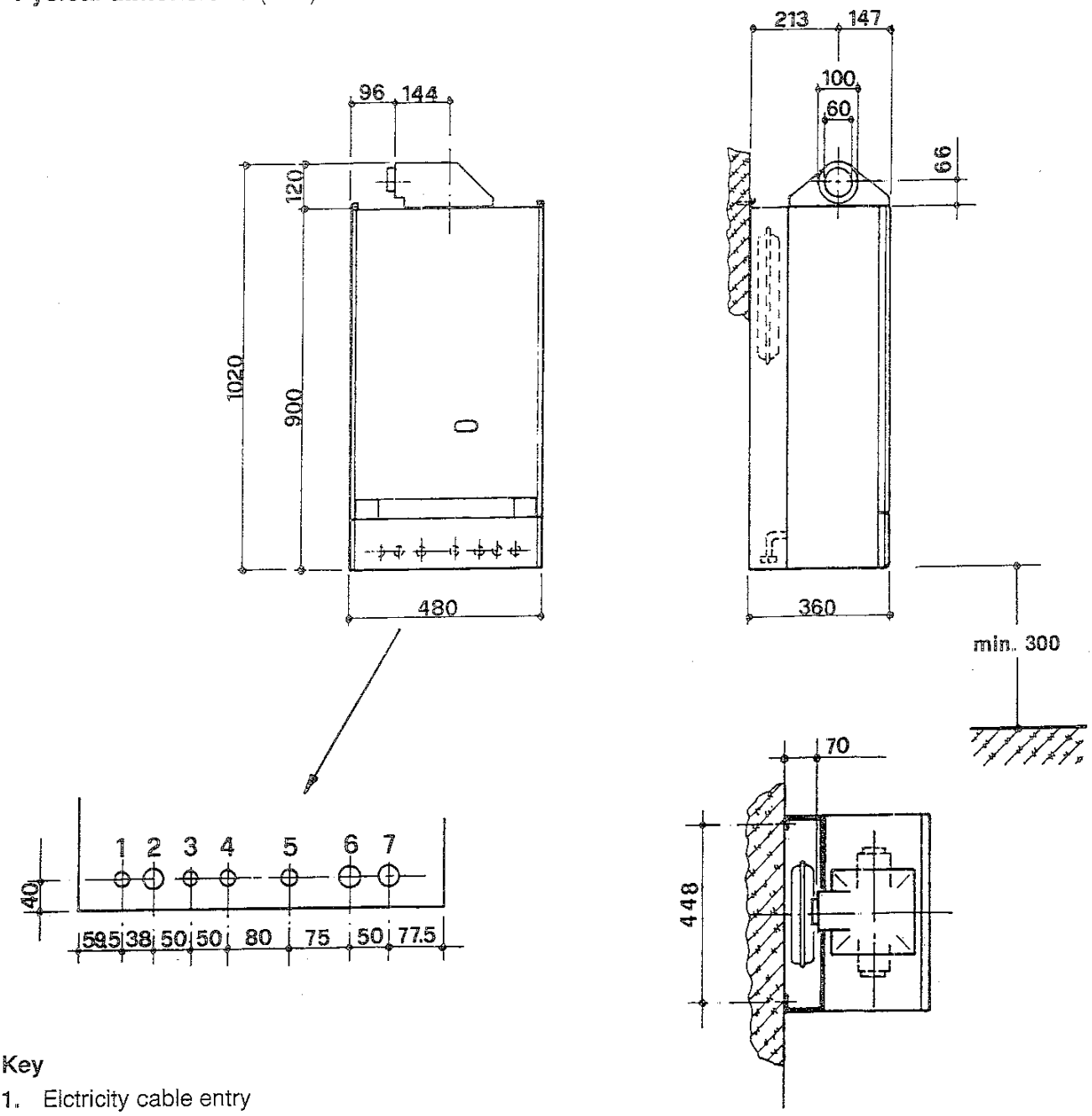
Pysical dimensions (mm)



Key

1. Elctricity 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

Fig. 1

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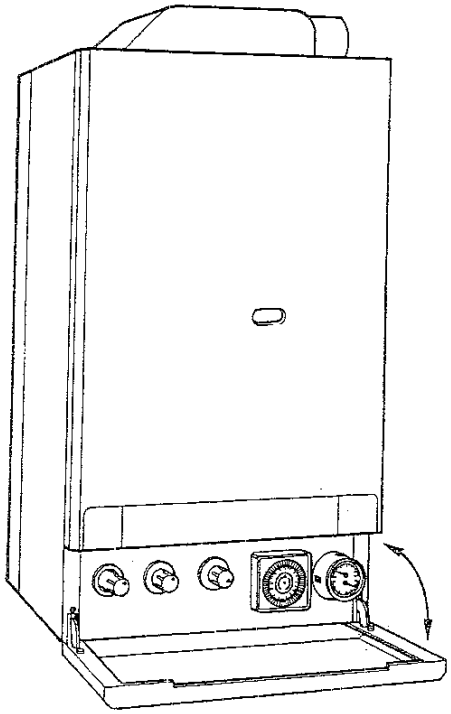
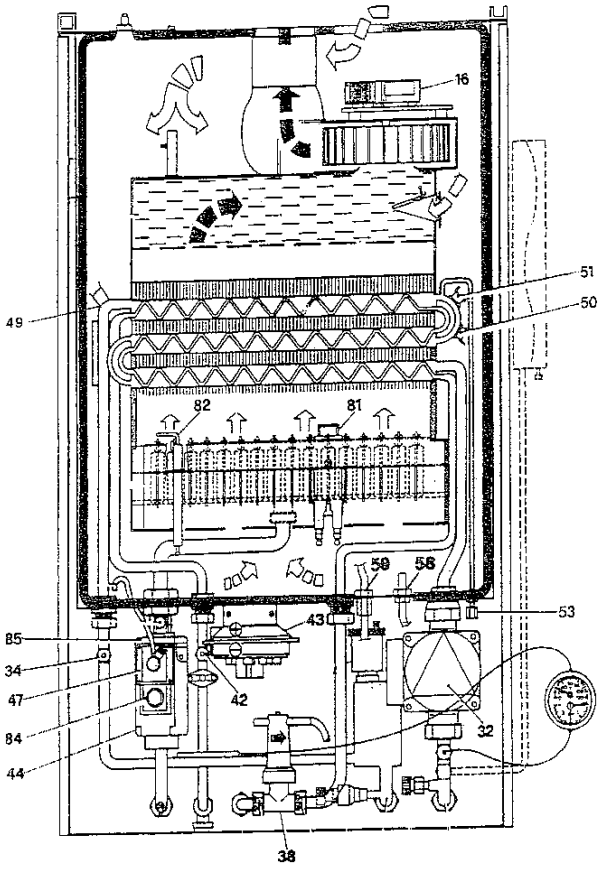
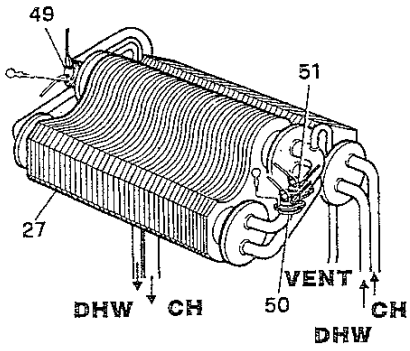
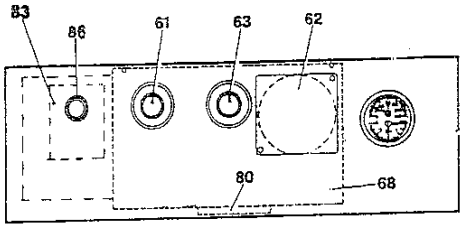
FERROLI COMBI 100 FF

Important components









On control panel **6**

51 C.H./D.H.W. selector switch
52 Time clock predisposition (not fitted)
53 C.H. boiler thermostat
54 C.H. temperature/pressure gauges

Inside the boiler

16 Fan
27 Copper heat exchanger for C.H. + D.H.W.
32 Central heating pump
38 Cold water flow switch
44 Automatic gas valve
68 Control box with P.C.B.
80 220/240 V + room stat terminal block
81 Spark electrode
82 Flame sensing electrode
83 Automatic ignition control panel
86-129 Automatic control reset knob

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General Description

The Combi 100 FF is wall mounted, room sealed, fan assisted combination boiler for central heating and domestic hot water. The boiler is of light weight construction and the unit provides central heating and domestic hot water from an integrally designed double heat exchanger The appliance is suitable for sealed systems only, and is not suitable for external installation. An expansion vessel is incorporated. The wall mounting jig contains connections for the water and gas supplies. This can be fitted to the wall and provides all the necessary gas and water connections prior to the boiler being attached (the jig assembly is optional).

Important details

3 The flue can either be left hand, right hand or rear. There are two flue longths available and they are 0,75 metre (for wall thickness up to 565 mm), 2 metres (for wall thickness up to 1815 mm).

16 The fan supplies the outside air into the room-sealed compartment of the boiler and pushes the products of combustion to the flue terminal. Without heat demand the fan runs at low speed to avoid pilot flame failure and condensation problems within the unit.

22 Stainless Steel gas burner for the complete and safe combustion of Natural Gas (and on request L.P G.).

27 Copper heat exchanger for C.H. and D.H.W. The central heating water and domestic water are heated up directly by the gas flame (in separated circuits of course). This system provides quick response (instantaneous), avoids heat losses and makes heating and domestic hot water completely independent.

31 Air pressure control damper. Bypasses the surplus of air which is not necessary for combustion to the flue outlet. This system keeps the combustion at a constant high efficiency, independent on flue length, wind influence and fan speed.

32 Central heating pump with 3 speed switch, perfectly adaptable to the nature of the central heating system. This avoids necessary electrical power consumption and noise problems. The pump is switched ON/OFF by the time clock (if fitted) and/or a 24 Volt room thermostat. The pump circuit also has a 6 minute over/run time.

38 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 litres/minute) the central heating pump is switched off, making available the maximum output of the gas burner for domestic hot water.

43 Air pressure switch which checks the air pressure, necessary for safe and complete combustion.

44 Combination gas valve, providing on/off and modulating control of the gas burner.

51 Frost thermostat to protect the boiler in winter conditions This thermostat activates the boiler as soon as the heat exchanger temperature is too low, regardless of position of the controls.

68 Control box with printed circuit board (P.C.B.). The central heating and the domestic hot water tem-perature is controlled by the Honeywell Modureg gas valve (44) in conjunction with the P.C.B. and the two sensor for C.H. (34) and D.H.W. (42). The C.H. temperature can be set with the C.H. boiler stat (63). The D.H.W. temperature is factory set on the P.C.B. There is a limit thermostat (50) on the central heating circuit which operates/at 85°C. There is also on overheat cut/off thermostat (49) which will shut the boiler and pilot down completely at 100°C. 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!

61 Selector switch with 4 positions:

- Off
- Domestic hot water only
- Domestic hot water and central heating
- Domestic hot water and central heating continuous

83 Automatic ignition control panel

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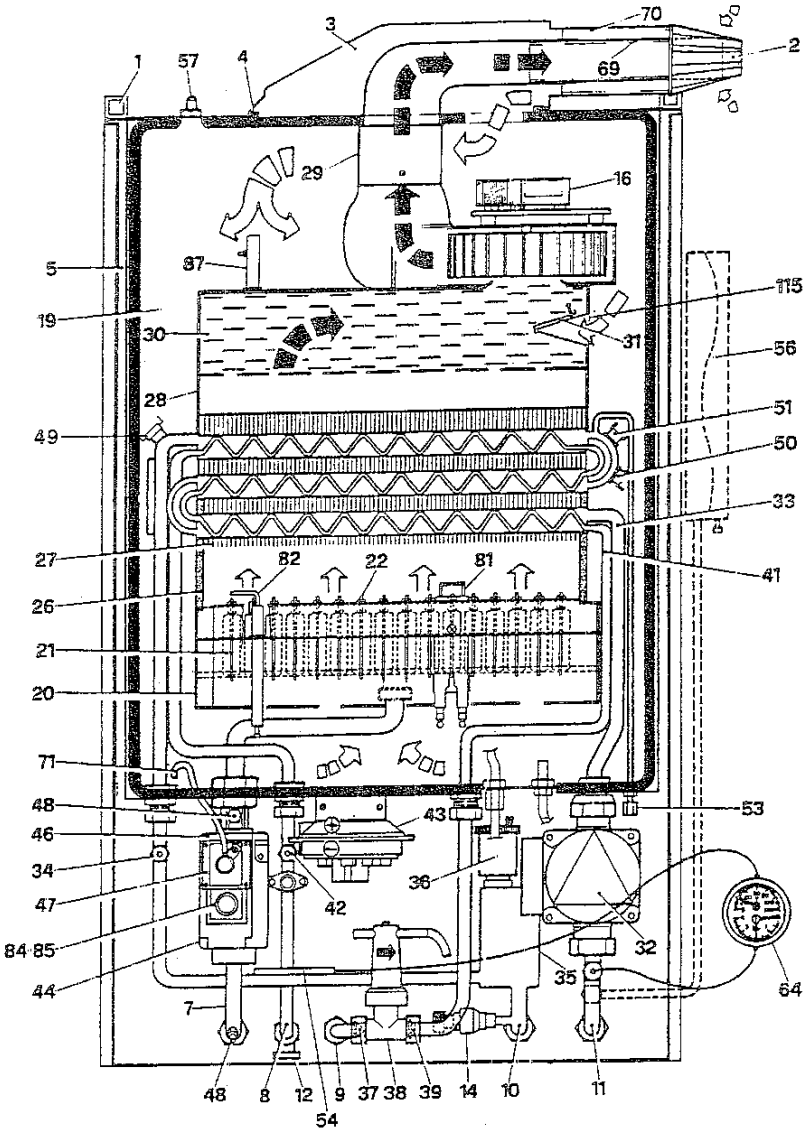
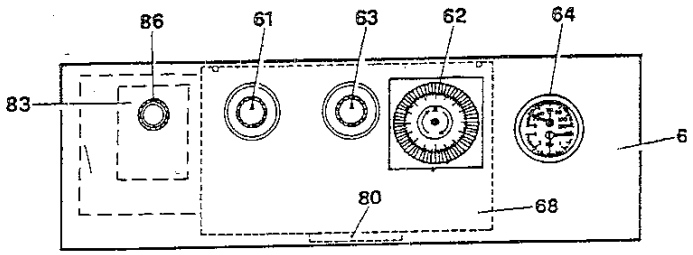
FERROLI COMBI 100 FF

