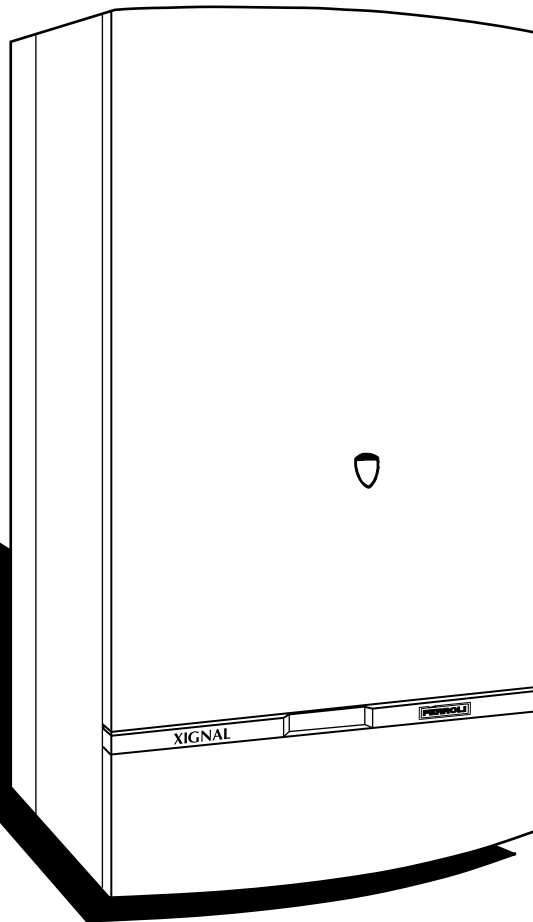




XIGNAL CE

01/01

**WALL MOUNTED, ROOM SEALED,
FAN ASSISTED, GAS COMBINATION BOILER,
COMPUTERISED AND SYNTHESIZED VOICE**



TECHNICAL INFORMATION INSTALLATION and SERVICE INSTRUCTIONS

Read these Instructions thoroughly before
using the appliance



Phone numbers:

Installer _____

Service Engineer _____

Serial No. _____

FERROLI HELPLINE
FOR SERVICE INFORMATION OR
HELP TELEPHONE: 08707 282 885
ALWAYS QUOTE YOUR SERIAL NUMBER
FOR IMMEDIATE ASSISTANCE



ALL SPECIFICATIONS SUBJECT TO CHANGE

Lichfield Road, Branston Industrial Estate, Burton Upon Trent, Staffordshire DE14 3HD
Tel. 08707 282 885 - Fax 08707 282 886



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Introduction

The **XIGNAL CE** boiler is a high efficiency heat generating appliance of a totally new design. It is environment friendly, gas fired and produces hot water for both the central heating system and domestic hot water.

The new concept of **XIGNAL CE** is that it is fitted with a microcomputer to regulate the boiler performance through technically sophisticated controls. This guarantees correct and optimum operation while being extremely simple to use. The diagnostic information and the operative status of the boiler are constantly visible on the display and can also be communicated by synthesized voice.

The boiler operation can be easily programmed by setting four daily heating levels. The fuel management system incorporates an internal and external sensor accurately calculating the heat output required (the temperature of the water in the radiators is regulated depending on the external temperature).

XIGNAL CE has a new generation gas burner ensuring perfect combustion with high flame efficiency and low emissions of polluting gases like NO_x and CO₂. The burner is ignited and monitored electronically ensuring the burner performance functions completely automatic and safe. This system also isolates the boiler from the domestic environment, ensuring total safety.

XIGNAL CE heat exchanger is made entirely of copper this ensures high efficiency even when the heating is low, protection against rust and oxidation makes the heat exchanger both reliable and long lasting.

Related Documents

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

The Gas Safety Regulations (Installation & Use) 1984.

The Local Building Regulations.

The Building Regulations.

The Building Standards (Scotland - Consolidated) Regulations.

British Standards Codes of Practice:

B.S. 7593 - 1993 Treatment of water in domestic hot water central heating systems.

B.S. 5546 - 1990 Installation of hot water supplies for domestic purposes

B.S. 5440 - Part 1 FLUES

B.S. 5440 - Part 2 AIR SUPPLY

B.S. 5449 - 1990 FORCED CIRCULATION HOT WATER SYSTEMS

B.S. 6798 - 1987 INSTALLATION OF GAS FIRED HOT WATER BOILERS

B.S. 6891 - 1989 GAS INSTALLATIONS

B.S. 7671 - 1992 IEE WIRING REGULATIONS




GENERAL DESCRIPTION

The boiler is able to operate with two types of fuel gas: natural or propane (L.P.G.). The type of gas should be chosen when the boiler is ordered. Conversions can also be carried out during the installation phase.

The boiler is controlled by an internal microcomputer and all settings to the regulating systems are carried out on the assembly line by use of software. This ensures that the set values always remain absolutely accurate throughout plant use.

The user may program and select the various options through the control panel. These functions include summer/winter operation, choice of the sanitary water temperature and that of the plant delivery, daily program setting and activation, boiler release.

The heating function is only activated when Winter operation is selected (key ). The microcomputer handles the heating function either according to the set daily program or according to the temperature set on the knob of the ambient unit. In both cases, the demand for heat will activate the circulation pump, the fan and the electronic equipment to start the burner. The burner ignites at a power value that will have been preset according to the fuelling gas. If the pressure in the heating system is less than 0.5 bar or more than 2.5 bar, the microcomputer will prevent boiler operation for safety reasons.

During operation, the plant delivery temperature is regulated according to the external temperature (detected by the relative probe). Temperature regulation will be proportional to the compensating curve set on installation according to the structural characteristics of both the building and system.

When the temperature of the water in the boiler approaches the value established by the computer, the valve will reduce the amount of gas (modulating) delivered to the main burner in order to keep the water temperature near to the required value. If the water temperature reaches the preset value, the burner will go out and will wait 2 minutes until igniting again. Having terminated the demand for heat, the burner will stop while the circulator will continue to operate for six minutes so that the temperature is evenly distributed throughout the system.

If hot water is used during the heating system, the microcomputer will detect this by means of the flowmeter and will deactivate the heating function. This stops the circulator and activates hot water production. Hot water is constantly maintained at the set value even during different water flow rates. This is due to a correct establishment of the outlet flow of hot water and adequate modulation of the burner rating. Once use of hot water ceases, the computer will wait for 2 minutes before re-activating the heating function.

Only hot water production is activated during "Summer" operation. However, the circulating pump of the heating function will operate for 1 sec. at the end of each demand for water in order to prevent the pump itself from sticking.

The microcomputer continuously checks that boiler operation is correct. In the event of faults, these are immediately visualized (the display will flash) and notified by synthesized voice when the relative button is depressed. Boiler operation will be inhibited until the fault is rectified or, in some cases, until the boiler is manually reset.

All faults are memorized by the microcomputer together with the other operational parameters. This enables the technical assistance service to proceed with a correct diagnosis.



Technical data

	NATURAL GAS (G20)	PROPANE LPG (G31)
Nominal heat input (gross caloric value)	34.8 kW	34.0 kW
Minimum heat input (gross caloric value)	15.1 kW	14.8 kW
Nominal heat input (net caloric value)	31.3 kW	31.3 kW
Minimum heat input (net caloric value)	13.6 kW	13.6 kW
Nominal heat output	27.9 kW	27.9 kW
Minimum heat output	11.8 kW	11.8 kW
Gas rate	3.27 m ³ /h	2.40 kg/h
Burner setting pressure	15,0 mbar (max.)	34,5 mbar (max.)
Minimum burner pressure	3,0 mbar (min.)	6,9 mbar (min.)
Main injector Ø	1.15 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:	230V - 50 Hz	
Fuse rating:		
Mains on P.C.B. in boiler	2 Amp. (main fuse) F2 Amp (Fast)	
Electrical input	150 Watt	
Domestic Hot Water flow: (35°C rise)	11.4 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	22 mm	
Domestic cold water inlet	15 mm	
Domestic cold water outlet	15 mm	
Central heating flow	22 mm	
Central heating return	22 mm	
Pressure relief valve drain	15 mm	
Min. installation clearances. Sides:		
Left hand	5* mm	
Right hand	5* mm	
Front	50** mm (plus access for service)	
Min. height from worktop to base	200 mm	

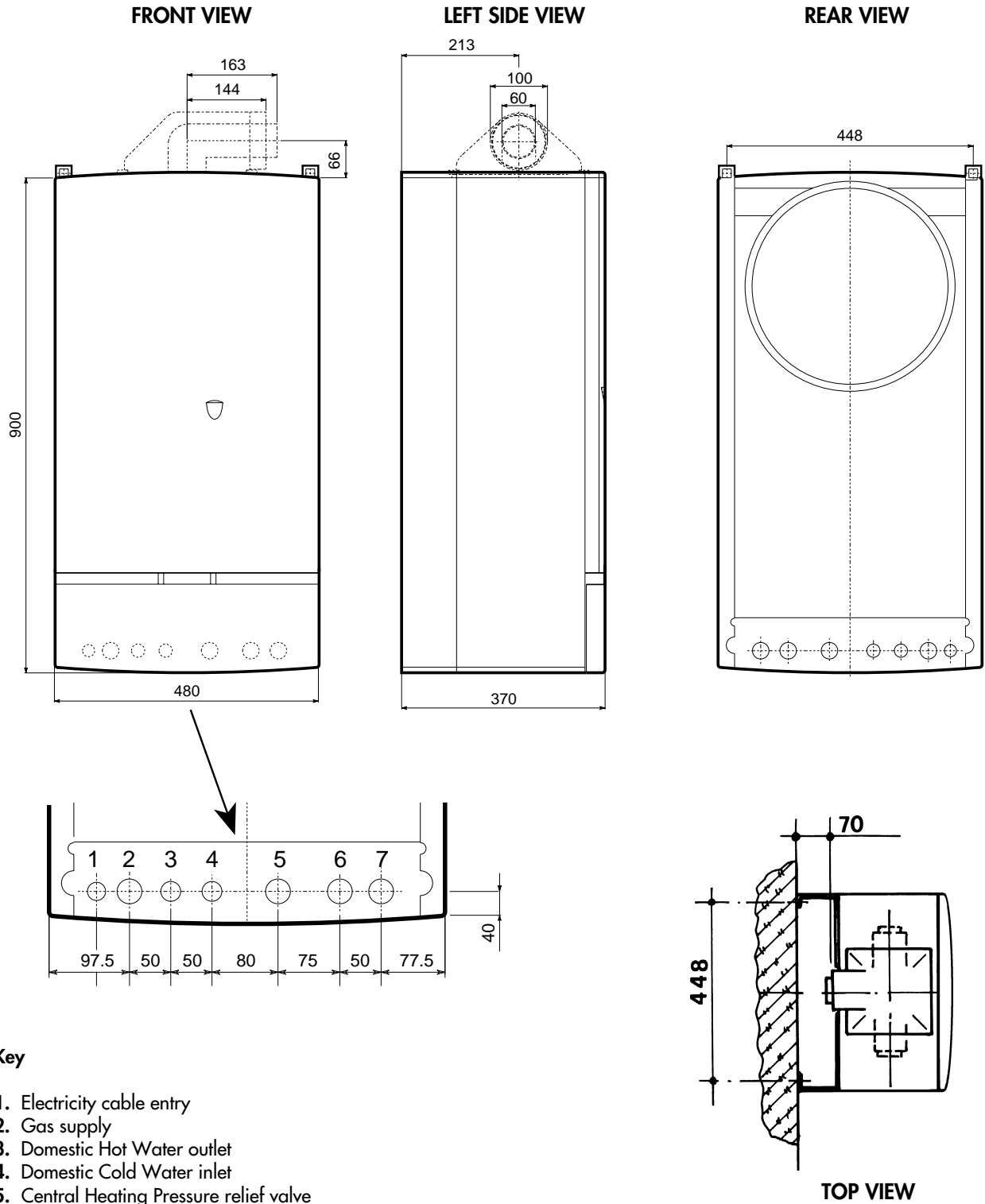
* If using a side outlet flue then the minimum clearance on the flue outlet side of the appliance is increased to 75 mm (3 in.)

