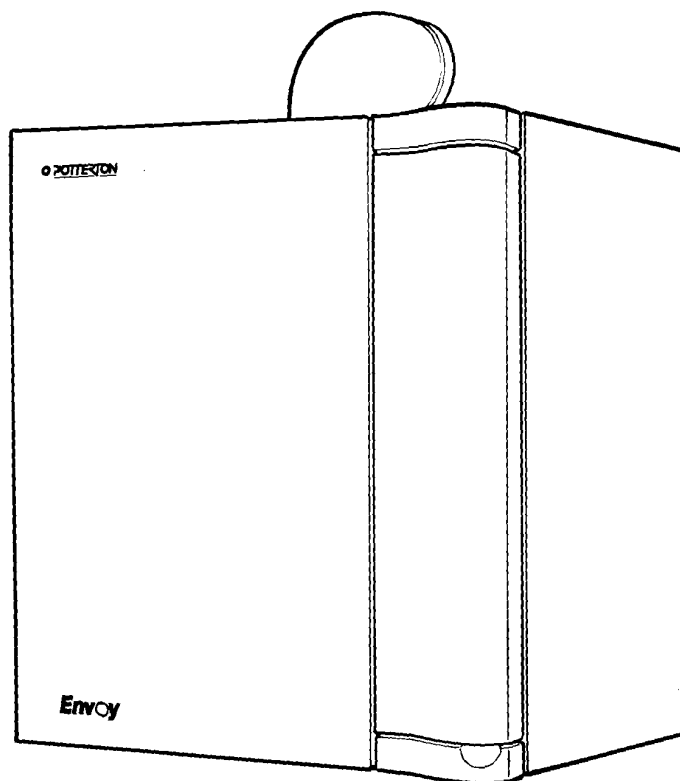


Installation & Service Instructions

POTTERTON ENVOY 30, 40, 50, 60, & 80 FAN POWERED BALANCED FLUE GAS FIRED CONDENSING BOILER



THE GAS SAFETY (INSTALLATION AND USE) REGULATIONS

“In your own interest, and that of safety, it is law that all gas appliances are installed by competent persons, in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution.”

The polythene bags used for packaging are a potential hazard to babies and young children and **MUST BE DISPOSED OF IMMEDIATELY.**

LEAVE THESE INSTRUCTIONS WITH THE USER FOR USE ON FUTURE CALLS

For Use With Natural Gas
(G20) Only At 20mbar For
Use in GB & IE



IMPORTANT
PLEASE READ THIS BOOK
BEFORE INSTALLING
OPERATING OR SERVICING
THIS APPLIANCE



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The Potterton ENVOY is a high efficiency lightweight, automatically controlled wall hung gas fired condensing boiler. The flue system is room sealed and fan powered. There are five models available with outputs of 8.8kW (30,000 Btu/hr), 11.7kW (40,000 Btu/hr), 14.6kW (50,000 Btu/hr), 17.6kW (60,000 Btu/hr) and 23.4kW (80,000 Btu/hr).

The boilers which are designed to provide domestic hot water and/or central heating must be used on INDIRECT FULLY PUMPED systems only, which may be sealed or open vented.

The boilers can be supplied with either of the following flue systems:-

One metre, 1.5 metre, 2 metre, 2.5 metre or 3 metre horizontal and one metre, 1.5 metre, 2 metre, 2.5 metre or 3 metre vertical.

ACCESSORIES

The following Potterton Myson controls are recommended for use with your boiler:-

Electronic Programmer EP2002, EP3002 or EP6002
 Cylinder Thermostat PTT2 or PTT1 00
 Room Thermostat PRT2 or PRT100
 Frost Thermostat PRT100FR
 Motorised Zone Valve M5V222 or M5V228
 Motorised Diverter Valve M5V322
 Thermostatic Radiator Valve

Data sheets describing these products are available on request.

OPTIONAL EXTRA

Terminal Wall Plate - where necessary can be fitted to the outside wall face to improve the appearance, after making good around the terminal. Part No. 236349. Terminal guard Part No. 236591.

Flat roof flashing kit for use with vertical flue.

Part No. 430080.

Pitched roof flashing kit for use with vertical flue.

Part No. 430081.

TECHNICAL DATA – Page 3

Boiler Output		30	40	50	60	80
Heat Input	kW Btu/hr	10.1 34,500	13.43 45,800	16.87 57,600	20.2 68900	26.86 91,600
NONE CONDENSING Heat Output	kW Btu/hr	8.79 30,000	11.72 40,000	14.65 50,000	17.58 60,000	23.45 80,000
CONDENSING Heat Output	kW Btu/hr	9.7 33,100	12.8 43,700	16.1 55,000	19.0 64,800	25.0 85,400
Gas Rate	M3/h ft3/hr	0.96 34.0	1.28 45.2	1.6 56.7	1.92 68.0	2.56 90.4
Burner Pressure	mb in/wg	11.4 4.6	11.8 4.7	11.8 4.7	10.6 4.24	12.2 4.9
Injector Size mm		2.5	2.9	3.2	3.7	4.2

Classification	12H. C1. C3. 1P20
Burner	Furigas Pre-mix
Igniter	Norton 401S Hot Surface
Flame Detector	Morgan Matroc
Gas Control Valve	SIT Nova Mix 1-8 Air Gas Ratio
Electrical Supply	230V - 50Hz
Fuse Rating - External	3A
Packed Weight	37.0 Kg
Water Capacity	2.4 Litres
Gas Supply Connections	1/2" BSP Female Gas Cock
Flow Connections	22mm Compression
Return Connections	22mm Compression
Condense Discharge Connection	21.5mm (3/4") Plastic Compression
Maximum Flow Temperature	82 Degree Centigrade
Maximum Static Head	30.5M (100 Ft) Measured from the top of the casing
Minimum Static Head	150mm (6") Measured from the top of the casing
Flue Size	100mm Concentric

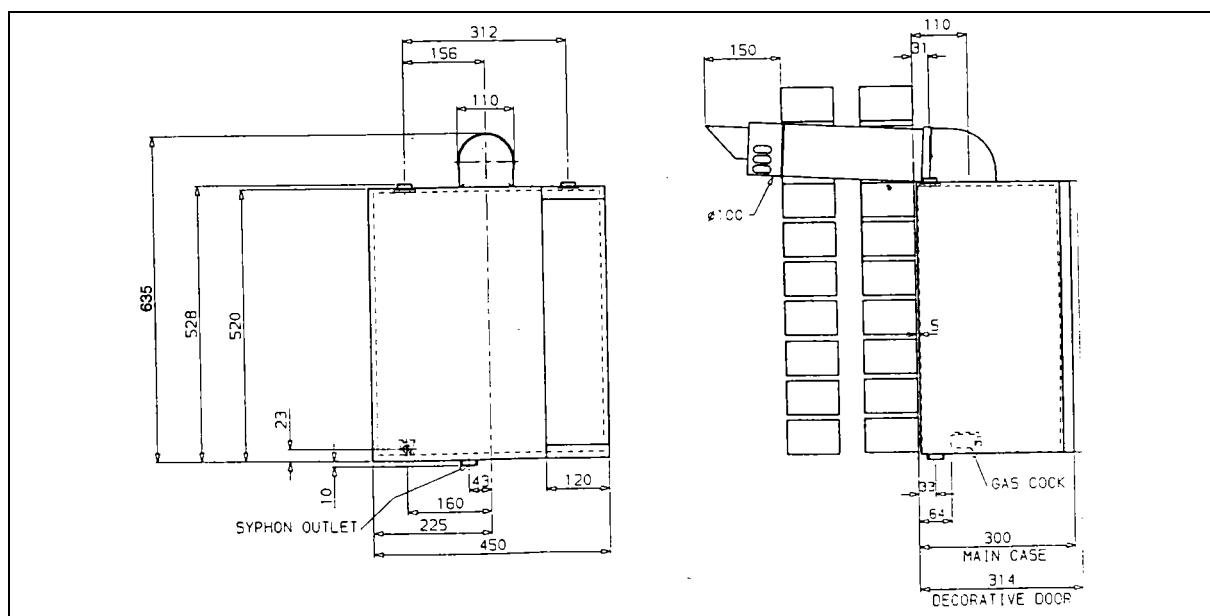


FIG.1 BOILER DIMENSIONS

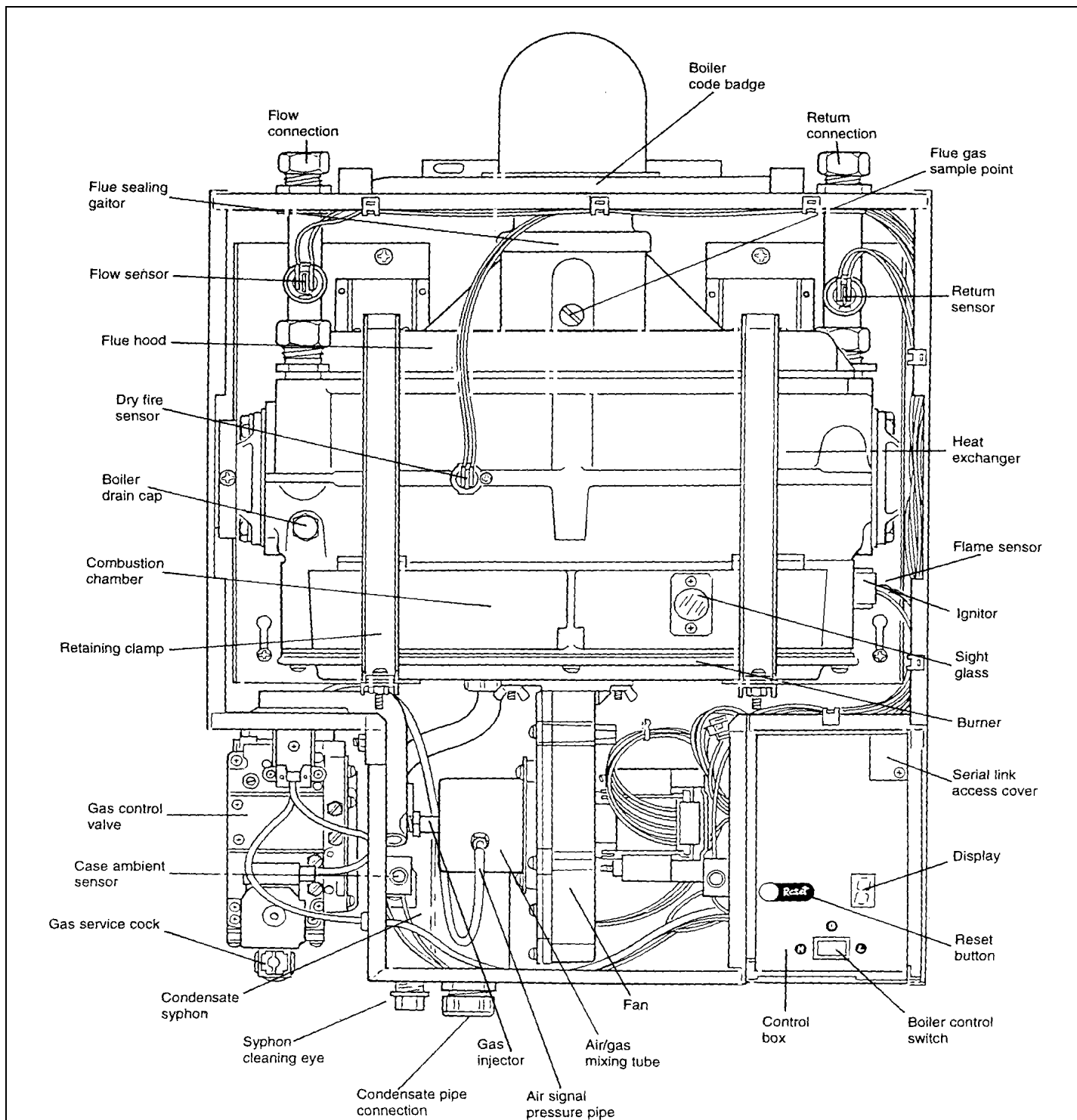


FIG.2 GENERAL ARRANGEMENT

INSTALLATION REQUIREMENTS – Page 5

GENERAL INFORMATION

Both the user and the manufacturer rely heavily on the installer, whose job it is to install the boiler and connect it to a correctly designed heating system. Acquaint yourself with the British Standards concerning installation requirements. If you need advice on any points, Potterton Service Operations will be pleased to help (see back page).

CODES OF PRACTICE

I.E.E. Regulations

Model Water Bye Laws

Building Regulations/Building Standards for Scotland. Health and Safety Document No.635. (The Electricity at Work Regulations 1989).

BS.6891	Installation of low pressure pipes.
BS.6798	Installation of gas boilers of rated input not exceeding 60kW.
BS.5449	Forced circulation hot water CH systems. Including smallbore and microbore domestic central heating systems.
BS.5546	Installation of gas hot water supplies for domestic purposes.
BS.5440:1	Flues (for gas appliances of rated input not exceeding 60kW).
BS.5440:2	Air supply (for gas appliances of rated input not exceeding 60kw).
BG.DM2	Guide for gas installation in timber framed buildings.

Note: Samples of Envoy boiler have been examined by the Netherlands Notified Body, Gastec and the range is certified to comply with the essential requirements of the GAD and is permitted to carry the CE Mark.

It is important that no external control devices e.g. flue dampers, economisers etc, be directly connected to this appliance unless covered by these Installation and Service instructions or otherwise recommended by Potterton in writing. If in doubt please enquire.

Any direct connection of a control device not recommended by Potterton could invalidate the certificate and the normal appliance warranty and could also infringe the Gas Safety Regulations.

Manufacturers instructions must not be taken in any way as over-riding statutory obligations.

ELECTRICITY SUPPLY

A 230 volts - 50Hz, single phase electricity supply fused to 3 amperes, must be provided in accordance with the latest edition of the IEE Wiring Regulations and any other local regulations that apply. The current rating of the wiring to the boiler must exceed 3 amperes and have a cross sectional area of at least 0.75mm² in accordance with BS.6500, Table 16.

The supply to the boiler and its associated equipment should be controlled by an exclusive 3A fused double pole switch (having at least 3mm contact separation in both poles) so that complete isolation from the supply can be achieved to enable servicing work to be carried out in safety.

GAS SUPPLY

A gas supply pressure of 20 mbar is required at the inlet to the appliance. Performance data is based on use of reference gas G20.

CONDENSATE DRAIN

The condensate outlet on the boiler is designed to accept 21.5mm (3/4 in) plastic overflow pipe, which if possible should discharge into the household drainage system and have an internal termination. If this is not practical, discharge into an outside gully or soak away is acceptable. To avoid blockage of this pipe due to freezing it should be routed internally where possible and have sufficient fall over its entire length to dispose of condensate quickly. See British Gas Guidance Notes for the Installation of Domestic Gas Condensing Boilers'.

LOCATION OF BOILER

These boilers are not suitable for external installation and should not be fitted directly above a cooking appliance. The boiler may be installed in any room, although particular attention is drawn to the requirements of the current IEE Wiring Regulations and in Scotland, the electrical provisions of the Building Standards applicable in Scotland with respect to the installation of the appliance in a room containing a bath or shower.

INSTALLATION REQUIREMENTS – Page 6

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.

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

It should be noted that due to the high efficiency of this boiler a white plume of condensate will be emitted from the flue terminal therefore care should be taken when selecting the terminal position.

Ensure that the gas supply pipe and meter are large enough for the appliance and any others that may be run off the same meter. Reference should be made to BS.6891.

BOILER MOUNTING SURFACE

The boiler must be mounted on a flat wall, which may be of combustible material and must be sufficiently robust to take the weight of the boiler. The requirements of the local authorities and the Building Regulations must be adhered to.

IMPORTANT NOTICE:–TIMBER FRAMED HOUSES

If the appliance is to be fitted in a timber framed building, it should be fitted in accordance with British Gas Publication 'Operational Procedures for Customer Service' Part 19. If in any doubt, advice should be sought from the local region of British Gas.

CLEARANCES AROUND THE BOILER

The following minimum clearances must be maintained after installation, for correct operation and servicing of the boiler:

610mm (2ft)	at the front of the boiler
5mm (0.2 in)	each side of the boiler
140mm (5.5 in)	at the top (measured from the top of the boiler case)
100mm (4 in)	at the bottom of the boiler

VENTILATION

If the boiler is to be installed in a confined space such as a cupboard, the space will need ventilating. Openings must be provided at the top and bottom of the cupboard each of which should have a free area as shown in TABLE 1. Further details for installation of a boiler within a compartment are given in BS.6798.

TABLE 1

	AIR VENT AREAS	
	in ²	cm ²
30	16	103
40	21	135
50	26	170
60	32	206
80	43	277

If the openings draw air from outside the building the free areas may be halved. Refer to BS.5440 Part 2 for further guidance.

FLUE TERMINAL AND DUCTING (Fig. 3a, b & c)

The standard **horizontal** flue system (Potterton Part No. 236346) is suitable for installations up to 1030mm, measured from the centre line of the boiler outlet to the outside face of the wall.

One metre flue extension kits (Part No. 430085) are available to extend horizontal flues to a maximum length of 2920mm. The siting positions for horizontal flue terminals are shown in Figs. 3a, b & c.

A concentric vertical flue system is available (Part No. 236348) which when used in conjunction with **one metre flue extension kits** (Part No. 430085) is suitable for flue heights up to 3 metres to terminate through a roof.

The siting of the flue terminal through a roof is shown in Fig. 3c.

Only the above flue systems should be used with Envoy boilers.

As with all condensing boilers, the flue will produce a plume of visible condensation for much of the time that the boiler is running.

Care must therefore be taken in the siting of the terminal so as not to be a nuisance to adjacent property.

In particular, prolonged wetting of a facing wall should be avoided, if necessary by use of an appropriate deflector.

If a horizontal flue is sited less than 2m above a balcony, above ground, or above a flat roof to which people have access, a suitable terminal guard must be fitted. This serves two purposes, to protect the terminal against damage or interference and to protect passers-by. A terminal guard is available (Part No. 236591).

INSTALLATION REQUIREMENTS – Page 7

Note: Where a flue terminal is installed less than one metre from a plastic, or painted gutter, or 500mm from painted eaves, an aluminium shield one metre long, should be fitted to the underside of the gutter or painted surface. A suitable wall plate should be fitted to the painted wall surface of a mobile home.

IMPORTANT: It is absolutely ESSENTIAL to ensure that products of combustion discharging from the terminal cannot re-enter the building, or any other adjacent building, through ventilators, windows, doors, natural air infiltration, or forced ventilation/air conditioning. If products of combustion are found to be re-entering any building, the appliance MUST be turned OFF IMMEDIATELY.

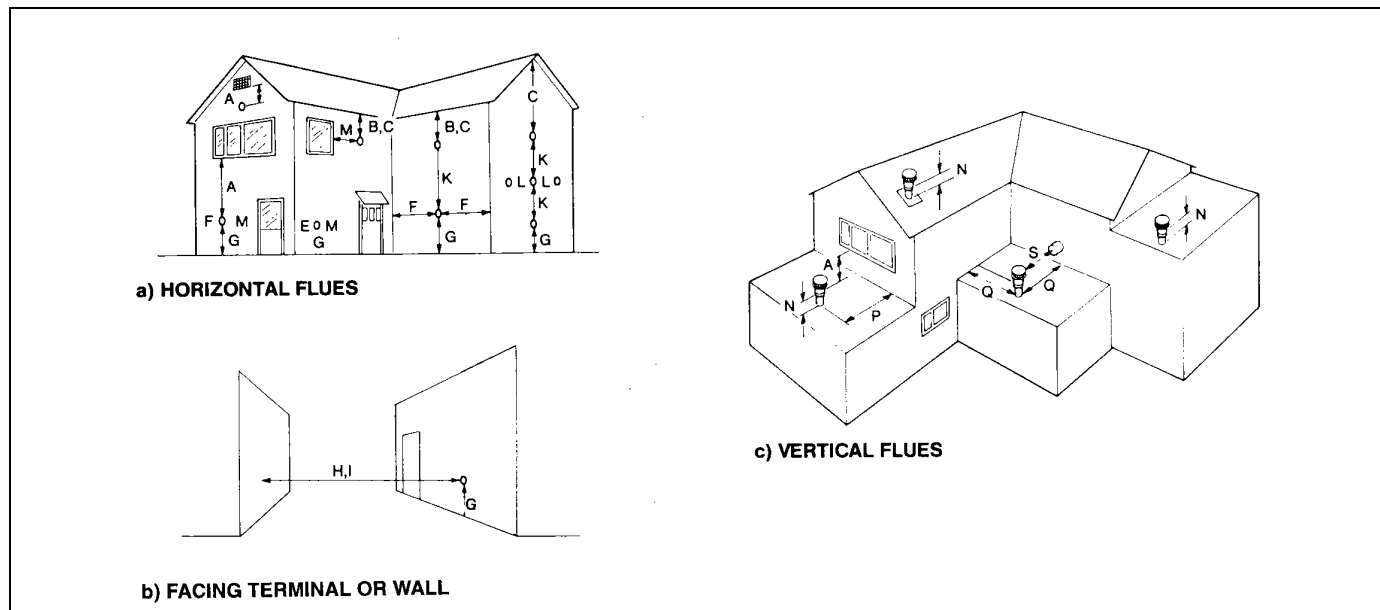


FIG. 3 FLUE TERMINAL POSITIONS

	Mm. Distance mm
A DIRECTLY BELOW AN OPENABLE WINDOW, AIR VENT, OR ANY OTHER VENTILATION OPENING	300
B BELOW GUTTER, DRAIN/SOIL PIPE	75
C BELOW EAVES (HORIZONTAL FLUE ONLY)	200
* BELOW A BALCONY/CARPORT ROOF	NOT RECOMMENDED
E FROM VERTICAL DRAIN PIPES AND SOIL PIPES	75
F FROM INTERNAL OR EXTERNAL CORNERS	300
G ABOVE ADJACENT GROUND OR BALCONY LEVEL	300
H FROM A SURFACE FACING THE TERMINAL	600
I FACING TERMINALS	1200
* FROM OPENING (DOOR/WINDOW) IN CARPORT INTO DWELLING	NOT RECOMMENDED
K VERTICALLY FROM A TERMINAL ON THE SAME WALL	1,500
L HORIZONALLY FROM A TERMINAL ON THE SAME WALL	300
M ADJACENT TO OPENING	300
N ABOVE ROOF LEVEL (TO BASE OF TERMINAL)	300
P FROM ADJACENT WALL TO FLUE	300
Q FROM INTERNAL CORNER TO FLUE	400
* BELOW EAVES OR BALCONY (VERTICAL FLUE)	NOT RECOMMENDED
S FROM FACING TERMINAL	2000

THE SYSTEM – Page 8

The Envoy boiler has an aluminium alloy heat exchanger therefore all systems need to be thoroughly cleansed and the correct treatment added to the system water.

The only system additives recommended by Potterton are FERNOX-COPAL or GRACE DEARBORN-SENTINEL X 100 and should be used in accordance with the manufacturers instructions. This will include use of the appropriate system cleanser.

The boiler must be used on INDIRECT FULLY PUMPED systems only, which may be sealed or open vented.

The system should be designed so that the maximum static head does not exceed 30.5m (100ft) and a minimum of 150mm (6in). See FIG. 4.

On all systems the pump live should be wired to the boiler terminal block, it will then be controlled by the pump over-run timer. This will ensure that the pump will continue to run after boiler shut down if the water temperature is high, thus preventing nuisance operation of the overheat control.

It is important that where electrically operated zone valves are used the boiler is wired so it does not cycle when the zone valves are closed. Also, systems fitted with controls that close both hot water and central heating circuits while the boiler is still hot, must be fitted with a by-pass circuit to dissipate residual heat from within the boiler.

If a three port diverter valve is used as shown in FIGS. 4 & 5 a by-pass is not necessary since one circuit is always open.

Where a pair of two port valves are used, a by-pass is necessary. The total length of the by-pass circuit taken from the boiler connections should be greater than 4 metres of 22mm pipe. It should be fitted with a lockshield valve and be adjusted to maintain a minimum flow through the boiler of 4.5 litres/mm (1 gal/mm) see FIGS. 4 & 5.

Systems fitted with controls which allow the boiler to operate when both the hot water and central heating circuits are closed i.e. mechanically operated thermostatic control valves, must be fitted with a by-pass circuit capable of:-

1. Dissipating a minimum of 1kW (3400 Btu/h).
2. Maintaining a minimum water flow through the boiler of 9 litres/mm (2 gal/mm).

A suggested method of meeting these requirements by using a bathroom radiator fitted with two lockshield valves is shown in FIGS. 4 & 5.

Drain off taps should be fitted in the pipework close to the boiler and in the low points of the system.

NOTE

Although the system can be emptied using the drain off taps installed in the pipework around the system, to empty the boiler it is necessary to remove the drain off cap positioned within the boiler case. See FIG. 2.

SEALED SYSTEMS

Installation

The installation must comply with the requirements of BS.6798 1987 and BS.5449 Part 1. The B.G. publication "British Gas Specification for Domestic Wet Central Heating Systems" should also be consulted.

SAFETY VALVE

A non-adjustable spring-loaded safety valve, preset to operate at 3 bar (451bf/in²) shall be used. It must comply with BS.6759 Part 1 and include a manual testing device. It shall be positioned in the flow pipe either horizontally or vertically upwards and close to the boiler. No shut-off valves are to be placed between the boiler and the safety valve. The valve should be installed into a discharge pipe which permits the safety discharge of steam and hot water such that no hazard to persons or damage to electrical components is caused.

PRESSURE GAUGE

A pressure gauge incorporating a fill pressure indicator, covering the range 0-4 bar (60lbf/in²) shall be fitted to the system. It should be connected to the system, preferably at the same point as the expansion vessel. Its location should be visible from the filling point.

THE SYSTEM – Page 9

EXPANSION VESSEL

A diaphragm type expansion vessel to BS.4814 Part 1 shall be fitted close to the inlet side of the pump. The connecting pipework should not be less than 15mm (1/2in nominal). Pipework connecting the expansion vessel should not incorporate valves of any sort.

Methods of supporting the vessel are supplied by the manufacturer. The nitrogen or air charge pressure of the expansion vessel shall not be less than the hydrostatic head (height of the top point of the system above the expansion vessel). To size the expansion vessel it is first necessary to calculate the volume of water in the system in litres. The following volumes may be used as a conservative guide to calculating the system volume.

Boiler Heat Exchanger	2.4 litres
Small Bore Pipework	1 litre per kW of system output
Micro Bore Pipework	7 litres
Steel Panel Radiators	8 litres per kW of system - output
Low Water Capacity - Radiators	2 litres per kW of system - output
Hot Water Cylinder	2 litres

If the system is extended, the expansion vessel volume may have to be increased unless previous provision has been made for the extension. Where a vessel of the calculated size is not available, the next available larger size should be used.

The boiler flow temperature is controlled at approximately 82°C MAX.

The vessel size can now be determined from the following table where V=System volume in litres.

Vessel Charge Pressure (Bar)	0.5	1.0
Initial System Pressure (Bar)	1.0	1.0
Expansion Vessel Volume Litres	$V \times 0.11$	$V \times 0.087$

CYLINDER

The hot water cylinder must be an indirect coil type or a direct cylinder fitted with an immersion calorifier suitable for operating at a gauge pressure of 0.3 bar (Slbf/in²) in excess of safety valve setting. Single feed indirect cylinders are not suitable for sealed systems.

METHOD OF MAKE-UP

Provision shall be made for replacing water loss from the system either:-

- i) from a make-up vessel or tank mounted in a position higher than the top point of the system, and connected through a non-return valve to the system on the return side of hot water cylinder or the return side of all heat emitters.
or
- ii) where access to make-up vessel would be difficult by using the mains top up method or a remote automatic pressurisation and make-up unit as illustrated in FIG. 5, Methods 1 and 2.

MAINS CONNECTION

There shall be no connection to the mains water supply or to the water storage tank which supplies domestic water even through a non-return valve, without the approval of the local Water Authority.

FILLING POINT

The system shall be fitted with a low filling point at low level which incorporates a stop valve to BS.1010 and a double check valve (approved by the National Water Council) to be fitted in this order from the system mains, refer to FIG. 5, Method 1.

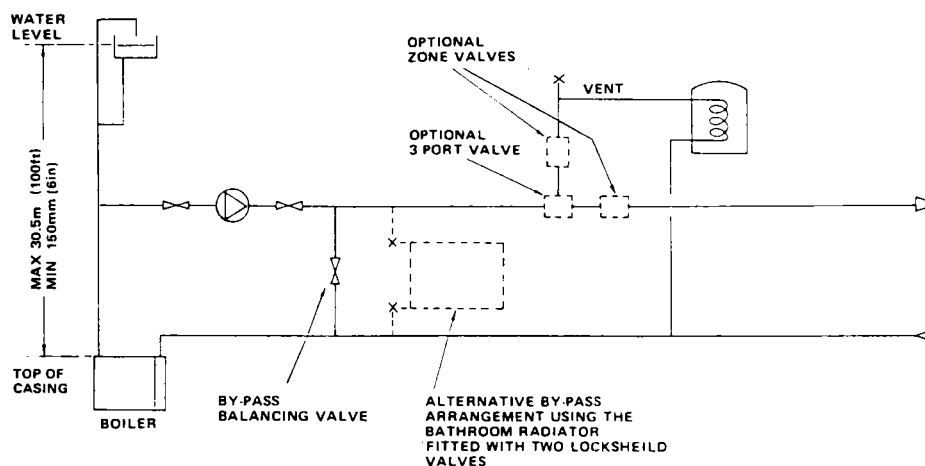
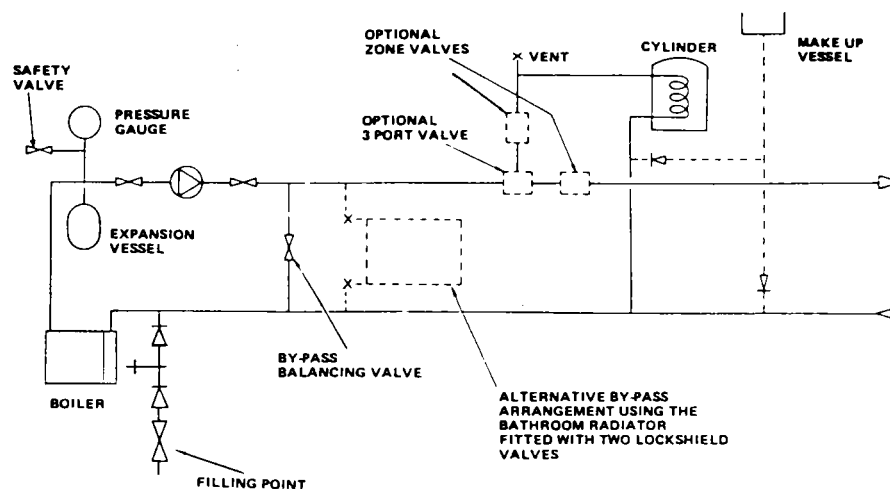


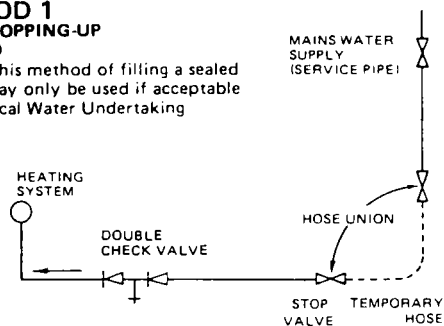
FIG. 4: OPEN VENTED FULLY PUMPED SYSTEM FITTED WITH A COMBINED FEED AND VENT



Two methods of filling a sealed water system

METHOD 1 MAINS TOPPING-UP METHOD

NOTE: This method of filling a sealed system may only be used if acceptable to the Local Water Undertaking



METHOD 2 CISTERN FILLING METHOD

NOTE: Cistern to be supplied through a temporary connection from a service pipe or cold water distributing pipe

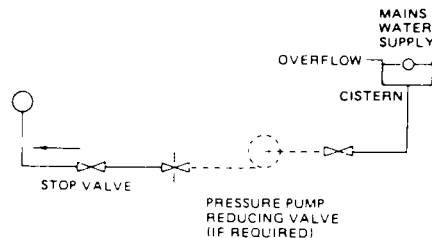


FIG. 5: FULLY PUMPED SEALED SYSTEM.

CIRCULATION PUMP SELECTION – Page 11

The resistance through the heat exchanger when operating with a water flow rate producing an 11°C temperature rise at maximum boiler output are shown in TABLE 2. If other controls, such as three-position valves are used in the system, the resistance through them, quoted in their manufacturer's literature must be taken into account. The pump may be fitted on

either the flow or return and MUST be wired directly to the boiler terminal block. It must be fitted with two isolating valves which are positioned as close to the pump as possible. Closing of any valve must always leave the open vent unobstructed.

TABLE 2

Boiler Size	Water Flow Rate		Boiler Resistance	
	Litres/sec	gal.min	mb	in wg
30	0.19	2.5	17.5	7.0
40	0.25	3.34	30.0	12.0
50	0.32	4.17	44.0	17.5
60	0.38	5.0	60.0	24.0
80	0.51	6.67	105	42.0

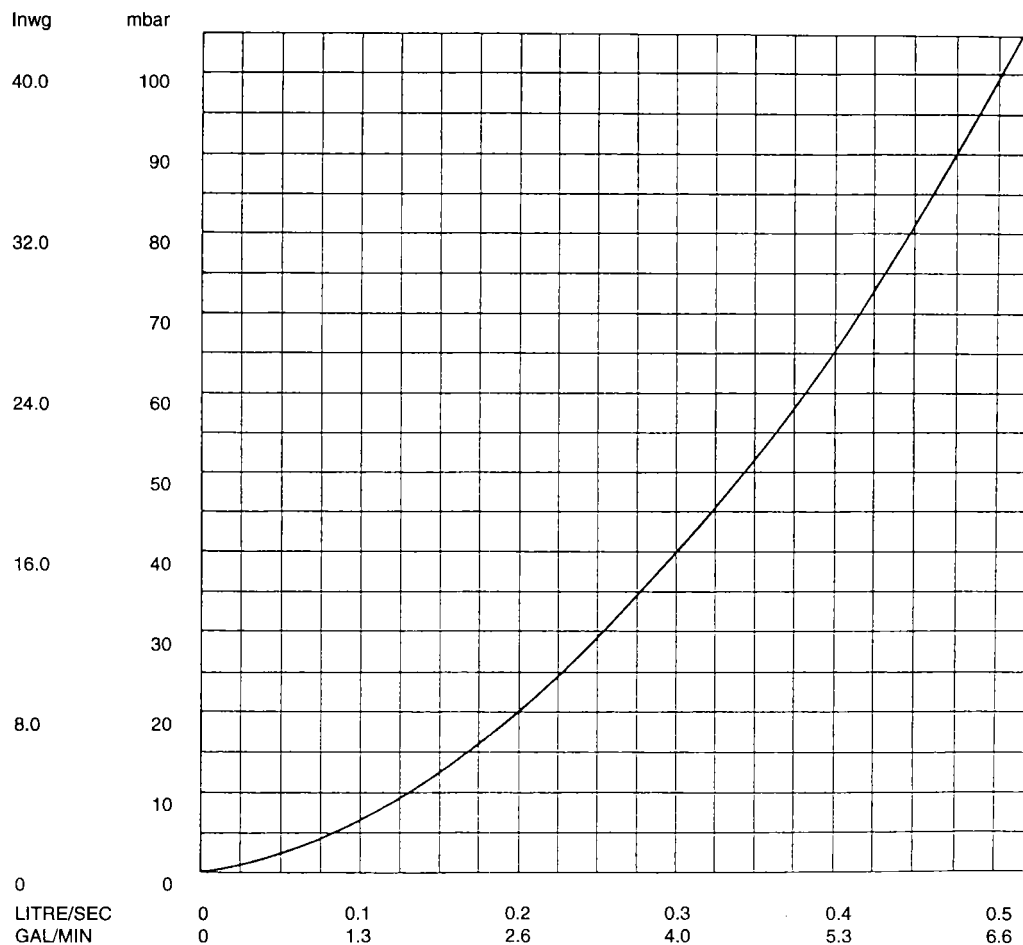


FIG. 6 PRESSURE LOSS ACROSS BOILER

INSTALLATION – Page 12

It is the law that all gas appliances are installed and serviced by a competent person as stated in Gas Safety (Installation and Use) Regulations 1994.

For Health and Safety Information Page 35.

Electrical test work should be carried out by a competent person in accordance with IEE Wiring Regulations.

The boiler and its associated equipment will arrive on site in 2 cartons. The contents of each carton is as follows:-

- CARTON 1:- Boiler Pack
- Boiler
- Outer casing assembly
- Template
- Boiler mounting plate
- Accessory pack
- Literature pack containing:
- Installation and Service instructions, Users instructions
- Warranty Envelope
- CARTON 2:- Flue Pack
- Flue system as ordered
- Flue fitting instructions

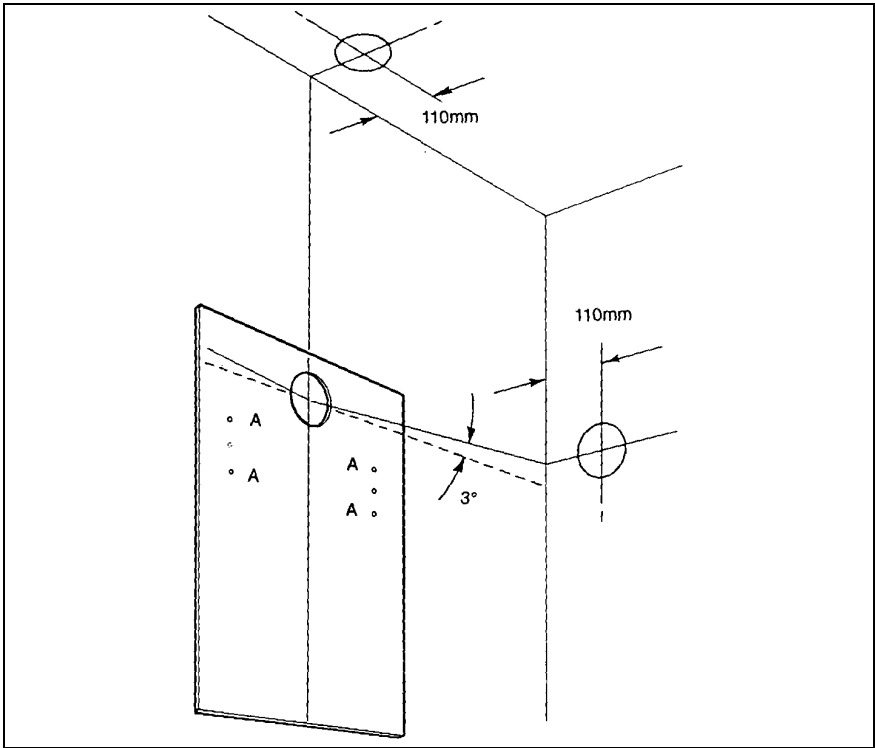


FIG. 7 TEMPLATE

Taking due account of the terminal position and making allowance for all horizontal flues to rise at an angle of 3° (52mm per metre) from the boiler, place template in proposed boiler position. Ensure the template is level and mark hole positions 'A'. If rear fluing mark flue outlet hole through template.

When side or vertically fluing extend flue outlet centre line on the template horizontally or vertically as appropriate and mark flue outlet hole on adjacent surface as illustrated. Vertical flues require a 105mm diameter hole unless extension kits are used when the hole size will need to be increased to 125mm to allow joining clamps to pass through.

Horizontal flues require a hole diameter of 125mm for all wall thicknesses providing the hole rises through the wall at an angle of 3°. Where a horizontal hole is produced using a core drill the hole diameter will need to be increased for thicker walls as shown in the following table.

Hole Diameter	Maximum wall thickness
125mm	230mm
150mm	720mm
175mm	1000mm

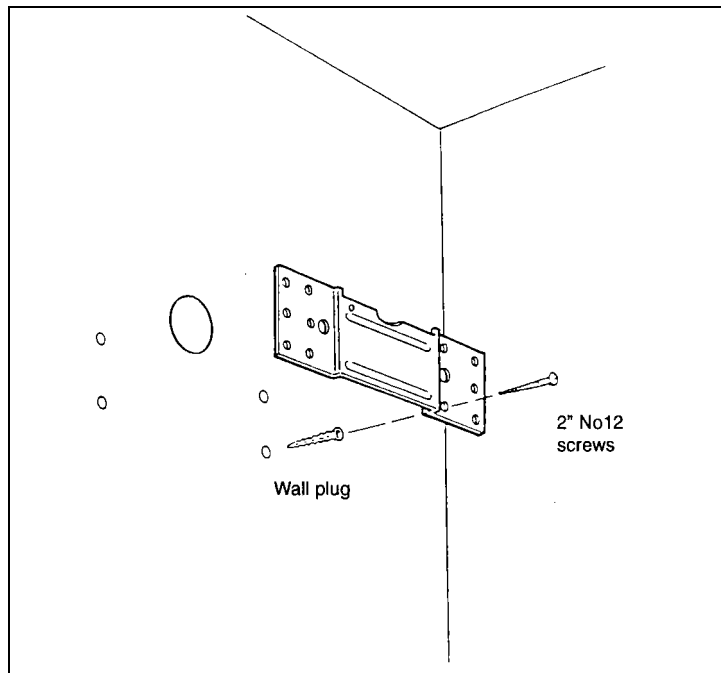


FIG. 8 BOILER MOUNTING PLATE

Remove template and drill holes 'A' using a 7mm drill. Carefully cut flue outlet hole through wall or ceiling allowing for any horizontal flue to rise at an angle of 3° throughout its length.

Using wall plugs and screws from accessory pack 'A' attach boiler mounting plate to wall ensuring that it is level.

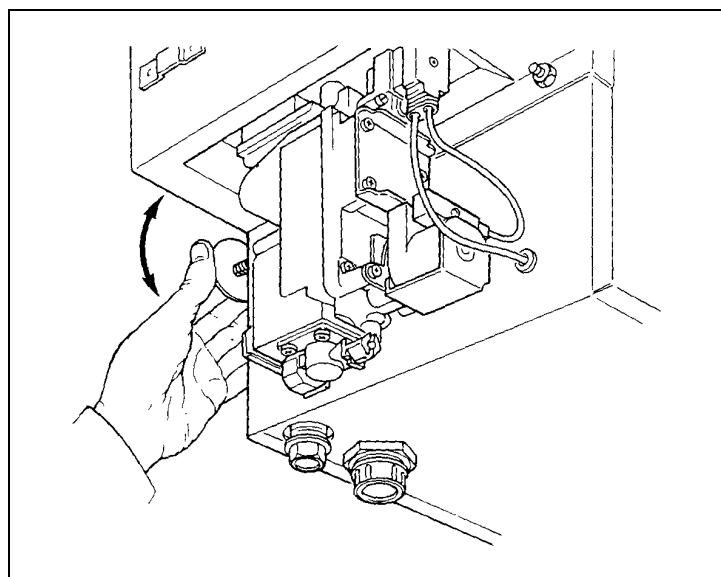


FIG. 9 LIFTING, ADJUSTING AND SECURING THE BOILER

Lift the boiler onto the mounting plate and adjust vertical alignment using the adjustment screws at the rear of the boiler. Refer to FIG. 11 and secure the boiler to the mounting plate using the MS screw from accessory pack 'A'.

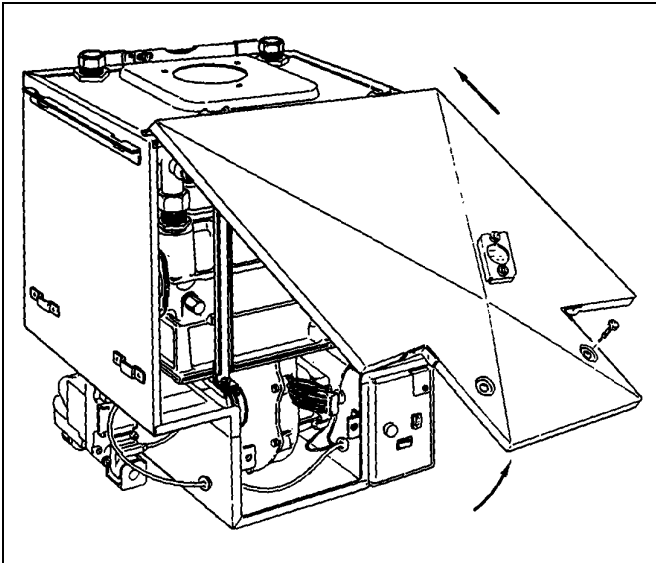


FIG. 10 REMOVING FUNCTIONAL CASE DOOR

Remove functional case door by undoing the two lower securing screws and lift door off the two upper hinge brackets.

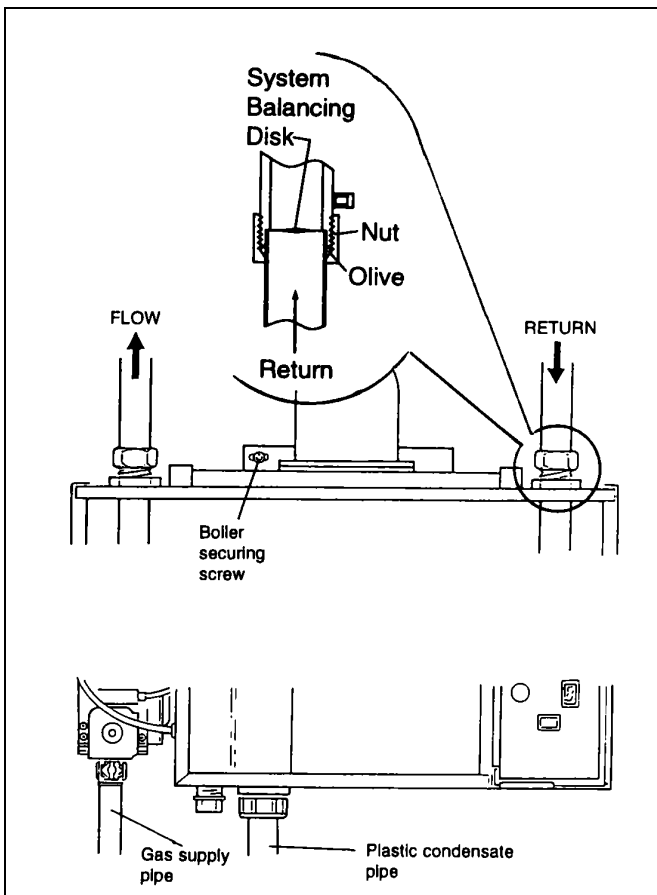


FIG. 11 PIPE CONNECTIONS

Envoy 30 & 40 Only: These boilers are supplied with a balancing disc in the separate fittings pack. The disc should be fitted in the boiler return pipe before the system pipework is connected to the boiler.

Envoy 30 disc - 7 mm diameter orifice

Envoy 40 disc - 9 mm diameter orifice

Connect system pipework to the boiler. A drain off tap should be installed close to the boiler. Compression nuts and olives are provided in Accessory pack 'C'.

Connect plastic condensate drain pipe to the outlet connection at the base of the boiler.

Connect the gas supply pipe to the inlet connection of the gas cock. The gas cock should be temporarily disconnected from the gas control valve if a solder connection is being made. Ensure that the 'O' ring seal is correctly located between gas cock and gas control valve on reassembly.

FLUE SYSTEM

Assemble and attach the flue system to the boiler by following the instructions supplied with the flue kit.

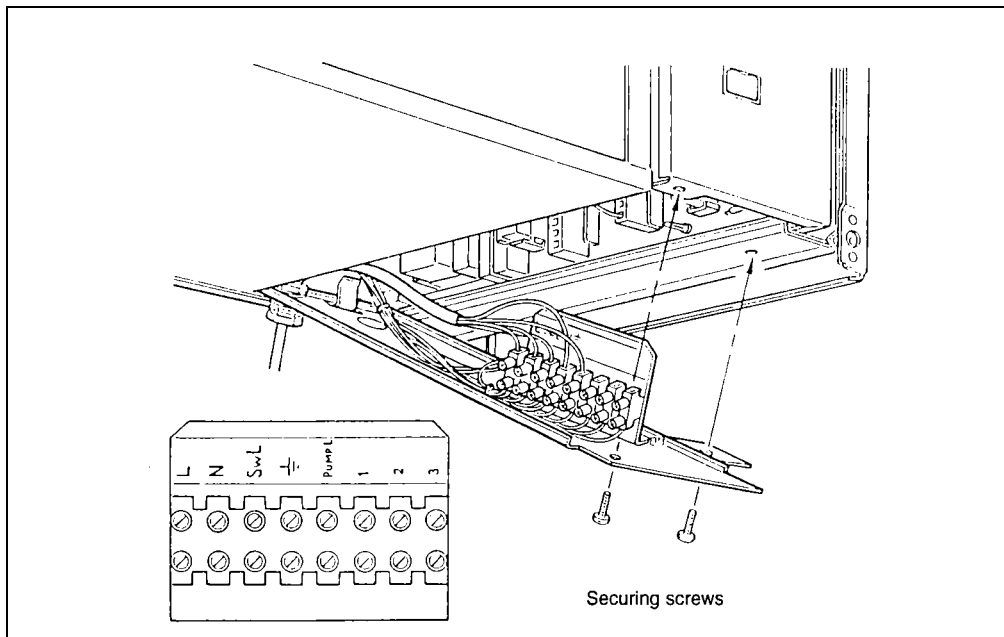


FIG. 12 ACCESSING TO THE BOILER ELECTRICAL TERMINAL BLOCK & ROUTING OF ELECTRICAL WIRING

ELECTRICAL CONNECTIONS

The boiler and all external control circuit wiring must be supplied from the same isolating switch or plug and socket.

The boiler terminal block which is situated in the control box is not designed to accept wiring from all the on-site controls therefore the installer will need to incorporate an external junction box.

Open the control box by removing the two M4 securing screws and lowering the access door as illustrated.

ELECTRICAL WIRING

Route a five core cable from the external junction box through the cable clamp in the underside rear of the control box and connect to boiler terminal box as follows.

Permanent live to terminal marked L

Neutral to terminal marked N

Earth to terminal marked 

Switched live from external controls to terminal marked SwL

Following the pump manufacturers instructions connect the pump live to terminal marked PUMP L.

The neutral and earth wires for the pump should be routed and connected to the appropriate connections within the external junction box.

If there are no external controls fitted connect SwL terminal to permanent live in the junction box.

Note: The electrical mains supply must be fused at 3A and the connection must be made to the boiler terminals in such a way that should the lead disengage from the cable clamp, the current carrying conductors become taut before the earth conductor.

Close the control box and replace the two M4 securing screws.

COMMISSIONING – Page 16

OPEN VENTED SYSTEMS

Remove the pump and flush out the system thoroughly with cold water. Refit the pump. Fill and vent the system. Examine for leaks.

SEALED SYSTEMS

NOTE:

The system can be filled using a sealed system filler pump with a break tank or by any other method approved by the Local Water Authority. Refer to 'THE SYSTEM' section Page 9 in these instructions, also BS.6798 1987.

Remove pump and flush out the system thoroughly with cold water. Refit the pump. Fill and vent the system until the pressure gauge registers 1.5 bar (21.5 lbf/in²). Examine for leaks. Raise the pressure until the safety valve lifts. This should occur within ± 0.3 bar of the preset lift pressure of 3 bar. Release water to attain the correct cold fill pressure, and set the indicator on the water gauge to this value.

ALL SYSTEMS


The whole of the gas installation including the meter should be inspected and tested for soundness and purged in accordance with the recommendations of BS.6891.

Electrical testwork should be carried out by a competent person in accordance with the IEE Wiring Regulations.

Conduct a preliminary electrical test by checking: for short circuits, fuse failure, incorrect polarity, earth continuity and resistance to earth. If a fault has occurred on the appliance, the fault finding procedure should be followed. See page 27

Fit the functional case door into position by lifting it onto the top hinge brackets and secure it with the lower two fixing screws.

FIRST LIGHTING


WARNING: Before lighting the boiler ensure that the functional case door HAS BEEN CORRECTLY FITTED and that the sealing strip fitted to the door is forming a tight seal with the main boiler casing. Before proceeding to light the boiler, check that the external electricity supply to the boiler is switched off and that the boiler control switch is in the mid i.e.  position.



Turn on the gas service cock.

Ensure that the pump and radiator isolating valves are open.

Ensure that the time control, if fitted is in an on condition, and that the room and/or cylinder thermostats, where fitted are set to high temperatures.

Switch on the external electricity supply to the boiler.

The display on the front of the control panel will show the character "".

Note: The boiler is protected by an automatic frost protection device, therefore if the water temperature within the boiler is below 5°C the character "" will be displayed and the boiler will fire until a return temperature of 10°C is reached. The boiler will then shut down and the character "" will be displayed.

Switch the boiler control switch to the “H” position and the character “H” will be displayed. After approximately 10 seconds the boiler should light. Due to the presence of air in the gas supply it is possible that the boiler will not light at the first attempt but will automatically cycle and make two further attempts. If the boiler still fails to light it will go to lockout indicated by the character “F” shown flashing on the display. If this should occur wait 10 seconds then press the lockout reset button and the boiler will go through another start sequence.