Boiler Flow Diagram





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FERROLI COMBI 100 FF

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

16. Fan

19. Combustion - heat exchanging compartment
20. Burner assembly
21. Main injector
22. Burner

26. Combustion chamber insulation
27. Copper heat exchanger for C.H. + D.H.W.
29. Internal flue exit
30. Flue/surplusair 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

NOTE:

Air inlet to 31 air pressure control damper is covered with a plate

36. Automatic air vent
37. Cold water inlet filter
38. Cold water flow switch
39. Cold water flow limiter
41. D.H.W. waterway of the heat exchanger
42. D.H.W. temperature sensor
43. Air pressure switch
44. Combination gas valve

46. Operator gas valve
47. Modulating regulator (Modureg) gas valve
48. Burner pressure test point
49. Overheat cut-off thermostat 100°C
50. Central heating limit thermostat 88°C
51. Central heating frost thermostat
53. Heat exchanger venting point
54. Temperature sensing bulb
56. Expansion vessel
57. Fan air inlet pressure test point

61. C.H. selector switch
62. Time clock
63. C.H. boiler thermostat

64. C.H. temperature/pressure gauges
28. Flue collector from heat exchanger
68. Control box with P.C.B.
69. Inner flue duct
70. Outer air intake duct
71. Modulating balance tube

80. 220/240 V + room stat terminal block
81. Spark electrode
82. Ionisation electrode
83. Automatic ignition control panel
84. 1. gas valve operator 220 V
85. 2. gas valve operator 220 V
86. Automatic control reset knob
87. Venturi test point

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Domestic Hot Water Performance

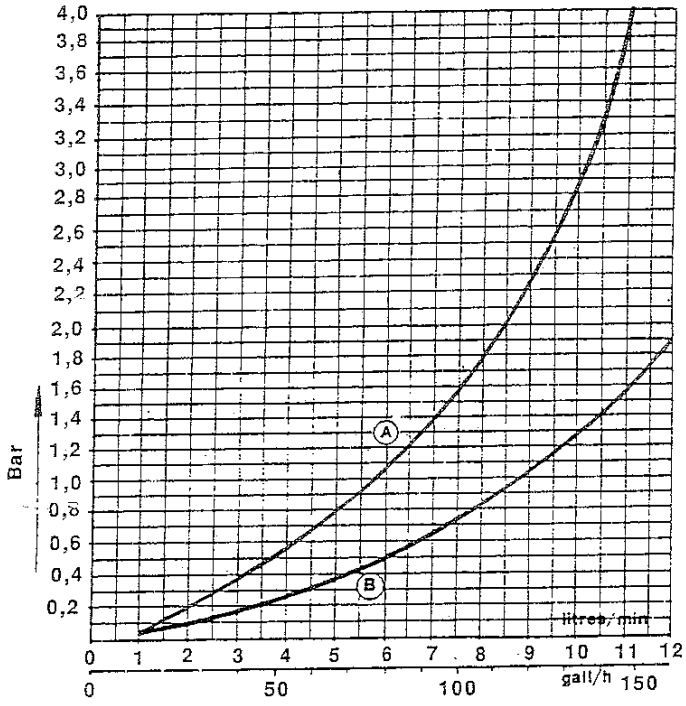

Fig. 1

Fig. 1 - D.H.W. Pressure Drop VS. flow

A = Standard with cold water Flow Restricter 10 l/min

B = Cold Water Flow Restricter Removed

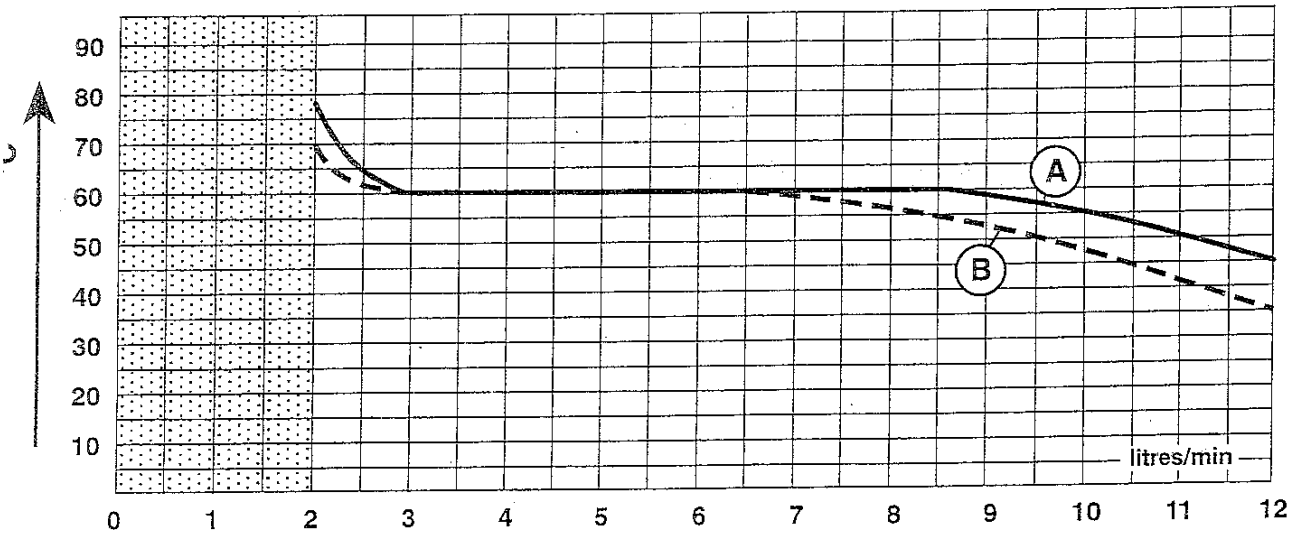

Fig. 2 - D.H.W. temperature VS. flow

A = Cold Water 15°C

B = Cold Water 5°C

Fig. 2

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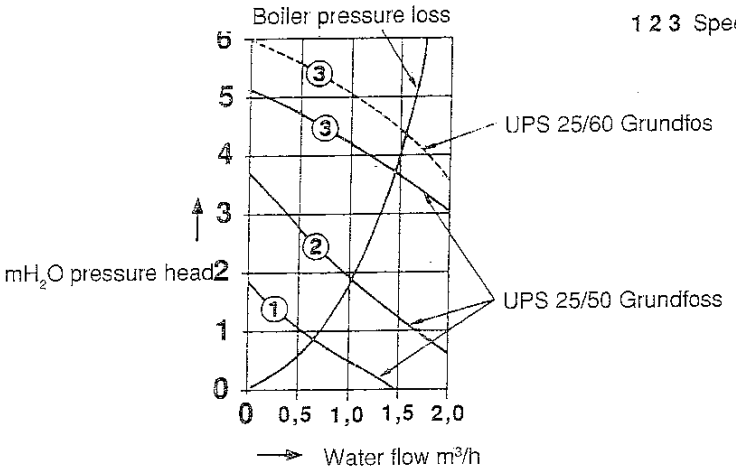
Pump performance curve + Bypass C.H.



NOTES:

Additional expansion vessel (if required), must be fitted to Central Heating Return Inlet (fig. 2).

A bypass as far as possible from boiler is necessary if all radiators have Thermostatic Radiator Valves (fig. 2).

Check automatic air vent (fig. 3).

Always check if shaft of pump is not locked.

Set C.H. pressure to minimum of 1,0 bar (by preference to 1,5 bar).

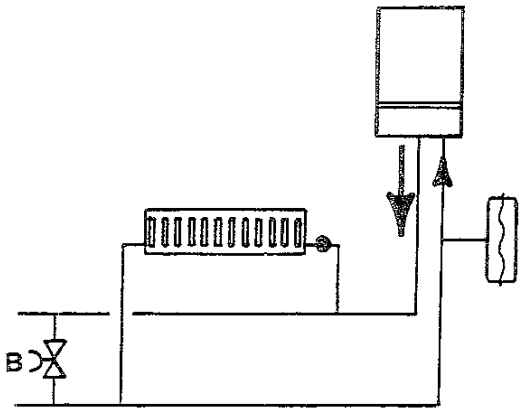


Fig 2

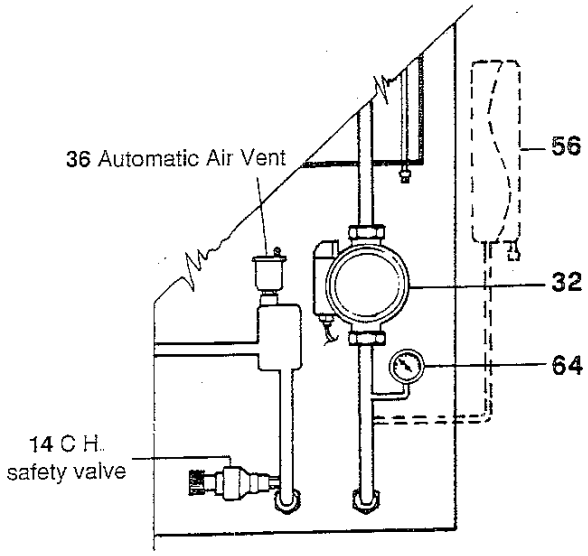


Fig 3

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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 Regualtions, 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 building 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 soought from the Local Gas Region of British Gas Pic.

Location of Boiler

The installation of the boiler 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 pipes 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 drawn 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 drainpipes 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. N° C2) should be screwed to the wall centrally over the terminal, when the distance is les 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 vents are required in the cupboard or compartment, one at high level and one at low level, either direct to the outside air or 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).

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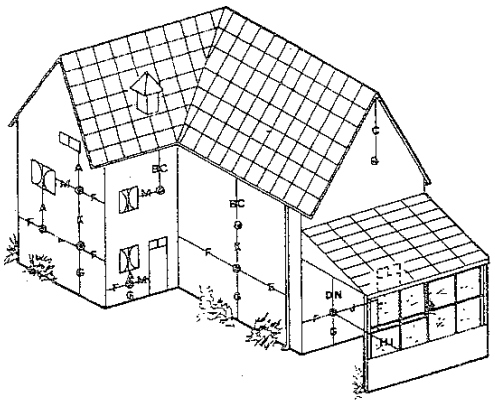
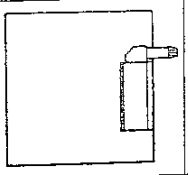
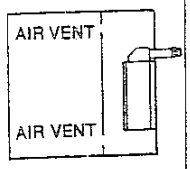
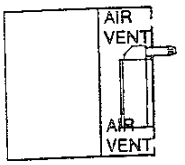
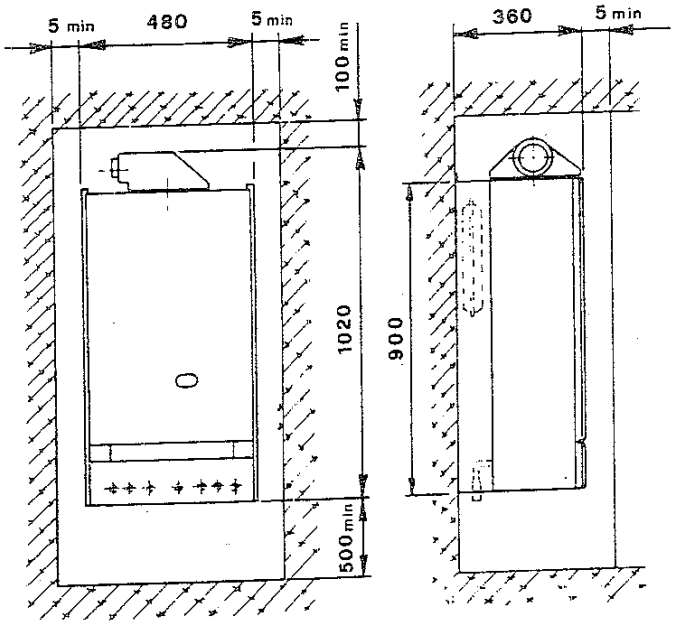
Terminal Position



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)

Minimum Clearance mm



Notes - Access to the front of the boiler must be available for maintenance (min. 600 mm).
If side outlet flue is to be used, a clearance of 75 mm will be needed on the flue outlet side of the boiler.

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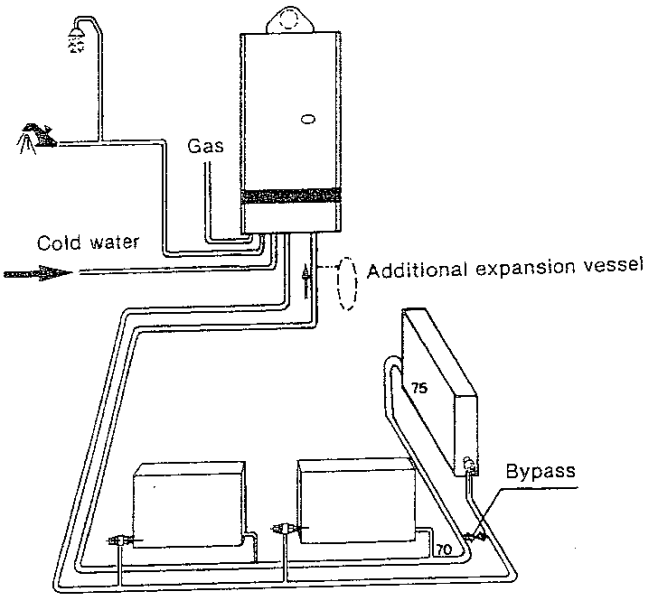
FERROLI COMBI 100 FF

Typical Installation of Pipe Work, Bypass and fitting additional expansion vessel C.H.