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

The maximum working temperature of the central heating water is 85°C.

The maximum domestic hot water production temperature is 65°C, which can be regulated from 40 to 65°C.

Appliance Dimensions



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



XIGNAL CE

Model Water Bye Laws.

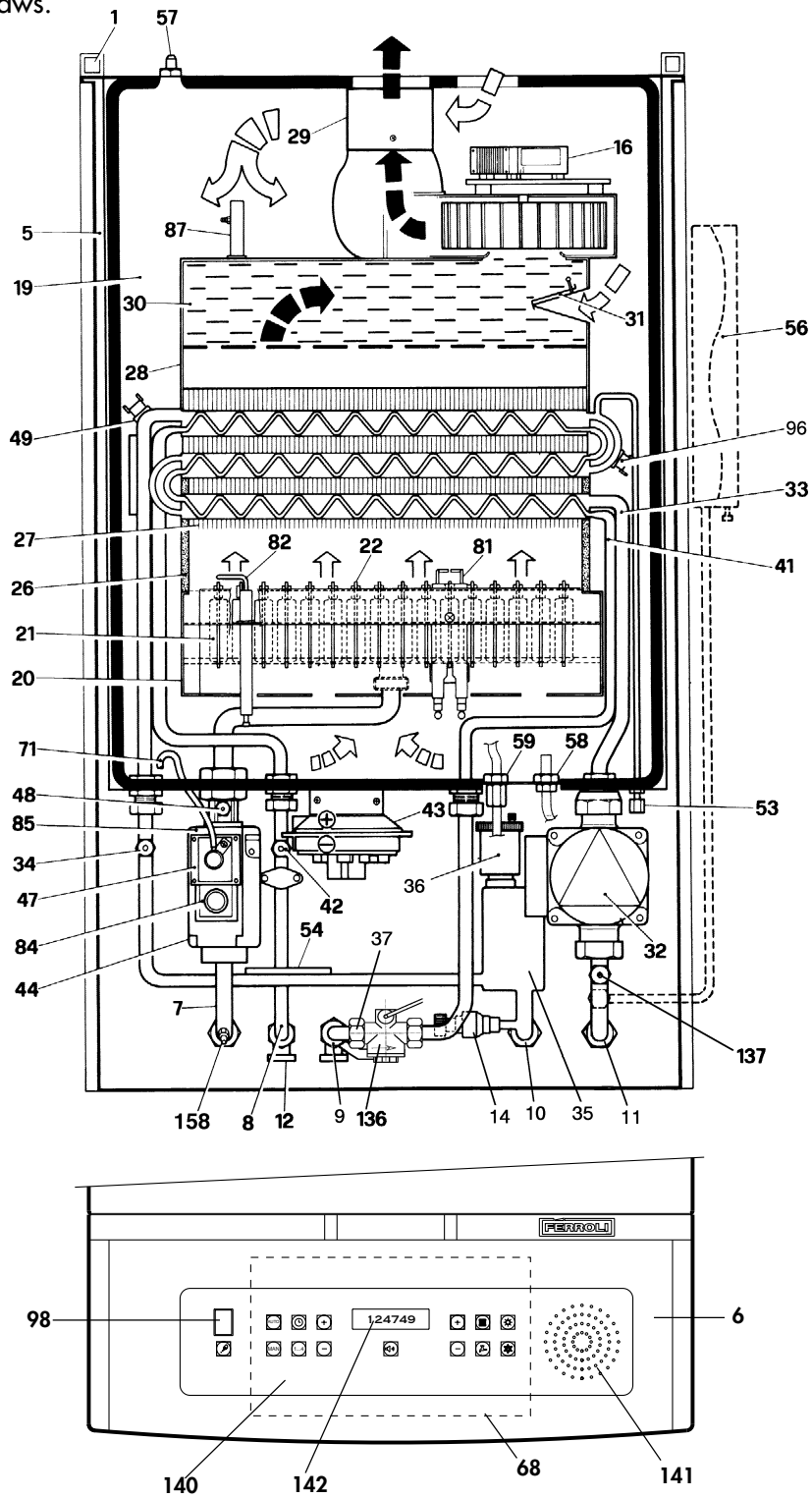


Fig. 2





Boiler flow diagram

Main parts

1	Fixing point	43	Air pressure switch
5	Room sealed compartment	44	Gas valve
6	Instrument panel	47	Gas valve modulator
7	Gas inlet	48	Burner pressure test point
8	Domestic hot water outlet	49	Overheat thermostat
9	Domestic hot water inlet	53	Heat exchanger venting point
10	Central heating flow	54	Temperature sensing phial
11	Central heating return	56	Expansion tank
12	D.H.W. drain point	57	Fan air inlet pressure test point
14	Safety valve	58	Fan air outlet pressure test point
16	Fan	59	Flue outlet pressure test point
19	Combustion chamber	65	230V line terminal strip and probe connections
20	Burner unit	68	Control box with P.C.B.
21	Main injector	71	Balance tube
22	Burner	81	Ignition electrode
26	Combustion chamber insulation	82	Flame sensing electrode
27	Copper exchanger for C.H. or D.H.W.	83	Automatic ignition control panel
29	Flue outlet manifold	84	1. gas valve operator 230V
30	Excess air chamber	85	2. gas valve operator 230V
31	Air pressure control damper	87	Venturi test point
32	C.H. pump	96	Control heating limit sensor
33	Heating water circuit	98	Main switch
34	Heating temp. sensor	101	P.C.B.
35	Air separator	136	Flowmeter
36	Automatic air vent	137	Pressure sensor
37	Cold water inlet filter	140	Touch keyboard
41	Domestic hot water circuit	141	Loudspeaker
42	D.H.W. temperature sensor	142	Display P.C.B.
		158	Gas inlet pressure test point



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 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 sought from the Local Gas Region of British Gas Plc.

Location of Boiler

The installation of the **XIGNAL CE** 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

POS.	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
N	Below carport	600

A Quinnet Barrat and Quinnet 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

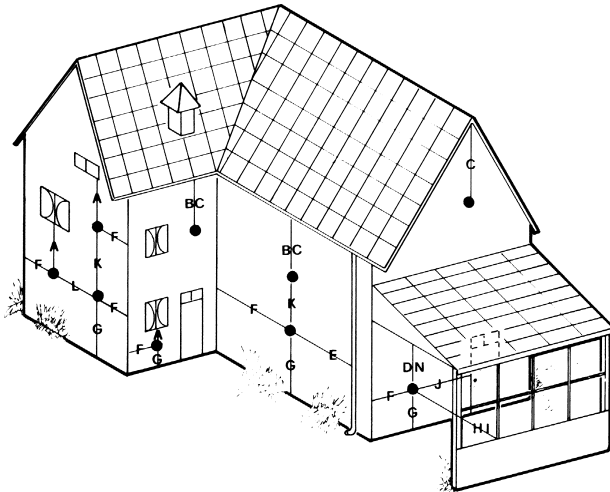


Fig. 3

Minimum Clearance mm

Air supply

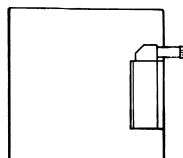
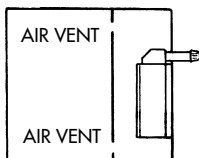
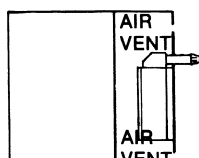
APPLIANCE FLUE SYSTEM APPLIANCE LOCATION	ROOM-SEALED	AIR VENT AREAS
IN ROOM		NIL
IN COMPARTMENT OPEN TO ROOM		HIGH LEVEL: 252 cm ² (38 in. ²) LOW LEVEL: 252 cm ² (38 in. ²)
IN COMPARTMENT OPEN TO OUTSIDE		HIGH LEVEL: 126 cm ² (19 in. ²) LOW LEVEL: 126 cm ² (19 in. ²)

Fig. 4

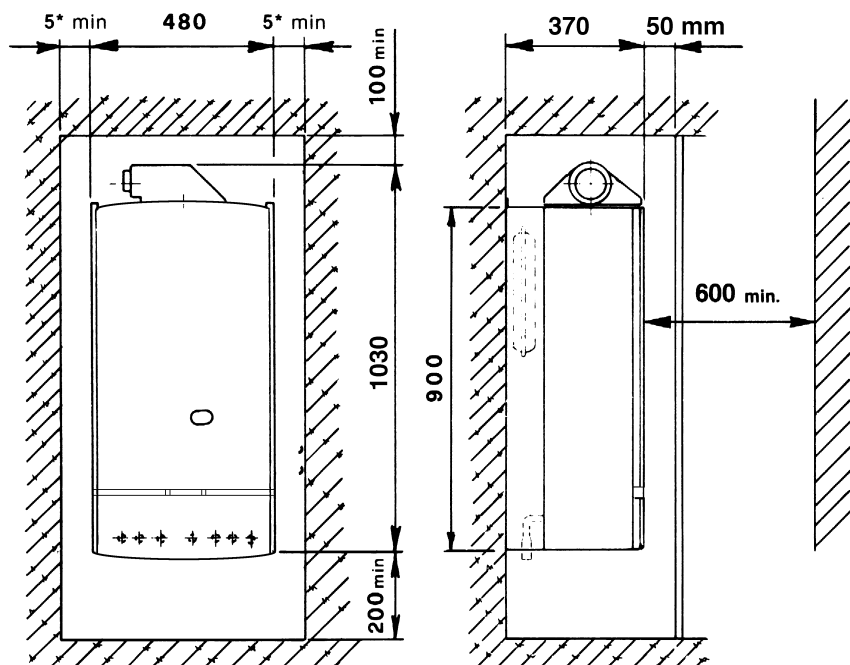


Fig. 5

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.
- ** Access 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.