It should be noted that the boiler control continuously monitors the temperature rise across the heat exchanger. Therefore, if the system is not correctly vented, air passing through the pump may lead to boiler shut down with the character “2” being displayed. If this occurs thoroughly vent the system and press the reset button.

If the boiler fails to start after 1 or 2 attempts refer to fault finding section on Page 27

BURNER PRESSURE

This appliance is fitted with a Gas/Air ratio control mixing valve. This gas valve ensures that the correct amount of gas is delivered to the burner to match the available air supply under all operating conditions. THE BURNER PRESSURE AND GAS RATE HAVE BEEN PRECISELY SET AND CHECKED DURING MANUFACTURE AND NO ATTEMPT SHOULD BE MADE TO ADJUST IT.

To check the correct operation of the gas valve follow the instructions below carefully.

- a. A good indication of correct operation of the boiler will be obtained by measuring the gas rate at the gas meter.

1. Run the appliance for at least 10 minutes.
2. With all other gas appliances turned off measure the gas rate at the meter for a period of at least 5 minutes. Check that the measured rate is within $\pm 5\%$ of the rate stated on the data plate.
- b. To measure the burner pressure.
 1. Turn off the gas service cock. Fit a pressure gauge to the gas inlet pressure tapping on the gas control valve. Connect a differential pressure gauge or ‘U’ tube manometer between the burner pressure gauge tapping (high pressure side) and the reference pressure tapping (low pressure side) on the gas valve (see Fig. 13).
 2. Turn on the gas service cock and run the appliance for at least 10 minutes. Check that the gas inlet pressure is between 19-20 mbar.
 3. Check that the differential burner pressure is within ± 1.0 mbar of that stated on the data plate.
 4. Turn off the gas service cock and remove the pressure gauge and replace the pressure tapping sealing screws on the gas valve.

Should the gas rate or differential burner pressure fall outside the specified range run the boiler for a further 10 mins and carry out a recheck, if after rechecking either the gas rate or the burner pressure falls outside the tolerance specified, Potterton Myson Service Department should be called as specialist equipment is required to enable adjustment to be made.

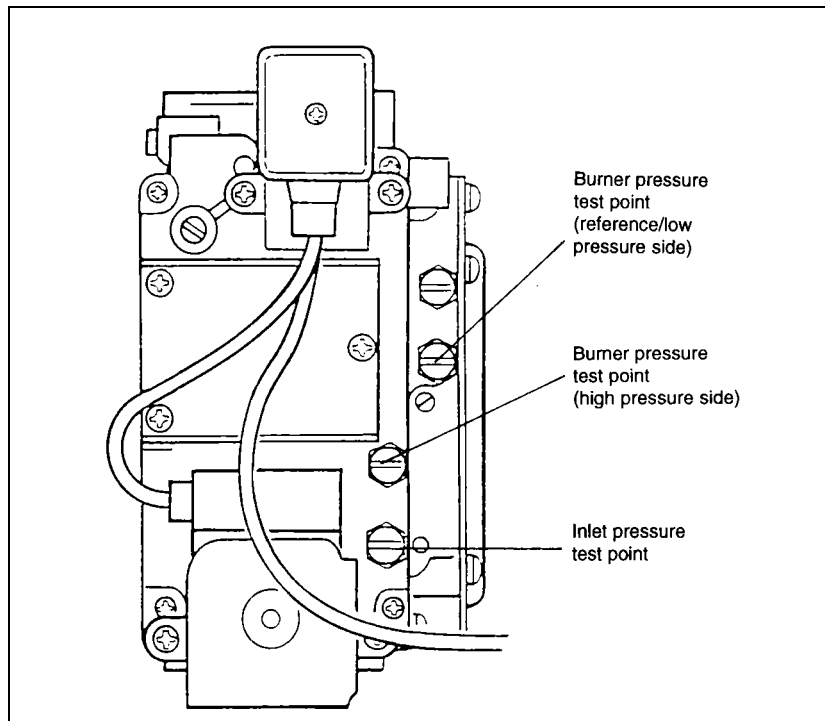


FIG. 13 GAS CONTROL VALVE

Relight the boiler and reheat the system to maximum. Check for water leaks, turn the boiler off, drain the system whilst hot.

Remove functional case door and ensure there are no condensate leaks from around the boiler or the condensate drainage system.

Refit functional case door ensuring a good seal.

Refill the system and add the correct concentration of FERNOX COPAL or GRACE DEARBORN SENTINEL XI 00 water treatment. On sealed systems adjust to the correct cold fill pressure.

If a by-pass circuit is fitted the by-pass valve should be adjusted with the boiler operating under minimum load conditions to maintain sufficient water flow through the boiler to ensure that the overheat device does not operate under normal operating conditions.

BOILER CONTROL SWITCH

In the mid i.e. "0" position holds the boiler in a STANDBY condition. In the "L" position allows the boiler to operate

automatically but controlled at a maximum flow temperature of 60°C. In the "H" position the boiler will operate automatically at a maximum flow temperature of 82°C.

PUMP OVER RUN TIMER

Will keep the pump running for approximately 3 minutes after burner shutdown to dissipate heat left within the boiler. The times are pre-set and no adjustment is possible.

OVERHEAT PROTECTION DEVICE

The overheat protection device is pre-set and no adjustment is possible. Manual resetting is required if an overheat condition occurs. The reset button is situated in the front of the boiler control box.

BOILER DISPLAY

Under normal conditions of operation the following characters will indicate:-

- O** Electricity supply ON but secondary controls switched OFF and boiler control switch in mid position
- L** Boiler operating at lower flow temperature
- H** Boiler operating at higher flow temperature
- h** Boiler operating but up to temperature
- E** Boiler restart delayed to prevent rapid cycling. (Max. delay time is 5 mm)
- C** Main burner off, pump running to transfer remaining heat from boiler into the system
- F** FLASHING. Boiler at lock-out

Other characters will be displayed if a fault condition should occur. Their purpose is to assist the service engineer and more information is provided in the **SERVICING** section of these instructions.

OTHER BOILER CONTROLS

All boiler mounted controls are designed so that if any fault should occur they will fail safe. No further setting or checking is necessary.

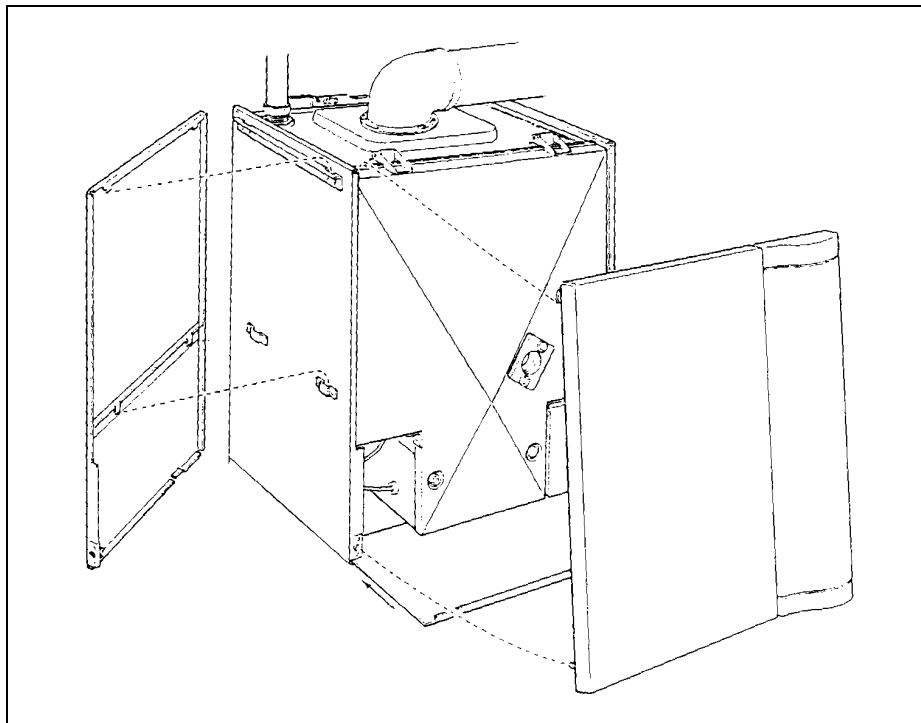


FIG. 14 CASE ASSEMBLY

Attach casing side panels onto the boiler as illustrated ensuring that the four lugs on each panel are correctly located. Slide in the bottom panel and push fully home. Engage hooks on the top rear of the front panel into the slot in the top front corner of each side panel. Lower the front panel to engage brass studs into the retaining clips, press fully home to lock panel into position.

EXTERNAL CONTROLS

Check that any other external control connected in the system, such as clocks and thermostats, control the boiler as required.

USER'S INSTRUCTIONS

A user's instruction leaflet is provided with this boiler but the householder must have the operation of the boiler and system explained by the installer. **THE HOUSEHOLDER MUST ALSO BE ADVISED OF THE IMPORTANCE OF ANNUAL SERVICING** and of the precautions necessary to prevent damage to the system and building, in the event of the system remaining out of commission in frost conditions. Information must also be passed to the customer on the type of corrosion inhibitor that has been added to the system and of the need to maintain the correct concentration levels as recommended by the manufacturer.

SERVICING & REPLACING PARTS – Page 20

It is the law that all gas appliances are installed and serviced by a competent person as stated in Gas Safety (Installation and Use) Regulations 1994. For Health and Safety Information see page 35.

Electrical test work and servicing should be carried out by a competent person in accordance with the I.E.E. Wiring Regulations.

Regular skilled servicing and cleaning of the appliance is essential to ensure continued safe and efficient operation. The frequency of cleaning will depend upon the particular installation conditions, and the use to which the appliance is put, but in general, once a year should be adequate.

The boiler DATA PLATE and WIRING DIAGRAM are located on the front of the boiler functional casing. The boiler code number which is on the code badge located on the boiler top panel see FIG.2 should always be quoted when ordering spares or requesting information.

Before commencing the servicing of the boiler it is advisable to carry out a precheck on the boiler to establish that it is functioning correctly.

- a) Set boiler control switch to the mid i.e. “0” and the display should read “0”.
- b) Set boiler control switch to “H”, the display should read “H” and the boiler should light.

Note: If the boiler fails to start or does not follow the sequence above then refer to fault finding section on Page 27.

WARNING

Before the start of any servicing or replacement of parts ensure that you have:

- a) Switched off at the external electrical supply by removing the plug from the wall socket or by switching off the appliance at the external isolating switch.
- b) Isolated the gas supply at the boiler service cock.

PREPARATION OF THE BOILER

Preparation for servicing should be carried out in the following manner.

- 1) Remove decorative outer casing door by pulling the bottom of the door from its fixing clips and pushing upwards until it is clear of its top fixing.
- 2) Remove bottom decorative panel.
- 3) Remove functional case door by undoing the two lower securing screws and lift door off the two upper hinge brackets. FIG. 15.

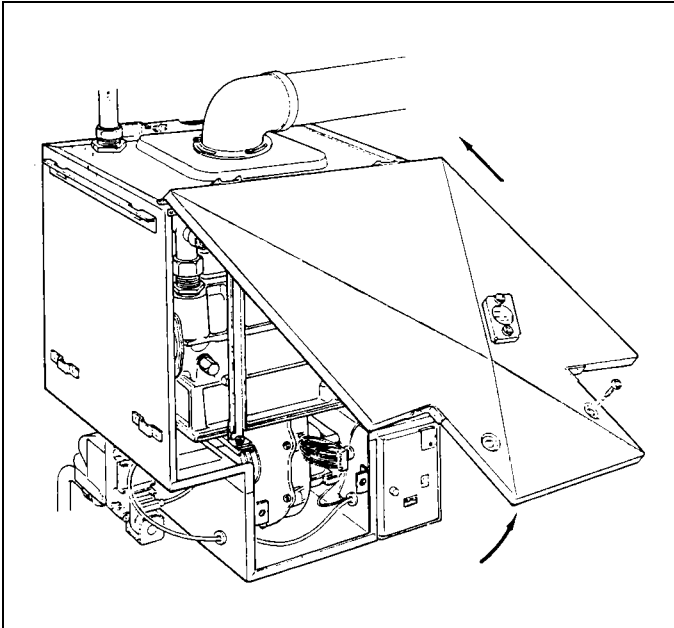


FIG. 15 REMOVING FUNCTIONAL CASE DOOR

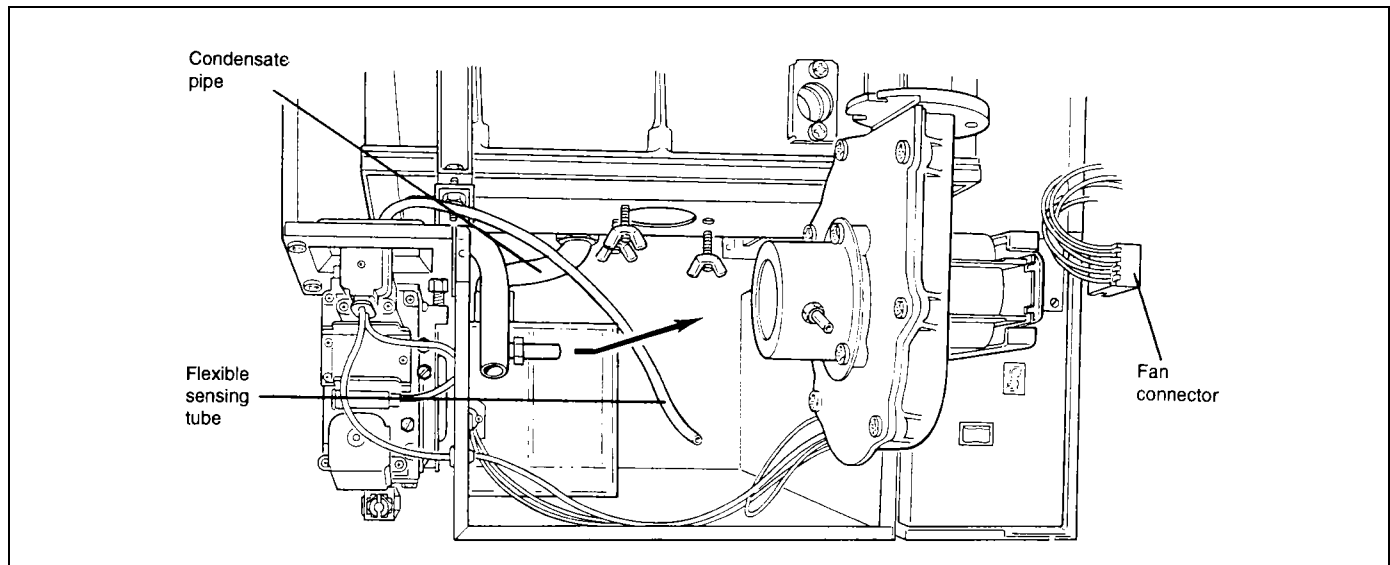


FIG. 16 REMOVING FAN

REMOVING FAN

- 1) Disconnect electrical connection from fan motor. FIG. 16.
- 2) Disconnect flexible sensing tube from the fan inlet housing. FIG. 16.
- 3) Remove fan by slackening two wing screws on left hand side and removing the MS wing screw on the right hand side of the fan. FIG. 16.
- 4) Slide fan to the right then forward and remove from boiler. FIG. 16.

REMOVING COMBUSTION CHAMBER AND FLUE HOOD

- 5) Disconnect flexible condensate pipe from the rear of the combustion chamber/sump casting. FIG. 16.
- 6) Disconnect inline connectors for the hot surface igniter and the flame sensor on the right hand side of the combustion chamber. FIG. 17.

Note the hot surface igniter is a fragile component and requires extreme care when handling.

- 7) Remove two M6 screws retaining clamps around flue hood and combustion chamber. FIG. 17.
- 8) Remove the top clamps from their anchor points at the rear of the casing. FIG. 17.

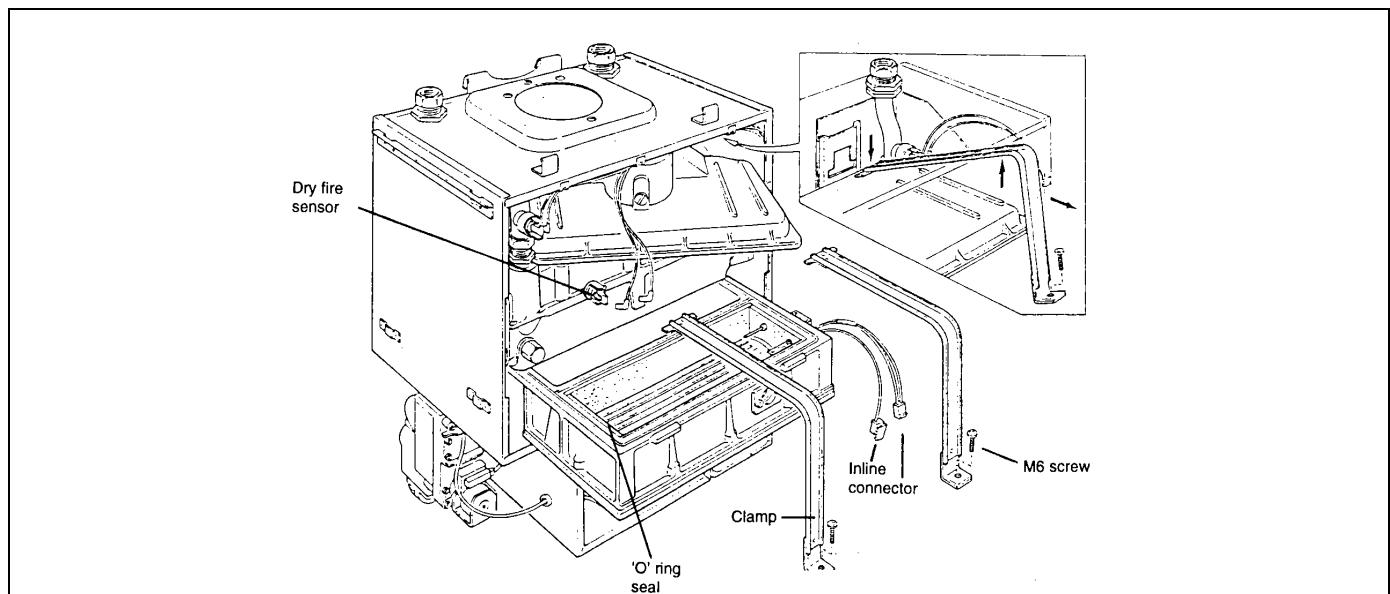


FIG. 17 REMOVING CLAMPS

REMOVING COMBUSTION CHAMBER AND FLUE HOOD - Continued.

- 9) Disconnect electrical connections from dry fire sensor. FIG.17.
- 10) Fold back gaiter between the flue hood and elbow. FIG.18.
- 11) Carefully remove flue hood by moving the right hand side of the flue hood forward and gently
- 12) Pull combustion chamber forward until it is clear of the boiler casing.

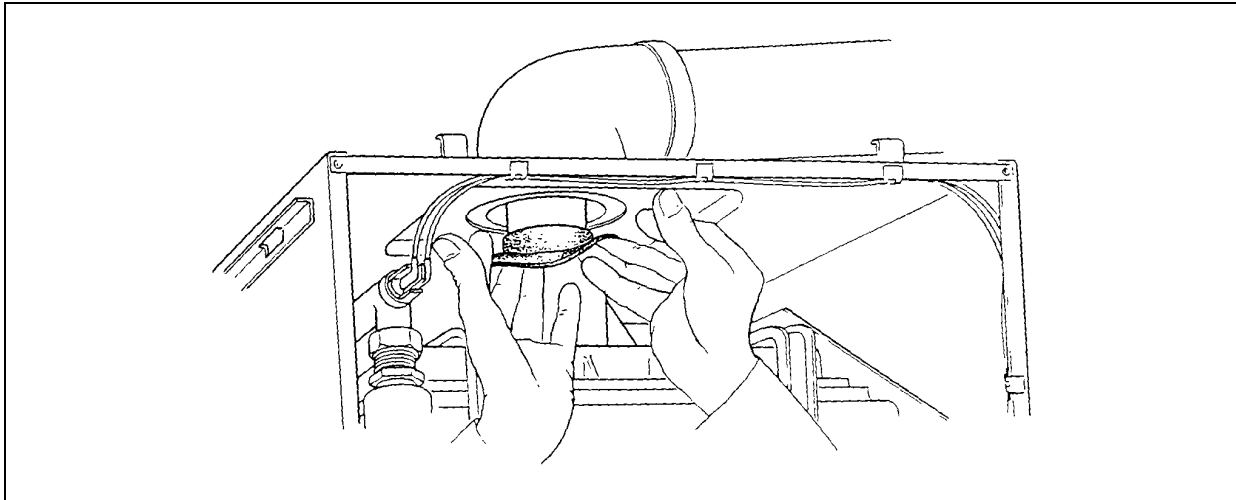


FIG. 18 FOLDING BACK FLUE SEALING GAITOR

EXAMINATION OF FLUE WAYS AND CLEANING

- 1) Place a sheet of clean paper over the inlet of the condense syphon and the gas assembly. It is particularly important that debris is prevented from entering the short upward facing tube from the gas control valve.
- 2) Cleaning of the heat exchanger must be carried out using a Potterton scraper Part No. 907736.
- 3) Working from below and above the heat exchanger remove all deposits from between the fins.
- 4) Examine top and bottom sealing face of the heat exchanger for deep scratches and remove any debris with a soft brush to provide a smooth flat sealing face.
- 5) Examine Syphon for evidence of leakage or build up of debris.

Note Place a catch tray beneath the syphon cleaning eye plug and remove plug this should remove any debris which has collected in the type section. If necessary the syphon should be removed and flushed with tap water. See replacement of parts for further information.

RE-ASSEMBLY OF BOILER

- 6) Before reassembling combustion chamber and flue hood to the boiler examine for the following:-
 - The “O” ring seals for damage
 - The insulation in the combustion chamber. **Note** if there is any visible deterioration of this material it must be replaced
 - Damage to the hot surface igniter
 - Damage to the surface of the burner
 - Damage to sight glass
 - Build up of debris in the condensate sump (This may be removed with a soft brush)

If any of the above components require changing see section **“Replacement of Parts”** for further information.

- 7) Replacement of components is the reverse of removal.

Note great care should be taken not to damage the flue hood and combustion chamber seals during replacement of these assemblies.

- 8) When refitting straps ensure that they are located correctly in the guides on both the flue hood and combustion chamber.
- 9) Ensure that screws are fully tightened and clamps fix the combustion chamber and flue hood securely.

REPLACEMENT OF PARTS

Before replacing any component carry out pre-check detailed at the beginning of the Service section and then refer to fault finding section of these instructions.

WARNING

Before the start of any servicing or replacement of parts ensure that you have:

- a) Switched off at the external electrical supply by removing the plug from the wall socket or by switching off the appliance at the external isolating switch.
- b) Isolated the gas supply at the boiler service cock.

If the combustion chamber has been removed follow procedure in Service section “Re-assembly of boiler”

1) FAN

- a) Follow procedure in “Preparation for servicing” at the beginning of the servicing section.
- b) Replacement of fan is the reverse of removal.

2) HOT SURFACE IGNITER

WARNING this component is fragile and requires careful handling.

- a) Remove combustion chamber as described in “**Servicing Boiler**”.
- b) The igniter assembly is retained by two MS pozi drive screws. Remove screws and carefully remove old igniter, if the igniter has become damaged, invert the combustion chamber and shake gently to allow damaged segments to be removed from the chamber. See FIG. 19.
- c) Replacement of the igniter is the reverse of removal ensure that a new sealing gasket is always fitted and that a good seal is made between the igniter and combustion chamber.

- 10) Ensure connection from sump to syphon is made before refitting fan.
- 11) Ensure that the gaitor between the flue hood and elbow is correctly positioned untwisted and forms a good seal to both components.
- 12) Relight the boiler as described by following the lighting procedure in the commissioning section of these instructions.

3) FLAME SENSOR

- a) Remove combustion chamber as described in “**Servicing Boiler**”.
- b) Remove screw retaining sensor and withdraw from the combustion chamber. See FIG. 19.
- c) Replacement of the sensor is the reverse of removal, ensure new gasket is always fitted.

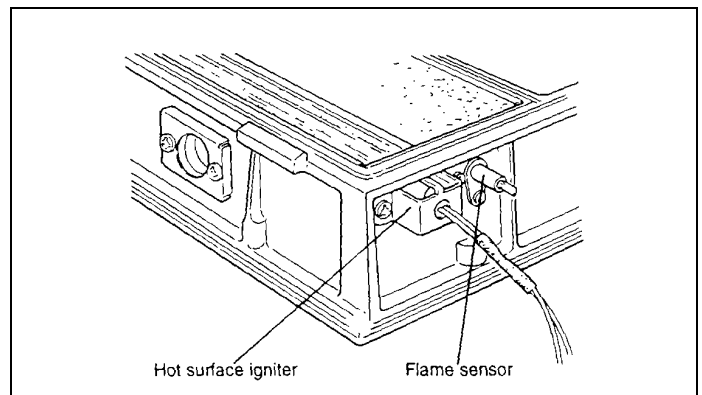


FIG. 19 HOT SURFACE IGNITER & FLAME SENSOR

4) INSULATION

Note all four insulation pads must be replaced.

- a) Remove combustion chamber as described in “**Servicing Boiler**”. See FIG. 17.
- b) Remove burner FIG. 20 hot surface igniter and flame sensor. FIG. 19.
- c) Remove old insulation.
- d) Replace front pad first ensuring that bevelled edge is uppermost and fits into the chamber correctly.
- e) Fit rear pad and use end insulation to retain rear pad.

4) INSULATION (Continued)

- f) Carefully replace burner.
- g) Refit hot surface igniter **WARNING** this component is fragile and requires careful handling.
- h) Replacement is the reverse of removal.

5) BURNER

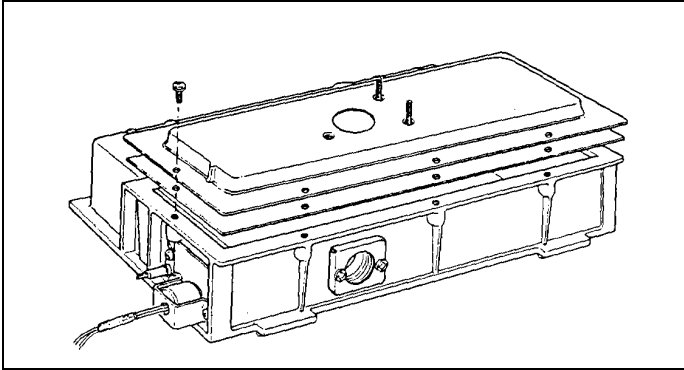


FIG. 20 REMOVAL OF BURNER

- a) Remove combustion chamber as described in “**Servicing Boiler**”.
- b) Remove 8 M5 screws retaining burner to the combustion chamber. FIG. 20.
- c) Remove burner from the combustion chamber.
- d) Ensure the burner is fitted with the gasket supplied with it.
- e) Taking care not to damage the burner surface, install new burner into combustion and secure with 8 screws.
- f) Reassemble as described in section “**Servicing Boiler**”.

6) SYPHON

- a) Remove decorative and functional doors as described in “**Servicing Boiler**”.
- b) Remove fan see “**Servicing Boiler**”.
- c) Disconnect flexible condensate pipe from the rear of the combustion chamber/sump casting. FIG. 16.
- d) Disconnect syphon from its wastepipe. See FIG. 11.
- e) Undo nut securing Syphon to the bottom of the boiler casing.
- f) Relacement of the Syphon is the reverse of removal.

See servicing instructions for reassembly of boiler.

7) FLUE HOOD/COMBUSTION CHAMBER SEALS.

- a) Remove combustion chamber/fluehood as described in “**Servicing Boiler**” See Fig.17.
- b) Remove old seal.
- c) Clean groove Lising a soft brush or dry lint free cloth.
- d) Ensure new seal is correct (flue hood and combustion chamber require different seals).
- e) Lay seal over groove and gently push into the groove until fully home.

See **servicing instructions** for reassembly of boiler.

8) INJECTOR

- a) Remove decorative and functional doors as described in “**Servicing Boiler**”.
- b) Remove fan see “**Servicing Boiler**”.
- c) Remove injector by unscrewing from gas supply pipe.
- d) Replacement is the reverse of removal.

9) GAS VALVE ASSEMBLY

Warning always ensure before filling that the correct assembly is being used, they are provided preset for different boiler outputs.

- a) Remove decorative and functional doors as described in “**Servicing Boiler**”.
- b) Remove fan as described in “**Servicing Boiler**”.
- c) Disconnect electrical supply lead at the gas valve by removing the two retaining screws and unplug.
- d) Remove 4 M5 screws securing gas control valve to boiler service cock.
- e) Remove 6 MS screws retaining gas assembly mounting plate 4 MS on the left underside of the plate and two within the casing. Remove MS screw attaching the valve to its mounting bracket.
- f) Slide gas assembly forward and remove from boiler.
- g) Remove flexible tube from assembly and fit to new gas assembly.
- h) Replacement is the reverse of removal ensuring a new gasket is fitted between casing and mounting plate and the “O” ring seal is correctly positioned between the gas control valve and the boiler service cock.

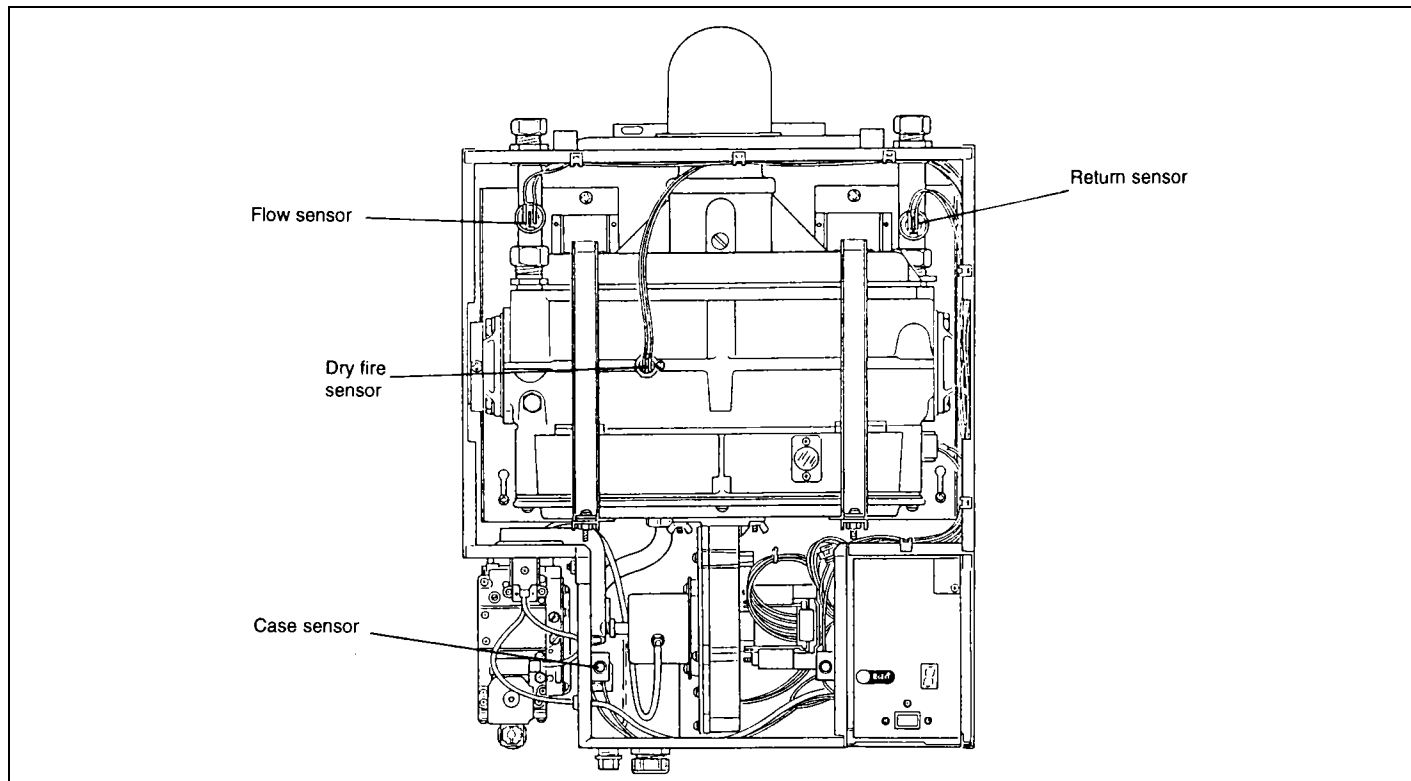


FIG. 21

10) SIGHT GLASS (COMBUSTION CHAMBER OR CASE DOOR).

Note care should be taken when handling and disposing of broken glass.

- a) Remove decorative casing door if changing functional door sight glass or both decorative and functional doors if changing combustion chamber sight glass, as described in “**Servicing Boiler**”.
- b) Remove two screws retaining sight glass assembly and carefully remove from the combustion chamber or door.
- c) Replacement is the reverse of removal ensuring a new gasket is fitted either side of the glass.

11) WATER TEMPERATURE SENSOR (FLOW AND RETURN).

- a) Remove decorative and functional doors as described in “**Servicing Boiler**”.
- b) Disconnect two leads from the sensor and remove it by gently squeezing two protruding plastic lugs and while still squeezing pull from its housing.
- c) Replacement is the reverse of removal ensure when fitting new sensor that sensor tip is coated with heat conducting paste and that it is correctly located and firmly home in its housing.

12) DRY FIRE TEMPERATURE SENSOR.

- a) Remove decorative and functional doors as described in “**Servicing Boiler**”.
- b) Disconnect two grey leads from the sensor.
- c) Remove retaining screw and gently pull sensor from the heat exchanger.
- d) Replacement is the reverse of removal. Ensure that the sensor tip is coated with conductive paste and correctly located in its housing.

13) CASE TEMPERATURE SENSOR.

- a) Remove decorative and functional doors as described in “**Servicing Boiler**”.
- b) Disconnect two yellow leads from the sensor.
- c) Remove fixing screw from mounting bracket.
- d) Remove sensor
- e) Replacement is the reverse of removal.

14) BOILER CONTROL BOARD.

IMPORTANT

Before replacing the control board refer to fault finding section of these instructions. The control should only be replaced if the diagnostic display indicates it is faulty.

- a) Remove decorative and functional doors as described in “Servicing Boiler”.
- b) Remove screw retaining access door on under side of boiler. FIG. 22.
- c) Remove screw retaining control front panel and tray. FIG. 22.
- d) Gently pull front panel forward removing connectors from the control as they become accessible. FIG. 23.
- e) Remove tray from boiler and carefully remove retaining screws at the rear of the control tray, single M4 and washer nut on the top of the control and plastic fixings holding the board to the tray.
- f) Replacement is the reverse of removal. Ensure that M4 nut and washer used to earth the control tray is refitted.

15) BOILER CONTROL BOARD FUSES.

- a) Remove decorative & functional doors as described in “Servicing Boiler”.
- b) Remove screw retaining access door on under side of boiler. FIG. 22.
- c) Remove screw retaining control front panel and tray. FIG. 22.
- d) Gently pull front panel forward removing connectors from the control as they become accessible. FIG. 23.
- e) Remove old fuse and replace with the correct Potterton component T3 ISA Pt 933005.
- f) Replacement is the reverse of removal.

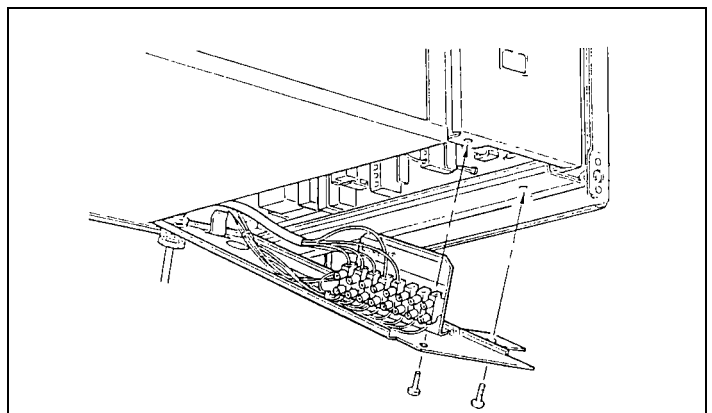


FIG. 22 REMOVING CONTROL SECURING SCREWS

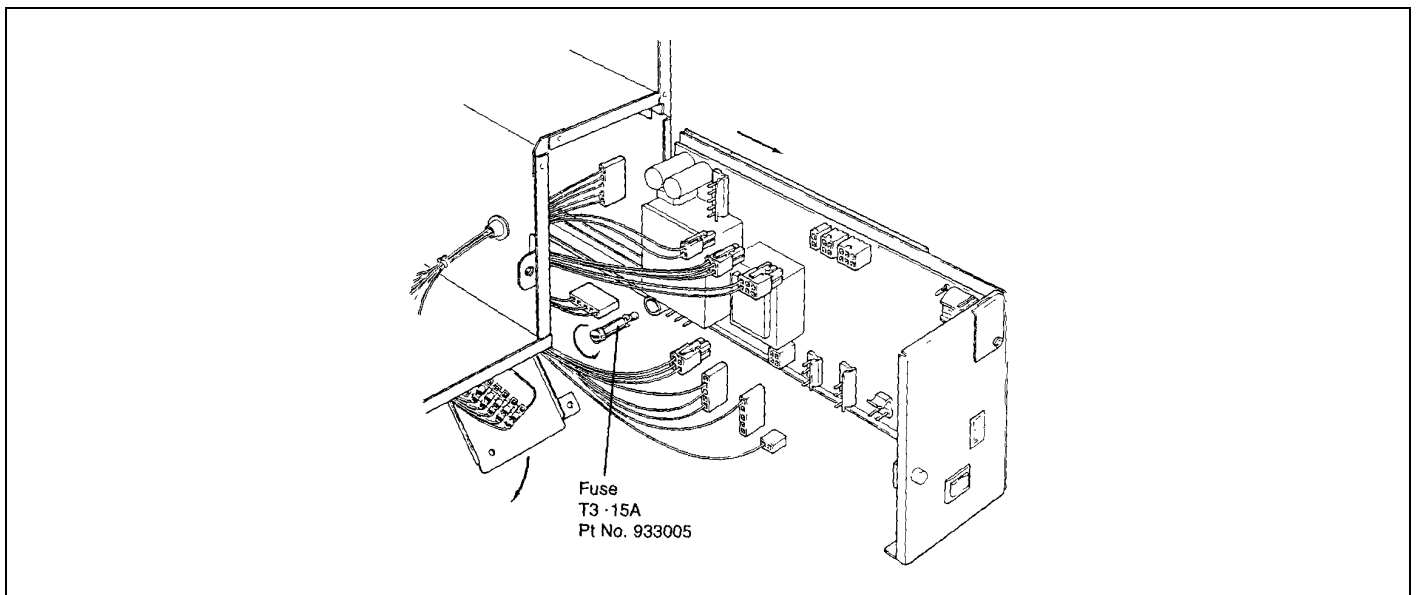


FIG. 23 REMOVING CONTROL TRAY

FAULT FINDING – DIAGNOSTIC DISPLAY – Page 27

DIGITAL DISPLAY

This boiler is fitted with a single digit display which is located in the front control box behind the hinged door.

The display on which up to 30 different characters can be illuminated performs two functions.

1. By displaying the following characters provides the user with a visual indication of the current boiler operating status.

- O** Power supply switched on but waiting a call for heat from secondary controls or boiler control switch is in the "O" position.
- L** Boiler operating, low flow temperature selected.

- H** Boiler operating, high flow temperature selected.
 - h** Boiler operating but up to temperature.
 - E** Boiler restart delayed to prevent rapid cycling (max delay time 5 mins).
 - C** Pump over run is operating.
 - F** FLASHING. Boiler at lockout.
- DISPLAY NOT ILLUMINATED – all power off.

2. By displaying the following characters it will assist the service engineer by working as a fault diagnosing system.

I	Sensor	Flow or return sensor out of calibration	See chart
2	Flow sensor	Flow sensor is incorrectly fitted	Check sensor
3	Case temperature	Temperature within boiler casing too high	See chart
4	Dry fire	Boiler has been fired without water	Check system
5	Flow sensor	Sensor failed open or closed circuit	Replace sensor
6	Return sensor	Sensor failed open or closed circuit	Replace sensor
7	Case sensor	Sensor failed open or closed circuit	Replace sensor
8	Dry fire sensor	Sensor failed open or closed circuit	Replace sensor
9	Fan speed	Fan speed incorrect	See chart
R	Shorted signal	Flame signal shorted to ground	Check igniter etc
C	Flame loss	Flame loss after initial detection	See chart
E	Control failed	Control has failed	Replace control
P	Wiring fault	Live on neutral connection	Correct fault

Preliminary Test Diagnostics

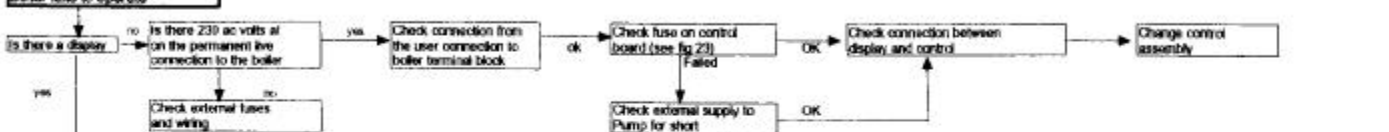
All boilers are fully tested before leaving the factory, therefore, if an electrical problem is experienced it is very likely that this is caused by faulty external wiring. If a problem exists disconnect all site wiring from the boiler. Connect a direct fused electrical supply to boiler terminals L, SwL, N and E and pump live to terminal marked pump L, taking a temporary neutral and earth connection for the pump from the boiler terminal block.

If boiler now operates correctly, site wiring should be further investigated.

BNOVY

Electrical test work and servicing should be carried out by a competent person in accordance with the I.E.E. Wiring Regulations.

Boiler fails to operate



The display will show one of the characters below as part of the fault finding diagnosis:

0

Check the following
The standby switch on the boiler set to H or L.
That all external controls set to give call for heat.

yes: Check there is 230 ac volts at switched live contact on the boiler customer connection block.

no: Check all external fuses.

yes: Check connection to boiler control (orange wire) from the terminal block.

Check connection between display and switch is correctly fitted.

1

This is a usually a temporary condition caused by warm system water returning to a boiler when it is in a cold condition and will only last for a few minutes. If this symbol persists the cause will be a inaccurate temperature sensor in the flow or return refit or replace as described in "Replacement of components" section of this literature.

FLASHING

2

Check that flow & return sensors are correctly fitted and coated with heat transfer compound.

Check that pump is rotating and that there are no blockages or air locks in the system.

FLASHING

3

Do not reset lockout follow inspection procedure.

Check sight glass is intact and securely retained and sealed.

Remove combustion chamber and examine "O" ring seal.

Check hot surface igniter body is intact and securely retained and sealed.

Replace components where necessary and follow reassemble procedure in "servicing boiler" section of this literature.

Reset Boiler.

Temperature in casing has become excessively high.

FLASHING

4

Do not reset lockout follow inspection procedure.

Remove combustion chamber, flue hood and examine "O" ring seals.

Fill system with water and ensure no there are no water leaks present.

Reset lockout.

Boiler has been fired with no water in the heat exchanger.

5

Check that both connectors are secure and in good contact with the sensor.

Yes: Follow procedure in "Replacement of components" section of this literature.

Resetting of the lockout is not required for this fault.

Flow sensor fault.

6

Check that both connectors are secure and in good contact with the sensor.

Yes: Follow procedure in "Replacement of components" section of this literature.

Resetting of the lockout is not required for this fault.

Return sensor fault.

7

Check that both connectors are secure and in good contact with the sensor.

Yes: Follow procedure in "Replacement of components" section of this literature.

Resetting of the lockout is not required for this fault.

Case sensor fault.

8

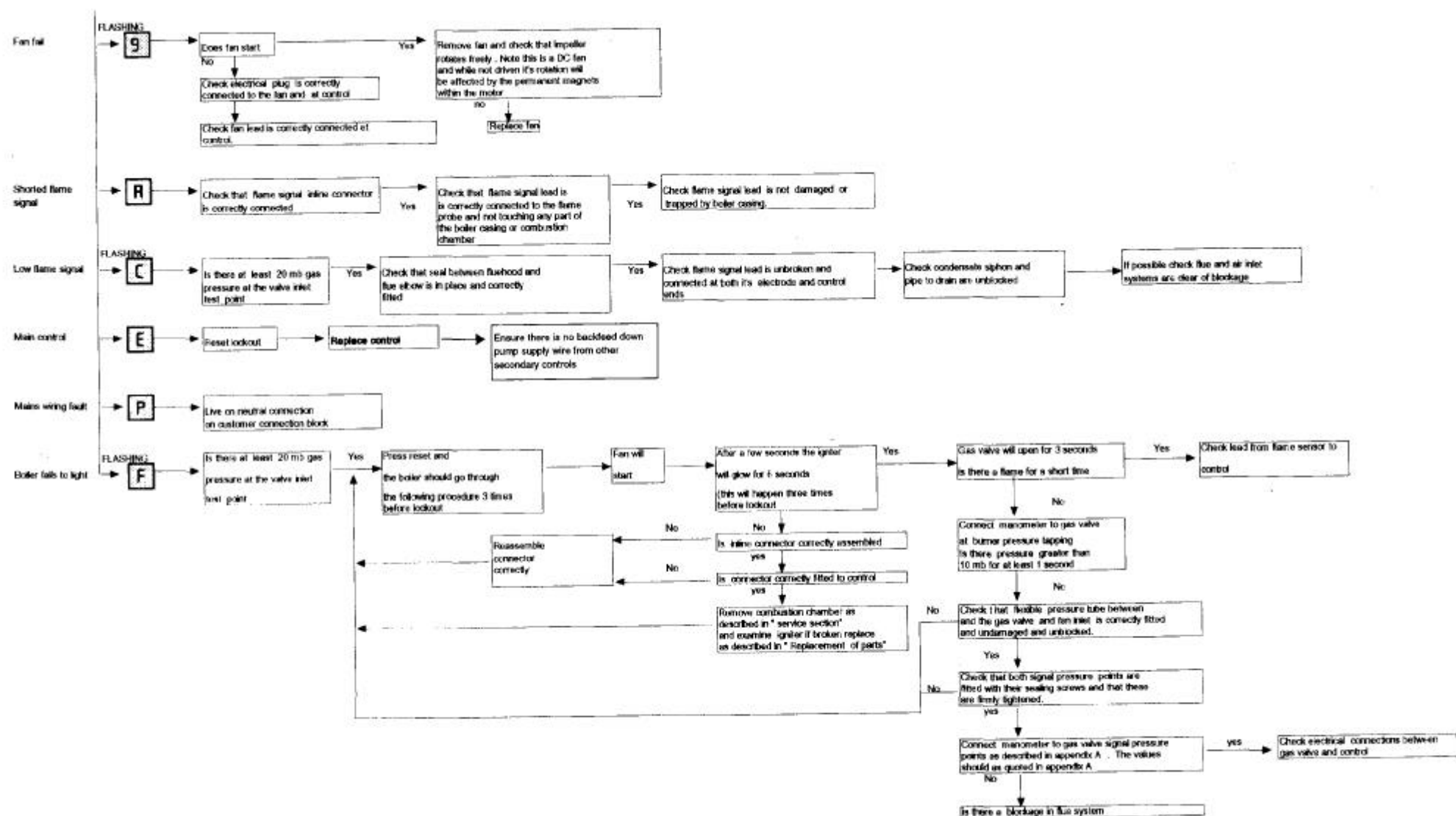
Check that both connectors are secure and in good contact with the sensor.

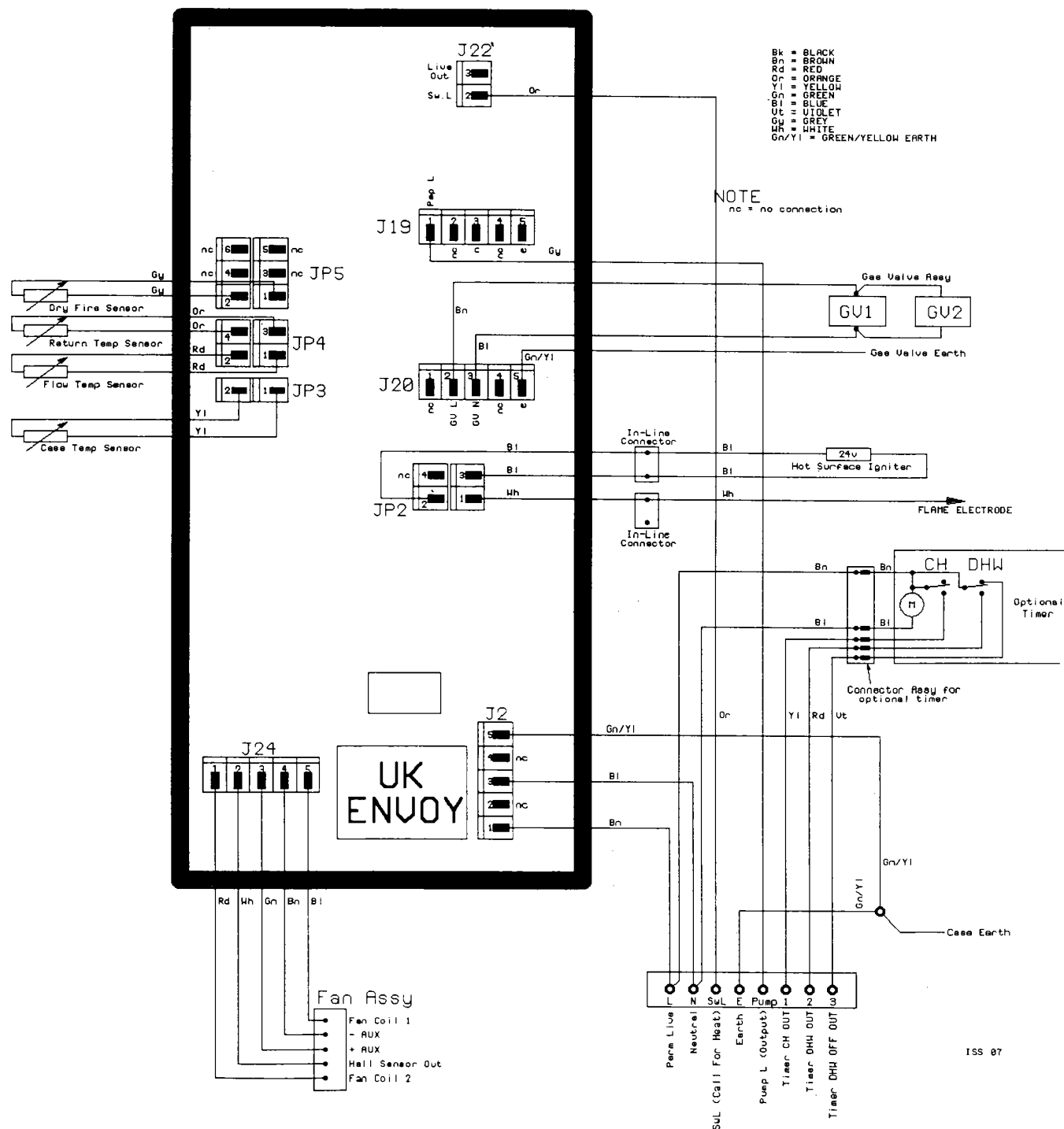
Yes: Follow procedure in "Replacement of components" section of this literature.