Important - Fit bypass as far as possible from boiler if thermostat radiator valves are fitted.

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

SIZING OF ADDITIONAL EXPANSION VESSELS:

Deduct from the value given in the table the 7 litre supplied.

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	96.4	33.2	72 1	57.9
200	28.	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

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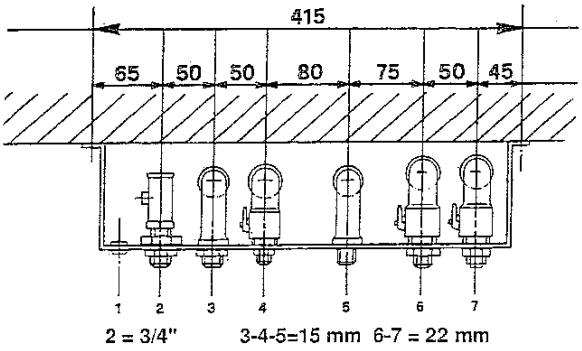
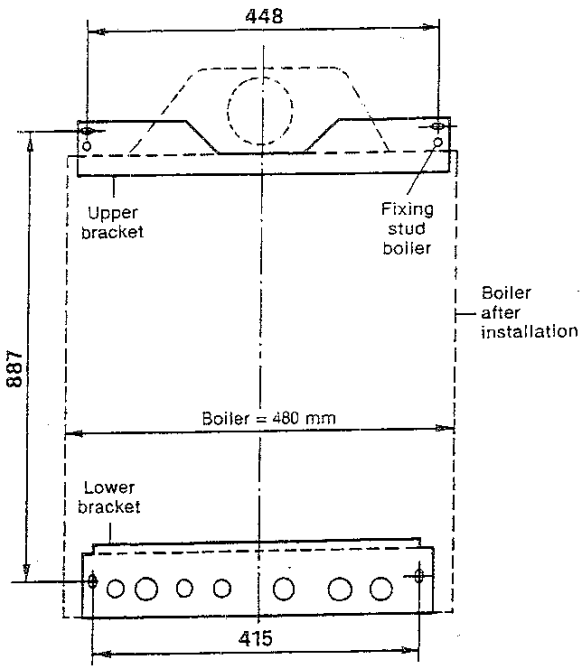
Jig assembly (optional)

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

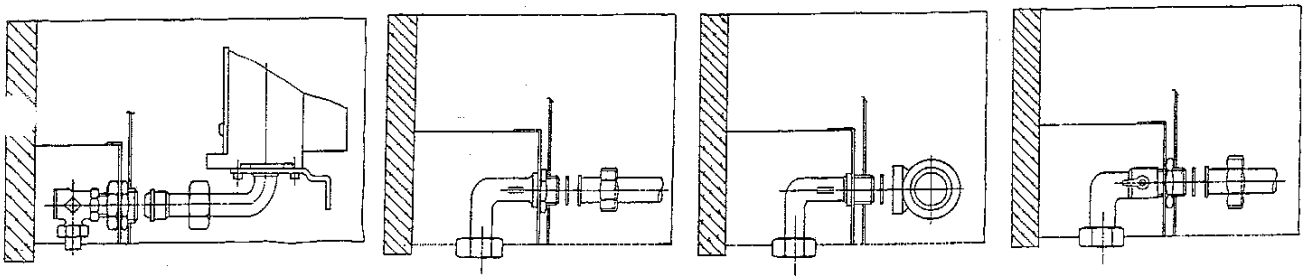




1 Electrical cable entry
2 Gas supply
3 Domestic Hot Water outlet
4 Domestic Cold Water inlet
5 Outlet Central Heating safety valve
6 Central Heating flow outlet
7 Central Heating return inlet

note - Jig bracket is optional, only valves are supplied.

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 1/2"
6 = Central Heating flow outlet 22 mm
7 = Central Heating return inlet 22 mm

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

Note - The centrtal heating safety valve (5) should be piped 15 mm to discharge safely outside the property.

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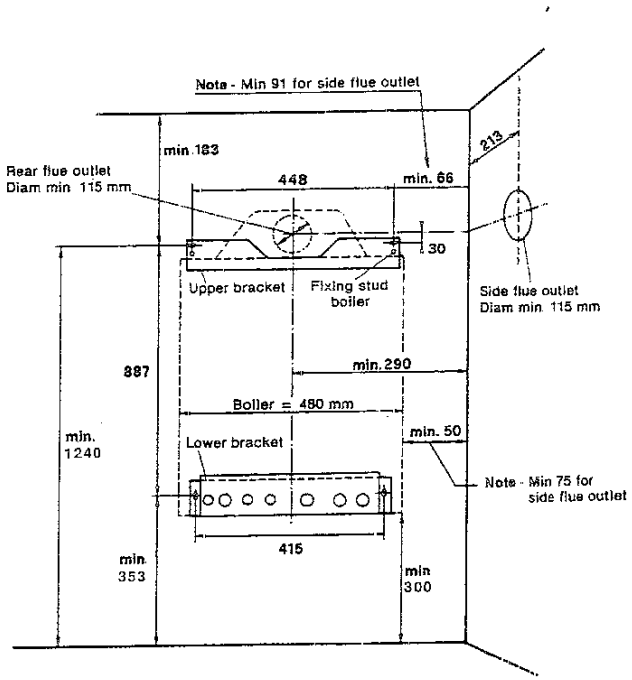
Important Note - Always use two spanners to prevent twisting of soft copper pipework.

Flush out the water systems.

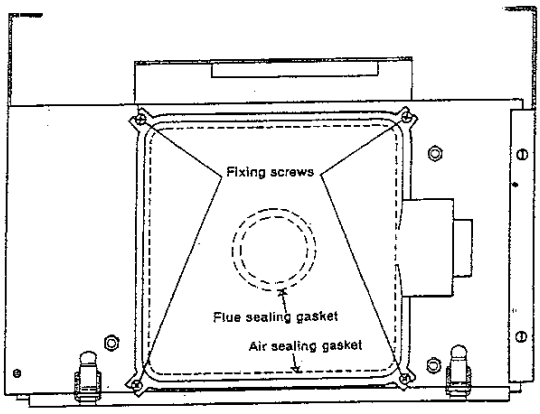
Note - The maximum inlet cold water pressure must not exceed 10 bar (145 lbf/in^3) and a water governor or a pressure reducing valve will be required if the pressure is in excess of this figure.

Ensure all pipework is adequately supported.

Drilling template



Flue Turret



TOP VIEW BOILER SIDE OUTLET

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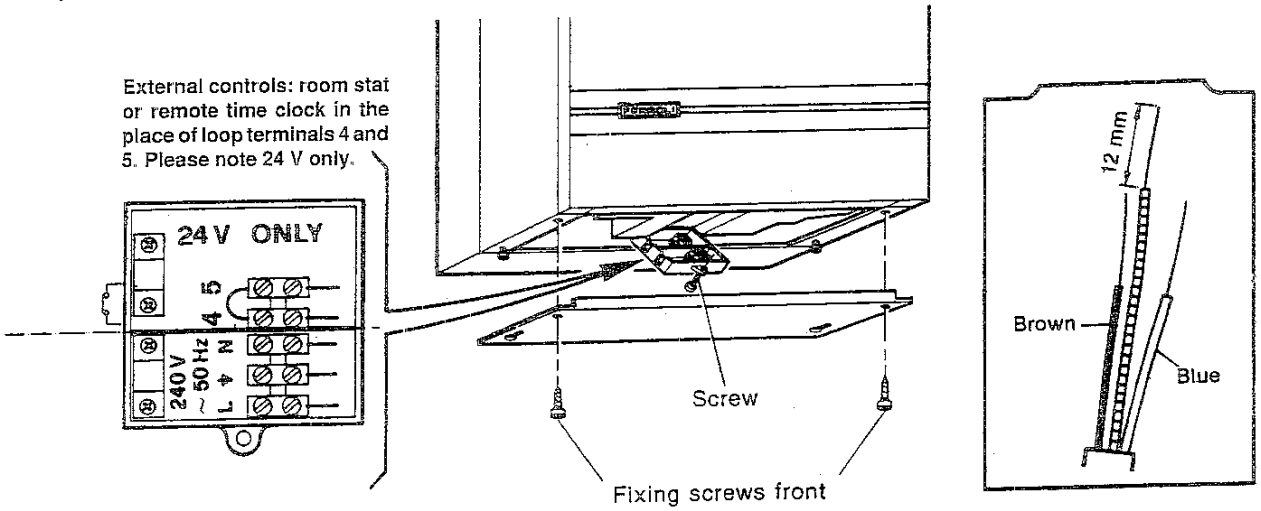
Electricity supply and external controls

Electrical installation must be carried out by a competent electrician. The appliance is to be connected to a 220/240 V 50 Hz supply. The supply fuse rating is 3A. The terminals are accessible after removing the white base plate and single screw securing the terminal cover.



PROCEDURE

The supply cable must not be no less than 0 75 mm (24 x 0.2 mm)

The earth conductor must be cut longer than the live and neutral.

Connect the Supply Cable to the terminal block marked 2201240 V 50 Hz, L, N, the supply cable is to be connected as follows:

- Connect the brown wire to the L (live) terminal.
- The blue wire to the N (neutral) terminal.
- The green/yellow wire to the (earth) terminal.

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 BS1363. 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, inside the electrical control box. In addition, there is one in this manual (page 34 - 36)

Attention is drawn to the requirements of the current regulations and the electrical provisions of the Building regulations.

ROOM THERMOSTAT (or remote time clock connection)

Please note that the room thermostat connection block is 24 V.

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

If using a remote 220/240 Volt time clock ensure that the motor 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

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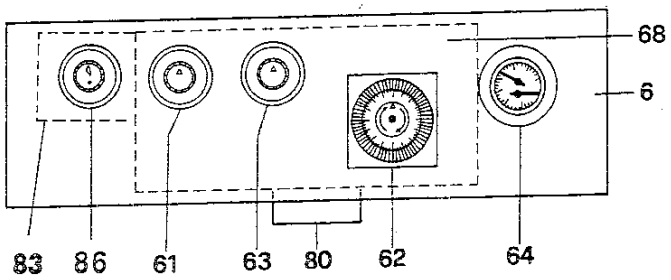
General Explanation on Operation



Key

61 C.H./D.H.W. selector switch
62 Time clock predisposition
63 C.H. boiler thermostat
64 C.H. temperature/pressure gauges
68 Control box with P.C.B.
80 Five pole terminal block
83 Automatic ignition control panel
86 Automatic control reset knob

General Explanation on Operation

1.0 Selector switch 61 In position "Zero".
In this position the main burner remain stops.

2.0 Selector Switch 61 In position (Domestic Hot Water Only).

2.1 **Hot water taps closed (situation after at least 10 minutes).**
- Central Heating pump is stopped.
- The frost thermostat in the boiler can activate the boiler.

2.2 **Hot Water tap open (water flow of min. 0,5 Gallon/min. 2,5 Litres/min.).**
- At opening of a hot water tap, the burner will light
- Boiler Is controlled to keep the hot water at a on the P.C.B. factory set temperature of 55°C (if water flow through boiler is not too high see performance curve).
- Time Clock and Room thermostat (if fitted) will not activate the boiler.

3.0 Selector switch 61 In position Domestic Hot Water and Central Heating (Timed).

3.1 **Hot water taps closed**

3.1.1 Central Heating pump starts on command of the time clock **62** and room thermostat (if fitted) Boiler temperature is controlled In a modulating way by boiler thermostat 63

3.1.2 If contact In time clock **62** or room thermostat breaks:
- Burner stops immediately
- Central Heating pump stops after about 6 minutes (pump overrun)

3.2 **Hot water tap open (water flow min. 0,5 Gallon/min. 2,5 Litres/min.).**
- Central heating pump stops immediately (priority to domestic hot water .
- Burner is controlled to keep the hot water at a Internally factory set temperature of 55°C (if water flow through boiler is not high, see performance curve).

I.0 Selector-switch 61 in position "Central heating Continuous".
burner will start even without demand for heat from clock.

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

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Commissioning and General Check Out

1.0 General Check before lighting.

1.1 Isolating valves in jig bracket open.
1.2 Central Heating system filled to min. 1,0 bar.
1.3 Central Heating pump free.
1.4 Heat exchanger vented.
1.5 Water flow D.H.W. min. 2,5 Litres/min. (0,5 Gallon/min.).
1.6 C.H. radiators vented.
1.7 Bypass C.H. open.
1.8 Gas supply purged.
1.9 Cap automatic air vent unscrewed.

2.0 To operate Boiler.

2.1 Before operating check central heating system is pressurised (5) to minimum 1 bar
2.2 Ensure electric, gas and water are turned on.
2.3 Select heating continuous/hot water on selector switch (2).
2.4 Set any room thermostat to a high setting.
2.5 Set boiler thermostat (4) to maximum.
2.6 Fan in boiler will commence to run.
2.7 Burner will automatically ignite
2.8 If burner is not ignited within 10 seconds a small lamp in the reset knob (1) will light
2.9 Wait 10 seconds and press reset knob.
2.10 Boiler will begin firing sequence.
2.11 Set selector switch in position required

3.0 General check.

3.1 Close hot water tap (if open).
3.2 Selector switch boiler in position:
Hot water and central heating.
Clock in on position.
Room stat at maximum.
Boiler stat at higher position.
3.3 After a waiting time of 3 min fan runs at full speed.
Circulating pump will run.
Main burner lights.
3.4 Boiler stat at min. position.
Main burner extinguishes.
C.H. pump keeps running.
3.5 Hot water tap open.
Water flow minimum 2,5 Liters/min.
After 2 sec. fan runs at full speed.
C.H. pump stops.
Main burner lights.
3.6 Hot water tap closed.
Main burner extinguishes.
3.7 Room stat at minimum or clock off

4.0 Adjustment C.H.

4.1 Adjust Central Heating Output of boiler for a according C.H installation requirement
see page: C.H. output adjustment.
Fill in the C.H. installation output on the label at the inside of the control panel.
This assist when servicing.