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

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 By-law. Again any such connection must be disconnected after use (fig. 7).

Domestic Hot Water

Always fit a water softener or descaler in «hard water areas». A 15 mm copper connection point on the boiler jig bracket for attaching to the main supply is provided. The maximum domestic water pressure for the inlet supply is 10 bar (145 P.S.I.). If the cold mains supply exceeds 5 bar (72 P.S.I.), a water governor or pressure reducing valve must be fitted by the installer into the mains supply in an inconspicuous but accessible position preferable between 3 and 5 metres (10-16 ft) before the appliance. Such a valve must be approved by the Water Research Council.

Attention - Is drawn to the Model Water By-laws.

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

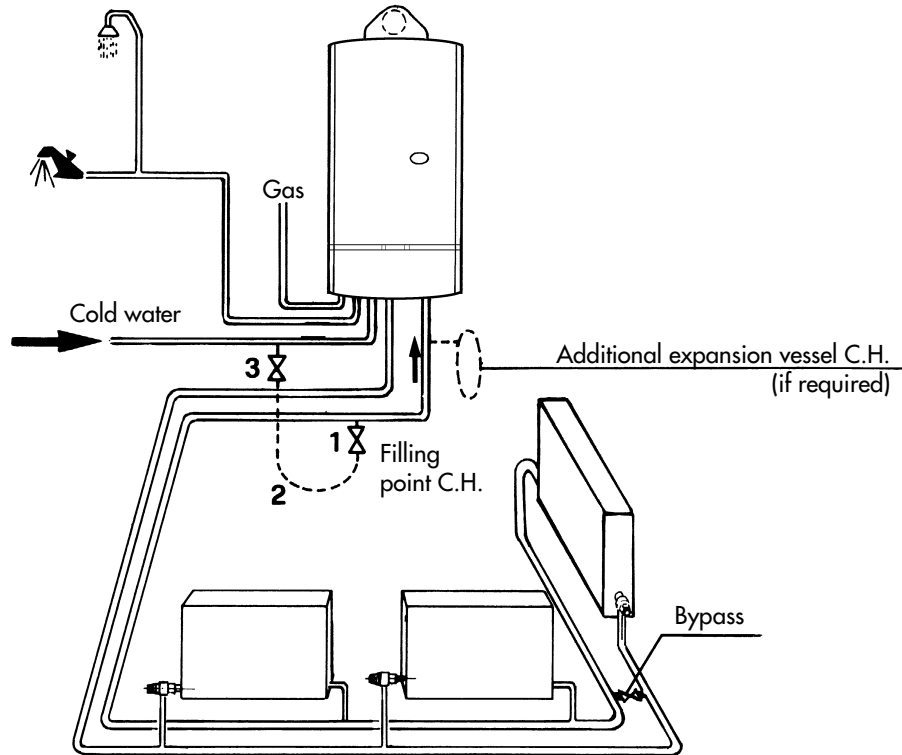
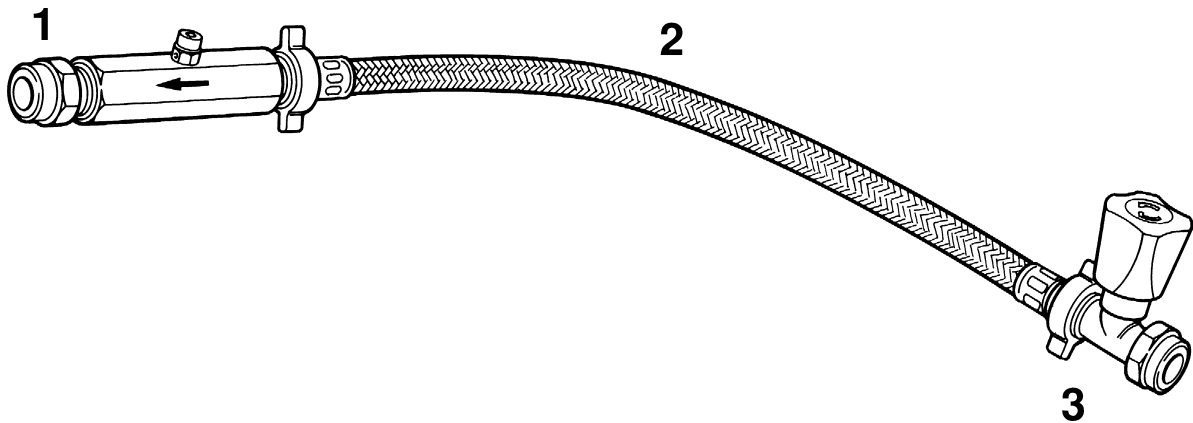


Fig. 6

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



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.

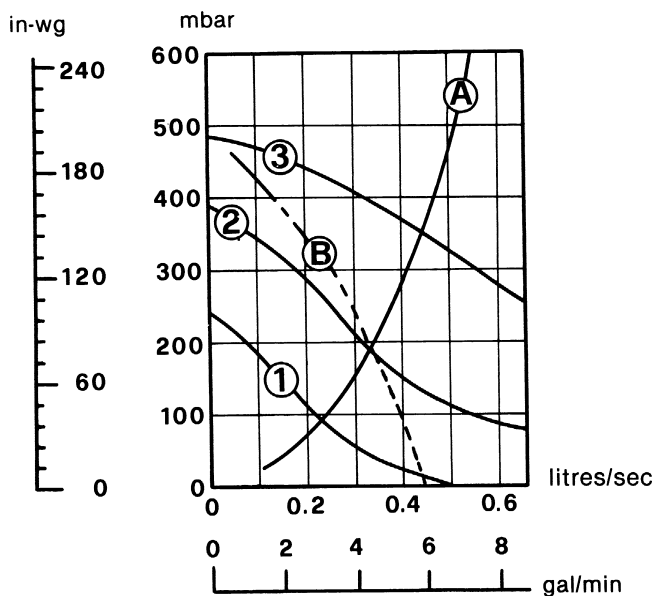
Grundfos Pump performance graph

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



Installation

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

1.0 UNPACKING

The appliance is delivered in 2 cartons.

- 1.1 The large carton contains the boiler, the Installation/Service and Users Instructions, external and internal sensors.
- 1.2 The second carton contains the mounting jig assembly, complete with isolating valves, the assembly fixing screws and wall plugs (x4), the boiler mounting nuts and washers (x2), drilling template, flue assembly and turret.

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 FIXING THE MOUNTING JIG ON THE WALL (Rear Wall Flue Applications)

- 2.1 Select the boiler location carefully ensure that all requirements given in previous text are satisfied. Fig. 10 will also give guidance to fixing dimensions.
- 2.2 Locate template on wall, mark the positions of the four jig bracket fixing holes and the flue opening.
- 2.3 Carefully cut the circular hole (118 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.
- 2.5 Fit the mounting jig assembly using the four fixing screws provided (Ensure that all the service cocks are in the OFF position). Operate valves several times to ensure they are free.
- 2.6 With the exception of the connection to the pressure relief valve, make all the water and gas connections to the jig bracket valves. Fully tighten (fig. 11). Water connections can be made with compression or capillary fittings (before the gas inlet to the boiler there must be at least 100 mm of straight before any bends).

3.0 FIXING THE MOUNTING JIG ON THE WALL (Side Wall Flue Applications)

- 3.1 Select the boiler location carefully ensuring that all the requirements given in previous text are satisfied. Fig. 10 will also give guidance.
- 3.2 Locate the template on wall and mark the position of the four jig bracket fixing holes.
- 3.3 Using a 10 mm drill, drill 70 mm deep holes to accept the wall plugs, and insert wall plugs.
- 3.4 Fit the mounting jig assembly using the four fixing screws provided.
- 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 (118 mm minimum diameter) for the flue assembly.



Important Note - Always use two spanners to prevent twisting of soft copper pipework on the boiler.
Flush out the water system.

Note - The maximum inlet cold water pressure must not exceed 10 bar (145 P.S.I.) and a water governor or a pressure reducing valve will be required if the pressure is in excess of 5 bar (72 P.S.I.).

Ensure all pipework is adequately supported.