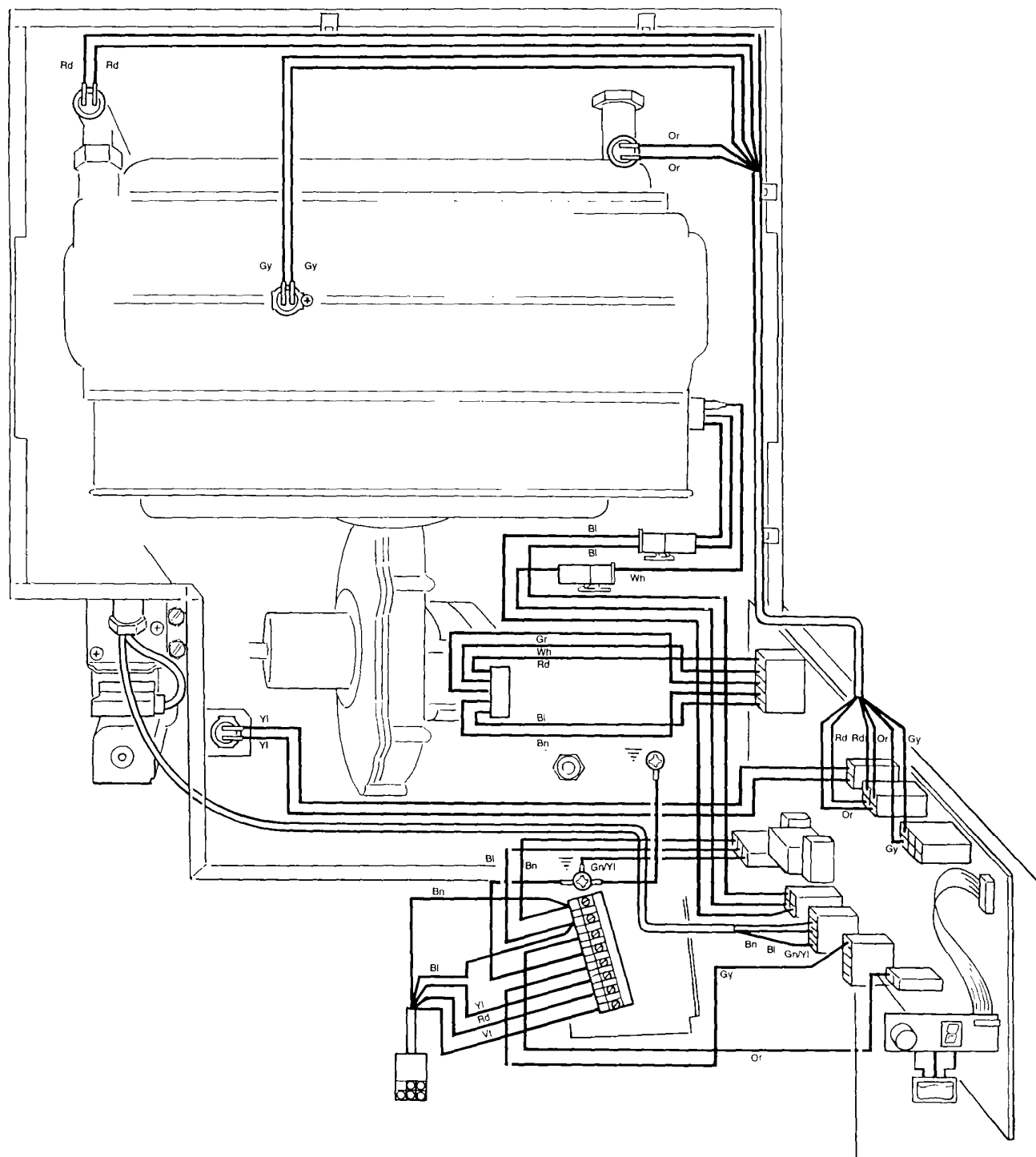
Resetting of the lockout is not required for this fault.

Heat exchanger sensor fault.

AULT FINDING CHART (2) – Page 29







Burner pressure checking and adjustment procedure.

This appliance is fitted with a Gas/Air ratio control mixing valve. This gas valve ensures that the correct amount of gas is delivered to the burner to match the available air supply under all operating conditions. The burner pressure and gas rate have been precisely set and checked during manufacture and it is extremely unlikely that any further adjustment will be necessary.

To check the correct operation of the gas valve follow the instructions below carefully.

- a. A good indication of correct operation of the boiler will be obtained by measuring the gas rate at the gas meter.
 1. Run the appliance for at least 10 minutes.
 2. With all other gas appliances turned off measure the gas rate at the meter for a period of at least 5 minutes. Check that the measured rate is within $\pm 5\%$ of the rate stated on the data plate.
- b. To measure the burner pressure.
 1. Turn off the gas service cock. Fit a pressure gauge to the gas inlet pressure tapping on the gas control valve. Connect a differential pressure gauge or "U" tube manometer between the burner pressure tapping (high pressure side) and the reference pressure tapping (low pressure side) on the gas valve (See FIG. 24).
 2. Turn on the gas service cock and run the appliance for at least 10 minutes. Check that the gas inlet pressure is between 19-20 mbar.
 3. Check that the differential burner pressure is within ± 0.5 mbar of that stated on the data plate.
 4. Turn off the gas service cock and remove the pressure gauge and replace the pressure tapping sealing screws on the gas valve.

A burner pressure reading outside the specified range does not necessarily indicate a wrongly adjusted gas valve. Other factors i.e. insufficient air flow will cause the gas valve to automatically adjust the burner pressure to maintain safe combustion. Before attempting to adjust the gas valve a check must be conducted on the whole appliance to ensure that any other faults present are found and rectified.

SETTING THE BURNER PRESSURE

WARNING

Setting the burner pressure requires the following equipment.

ESSENTIAL

1. A differential pressure gauge or "U" tube manometer capable of measuring pressures in the range 0-25 mbar (0-10 "H₂O) with a resolution of 0.1 mbar (0.05 "H₂O).
2. A differential pressure gauge capable of measuring pressures in the range of 0-2.50 mbar (0-1.00 "H₂O) with a resolution of 0.01 mbar (0.005 "H₂O).
3. Sufficient flexible tube and "T" piece connector to enable these instruments to be connected to the gas valve in the arrangement shown in FIG. 24.

ADVISABLE

A CO₂ analyser capable of measuring CO₂ concentrations in the range 0-15% with a resolution of 0.1%.

1. Remove sealing screws and connect the two differential pressure gauges to the gas valve as shown in Fig. 24 and remove the adjustment screw sealing cap.
2. Run the appliance for at least 10 minutes.
3. Note the gas valve signal pressure (differential pressure gauge 2) set the burner pressure (differential pressure gauge 1) to the corresponding value shown in Fig. 25 for the appropriate boiler. Screw the adjuster in to decrease pressure and out to increase pressure.
4. If a CO₂ analyser is available check that the flue gas CO₂ concentration is in line with the value given in the FIG.25.

If a new burner or fan has been fitted it may be necessary to adjust the fan speed offset to achieve the correct gas valve signal pressure. This is accessible by carrying out the following procedure.

Press the reset button and hold in for 10 secs. At this time a number between 0 & 6 will be displayed. It is possible to adjust the fan speed within this range by setting the boiler control switch to L and return it to the mid position to lower the speed and switch to H to increase the speed. Press the reset button once to return to normal operation.

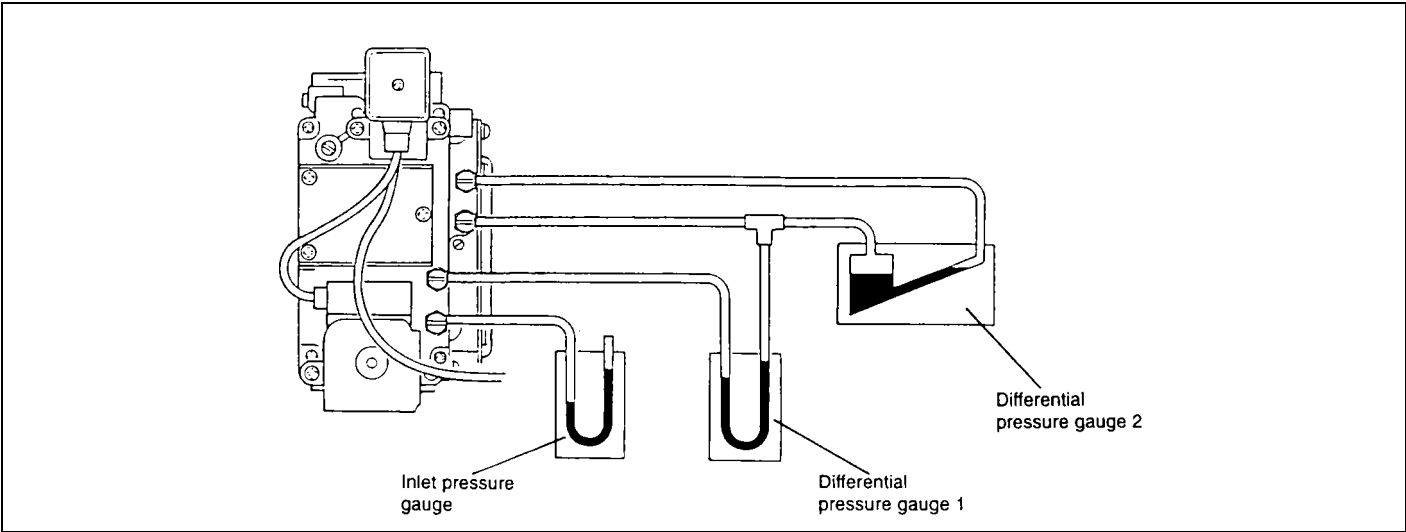


FIG. 24 GAS CONTROL VALVE ADJUSTMENT

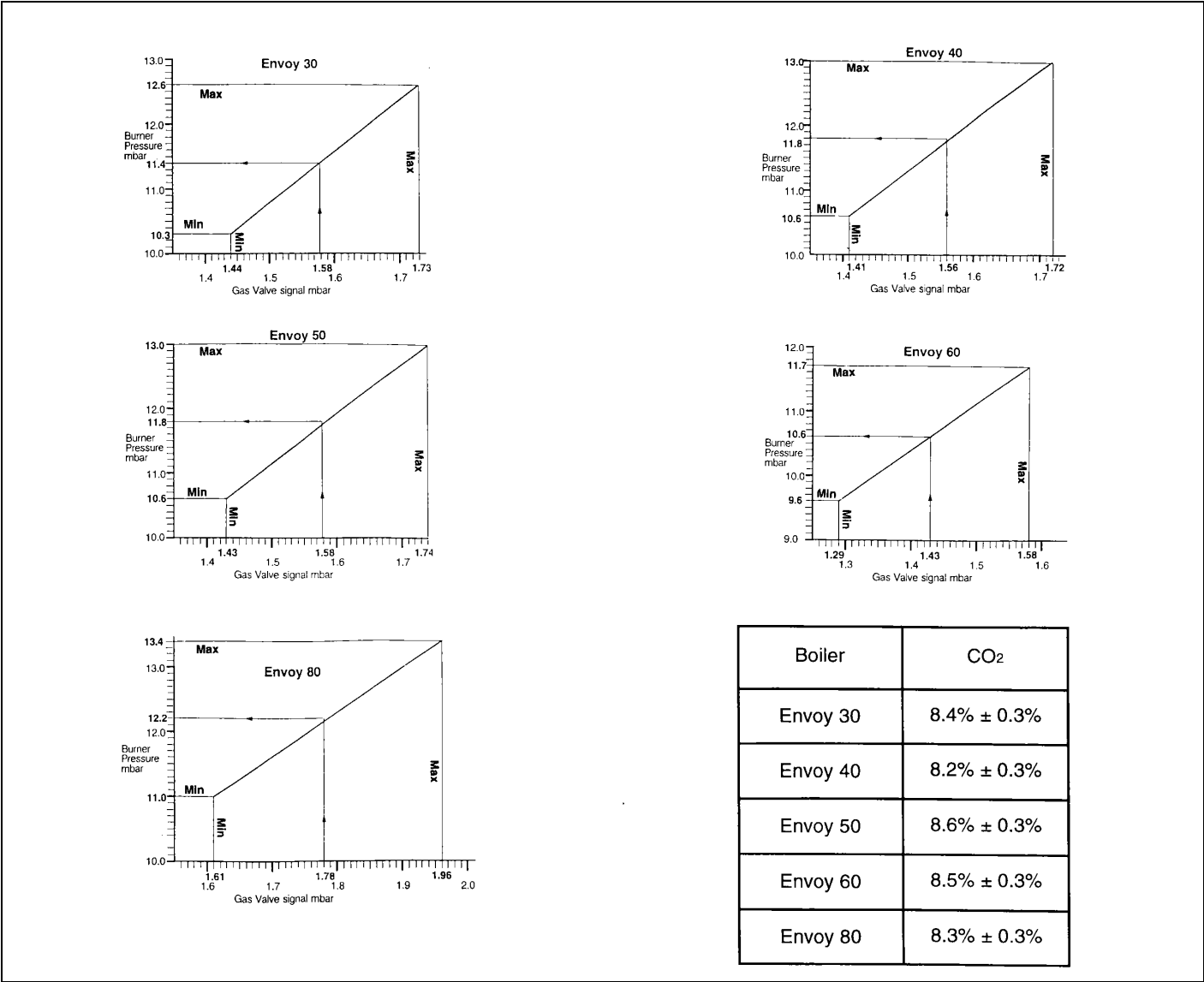
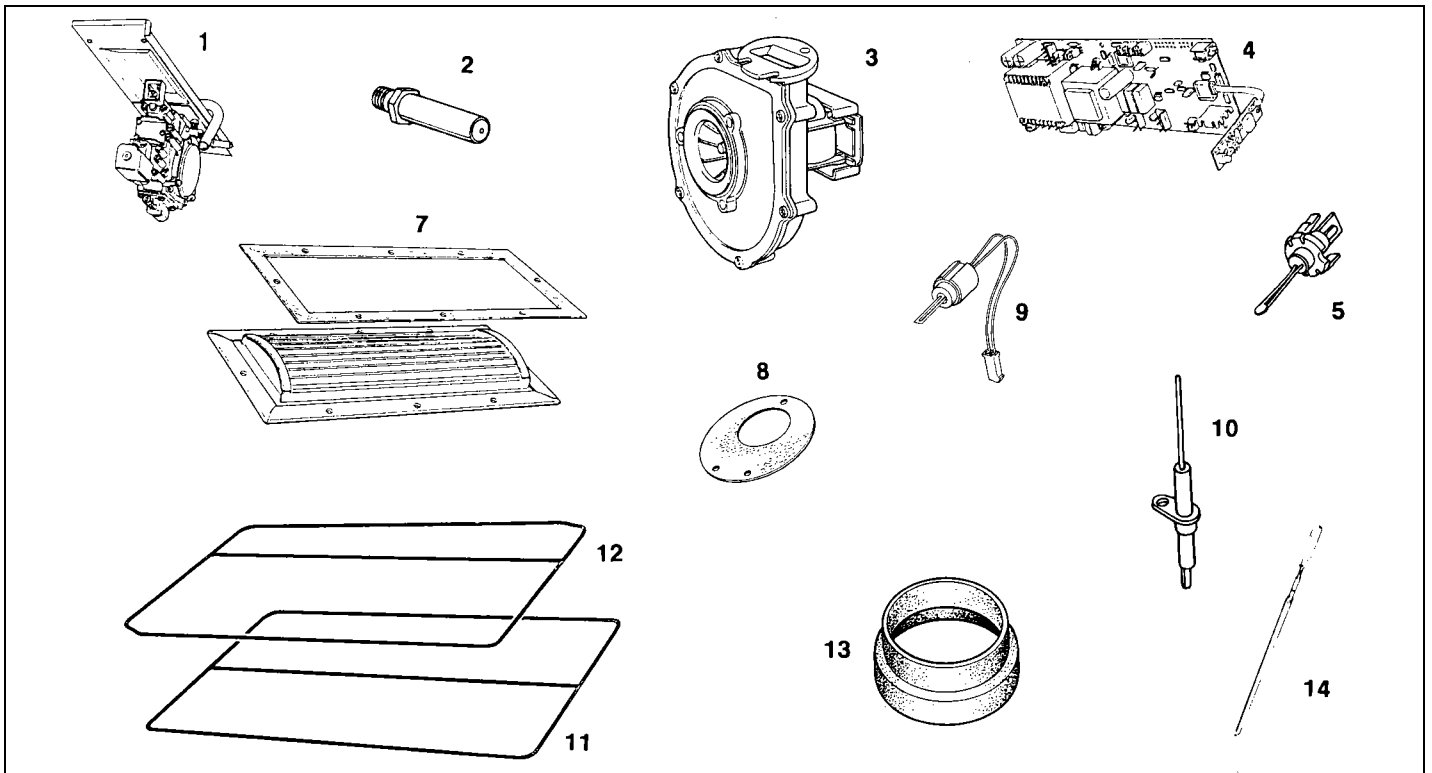


FIG. 25 PRESSURE ADJUSTMENT GRAPH
Signal and Burner Pressures are based on a
Burner Injector with a nominal flow rate.

SHORT PARTS LIST – Page 34

	Description of part		P/M Part No	G.C. Part No
1	Gas Valve Assembly	30 Boiler	930103	114621
		40 Boiler	930104	114622
		50 Boiler	930105	114623
		60 Boiler	930106	114624
		80 Boiler	930107	114625
2	Injector 30 Boiler		411014	114662
	Injector 40 Boiler		411007	114663
	Injector 50 Boiler		411008	114664
	Injector 60 Boiler		411009	114665
	Injector 80 Boiler		411010	114666
3	Fan 30, 40 Boilers		409584	114569
	Fan 50, 60, 80 Boilers		409592	E00040
4	Control Assembly		407734	114629
5	Temperature Sensor		404513	378868
6	Burner 30 Boiler		414727	378870
	Burner 40 Boiler		414728	378871
	Burner 50 Boiler		414729	378872
	Burner 60 Boiler		414730	378873
	Burner 80 Boiler		414731	378874
7	Burner Gasket		236120	114561
8	Fan Outlet Gasket		236253	114596
9	Hot Surface Igniter		407728	378869
10	Flame Sensor		407729	378876
11	Combustion Chamber "O" Ring Seal		236123	114556
12	Flue Hood "O" Ring Seal		236122	114544
13	Flue Gaitor		236139	114618
14	Flue Scraper		907736	337862
15	Fuse T3 .15A (Not Illustrated)		933005	114681



HEALTH AND SAFETY INFORMATION FOR THE INSTALLER AND SERVICE ENGINEER – Page 35

Health and Safety for the Installer and Service Engineer.

Under the Consumer Protection Act 1987 and Section 6 of the Health and Safety at Work Act 1974, we are required to provide information on substances hazardous to health. Small quantities of adhesives and sealants used in the product are cured and present no known hazards. The following substances are also present.

Insulation and Seals

Material - Ceramic Fibre, Alumino - Silicone Fibre.

Description - Boards, Ropes, Gaskets.

Known Hazards - Some people can suffer reddening and itching of the skin. Fibre entry into the eye will cause foreign body irritation. Irritation to respiratory tract.

Precautions - People with a history of skin complaints may be particularly susceptible to irritation. High dust levels are only likely to arise following harsh abrasion. In general, normal handling and use will not present discomfort, follow good hygiene practices, wash hands before consuming food, drinking or using toilet.

First Aid - Medical attention must be sought following eye contact or prolonged reddening of the skin.

Envoy 30, 40, 50, 60, & 80

USER'S GUIDE

USER'S INSTRUCTIONS

It is important that the inner case door of this appliance is not removed for any reason other than for servicing by a qualified service engineer. The appliance must not be operated without the inner casing door correctly fitted and forming an adequate seal.

**THIS APPLIANCE IS FOR USE ON NATURAL GAS ONLY.
IT MUST BE INSTALLED AND SERVICED BY A COMPETENT PERSON AS STATED IN THE GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1994.**

If the appliance is installed in compartment, do not use for storage purposes and do not obstruct any purpose provided ventilation openings.

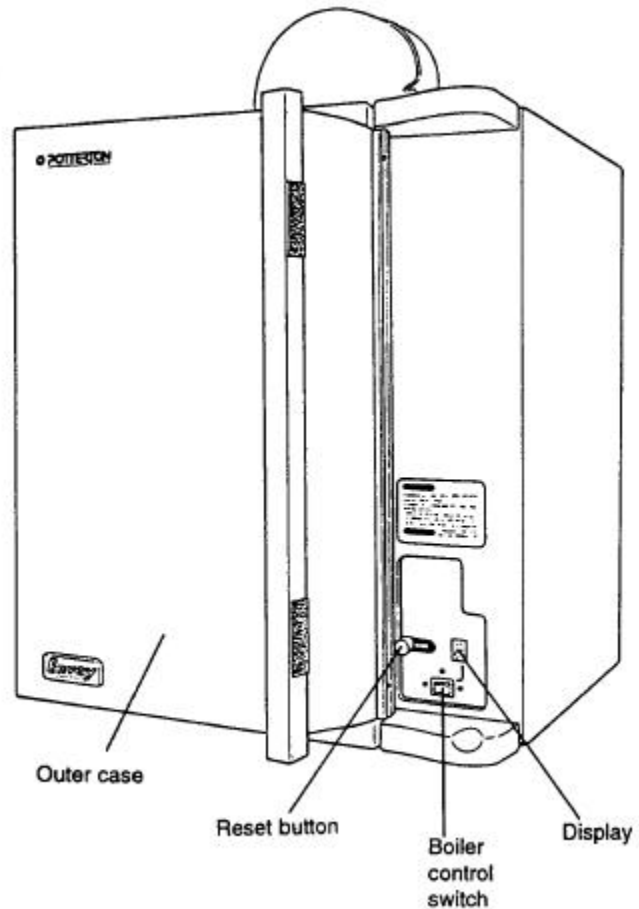
If a gas leak or fault is suspected, turn off the appliance and consult your local gas region or service engineer.

INTRODUCTION

The Potterton Envoy is a wall mounted, room sealed, fully automatic gas fired condensing boiler. The very high efficiency of this appliance results in the flue gases cooling to the point where part of their moisture content condenses inside the boiler, giving up further heat as it does so. This condensate is drained to a suitable disposal point through the plastic waste pipe at the lower rear of the boiler.

Due to the high efficiency and the resulting low flue gas temperature a white plume of condensate will be emitted from the flue outlet terminal. This will be particularly evident during periods of low outdoor temperatures.

Annual skilled servicing is required to maintain the safe and efficient operation of your boiler throughout its long working life. Further information on this subject is given at a later stage.



ELECTRICITY SUPPLY

WARNING: This appliance must be earthed.
Connection shall be made to a 240V 50Hz supply.
The appliance must be protected by a 3 amp fuse.

SAFETY

The boiler should have the following minimum clearances for safety and maintenance, 610mm (2ft) at the front of the boiler, 5mm (0.2in) each side, 100mm (4in) at the bottom, 140mm (5.5in) at the top. Flammable materials must not be stored in close proximity to the boiler.
Ensure that the flue terminal outside the house does not become obstructed, particularly by foliage.

SYSTEM CONTROLS


Because this is a high efficiency appliance Potterton recommend the use of an external control system which independently controls the temperatures of heating and hot water.


A Potterton Electronic Programmer or other type of clock may have been fitted, together with room and/or cylinder thermostats. Full instructions on the use of these controls should be supplied with them.


BOILER CONTROLS


All boiler mounted user controls are situated in the front of the boiler control box behind the hinged door. These are:-


BOILER CONTROL SWITCH

In the mid i.e.  position the boiler is at STANDBY and under normal conditions the boiler will not operate. However, if the water temperature within the boiler falls below 5°C an in-built low temperature device will operate the boiler to maintain a water temperature between 5°C and 10°C to prevent freezing of the boiler.

In the  position will allow the boiler to operate on demand from the time clock or any other external control device. The water temperature leaving the boiler will be controlled at approximately 82°C.

In the  position will allow the boiler to operate on demand from the time clock or any other external control device. The water temperature leaving the boiler will be controlled at approximately 60°C.








When the boiler is only being used to supply domestic hot water and there is no independent hot water temperature control the switch should be set at the  position which will probably be hot enough to meet most hot water requirements.

When the control switch is set at the  position it must be remembered that unless the temperature of the

water in the domestic hot water is controlled independently, the stored hot water could be at a temperature that could scald, i.e. about 82°C.

DIGITAL DISPLAY

During normal operation of the boiler the following characters will be shown on the display:-
Display not illuminated. All power off.

Illuminated Character		Power on, boiler at standby.
Illuminated Character		Heat demand, boiler operating at high temperature
Illuminated Character		Heat demand, boiler operating at low temperature
Illuminated Character		Boiler operating but up to temperature
Illuminated Character		Boiler re-start delayed to prevent rapid cycling
Illuminated Character		Main burner off, pump running to transfer remaining heat from boiler into the system
Illuminated Character		Flashing - boiler at lock-out

To assist the service engineer a fault diagnostic system is incorporated within the electronic control. If a fault should develop within the boiler upto 30 different characters can be displayed thereby directing the engineer to the precise area of the problem.



RESET BUTTON

Pressing the reset button will allow the control to be reset and the boiler restarted should a lockout condition have occurred.

OTHER CONTROLS

A Potterton Electronic Programmer or other type of clock may have been fitted in your system, together with room and/or cylinder thermostats. Full instructions on the use of these controls should be supplied with them.

TO LIGHT

1. Ensure that the boiler control switch is set to the mid position i.e. .
2. Switch 'ON' the main electricity supply. (Character  will be displayed).
3. Ensure the electronic programmer or other time control, if fitted, is in an 'ON' period.

Proceed as follows:-

Switch boiler control switch to the **L** or **H** position, (Character **L** or **H** as appropriate will be displayed). After a short period the boiler will light. Set the time control and any thermostats, where fitted, to their desired settings.

NOTE When the boiler is first lit, there may be a slight smell. This will disappear with use.

TO SHUT THE BOILER OFF

Set the boiler control switch to mid position i.e. **0** or switch the external programmer to the 'OFF' position.

FOR LONGER SHUT DOWN PERIODS

Switch the boiler control switch to mid position i.e. **0**, isolate the electrical supply at the isolating switch or pull the plug out of its socket.

NOTE The boiler **IS** fitted with an internal low water temperature device to prevent it from freezing during cold weather. Should the water temperature in the boiler fall below 5°C the boiler will operate to maintain a system water temperature between 5°C and 10°C. It is therefore important during cold weather not to isolate the boiler from the electrical supply, but to shut OFF the boiler only by turning OFF the programmer or setting the boiler control switch to the mid position i.e. **0**.

IMPORTANT

Gas and electricity are required to operate your boiler. Its performance will not be affected by normal variation in gas or electricity supply, but a gas or electricity failure will put the boiler out of operation. In the case of electricity failure the boiler will automatically re-start when the supply is restored, provided that the time clock and/or thermostats are in an 'ON' position.

In the event of your boiler not working, there are several checks you should carry out before calling in a service engineer, as this could save you unnecessary expense.

1. Check that the gas, electricity and water are all turned on at the main supply.
2. Check that the time control, if fitted, is in an 'ON' period.
3. Check that all thermostats in the system are not at low settings.
4. If the character F is shown flashing on the display a lockout condition is indicated due to either to the burner failing to light during a start sequence or a high temperature being recorded. To relight the boiler press the reset button adjacent to the display and the boiler will go through the restart sequence. If the character returns to the display consult your local Gas Region or Service Engineer.

Having checked these points, run through the lighting procedure once more and if the boiler still fails to light, call in your local service engineer.

CARE OF YOUR BOILER AND SYSTEM

Annual skilled servicing is required to keep your boiler operating safely and efficiently throughout its long working life.

It is also advisable to have the whole heating system checked over annually, so that excessive costs are not incurred by such things as air temperature thermostats or radiator valves getting out of adjustment. Servicing should be carried out by a trained service engineer, and it is suggested that an annual contract be arranged. Contact your local Potterton regional service office.

The outside of the boiler casing can be wiped when necessary using a damp cloth to remove finger marks etc. Do not use an abrasive material.

ADDITIONAL FROST PRECAUTIONS

Your boiler is fitted with a device to protect it from freezing. However, since this device is located within the boiler there may be some pipework etc more vulnerable to frost and additional protection will be required. Various methods can be used.

1. Insulation of pipework etc. taking care not to impede any ventilation supply.
 2. Completely draining the water system if not in use for long periods. On a sealed system, draining and refilling must be carried out by a competent person, e.g. your service engineer.
- NOTE** Although the system can be emptied using the drain off taps installed in the pipework around the system, to empty the boiler it is necessary to remove the drain off cap positioned within the boiler case. This operation is best left to your service engineer.
3. Having an additional low limit thermostat fitted. Seek advice from your installer.

NOTE Frost protection devices cannot operate if the boiler is completely shut down and the electricity supply turned off. Where there is vulnerable pipework and no additional protection is provided it may be necessary to run the boiler at the low setting at times when it would normally be turned off.

To ensure that the highest possible efficiency can be obtained from your Envoy boiler an aluminium heat exchanger is used. Your installer has therefore been advised that the heating system should be protected by a corrosion inhibitor.

The products recommended by Potterton are; FERNOX COPAL or GRACE DEARBORN SENTINEL X100. Periodical checks will need to be made to ensure that the correct concentration levels are maintained. Your installer should provide further information on these aspects.

CARE OF YOUR BOILER AND SYSTEM DURING THE GUARANTEE PERIOD AND BEYOND

1. Registration of Purchase

It is important to register the purchase of your Potterton boiler to ensure you receive prompt and efficient handling in the event your boiler requires attention during the guarantee period.

To register your guarantee simply complete and detach the Registration of Purchase form enclosed with these instructions. It is important to include details of your installer (if known) and to return the completed form to the Potterton Registration Department.

2. During the Guarantee Period

In the event of any problems with your system or the operation of your boiler, you should **first call your installer**. If there is a fault with the boiler under guarantee which your installer is unable to rectify, he will call Potterton Service Operations. For 12 months after the date of installation of the boiler (or 18 months from the date of manufacture, whichever is the shorter), Potterton will attend to any manufacturing defect, on the appliance only (not the system or ancillary controls), free of charge for parts and labour, subject to there being no misuse or abuse. This does not affect your statutory rights.

Service visits by Potterton Service Operations outside the terms of the boiler guarantee will be charged for both parts and labour at our normal rates for chargeable work.

During the period of the boiler guarantee, Potterton will only be responsible for the costs of work done by them or on their instructions by their Agent. We cannot accept any liability for expenditure or work done by other parties without our knowledge and/or approval.

3. Safety Check/Routine Maintenance

It is strongly recommended you have your boiler checked annually for safety and to have routine maintenance. This should be carried out by a CORGI Registered Installer/Service Agent or Potterton Service Operations to comply with the requirements of the Gas Safety (Installation and Use) Regulations 1994.

4. Boiler Breakdown Insurance

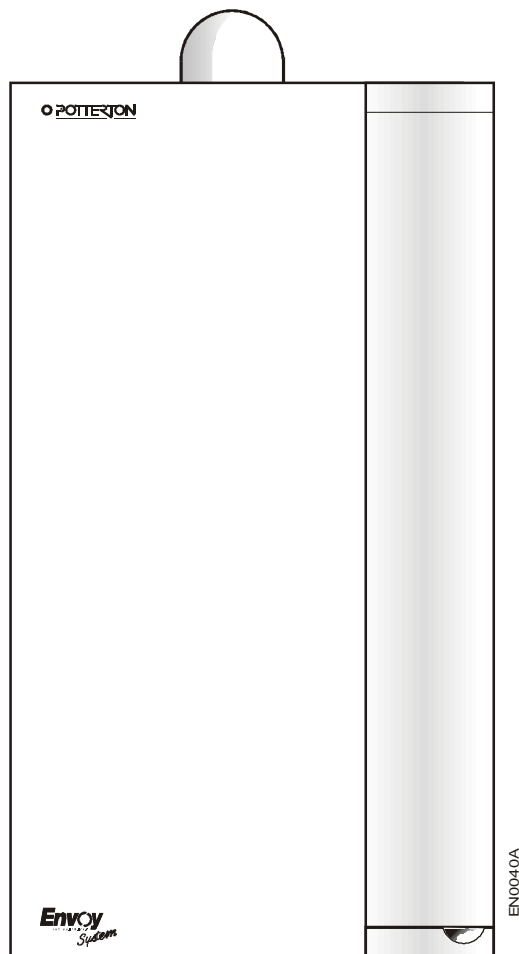
We are pleased to offer you the opportunity to protect your investment once your boiler guarantee has expired, by the payment of an annual premium. You can continue with this insurance for the normal life of your boiler and you will find a special 30 day introductory offer for second year cover together with a card to register your purchase, as part of the 'User Pack' supplied with your boiler.

If you have not been handed a Registration Card/Optional 2nd Year Breakdown Insurance Offer, please contact the Potterton Registration Department for a copy by telephoning 0181 944 4972

Installation & Service Instructions

Envoy System

**Wall Mounted, Fan Powered, Balanced Flue,
Gas Condensing System Boiler**



THE GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1994 (as amended).

“ In your own interest, and that of safety, it is law that all gas appliances are installed by competent persons, in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution.”

The polythene bags used for packaging are a potential hazard to babies and young children and **MUST BE DISPOSED OF IMMEDIATELY.**

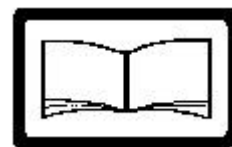
Installation must be in accordance with the Installation & Service Instructions and the rules in force.

LEAVE THESE INSTRUCTIONS WITH THE USER FOR USE ON FUTURE CALLS

**For Use With Natural Gas
(G20) Only At 20mbar
For Use in GB & IE**



IMPORTANT
PLEASE READ THIS BOOK
BEFORE INSTALLING,
OPERATING OR SERVICING
THIS BOILER.



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Introduction - Page 2

The Potterton Envoy System is a high efficiency lightweight, automatically controlled wall hung gas fired condensing boiler. The flue system is room sealed and fan powered. There are five models available with outputs of 8.8kW (30,000 Btu/hr), 11.7kW (40,000 Btu/hr), 14.6kW (50,000 Btu/hr), 17.6kW (60,000 Btu/hr) and 23.4kW (80,000 Btu/hr).

These boilers are designed to provide domestic hot water and/or central heating and must be used on FULLY PUMPED sealed systems only.

Concentric horizontal and vertical flues are available from 1 metre to 3 metres in steps of 0.5 metre using the following options:-

Sales Code.	Description.
EFLUEXT 500	- 0.5 metre Flue Extension
EFLUEXT	- 1.0 metre Flue Extension
1EFLUEH	- Std 1 metre Horizontal Flue
1EFLUEV	- Std 1 metre Vertical Flue

Accessories

The following Potterton Myson controls are recommended for use with your boiler:-

Electronic Programmer EP2002, EP3002 or EP6002
Cylinder Thermostat PTT2 or PTT100
Room Thermostat PRT2 or PRT100
Frost Thermostat PRT100FR
Motorised Zone Valve MSV222 or MSV228
Motorised Diverter Valve MSV322
Thermostatic Radiator Valve

Data sheets describing these products are available on request.

Optional Extras

Sales Code.	Description.
EWPLATE	Terminal Wall Plate - where necessary can be fitted to the outside face to improve the appearance, after making good around the terminal.
EGUARD	Terminal Guard.
EFRFKIT	Flat Roof Flashing Kit - for use with Vertical Flue.
EPRFKIT	Pitched Roof Flashing Kit - for use with Vertical Flue.
ENVOYDIV	Mid Position Diverter Valve Kit

Technical Data - Page 3

<i>Boiler Details</i>		30	40	50	60	80
Heat Input	KW Btu/hr	10.1 34,500	13.43 45,800	16.87 57,600	20.2 68,900	26.86 91,600
Heat Output, NON-CONDENSING	KW Btu/hr	8.79 30,000	11.72 40,000	14.65 50,000	17.58 60,000	23.45 80,000
Heat Output, CONDENSING	KW Btu/hr	9.7 33,100	12.8 43,700	16.1 55,000	19.0 64,800	25.0 85,400
Gas Rate	M3/h ft3/hr	0.96 34.0	1.28 45.2	1.6 56.7	1.92 68.0	2.56 90.4
Burner Pressure	Mb in/wg	11.4 4.6	11.8 4.7	11.8 4.7	10.6 4.24	12.2 4.9
Injector Size	Mm	2.5	2.9	3.2	3.7	4.2

Classification	I2H. C1. C3. IP20	Water Capacity	3.4 litre
Burner	Furigas Pre-Mix	Condense Discharge	
Igniter	Norton 401S Hot Surface	Connection	21.5mm (¾ Plastic Compression)
Flame Detector	Morgon Matroc	Maximum Flow	
Gas Control Valve	SIT Nova Mix 1 - 8 Air Gas Ratio	Temperature	82°C
Electrical Supply	230V ~ 50Hz	Expansion Vessel	13.5 litre
Fuse Rating - External	3A		(charge pressure 1.0 bar)
Packed Weight - Boiler	52kg	Pressure Relief Valve	3 bar
Gas Supply Connections	15mm Compression	Pump 30 - 60 Models	CP53
Flow Connection	22mm Compression	Pump 80 Model	CP63
Return Connection	22mm Compression	Flue Size	100mm Concentric

Boiler Dimensions

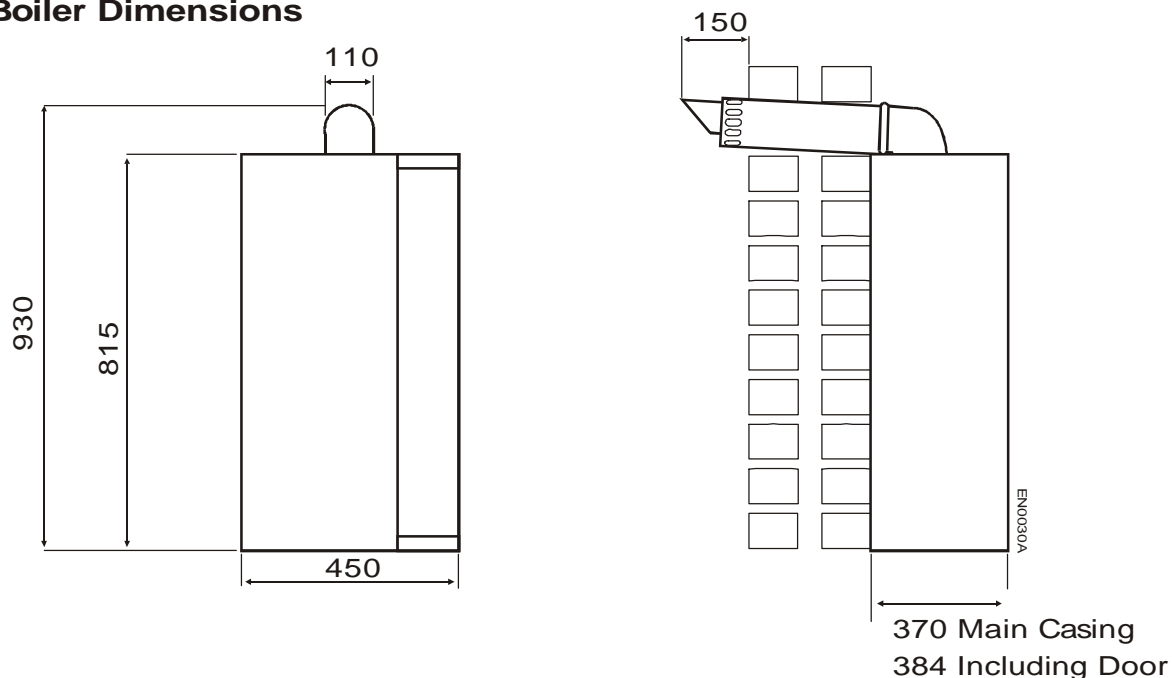


Fig.1

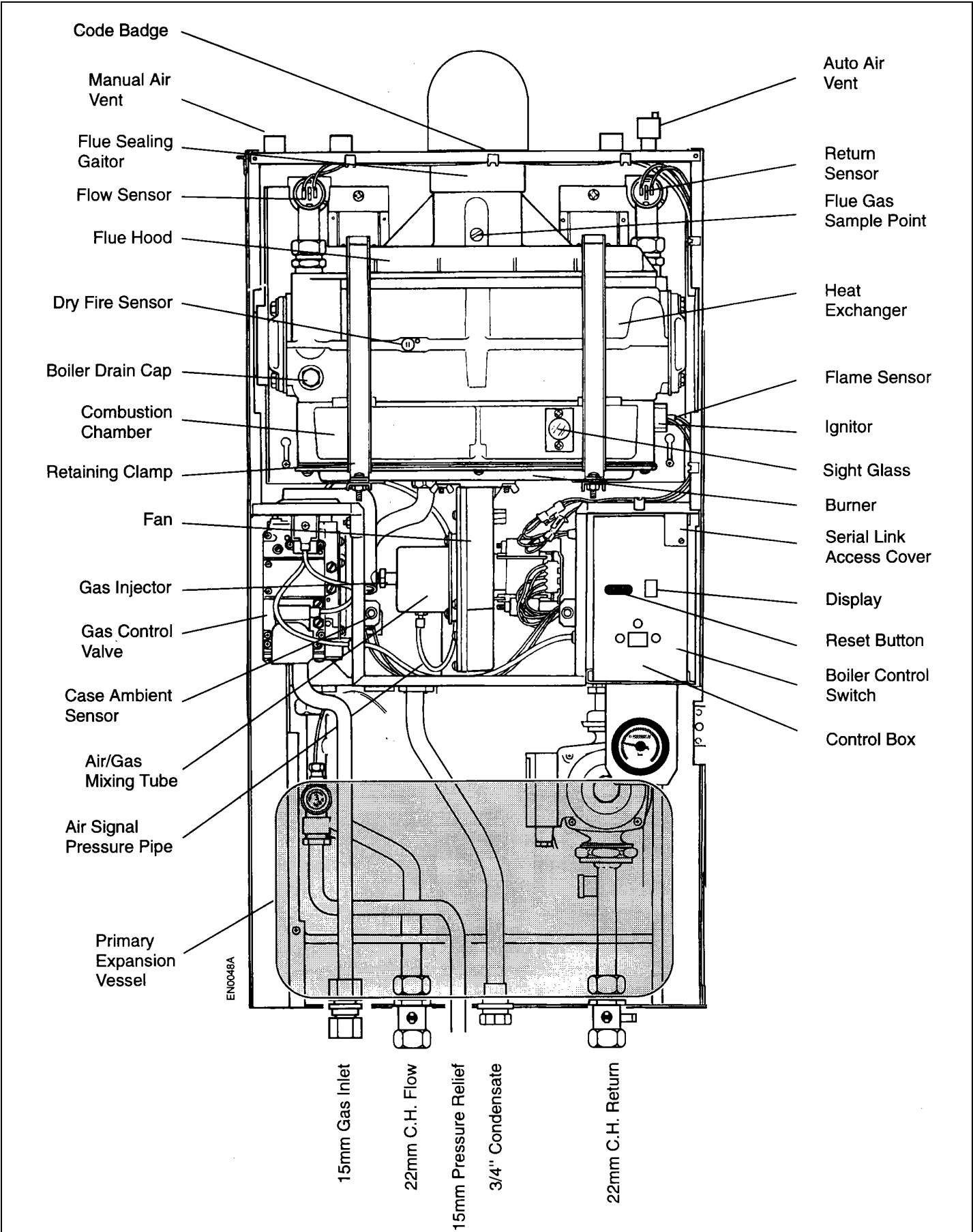


Fig.2

1. Installation Requirements - Page 5

General Information

Prior to installation the boiler should be stored as directed on the carton and in a dry place. Both the user and manufacturer rely heavily on the installer, whose job it is to install the boiler and connect it to a correctly designed heating system. Acquaint yourself with the British Standards concerning installation requirements. If you need advice on any points, Potterton Myson's Service Operations will be pleased to help (see back page).

Samples of the Envoy System Boilers have been examined by Gastec, a Netherlands Notified Body. The range is certified to comply with the essential requirements of the Gas Appliance Directive 90/396/EEC, the Low Voltage Directive 72/23/EEC and shows compliance with the Electro Magnetic Compatibility Directive 89/336/EEC and are therefore permitted to carry the CE mark.

It is important that no external devices e.g. flue dampers, economisers etc, be directly connected to this appliance unless covered by these Installation and Service Instructions or otherwise recommended by Potterton Myson Ltd. in writing. If in doubt please enquire.

Any direct connection of a control device not recommended by Potterton Myson could invalidate the certificate and normal appliance warranty and could also infringe the Gas Safety Regulations. Manufacturers instructions must not be taken in any way as over-riding statutory obligations.

Codes of Practice

The boiler must be installed in accordance with the Gas Safety (Installation & Use) Regulations 1994 (as amended), and the current issue of:-

- I.E.E. Regulations.
- Model Water Bye Laws.
- Building Regulations.
- Building Standards for Scotland.
- Health and Safety Document No. 635. (The Electricity at Work Regulations 1989).

Health and Safety Information for the Installer and Service Engineer

Under the Consumer Protection Act 1987 and Section 6 of the Health and Safety at Work Act 1974, we are required to provide information on substances hazardous to health. Small quantities of adhesives and sealants used in the product are cured and present no known hazards. The following substances are also present.

Insulation and Seals

Material - Ceramic Fibre. Alumino - Silicone Fibre.

Description - Boards, Ropes, Gaskets.

Known Hazards - Some people can suffer reddening and itching of the skin. Fibre entry into the eye will cause foreign body irritation. Irritation to respiratory tract.

Precautions - People with a history of skin complaints may be particularly susceptible to irritation. High dust levels are only likely to arise following **harsh** abrasion. In general, normal handling and use will not present discomfort, follow good hygiene practices, wash hands before consuming food, drinking or using the toilet.

First Aid - Medical attention must be sought following eye contact or prolonged reddening of the skin.

Electricity Supply

A 230 volts ~ 50Hz, single phase electricity supply fused to 3A, must be provided in accordance with the latest edition of the IEE Wiring Regulations and any other local regulations that apply. The current rating of the wiring to the boiler must exceed 3 A and have a cross sectional area of at least 0.75mm in accordance with BS 6500, Table 16.

The supply to the boiler and its associated equipment should be controlled by an exclusive 3A fused double pole switch (having at least 3mm contact separation in both poles) so that complete isolation from the supply can be achieved to enable servicing work to be carried out in safety.

Gas Supply

A gas supply pressure of 20mbar is required at the inlet of the appliance. Performance data is based on use of reference gas G20. The meter and supply pipes must be capable of delivering this quantity of gas in addition to the demand from any other appliances in the house and must be governed at the meter.

Condensate Drain

The condensate outlet on the boiler is designed to accept 21.5mm (¾") plastic overflow pipe, which if possible should discharge into the household drainage system and have an internal termination. If this is not practical, discharge into an outside gully or soak away is acceptable. To avoid blockage of this pipe due to freezing it should be routed internally where possible and have sufficient fall over its entire length to dispose of condensate quickly. See British Gas 'Guidance Notes for the Installation of Domestic Gas Condensing Boilers'.

Installation Requirements - Page 6

Location of Boiler

These boilers are not suitable for external installation and should not be fitted directly above a cooking appliance. The boiler may be installed in any room, although particular attention is drawn to the requirements of the current IEE Wiring Regulations and in Scotland, the electrical provisions of the Building Standards applicable in Scotland with the respect to the installation of the appliance in a room 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.

Where the installation of the boiler will be in an unusual position, special procedures may be necessary and BS6798 and BS5546 give detailed guidance on this aspect.

It should be noted that due to the high efficiency of this boiler a white plume of condensate will be emitted from the flue terminal, therefore care should be taken when selecting the terminal position.

Boiler Mounting Surface

The boiler must be mounted on a flat wall, which may be of combustible material and must be sufficiently robust to take the weight of the boiler. The requirements of the Local Authorities and the Building Regulations must be adhered to.

Timber Framed Houses

If the boiler is to be installed in a timber framed building it should be fitted in accordance with the British Gas publication- Part 19 - Building and Kitchen Work. If in doubt advice must be sought from the local region of British Gas or from Potterton Myson.

Clearances around the Boiler and Tank

The following minimum clearances must be maintained after installation for correct operation and servicing of the boiler and tank.

Front:	15mm (610mm for servicing)
Sides:	5mm each side
Top:	140mm (from top of boiler case)
Bottom:	120mm

Ventilation

The room in which the boiler is installed does not require a purpose provided air 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 level and low level air vents must communicate with the same room or must be on the same wall to outside air. Both the high level and low level vent must each have a free area as stated below. The free area of each vent may be halved if the ventilation is provided directly from outside.

High and Low air vent areas:

Envoy System 30	103 cm ²
Envoy System 40	135 cm ²
Envoy System 50	170 cm ²
Envoy System 60	206 cm ²
Envoy System 80	277 cm ²

If the boiler is installed in a cupboard or compartment with a door, allow at least 15 mm clearance between the front of the boiler and the door for air movement.

Flue Terminal and Ducting

The **Standard Horizontal Flue** system (Part No. 236346) is suitable for installations up to 1030mm, measured from the centre line of the boiler outlet to the outside face of the wall.

0.5 & 1 Metre Flue Extension kits (0.5m - Part No. 430092, 1m - Part No. 430085) are available to extend horizontal flues to a maximum length of 2920 mm and vertical flues to a maximum length of 3 metres. The siting positions for horizontal flue terminals are shown in Fig. 3.

A **Concentric Vertical Flue** system is available (Part No. 236348) when used in conjunction with the 0.5 & 1 Metre Flue Extension kits and is suitable for flue heights up to 3 metres to terminate through a roof.

The siting of the flue terminal through a roof is shown in Fig. 3.

Only the flue systems shown here can be fitted to the Envoy System boilers.

As with all condensing boilers, the flue will produce a plume of visible condensation for much of the time that the boiler is running.

Care must therefore be taken in the siting of the terminal so as not to be a nuisance to adjacent property.

In particular, prolonged wetting of a facing wall should be avoided, if necessary by use of an appropriate deflector.

If the terminal is fitted less than 2m (6.6 ft) above a balcony, above ground or above a flat roof to which people have access then a suitable terminal guard must be provided and fitted.

A protective guard is available from the Potterton Myson Sales Office whose address and telephone number are shown on the rear cover. The guard (Part No 236591) must be securely fitted to the wall and centrally located over the flue terminal.

Where a flue terminal is installed less than one metre from a plastic, or painted gutter, or 500mm from painted eaves, an aluminium shield one metre long, should be fitted to the underside of the gutter or painted surface. A suitable wall plate should be fitted to the painted wall surface of a mobile home.

Installation Requirements - Page 7

It is absolutely ESSENTIAL to ensure that products of combustion discharging from the terminal cannot re-enter the building, or any other adjacent building, through ventilators, windows, doors, natural air infiltration, or forced ventilation/air conditioning. If products of combustion are found to be re-entering any building, the appliance MUST be turned OFF IMMEDIATELY.