5.0 Explain and demonstrate the lighting and shutting down procedure to the user.

6.0 It is advisable to flush and refill the Central Heating system 1 day after the complete system has functioned at max. temperature.

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C.H. output adjustment

C.H. output is factory set at max. output.

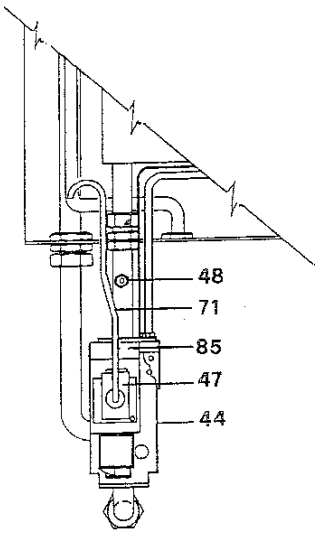
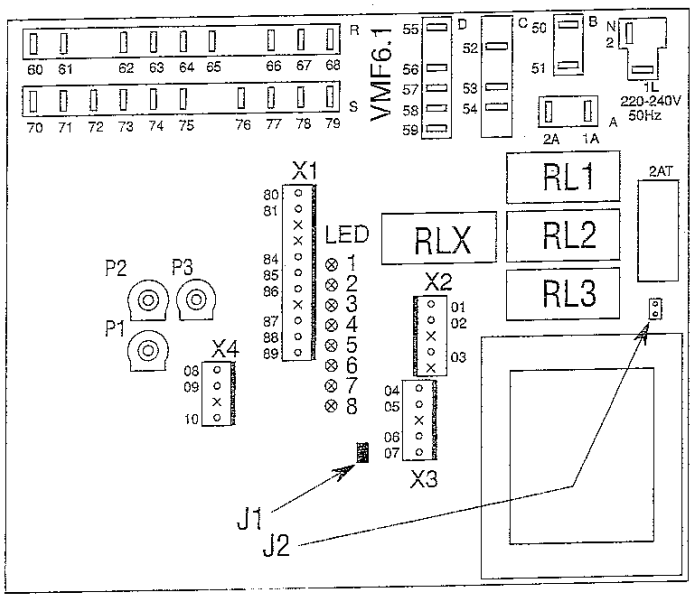
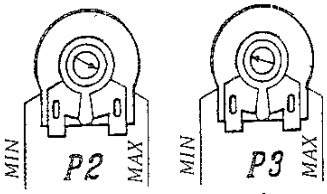
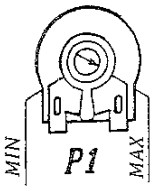


Fig 1 - Gas valve







Jumper J1 fitted
Jumper J2 not fitted

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

44 - Combination gas valve
47 - Modulating regulator (Modureg)
48 - Burner pressure test point
71 - Modulating balance tube
85 - Operator gas valve (on/off)

Operations

1. Check if all hot water taps are closed and gas supply cock is closed.
2. Set selector switch on "D.H.W. + C.H. continuous" and C.H. Boiler thermostat to max. and switch extern! controls on!
3. A waiting time of max. 3 minutes before fan will run is possible!
4. Boiler starts on C.H., fan will run, cool down C.H system.
5. Connect a suitable pressure gauge to burner pressure test point **48**.
6. **To Note** - Pressure on pressure gauges = reference air pressure.
7. Open gas cock and push flame failure reset knob.§
8. 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.
9. Set outlet pressure of gas valve **44** with potentiometer P1 on P.C.B. in control box.
   Outlet pressure = Burner pressure + Reference air pressure (tested in step 5).
10. Fill in C.H. output on label at inside of control panel. This assist when servicing

Note - On L.P.G. min. pressure is 5.0 mbar (2.0 inch WG). See page 24

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Burner Perssure C.H.

- Natural gas
- L.P.G. (Propane)

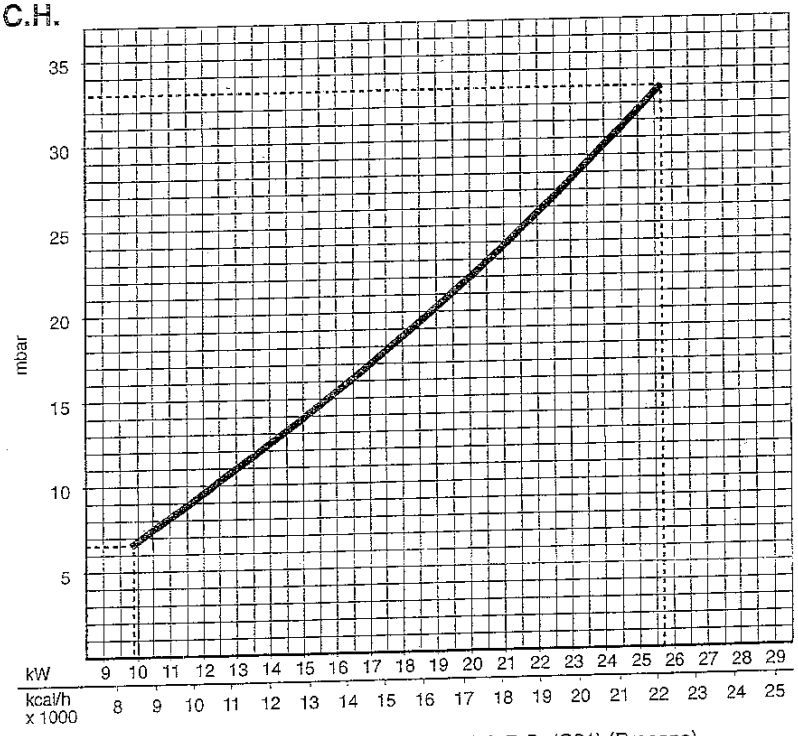

Fig. 4 - Burner pressure VS C.H. Load with L.P.G. (G31) (Propane)

Note:
UK = G20

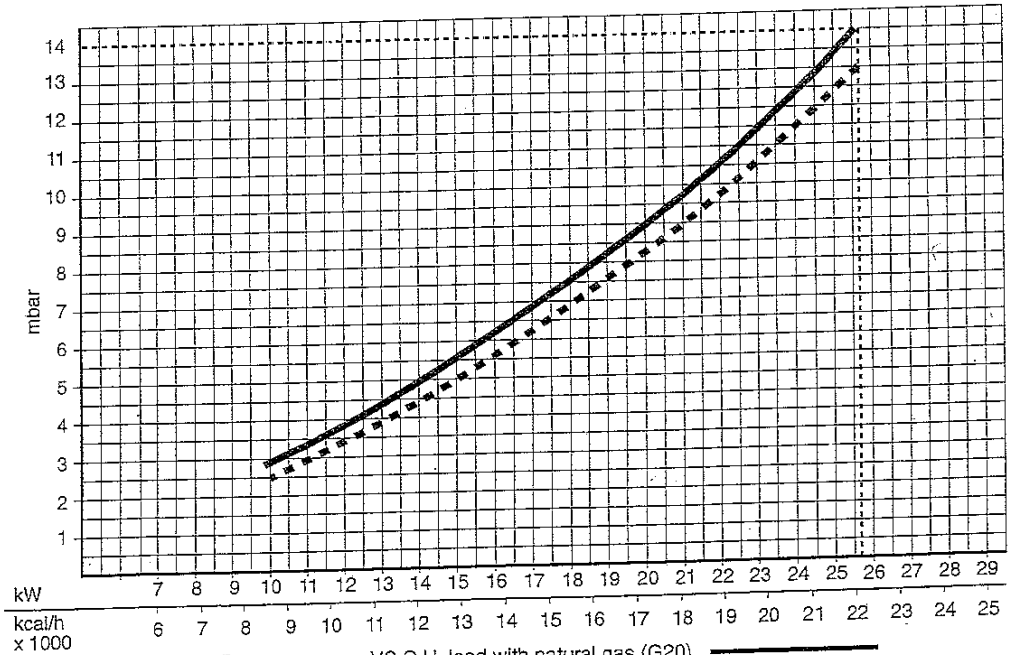

Fig. 5 - Burner pressure VS C.H. load with natural gas (G20) ——
Burner pressure VS C.H. load with natural gas (G25) ■ ■ ■ ■ ■ ■ ■ ■

NOTE - For gases not mentioned please ask for details FERROLI technical Dpt.

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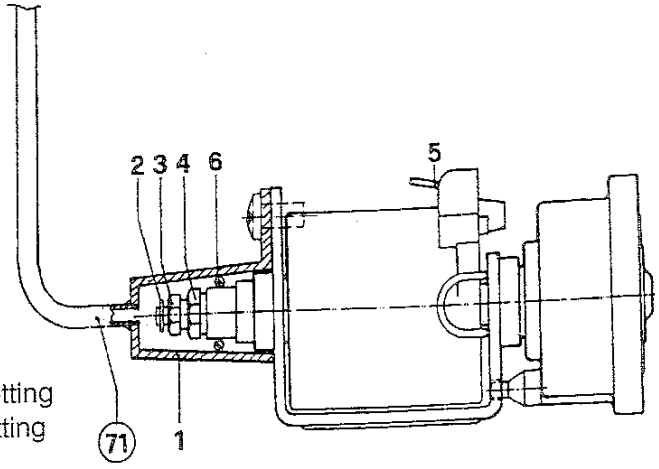
Modulating regulator (Modureg) gas valve



Key

1. Cap (with tube 71)
2. Shaft
3. Adjustment screw for maximum pressure setting
4. Adjustment screw for minimum pressure setting
5. 6,3 mm AMP terminals
6. "O" ring

71. Modulating balance tube

If necessary replace complete MODUREG

Pressure setting	Minimum		Maximum	
	mbar	inch WG	mbar	inch WG
G 20 Natural Gas	2.8	1.1	14.0	5.6
G31 L.P.G.	6,5	2,5	33,0	13.1

ADJUSTMENTS and CHECK-OUT

Important

1. Adjustments should be made by qualified personal only.
2. Allow time for pressure to stabilize before making adjustments.
3. It is recommended that the Modureg is operated a few times to ensure correct setting.
4. Cap has to be removed before adjustment can be made.
5. The minimum pressure setting must first be adjusted to ensure that burner will safety light up, then the maximum pressure setting can be adjusted.
6. Any adjustment of minimum pressure setting influences maximum pressure setting.

ADJUSTING MINIMUM and MAXIMUM PRESSURE SETTINGS

1. Connect a suitable pressure gauge to burner pressure (test point).
2. Disconnect one electrical connection of Modureg.
3. Wait until minimum pressure is stable.
4. If minimum rate pressure needs adjustment then use a 9 mm wrench to turn the brass nut clock wise to increase or counter-clockwise to decrease pressure, until the desired minimum outlet pressure is obtained.
5. Replace cap.
6. Check several times if main burner lights easily and reliable at minimum pressure (with cap replaced).
7. Remove cap again.
8. Push top of the shaft gently downwards to the red nut and check pressure.
9. If maximum rate pressure needs adjustments then use a 7 mm wrench to turn the red nut clockwise to increase and counter-clockwise to decrease pressure.
10. Check minimum and maximum setting several times by releasing and pushing the top of shaft gently.
11. Replace cap.
12. If minimum and maximum pressures are set, wire Modureg into the circuit.

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System Operation

Let the boiler operate normally on central heating for about 30 minutes.
Vent radiators.
Vent heat exchanger.
Examine all pipework for leakage.
Turn on a D.H.W. tap and check that the C.H. pump stops running.
As the D.H.W. temperature reaches 60°C check the burner for modulation.

Handing over to the User

After completion of installation and commissioning of the system.

Explain and demonstrate the lighting and shutting down procedure.

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.

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.

Cleaning and Maintenance

The following operations must be performed only by qualified technicians.

Seasonal boiler and flue system checking

It is advised to submit the system at least once a year to the following controls.

The system water pressure when hot in operation has to be between 1 and 1.5 bar, if not it has to be brought inside the required level. The boiler safety and regulating controls have to work properly.

The burner and the copper heat exchanger have to be cleaned by mean of soft brushes, do not use cheminal products. The expansion tank has to be under pressure.

The gas and water circuits have to be tightened. The boiler flue have to be free of any obstruction and without any leaking. The gas flow pressure has to be in accordance to the technical data.

The circulating pump has to run freely.