Drilling template

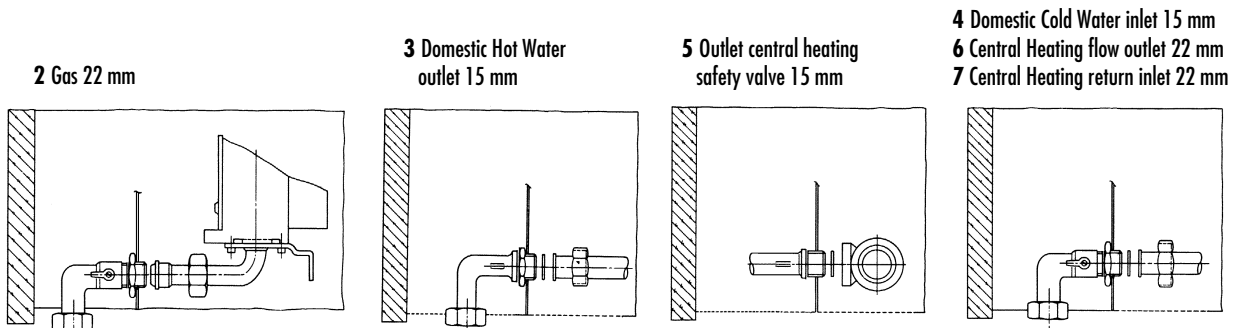
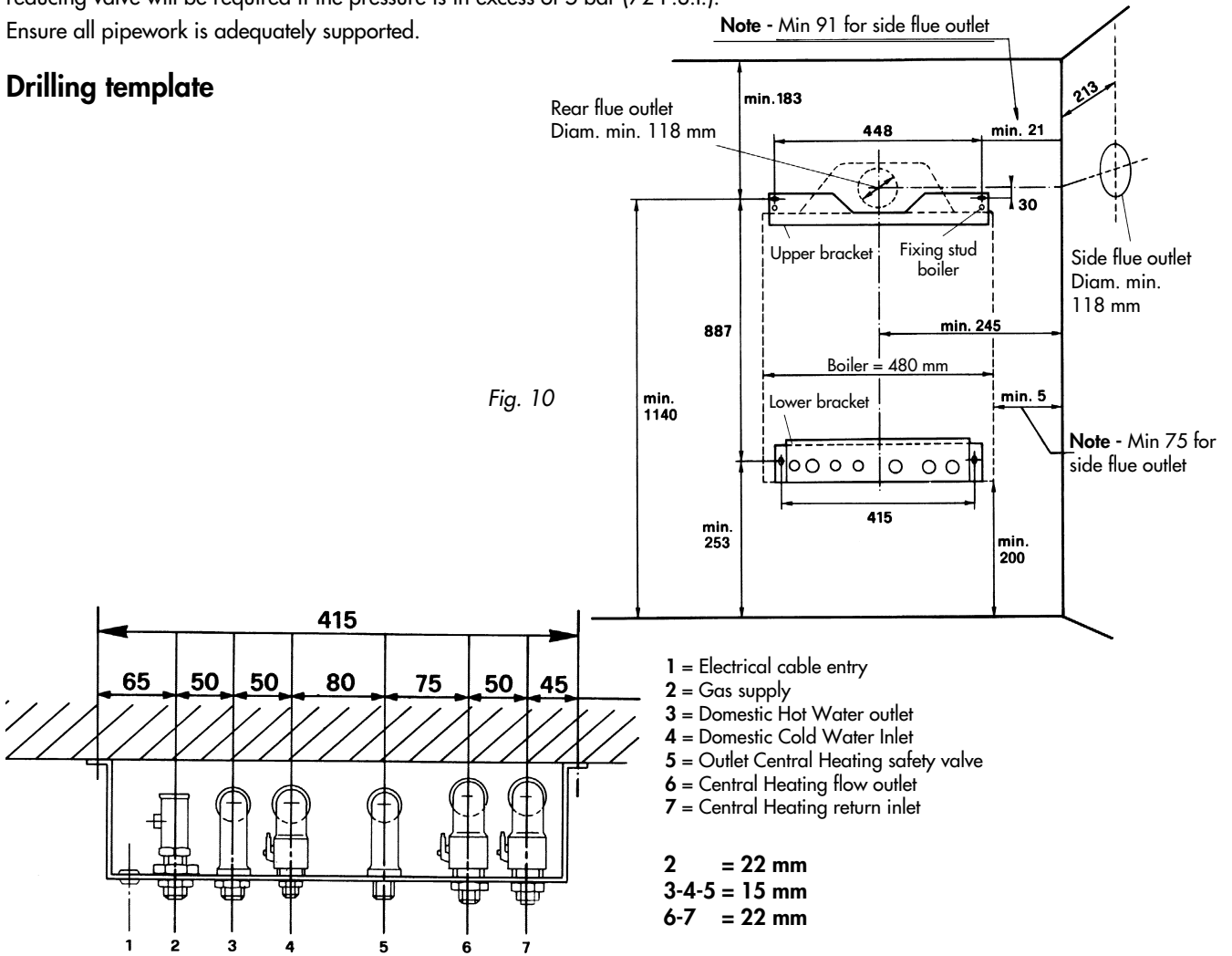


Fig. 11

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

Note - The central heating safety valve (5) should be piped 15 mm to discharge safely 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 length as the plastic air pipe (aluminium flue pipe = plastic air inlet pipe + 50 mm !).

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

- 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.

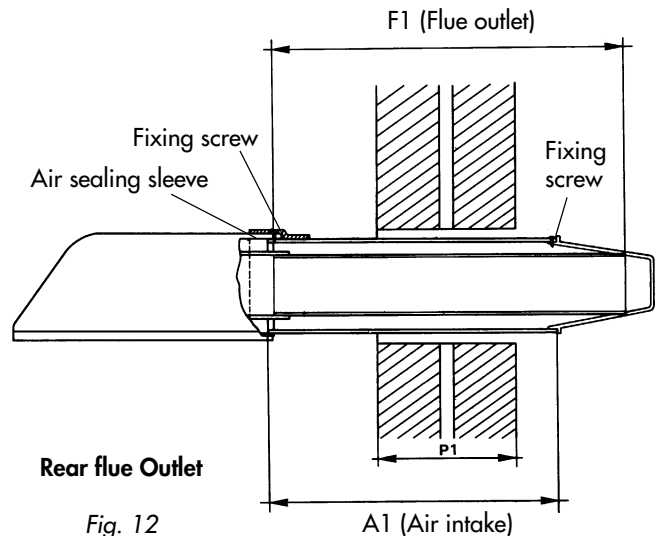


Fig. 12

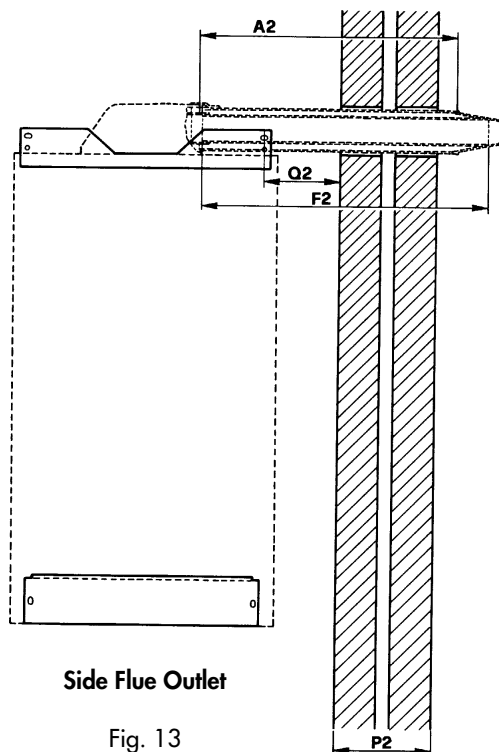


Fig. 13

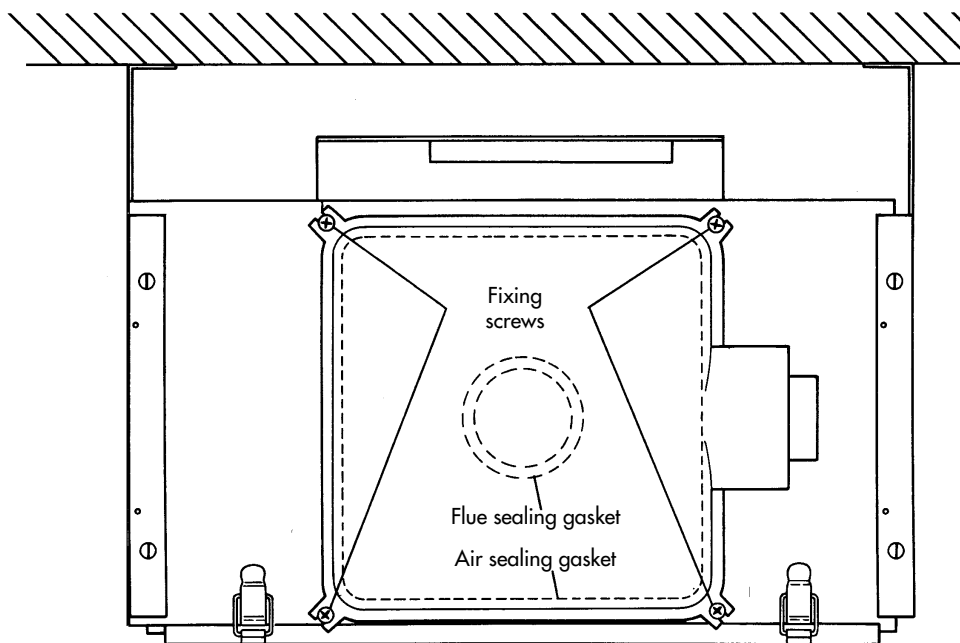
Aluminium flue pipe length = Plastic air inlet pipe length plus 50 mm (2") longer.