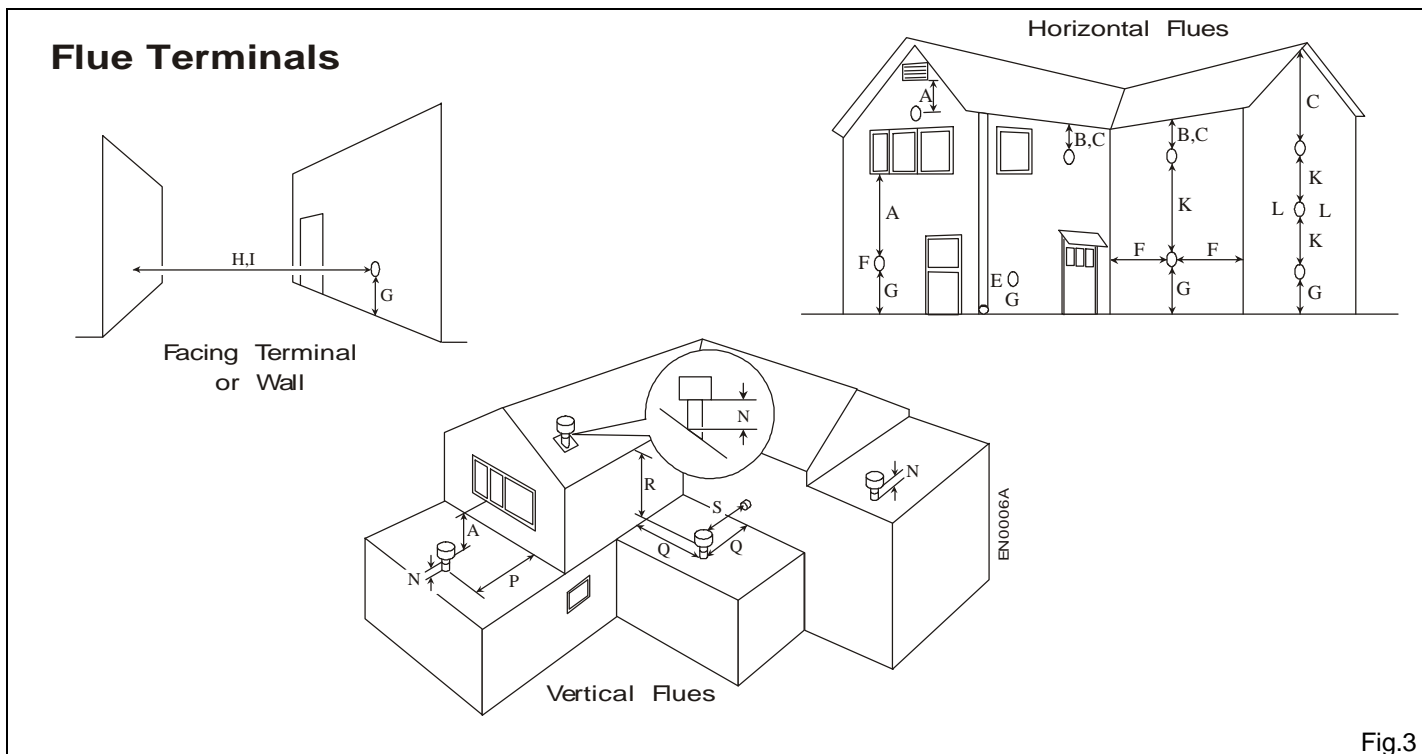
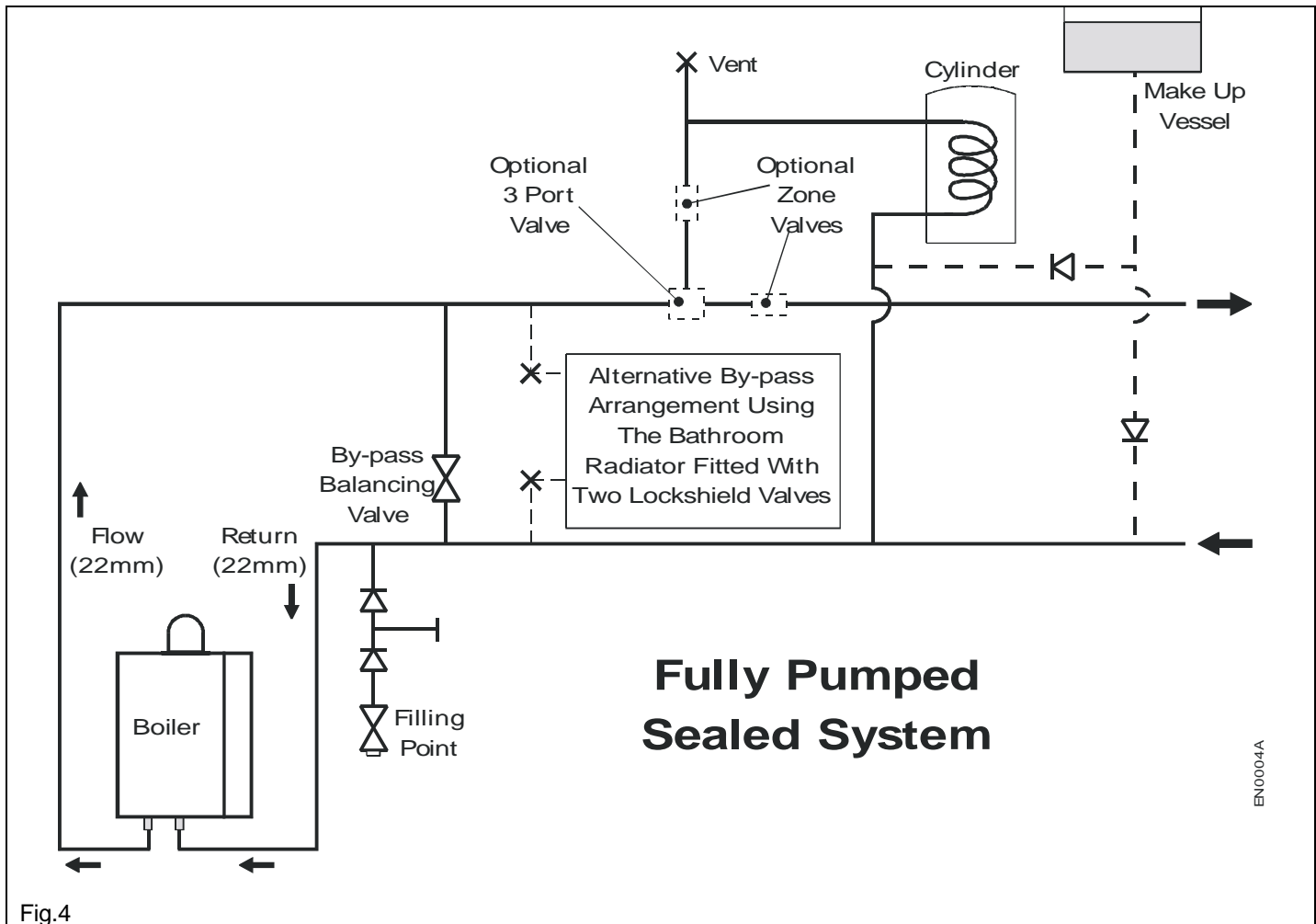


Fig.3

Terminal position	Minimum spacing
A - Directly below an openable window, air vent or any other ventilation opening	300 mm
B - Below gutters, soil pipes or drain pipes	75 mm
C - Below eaves (Horizontal Flue Only)	200 mm
* - Below balconies/Carport Roof	Not Recommended
E - From vertical soil pipes or drain pipes	75 mm
F - From an internal or external corner	300 mm
G - Above adjacent ground or balcony level	300 mm
H - From a surface facing the terminal	2000 mm
I - From a terminal facing the terminal	2000 mm
* - From opening (Door/Window) in carport into dwelling	Not Recommended
K - Vertically from a terminal on the same wall	1500 mm
L - Horizontally from a terminal on the same wall	300 mm
M - Adjacent to opening	300 mm
N - Above roof level (to base of terminal)	300 mm
P - From adjacent wall to flue	300 mm
Q - From internal corner to flue	400 mm
* - Below eaves or balcony (Vertical flue)	Not Recommend
S - From facing terminal	2000



The System

The Envoy System boiler has an aluminium alloy heat exchanger, therefore all systems must be thoroughly cleansed and the correct treatment added to the system water.

The only system additives recommended by Potterton Myson Ltd. are FERNOX-COPAL or GRACE DEARBORN - SENTINEL X 100 and should be used in accordance with the manufacturers instructions. This will include use of the appropriate system cleanser.

The boiler must only be used on INDIRECT FULLY PUMPED SEALED Systems.

To ensure sufficient pump head is available on the 80 model to overcome system resistance, a system differential of 14°C should be allowed for when sizing radiators.

Where the the D.H.W & C.H circuits are controlled by two 2 port zone valves as illustrated or where all radiators may be controlled by thermostatic radiator valves a by-pass must be fitted.

Drain off taps should be fitted in the pipework close to the boiler and at all low points of the system.

Note: Although the system can be emptied using the drain off taps installed in the pipework around the system, to empty the heat exchanger it is necessary to remove the drain off cap positioned within the boiler case.

Installation

The installation must comply with the requirements of BS 6798: 1987 and BS 5449: Pt 1.

The British Gas publication "British Gas Specification for Domestic Wet Central Heating Systems" should also be consulted.

The following components are incorporated within the appliance.

- Circulating pump.
- Diverter valve (Optional Extra).
- Pressure Relief valve with a non-adjustable pre-set

Installation Requirements - Page 9

- lift pressure of 3 bar (45 psi).
- d) Pressure gauge covering the range 0-4 bar (0-60 psi).
- e) 13.5 litre expansion vessel with initial charge pressure of 1.0 bar (14 psi).

Ancillary pipework, not forming part of the useful heating surface, should be lagged to prevent heat loss and any possible freezing, particularly where pipes run through roof spaces and ventilated under-floor spaces.

The expansion vessel on this appliance is suitable for central heating systems up to 135 litres. For systems greater than this, an additional expansion vessel will be required.

Mains Water Feed: Central Heating

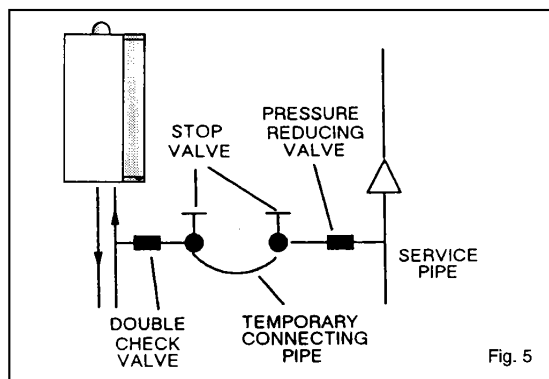
A connection must be incorporated into the central heating system to facilitate filling. There must be no direct connection to the mains water supply, even through a non-return valve, without the approval of the Local Water Authority.

Permissible Methods of Filling

(1) Direct Method (Fig. 5)

A detachable flexible hose is connected to a stop valve fitted to an outlet on the service main. The other end of the hose is connected to a second stop valve and a double check valve. The double check valve is fitted to an inlet connection on the central heating return pipe under the appliance. The hose should be disconnected after filling. Where the mains pressure is excessive a pressure reducing valve could be used to make filling easier. The following fittings shall form a permanent part of the system and shall be fitted in the order stated.

- a) A stop valve complying with the requirements of BS 1010 Part 2, (the temporary hose from the draw off tap shall be connected to this fitting).
- b) Double check valve of an accepted type.



(2) Booster Pump Method

The system may be filled through a self contained unit comprising a cistern, pressure booster pump and if

necessary, an automatic pressure-reducing valve or flow restrictor.

The pressure booster pump must be capable of pressurising the system to a minimum of 1.0 bar (14 p.s.i.) measured at the appliance.

The cistern should be supplied through a temporary connection from a service pipe or cold water distributing pipe. The unit may remain permanently connected to the heating system to provide limited water make-up.

Provisions for make up water

Provision should be made for replacing water loss from the system by re-pressurisation of the system. See section on Methods of Filling.

Reference should be made to British Gas Publications "Material and Installation Specifications for Domestic Central Heating and Hot Water".

Note: The pre-charge pressure of the expansion vessel is set at 1 bar, therefore, the cold fill pressure should be 1 bar.

Installation to an Existing Central Heating System

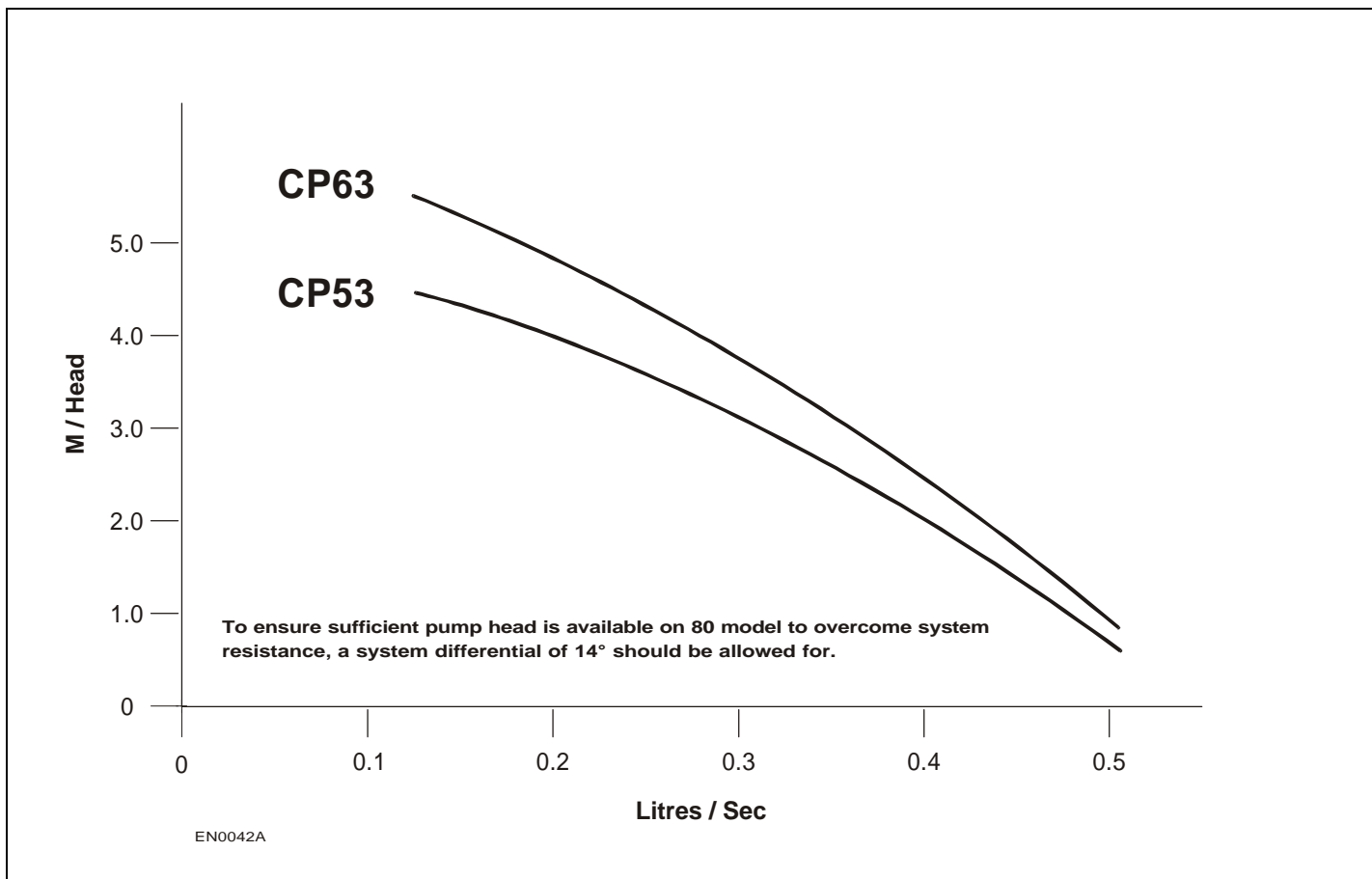
The boilers are designed to operate on a sealed system only, therefore if the existing system is of the open type it will have to be modified to comply with BS 6798.

Before installing a new boiler to an existing system flush out the old system with a recommended descaling/flushing agent at least twice.

Also check pipework and renew any corroded pipework or fittings. Valve glands must be re-packed or replaced wherever necessary and any defective controls replaced.

Pump

The variable speed circulating pump fitted within the appliance should be capable of satisfying most system requirements. Fig. 6 indicates the amount of pump head available for the system. The boiler resistance is already taken into account in this curve.



Boiler Size	Water Flow Rate		System Differential
	Litres/sec	gal. min	
30	0.19	2.50	10°C
40	0.25	3.34	10°C
50	0.32	4.17	10°C
60	0.38	5.00	10°C
80	0.40	5.27	14°C

2. Installation

It is the law that gas appliances are installed and serviced by a competent person as stated in the Gas Safety (Installation & Use) Regulations 1994.

Electrical test work should be carried out by a competent person in accordance with IEE wiring regulations.

The boiler and its associated equipment will arrive on site in 3 cartons. The contents will be as follows:-

Carton 1:- Boiler Pack

Boiler
Outer Casing Assembly
Accessory Pack

Carton 2:- Flue Pack

Flue System
Flue Installation Instructions

Carton 3:- Frame

Boiler Mounting Frame
Template
Screw Pack
Literature Pack

When side or vertical fluing extend flue outlet centre line on the template horizontally or vertically as appropriate and mark flue outlet hole on adjacent surface as illustrated. Vertical flues require a 105mm diameter hole unless extension kits are used when the hole size will need to be increased to 125mm to allow joining clamps to pass through.

Where a horizontal hole is produced using a core drill the hole diameter will need to be increased for thicker walls as shown in the following table.

Hole Diameter	Maximum Wall Thickness
125mm	230mm
150mm	720mm
175mm	1000mm

Using wall plugs and screws from accessory pack attach boiler mounting frame to wall ensuring that it is level.

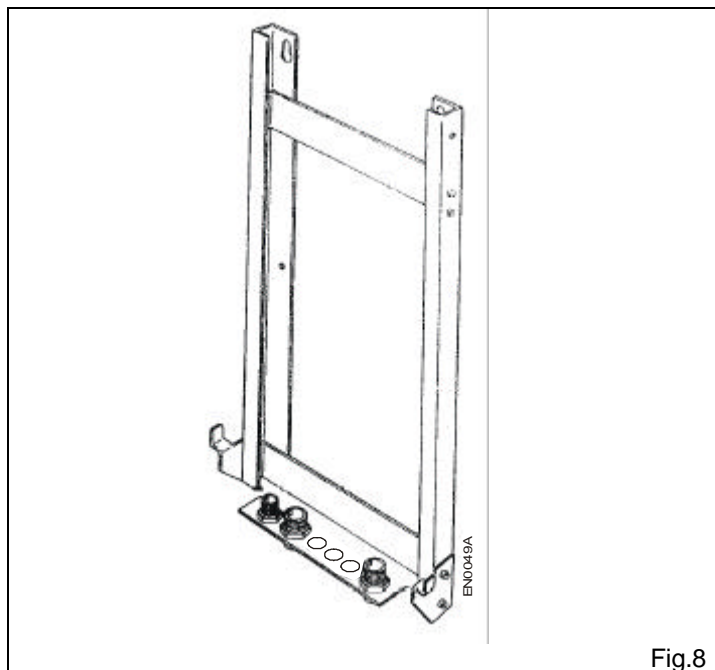
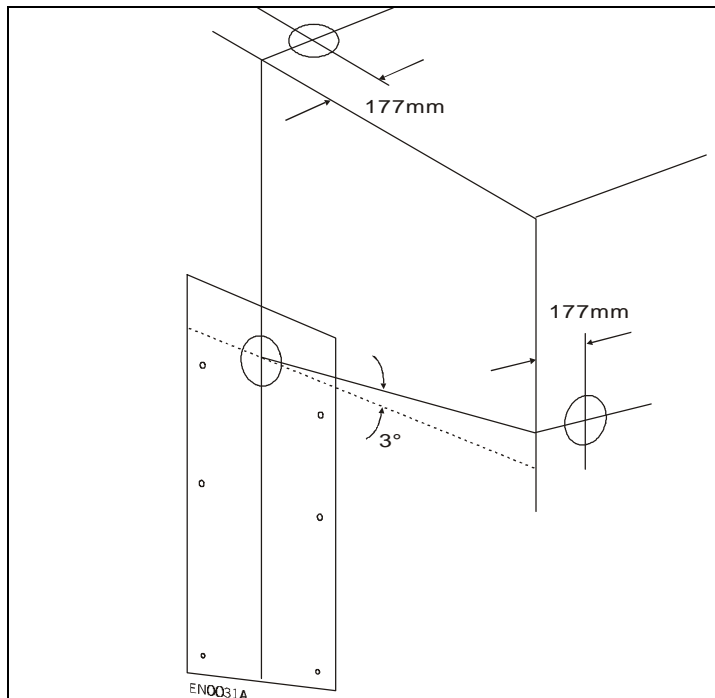


Fig.8

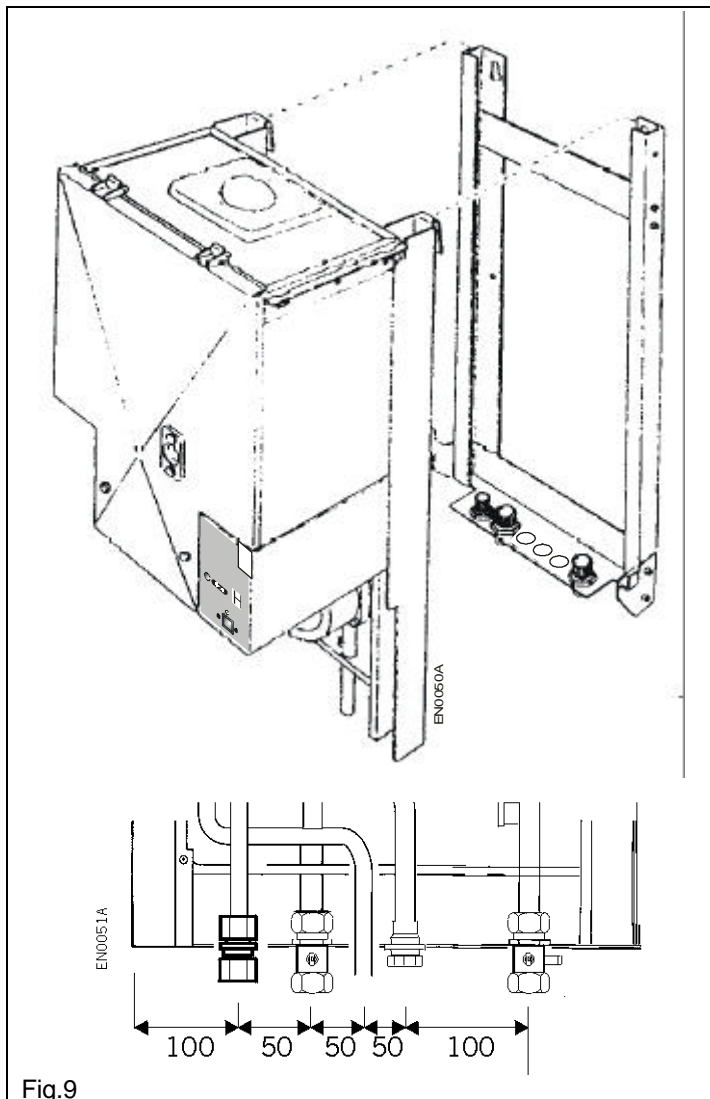


Fig.9

Remove functional case door by undoing the two lower securing screws and lift door off the two upper hinge brackets.

From the accessory pack, connect the fittings to the base of the mounting frames as shown - see Fig. 2 for guidance.

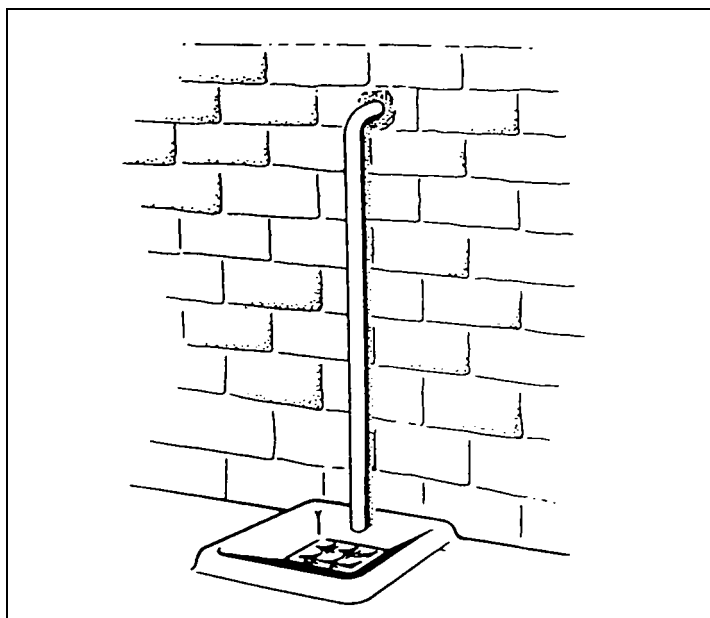
Slide the nuts and olives from the fittings onto the boiler pipes and temporarily tape them clear of the pipe ends.

Lift and hang the boiler onto the mounting frame ensuring the pipework at the base of the boiler locates into the fittings in the base of the mounting frame.

Connect the plastic condensate drain pipe to the mounting frame.

Connect system pipework to the base of the mounting frame as shown.

Connect the gas supply to the base of the mounting frame as shown.



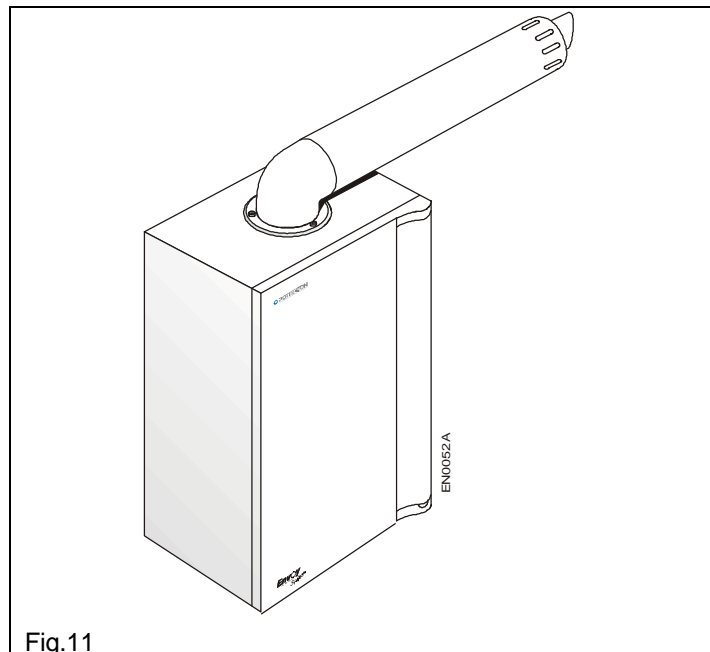
Pressure Relief Valve: The pressure relief valves is pre-set at 3 bar.

Install a pressure relief valve discharge pipe to the boiler valve, not less than 15 mm diameter and connect to the pressure relief outlet connection using a 15mm Compression fitting. The pipe run should be as short as possible, run continuously downwards and discharge to the outside of the building, where possible over a drain. The pipe end should be directed towards the wall. The discharge point must be such that it will not be hazardous to occupants or cause damage to external electrical components or wiring.

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.

Flue System

Assemble and attach the flue system to the boiler by following the instructions supplied with the flue kit.



Electrical Connections

The boiler and all external control circuit wiring must be supplied from the same isolating switch or plug and socket.

The boiler terminal block which is situated in the control box is not designed to accept wiring from all the on-site controls therefore the installer will need to incorporate an external junction box.

Remove the securing screw and lower the expansion vessel.

Open the control box by removing the two M4 securing screws and lowering the access door as illustrated.

Electrical Wiring

Route a four core cable from the external junction box through the cable clamp in the underside rear of the control box and connect to boiler terminal block as follows.

Permanent live to terminal marked L

Neutral to terminal marked N

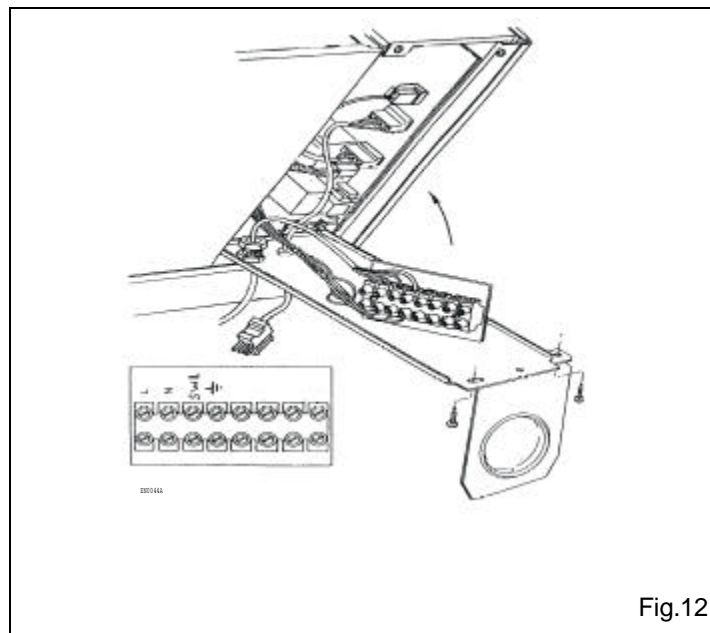
Earth to terminal marked 

Switched live from external controls to terminal marked SwL

If there are no external controls fitted connect SwL terminal to permanent live in the junction box.

Note: The electrical mains supply must be fused at 3A and the connection must be made to the boiler terminals in such a way that should the lead disengage from the cable clamp, the current carrying conductors become taut before the earth conductor.

Close the control box and replace the two M4 securing screws.



3. Commissioning - Page 14

All Systems

Note: The system can be filled using a sealed system filler pump with a break tank or by any other method approved by the Local Water Authority. Refer to 'THE SYSTEM' section Page 8 in these instructions, also BS.6798 1987.

Flush out the system thoroughly with cold water. Fill and vent the system until the pressure gauge registers 1.5 bar (21.5 lbf/in²). Examine for leaks. Raise the pressure until the safety valve lifts. This should occur within ± 0.3 bar of the preset lift pressure of 3 bar. Release water to attain the correct cold fill pressure.

The whole of the gas installation including the meter should be inspected and tested for soundness and purged in accordance with the recommendations of BS.6891.


Electrical testwork should be carried out by a competent person in accordance with the IEE Wiring Regulations.

Conduct a preliminary electrical test by checking: for short circuits, fuse failure, incorrect polarity, earth continuity and resistance to earth. If a fault has occurred on the appliance, the fault finding procedure should be followed. See Page 25.

Fit the functional case door into position by lifting it onto the top hinge brackets and secure it with the lower two fixing screws.

First Lighting

WARNING: Before lighting the boiler ensure that the functional case door HAS BEEN CORRECTLY FITTED and that the sealing strip fitted to the door is forming a tight seal with the main boiler casing.


Before proceeding to light the boiler, check that the external electricity supply to the boiler is switched off and that the boiler control switch is in the mid i.e.  position.

Turn on the gas service cock.



Ensure that the boiler and radiator isolating valves are open.



Ensure the electronic timer if fitted, is in an 'ON' period (refer to the time control literature).

Ensure that the room and/or cylinder thermostats where fitted are set to a high temperature.


Switch ON the main electricity supply (character  will be displayed).

Note: The boiler is protected by an automatic frost

Protection device, therefore if the water temperature within the boiler is below 5°C the character  will be displayed and the boiler will fire until a return temperature of 10°C is reached. The boiler will then shut down and the character  will be displayed.

Switch the boiler control switch to the "H" position and the character  will be displayed. After approximately 10 seconds the boiler should light. Due to the presence of air in the gas supply it is possible that the boiler will not light at the first attempt but will automatically cycle and make two further attempts. If the boiler still fails to light it will go to lockout indicated by the character  shown flashing on the display. If this should occur wait 10 seconds then press the lockout reset button and the boiler will go through another start sequence.

If the boiler fails to start after 1 or 2 attempts refer to fault finding section.

It should be noted that the boiler control continually monitors the temperature rise across the heat exchanger. Therefore if the system is not correctly vented, air passing through the pump may lead to boiler shut down with the character  being displayed. If this occurs, thoroughly vent the system and press the reset button.

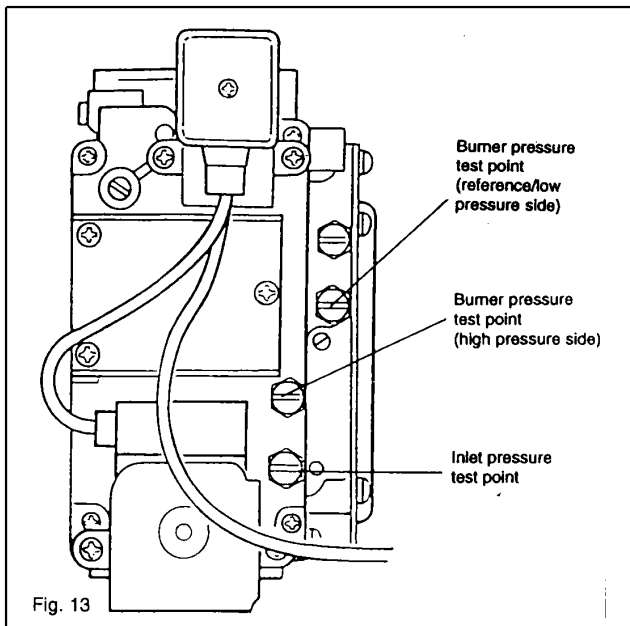
Burner Pressure

This appliance is fitted with a Gas/Air ratio control valve. This gas valve ensures that the correct amount of gas is delivered to the burner to match the available air supply under all operating conditions.

THE BURNER PRESSURE AND GAS RATE HAVE BEEN PRECISELY SET AND CHECKED DURING MANUFACTURE AND NO ATTEMPT SHOULD BE MADE TO ADJUST IT.

To check the correct operation of the gas valve follow the instructions below carefully.

- a. A good indication of correct operation of the boiler will be obtained by measuring the gas rate at the gas meter.
 1. Run the appliance for at least 10 minutes.
 2. With all other gas appliances turned off measure the gas rate at the meter for a period of at least 5 minutes. Check that the measured rate is within $\pm 5\%$ of the rate stated on the data plate.
- b. To measure the burner pressure.
 1. Turn off the gas service cock. Fit a pressure gauge to the gas inlet pressure test point on the



gas control valve. Connect a differential pressure gauge or 'U' tube manometer between the burner pressure gauge test point (high pressure side) and the reference pressure test point (low pressure side) on the gas valve (see Fig. 11).

2. Turn on the gas service cock and run the appliance for at least 10 minutes. Check that the gas inlet pressure is between 19-20 mbar.
3. Check that the differential burner pressure is within ± 1.0 mbar of that stated on the data plate.
4. Turn off the gas service cock and remove the pressure gauge and replace the pressure test point sealing screws on the gas valve.

Should the gas rate or differential burner pressure fall outside the specified range run the boiler for a further 10 mins and carry out a re-check, if after re-checking either the gas rate or the burner pressure falls outside the tolerance specified, Potterton Myson Service Department should be called as specialist equipment is required to enable adjustment to be made.

Relight the boiler and reheat the system to maximum. Check for water leaks, turn the boiler off, drain the system whilst hot.

Remove functional case door and ensure there are no condensate leaks from around the boiler or the condensate drainage system.

Refit functional case door ensuring a good seal.

Refill the system and add the correct concentration of FERNOX COPAL or GRACE DEARBORN SENTINEL X100 water treatment.

Adjust to the correct cold fill pressure (1 bar).

If a by-pass circuit is fitted the by-pass valve should be adjusted with the boiler operating under minimum load conditions to maintain sufficient water flow through the boiler to ensure that the overheat device does not operate under normal operating conditions.

Pump Overrun Timer

Will keep the pump running for approximately 3 minutes after burner shutdown to dissipate heat left within the boiler. The times are pre-set and no adjustment is possible.

Overheat Protection Device

The overheat protection device is pre-set and no adjustment is possible. Manual resetting is required if an overheat condition occurs. The reset button is situated in the front of the boiler control box.

Boiler Control Switch

In the mid i.e. "0" position holds the boiler in a standby condition. In the "L" position allows the boiler to operate automatically but controlled at a maximum flow temperature of 60°C. In the "H" position the boiler will operate automatically at a maximum flow temperature of 82°C.

Boiler Display

Under normal conditions of operation the following characters appear:-

Display not illuminated. All power off.

- 0** Power on, boiler at standby.
- H** Heat demand, boiler operating at higher flow temperature.
- L** Heat demand, boiler operating at lower flow temperature.
- h** Boiler operating but up to temperature.
- E** Boiler re-start delayed to prevent rapid cycling. (Max. delay time is 5 minutes)
- C** Main burner off, pump running to transfer remaining heat from boiler into the system.
- F** Flashing - boiler at Lock-Out

Other characters will be displayed if a fault condition should occur. Their purpose is to assist the service engineer and more information is provided in the SERVICING section of these instructions.

Other Boiler Controls

All boiler mounted controls are designed so that if any fault should occur they will fail safe. No further setting or checking is necessary.

Final Assembly

Attach casing side panels onto the boiler as illustrated (Fig. 14) ensuring that the three lugs on each panel are correctly located. Slide in the bottom panel and push fully home. Engage hooks on the top rear of the front panel into the slot in the top front corner of each side panel. Lower the front panel to engage brass studs into the retaining clips, press fully home to lock panel into position.

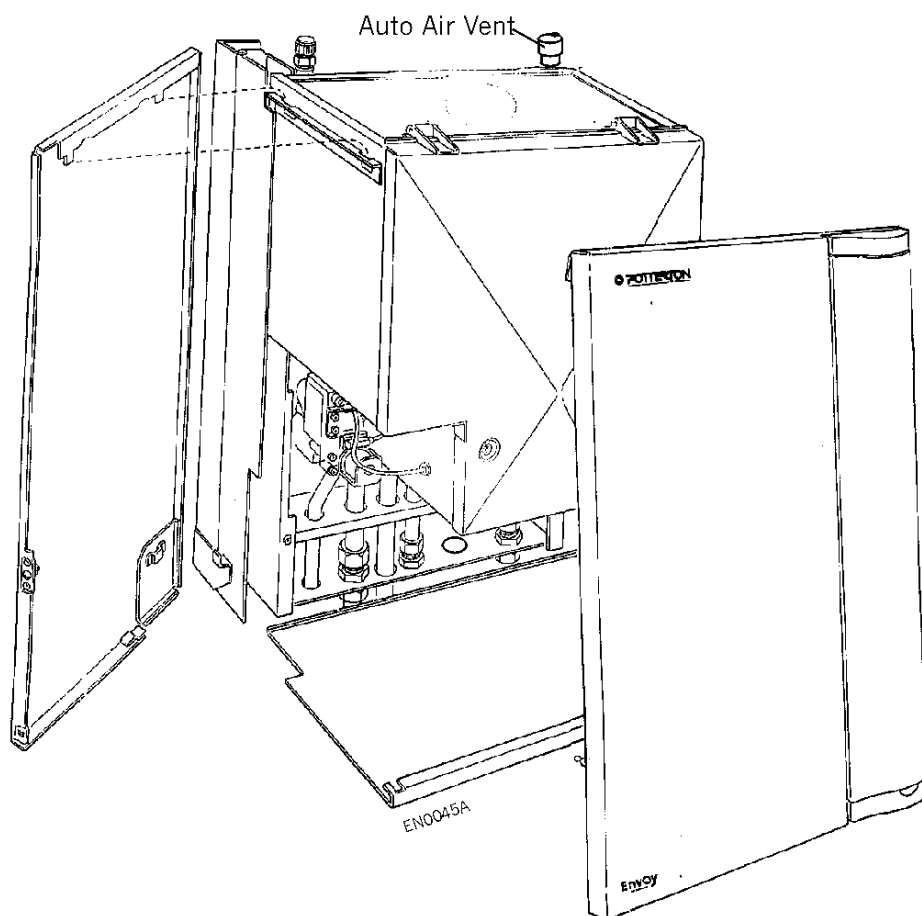
the system and of the need to maintain the correct concentration levels as recommended by the manufacturer.

External Controls

Check that any other external control connected in the system, such as timers and thermostats, control the boiler as required.

User's Instructions

A User's Guide is provided with this boiler but the householder must have the operation of the boiler and system explained by the installer. The householder must also be advised of the importance of annual servicing and of the precautions necessary to prevent damage to the system and building, in the event of the system remaining out of commission in frost conditions. Information must also be passed to the customer on the type of corrosion inhibitor that has been added to



4. Servicing & Replacement of Parts - Page 17

It is the law that all gas appliances are installed and serviced by a competent person as stated in Gas Safety (Installation and Use) Regulations 1994.

For Health and Safety Information see Page 5.

Electrical test work and servicing should be carried out by a competent person in accordance with the I.E.E. Wiring Regulations.

Regular skilled servicing and cleaning of the appliance is essential to ensure continued safe and efficient operation.

The frequency of cleaning will depend upon the particular installation conditions, and the use to which the appliance is put, but in general, once a year should be adequate.

The boiler DATA PLATE and WIRING DIAGRAM are located on the front of the boiler functional casing.





The boiler code number which is on the code badge located on the boiler top panel see Fig.2 should always be quoted when ordering spares or requesting information.

Before commencing the servicing of the boiler it is advisable to carry out a pre-check on the boiler to establish that it is functioning correctly.

Preparation of the Boiler

Preparation for servicing should be carried out in the following manner.

- 1) Remove decorative outer casing doors by pulling the bottom of the door from its fixing clips and pushing upwards until it is clear of its top fixing.
- 2) Remove bottom decorative panel.
- 3) Remove functional case door by undoing the two lower securing screws and lift door off the two upper hinge brackets. Fig. 15.

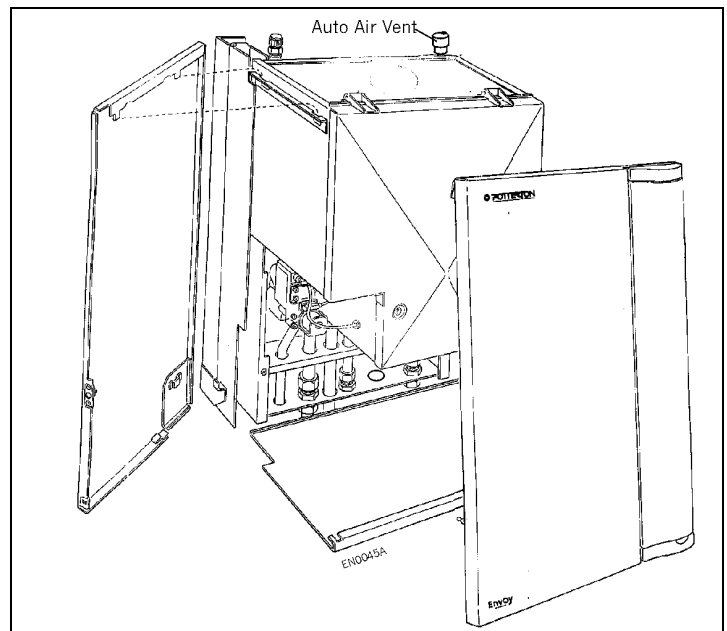
- Set boiler control switch to the mid i.e.  and the display should read ".
- Set boiler control switch to "", the display should read " and the boiler should light.

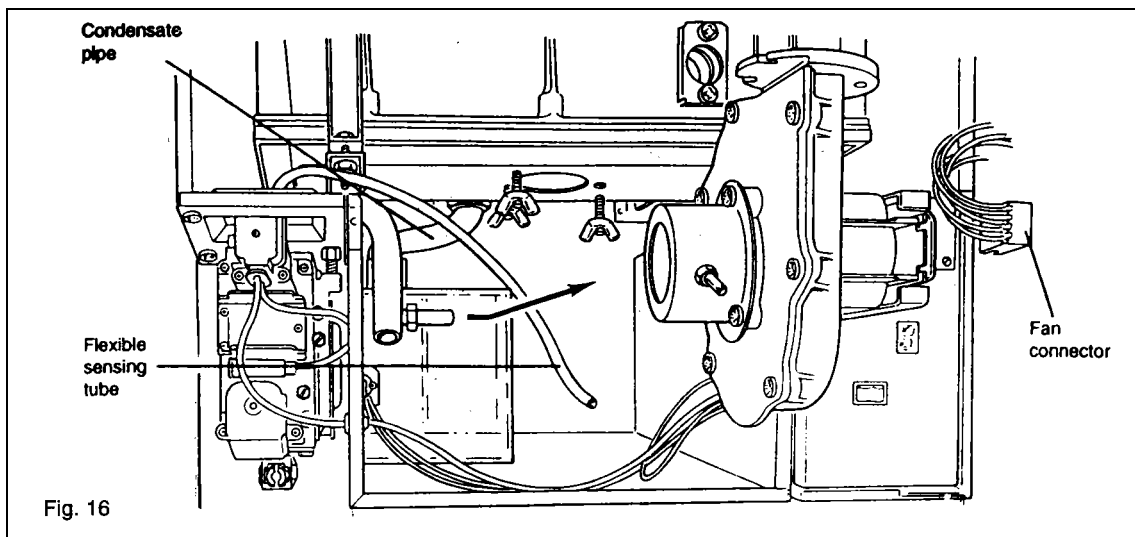
Note: If the boiler fails to start or does not follow the sequence above then refer to fault finding section on Page 25.

WARNING

Before the start of any servicing or replacement of parts ensure that you have:

- a) Switched off at the external electrical supply by removing the plug from the wall socket or by switching off the appliance at the external isolating switch.
- b) Isolated the gas supply at the boiler service cock.





Removing Fan

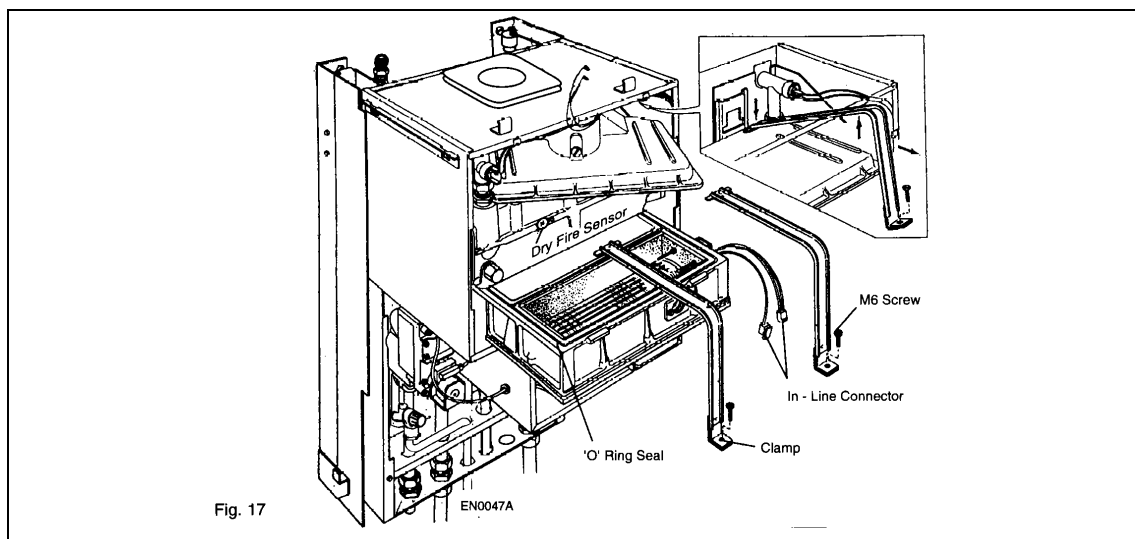
- 1) Disconnect electrical connection from fan motor. Fig. 16.
- 2) Disconnect flexible sensing tube from the fan inlet housing.
- 3) Remove fan by slackening two wing screws on left hand side and removing the M5 wing screw on the right hand side of the fan.
- 4) Slide fan to the right then forward and remove from boiler.

Removing Combustion Chamber & Flue Hood

- 5) Disconnect flexible condensate pipe from the rear of the combustion chamber/sump casting.
- 6) Disconnect inline connectors for the hot surface igniter and the flame sensor on the right hand side of the combustion chamber. Fig. 17.

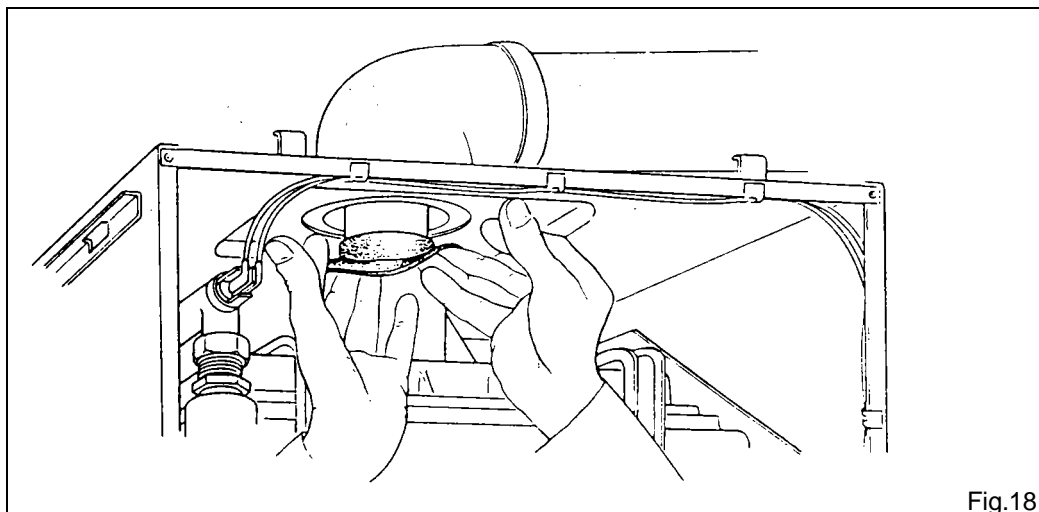
Note the hot surface igniter is a fragile component and requires extreme care when handling.

- 7) Remove two M6 screws retaining clamps around flue hood and combustion chamber.
- 8) Remove the top clamps from their anchor points at the rear of the casing.



Removing Combustion Chamber and Flue Hood - Continued.

- 9) Disconnect electrical connections from dry fire sensor. Fig. 17.
- 10) Fold back flue sealing gaiter between the flue hood and flue elbow. Fig.18.
- 11) Carefully remove flue hood by moving the right hand side of the flue hood forward and gently guide the hood around the flow tapping on the heat exchanger.
- 12) Pull combustion chamber forward until it is clear of the boiler casing.



Examination of Flue Ways and Cleaning

- 1) Place a sheet of clean paper over the inlet of the condense syphon and the gas assembly. It is particularly important that debris is prevented from entering the short upward facing tube from the gas control valve.
- 2) Cleaning of the heat exchanger must be carried out using a Potterton scraper Part No. 907736.
- 3) Working from below and above the heat exchanger remove all deposits from between the fins.
- 4) Examine top and bottom sealing face of the heat exchanger for deep scratches and remove any debris with a soft brush to provide a smooth flat sealing face.
- 5) Examine Syphon for evidence of leakage or build up of debris.

Note: Place a catch tray beneath the syphon cleaning eye plug and remove plug this should remove any debris which has collected in the pipe section. If necessary the syphon should be removed and flushed with tap water. See replacement of parts for further information.

Re-assembly of Boiler

- 6) Before reassembling combustion chamber and flue hood to the boiler examine for the following:-
 - The 'O' ring seals for damage
 - The insulation in the combustion chamber. Note if there is any visible deterioration of this material it **MUST** be replaced
 - Damage to the hot surface igniter
 - Damage to the surface of the burner
 - Damage to sight glass
 - Build up of debris in the condensate sump (This may be removed with a soft brush)

If any of the above components require changing see section 'Replacement of Parts' for further information.

Servicing & Replacement of Parts - Page 20

- 7) Replacement of components is the reverse of removal.

Note: great care should be taken not to damage the flue hood and combustion chamber seals during replacement of these assemblies.

- 8) When refitting retaining clamps ensure that they are located correctly in the guides on both the flue hood and combustion chamber.
- 9) Ensure that the combustion chamber seats correctly onto the heat exchanger, that the screws are fully

tightened and that the clamps fix the combustion chamber and flue hood securely.

- 10) Ensure connection from sump to syphon is made before refitting fan.
- 11) Ensure that the flue sealing gaiter between the flue hood and elbow is correctly positioned untwisted and forms a good seal to both components.
- 12) Relight the boiler as described by following the lighting procedure in the commissioning section of these instructions.

Replacement of Parts

Before replacing any component carry out pre-check detailed at the beginning of the Service section and then refer to fault finding section of these instructions.

WARNING

Before the start of any servicing or replacement of parts ensure that you have:

- a) Switched off at the external electrical supply by removing the plug from the wall socket or by switching off the appliance at the external isolating switch.
- b) Isolated the gas supply at the boiler service cock.

If the combustion chamber has been removed follow procedure in Service section 'Re-assembly of boiler'

1) Fan

- a) Follow procedure in 'Preparation for servicing' at the beginning of the servicing section.
- b) Replacement of fan is the reverse of removal.

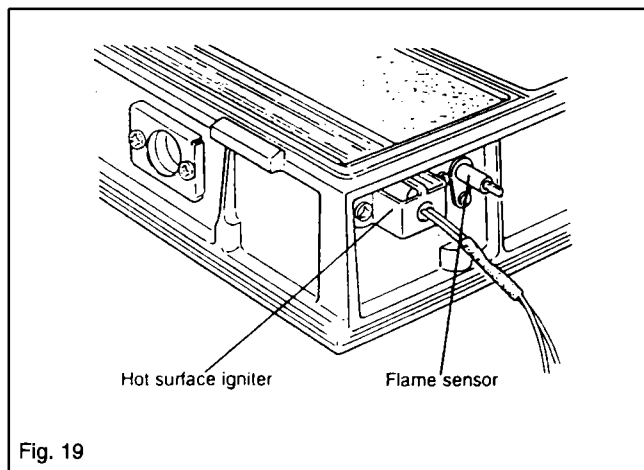
2) Hot Surface Igniter

WARNING This component is fragile and requires careful handling.

- a) Remove combustion chamber as described in 'Servicing Boiler'.
- b) The igniter assembly is retained by two M5 pozi drive screws. Remove screws and carefully remove old igniter, if the igniter has become damaged, invert the combustion chamber and shake gently to allow damaged segments to be removed from the chamber. See Fig. 19.
- c) Replacement of the igniter is the reverse of removal ensure that a new sealing gasket is always fitted and that a good seal is made between the igniter and combustion chamber.

3) Flame Sensor

- a) Remove combustion chamber as described in 'Servicing Boiler'.
- b) Remove screw retaining sensor and withdraw from the combustion chamber. See Fig. 19.
- c) Replacement of the sensor is the reverse of removal, ensure new gasket is always fitted.



4) Insulation

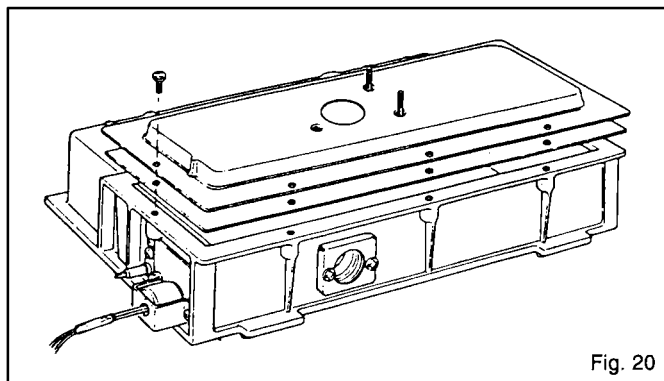
Note: all four insulation pads must be replaced.

- a) Remove combustion chamber as described in 'Servicing Boiler'. See Fig. 17.
- b) Remove hot surface igniter, flame sensor. Fig. 19 and burner Fig. 20.
- c) Remove old insulation.
- d) Replace front pad first ensuring that bevelled edge is uppermost and fits into the chamber correctly.
- e) Fit rear pad and use end insulation to retain rear pad.

4) Insulation (Continued)

- f) Carefully replace burner.
- g) Refit hot surface igniter and flame sensor.
WARNING This component is fragile and requires careful handling.
- h) Replacement is the reverse of removal.