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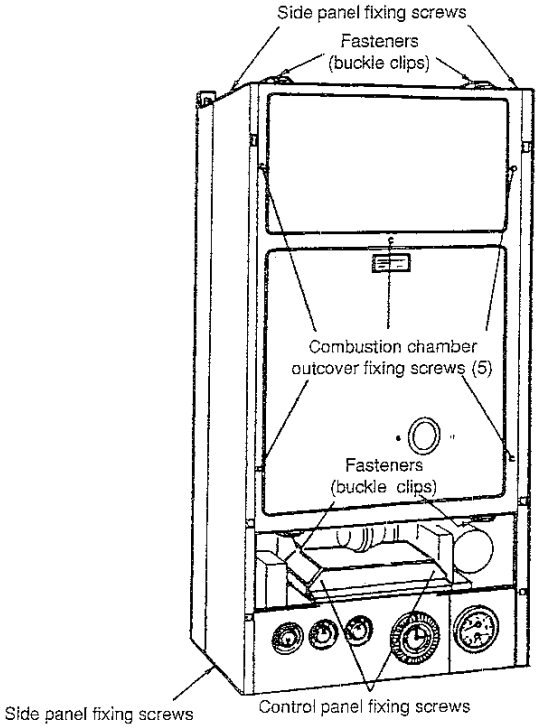
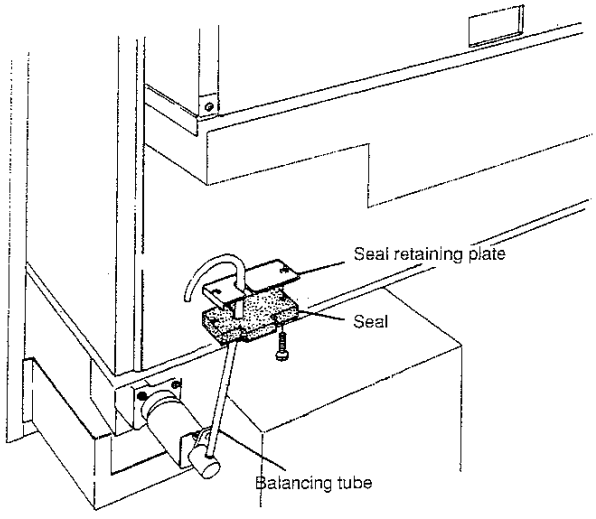
Details





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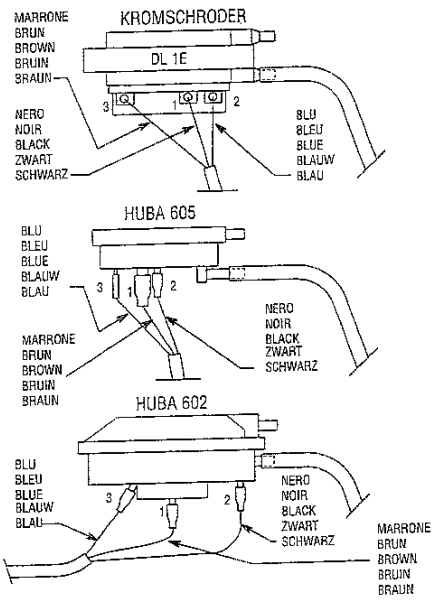
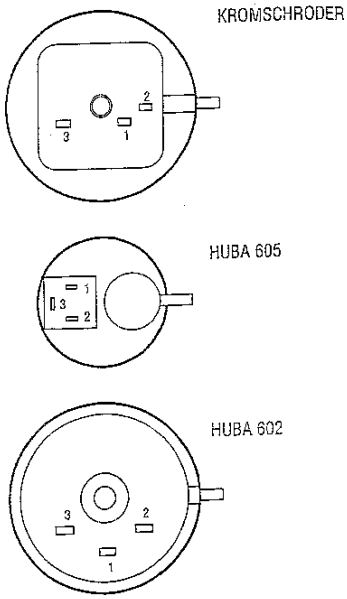
Wiring Diagram Components

43. Air pressure switch



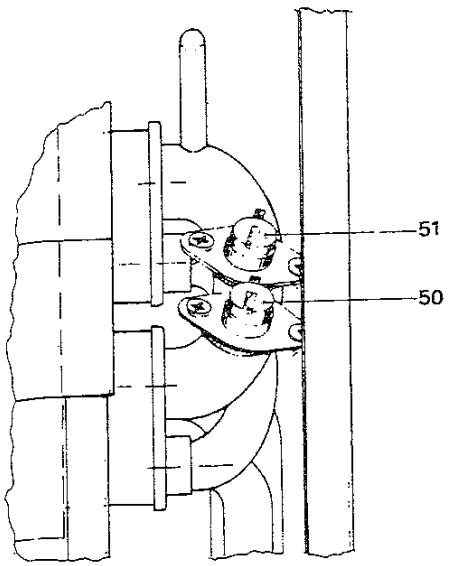


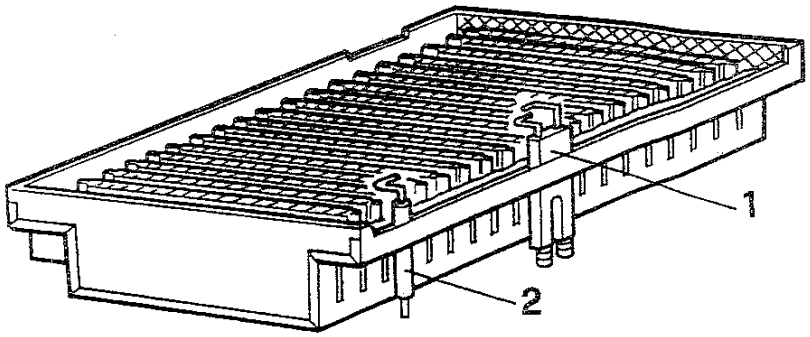
Details Thermostats

50. Heat exchanger limit thermostat (black cable)
51. Heat exchanger frost thermostat (white cable)

Burner

1. Sparkelectrode
2. Flame sensing electrode





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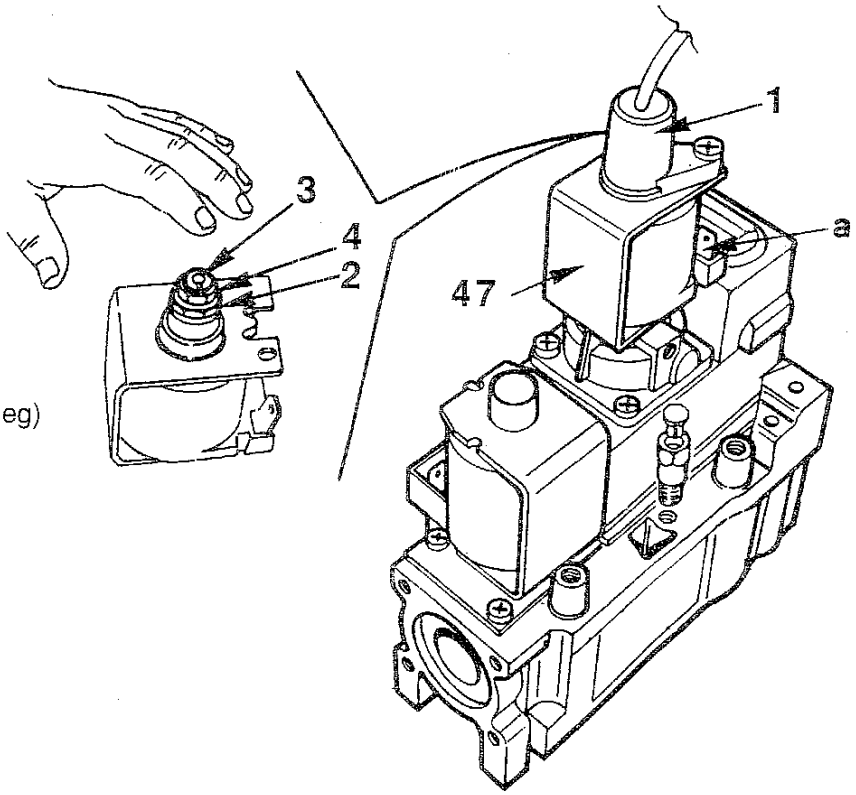
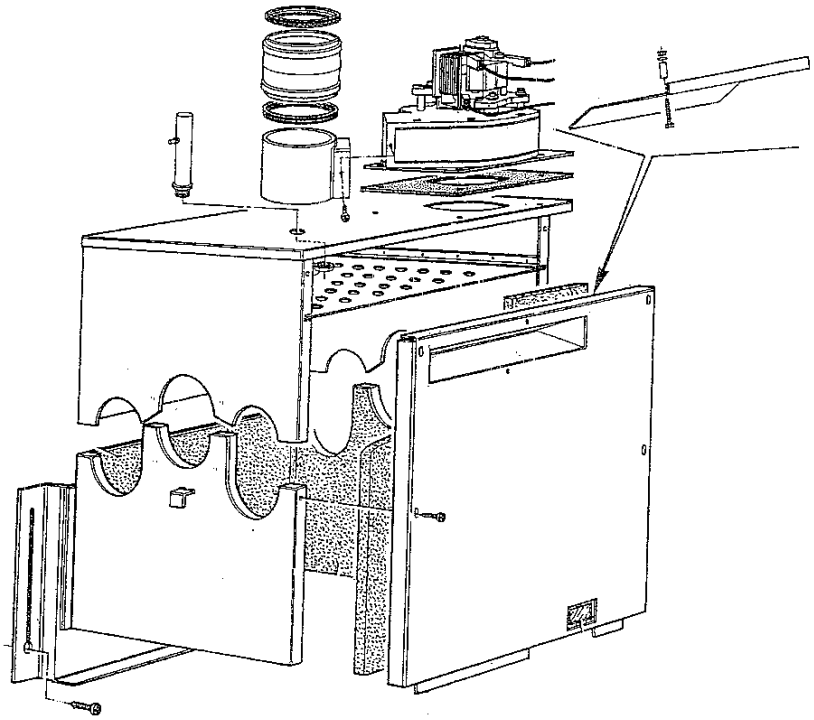
Details GAS Valve



Key
a. 6,3 mm AMP terminals
1. Cover
2. Min. burner pressure setting
3. Shaft
4. Max. burner pressure setting
47. Modulating regulator (Modureg)

Details Combustion Chamber



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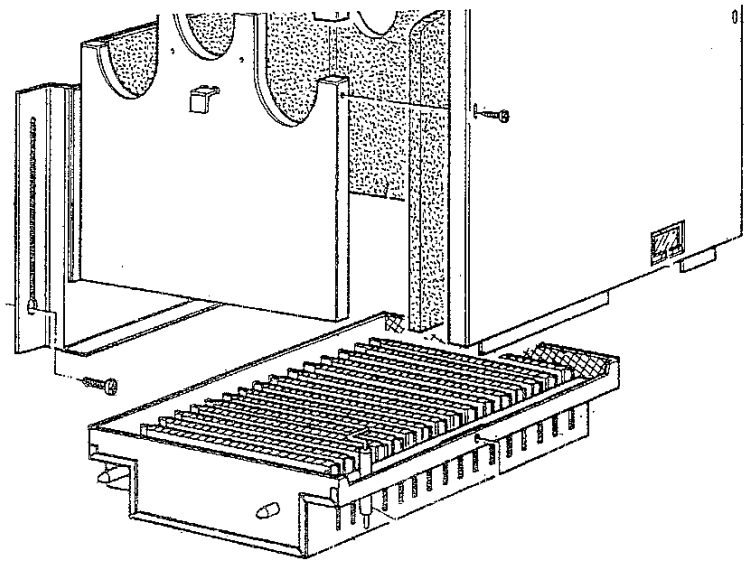
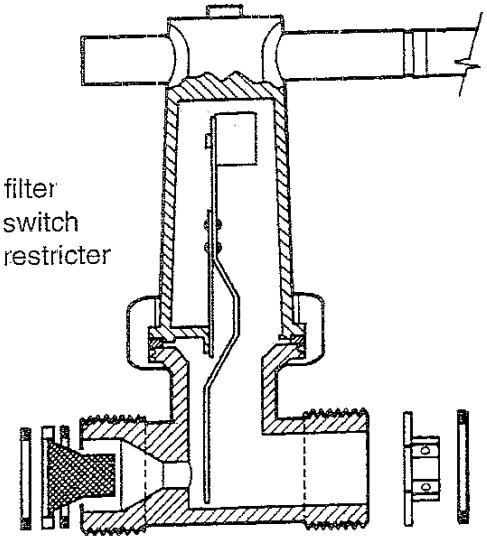
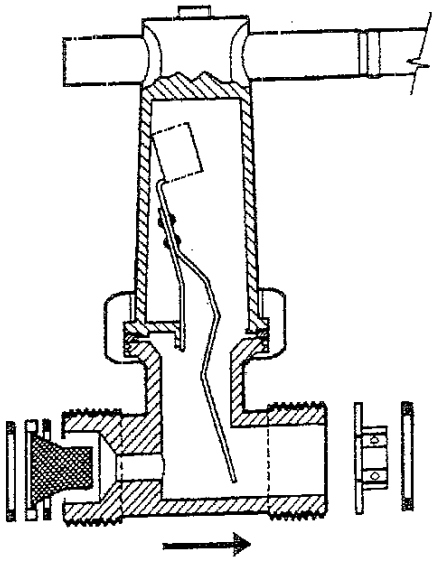


Details Domestic Hot Water Flow Switch (in Cold Water Inlet)