- 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

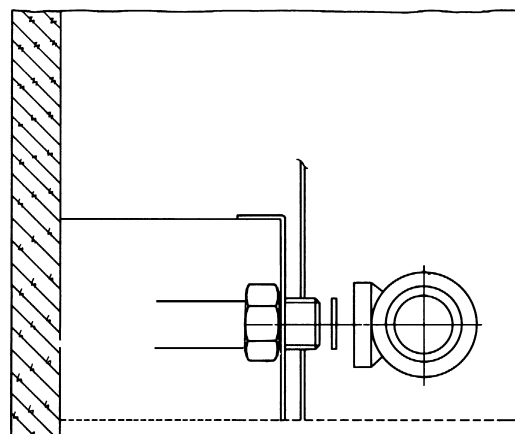
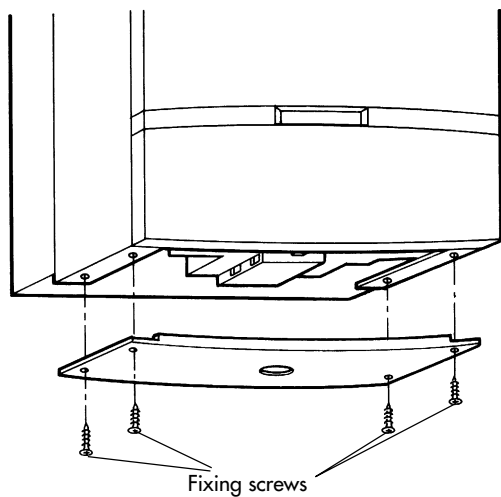
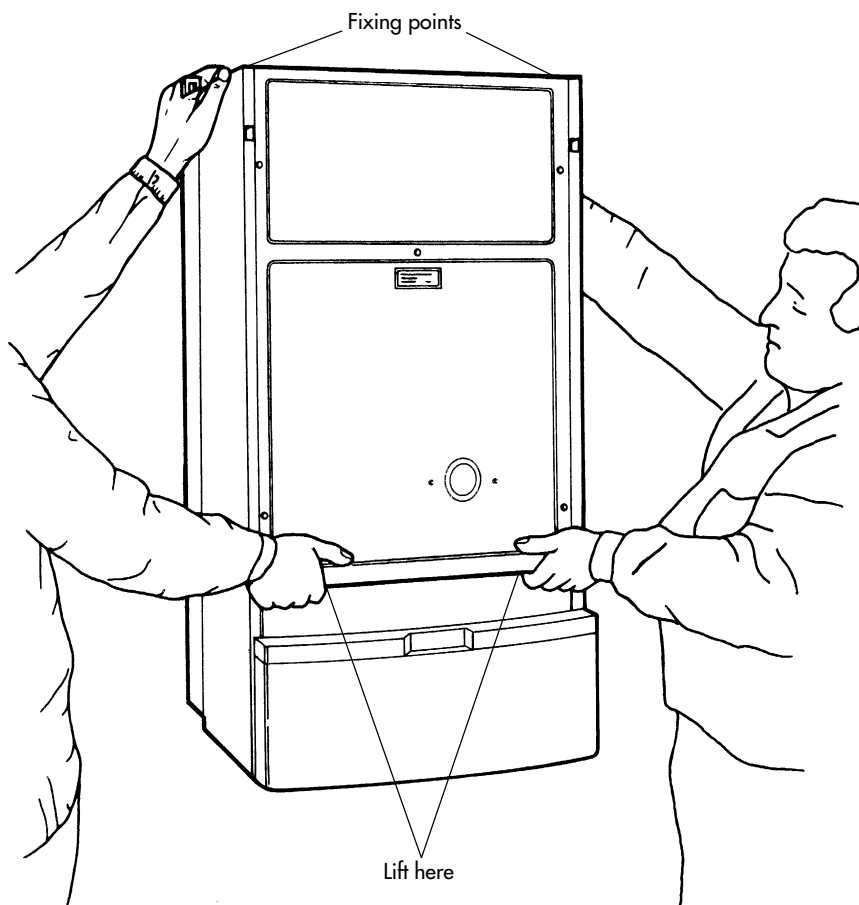
- 5.1 Place the boiler on its back.
- 5.2 Remove the boiler base plate, four screws (fig. 16). Remove the plugs fitted to the boiler water connections.
Remove the bag of sealing washers from the boiler pipework. Remove the front panel by sliding up and pulling away from the main boiler.
- 5.3 Lift boiler as shown in fig. 15 onto the top studs and fit supplied nuts and washers hand tight.
- 5.4 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.
- 5.5 Screw the pressure relief valve adaptor provided, through the jig bracket into the valve, using the remaining washer (fig. 17).
- 5.6 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 external electric components or wiring. The pipe should be directed towards the wall.

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



TOP VIEW BOILER SIDE OUTLET

Fig. 14





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 230 V ~ 50 Hz supply (see fig. 18). The supply fuse rating is 3A. The terminals are accessible after removing the white base plate (see fig. 18).

7.1 Procedure

- 7.1.1 The supply cable must 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 230 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 connected 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.

Remote sensors

The XIGNAL CE is supplied with an internal and external sensor to ensure maximum fuel savings.

Room Sensor

To be in a position within the property normally used for a room thermostat.

Ensure connections complies with the polarity shown in Figure 18 wired to terminals No. 5 and No. 6.

External Sensor

To be wired to terminals No. 7 and No. 8.

Location of sensor see Figure 21 and 22.

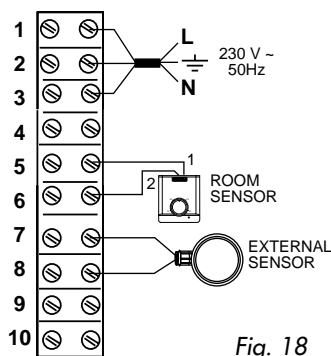


Fig. 18

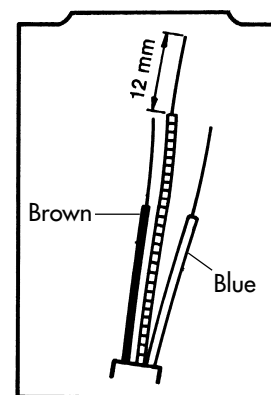
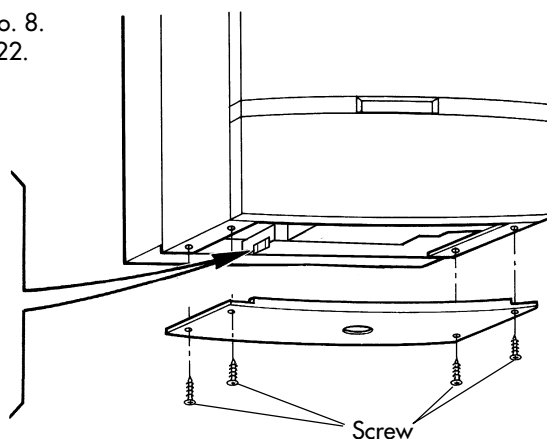


Fig. 19



Wiring diagram

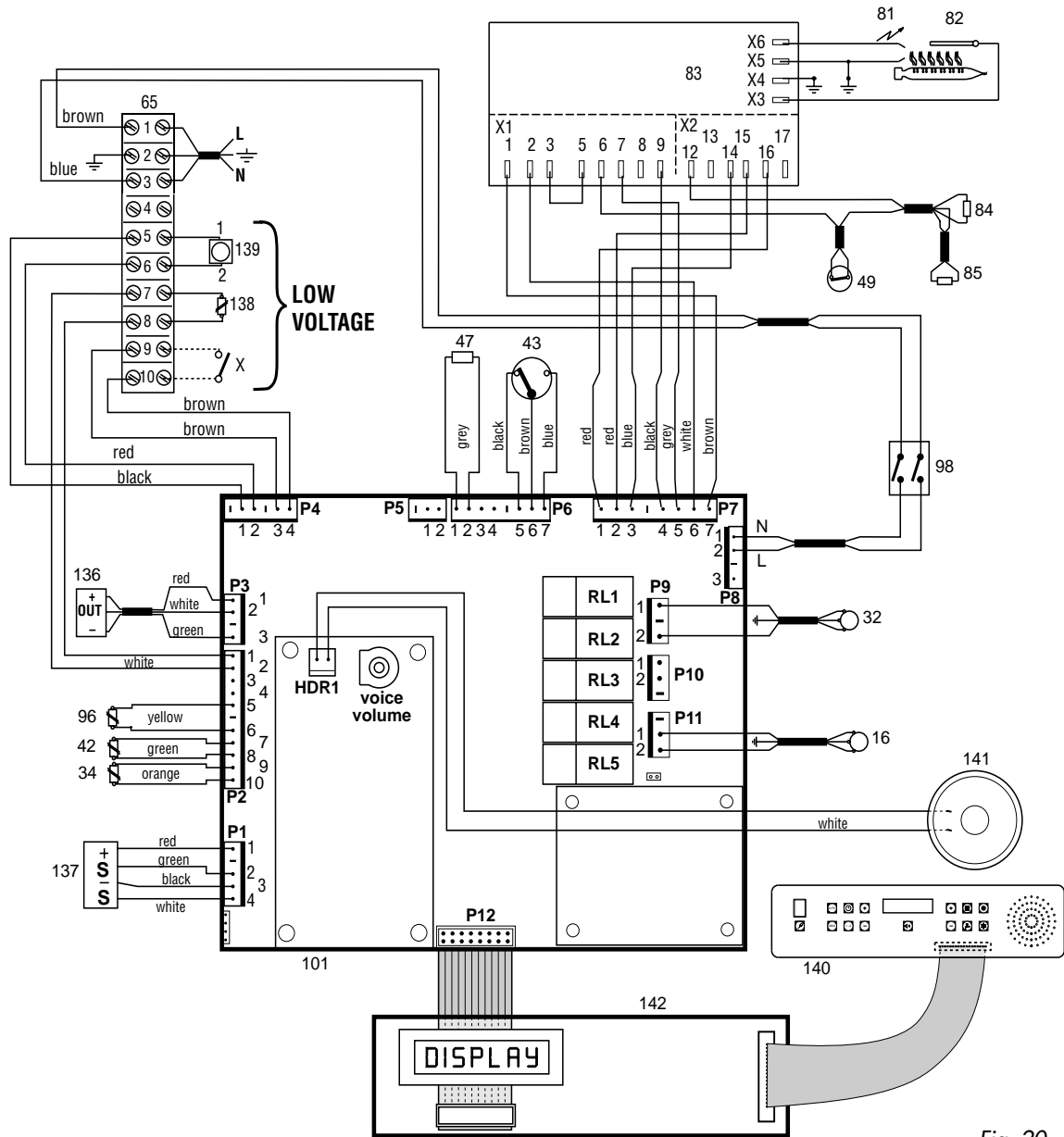


Fig. 20

KEY

- | | | | |
|----|---|-----|--|
| 16 | Fan | 96 | C.H. limit sensor |
| 32 | C.H. pump | 98 | Main switch |
| 34 | Heating temperature sensor | 101 | Main P.C.B. |
| 42 | D.H.W. temperature sensor | 136 | Flowmeter |
| 43 | Air pressure switch | 137 | Pressure sensor |
| 47 | Gas valve modulator | 138 | External sensor |
| 49 | Overheat thermostat | 139 | Room sensor |
| 65 | 230V line and probe connection terminal strip | 140 | Touch keyboard |
| 81 | Ignition electrode | 141 | Loudspeaker |
| 82 | Flame sensing electrode | 142 | Display P.C.B. |
| 83 | Automatic ignition control panel | x | possible connection for standard room thermostat |
| 84 | 1. operator 230V gas valve | | |
| 85 | 2. operator 230V gas valve | | |

Note: strictly comply with the neutral, line connection polarities and those of the room sensor.