5) Burner



- a) Remove combustion chamber as described in 'Servicing Boiler'.
- b) Remove 8 M5 screws retaining burner to the combustion chamber. Fig. 20.
- c) Remove burner from the combustion chamber.
- d) Ensure the burner is fitted with the gasket supplied with it.
- e) Taking care not to damage the burner surface, install new burner into combustion and secure with 8 screws.
- f) Re-assemble as described in section 'Servicing Boiler'.

6) Syphon

- a) Remove decorative and functional doors as described in 'Servicing Boiler'.
- b) Remove fan see 'Servicing Boiler'.
- c) Disconnect flexible condensate pipe from the rear of the combustion chamber/sump casting. Fig. 16.
- d) Disconnect syphon from its wastepipe.
- e) Undo nut securing Syphon to the bottom of the boiler casing.
- f) Replacement of the Syphon is the reverse of removal.

See **Servicing Instructions** for re-assembly of boiler.

7) Flue Hood/Combustion Chamber Seals.

- a) Remove combustion chamber/fluehood as described in 'Servicing Boiler' See Fig.17.
- b) Remove old seal.
- c) Clean groove using a soft brush or dry lint free cloth.
- d) Ensure new seal is correct (flue hood and combustion chamber require different seals).
- e) Lay seal over groove and gently push into the groove until fully home.

See **Servicing Instructions** for re-assembly of boiler.

8) Injector

- a) Remove decorative and functional doors as described in 'Servicing Boiler'.
- b) Remove fan see 'Servicing Boiler'.
- c) Remove injector by unscrewing from gas supply pipe.
- d) Replacement is the reverse of removal.

9) Gas Valve Assembly

- a) Remove decorative and functional doors as described in 'Servicing Boiler'.
- b) Remove fan as described in 'Servicing Boiler'.
- c) Disconnect electrical supply lead at the gas valve by removing the two retaining screws and unplug.
- d) Remove 4 M5 screws securing gas control valve to boiler service cock.
- e) Remove 6 M5 screws retaining gas assembly mounting plate 4 M5 on the left underside of the plate and two within the casing. Remove M5 screw attaching the valve to its mounting bracket.
- f) Slide gas assembly forward and remove from boiler.
- g) Remove flexible tube from assembly and fit to new gas assembly.
- h) Replacement is the reverse of removal ensuring a new gasket is fitted between casing and mounting plate and the 'O' ring seal is correctly positioned between the gas control valve and the boiler service cock.

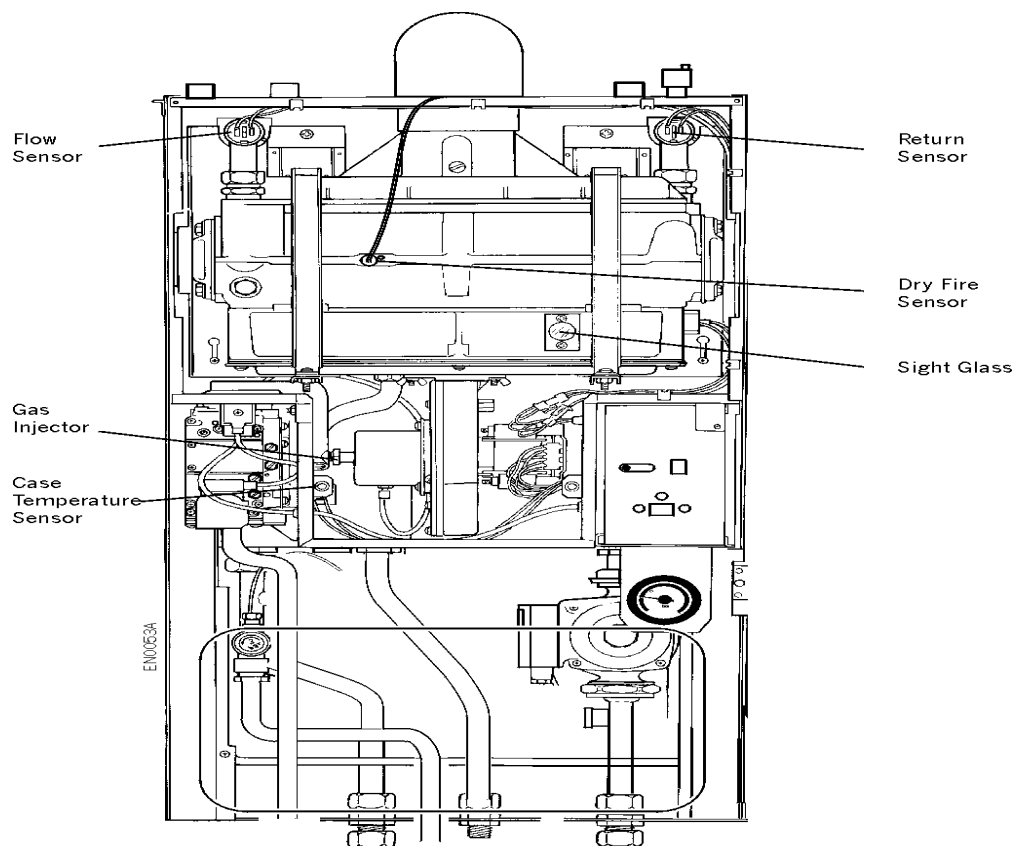


Fig.21

10) Sight Glass (combustion chamber or case door).

Note: Care should be taken when handling and disposing of broken glass.

- Remove decorative casing door if changing functional door sight glass or both decorative and functional doors if changing combustion chamber sight glass, as described in '**Servicing Boiler**'.
- Remove two screws retaining sight glass assembly and carefully remove from the combustion chamber or door.
- Replacement is the reverse of removal ensuring a new gasket is fitted either side of the glass.

11) Water Temperature Sensor (flow and return).

- Remove decorative and functional doors as described in '**Servicing Boiler**'.
- Disconnect two leads from the sensor and remove it by gently squeezing two protruding plastic lugs and while still squeezing pull from its housing.
- Replacement is the reverse of removal ensure when fitting new sensor that sensor tip is coated with heat conducting paste and that it is correctly located and firmly home in its housing.

12) Dry Fire Temperature Sensor.

- Remove decorative and functional doors as described in '**Servicing Boiler**'.
- Disconnect two grey leads from the sensor.
- Remove retaining screw and gently pull sensor from the heat exchanger.
- Replacement is the reverse of removal. Ensure that the sensor tip is coated with conductive paste and correctly located in its housing.

13) Case Temperature Sensor.

- Remove decorative and functional doors as described in '**Servicing Boiler**'.
- Disconnect two yellow leads from the sensor.
- Remove fixing screw from mounting bracket.
- Remove sensor
- Replacement is the reverse of removal.

14) Diverter Valve Head (If Fitted).

- a) Remove decorative door and base panel as described in **'Servicing Boiler'**.
- b) Lower the expansion vessel to provide access.
- c) Disconnect the diverter valve from the connections within the plastic junction box. release cable restraint.
- d) Remove the two screws securing the diverter valve head to the main body and remove the head.
- e) Fit the diverter valve head to the valve body ensuring that the shaft seats correctly. Secure the head in position with the two new screws supplied.
- f) Connect the diverter valve connections in the junction box. Refit cable restraint.

15) Boiler Control Board.

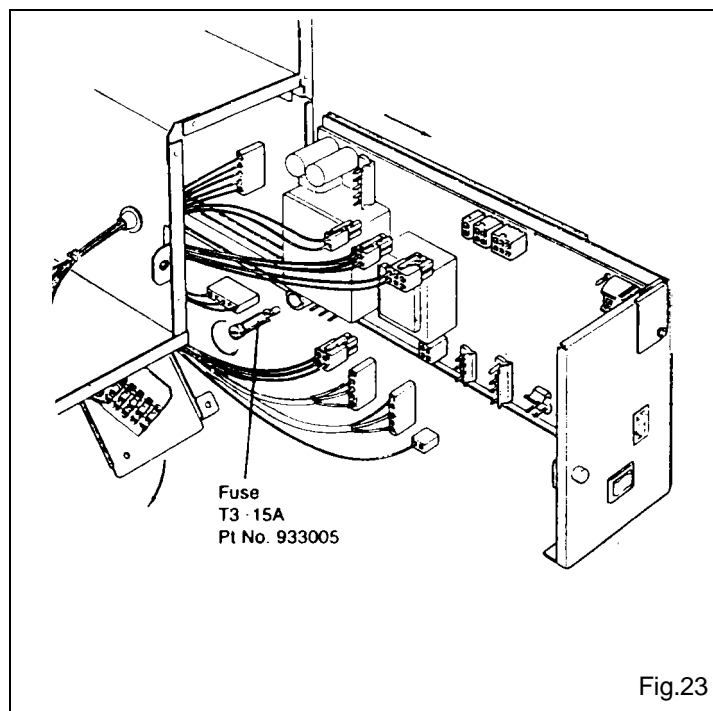
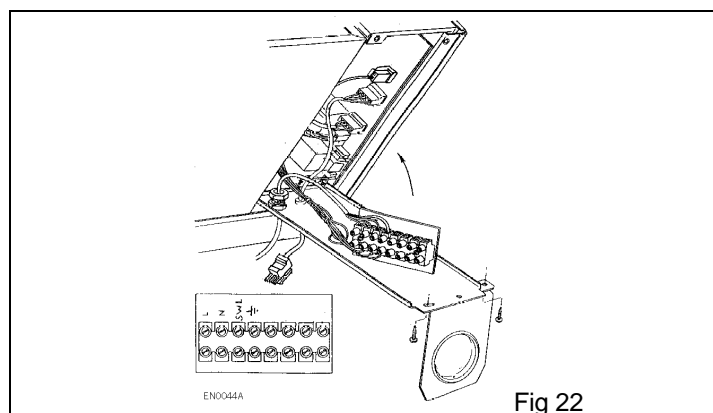
IMPORTANT

Before replacing the control board refer to fault finding section of these instructions. The control should only be replaced if the diagnostic display indicates it is faulty.

- a) Remove decorative door as described in **'Servicing Boiler'**.
- b) Remove screw retaining access door on under side of boiler. Fig. 22.
- c) Remove screw retaining control front panel and tray. Fig. 22.
- d) Gently pull front panel forward removing connectors from the control as they become accessible. Fig. 23.

16) Boiler Control Board Fuses.

- a) Remove decorative & functional doors as described in **'Servicing Boiler'**.
- b) Remove screw retaining access door on under side of boiler. Fig. 22.
- c) Remove screw retaining control front panel and tray. Fig. 22.
- d) Gently pull front panel forward removing connectors from the control as they become accessible. Fig. 23.
- e) Remove old fuse and replace with the correct Potterton component T - 3.15A (Part No. 933005).
- f) Replacement is the reverse of removal.



Error! Not a valid embedded object.

Fig.24

17) Water Components.

Replacement of Pump, Diverter Valve (If Fitted) and Water Pressure Gauge.

- Remove decorative & functional doors as described in **'Servicing Boiler'**.
- Remove blanking screw and attach a hose to the drain valve on the return pipe isolating valve.
- Release system pressure by opening the pressure relief valve on the boiler flow pipe.
- Turn off the isolating cocks on the flow and return pipe connections to the boiler and the boiler will drain.
- Remove the clamping screw and lower the expansion vessel to provide access to the water components.

Pump:

- f) Disconnect the in-line connector on the pump supply cable.
- g) Undo the union nuts on the inlet and outlet connections and lift out the pump.
- h) Replacement is the reverse of removal. New seals should be used on re-assembly.

Diverter Valve (If Fitted):

- f) Disconnect the valve wiring from connections within the plastic junction box. Release the cable restraint.
- g) Disconnect the electrical connectors from the water pressure switch.
- h) Disconnect the pressure gauge connection from the pressure relief valve.
- j) Disconnect the D.H.W flow pipe at the union nut above the diverter valve.
- k) Disconnect the CH flow connection at the bracket where it connects with the heat exchanger pipe.
- l) Disconnect the CH flow pipe from the isolating cock.
- m) Disconnect the nut at the base of the pressure relief valve and swing the pipe out of the way.
- n) Carefully lift out the assembly.
- p) Replacement is the reverse of removal.

Water Pressure Gauge:

- f) Disconnect the pressure gauge connector from the pressure relief valve.
- g) Disconnect the pressure gauge from the bracket under the controls panel and remove the gauge.
- h) Replacement is the reverse of removal.


5. Fault Finding - Page 25

Digital Display

This boiler is fitted with a single digit display which is located in the front control box behind the hinged door.

The display on which up to 30 different characters can be illuminated performs two functions.

1. By displaying the following characters provides the user with a visual indication of the current boiler operating status.

 Power supply switched on but waiting for a call for heat from secondary controls or boiler control switch is in the '..' position.

Boiler operating, high flow temperature selected.

 Boiler operating, low flow temperature selected.

h Boiler operating but up to temperature.

t Boiler re-start delayed to prevent rapid cycling (Max. delay time 5 mins).

C Main burner off, pump running to transfer remaining heat from boiler into the system.

F Flashing - boiler at Lock-Out

DISPLAY NOT ILLUMINATED - all power off.

2. By displaying the following characters it will assist the service engineer by working as a fault diagnosing system.

1	Sensor	Flow or return sensor out of calibration	See chart
2	Flow sensor	Flow sensor is incorrectly fitted	Check sensor
3	Case temperature	Temperature within boiler casing too high	See chart
4	Dry fire	Boiler has been fired without water	Check system
5	Flow sensor	Sensor failed open or closed circuit	Replace sensor
6	Return sensor	Sensor failed open or closed circuit	Replace sensor
7	Case sensor	Sensor failed open or closed circuit	Replace sensor
8	Dry fire sensor	Sensor failed open or closed circuit	Replace sensor
9	Fan speed	Fan speed incorrect	See chart
A	Shorted signal	Flame signal shorted to ground	Check igniter etc
C	Flame loss	Flame loss after initial detection	See chart
E	Control failed	Control has failed	Replace control
P	Wiring fault	Live on neutral connection	Correct fault

Preliminary Test Diagnostics

All boilers are fully tested before leaving the factory therefore if an electrical problem is experienced it is very likely that this is caused by faulty external wiring. If a problem exists, disconnect all site wiring from boiler. Connect a direct fused electrical supply to boiler terminals L, Swl, N & E.

If the boiler now operates correctly the site wiring should be investigated further.

FAULT FINDING CHART (1)

ENVOY

Electrical test work and servicing should be carried out by a competent person in accordance with the I.E.E. Wiring Regulations.

Boiler fails to operate



The display will show one of the characters below as part of the fault finding diagnostic

0

Check the following
The standby switch on the
boiler set to H or L
That all external controls
set to give call for heat

yes --> Q8{Check there is 230 ac volts at
switched live contact on
the boiler customer connection
block}

no --> Q9[Check all external fuses]

yes --> Q10{Check connection
to boiler control (orange wire)
from the terminal block}

Check connection between
display and switch is correctly fitted

1

This is a usually a temporary condition caused by warm system water returning to a boiler when it is in a cold condition and will only last for a few minutes. If this symbol persists the cause will be an inaccurate temperature sensor in the flow or return rail or replace as described in "Replacement of components" section of this literature.

FLASHING

2

Check that flow & return sensors
are correctly fitted and coated with heat transfer compound

Check that pump is rotating and that there
are no blockages or air locks in the system

FLASHING

3

Do not reset lockout
follow inspection procedure

Check sight glass is intact and securely
stained and sealed

Remove combustion chamber and
examine "O" ring seal

Check hot surface igniter body is intact and
securely retained and sealed

Replace components where necessary
and follow reassemble procedure in
"servicing boiler" section of this literature

Reset Boiler

Temperature in casing
has become
excessively high

FLASHING

4

Do not reset lockout
follow inspection procedure

Remove combustion chamber, flue
hood and examine "O" ring seals

Fill system with water and ensure no there are
no water leaks present

Reset lockout

Boiler has been fired
with no water in the
heat exchanger

5

Check that both connectors are
secure and in good contact
with the sensor.

yes --> Q11{Follow procedure in
"Replacement of components"
section of this literature}

Resetting of the lockout is not required for this
fault

Flow sensor fault

6

Check that both connectors are
secure and in good contact
with the sensor.

yes --> Q12{Follow procedure in
"Replacement of components"
section of this literature}

Resetting of the lockout is not required for this
fault

Return sensor fault

7

Check that both connectors are
secure and in good contact
with the sensor.

yes --> Q13{Follow procedure in
"Replacement of components"
section of this literature}

Resetting of the lockout is not required for this
fault

Case sensor fault

8

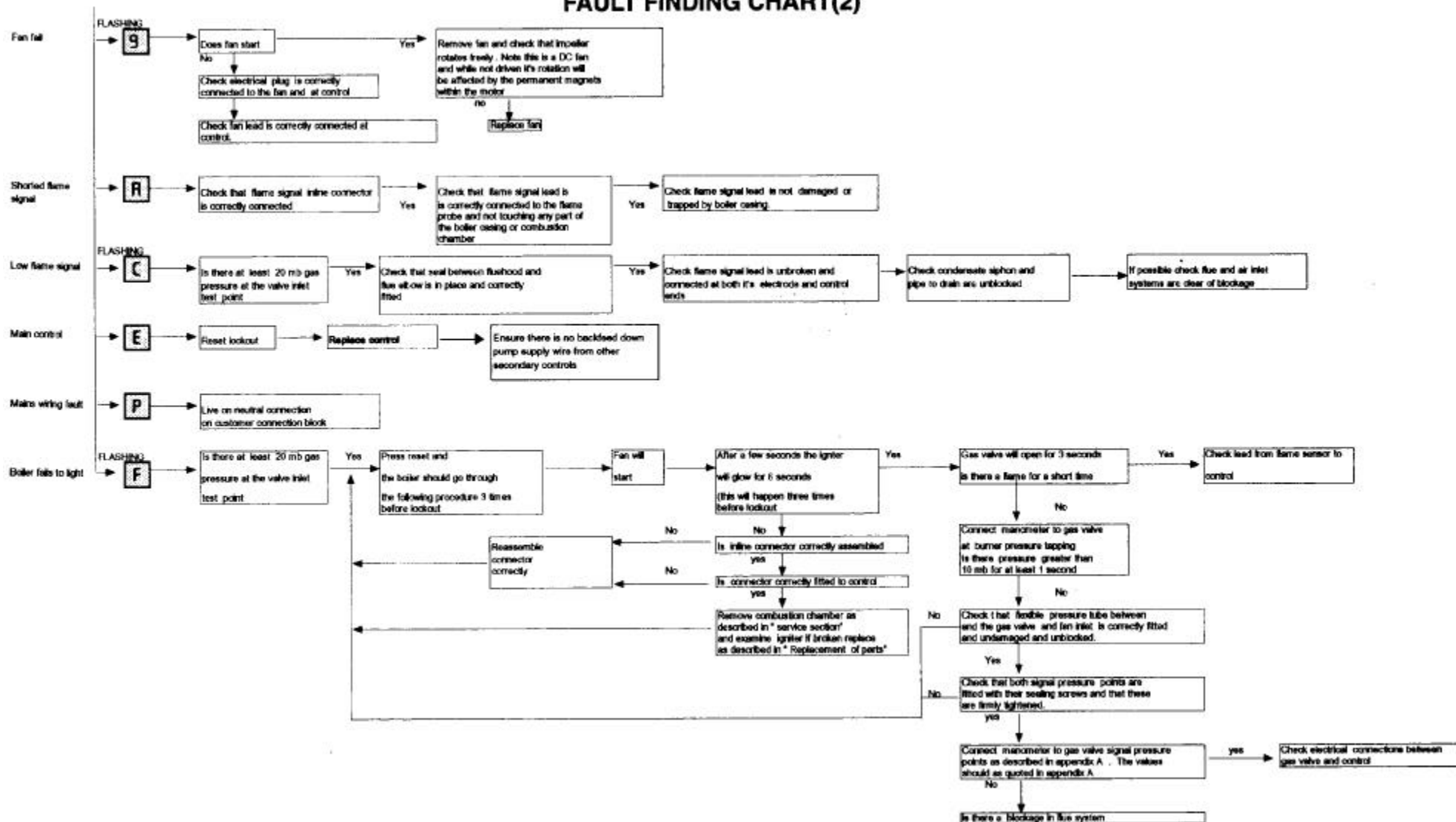
Check that both connectors are
secure and in good contact
with the sensor.

yes --> Q14{Follow procedure in
"Replacement of components"
section of this literature}

Resetting of the lockout is not required for this
fault

Heat exchanger
sensor fault

FAULT FINDING CHART(2)



6. Boiler Internal Wiring - Page 28

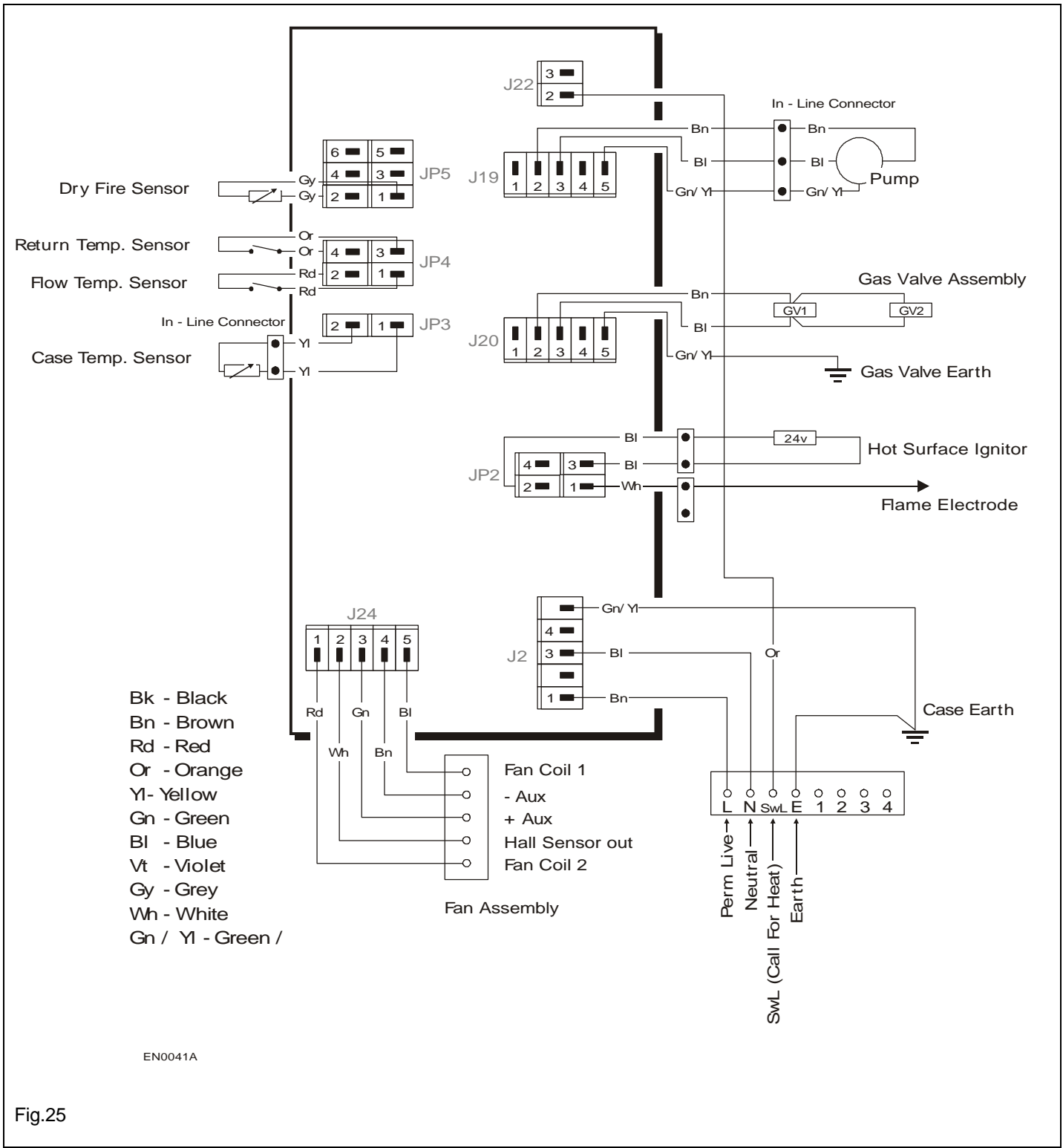


Fig.25

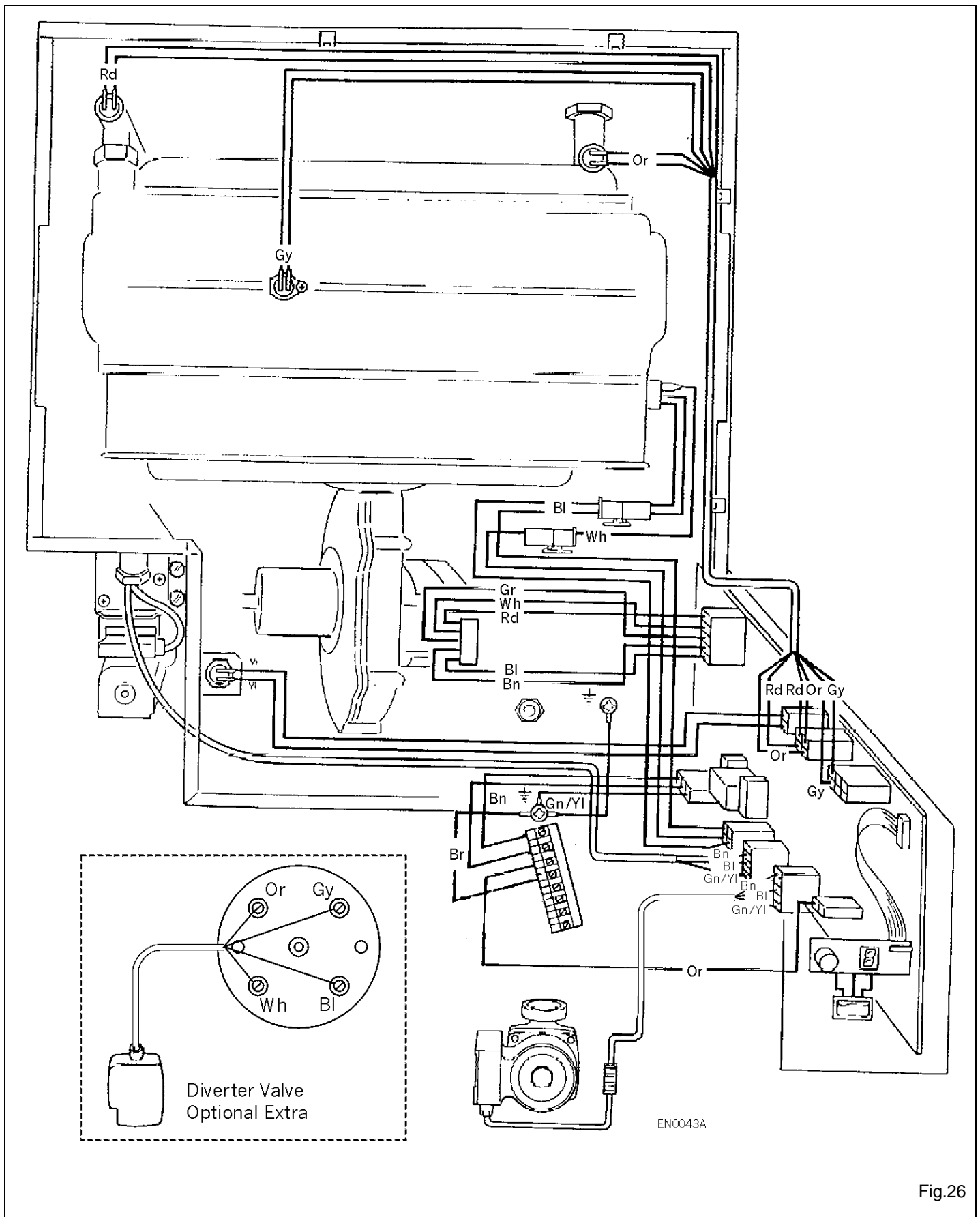


Fig.26

8. Short List Of Spare Parts - Page 30

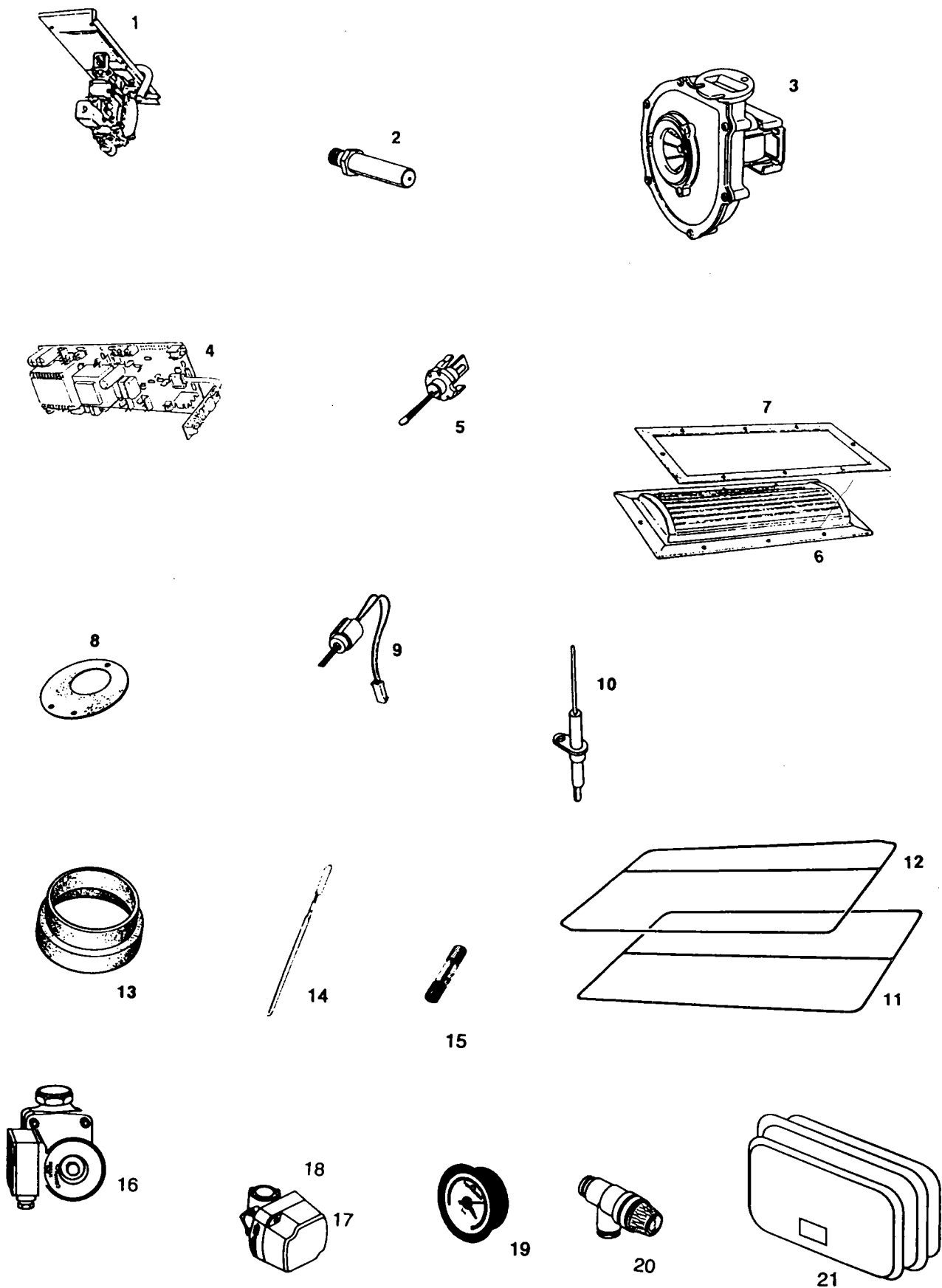


Fig.27

Short List of Spares - Page 31

Drg. Ref.	Description	Potterton Part No.	G.C. No.
1	Gas Valve Assembly	930103	114 621
	30 Boiler	930104	114 622
	40 Boiler	930105	114 623
	50 Boiler	930106	114 624
	60 Boiler	930107	114 625
	80 Boiler		
2	Injector	411014	114 662
	30 Boiler	411007	114 663
	40 Boiler	411008	114 664
	50 Boiler	411009	114 665
	60 Boiler	411010	114 666
	80 Boiler		
3	Fan	409584	114 569
	30, 40, 50 & 60 Boilers	409585	114 570
	80 Boilers		
4	Control Assembly	407734	114 629
5	Temperature Sensor	404513	378 868
6	Burner	414727	378 870
	30 Boiler	414728	378 871
	40 Boiler	414729	378 872
	50 Boiler	414730	378 873
	60 Boiler	414731	378 874
	80 Boiler		
7	Burner Gasket	236120	114 561
8	Fan Outlet Gasket	236253	114 596
9	Hot Surface Igniter	407728	378 869
10	Flame Sensor	407729	378 876
11	Combustion Chamber "O" Ring Seal	236123	114 556
12	Flue Hood "O" Ring Seal	236122	114 544
13	Flue Gaitor	236139	114 618
14	Flue Scraper	907736	337 862
15	Fuse T3. 15A (Not Illustrated)	933005	114 681
16	Pump CP53	411151	
	30, 40, 50 & 60 Boilers	411153	
	Pump CP63		
	80 Boilers		
17	Diverter Valve	430065	
18	Diverter Valve Head		
19	Pressure Gauge	430101	
20	Pressure Relief Valve	430044	
21	Expansion Vessel	430052	

Appendix A - Page 32

Burner pressure checking and adjustment procedure.

This appliance is fitted with a Gas/Air ratio control mixing valve. This gas valve ensures that the correct amount of gas is delivered to the burner to match the available air supply under all operating conditions. The burner pressure and gas rate have been precisely set and checked during manufacture and it is extremely unlikely that any further adjustment will be necessary.

To check the correct operation of the gas valve follow the instructions below carefully.

- a. A good indication of correct operation of the boiler will be obtained by measuring the gas rate at the gas meter.
 1. Run the appliance for at least 10 minutes.
 2. With all other gas appliances turned off measure the gas rate at the meter for a period of at least 5 minutes. Check that the measured rate is within $\pm 5\%$ of the rate stated on the data plate.
- b. To measure the burner pressure.
 1. Turn off the gas service cock. Fit a pressure gauge to the gas inlet pressure test point on the gas control valve. Connect a differential pressure gauge or 'U' tube manometer between the burner pressure test point (high pressure side) and the reference pressure test point (low pressure side) on the gas valve (See Fig. 28).
 2. Turn on the gas service cock and run the appliance for at least 10 minutes. Check that the gas inlet pressure is between 19-20 mbar.
 3. Check that the differential burner pressure is within ± 1.0 mbar of that stated on the data plate.
 4. Turn off the gas service cock and remove the pressure gauge and replace the pressure test point sealing screws on the gas valve.

A burner pressure reading outside the specified range does not necessarily indicate a wrongly adjusted gas valve. Other factors i.e. insufficient air flow will cause the gas valve to automatically adjust the burner pressure to maintain safe combustion. Before attempting to adjust the gas valve a check must be conducted on the whole appliance to ensure that any other faults present are found and rectified.

Setting the Burner Pressure

Warning

Setting the burner pressure requires the following equipment.

Essential

1. A differential pressure gauge or "U" tube manometer capable of measuring pressures in the range 0-25 mbar (0-10" H₂O) with a resolution of 0.1 mbar (0.05" H₂O).
2. A differential pressure gauge capable of measuring pressures in the range of 0-2.50 mbar (0-1.00" H₂O) with a resolution of 0.01 mbar (0.005" H₂O).
3. Sufficient flexible tube and "T" piece connector to enable these instruments to be connected to the gas valve in the arrangement shown in Fig. 28.

Advisable

A CO₂ analyser capable of measuring CO₂ concentrations in the range 0-15% with a resolution of 0.1%.

1. Remove sealing screws and connect the two differential pressure gauges to the gas valve as shown in Fig. 28 and remove the adjustment screw sealing cap.
2. Run the appliance for at least 10 minutes.
3. Note the gas valve signal pressure (differential pressure gauge 2) set the burner pressure (differential pressure gauge 1) to the corresponding value shown in Fig. 29 for the appropriate boiler. Screw the adjuster in to decrease pressure and out to increase pressure.
4. If a CO₂ analyser is available check that the flue gas CO₂ concentration is in line with the value given in the FIG.25.

Note: If the gas valve signal is outside the specified range contact Potterton Myson Service Department.

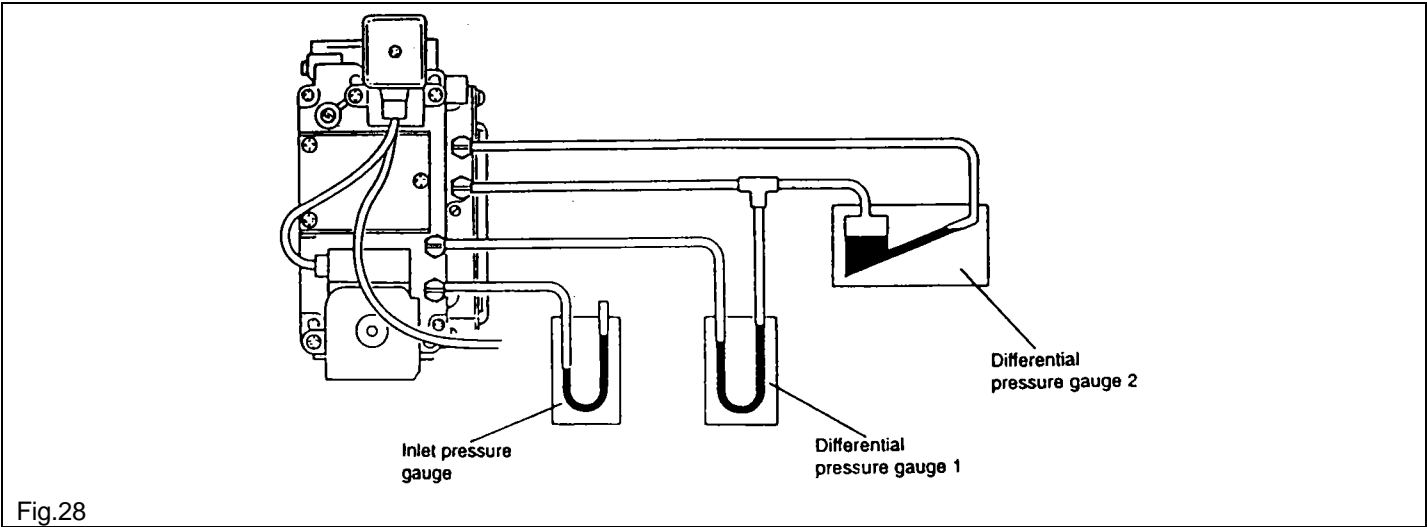


Fig.28

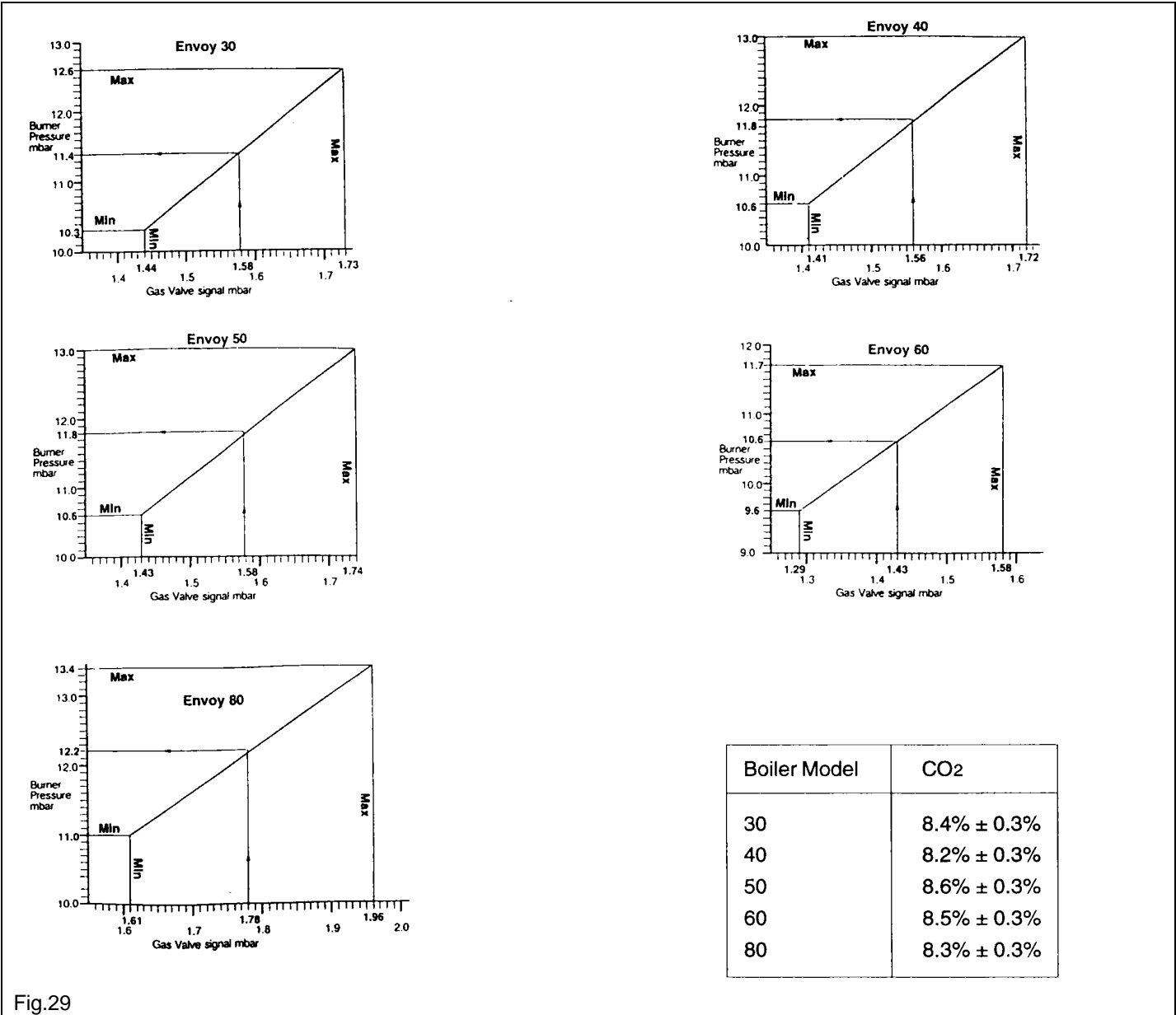


Fig.29

Envoy System 30, 40, 50, 60 & 80

User's Guide

Wall Mounted, Fan Powered, Balanced Flue, Gas Condensing System Boiler

**THIS APPLIANCE MUST BE INSTALLED AND
SERVICED BY A COMPETENT PERSON
AS STATED IN THE GAS SAFETY
(INSTALLATION & USE) REGULATIONS 1994.**

Regular skilled servicing is required to maintain the safe and efficient operation of your boiler throughout its long working life. Further information on this subject is given at a later stage.

Samples of the Potterton Envoy System boilers have been examined by Gastec, a Netherlands Notified Body. The range is certified to comply with the essential requirements of the Gas Appliance Directive 90/396/EEC, the Low Voltage Directive 72/23/EEC and shows compliance with the Electro Magnetic Compatibility Directive 89/336/EEC and are therefore permitted to carry the CE Mark.

The Potterton Envoy System is a wall mounted, room sealed fully automatic gas fired condensing system boiler.

The very high efficiency of the appliance results in the flue gases cooling to a point where part of their moisture content condenses inside the boiler, giving up further heat as it does so. The condensate is drained to a suitable disposal point through the plastic waste pipe at the lower rear of the boiler.

Due to the high efficiency and the resulting low flue gas temperature a white plume of condensate will be emitted from the flue outlet terminal. This will be particularly evident during periods of low outdoor temperatures.

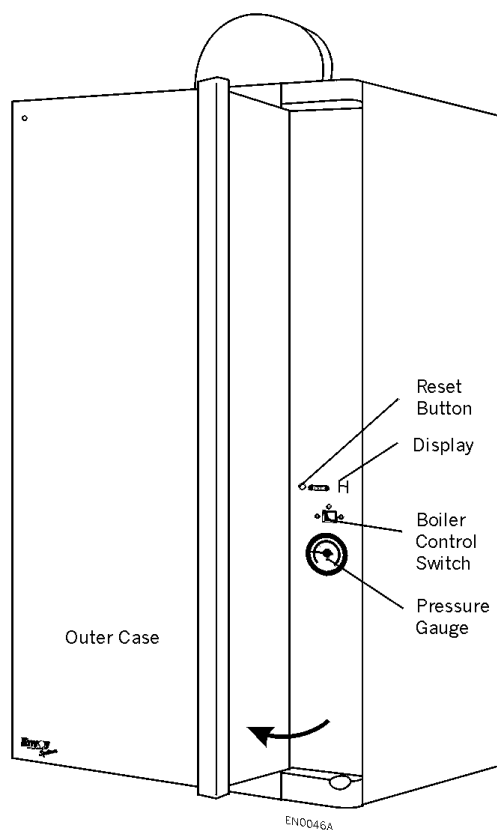
**For Use With Natural Gas (G20) Only
At 20mbar For Use in GB & IE**

Safety

If the appliance is installed in a compartment, do not use it for storage purposes and do not obstruct any purpose provided ventilation openings.

If a gas leak or fault is suspected turn off the appliance and consult your Local Gas Region or Service Engineer.

Any warning labels on the boiler must be adhered to.



Envoy
THE HEAT & AIR
System

**IT IS IMPORTANT THAT THE INNER CASE DOOR
OF THIS APPLIANCE IS NOT REMOVED FOR ANY
OTHER REASON OTHER THAN FOR SERVICING
BY A QUALIFIED SERVICE ENGINEER. THE
APPLIANCE MUST NOT BE OPERATED WITHOUT
THE INNER CASING DOOR CORRECTLY FITTED
AND FORMING AN ADEQUATE SEAL.**

The appliance should have the following minimum clearances for Safety and Maintenance:-

Front	15mm (610mm for Servicing).
Sides	5mm each.
Bottom	120mm.
Top	140mm (From Top of Boiler Case).

Flammable materials must not be stored in close proximity to the boiler.

Ensure that the flue outlet, outside the house, does not become obstructed, particularly by foliage.

Warning: This appliance must be earthed. Connection shall be made to a 230V~50Hz supply. The appliance must be protected by a 3 amp fuse.

The boiler is protected against water loss from the system by a temperature sensor fitted to the heat exchanger.

If the pressure indicated on the pressure gauge falls below 1.0 bar get your Service Engineer to re-pressurise the system. Some sealed systems include a 'Top Up' vessel, ask your Service Engineer about this.

If the system has to be re-pressurised on a regular basis get your Service Engineer to check the system for leaks.


System Controls


Because this is a high efficiency appliance Potterton recommend the use of an external control system which independently controls the temperatures of heating and hot water.


Boiler Controls

All boiler mounted user controls are situated in the front of the boiler control box behind the hinged door.


Boiler Control Switch


In the mid i.e.  position the boiler is at Standby and under normal conditions will not operate. However, if the water temperature within the boiler falls below 5°C an in-built low temperature device will operate the boiler to maintain a water temperature between 5°C and 40°C to prevent freezing of the boiler.

In the  position the boiler will operate on demand from the time clock or any other external control device. The water temperature leaving the boiler will be controlled at approximately 82°C.

In the  position the boiler will operate on demand from the time clock or any other external control device. The water temperature leaving the boiler will be controlled at approximately 65°C.

When the boiler is only being used to supply domestic hot water and there is no independent hot water temperature


Control the switch should be set at the  position which will probably be hot enough to meet most hot water requirements.


When the control switch is set at the  position it must be remembered that unless the temperature of the water in the domestic hot water is controlled independently, the stored hot water could be at a temperature that could scald, i.e. about 82°C.


Digital Display


Under normal conditions of operation the following characters appear:-

Display not illuminated. All power off.


.. Power on, boiler at standby.


.. Heat demand, boiler operating at high temperature.

.. Heat demand, boiler operating at low temperature.

.. Boiler operating but up to temperature.

.. Boiler re-start delayed to prevent rapid cycling.

.. Main burner off, pump running to transfer remaining heat from boiler into the system.

.. Flashing - boiler at Lock-Out.

To assist the service engineer a fault diagnostic system is incorporated within the electronic control. If a fault should develop within the boiler up to 30 different characters can be displayed thereby directing the engineer to the precise area of the problem.



Reset Button

Pressing the reset button will allow the control to be reset and the boiler restarted should a lockout condition have occurred.

Other Controls

A Potterton electronic timer or other type of control clock may have been fitted in your system, together with room and/or cylinder thermostats. Full instructions on the use of these controls should be supplied with them.

To Light

1. Ensure that the boiler control switch is set to the mid position i.e. .
2. Switch ON the main electricity supply (character  will be displayed).
3. Ensure the electronic programmer or other time control if fitted, is in an 'ON' period (refer to the time control literature).

User's Guide - Page 3

Proceed as follows:-

Switch boiler control switch to the **L** or **H** position (Character **L** or **H** as appropriate will be displayed). After a short period the boiler will light. Set the time control and any thermostats, where fitted, to their desired settings.

Note: When the boiler is first lit, there may be a slight smell. This will disappear with use.

To Shut the Boiler Off

Set the boiler control switch to mid position i.e. **0** or switch the external programmer to the 'OFF' position.

To Shut Off - Long Periods

Set the boiler control switch to mid position i.e. **0**, isolate the electricity supply at the isolating switch or pull the plug out of its socket.

Note: The boiler is fitted with an internal low water temperature device to prevent it from freezing during cold weather. Should the water temperature in the boiler fall below 5°C the boiler will operate and maintain a system water temperature between 5°C and 40°C. It is therefore important during cold weather not to isolate the boiler from the electrical supply, but to shut Off the boiler only by turning Off the programmer or setting the boiler control switch to the mid position **0**.

Important

Gas and electricity are required to operate your boiler. Its performance will not be affected by normal variation in either supply, but a gas or electricity failure will put the boiler out of operation. It will automatically re-start when the electricity supply is restored provided that the time clock and/or thermostats are in the On position. Following failure of the gas supply it may be necessary to press the reset button.

Boiler Failure Check List

In the event of your boiler not working, there are several checks you should carry out before calling in a Service Engineer, as this could save you unnecessary expense.

1. Check that the gas, electricity and water supplies are all turned on at the main supply.
2. Check that the time control, if fitted, is in an 'On' period.
3. Check that any thermostats in the system are not at low settings.
4. If the character **F** is shown flashing on the display a lockout condition is indicated due to either the burner failing to light during a start sequence or a high temperature being recorded. To relight the boiler press the reset button adjacent to the display and the boiler will go through the restart sequence. If the character

returns to the display consult your local Gas Region or Service Engineer. Having checked these points, run through the lighting procedure once more and if the boiler still fails to light, call in your Service Engineer.

Additional Frost Precautions

Your boiler is fitted with a device to protect it from freezing. However, since this device is located within the boiler there may be some pipework etc, that is vulnerable to frost and additional protection will be required. Various methods can be used:-

1. Insulation of the boiler and pipework, taking care not to impede any ventilation or air supply.
2. Completely draining the water system if not in use for long periods. Draining and refilling must be carried out by a competent person.

Note: Although the system can be emptied by using the drain off taps installed in the pipework around the system, to empty the boiler, it is necessary to remove the drain off cap within the boiler case. This should only be done by a competent person.

3. Have an additional low limit thermostat fitted.

Note: Frost protection devices cannot operate if the boiler is completely shut down and the electricity supply turned off. Where there is vulnerable pipework and no additional protection is provided it may be necessary to run the boiler at a low setting at times when it would normally be turned off.

To ensure that the highest possible efficiency can be obtained from your boiler an aluminium heat exchanger is used. Your installer has therefore been advised that the heating system must be protected by a corrosion inhibitor.

The products recommended by Potterton are:- Fernox Copal or Grace Dearborn Sentinel X100. Periodical checks will need to be made to ensure that the correct concentration levels are maintained. Your installer should provide further information on these aspects.

Annual Servicing

Annual skilled servicing is required to keep your boiler operating safely and efficiently throughout its long working life. It is also advisable to have the whole heating system checked over annually, so that excessive costs are not incurred by such things as air temperature thermostats or radiator valves getting out of adjustment. Servicing should be carried out by a trained service engineer, and it is suggested that an annual contract be arranged. Contact your local Potterton regional service office for details.

Cleaning the Outside of the Boiler Casing

The outside of the boiler casing can be wiped when necessary by using a damp cloth to remove finger marks etc. Do not use an abrasive cleaner as this may damage the casing finish.

1. Registration of Purchase

It is important to register the purchase of your Potterton boiler to ensure you receive prompt and efficient handling in the event your boiler requires attention during the guarantee period.

To register your guarantee simply complete and detach the Registration of Purchase form enclosed with these instructions. It is important to include details of your installer (if known) and to return the completed form to the Potterton Myson Registration Department.

2. During the Guarantee Period

In the event of any problems with your system or the operation of the boiler, you should first **call your installer**.

If there is a fault with the boiler under guarantee which your installer is unable to rectify, he/she will call Potterton Myson Service Operations. For 12 months from the date of installation (or 18 months from the date of manufacture, whichever is shorter), Potterton Myson will attend to any manufacturing defect, on the appliance only (not the system or ancillary controls), free of charge for parts and labour, subject to there being no misuse or abuse. This does not effect your statutory rights.