37. Cold water inlet filter
38. Cold water flow switch
39. Cold water flow restricter



without flow



with flow

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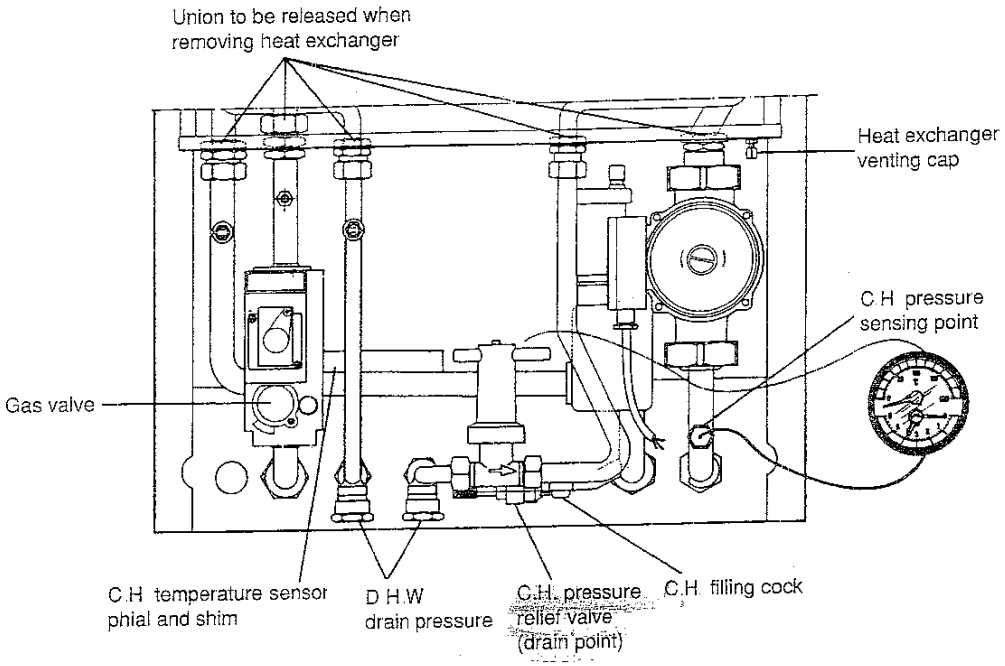
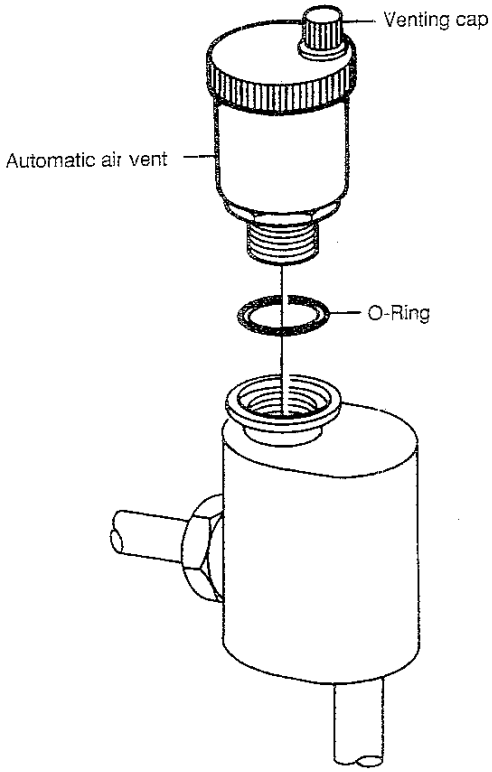
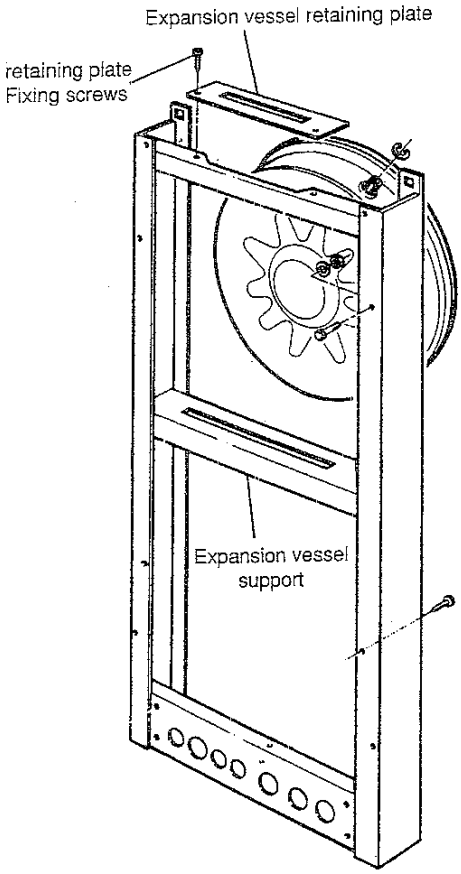
FERROLI COMBI 100 FF







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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 coil (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
2.2 Pump controlled by Relay 1.
2.3 Burner will be automatically ignited as soon as contact RL3 of relay 3 is energised.

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 off.
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 off).
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 If the high limit thermostat (heat exchanger) demand heat and the air pressure switch was switched in the safe position (67-66 closed) relay RL3 can be energised (20 sec. time delay relay RL3)

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»)

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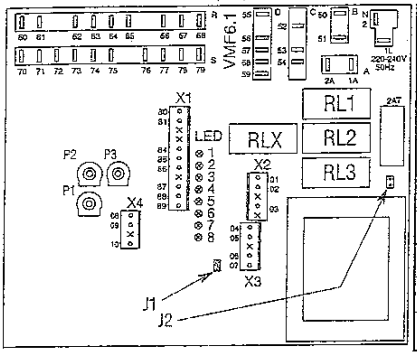
FERROLI COMBI 100 FF

General Notes - For use on the 100FF fitted with VMF6.1 Printed Circuit Board

*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. *Fuse on P.C.B.: 2 Amp.



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
4	green	Sensor (34) or (42) calling for heat
5	red	Central Heating waiting time, 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	Automatic ignition board (83) will be energised

Jumpers J1 - J2

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

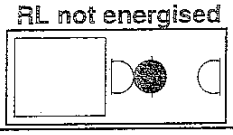
Resistance of Central Heating or Hot Water sensors (34) + (42)

10° C 890 ohm 60° C 1300 ohm
25° C 1000 ohm

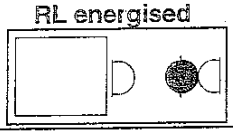
RELAYS

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	Room stat (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 (61) 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) at low speed remove jumper J2
7	1	0	- fan (16) not running at full speed or
			- air flow too low:
			- air pressure switch (43) faulty
8	1	0	- CH limit thermostat (50) open circuit (pump will run)

D — IGNITION OF BURNER (AUTOMATIC IGNITION)

1 Fan (16) should run at full speed (open hot tap or set controls so boiler is calling for heat).
2 Check first A, B and C above (LED 8 is ON?)
3 Check if Jumper J1 is fitted
4 Relay RL3 will energise if not replace P.C.B.
5 Check spark and position of spark electrode (81)
6 Check position of flame sensing electrode (82)
7 Check burner gas pressure during ignition

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

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No electrical mains voltage - Temperature too low (alla mechanical thermostats closed)
1.1 The electrical systems can be devided on 4 main areas
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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 coil (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
2.2 Pump controlled by Relay 1
2.3 Burner will be automatically ignited as soon as contact RL3 of relay 3 is energised.

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 off.
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 off).
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 If the high limit thermostat (heat exchanger) demand heat and the air pressure switch was switched in the safe position (67-66 closed) relay RL3 can be energised (20 sec. time delay relay RL3).

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»).

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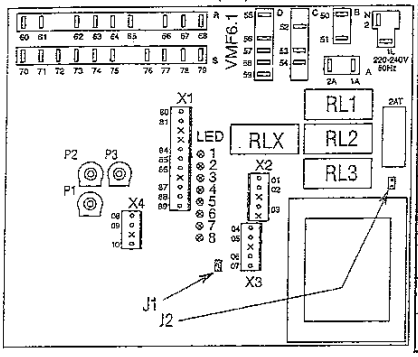
FERROLI COMBI 100 FF

General Notes - For use on the 100FF fitted with VMF6.1 Printed Circuit Board

*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. *Fuse on P.C.B.: 2 Amp.



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
4	green	Sensor (34) or (42) calling for heat
5	red	Central Heating waiting time, 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	Automatic ignition board (83) will be energised

Jumpers J1 - J2

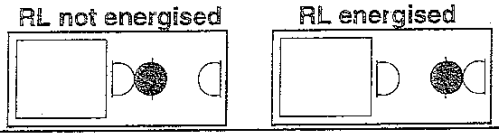
	Fitted	Not Fitted
J1	Prepurge time before ignition = 0 second	Prepurge time beforeignition = 20 seconds
J2	Fan control High & Low speed	Fan control High speed only/off

Resistance of Central Heating or Hot Water sensors (34) + (42)

10° C 890 ohm 60° C 1300 ohm
25° C 1000 ohm

RELAYS

RL1 central heating pump
RL2 fan
RL3 ignition



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	Room stat (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 (61) 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) at low speed remove jumper J2
7	1	0	- fan (16) not running at full speed or
			- air flow too low:
			- air pressure switch (43) faulty
8	1	0	- CH limit thermostat (50) open circuit (pump will run)

D

IGNITION OF BURNER (AUTOMATIC IGNITION)	
1 Fan (16) should run at full speed (open hot tap or set controls so boiler is calling for heat).	5 Check spark and position of spark electrode (81)
2 Check first A, B and C above (LED 8 is ON?)	6 Check position of flame sensing electrode (82)
3 Check if Jumper J1 is fitted	7 Check burner gas pressure during ignition
4 Relay RL3 will energise if not replace P.C.B.	

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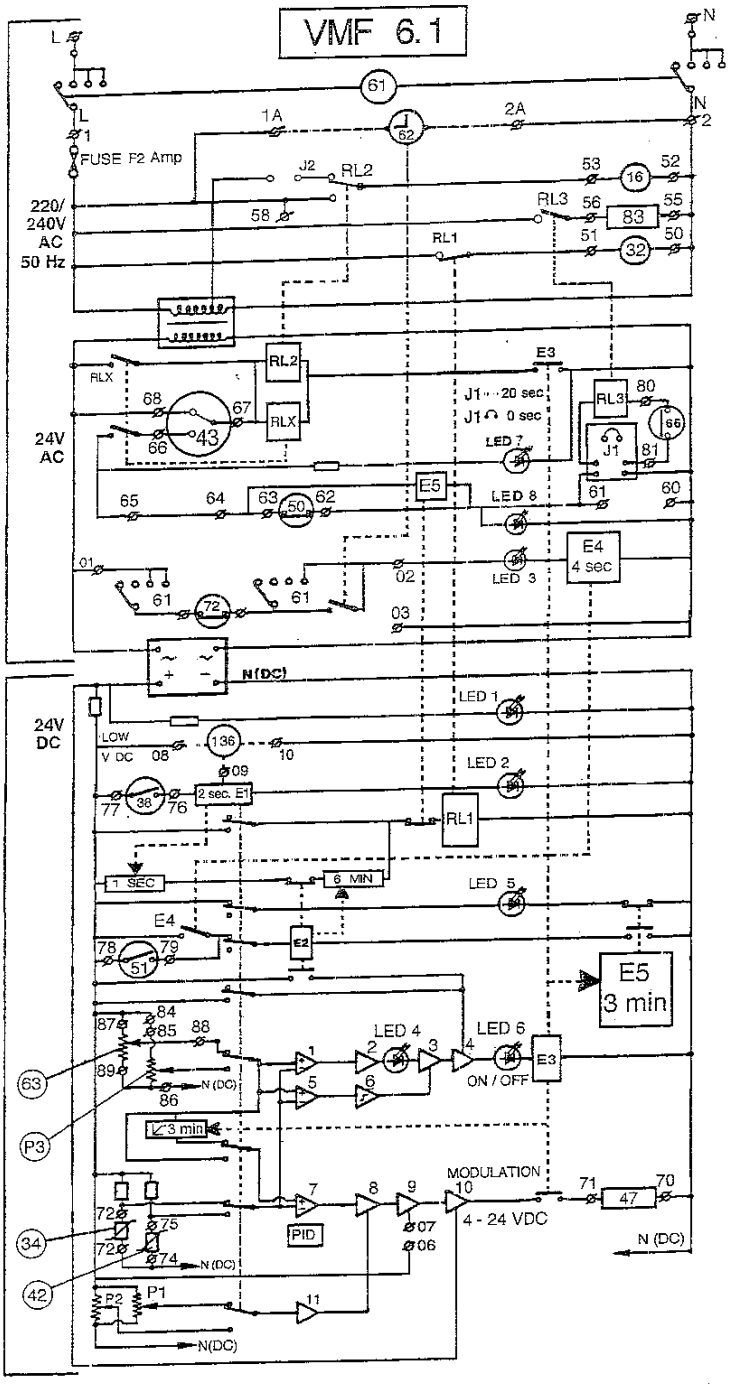
NC C NO

FERROLI COMBI 100 FF

Electrical functional Drawing



NOTE - All contacts shown in following condition

- No electrical mains
  No domestic hot water flow
- Tmperature too low

(all mechanical thermostats closed)

Attention

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 during 2 sec after D H W. tap has been closed

Key

16. Fan
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
47. Modulating regulator (Modureg) gas valve
50. Heat exchanger limit thermostat
51. Heat exchanger frost thermostat
61. C.H. selector switch (4 positions)
62. Time clock (if fitted)
63. C H. boiler thermostat
72. Room thermostat (not fitted - linked in factory)
83. Automatic ignition control panel

Fitted on P.C.B.:

RL Mechanical relay
E Electronic relay
P1 Max output C H.
P2 Max. output D H.W.
P3 D.H W. temperature set point

Note - Sensor 3
1000 Ohm 25°C
1300 Ohm 60°C
1490 Ohm 80°C

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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.

5.6 **Function of selector switch Central Heating.**

5.6.1 Hot water Only.

5.6.2 Heating timed and Hot Water

5.6.2.1 Fan and burner will start on "call for Heat" from (domestic) water flow switch.

5.6.2.2 Fan and burner and C.H. pump will start on call for Heat from frost thermostat. C.H. pump will stop 6 min. after frost thermostat contact breaks.