Ohm value of the sensors	
°C	Ohm
25	10 K
40	5,4 K
60	2,5 K
80	1,3 K

External sensor location

The external sensor should preferably be installed on the North, North-East wall or on the one facing the majority of the main living rooms in the building. The sensor must never be exposed to the first morning sunlight. Where possible, it must never be subjected to direct sunlight and should be protected if necessary.

In no case may the sensor be mounted near windows, doors, ventilation openings, stacks or heat sources which could alter its reading.

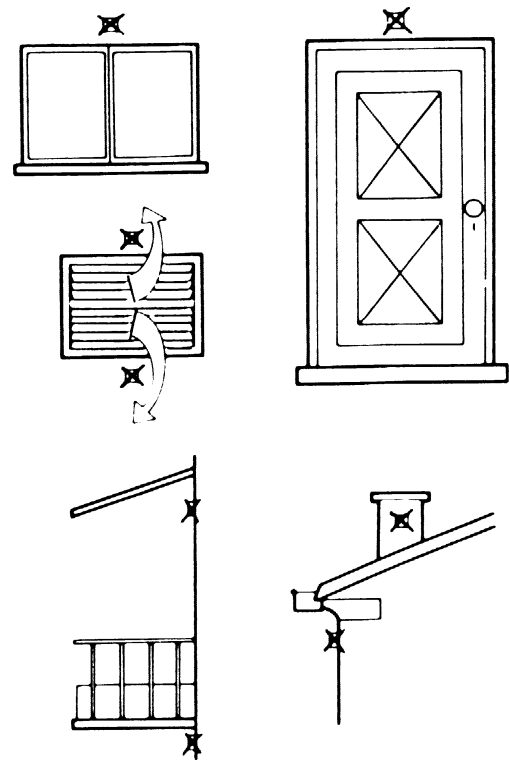


Fig. 21

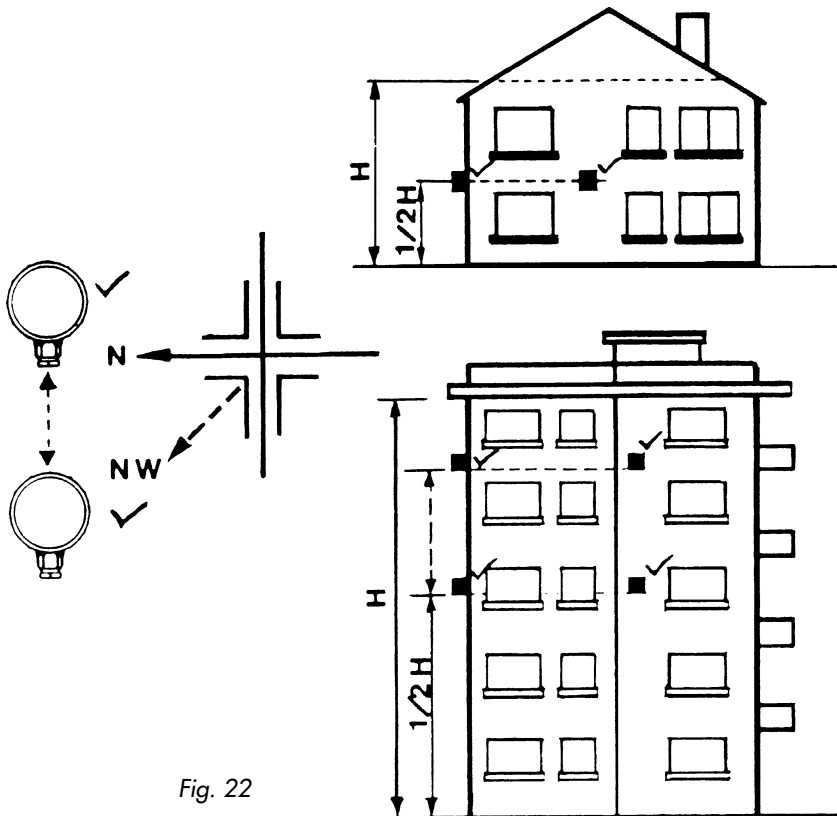


Fig. 22



8 Gas conversion

Only Qualified Personnel may carry out the following regulating and conversion operations. Ferroli S.p.A. declines all responsibility for damage to persons and/or property caused by unauthorized persons having tampered with the appliance. Proceed with the following conversions if the appliance must be used with a different type of gas.

To switch from Natural gas to L.P.G. and vice versa, it will be necessary to change the main injectors and to fit the delayer union to the gas valve (part F. fig. 23). Now adjust the minimum and maximum gas pressure values on the gas valve (see relative paragraph).

9 Adjustments


Adjusting the pressure and flow rate to the main burner

Being the flame modulating type, this appliance has two fixed pressure values: the minimum and maximum rate. These must be those indicated in the chart for each type of gas.



Attention - The minimum pressure must be regulated first. This will ensure correct burner ignition. Following this, regulate the maximum pressure value. Each minimum pressure adjustment involves a variation to the maximum setting value. Since they are particularly delicate, the following regulating operations must only be carried out by Specialized Personnel.


Adjusting the minimum and maximum pressure values

Connect a suitable pressure gauge to the pressure test point above the gas valve.

Keep button  depressed for more than 5 seconds. The following message will appear on the display:

TEST NOT ACTIVATED
CURRENT: 165 mA



Use buttons   on the right to adjust the current to 0 mA.

Press button . The boiler will operate in TEST mode.

TEST ACTIVATED
CURRENT 0 mA

Remove protective cap "b" from the top of the coil.

Adjust the minimum pressure value using nut "c". Turn this screw anticlockwise to decrease the pressure or in a clockwise direction to increase it.

Switch the burner off and on three or four times, depressing keys  and , checking each time that the pressure remains regulated and that the burner regularly ignites. Further adjustment is required if this fails to occur.

Having terminated this operation, check the maximum pressure value.

Delicately depress pin "d" and keep it fully pressed down. If the maximum pressure value must be adjusted, slowly turn adjuster nut "e" in a clockwise direction to increase the pressure and in an anticlockwise direction to lower the pressure value.

Having regulated the minimum and maximum pressure values, reset compensating tap "b". The current value should now be reset to 165 mA.

**TEST ACTIVATED
CURRENT 165 mA**

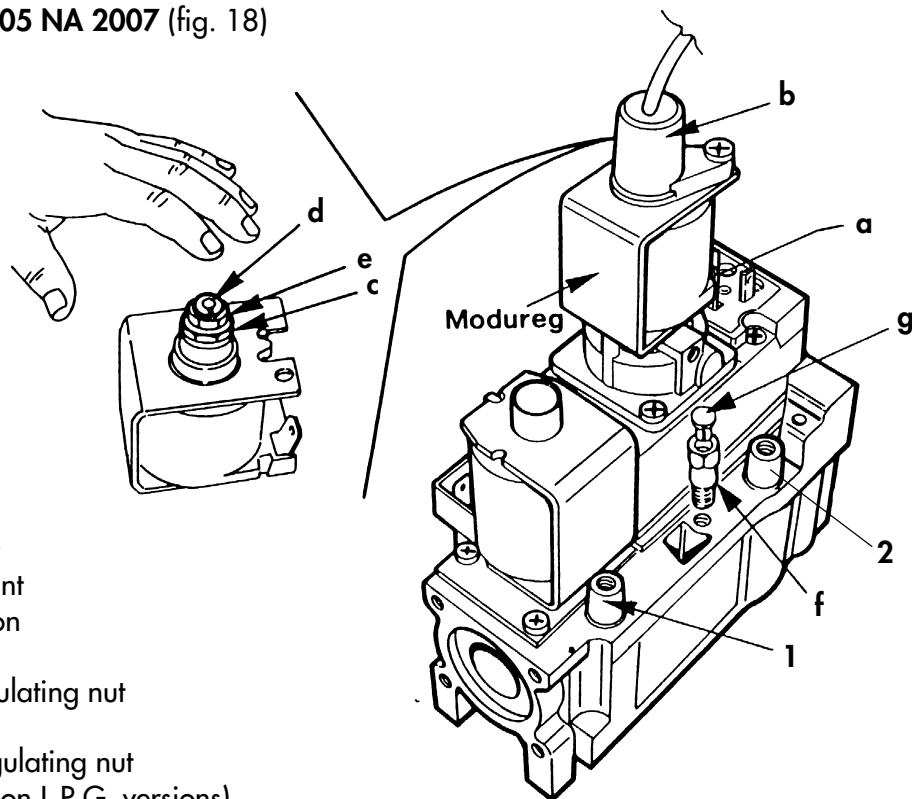
Disactivate the TEST function by depressing button . The boiler will now be ready to operate automatically.

NOTE - The above listed adjustments establish the mechanical travel of the plunger of the "Modureg" modulator between a minimum and maximum setting.

NOTE - The complete "Modureg" unit must be replaced if the "Modureg" coil fails to operate. Any attempts to replace the coil alone would irreparably jeopardize the "Modureg" setting.

Anyone carrying out adjustments with these nut should proceed very delicately.