Service visits by Potterton Myson Service Operations outside the terms of the boiler guarantee, will be charged for both parts and labour at our normal rates

for chargeable work. During the period of the boiler guarantee, Potterton Myson will only be responsible for the cost of work done by them or on their instructions by their Agent. We cannot accept any liability for expenditure or work done by other parties without our knowledge and/or approval.

3. Safety Check / Routine Maintenance

It is strongly recommended you have your boiler checked annually for safety and to have routine maintenance. This should be carried out by a CORGI Registered Installer/Service Agent or Potterton Myson Service Operations to comply with the requirements of the Gas Safety (Installation & Use) Regulations 1994.

4. Boiler Breakdown Insurance

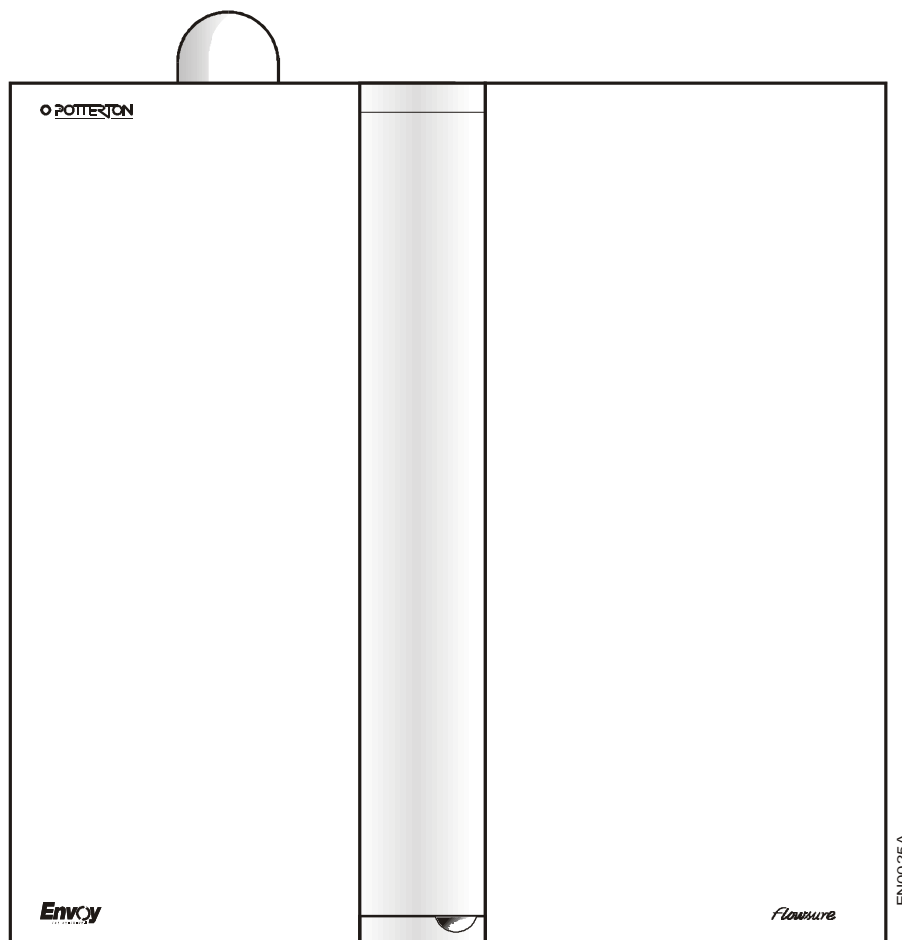
We are pleased to offer you the opportunity to protect your investment once your initial boiler guarantee has expired, by the payment of an annual premium. You can continue with this insurance for the normal life of your boiler and you will find a special 30 day introductory offer for a second year cover together with a card to register your purchase, as part of the "User Pack" supplied with your boiler.

If you have not been handed a Registration Card/additional 2nd Year Breakdown Insurance offer, Please contact the Potterton Myson Registration Department for a copy by telephoning (0181) 944 4972.

Installation & Service Instructions

Envoy Flowsure & Envoy Flowsure+

Wall Mounted Fan Powered Balanced Flue Gas Condensing
Combination Boiler and Storage Combination Boiler



THE GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1994.

“ In your own interest, and that of safety, it is law that all gas appliances are installed by competent persons, in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution.”

The polythene bags used for packaging are a potential hazard to babies and young children and
MUST BE DISPOSED OF IMMEDIATELY.

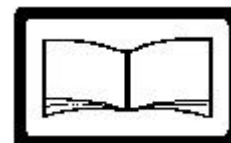
Installation must be in accordance with the Installation & Service Instructions and the rules in force.

LEAVE THESE INSTRUCTIONS WITH THE USER FOR USE ON FUTURE CALLS

**For Use With Natural Gas
(G20) Only At 20mbar
For Use in GB & IE**



IMPORTANT
PLEASE READ THIS BOOK
BEFORE INSTALLING,
OPERATING OR SERVICING
THIS BOILER.



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Introduction - Page 2

The Potterton Envoy Flowsure (20l) and Flowsure+ (50l) are high efficiency, lightweight, automatically controlled wall hung gas fired condensing combination boilers with Storage Tanks. The flue system is room sealed and fan powered.

The combination boilers which are designed to provide domestic hot water and/or central heating must be used on FULLY PUMPED sealed systems only.

The combination boiler will adjust automatically to provide central heating outputs between 23.45 kW and 14.8 kW to suit the system requirements.

Domestic hot water has priority over the central heating system and is generated within the integral indirect storage tank.

The combination boilers can be supplied with either of the following flue systems:-

Horizontal
1 metre, 1.5 metre, 2 metre, 2.5 metre or 3 metre

Vertical
1 metre, 1.5 metre, 2 metre, 2.5 metre or 3 metre

Accessories

The following Potterton Myson controls are recommended for use with your boiler:-

Electronic Timer
Room Thermostat PRT2 or PRT100
Frost Thermostat PRT100FR
Thermostatic Radiator Valve

Data sheets describing these products are available on request.

Optional Extras

Part No. 236349	Terminal Wall Plate - where necessary can be fitted to the outside face to improve the appearance, after making good around the terminal.
Part No. 236591	Terminal Guard.
Part No. 430080	Flat Roof Flashing Kit - for use with Vertical Flue.
Part No. 430081	Pitched Roof Flashing Kit - for use with Vertical Flue.
Part No. 236893	Outdoor Weather Compensator

Boiler Details

Heat Input	kW	26.86
	Btu/hr	91,600
Heat Output, NON-CONDENSING	kW	23.45
	Btu/hr	80,000
Heat Output, CONDENSING	kW	25.0
	Btu/hr	85,400
Gas Rate	M3/h	2.56
	ft3/hr	90.4
Burner Pressure	mb	12.2
	in/wg	4.9
Injector Size	mm	4.2
Classification	I2H. C1. C3. IP20	
Burner	Furigas Pre-Mix	
Igniter	Norton 401S Hot Surface	
Flame Detector	Morgon Matroc	
Gas Control Valve	SIT Nova Mix 1 - 8 Air Gas	
	Ratio	
Electrical Supply	230V ~ 50Hz	
Fuse Rating - External	3A	
Packed Weight - Boiler	52kg	
Gas Supply Connections	15mm Compression	
Flow Connections	22mm Compression	
Return Connections	22mm Compression	
Condense Discharge Connection	21.5mm (¾"Plastic Compression)	
Maximum Flow Temperature	85°C	
Expansion Vessel	13.5 litre (charge pressure 1.0 bar)	
Pressure Relief Valve	3 bar	

Boiler Details Cont...

Flue Size	100mm Concentric
Water Capacity	3.4 litre

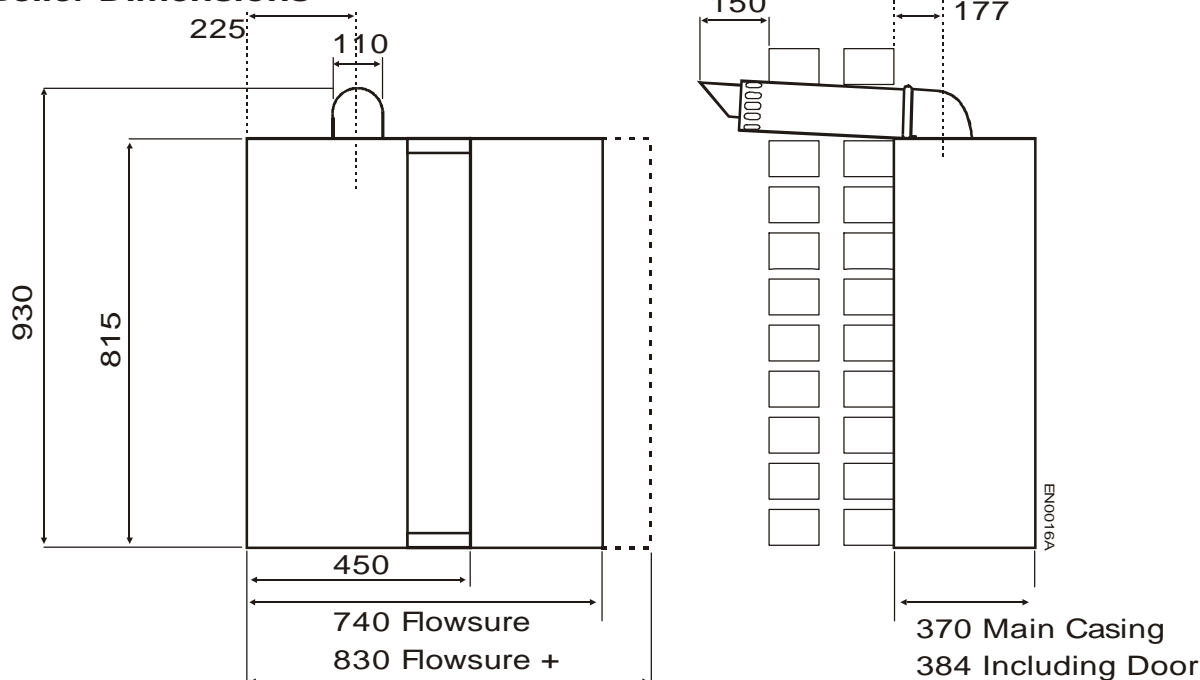
Storage Tank Details - 20 Litre

Packed Weight	20kg
Full Weight	39kg
Max. Cold Water Supply Pressure	10 bar
Normal Secondary Operating Pressure	Mains Pressure
Water Capacity	17.0 litres primary 1.7 litres secondary

Storage Tank Details - 50 Litre

Packed Weight	20kg
Full Weight	65kg
Max. Cold Water Supply Pressure	10 bar
Normal Secondary Operating Pressure	3.5 bar
Secondary Expansion Vessel Charge Pressure	3.5 bar
Water Capacity	2.9 litres primary 41.8 litres secondary
T & P Valve	90°C / 7 bar
Pressure Relief Valve	6 bar

Boiler Dimensions



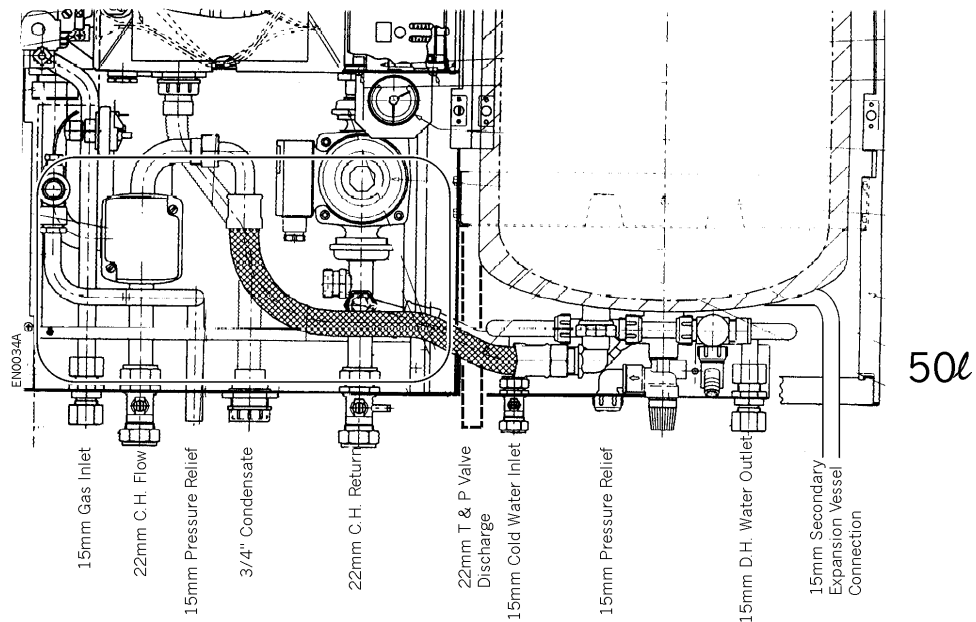
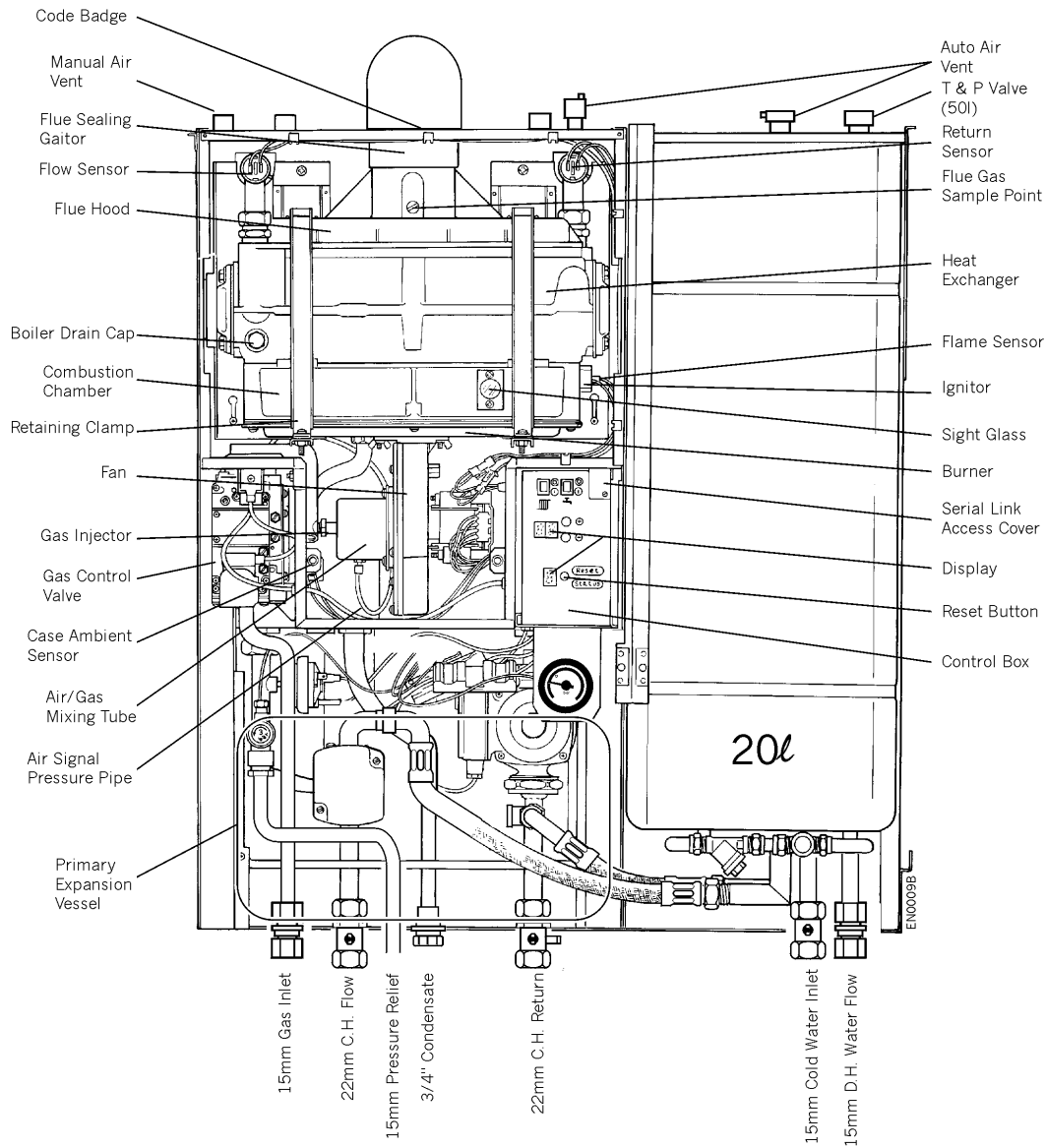


Fig. 2

A gas supply pressure of 20mbar is required at the inlet of the appliance. Performance data is based on use of reference gas G20. The meter and supply pipes must be capable of delivering this quantity of gas in addition to the demand from any other appliances in the house and must be governed at the meter.

Condensate Drain

The condensate outlet on the boiler is designed to accept 21.5mm plastic overflow pipe, which if possible should discharge into the household drainage system and have an internal termination. If this is not practical, discharge into an outside gully or soak away is acceptable. To avoid blockage of this pipe due to freezing it should be routed internally where possible and have sufficient fall over its entire length to dispose of condensate quickly. See British Gas 'Guidance Notes for the 'Installation of Domestic Gas Condensing Boilers'.

Location of Boiler and Tank

These boilers and tanks are not suitable for external installation and should not be fitted directly above a cooking appliance. The boiler and tank may be installed in any room, although particular attention is drawn to the requirements of the current IEE Wiring Regulations and in Scotland, the electrical provisions of the Building Standards applicable in Scotland with the respect to the installation of the appliance in a room 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.

Where the installation of the boiler will be in an unusual position, special procedures may be necessary and BS6798 and BS5546 give detailed guidance on this aspect.

It should be noted that due to the high efficiency of this boiler a white plume of condensate will be emitted from the flue terminal, therefore care should be taken when selecting the terminal position.

Boiler Mounting Surface

The boiler and tank must be mounted on a flat wall, which may be of combustible material and must be sufficiently robust to take the weight of the boiler. The requirements of the Local Authorities and the Building Regulations must be adhered to.

Timber Framed Houses

If the boiler is to be installed in a timber framed building it should be fitted in accordance with the British Gas publication- Part 19 - Building and Kitchen Work. If in doubt advice must be sought from the local region of British Gas or from Potterton Myson.

Clearances around the Boiler and Tank

The following minimum clearances must be maintained after installation for correct operation and servicing of the boiler and tank.

Front:	15mm (610mm for servicing)
Sides:	5mm each side
Top:	140mm (from top of boiler case)
Bottom:	120mm

Ventilation

The room in which the boiler is installed does not require a purpose provided air 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 level and low level air vents must communicate with the same room or must be on the same wall to outside air. Both the high level and low level vent must each have a free area as stated below. The free area of each vent may be halved if the ventilation is provided directly from outside.

High and Low air vent areas: 277 cm²

If the boiler is installed in a cupboard or compartment with a door, allow at least 15 mm clearance between the front of the boiler and the door for air movement.

Flue Terminal and Ducting

The **Standard Horizontal Flue** system (Part No. 236346) is suitable for installations up to 1030mm, measured from the centre line of the boiler outlet to the outside face of the wall.

0.5 & 1 Metre Flue Extension kits (0.5m - Part No. 430092, 1m - Part No. 430085) are available to extend horizontal flues to a maximum length of 2920mm. The siting positions for horizontal flue terminals are shown in Fig. 3.

A **Concentric Vertical Flue** system is available (Part No. 236348) when used in conjunction with the One Metre Flue Extension kits is suitable for flue heights up to 3 metres to terminate through a roof.

The siting of the flue terminal through a roof is shown in Fig. 3.

Only the flue systems shown here can be fitted to the Envoy Flowsure and Flowsure+ boilers.

If the terminal is fitted less than 2m (6.6 ft) above a balcony, above ground or above a flat roof to which people have access then a suitable terminal guard must be provided and fitted.

A protective guard is available from the Potterton Myson Sales Office whose address and telephone number are shown on the rear cover. The guard (Part No 236591) must be securely fitted to the wall and centrally located over the flue terminal.

Where a flue terminal is installed less than one metre from a plastic, or painted gutter, or 500mm from painted eaves, an aluminium shield one metre long, should be fitted to the underside of the gutter or painted surface. A suitable wall plate should be fitted to the painted wall surface of a mobile home.

It is absolutely ESSENTIAL to ensure that products of combustion discharging from the terminal cannot re-enter the building, or any other adjacent building,

through ventilators, windows, doors, natural air infiltration, or forced ventilation/air conditioning. If products of combustion are found to be re-entering any building, the appliance MUST be turned OFF IMMEDIATELY.

Flue Terminals

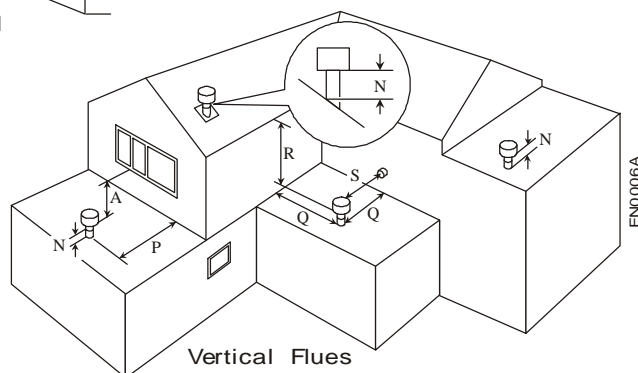
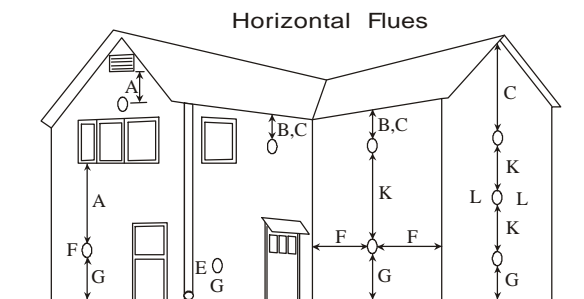
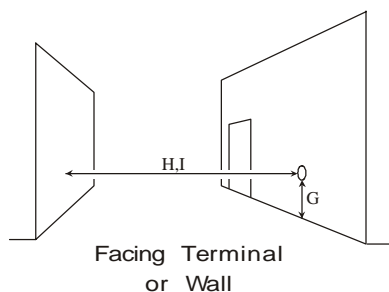
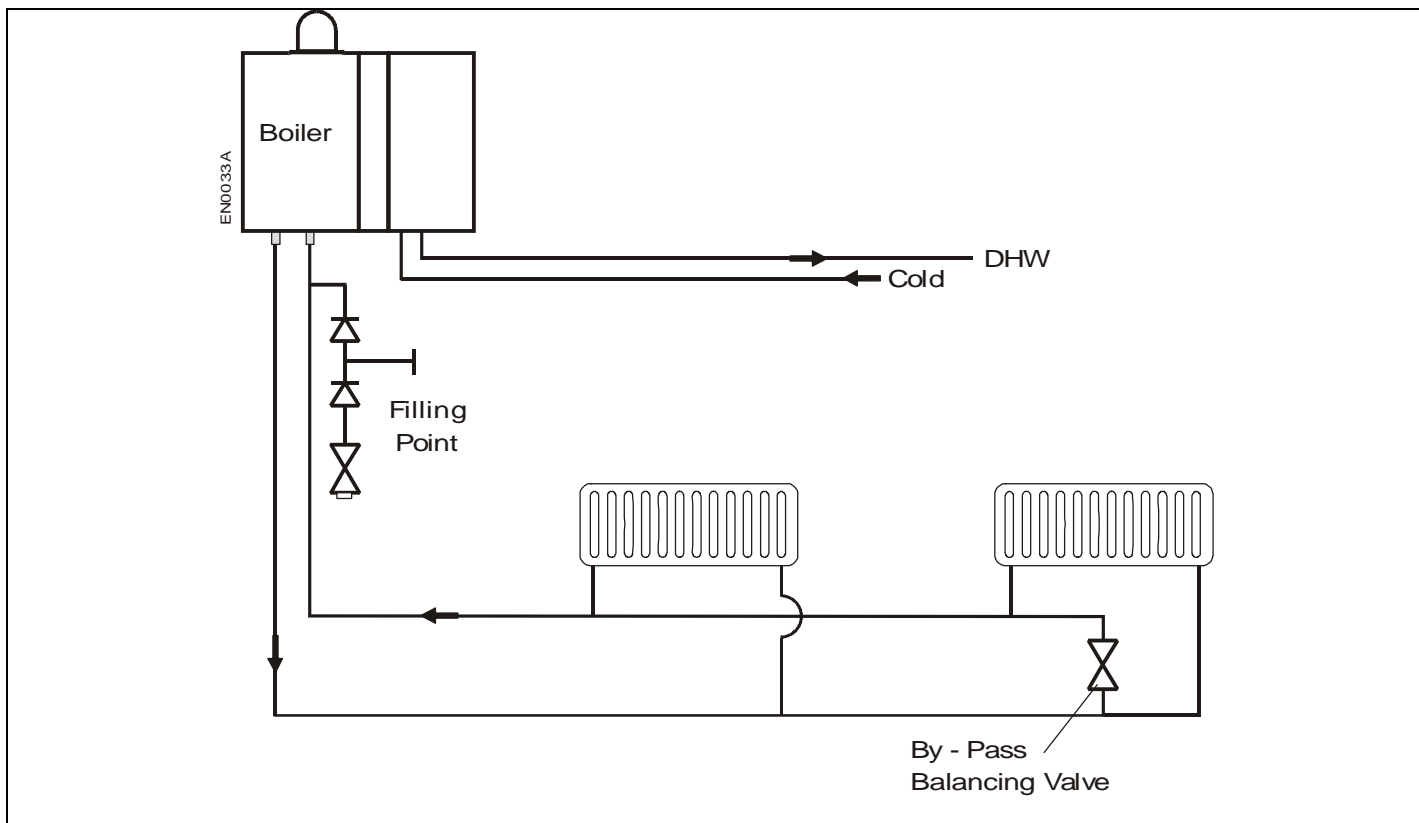


Fig. 3

Terminal position	Minimum spacing
A – Directly below an openable window, air vent or any other ventilation opening	300 mm
B – Below gutters, soil pipes or drain pipes	75 mm
C – Below eaves (Horizontal Flue Only)	200 mm
* – Below balconies/Carport Roof	Not Recommended
E – From vertical soil pipes or drain pipes	75 mm
F – From an internal or external corner	300 mm
G – Above adjacent ground or balcony level	300 mm
H – From a surface facing the terminal	2000 mm
I – From a terminal facing the terminal	2000 mm
* – From opening (Door/Window) in carport into dwelling	Not recommended
K – Vertically from a terminal on the same wall	1500 mm
L – Horizontally from a terminal on the same wall	300 mm
M – Adjacent to opening	300 mm
N – Above roof level (to base of terminal)	300 mm
P – From adjacent wall to flue	300 mm
Q – From internal corner to flue	400 mm
* – Below eaves or balcony (Vertical flue)	Not Recommended
S – From facing terminal	2000



The System

The Envoy Flowsure and Flowsure+ have an aluminium alloy heat exchanger, therefore all systems need to be thoroughly cleansed and the correct treatment added to the system water.

The only system additives recommended by Potterton Myson Ltd. are FERNOX-COPAL or GRACE DEARBORN - SENTINEL X 100 and should be used in accordance with the manufacturers instructions. This will include use of the appropriate system cleanser.

To ensure sufficient pump head is available to overcome system resistance, a system differential of 14° should be allowed for.

Where all radiators may be controlled by thermostatic radiator valves a by-pass should be fitted as far away from the boiler as possible.

Drain off taps should be fitted in the pipework close to the boiler and at all low points of the system.

Note: Although the system can be emptied using the

drain off taps installed in the pipework around the system, to empty the boiler it is necessary to remove the drain off cap positioned within the boiler case.

Installation

The installation must comply with the requirements of BS 6798: 1987 and BS 5449: Pt 1. The British Gas publication "British Gas Specification for Domestic Wet Central Heating Systems" should also be consulted.

The following components are incorporated within the appliance.

- Circulating pump.
- Diverter valve.
- Pressure Relief valve with a non-adjustable pre-set lift pressure of 3 bar (45 psi).
- Pressure gauge covering the range 0-4 bar (0-60 psi).
- 13.5 litre expansion vessel with initial charge pressure of 1.0 bar (14 psi).

The domestic hot water system must be in accordance

with the relevant recommendations of BS 5546. Copper tubing to BS 2871:1 is recommended for water carrying pipework and **MUST** be used for pipework carrying potable water. All capillary joints in the D.H.W pipework must be joined with a lead free solder.

Ancillary pipework, not forming part of the useful heating surface, should be lagged to prevent heat loss and any possible freezing, particularly where pipes run through roof spaces and ventilated under-floor spaces.

The expansion vessel on this appliance is suitable for central heating systems up to 135 litres. For systems greater than this, an additional expansion vessel will be required.

Mains Water Feed: Central Heating

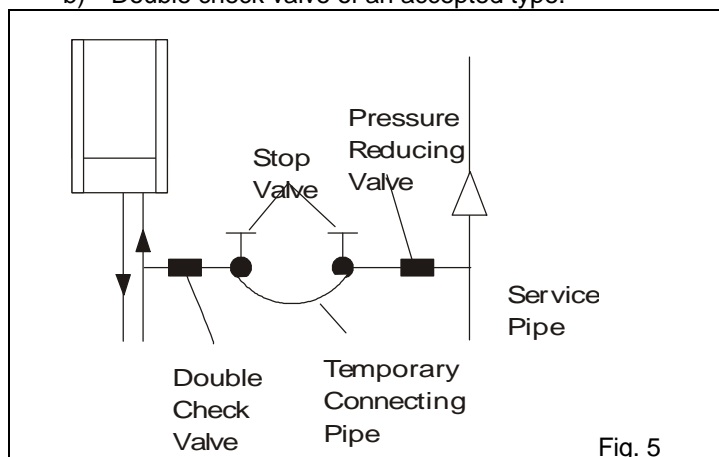
A connection must be incorporated into the central heating system to facilitate filling. There must be no direct connection to the mains water supply, even through a non-return valve, without the approval of the Local Water Authority.

Permissible Methods of Filling

(1) Direct Method (Fig. 5)

A detachable flexible hose is connected to a stop valve fitted to an outlet on the service main. The other end of the hose is connected to a second stop valve and a double check valve. The double check valve is fitted to an inlet connection on the central heating return pipe under the appliance. The hose should be disconnected after filling. Where the mains pressure is excessive a pressure reducing valve could be used to make filling easier. The following fittings shall form a permanent part of the system and shall be fitted in the order stated.

- a) A stop valve complying with the requirements of BS 1010 Part 2, (the temporary hose from the draw off tap shall be connected to this fitting).
- b) Double check valve of an accepted type.



(2) Booster Pump Method

The system may be filled through a self contained unit

comprising a cistern, pressure booster pump and if necessary, an automatic pressure-reducing valve or flow restrictor.

The pressure booster pump must be capable of pressurising the system to a minimum of 1.0 bar (14 p.s.i.) measured at the appliance.

The cistern should be supplied through a temporary connection from a service pipe or cold water distributing pipe. The unit may remain permanently connected to the heating system to provide limited water make-up.

Provisions for make up water

Provision should be made for replacing water loss from the system by re-pressurisation of the system. See section on Methods of Filling.

Reference should be made to British Gas Publications "Material and Installation Specifications for Domestic Central Heating and Hot Water".

Note: The pre-charge pressure of the expansion vessel is set at 1 bar, therefore, the cold fill pressure should be 1 bar.

Installation to an Existing Central Heating System

The boilers are designed to operate on a sealed system only, therefore if the existing system is of the open type it will have to be modified to comply with BS 6798.

Before installing a new boiler to an existing system flush out the old system with a recommended descaling / flushing agent at least twice.

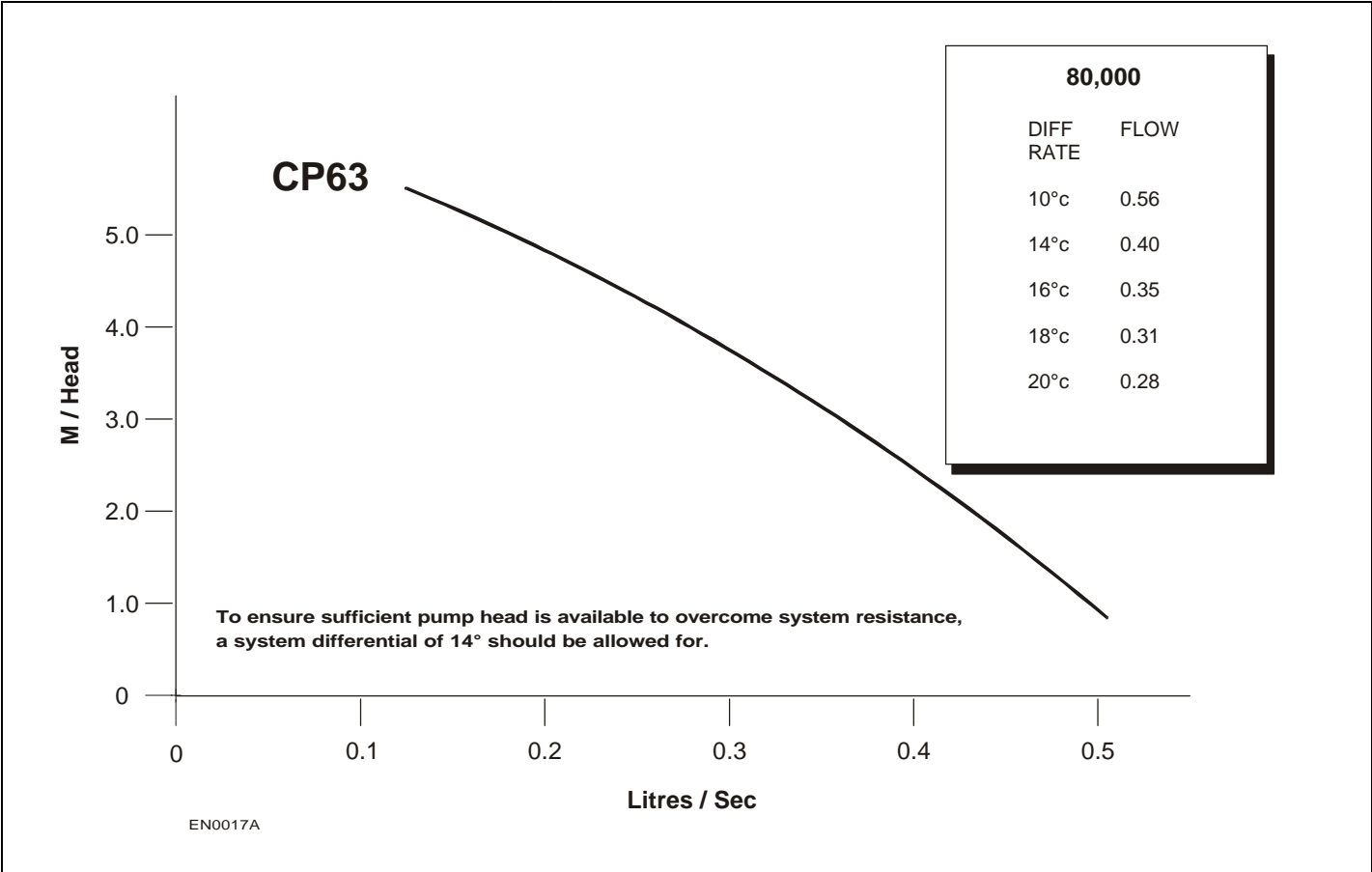
Also check pipework and renew any corroded pipework or fittings. Valve glands must be re-packed or replaced wherever necessary and any defective controls replaced.

Central Heating Range Rate

For most installations the boiler will automatically adjust the central heating output to match your heating system requirement.

Pump

When set on maximum the circulating pump fitted within the appliance should be capable of satisfying most system requirements. Fig. 6 indicates the amount of pump head available for the system. The boiler resistance is already taken into account in this curve.



Domestic Hot Water - 20 Litre Tank

The 20 litre tank is a primary store which is designed to be kept heated to meet instantaneous hot water demands. It is a compact unit designed to supply instant hot water at a flow rate of approximately 6.5 litres/min at a 50°C rise.

Domestic hot water always takes priority over central heating.

If domestic hot water is drawn off while the central heating is operating the boiler will automatically transfer the boiler output to the domestic hot water supply.

The tank is provided with all the necessary equipment to ensure correct operation, except when a water meter and/or water softener have been fitted in the system. In such cases, an external secondary mini expansion vessel (Part No. 430029) will need to be fitted on the mains inlet to the tank.

Domestic Hot Water - 50 Litre Tank

The 50 litre tank is a secondary store which is designed to be kept heated to meet instantaneous hot water demands that require intermittently higher flow rates.

At a flow rate of approximately 12 litres/min, hot water will be delivered for around 4 minutes at a 50°C rise reducing thereafter. The tank will fully recover after a few minutes to again deliver 12 litres/min at a 50°C rise.

Domestic hot water always takes priority over central heating.

If domestic hot water is drawn off while the central heating is operating the boiler will automatically transfer the boiler output to the domestic hot water supply.

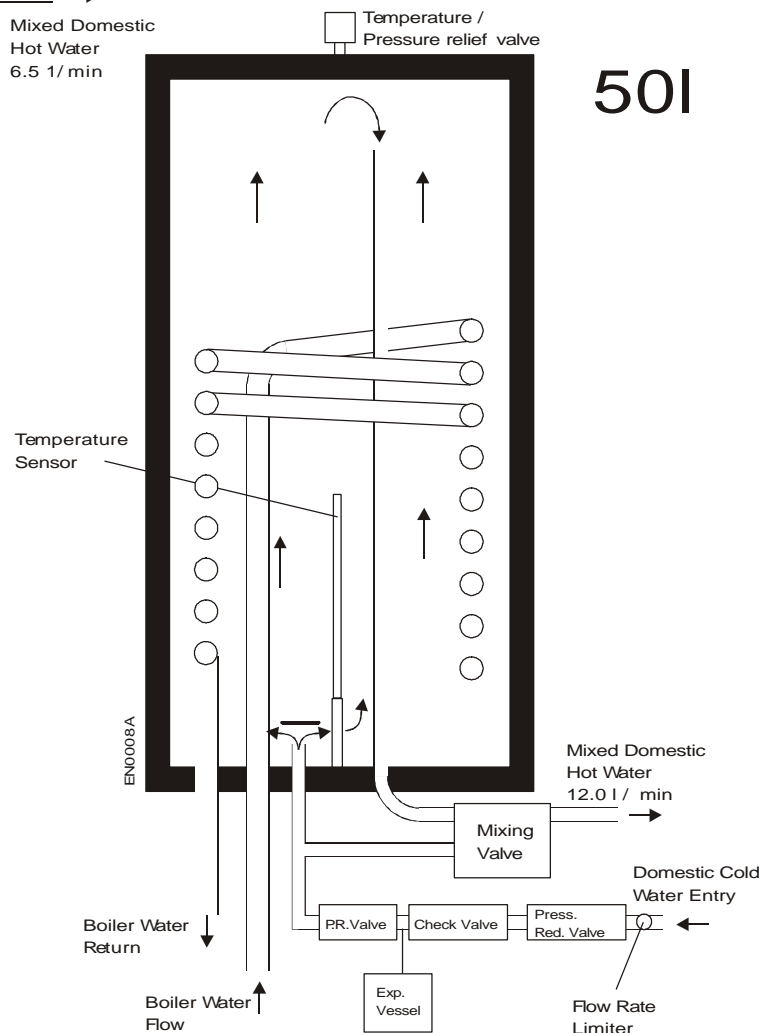
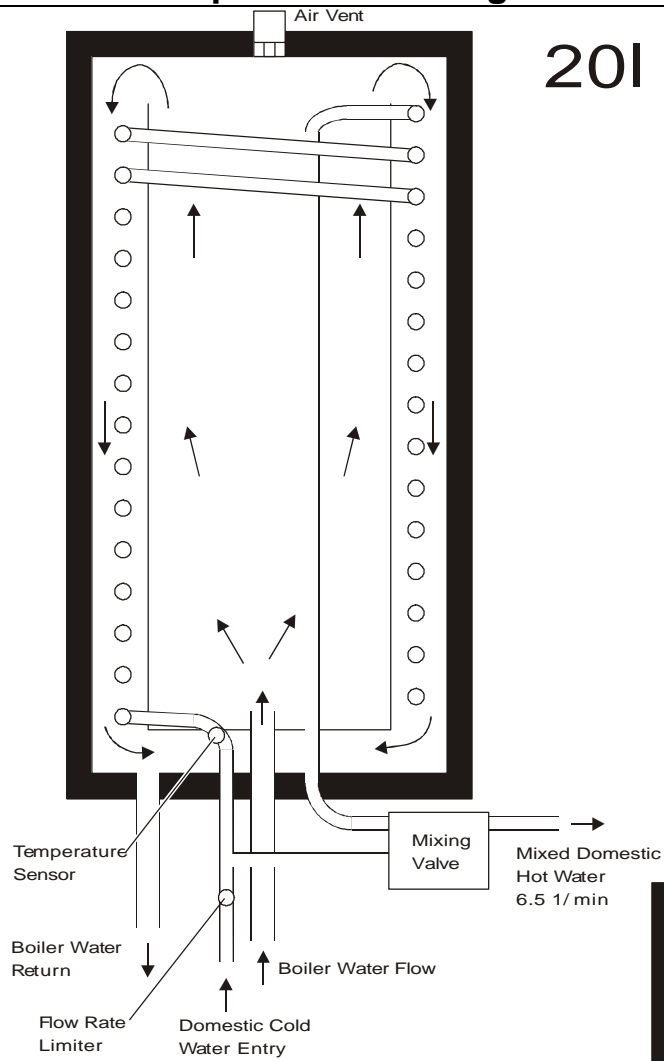
A secondary water expansion vessel is supplied with the tank and must be connected to the appropriate tapping on the controls assembly.

Important

No valves should be fitted between the expansion vessel and the storage cylinder.

DHW Store Temperature both tanks

Water is stored in the tank at approximately 73C. To ensure a safe delivery temperature a thermostatic mixing valve is fitted in the hot water outlet and should be adjusted to produce a hot water delivery temperature of 60C.



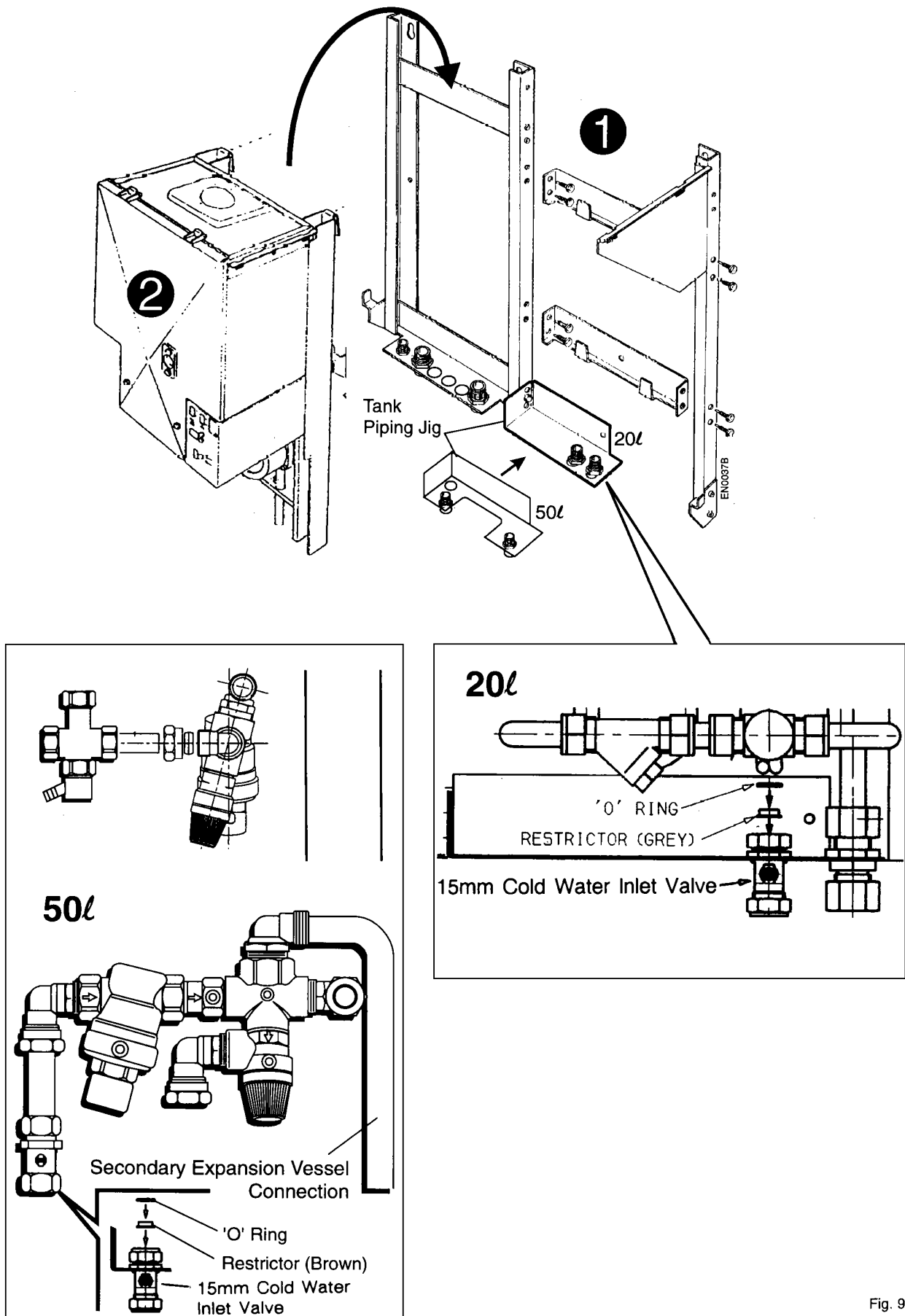
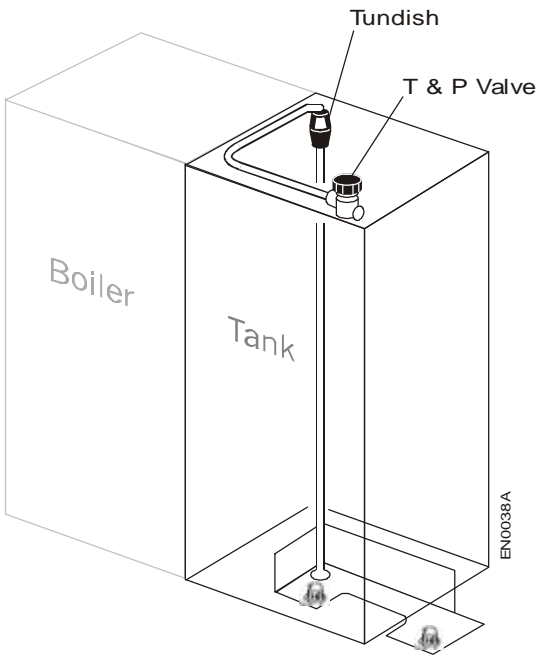


Fig. 9



Assemble the tank piping jig to the boiler mounting frame as illustrated.

Using 10 off wall plugs and screws from accessory pack attach the boiler mounting frame and tank piping jig to the wall ensuring that they are level.

Attach the tank mounting frame assembly to the wall and boiler mounting frame as shown.

From the accessory pack, connect the fittings to the base of the mounting frames as shown - see Fig. 2 for guidance.

Slide the nuts and olives from the fittings onto the boiler pipes and temporarily tape them clear of the pipe ends.

Lift and hang the boiler onto the mounting frame ensuring the pipework at the base of the boiler locates into the fittings in the base of the mounting frame. Drop the expansion vessel forward and using the sealing washers provided connect the flexible tank hoses to the boiler as shown (See Fig. 2), it may be necessary to remove the vessel.

Connect the plastic condensate drain pipe to the mounting frame.

Connect system pipework to the base of the mounting frame as shown. Use a compression fitting for the pressure relief pipe from the boiler.

Connect the gas supply to the base of the mounting frame as shown.

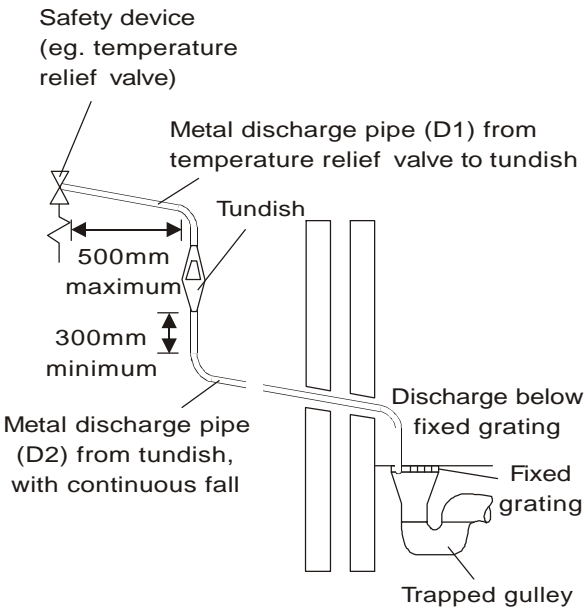
Important

Ensure the flow limiter is fitted as shown in the outlet connection of the cold water inlet valve - See Fig. 9.

50 litre vessel Only: Connect the controls assembly to the base of the tank.

50 litre vessel Only: Connect the remote secondary expansion vessel to the connection on the controls assembly. Support brackets are supplied.

Tundish and T & P Valve: The tundish must be left visible to the consumer once installed and must not come into contact with any electrical components. Connect the temperature and pressure relief valve to the tundish using the pipe supplied. Attach a 3/4 to 22mm compression fitting to the tundish and run a relief pipe down the back of the mounting frame as shown.



Sizing of Copper Discharge Pipe

Min size of discharge pipe (D1)	Min size of discharge pipe (D2) from tundish	Max. resistance allowed, expressed as a length of straight pipe no elbows or bends	Resistance created by each elbow or bend
15mm	22mm 28mm 35mm	up to 9m up to 18m up to 27m	0.8m 1.0m 1.4m

Pressure Relief Valve: The Flowsure has one P.R.V. fitted within the boiler pre-set at 3 bar. The Flowsure+ has two P.R.V.'s fitted, one within the boiler pre-set at 3 bar and one within the tank controls pre-set at 6 bar.

Install a pressure relief valve discharge pipe to the boiler and tank valves, not less than 15 mm diameter and connect to the pressure relief outlet connection using a 15mm Compression fitting. The pipe run should be as short as possible, run continuously downwards and discharge to the outside of the building, where possible over a drain. The pipe end should be directed towards the wall. (see Fig. 9C) The discharge point must be such that it will not be hazardous to occupants or cause damage to external electrical components or wiring.

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.

Electrical Connections

The boiler and all external control circuit wiring must be supplied from the same isolating switch or plug and socket.

The boiler terminal block which is situated in the control box is not designed to accept wiring from all the on-site controls therefore the installer will need to incorporate an external junction box.

Open the control box by removing the two M4 securing screws and lowering the access door as illustrated.

Electrical Wiring

Route a four core cable from the external junction box through the cable clamp in the underside rear of the control box and connect to boiler terminal block as follows.

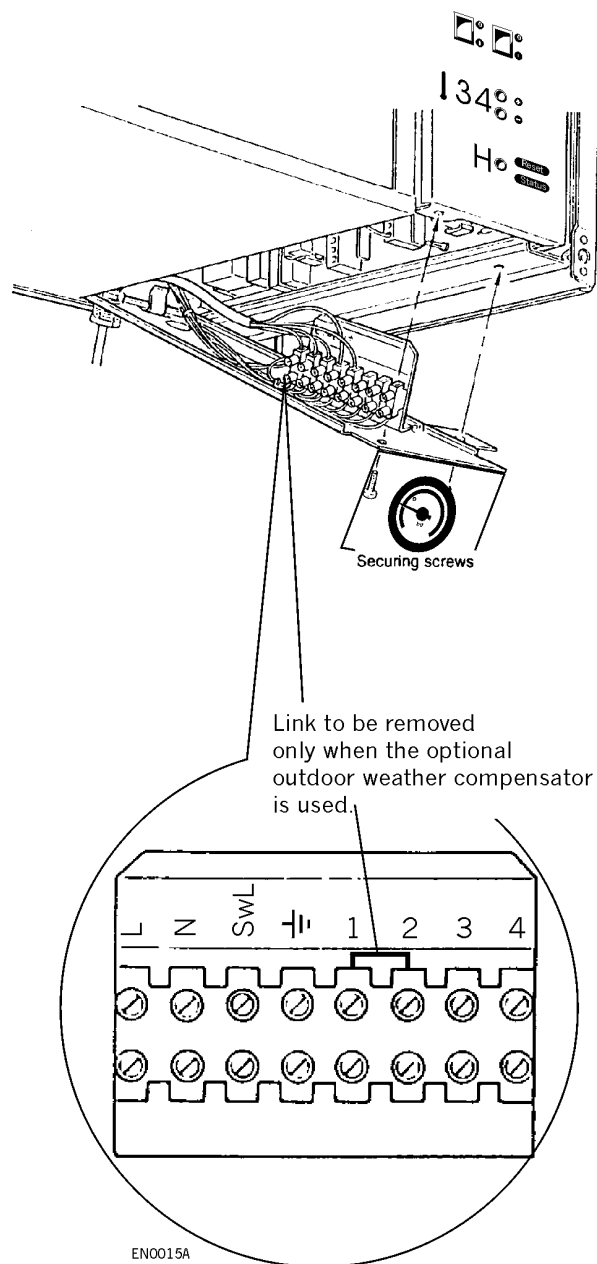
Permanent live to terminal marked L
Neutral to terminal marked N
Earth to terminal marked
Switched live from external controls to terminal marked SwL

If there are no external controls fitted connect SwL terminal to permanent live in the junction box.