5.6.3 Heating continuous and Hot Water see 5.5.1 and 5.5.2

5.6.3.1 See 5.6.2.1

5.6.3.2 See 5.6.2.2

5.6.3.3 Fan and burner and C.H. pump will start on call for heat from Time Clock and Room thermostat (if fitted) C.H. pump will stop 6 min. after Time Clock or Room thermostat (if fitted) contacts break

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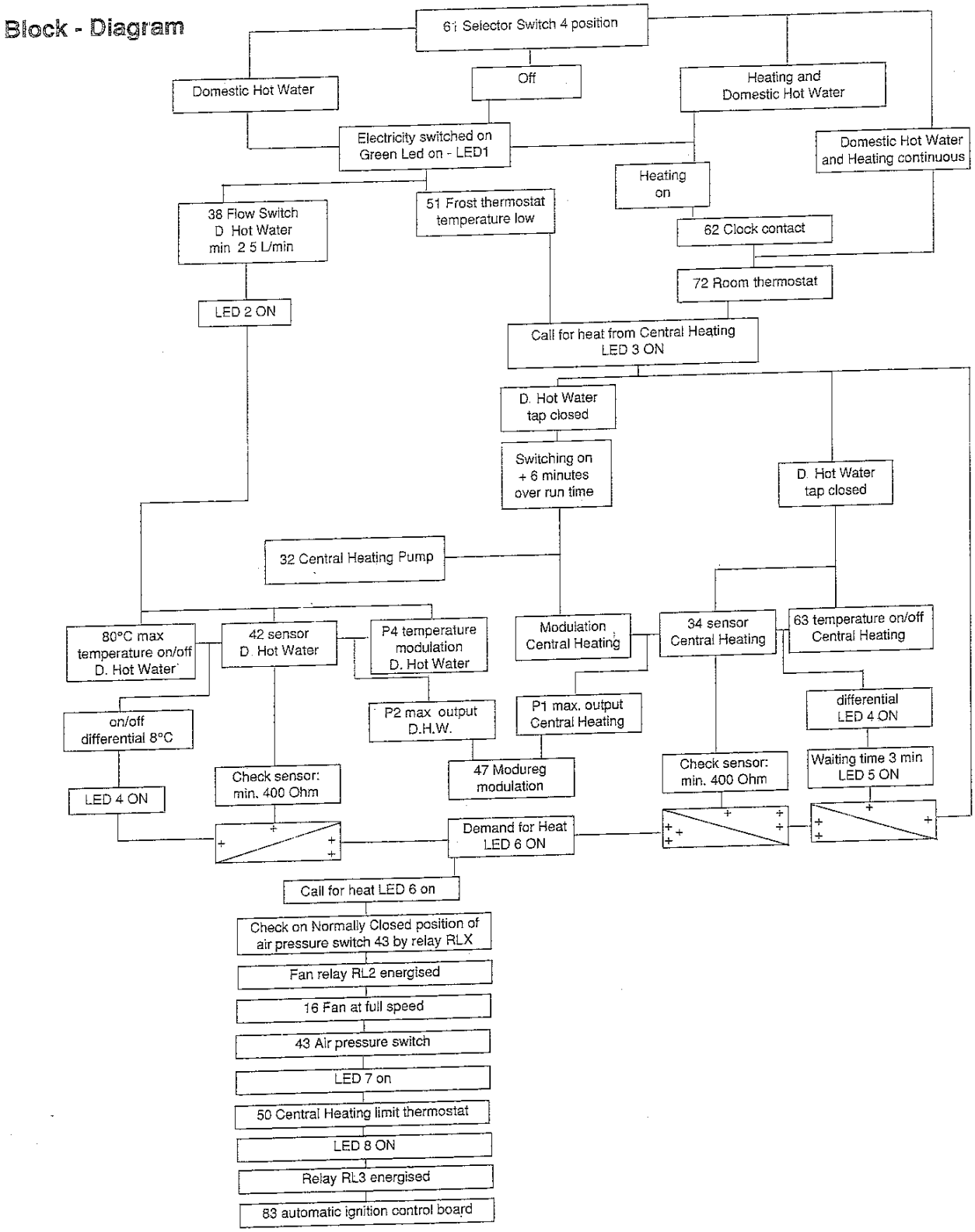
Block - Diagram



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General fault finding

For "fast" fault finding see page 33

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)
5. Selector switch on boiler in position central heating and hot water.
6. Is central heating pump running.
7. air inlet/flue outlet fre from obstacles.
8. Are all service cocks open?
9. Is at least one radiator valve or bypass in Central Heating system open?

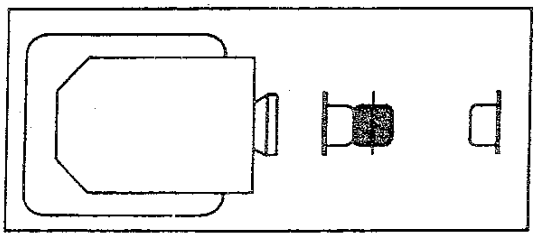
Always follow the complete General test Procedure to make sure that no fault remains unnoticed.

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.

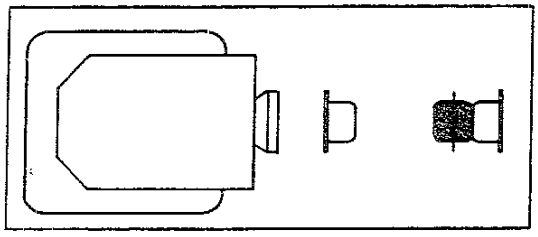
Never pull on the wires in the terminals.
To disconnect the terminal pull on the insulation cover, keeping the terminal pushed back.

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 relay is energised or not).

Relay not energised



relay energised



Top view relay

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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 fuses 2 Amp and 125 mAmp on P.C.B and external fuses
- Waterflow D.H.W min. 0.5 Gallon/min (2.5 Litre/min)

Put selector switch on hot water only

Close Domestic Hot Water taps

Fan runs at full speed

YES

NO

C.H. pump runs

YES

NO

Temperature of heat exchanger very low
Frost protection thermostat closed

If temp high check wiring or replace
frost thermostat

If temp very low

Disconnect Frost Thermostat 51 Fan speed?

Disconnect Connector
Water Flow Switch

Fan speed?

Fan keeps running at full speed

Replace P.C.B.

OFF

OFF

Fan off See fault finding chart 2

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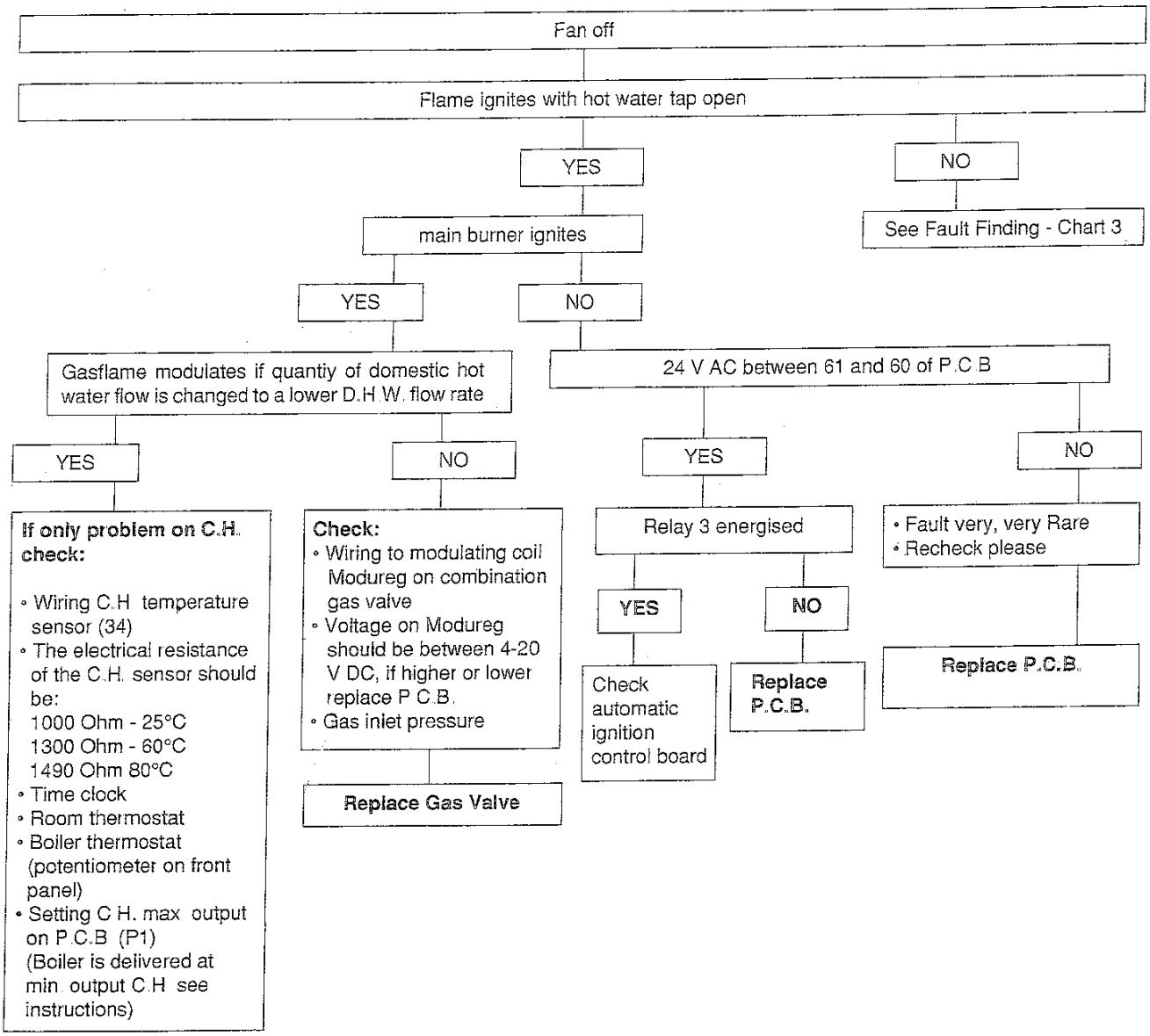
General Test + Fault Finding - Chart 2



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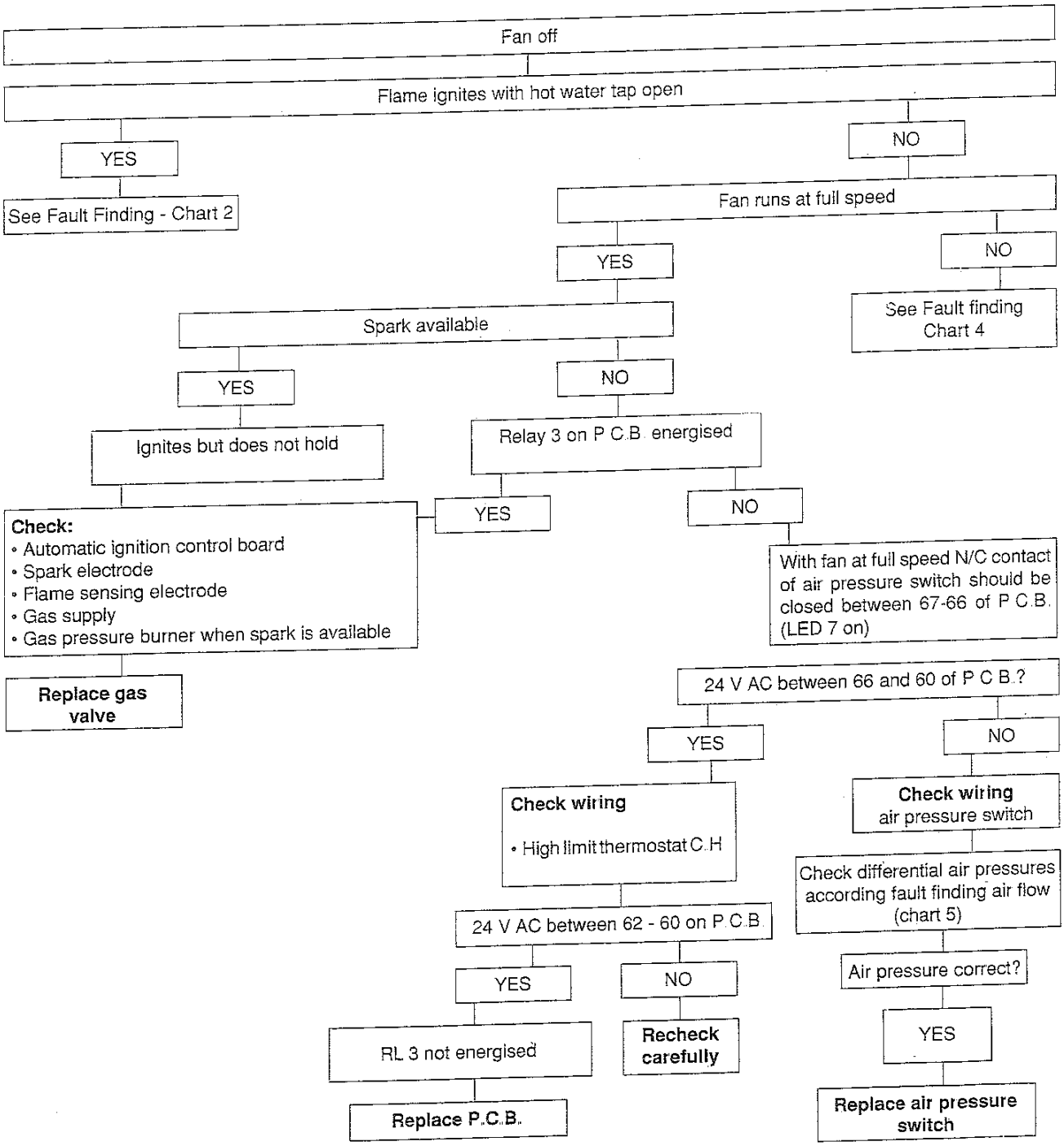
General Test + Fault Finding - Chart 3