HONEYWELL valve VR 4605 NA 2007 (fig. 18)



Key

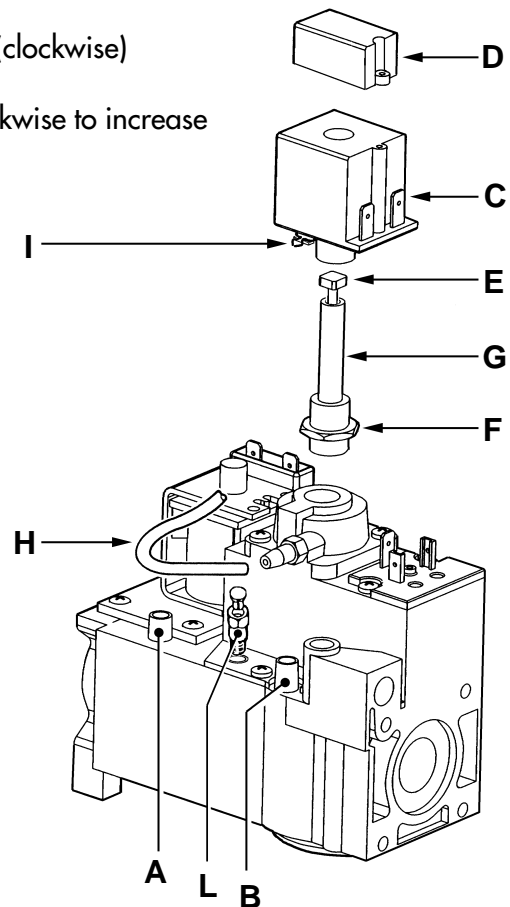
- 1. Inlet pressure test point
- 2. Outlet pressure test point
- a. Electrical coil connection
- b. Balance cap
- c. Minimum pressure regulating nut
- d. Maximum pressure pin
- e. Maximum pressure regulating nut
- f. "Adapter" fitting (only on L.P.G. versions)
- g. Protective cap

Fig. 23

Honeywell VR 4600 N 4002 valve with V7335A4014 Modureg

Gas pressure Adjustment

- 1 - **With the burner lit:**
- 2 - Connect suitable pressure gauge to burner test point "B", and then:
- 3 - Disconnect air pressure compensation tube "H";
- 4 - Disconnect the wires from coil "C" of the Modureg;
- 5 - Remove protective cover "D";
- 6 - Remove coil "C" by opening the coupling spring "I";
- 7 - Screw the minimum adjustment screw "E" up tightly. (clockwise)
- 8 - Unscrew lock nut "F" on sleeve "G";
- 9 - Adjust maximum pressure by rotating sleeve "G" clockwise to increase pressure and anticlockwise to reduce pressure;
- 10 - Tighten sleeve lock but "F" then check that the pressure is still at the required value;
- 11 - Adjust minimum pressure by rotating screw "E" anti-clockwise until the required value is reached;
- 12 - Fit coil "C" by sliding it into the sleeve, pushing and rotating it lightly until the coupling spring "I" clicks into place;
- 13 - Shut down and ignite the burner, checking that the minimum pressure value is stable;
- 14 - Reconnect the wires to coil "C" of the Modureg;
- 15 - Reconnect air pressure compensation tube "H";
- 16 - Replace protective cover "D";
- 17 - Turn burner off, remove pressure gauge, close and test, test point;



Key

A Test point inlet pressure - B Burner test point - C Coil -
 D Protective cover - E Minimum adjustment screw - F Lock nut
 - G Sleeve - H Pressure compensation tube - I Coupling
 spring - L Adapter (for only L.P.G. version)

Adjustment of the heating Δt by varying the circulator flow rate-head

Heat variation Δt (temperature difference in the heating water between the supply and return points of the system) must be less than 20°C. This is obtained by varying the flow rate head of the circulator using the multi-speed variator (or switch) of the same. The Δt value decreases when the speed of the circulator is increased, and vice versa.

Boiler pressure adjustment

The pressure of the water in the heating plant, indicated by the control panel display, must be regulated as described in the relative paragraph.

10. Control panel

Open the hinged door for access to the programming keyboard and combined display. The instructions enabling the user to program the system are affixed to the inner part of the door.

KEYBOARD

The touch keyboard has been designed for immediate and simple programming. The buttons are logically grouped according to the function in question.

The six buttons on the left of the display are used to program the daily heating function while the six buttons on the right are used to set the boiler parameters.

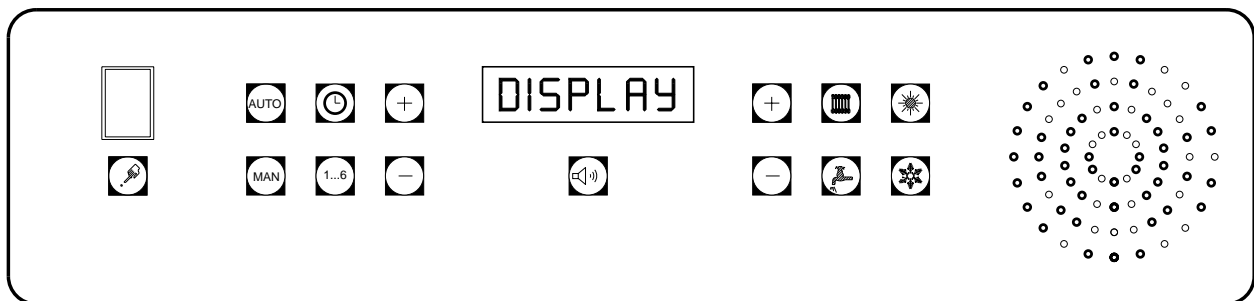
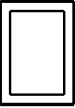












FIGURE 24: KEYBOARD

The button that activates the vocal messages is situated on its own, in the middle of the control panel. The reset button is installed under the lighted main switch.

Each button possesses a single distinct function:

- | | | | |
|---|---|---|---|
|  | Main switch:
powers the boiler |  | Vocal communication |
|  | Boiler release: resets operation after a boiler block |  | Heating temperature adjustment and selection of external probe compensating curve |
|  | Activates daily programming |  | Hot water temperature adjustment and delivered temperature display |
|  | Disactivates daily programming |  | Summer selection |
|  | Time setting:
used to set the time |  | Winter selection |
|  | Programming of the 6 daily heating levels | | |

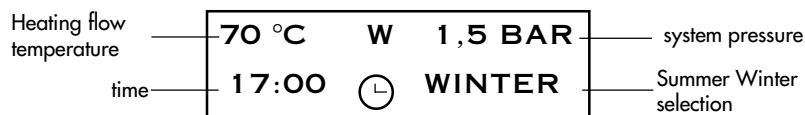


DISPLAY

The alphanumerical **display** with 2 lines of 16 characters allows the user to check the operational parameters of the boiler at any moment and to check the duration at the end of sanitary water production or heating mode. The programmed values can also be displayed, plus the relative flow rate and temperature during the production of sanitary water. Any faults are immediately indicated by the display which starts to flash.

Indications during operation:

During operation, the display shows the time, the temperature of the water in the radiators, the pressure in the plumbing circuit, the choice of summer or winter operation and timed or manual programming.



The following symbols may appear in the middle of the display:

- ⌚ - : indicates that daily programming has been activated

W-: indicates the hold status (2 minutes) after the maximum heating temperature has been reached, or after hot water has been used.

At the beginning of a demand for heating or hot water, the display will indicate the type of demand for 8 sec. and, if hot water has been used, the relative flow rate.

HEATING
DEMAND


D.H.W. DEMAND
FLOW RATE 13 L./MM.

The type and length of the demand will be displayed for 8 sec. at the end of the demand for heating or hot water.

END OF HEATING
DURATION 8 MIN.

END OF D.H.W.
DURATION 30 SEC.

SPEAKING FUNCTION

Press key  and the computer will communicate the operative status of the boiler, the ambient temperature and any faults by synthesized voice.



10.1 Programming the daily heating function

Clock adjustment

Press key

Adjust the time using the left-hand keys .

SET TIME 18:10

Programming the 4 daily heating levels

Press the key once or several times to set the programming level (respectively Levels 1-2-3-4-5-6).

LEVEL 1 7:00 20.0 °C
--

LEVEL 4 14:00 18.0 °C

LEVEL 2 9:00 18.0 °C
--

LEVEL 5 17:00 20.0 °C

LEVEL 3 12:00 20.0 °C

LEVEL 6 23:00 16.0 °C

Use the left-hand keys to regulate the time at which the Level is to begin.

Set the required Level temperature (between 5 and 30° C) using the right-hand keys .

Note: If a temperature of >30°C is set in one of the 6 Levels, the room sensor will control the heating function throughout the entire duration of that Level, as in manual operation.

Activating and deactivating daily programming

Press the key to activate the daily heating program (symbol will appear on the display .

Press key to deactivate the daily program (symbol will disappear from the display and heating will be controlled by the room sensor).



10.2 Programming the boiler parameters


General information

For access to the boiler programming parameters, just depress the relative function keys. The display indications will consequently change. Note that each key correspond to a single function.



After having selected a function, it will be possible to quit data entry mode in two ways:

- automatically after 8 sec. if no key has been pressed
- by pressing the same function key again.

Boiler flow temperature

Digit key . The following display message will appear


CONTROL TEMP.
C.H.: 85 °C

The delivery temperature may be regulated between 30° C and 85° C by means of the right-hand keys  



NOTE: When the external sensor is connected, set the temperature to 85°C and choose the compensation curve.

Setting the compensation curve of the external probe

Compensation curves must be set according to the characteristics of the heating system and the structural features of the building. This function is only activated when the external probe is connected.

Press key  twice for access to the programming mode. The following message will appear on the display:

SELECT OTC CURVE
C.H.: 7

Set the desired curve (from 1 to 10) using the right-hand keys  . Consult the table on the following page in order to choose the most suitable curve.

The external sensor will be deactivated if 0 is entered for the compensation curve.



Graph of plant delivery temperatures according to the external temperature and the set compensation curve.