Note: The electrical mains supply must be fused at 3A and the connection must be made to the boiler terminals in such a way that should the lead disengage from the cable clamp, the current carrying conductors become taut before the earth conductor.

Close the control box and replace the two M4 securing screws.

Plug tank sensor cable into the mating connector on the short cable coming from the bottom of the control box.



5. Commissioning – Page 16

All Systems

Note: The system can be filled using a sealed system filler pump with a break tank or by any other method approved by the Local Water Authority. Refer to 'THE SYSTEM' section Page 9 in these instructions, also BS.6798 1987.

Flush out the system thoroughly with cold water. Fill and vent the system until the pressure gauge registers 1.5 bar (21.5 lbf/in²). Examine for leaks. Raise the pressure until the safety valve lifts. This should occur within ± 0.3 bar of the preset lift pressure of 3 bar. Release water to attain the correct cold fill pressure.

The whole of the gas installation including the meter should be inspected and tested for soundness and purged in accordance with the recommendations of BS.6891.

Electrical testwork should be carried out by a competent person in accordance with the IEE Wiring Regulations.

Conduct a preliminary electrical test by checking: for short circuits, fuse failure, incorrect polarity, earth continuity and resistance to earth. If a fault has occurred on the appliance, the fault finding procedure should be followed. See Page 30.

Fit the functional case door into position by lifting it onto the top hinge brackets and secure it with the lower two fixing screws.


First Lighting

WARNING: Before lighting the boiler ensure that the functional case door HAS BEEN CORRECTLY FITTED and that the sealing strip fitted to the door is forming a tight seal with the main boiler casing.

Before proceeding to light the boiler, check that the external electricity supply to the boiler is switched off and that the CH & DHW control switches are in the 'Off' position.

Turn on the gas service cock.

Ensure that the boiler and radiator isolating valves are open.




Switch ON the main electricity supply (character  will be displayed).

Note: The boiler is protected by an automatic frost protection device, therefore if the water temperature within the boiler is below 5°C or 10°C in the tank the boiler will fire until the return temperature reaches 40°C or the tank temperature reaches 15°C.

Ensure the electronic timer if fitted, is in an 'ON' period (refer to the time control literature).

Ensure that the room thermostat if fitted is set to a high temperature.

Switch both the CH & DHW switches to the On position.



The symbol in the Status/Function display will change from  to  or .

The fan switches on and sets to maximum RPM to give a pre-purge.

The hot surface igniter turns on and reaches a preset temperature.

The gas valve is opened.



If the control fails to detect flame in the first 3 seconds, the boiler will stop and a new ignition cycle started. After 3 ignition attempts the control will go to lockout.

The Status/Function display will show an  and the Flow Temperature & settings display will show . Refer to fault finding section on Page 30.

If ignition is successful the flow temperature is measured by the control for the first twenty seconds to ensure that there is a greater than 3°C rise in the flow temperature. (If unsuccessful, the boiler will go to lockout - see fault finding).

When the temperature rise has been detected, the controls will adjust the boiler output depending on whether the call for heat is from the domestic hot water or central heating. When the set temperature is reached the controls will close the gas valve, allow the fan to run for a short time then set the pump overrun (if required).

It should be noted that the boiler control continuously monitors the temperature rise across the heat exchanger. Therefore, if the system is not correctly vented, air passing through the pump may lead to boiler

shut down with the characters  being displayed in the Flow Temperature & Settings display and the character  shown in the Status/Function. If this occurs thoroughly vent the system and press the reset button.

Burner Pressure

This appliance is fitted with a Gas/Air ratio control valve. This gas valve ensures that the correct amount of gas is delivered to the burner to match the available air supply under all operating conditions.

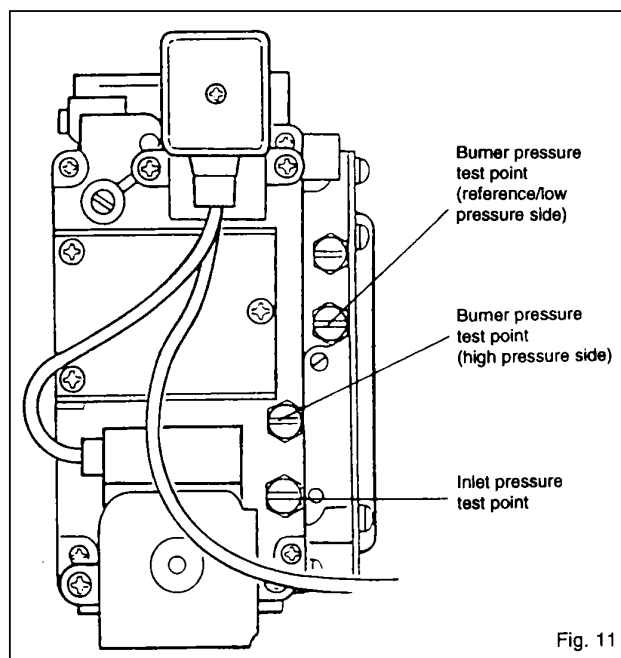


Fig. 11

THE BURNER PRESSURE AND GAS RATE HAVE BEEN PRECISELY SET AND CHECKED DURING MANUFACTURE AND NO ATTEMPT SHOULD BE MADE TO ADJUST IT.

To check the correct operation of the gas valve follow the instructions below carefully.

- a. A good indication of correct operation of the boiler will be obtained by measuring the gas rate at the gas meter.

1. Run the appliance for at least 10 minutes.

Ensure the boiler is NOT modulating by operating in the DHW mode with hot water taps fully open.

2. With all other gas appliances turned off measure the gas rate at the meter for a period of at least 5 minutes. Check that the measured rate is within $\pm 5\%$ of the rate stated on the data plate.

- b. To measure the burner pressure.

1. Turn off the gas service cock. Fit a pressure gauge to the gas inlet pressure test point on the gas control valve. Connect a differential pressure gauge or 'U' tube manometer between the burner pressure gauge test point (high pressure side) and the reference pressure test point (low pressure side) on the gas valve (see Fig. 11).
2. Turn on the gas service cock and run the appliance for at least 10 minutes. Check that the gas inlet pressure is between 19-20 mbar.
3. Check that the differential burner pressure is within ± 1.0 mbar of that stated on the data plate.
4. Turn off the gas service cock and remove the pressure gauge and replace the pressure test point sealing screws on the gas valve.

Should the gas rate or differential burner pressure fall outside the specified range run the boiler for a further 10 mins and carry out a re-check, if after re-checking either the gas rate or the burner pressure falls outside the tolerance specified, Potterton Myson Service Department should be called as specialist equipment is required to enable adjustment to be made.

Relight the boiler and reheat the system to maximum. Check for water leaks, turn the boiler off, drain the system whilst hot.

Remove functional case door and ensure there are no condensate leaks from around the boiler or the condensate drainage system.

Refit functional case door ensuring a good seal.

Refill the system and add the correct concentration of FERNOX COPAL or GRACE DEARBORN SENTINEL X100 water treatment.

Adjust to the correct cold fill pressure (1 bar).

If a by-pass circuit is fitted the by-pass valve should be adjusted with the boiler operating under minimum load conditions to maintain sufficient water flow through the boiler to ensure that the overheat device does not operate under normal operating conditions.

Pump Overrun Timer

Will keep the pump running for approximately 5 minutes after burner shutdown to dissipate heat left within the boiler. The times are adjustable and can be set via the control panel.

Overheat Protection Device

The overheat protection device is pre-set and no adjustment is possible. Manual resetting is required if an overheat condition occurs. The reset button is situated in the front of the boiler control box.

Boiler Display & Controls

For full details of the boiler display and controls see Page 19.

Other Boiler Controls

All boiler mounted controls are designed so that if any fault should occur they will fail safe. No further setting or checking is necessary.

Final Assembly

Remove the three M5 pozi head screws from the right hand side of the boiler as shown, Secure the centre case support bracket using the three screws previously removed. Attach casing side panels onto the boiler as illustrated (Fig. 12) ensuring that the three lugs on each panel are correctly located. Slide in the bottom panel and push fully home. Engage hooks on the top rear of the front panel into the slot in the top front corner of each side panel. Lower the front panel to engage brass studs into the retaining clips, press fully home to lock panel into position.

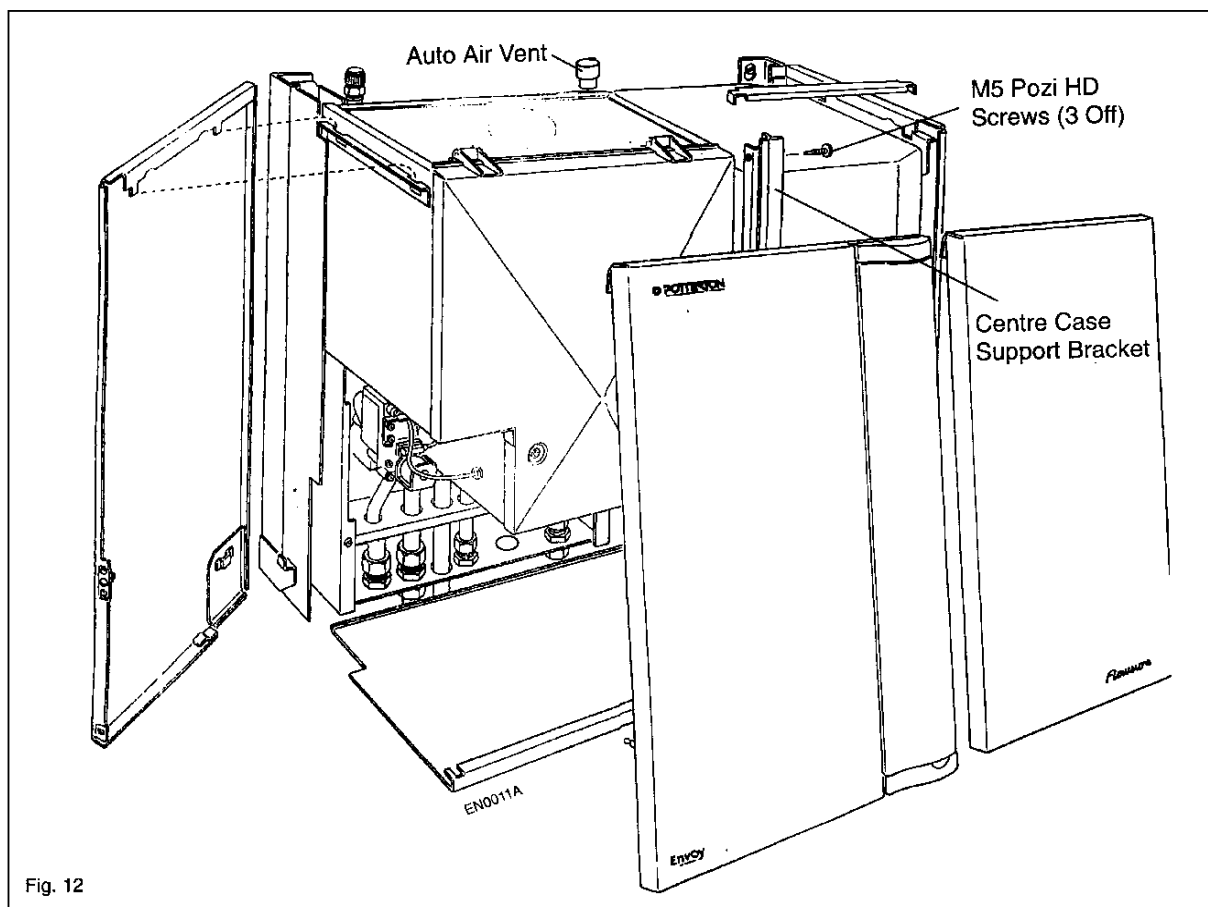
Information must also be passed to the customer on the type of corrosion inhibitor that has been added to the system and of the need to maintain the correct concentration levels as recommended by the manufacturer.

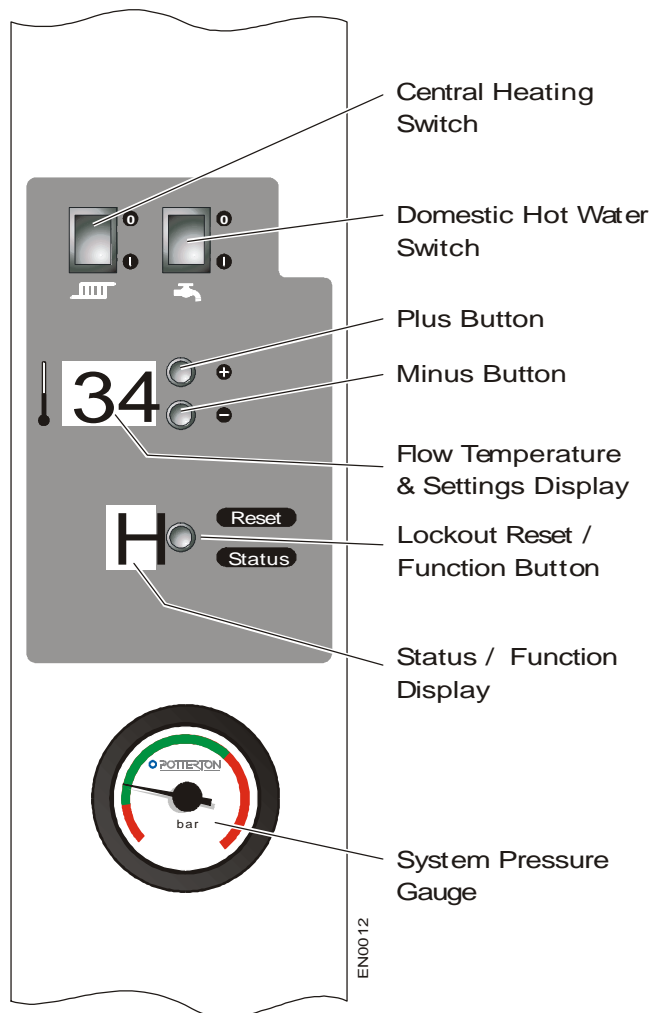
External Controls

Check that any other external control connected in the system, such as timers and thermostats, control the boiler as required.

User's Instructions

A User's Guide is provided with this boiler but the householder must have the operation of the boiler and system explained by the installer. The householder must also be advised of the importance of annual servicing and of the precautions necessary to prevent damage to the system and building, in the event of the system remaining out of commission in frost conditions.





Boiler Controls

All boiler mounted user controls are situated in the front of the boiler control box behind the hinged door.

Central Heating Switch: In the 'On' position the central heating (CH) will be on unless connected to a timer when it will operate on the timed settings.

Domestic Hot Water Switch: In the 'On' position, the domestic hot water (DHW) will be available on demand. Domestic hot water always takes priority over central heating.

Flow Temperature & Settings Display: This shows the boiler flow temperature under normal operation and error condition numbers if a fault should occur.

Status Function Display: This shows the boiler operating condition under normal operation and an error condition letter if a fault should occur.

Under normal conditions of operation the following characters appear:-

Display not illuminated. All power off.

□ **Stand-by:** This is displayed when the CH & DHW switches are in the 'Off' position. Also shown when both switches are in the 'On' position but there is no call for heat.

The boiler flow temperature will be shown on the Flow Temperature & Settings Display.

H **Central Heating:** This is displayed with a flashing dot when the CH switch is in the 'On' position (and there is a call for heat from the time control, if fitted). When the burner lights the dot will stop flashing.

The boiler flow temperature will be shown on the Flow Temperature & Settings Display.

Temperature Adjustment: The boiler thermostat setting can be adjusted as follows when in central heating mode:-

1. Press the Lockout Reset/Function Button once and the **H** will flash. The Flow Temperature & Setting Display will change to show the boiler thermostat setting.

The setting can now be changed in 1°C steps (between 50°C & 85°C) by pressing the Plus or Minus buttons.

2. Press the Lockout Reset/Function Button once and the flashing **H** will change to a flashing **□** this is the installer adjustment mode entry point (and the outdoor weather compensator slope adjustment point if fitted).
3. Outdoor Weather Compensator Slope Adjustment: (Optional Extra)

As well as the flashing **□** a number between 10 and 30 (default is 20) will be shown on the Flow Temperature & Settings Display. This feature is used to optimize the boiler output (flow temperature) to the heating demand (outside temperature) and takes into consideration such factors as the standard of insulation (heat loss) of the building, output of the heating system and the level of comfort required.

Note: This feature only works when an outdoor weather compensator is connected to the boiler, the display will remain the same with or without sensor.

4. Press the Lockout Reset/Function Button once and the flashing **□** will change to an **H**.

Note: If you hold the Lockout Reset/Function Button for more than 5 seconds you will enter the installer adjustment mode settings. If this happens, leave the controls alone and they will reset after a few minutes.

Further information on installer adjustment is provided below.

C Pump Overrun: This is displayed on completion of a heating period when the residual heat from the boiler is being dissipated.

h Hot Water: This is displayed when the storage tank water is being heated.

Reset Button

Pressing the reset button will allow the control to be reset and the boiler restarted should a lockout condition have occurred. (The character **L** is shown on the status/function display and a number i.e. **01** shown on the temperature/settings display)

To Shut Off

Set both the CH & DHW switches to 'Off'.

Installer Adjustment

The following functions allow you (the installer) to configure the boiler to a particular site or to gain information about the boiler and system including the most recent faults that may have occurred. In most cases the default settings will have been used to ensure the most efficient operation and should not be changed unless necessary. To enter the adjustment mode proceed as follows:-

From **C Stand-by:** Press the Lockout Reset/Function Button twice and the display will change to a flashing **C**.

From **H Central Heating:** Press the Lockout Reset/Function Button once and the flashing **H** will change to a flashing **C**.

To enter the installer settings mode depress the Lockout/Reset function button and hold down for around 5 seconds. The Status/Function display will change to **h**

Important:

If a setting is changed when in this mode the Lockout Reset/Function Button must be pressed through the following sequence to store the change in memory.

Settings: Press the reset button after each selection to move to the next function.

h Storage Tank: The 50 litre is set at 50 and the 20 litre tank is set at 20. The 20 litre may also use 00 in areas where water hardness is a problem. Whilst in this mode press the + or - buttons to select appropriate tank size as indicated in the Flow Temperature & settings Display.

t Minimum Flow Temp: See Outdoor Weather Compensator.

d Reference Temp: See Outdoor Weather Compensator - if fitted.

n Used only to change from the default setting of **ll:** This allows the Setback Function to operate and means that the boiler will run at times when the secondary controls are satisfied due to the Outdoor Weather Compensator controlling the boiler.

r Return Water Temp: Actual reading (°C) shown in Flow Temperature & Settings Display.

C Pump Overrun: Settings available are 1, 5, 10, 15, 20, 25, 30, 35, 40, minutes and **CC** (continuous). Whilst in this mode press the + or - buttons to select appropriate timings as indicated in the Flow Temperature & settings Display.

l Flame Signal: When this is shown, the flame signal will be shown as a percentage between **00** & **99** in the Temperature & Settings Display.

L Last Lockout: This is when a lockout has occurred and the control has been reset. *For more information see the Fault Finding section.*

b Last Blocking Error: This is when a blocking error has occurred and then cleared. *For more information see the Fault Finding section.*

C Maximum Fan Speed: This is normally set at 99 which is equivalent to 4680 RPM. *For more information see the Fault Finding section.*

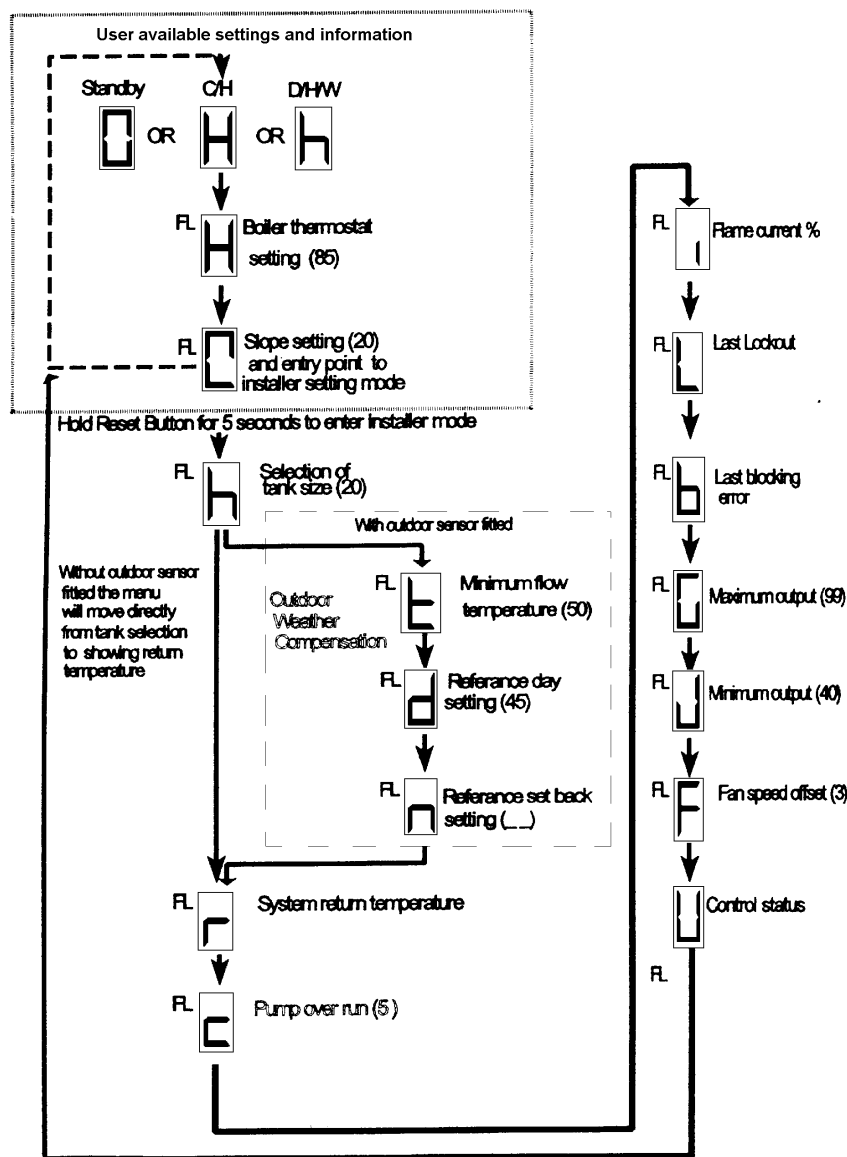
U Minimum Fan Speed: This is normally set at 40 which is equivalent to 2920 RPM. *For more information see the Fault Finding section.*

F Fan Speed Offset: This allows for an offset in the fan speed. *For more information see the Fault Finding section.*

U Control Status: From the information shown on the Flow Temperature & Settings Display it is possible to determine the function the control is performing at any one time. *For more information see the Fault Finding section.*

Display returns to User Mode at this point.

Menu of Settings and Information available to the Installer



Notes despatch settings are shown within brackets
"FL" indicates that the display will be flashing

Outdoor Weather Compensator - Optional Extra

The information taken from the sensor is used in conjunction with some of the software settings within the controls and used to calculate the required boiler output/system temperature to match the heat load of the dwelling. This is achieved by reducing the flow temperature setpoint as the outdoor temperature rises. Full information is provided with the outdoor weather compensator.

Settings

- Slope Setting:** This is used to vary the sensitivity of outdoor temperature compensation, the higher the setting the greater the change in flow temperature setpoint for a one degree change in outside temperature.
- Min. Flow Temp:** Setting: Used to fix the lowest setpoint achievable by the outdoor weather compensation. Available settings are 50°C to 60°C (default 50°C).
- Ref. Temp. Setting:** This is an offset to increase or decrease the boiler flow setpoint with reference to outside temp.
- Temp. Set Back:** The boiler is supplied with this function 'disabled' with default setting displayed. When 'enabled' the outdoor weather compensator will continue to control the boiler at times when all other secondary controls are satisfied if outdoor weather conditions require it.

3. Servicing & Replacement of Parts – Page 22

It is the law that all gas appliances are installed and serviced by a competent person as stated in Gas Safety (Installation and Use) Regulations 1994.

For Health and Safety Information see page 5.

Electrical test work and servicing should be carried out by a competent person in accordance with the I.E.E. Wiring Regulations.

Regular skilled servicing and cleaning of the appliance is essential to ensure continued safe and efficient operation.

The frequency of cleaning will depend upon the particular installation conditions, and the use to which the appliance is put, but in general, once a year should be adequate.

The boiler DATA PLATE and WIRING DIAGRAM are located on the front of the boiler functional casing.

The boiler code number which is on the code badge located on the boiler top panel see FIG.2 should always be quoted when ordering spares or requesting information.

Before commencing the servicing of the boiler it is advisable to carry out a pre-check on the boiler to establish that it is functioning correctly.

- a) Set the boiler running to check its operation.

Note: If the boiler fails to start or does not follow the sequence above then refer to fault finding section on Page 29.

WARNING

Before the start of any servicing or replacement of parts ensure that you have:

- a) Switched off at the external electrical supply by removing the plug from the wall socket or by switching off the appliance at the external isolating switch.
- b) Isolated the gas supply at the boiler service cock.

Preparation of the Boiler

Preparation for servicing should be carried out in the following manner.

- 1) Remove decorative outer casing doors by pulling the bottom of the door from its fixing clips and pushing upwards until it is clear of its top fixing.
- 2) Remove bottom decorative panel.
- 3) Remove functional case door by undoing the two lower securing screws and lift door off the two upper hinge brackets. FIG. 14.

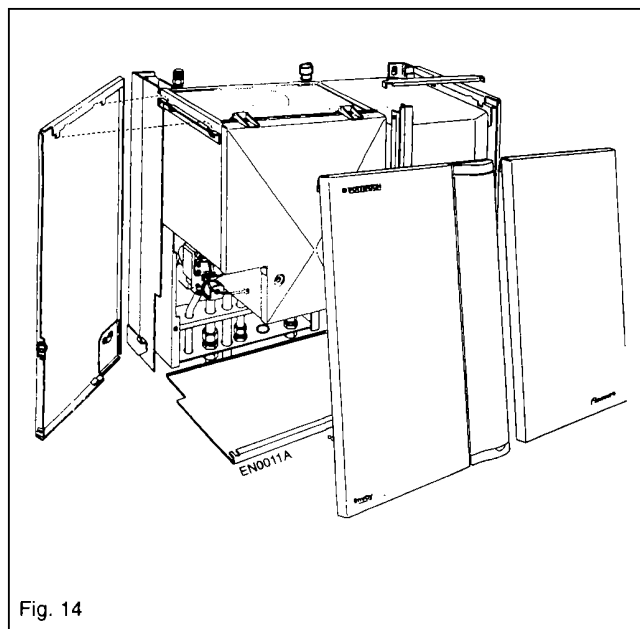


Fig. 14

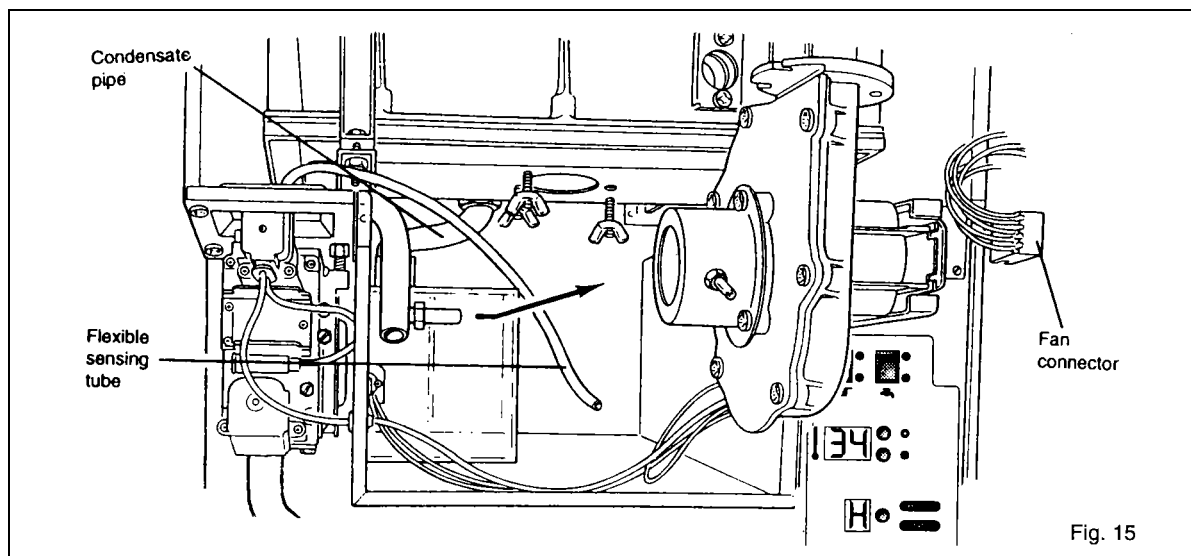


Fig. 15

Removing Fan

- 1) Disconnect electrical connection from fan motor. FIG. 15.
- 2) Disconnect flexible sensing tube from the fan inlet housing.
- 3) Remove fan by slackening two wing screws on left hand side and removing the M5 wing screw on the right hand side of the fan.
- 4) Slide fan to the right then forward and remove from boiler.

Removing Combustion Chamber & Flue Hood

- 5) Disconnect flexible condensate pipe from the rear of the combustion chamber/sump casting.
- 6) Disconnect inline connectors for the hot surface igniter and the flame sensor on the right hand side of the combustion chamber. FIG. 16.

Note the hot surface igniter is a fragile component and requires extreme care when handling.

- 7) Remove two M6 screws retaining clamps around flue hood and combustion chamber.
- 8) Remove the top clamps from their anchor points at the rear of the casing.

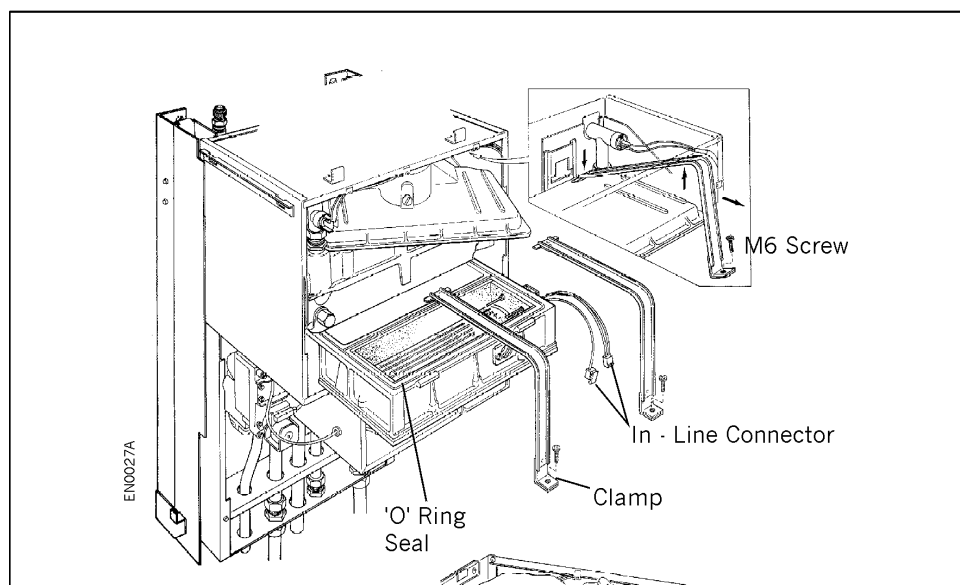
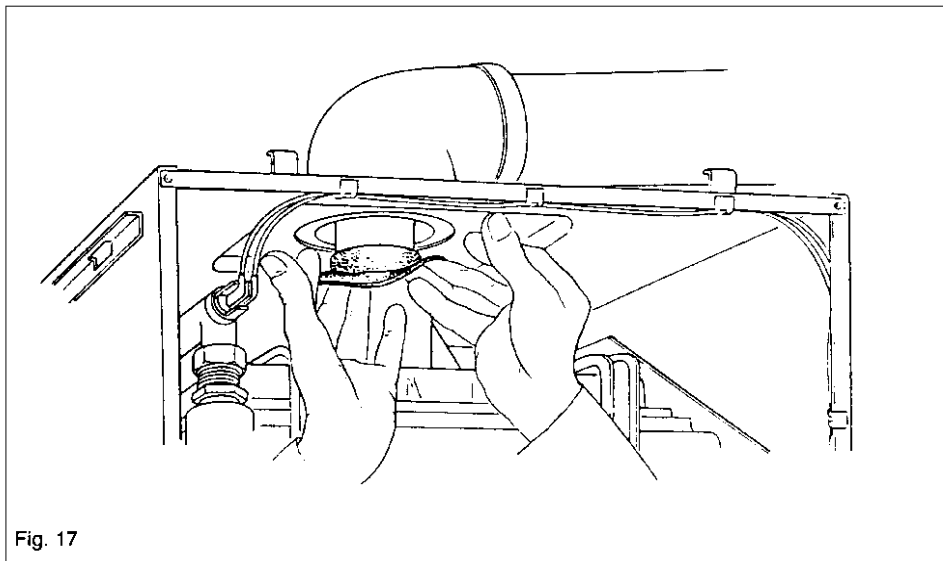


Fig. 16

Removing Combustion Chamber and Flue Hood - Continued.

- 9) Fold back flue sealing gaiter between the flue hood and flue elbow. FIG.17.
- 10) Carefully remove flue hood by moving the right hand side of the flue hood forward and gently guide the hood around the flow tapping on the heat exchanger.
- 11) Pull combustion chamber forward until it is clear of the boiler casing.



Examination of Flue Ways and Cleaning

- 1) Place a sheet of clean paper over the inlet of the condense syphon and the gas assembly. It is particularly important that debris is prevented from entering the short upward facing tube from the gas control valve.
- 2) Cleaning of the heat exchanger must be carried out using a Potterton scraper Part No. 907736.
- 3) Working from below and above the heat exchanger remove all deposits from between the fins.
- 4) Examine top and bottom sealing face of the heat exchanger for deep scratches and remove any debris with a soft brush to provide a smooth flat sealing face.
- 5) Examine Syphon for evidence of leakage or build up of debris.

Note: Place a catch tray beneath the syphon cleaning eye plug and remove plug this should remove any debris which has collected in the pipe section. If necessary the syphon should be removed and flushed with tap water. See replacement of parts for further information.

Re-assembly of Boiler

- 6) Before reassembling combustion chamber and flue hood to the boiler examine for the following:-
 - The 'O' ring seals for damage
 - The insulation in the combustion chamber. Note if there is any visible deterioration of this material it **MUST** be replaced
 - Damage to the hot surface igniter
 - Damage to the surface of the burner
 - Damage to sight glass
 - Build up of debris in the condensate sump (This may be removed with a soft brush)

If any of the above components require changing see section 'Replacement of Parts' for further information.

- 7) Replacement of components is the reverse of removal.

Note: great care should be taken not to damage the flue hood and combustion chamber seals during replacement of these assemblies.

- 8) When refitting retaining clamps ensure that they are located correctly in the guides on both the flue hood and combustion chamber.
- 9) Ensure that the combustion chamber seats correctly onto the heat exchanger, that the screws are fully

tightened and that the clamps fix the combustion chamber and flue hood securely.

- 10) Ensure connection from sump to syphon is made before refitting fan.
- 11) Ensure that the flue sealing gaiter between the flue hood and elbow is correctly positioned untwisted and forms a good seal to both components.
- 12) Relight the boiler as described by following the lighting procedure in the commissioning section of these instructions.

Replacement of Parts

Before replacing any component carry out pre-check detailed at the beginning of the Service section and then refer to fault finding section of these instructions.

WARNING

Before the start of any servicing or replacement of parts ensure that you have:

- a) Switched off at the external electrical supply by removing the plug from the wall socket or by switching off the appliance at the external isolating switch.
- b) Isolated the gas supply at the boiler service cock.

If the combustion chamber has been removed follow procedure in Service section 'Re-assembly of boiler'

1) Fan

- a) Follow procedure in 'Preparation for servicing' at the beginning of the servicing section.
- b) Replacement of fan is the reverse of removal.

2) Hot Surface Igniter

WARNING This component is fragile and requires careful handling.

- a) Remove combustion chamber as described in 'Servicing Boiler'.
- b) The igniter assembly is retained by two M5 pozi drive screws. Remove screws and carefully remove old igniter, if the igniter has become damaged, invert the combustion chamber and shake gently to allow damaged segments to be removed from the chamber. See Fig. 18.
- c) Replacement of the igniter is the reverse of removal ensure that a new sealing gasket is always fitted and that a good seal is made between the igniter and combustion chamber.

3) Flame Sensor

- a) Remove combustion chamber as described in 'Servicing Boiler'.
- b) Remove screw retaining sensor and withdraw from the combustion chamber. See Fig. 18.
- c) Replacement of the sensor is the reverse of removal, ensure new gasket is always fitted.

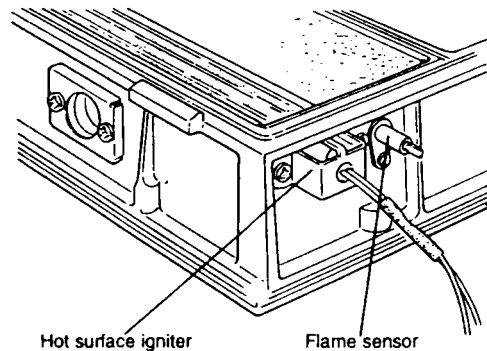


Fig. 18

4) Insulation

Note: all four insulation pads must be replaced.

- a) Remove combustion chamber as described in 'Servicing Boiler'. See Fig. 16.
- b) Remove hot surface igniter, flame sensor. Fig. 18 and burner Fig. 19.
- c) Remove old insulation.
- d) Replace front pad first ensuring that bevelled edge is uppermost and fits into the chamber correctly.
- e) Fit rear pad and use end insulation to retain rear pad.

4) Insulation (Continued)

- f) Carefully replace burner.
- g) Refit hot surface igniter and flame sensor.
WARNING This component is fragile and requires careful handling.
- h) Replacement is the reverse of removal.

5) Burner

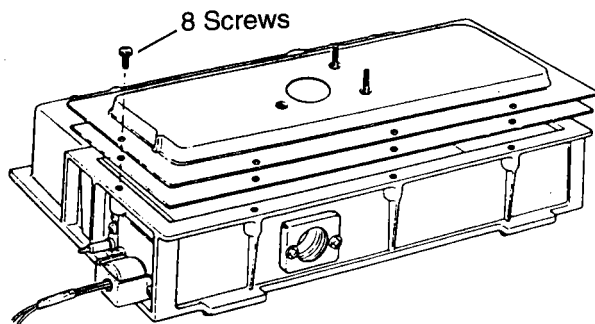


Fig. 19

- a) Remove combustion chamber as described in '**Servicing Boiler**'.
- b) Remove 8 M5 screws retaining burner to the combustion chamber. Fig. 19.
- c) Remove burner from the combustion chamber.
- d) Ensure the burner is fitted with the gasket supplied with it.
- e) Taking care not to damage the burner surface, install new burner into combustion and secure with 8 screws.
- f) Re-assemble as described in section '**Servicing Boiler**'.

6) Syphon

- a) Remove decorative and functional doors as described in '**Servicing Boiler**'.
- b) Remove fan see '**Servicing Boiler**'.
- c) Disconnect flexible condensate pipe from the rear of the combustion chamber/sump casting. Fig. 15.
- d) Disconnect syphon from its wastepipe. See FIG. 9.
- e) Undo nut securing Syphon to the bottom of the boiler casing.
- f) Replacement of the Syphon is the reverse of removal.

See **Servicing Instructions** for re-assembly of boiler.

7) Flue Hood/Combustion Chamber Seals.

- a) Remove combustion chamber/fluehood as described in '**Servicing Boiler**'. See Fig.16.
- b) Remove old seal.
- c) Clean groove using a soft brush or dry lint free cloth.
- d) Ensure new seal is correct (flue hood and combustion chamber require different seals).
- e) Lay seal over groove and gently push into the groove until fully home.

See **Servicing Instructions** for re-assembly of boiler.

8) Injector

- a) Remove decorative and functional doors as described in '**Servicing Boiler**'.
- b) Remove fan see 'Servicing Boiler'.
- c) Remove injector by unscrewing from gas supply pipe.
- d) Replacement is the reverse of removal.

9) Gas Valve Assembly

- a) Remove decorative and functional doors as described in '**Servicing Boiler**'.
- b) Remove fan as described in '**Servicing Boiler**'.
- c) Disconnect electrical supply lead at the gas valve by removing the two retaining screws and unplug.
- d) Remove 4 M5 screws securing gas control valve to boiler service cock.
- e) Remove 6 M5 screws retaining gas assembly mounting plate 4 M5 on the left underside of the plate and two within the casing. Remove M5 screw attaching the valve to its mounting bracket.
- f) Slide gas assembly forward and remove from boiler.
- g) Remove flexible tube from assembly and fit to new gas assembly.
- h) Replacement is the reverse of removal ensuring a new gasket is fitted between casing and mounting plate and the 'O' ring seal is correctly positioned between the gas control valve and the boiler service cock.

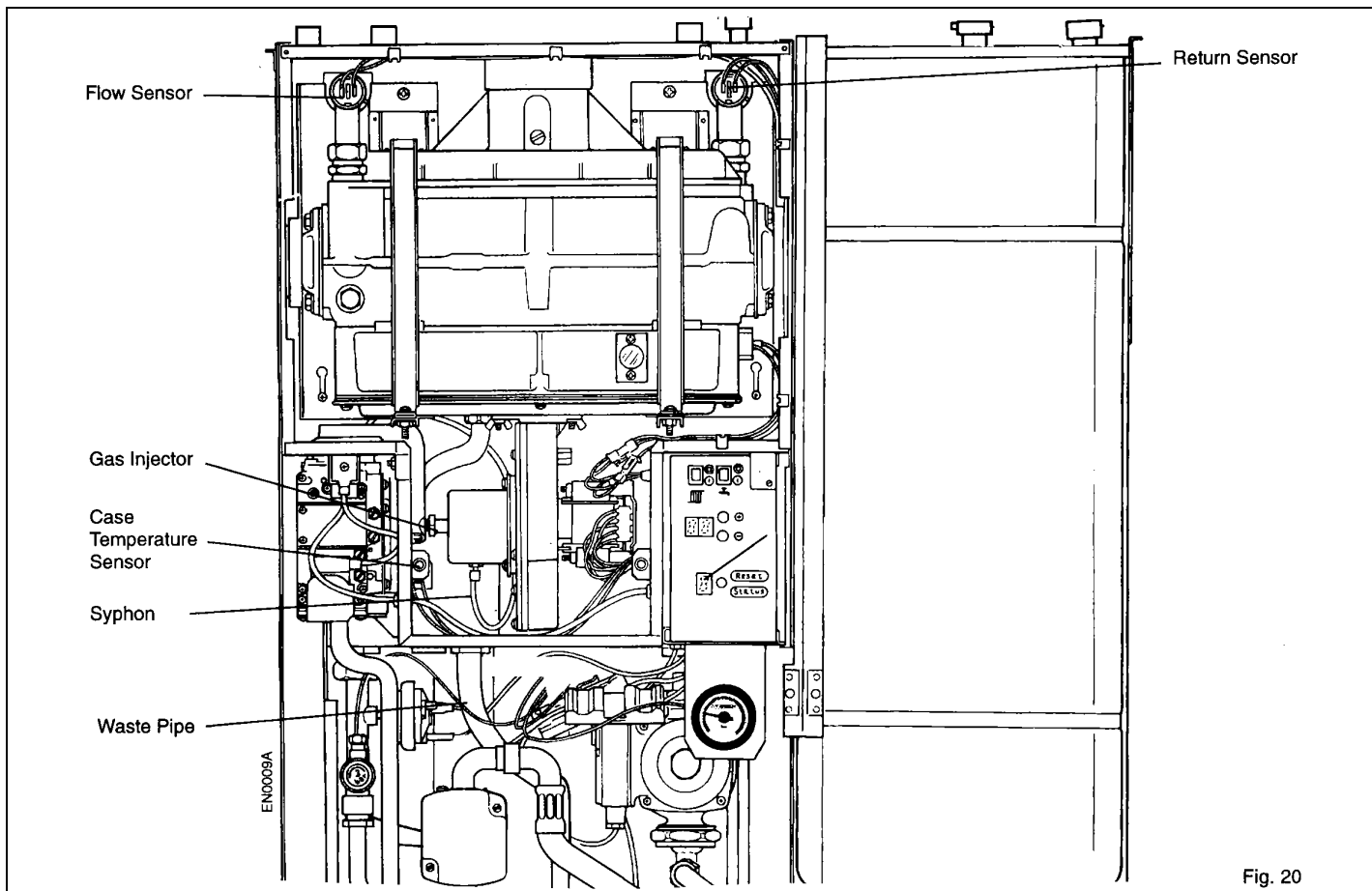


Fig. 20

10) Sight Glass (combustion chamber or case door).

Note: Care should be taken when handling and disposing of broken glass.

- a) Remove decorative casing door if changing functional door sight glass or both decorative and functional doors if changing combustion chamber sight glass, as described in 'Servicing Boiler'.
- b) Remove two screws retaining sight glass assembly and carefully remove from the combustion chamber or door.
- c) Replacement is the reverse of removal ensuring a new gasket is fitted either side of the glass.

11) Water Temperature Sensor (flow and return).

- a) Remove decorative and functional doors as described in 'Servicing Boiler'.
- b) Disconnect two leads from the sensor and remove it by gently squeezing two protruding plastic lugs and while still squeezing pull from its housing.
- c) Replacement is the reverse of removal ensure when fitting new sensor that sensor tip is coated with heat conducting paste and that it is correctly located and firmly home in its housing.

12) Diverter Valve Head.

- a) Remove decorative door and base panel as described in 'Servicing Boiler'.
- b) Lower the expansion vessel to provide access.
- c) Disconnect the diverter valve in-line electrical connector.
- d) Remove the two screws securing the diverter valve head to the main body and remove the head.
- e) Fit the diverter valve head to the valve body ensuring that the shaft seats correctly. Secure the head in position with the two new screws supplied.
- f) Connect the diverter valve in-line electrical connector.

13) Case Temperature Sensor.

- a) Remove decorative and functional doors as described in 'Servicing Boiler'.
- b) Disconnect two yellow leads from the sensor.
- c) Remove fixing screw from mounting bracket.
- d) Remove sensor
- e) Replacement is the reverse of removal.

14) Boiler Control Board.

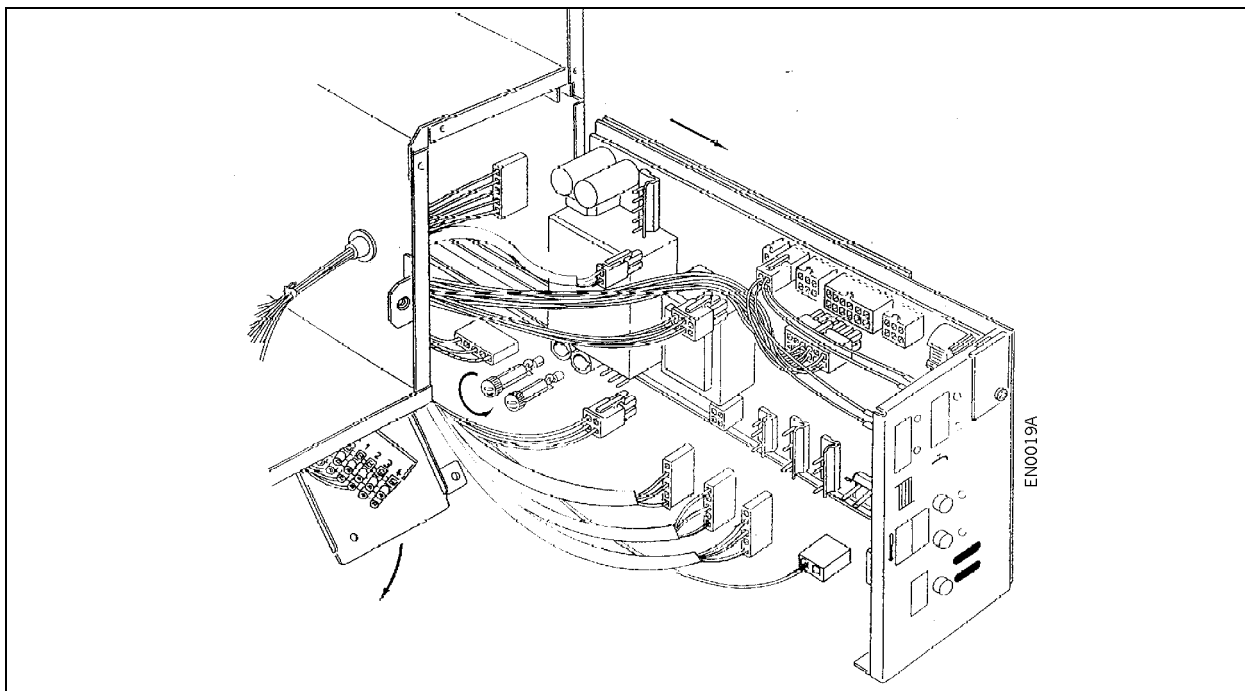
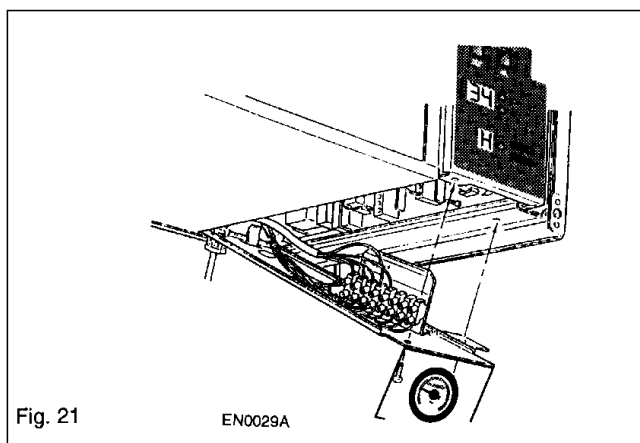
IMPORTANT

Before replacing the control board refer to fault finding section of these instructions. The control should only be replaced if the diagnostic display indicates it is faulty.

- a) Remove decorative door as described in 'Servicing Boiler'.
- b) Remove screw retaining access door on under side of boiler. Fig. 21.
- c) Remove screw retaining control front panel and tray. Fig. 21.
- d) Gently pull front panel forward removing connectors from the control as they become accessible. Fig. 22.

15) Boiler Control Board Fuses.

- a) Remove decorative & functional doors as described in 'Servicing Boiler'.
- b) Remove screw retaining access door on under side of boiler. Fig. 21.
- c) Remove screw retaining control front panel and tray. Fig. 21.
- d) Gently pull front panel forward removing connectors from the control as they become accessible. Fig. 22.
- e) Remove old fuse and replace with the correct Potterton component T - 3.15A (Part No. 933005).
- f) Replacement is the reverse of removal.



16) Water Components.

Replacement of Pump, Water Pressure Switch, Diverter Valve and Water Pressure Gauge.

- a) Remove decorative & functional doors as described in 'Servicing Boiler'.
- b) Remove blanking screw and attach a hose to the drain valve on the return pipe isolating valve.
- c) Release system pressure by opening the pressure relief valve on the boiler flow pipe.
- d) Turn off the isolating cocks on the flow and return pipe connections to the boiler and the boiler will drain.
- e) Remove the clamping screw and lower the expansion vessel to provide access to the water components.

Pump:

- f) Disconnect the in-line connector on the pump supply cable.
- g) Undo the union nuts on the inlet and outlet connections and lift out the pump.
- h) Replacement is the reverse of removal. New seals should be used on re-assembly.

Diverter Valve:

- f) Disconnect the inline connector on the valve supply cable
- g) Disconnect the electrical connectors from the water pressure switch.
- h) Disconnect the pressure gauge connection from the pressure relief valve.
- j) Disconnect the flexible hose from the top of the diverter valve.
- k) Disconnect the CH flow connection at the bracket where it connects with the heat exchanger pipe.
- l) Disconnect the CH flow pipe from the isolating cock.
- m) Disconnect the nut at the base of the pressure relief valve and swing the pipe out of the way.
- n) Carefully lift out the assembly.
- p) Replacement is the reverse of removal.