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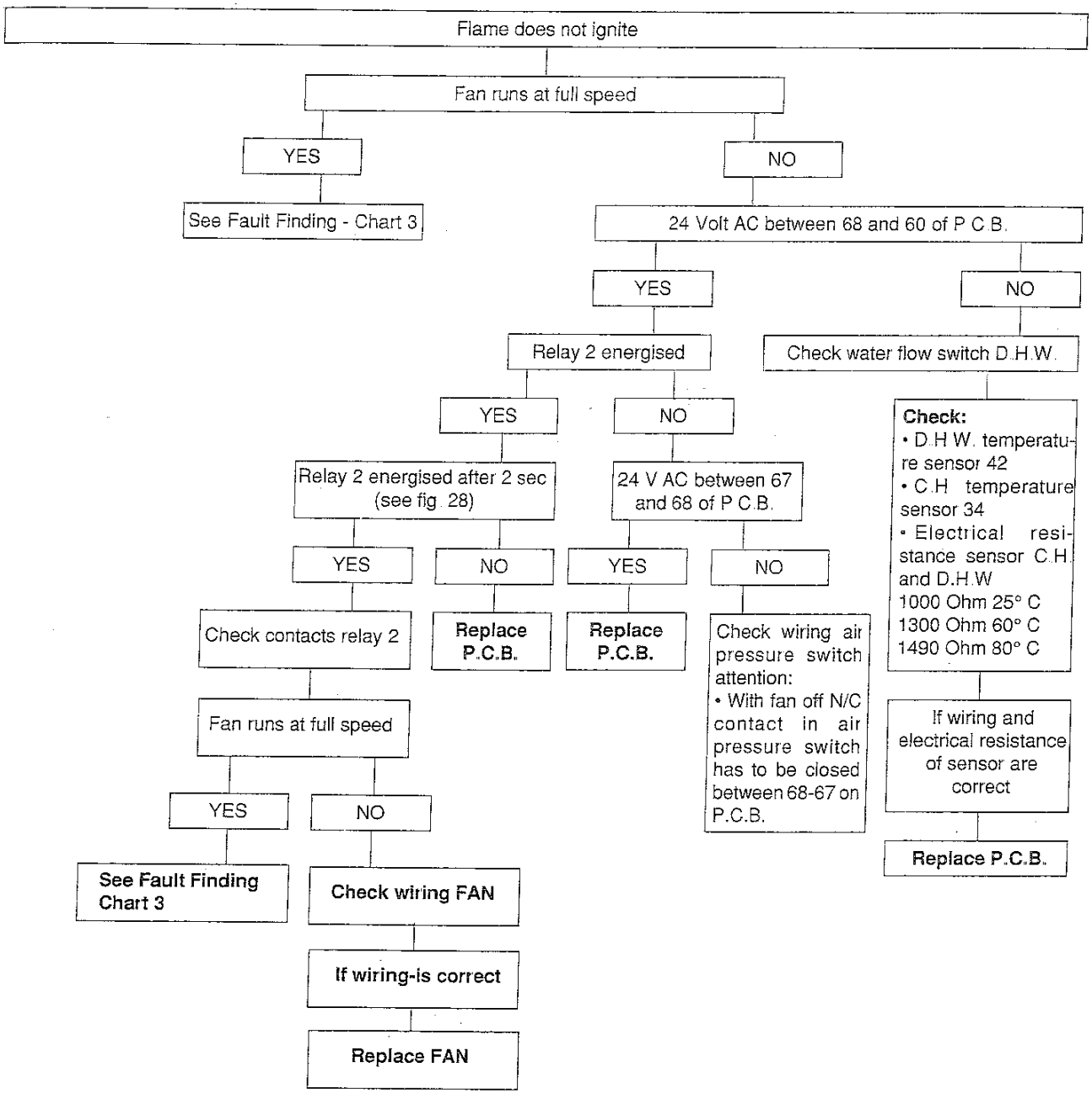
General Test + Fault Finding - Chart 4



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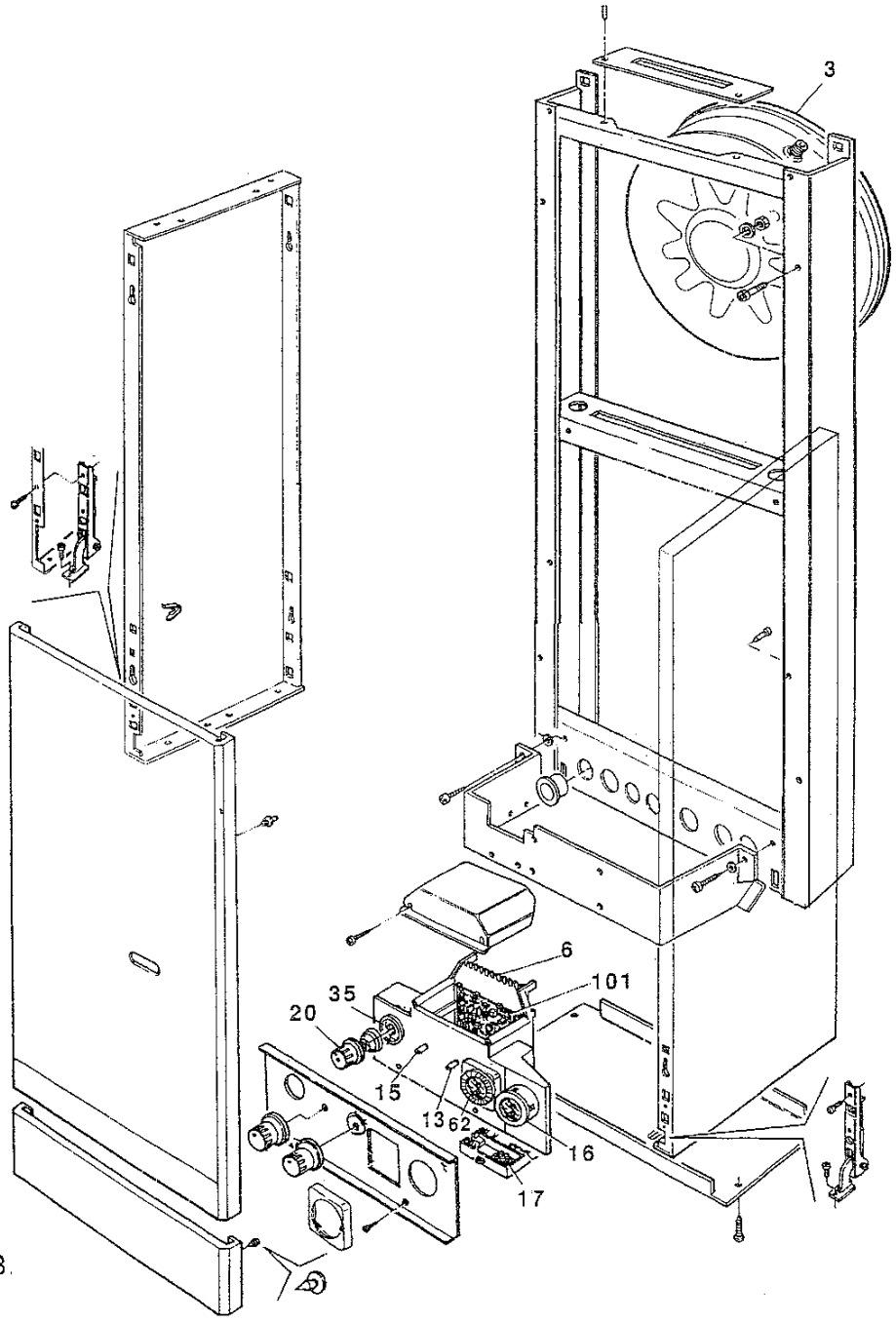
Exploded view jacket



3	Expansion vessel
6	Control box with P.C.B.
13	C.H. boiler thermostat
15	C.H. selector switch
16	C.H. temperature pressure gauges
17	240V-24V + room stat terminal blocks
20	Reset knob
35	Full sequence automatic control
62	Time clock
101	Main P.C.B.

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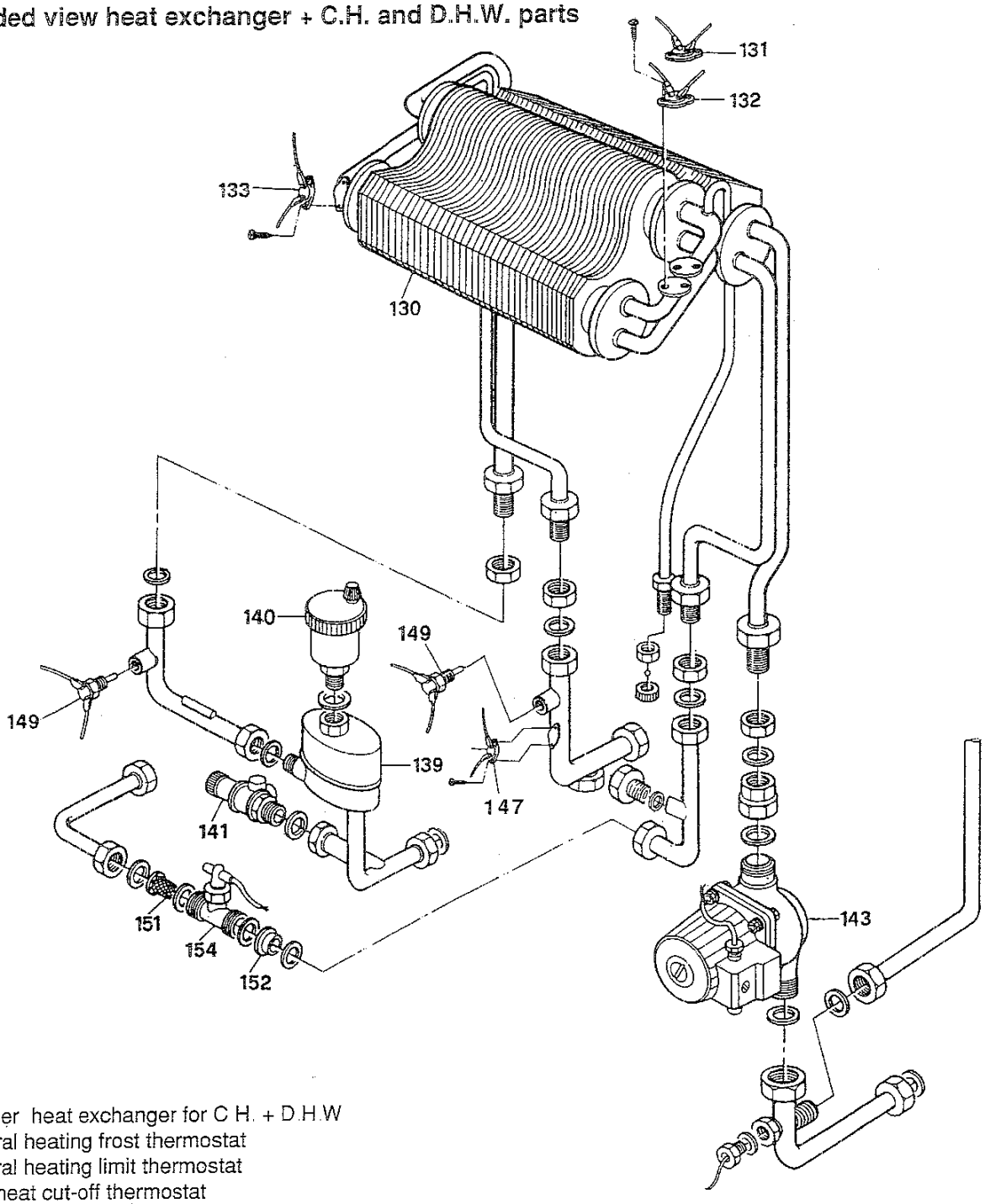
Exploded view heat exchanger + C.H. and D.H.W. parts



Key

130 Copper heat exchanger for C.H. + D.H.W
131 Central heating frost thermostat
132 Central heating limit thermostat
133 Overheat cut-off thermostat
140 Automatic air vent
141 Safety valve
143 Central heating pump
147 D.H.W. limit thermostat
149 Temperature sensor
151 Cold water inlet filter
152 Cold water flow limiter
154 Cold water flow switch

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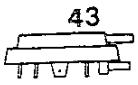
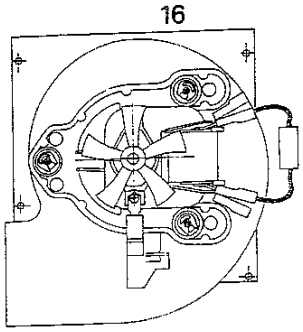
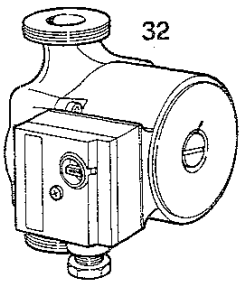
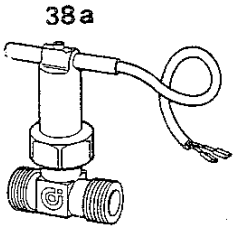
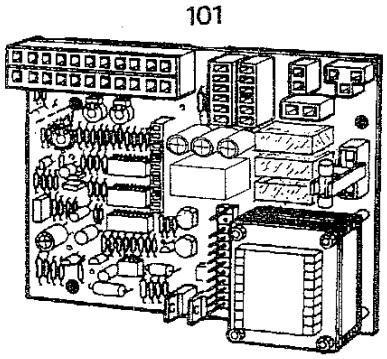
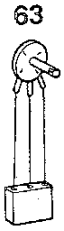


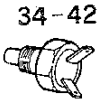


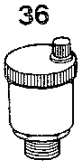






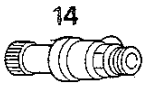


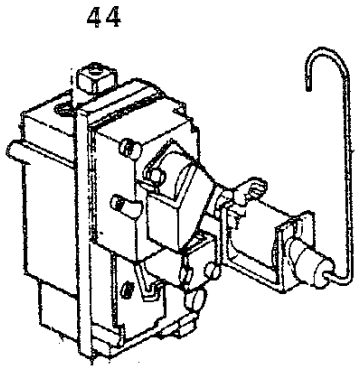




Spare parts List

Item N°	Makers Part N°	N° Off	DESCRIPTION
14	3980013/0	1	C.H. safety valve
16	3980243/0	1	Complete fan
21	3400955/0	16	Main injector (Natural Gas)
21	3980185/0	16	Main injector (L.P.G.)
29	3980249/0	1	Tube outlet fan with gaskets
32	3980060/0	1	Central heating pump
34	3980031/0	1	Temperature sensor
36	3980116/0	1	Automatic air vent
39	3980122/0	1	Cold water flow limiter 10 L/min
42	3980031/0	1	Temperatur sensor
43	3980014/0	1	Air pressure switch
44	3980250/0	1	Automatic gas valve
49	3980017/0	1	Overheat cut-off thermostat
50	3980016/0	1	Heat exchanger limit thermostat
51	3980018/0	1	Heat exchanger frost thermostat
52	3980100/0	1	D.H.W. Limit thermostat
61	3980155/0	1	C.H. selector switch 4 pos.
62	3980051/0	1	Time clock
63	3980126/0	1	C.H. boiler thermostat
64	3980262/0	1	C.H. temperature/pressure gauge
81	3980165/0	1	Ignition electrode
82	3980143/0	1	Flame sensing electrode
83	3980256/0	1	Ignition board Honeywell
101	3980254/0	1	P.C.B. VMF6.1
105	3980248/0	1	Burner set without injector rail
111	3980244/0	1	Cover combustion chamber with air damper
	3980183/0	1	Cable flame sensing electrode
	3980184/0	1	Ignition cable





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