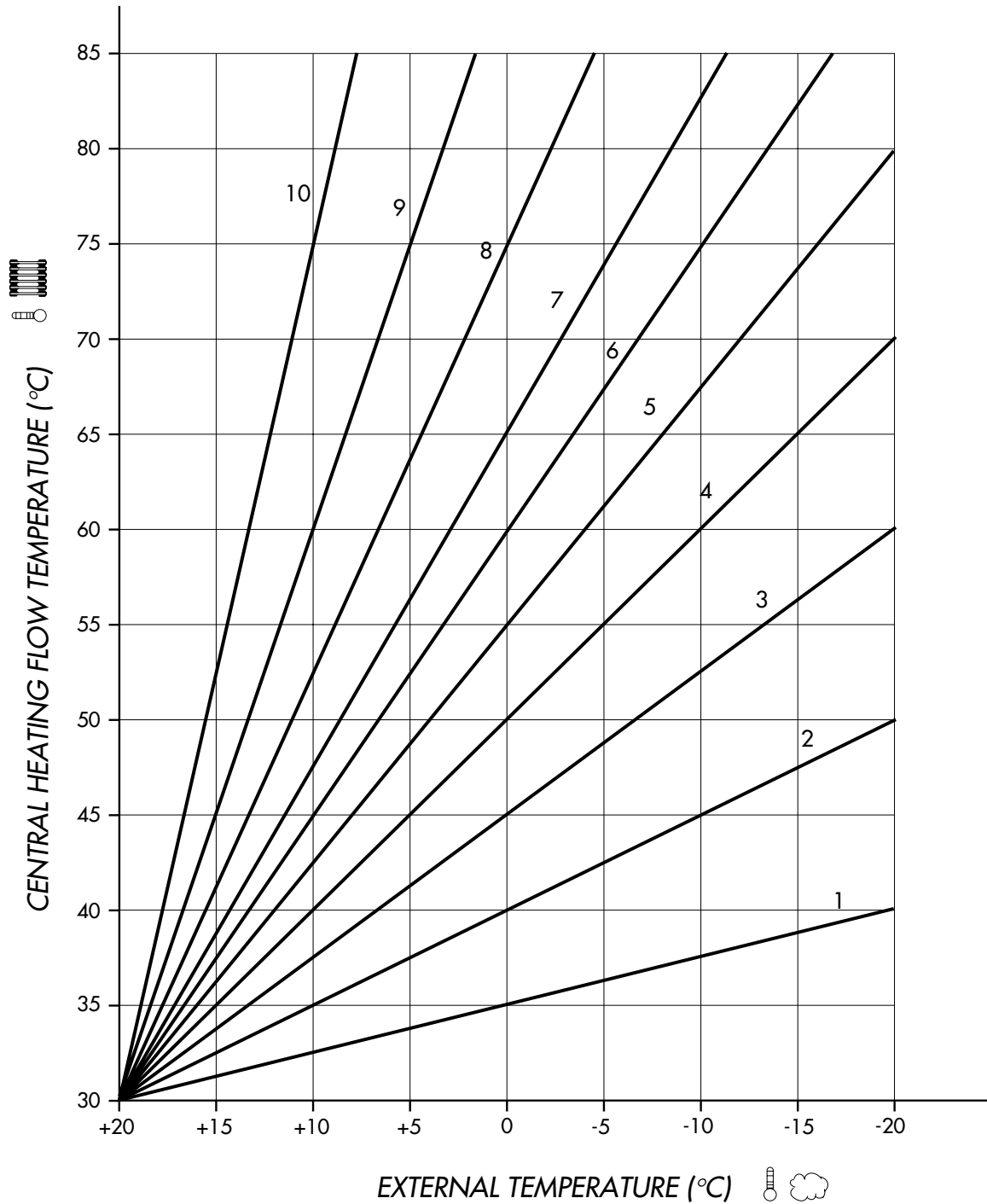




Fig. 25



Regulating the hot water temperature


Press key  once.

Set the temperature of the hot water to the required value between 40 and 65°C using the right-hand keys  . It is inadvisable to exceed a temperature of 50°C.

Also remember that, when multiplied by the water flow rate per minute and for 60 minutes, the product of the temperature difference between the D.H.W. output and input in the boiler cannot exceed the effective rating of the boiler itself.

CONTROL TEMP. D.H.W.: 50 °C

Hot water temperature and flow rate display

Press key  twice. The flow rate will appear on the lower left-hand side of the display with the temperature on the right.

FLOW D.H.W. TEMP. 13 L./M. 50 °C



10.3 Switching the boiler on and off

Inspections to make when switching on for the first time

When the boiler is being switched on for the first time, it is advisable to check that:

- the on-off valves between the boiler and systems are open;
- the entire system is well charged and vented;
- there are no gas or water leaks from the system or boiler;
- the electric connection is correct and that the earth wire is connected to an efficient earthing system;
- there are no inflammable liquids or materials in the immediate vicinity of the boiler;
- the gas pressure and flow rate values are those required for heating.

Switching on the boiler

- Open the gas cock prior to the boiler.
- Purge gas supply.
- Power the boiler by means of the main switch.
- Select summer or winter operation by means of the relative buttons.
- Adjust the knob of the room sensor to the desired value (if winter mode is selected) or open a hot water tap.

Switching off

Close the gas cock prior to the boiler and turn off the main switch.

Warnings - If the boiler is to remain inactive during the winter period, it is advisable to drain off all the water in order to prevent damage due to freezing. Failing this, just drain off the hot water and put a special antifreeze product into the heating system.

Inspections and monitoring after ignition

When switching on for the first time:

Check that the gas and plumbing systems are sound.

Check that the boiler ignites correctly. Test this by switching it on and off a few times by means of the regulating thermostat.

Check the efficiency of the air-flue pipe during boiler operation.

Check that the fuel consumption indicated by the meter corresponds to that indicated in the technical data.

Check that water correctly circulates between the boiler and systems.

Check that when a hot water tap opens during "Winter" mode, the circulator stops and regular production of hot water occurs.

Check that the burner switches on and off in the correct way when the hot water tap opens and closes in "Summer" mode.

Check that the gas valve modulates correctly during both the heating and hot water production phases.



11 Maintenance and troubleshooting

11.1 Routine maintenance

Only Qualified Personnel must carry out the following operations.

Seasonal inspections of the boiler

It is advisable to have Qualified Personnel check the appliance at least once a year:

The pressure of the water in the cold plant must be between 0.5 and 1 bar. Check that it does not exceed 1.5 bar when hot;

The control and safety devices (gas valve, flow switches, thermostats, etc.) must operate correctly;

The burner and exchanger must be clean. Use soft brushes or compressed air to prevent the parts from being damaged. never use chemical products;

The expansion tank must be full;

The gas and water systems must be sound;

The end part of the air-flue duct must be free from obstructions and must not leak;

The electrodes must be free from deposits and correctly positioned;

The gas flow rate and pressure must correspond to the indications in the relative tables;

The circulation pump must spin free.

Cleaning the boiler and burner

The boiler needs no particular maintenance. Just clean it once a year. Never use chemical products or steel brushes to clean the casing or the burner.

Particular care must be taken of all retention systems pertaining to the hermetic chamber (seals, cable clamps, etc.). This will prevent air leaks which, causing a pressure drop in the chamber itself, could activate the differential pressure switch which would block the boiler.

After all these operations have been carried out, particular care must also be taken to check and carry out all ignition and operation phases of the thermostats, gas valve and circulation pump.

Check that there are no gas leaks after these inspections.

11.2 Diagnosis and troubleshooting

The microcomputer will make a complete diagnosis during boiler operation. When a fault is detected, the display will flash and give an error message. Boiler operation will be inhibited and reset at the end of the fault. Manual reset is sometimes necessary (digit key).

List of diagnostic messages

The display and vocal message clearly indicate all types of fault. The following table lists the most common causes that may have generated the faults. Symbol in the right-hand column indicates that manual reset is necessary.

Display message	Causes and remedies	Reset
<div style="border: 1px solid black; height: 40px; width: 200px;"></div>	(Display off) No 230V power supply <i>Wait until 230V power returns</i> <i>Check 230V power supply and fuse</i>	
<div style="border: 1px solid black; padding: 5px;">ER 1 IGNITION PROBLEM</div>	No gas <i>Check gas system</i> Defective gas valve <i>Repair or replace the valve</i> Clogged injectors <i>Thoroughly clean the injectors</i> Gas pressure too low <i>Check pressure</i> No spark between electrodes during ignition phase <i>Check that the boiler is connected to the main with a good ground connection</i> <i>Check safety thermostat</i> <i>Check that the electrodes are correctly positioned and without incrustations</i> <i>Check electrical power supply</i> <i>Check that the Phase-Neutral are not inverted</i>	
<div style="border: 1px solid black; padding: 5px;">ER 2 IGNITION PROBLEM</div>	<i>Check ignition P.C.B. and electrical connections</i>	
<div style="border: 1px solid black; padding: 5px;">ER 3 FLAME LOST DURING OPERATION</div>	<i>Check ignition P.C.B. and electrical connections</i>	
<div style="border: 1px solid black; padding: 5px;">ER 4 FLAME NOT EXTINGUISHED</div>	<i>Leaks from the gas valve</i>	



<p>ER 5 FAULT AIR PRESS SWITCH</p>	<p>Defective pressure switch or clogged tubes <i>Check connections</i> <i>Replace pressure switch or clean tubes</i></p>	
<p>ER 6 BROKEN PROTECT SENSOR</p>	<p>Water temperature too high</p>	
<p>ER 7 FAULT C.H. SENSOR</p>	<p>Defective heating temperature sensor <i>Check connections or replace the sensor</i></p>	
<p>ER 8 FAULT S.H.W. SENSOR</p>	<p>Defective hot water temperature sensor <i>Check connections or replace the sensor</i></p>	
<p>ER 9 FAULT PROTECT SENSOR</p>	<p>Defective temperature limit sensor <i>Check connections or replace the sensor</i></p>	
<p>ER 10 WATER PESSURE TOO LOW</p>	<p>Plumbing system empty <i>Check plumbing system</i> Expansion tank defective <i>Check expansion tank</i></p>	
<p>ER 11 WATER PRESSURE TOO HIGH</p>	<p>Leaks from supply cock <i>Check plumbing system</i> Expansion tank defective <i>Check expansion tank</i> The plant has been filled when cold at an excessively high pressure <i>Reset the plant to an adequate pressure</i></p>	
<p>ER 12 FAULT MODUREG</p>	<p>Defective gas valve modulator <i>Check the coil</i> No power to Modureg <i>Check electrical connection</i></p>	
<p>ER 14 BAD WATER CIRCULATION</p>	<p>Blocked circulation pump <i>Release circulator by removing the plug, then turn the shaft with a screwdriver</i> <i>Check or replace the condenser or circulator</i></p>	
<p>ER 15 BROKEN ABOVE LIMIT</p>	<p>The water temperature has reached the safety limit.</p>	

Phone numbers:

Installer _____

Service Engineer _____

**BECAUSE OF OUR CONSTANT ENDEAVOUR FOR IMPROVEMENT DETAILS
MAY VARY SLIGHTLY FROM THOSE QUOTED IN THESE INSTRUCTIONS.**



ALL SPECIFICATIONS SUBJECT TO CHANGE

Lichfield Road, Branston Industrial Estate, Burton Upon Trent, Staffordshire DE14 3HD
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