Water Pressure Switch:

- f) Disconnect the electrical connectors from terminals 1 & 3 of the switch.
- g) Unscrew the switch to remove.
- h) Replacement is the reverse of removal. Polarity of the wires is not important.

Water Pressure Gauge:

- f) Disconnect the pressure gauge connector from the pressure relief valve.
- g) Disconnect the pressure gauge from the bracket under the controls panel and remove the gauge.
- h) Replacement is the reverse of removal.

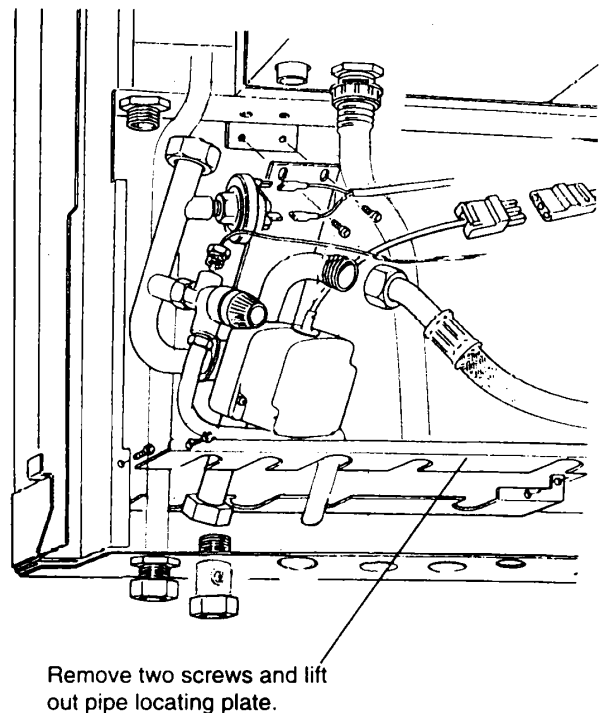
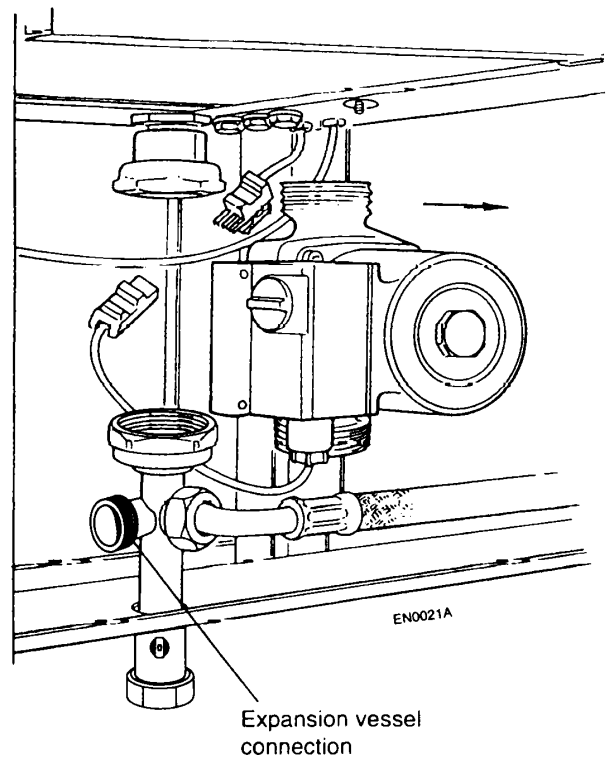






















Fig. 23

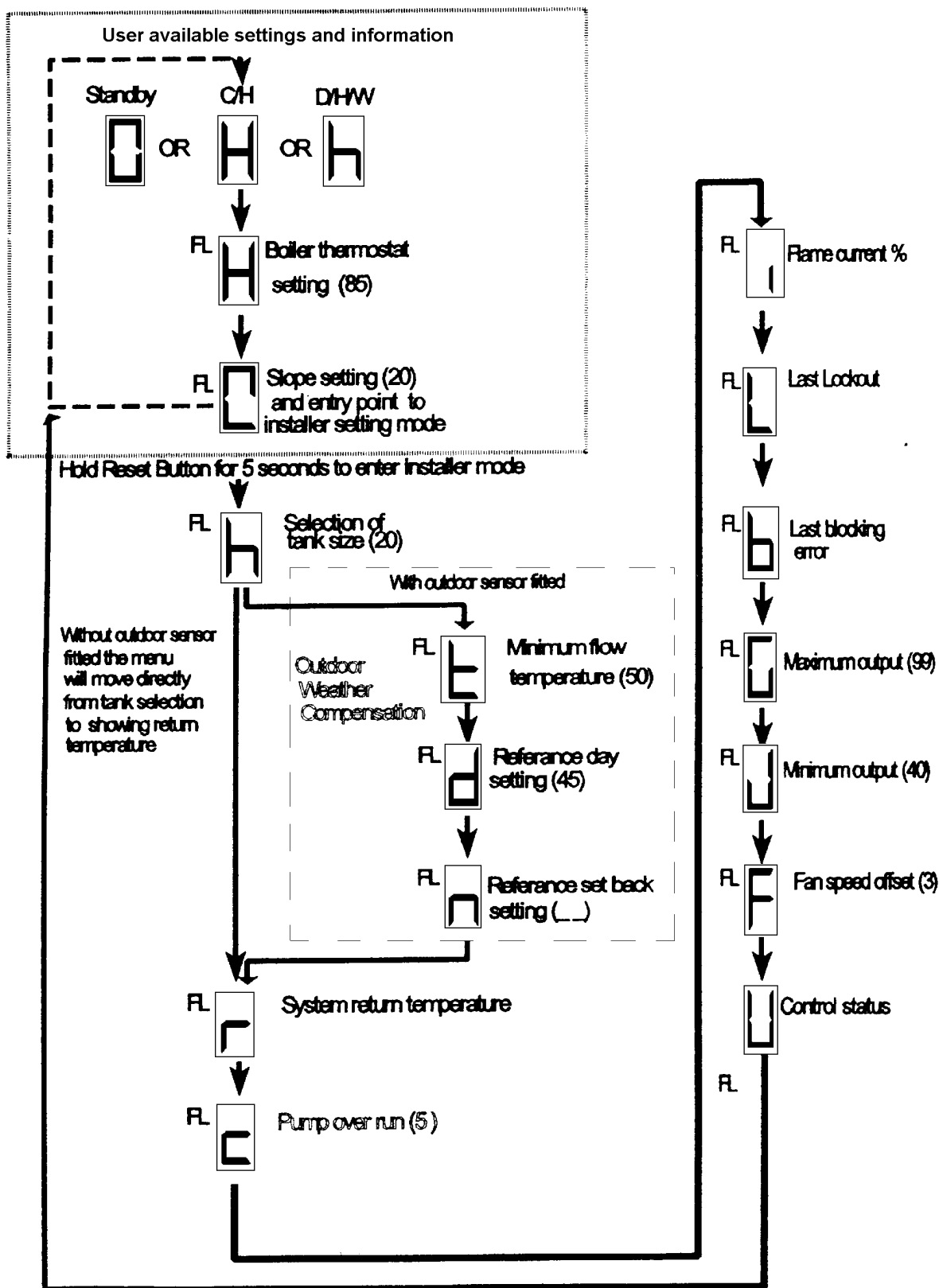
Error Codes

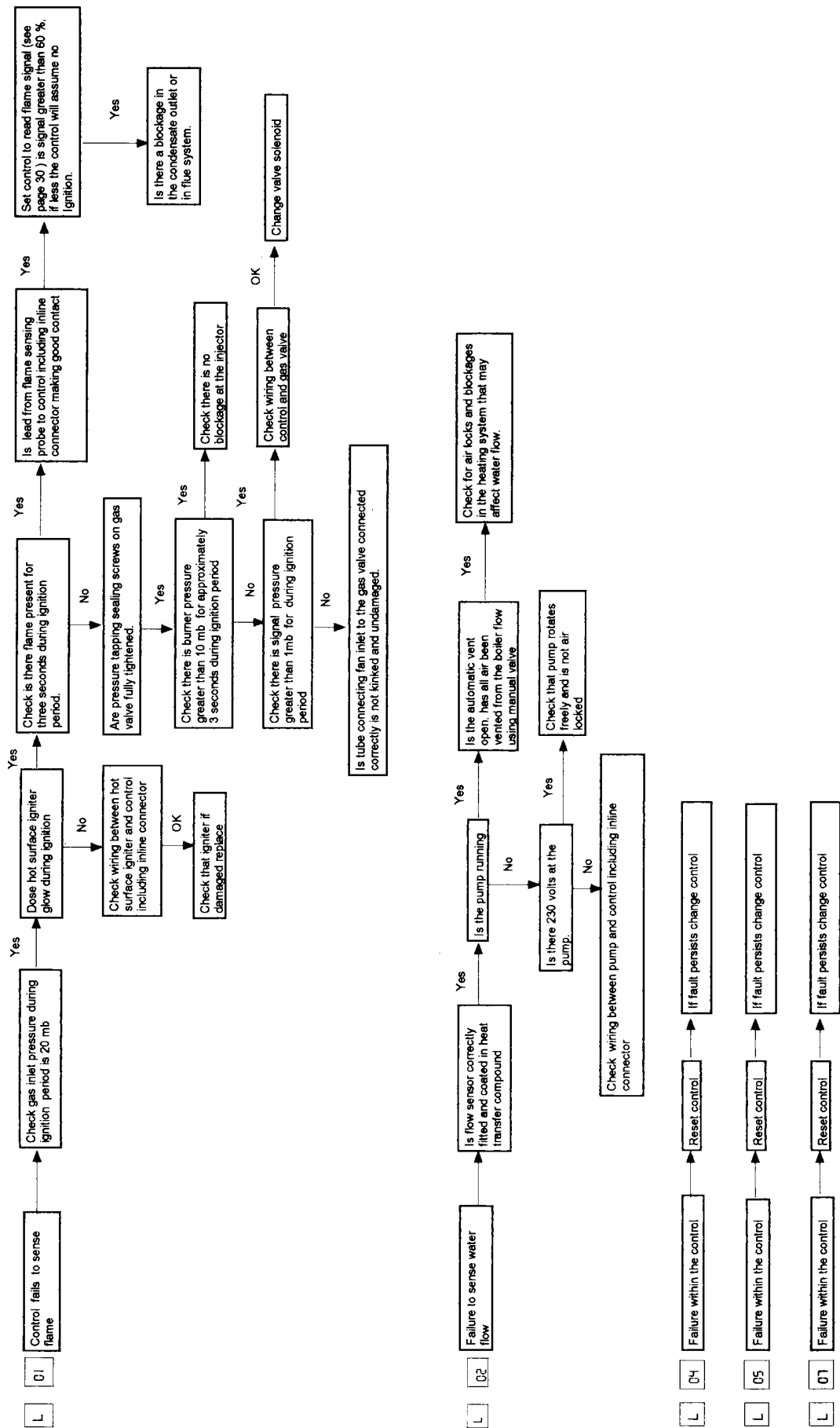
	Last Lockout:	This is when a lockout has occurred and the control has been reset, this event is then stored in the controls memory until another lockout occurs and is reset at which time the display is updated to reflect the new event. The type of lockout is shown in the Flow Temperature & Settings Display. <i>For more information see the Fault Finding Chart.</i>
	Last Blocking Error:	This is when a blocking error has occurred and then cleared, this event is then stored in the memory until another blocking error occurs at which time the control updates the display to reflect the new event. The type of Blocking Error is shown in the Flow Temperature and Settings Display. <i>For more information see the Fault Finding Chart.</i>
	Maximum Fan Speed:	This is normally set at 99 which is equivalent to 4680 RPM, this reading should not be changed as it affects the maximum heat output of the boiler.
	Minimum Fan Speed:	This is normally set at 40 which is equivalent to 2920 RPM, this reading should not be changed as it affects the minimum heat input of the boiler and may cause noise below this figure.
	Fan Speed Offset:	This allows the fan speed to be adjusted in 3 x 60 RPM increments above and below the nominal speed of 4680 RPM - Setting 03 on the Flow Temperature & Settings Display. This has been factory set to ensure that the correct air signal pressure is produced and may have been set anywhere between 00 and 06. Adjustment in the range is achieved by pressing the + or - buttons whilst the F is displayed in the Status/Function Display.
	Control Status:	From the information below it is possible to determine the function the control is performing at any one time. This is useful when diagnosing faults, as failure to carry out a step may point to a malfunctioning component.

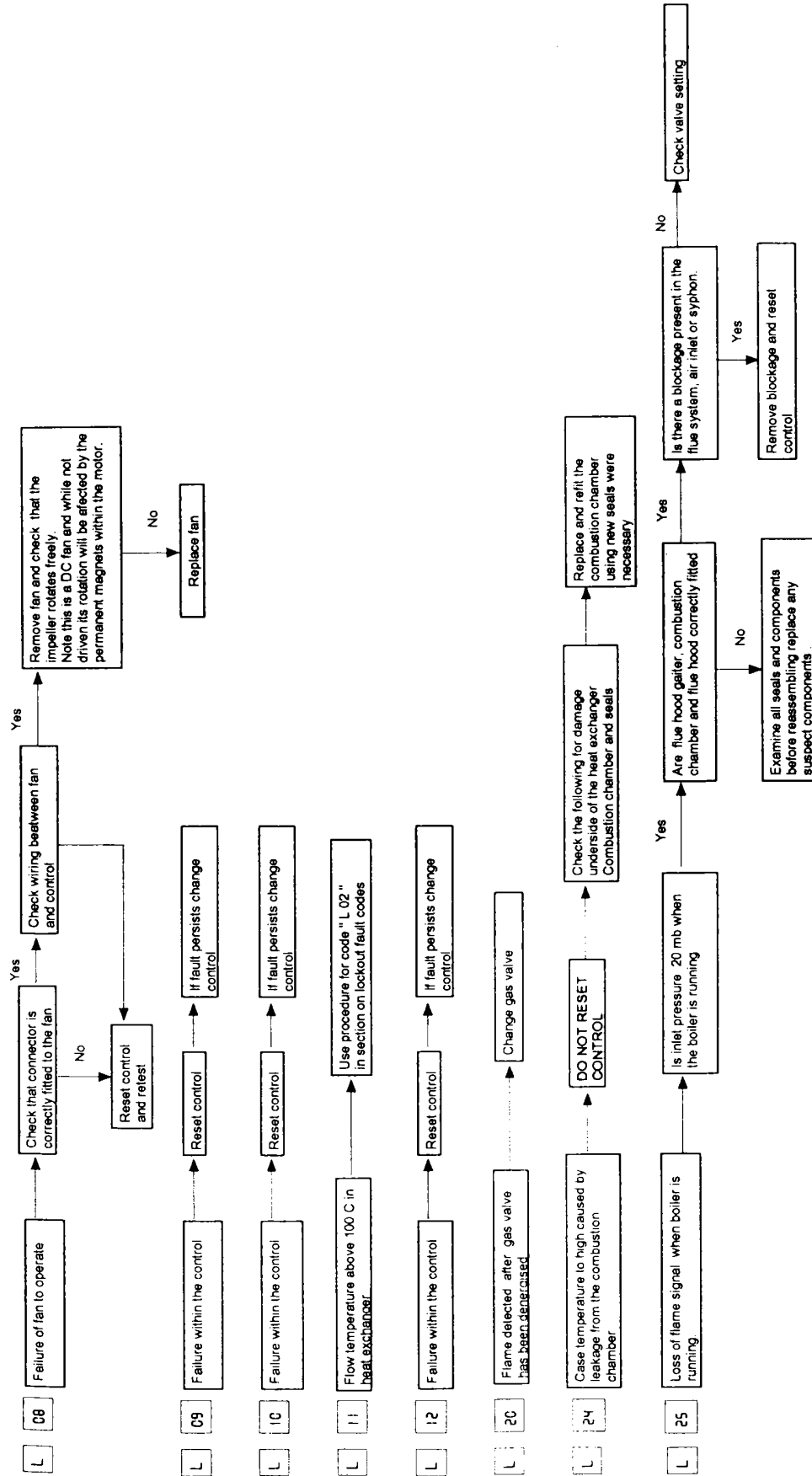
Flow Temperature & Settings Display	Step/ Function	Flow Temperature & Settings Display	Step/ Function
	Stand-by		Fan Overrun
	Fan Purge		Fan Overrun
	Ignition Pre Checks		Pump Overrun - Central Heating
	Ignition Pre Checks		Pump Overrun - Used in Frost Protection
	Hot Surface Igniter		Pump Overrun - Storage Tank
	Gas On		Lockout
	Burner On		Blocking Error

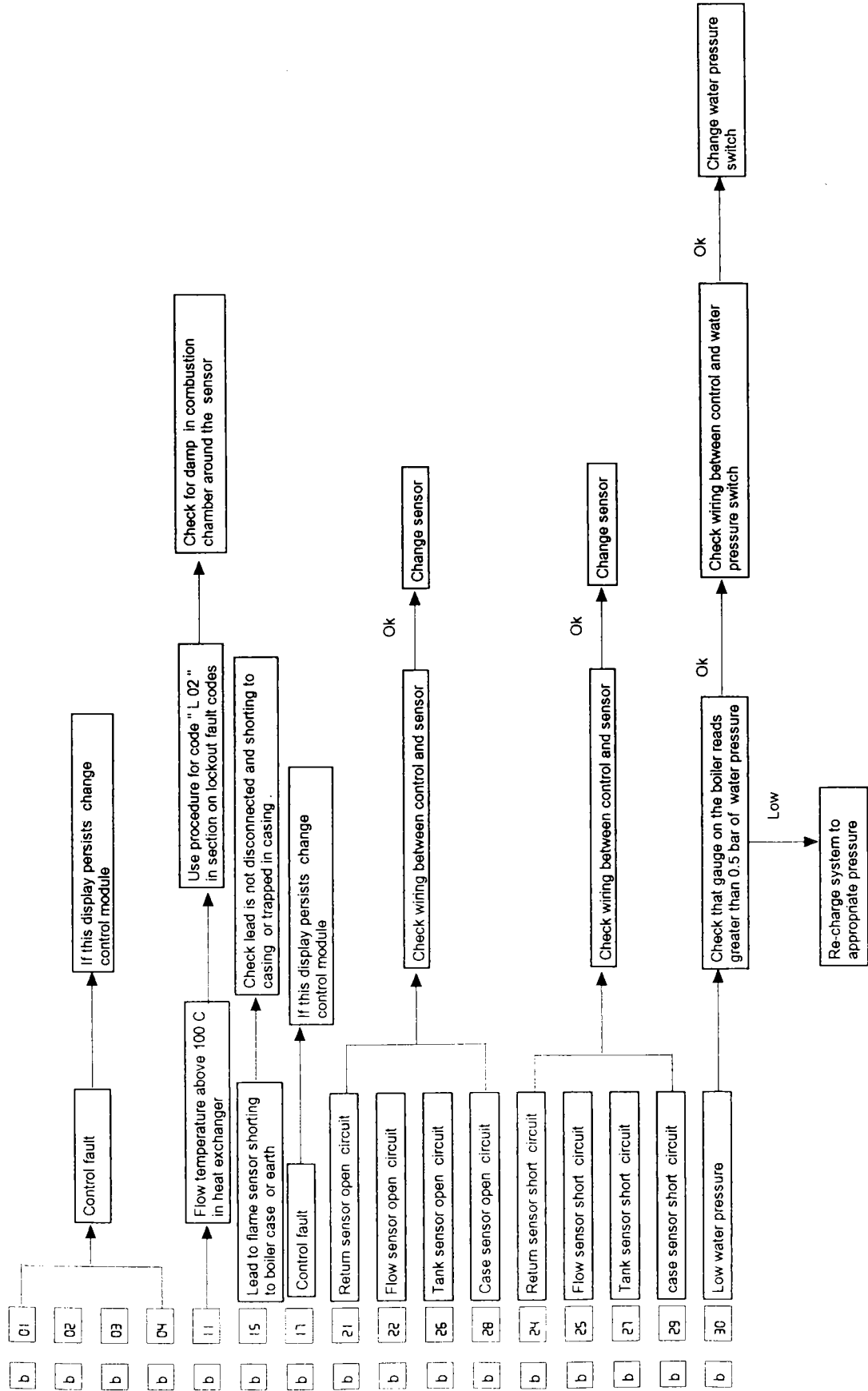
Preliminary Test Diagnostics	All boilers are fully tested before leaving the factory therefore if an electrical problem is experienced it is very likely that this is caused by faulty external wiring. If a problem exists, disconnect all site wiring from boiler. Connect a direct fused electrical supply to boiler terminals L, SwL, N & E. If the boiler now operates correctly the site wiring should be investigated further.
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Menu of Settings and Information Available to Installer









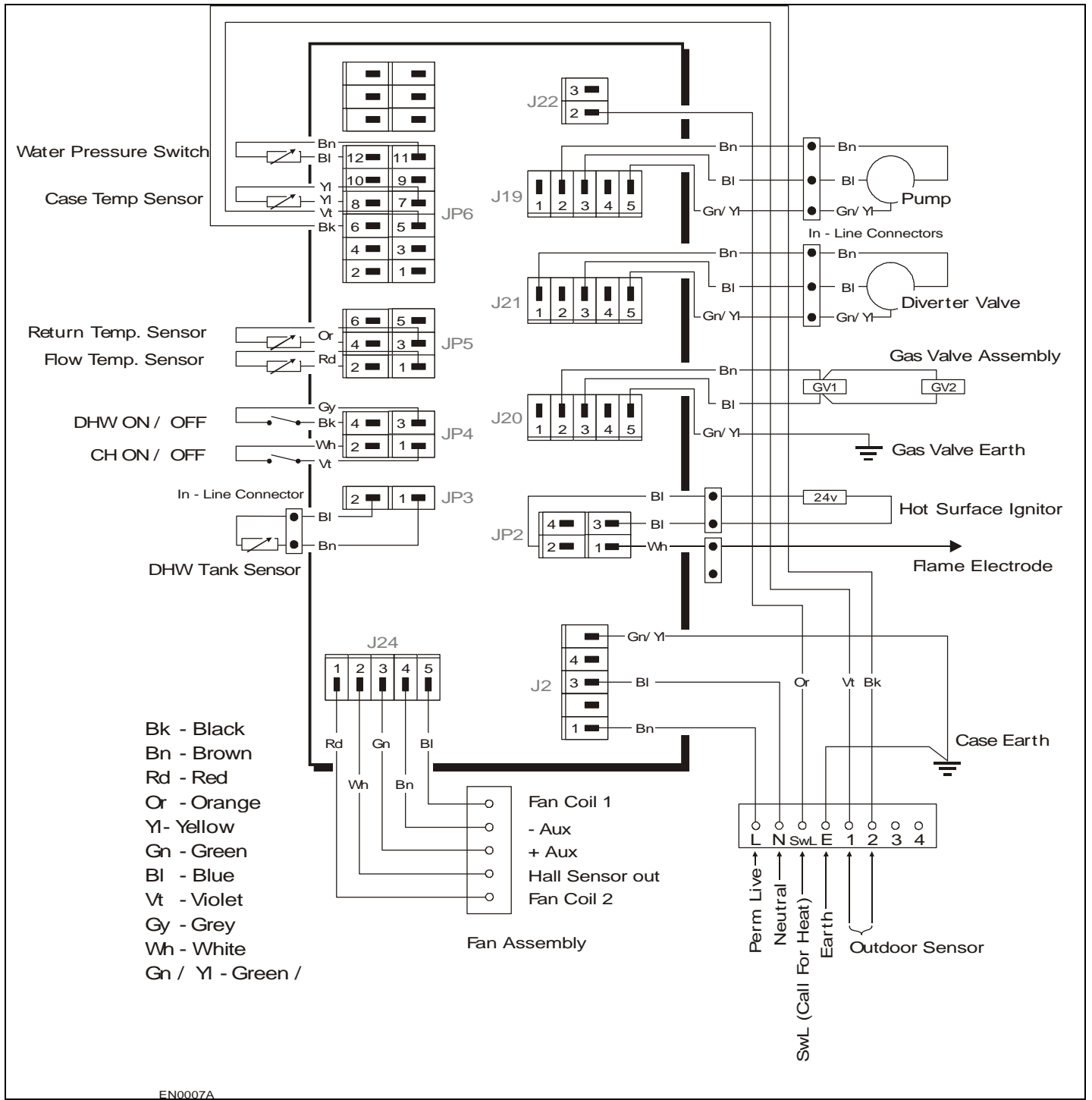
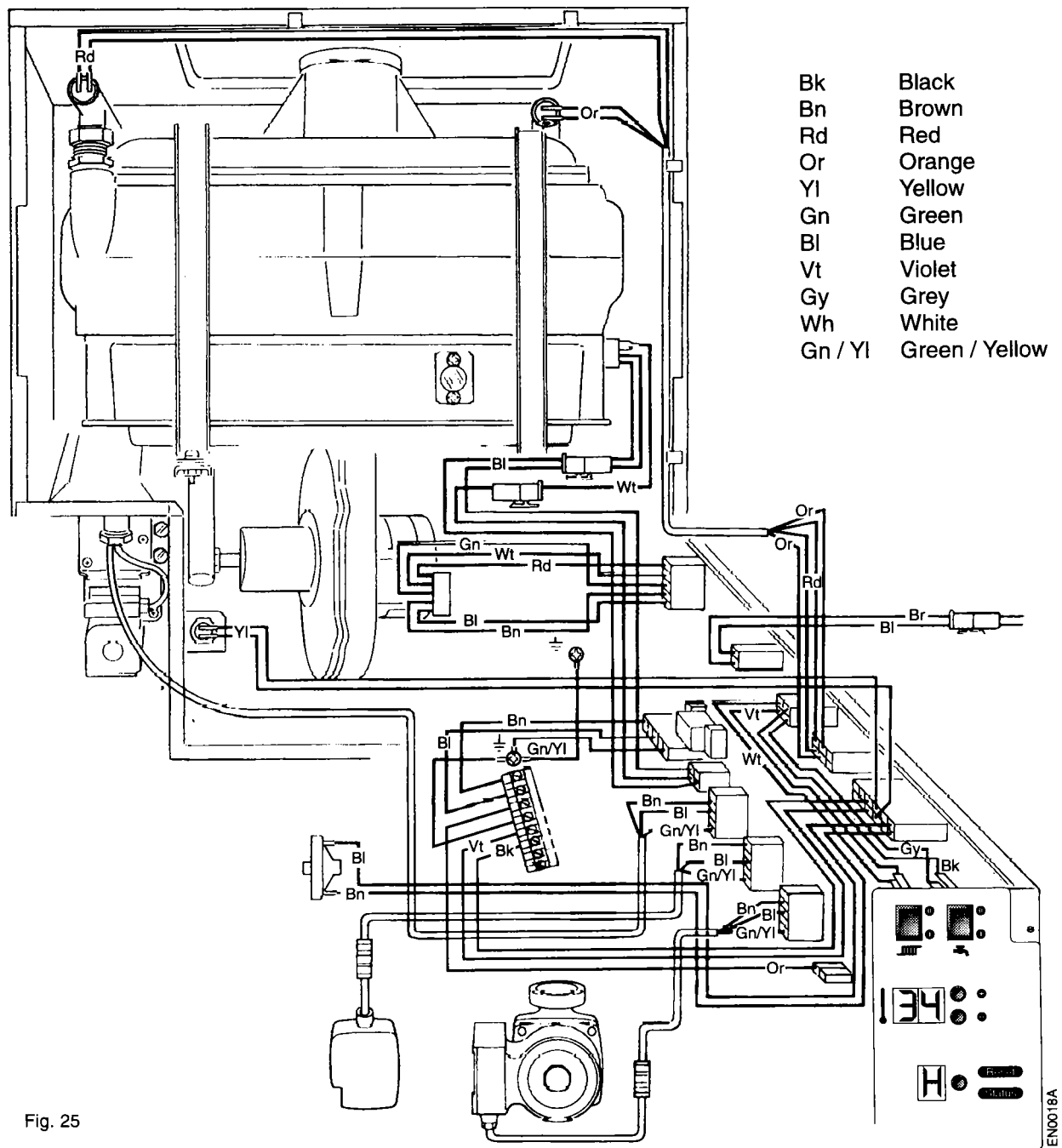


Fig. 24



Drg. Ref.	Description	Potterton Part No.	G.C. No.
1	Gas Valve Assembly	402992	
2	Injector	411010	
3	Fan	409585	
4	Control Assembly	407751	
5	Temperature Sensor	404513	
6	Burner	414732	
7	Burner Gasket	236120	
8	Fan Outlet Gasket	236253	
9	Hot Surface Igniter	407728	
10	Flame Sensor	407729	
11	Combustion Chamber 'O' Ring Seal	236123	
12	Flue Hood 'O' Ring Seal	236122	
13	Flue Scraper	907736	
14	Fuse T3, 15A	933005	
15	Pump	411153	
16	Diverter Valve	430065	
17	Diverter Valve Head		
18	Pressure Gauge	430101	
19	Pressure Relief Valve	430044	
20	Water Pressure Switch	642215	
21	Expansion Vessel	430052	
22	Gaiter	236139	

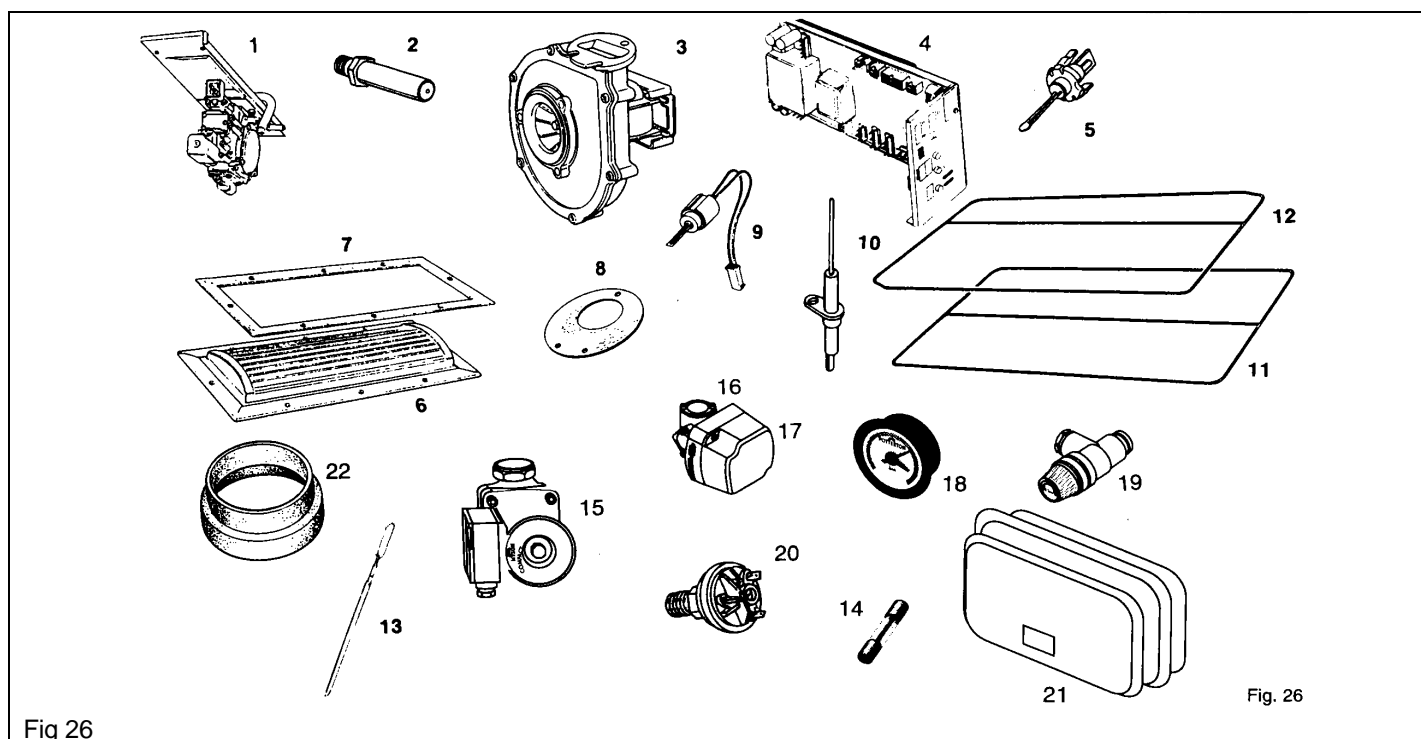


Fig 26

Fig. 26

the range the valve requires further adjustment, repeat steps 3 to 5. DO NOT ADJUST THE GAS VALVE AT MAXIMUM MODULATION. If the pressures are still outside the range contact the Potterton Service Department.

7. Remove the functional case door and connect the CO2 analyser to the sampling point on the flue hood. Note the maximum modulation CO2 concentration. Enter INSTALLER MODE on the control board and set the MINIMUM fan speed J to 40. Note the minimum modulation CO2 concentration. Check that the CO2 concentrations are within the limits shown below and that they reduce by 0.1 to 0.5% from maximum to minimum modulation, re-adjust the gas valve if necessary. If after adjustment the CO2 concentrations are outside these limits contact the Potterton Service Department.

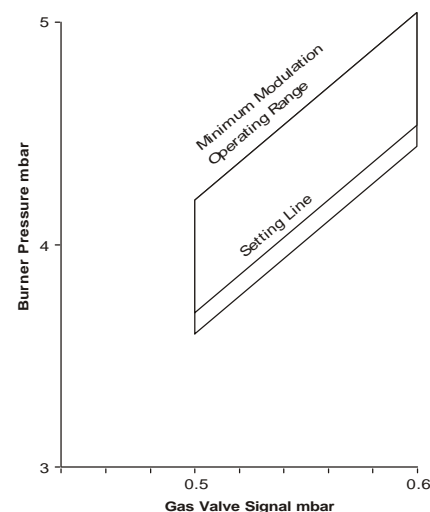
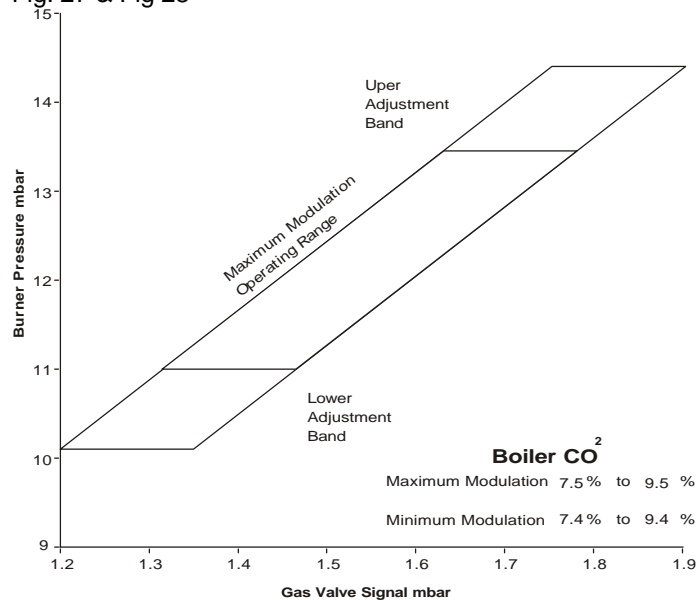
Boiler CO₂ - 8.3% ± 0.3%

8. Remove the CO2 analyser and replace the functional case door. Enter the INSTALLER MODE on the control board and return the MAXIMUM fan speed G to 99 and the MINIMUM fan speed J to 40.

If a new burner or fan has been fitted it may be necessary to adjust the fan speed offset to achieve the correct gas valve signal pressure. This is accessible by carrying out the following procedure.

Press the Reset/Function Button until a flashing 'C' is shown in the Status Display. Hold in the button until the 'C' changes to 'H' (control now in Installer Mode), release the button and then index through the menu by pressing the Reset/Function Button and releasing to move to the next feature until a flashing 'F' is seen in the Status Display. At this time a number between 0 & 6 will be seen in the Flow Temperature & Settings Display. The display setting is '3', it is possible to adjust the display to this figure by pressing the + / - buttons until the desired setting is attained. Press the Reset/Function button twice and the control display will return to user mode and store the change in settings.

Fig. 27 & Fig 28



EN0022A

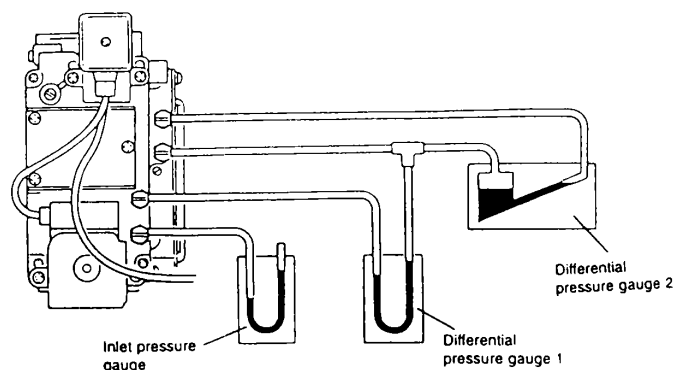
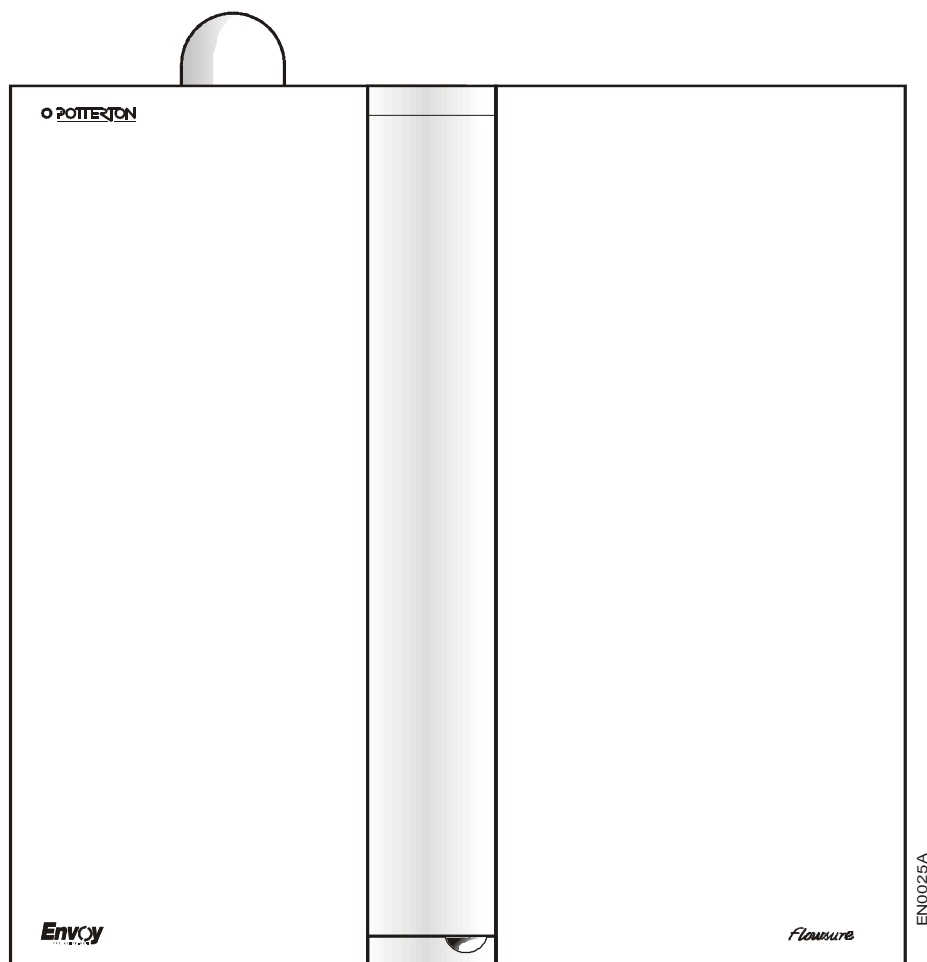


Fig. 28



User's Guide

Wall Mounted Fan Powered Balanced Flue Gas Condensing Combination Boiler and Storage Combination Boiler



Envoy
THE HEATSEVER
Flowsure

Envoy
THE HEATSEVER
Flowsure +

IT IS IMPORTANT THAT THE INNER CASE DOOR OF THIS APPLIANCE IS NOT REMOVED FOR ANY REASON OTHER THAN FOR SERVICING BY A QUALIFIED SERVICE ENGINEER. THE APPLIANCE MUST NOT BE OPERATED WITHOUT THE INNER CASING DOOR CORRECTLY FIITED AND FORMING AN ADEQUATE SEAL.

THIS APPLIANCE MUST BE INSTALLED AND SERVICED BY A COMPETENT PERSON AS STATED IN THE GAS SAFETY (INSTALLATION & USE) REGULATIONS 1994.

Regular skilled servicing is required to maintain the safe and efficient operation of your boiler throughout its long working life. Further information on this subject is given at a later stage.

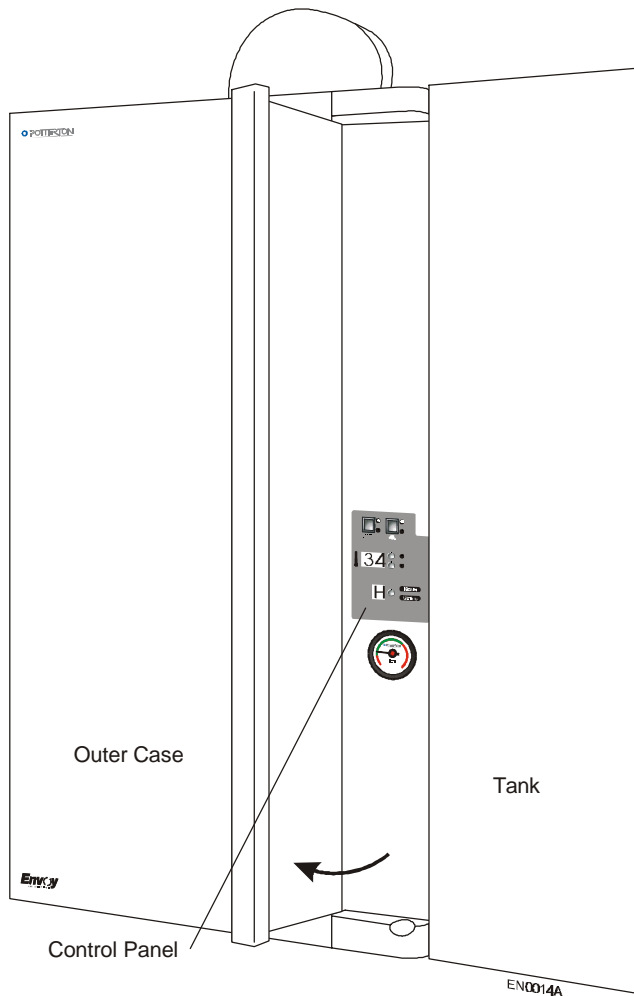
Samples of the Potterton Envoy Flowsure and Flowsure+ boilers have been examined by Gastec, a Netherlands Notified Body. The range is certified to comply with the essential requirements of the Gas Appliance Directive 90/396/EEC, the Low Voltage Directive 72/23/EEC and shows compliance with the Electro Magnetic Compatibility Directive 89/336/EEC and are therefore permitted to carry the CE Mark.

The Potterton Envoy Flowsure and Flowsure+ are wall mounted, room sealed fully automatic gas fired condensing combination boilers fitted with external storage tanks that supply instant hot water.

The very high efficiency of the appliance results in the flue gases cooling to a point where part of their moisture content condenses inside the boiler, giving up further heat as it does so. The condensate is drained to a suitable disposal point through the plastic waste pipe at the lower rear of the boiler.

Due to the high efficiency and the resulting low flue gas temperature a white plume of condensate will be emitted from the flue outlet terminal. This will be particularly evident during periods of low outdoor temperatures.

**For Use With Natural Gas (G20) Only
At 20mbar For Use in GB & IE**



User's Guide – Page 3

Domestic Hot Water – Flowsure

The 20 litre tank is a primary store which is designed to be kept heated to meet instantaneous hot water demands. It is a compact unit designed to supply instant hot water at a flow rate of approximately 6.5 litre/min at a 50°C temperature rise.

Domestic Hot Water - Flowsure +

The 50 litre tank is a secondary store which is designed to be kept heated to meet instantaneous hot water demands that require intermittently higher flow rates. At a flow rate of approximately 12 litre/min, hot water will be delivered for around 4 minutes at a 50°C rise reducing thereafter. The tank will fully recover after a few minutes to again deliver 12 litre/min at a 50°C rise.

Domestic Hot Water - Both Tanks

Domestic hot water always takes priority over central heating. If domestic hot water is drawn off while the central heating is operating the boiler will automatically transfer the boiler output to the domestic hot water supply.

Safety

If the appliance is installed in a compartment, do not use it for storage purposes and do not obstruct any purpose provided ventilation openings.

If a gas leak or fault is suspected turn off the appliance and consult your Local Gas Region or Service Engineer.

Any warning labels on the boiler must be adhered to.

The appliance should have the following minimum clearances for Safety and Maintenance:-
15mm at the front (610mm for servicing).
5mm each side.
120mm at the bottom.
140mm at the top (from top of boiler case).

Flammable materials must not be stored in close proximity to the boiler.

Ensure that the flue outlet, outside the house, does not become obstructed, particularly by foliage.

Warning: This appliance must be earthed. Connection shall be made to a 230V~50Hz supply. The appliance must be protected by a 3 amp fuse.

The boiler will not light if the system pressure is less than 0.5bar - see the pressure gauge.

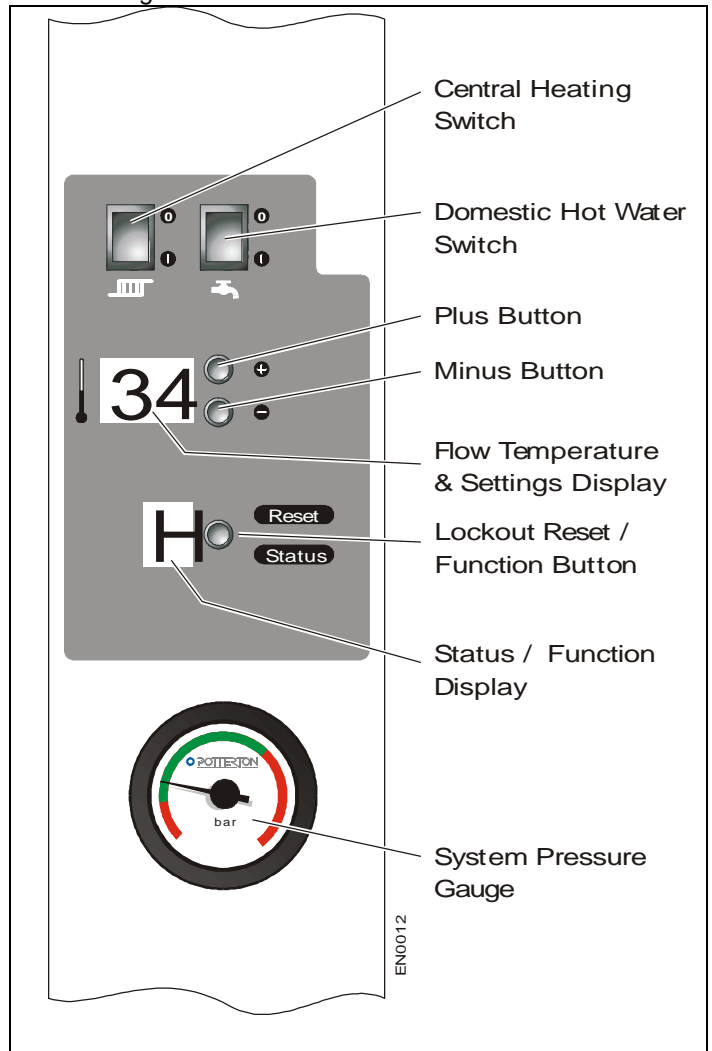
If the pressure has fallen below 1.0bar get your Service Engineer to re-pressurise the system. Some sealed

systems include a 'Top Up' vessel, ask your Service Engineer about this.

If the system has to be re-pressurised on a regular basis get your Service Engineer to check the system for leaks.

Boiler Controls

All boiler mounted user controls are situated in the front of the boiler control box behind the hinged door.



Central Heating Switch: In the 'On' position the central heating (CH) will be on unless connected to a timer when it will operate on the timed settings.

Domestic Hot Water Switch: In the 'On' position, the domestic hot water (DHW) will be available on demand. Domestic hot water always takes priority over central heating.

Flow Temperature & Settings Display: This shows the boiler flow temperature under normal operation

and error condition numbers if a fault should occur.

Status Function Display: This shows the boiler operating condition under normal operation and an error condition letter if a fault should occur.

Under normal conditions of operation the following characters appear:-

Display not illuminated. All power off.

[O] **Stand-by:** This is displayed when the CH & DHW switches are in the 'Off' position. Also shown when both switches are in the 'On' position but there is no call for heat.
The boiler flow temperature will be shown on the Flow Temperature & Settings Display.

[H] **Central Heating:** This is displayed with a flashing dot when the CH switch is in the 'On' position (and there is a call for heat from the time control, if fitted). When the burner lights the dot will stop flashing.
The boiler flow temperature will be shown on the Flow Temperature & Settings Display.

Temperature Adjustment: The boiler thermostat setting can be adjusted as follows when in central heating mode:-

1. Press the Lockout Reset/Function Button once and the **[H]** will flash. The Flow Temperature & Setting Display will change to show the boiler thermostat setting. The setting can now be changed in 1°C steps (between 50°C & 85°C) by pressing the Plus or Minus buttons.
2. Press the Lockout Reset/Function Button once and the flashing **[H]** will change to a flashing **[C]** (this is the installer adjustment mode entry point).
3. Press the Lockout Reset/Function Button once and the flashing **[C]** will change to an **[H]**.

Note: If you hold the Lockout Reset/Function Button for too long you may accidentally enter the installer adjustment mode settings. If this happens, leave the controls alone and they will reset after a few minutes.

[C] **Pump Overrun:** This is displayed on completion of a heating period when the residual heat from the boiler is being dissipated.

[h] **Hot Water:** This is displayed when the storage tank water is being heated.

Reset Button

Pressing the reset button will allow the control to be reset and the boiler restarted should a lockout condition have occurred. (The character **[L]** is shown on the status/function display and a number i.e. **[01]** shown on the temperature/settings display)

Other Controls

A Potterton electronic timer or other type of central heating control clock may have been fitted in your system, together with room and/or cylinder thermostats. Full instructions on the use of these controls should be supplied with them.

To Light

1. Ensure that both the CH & DHW switches are set to Off.
2. Switch ON the main electricity supply (character **[O]** will be displayed).
3. Ensure the electronic timer if fitted, is in an 'ON' period (refer to the time control literature).
4. Switch both the CH & DHW switches to the On position, (Character **[O]** will change to **[h]**). After a short period the boiler will light. Set the time control and any thermostats, where fitted, to their desired settings.

Note: When the boiler is first lit, there may be a slight smell. This will disappear with use.

To Shut Off - Long Periods



Set both the CH & DHW switches to 'Off'.

Important

Gas and electricity are required to operate your boiler. Its performance will not be affected by normal variation in either supply, but a gas or electricity failure will put the boiler out of operation. It will automatically re-start when the electricity supply is restored provided that the time clock and/or thermostats are in the On position. Following failure of the gas supply it may be necessary to press the reset button.

Boiler Failure Check List

In the event of your boiler not working, there are several checks you should carry out before calling in a Service Engineer, as this could save you unnecessary expense.

1. Check that the gas, electricity and water supplies are all turned on at the main supply.
2. Check that the time control, if fitted, is in an 'On' period.
3. Check that the CH & DHW switches are 'On' and any thermostats in the system are *not* at low settings.
4. If the character  is shown on the status/function display and a number i.e.  shown on the temperature/settings display then the boiler has gone to a lockout condition. To relight the boiler press the reset button adjacent to the display and the boiler will go through the restart sequence. If the character returns to the display consult your local Gas Region or Service Engineer.

Having checked these points, run through the lighting procedure once more and if the boiler still fails to light, call in your Service Engineer.

Frost Protection

Boiler: The boiler is fitted with an internal low water temperature device to prevent it from freezing during cold weather. Should the water temperature in the boiler fall below 5°C the boiler will operate and turn off when the return temperature reaches 40°C. It is therefore important during cold weather not to isolate the boiler from the electrical supply, but to shut Off the boiler only by turning Off the timer or setting both the boiler control switches to Off.

Storage Tank: The tank is fitted with an internal low water temperature device to prevent it from freezing during cold weather. Should the water temperature in the tank fall below 10°C the boiler will run at minimum rate until the water temperature reaches 15°C.

Outdoor Weather Compensator: If fitted offers further frost protection. Refer to the Outdoor Weather Compensator User Guide.

Additional Frost Precautions

There may be some pipework etc, that is vulnerable to frost and additional protection will be required. Various methods can be used:-

1. Insulation of the boiler and pipework, taking care not to impede any ventilation or air supply.

2. Completely draining the water system if not in use for long periods. On a sealed system, draining and refilling must be carried out by a competent person.
Note: Although the system can be emptied by using the drain off taps installed in the pipework around the system, to empty the boiler, it is necessary to remove the drain off cap within the boiler case. This should only be done by a competent person.
3. Have an additional low limit thermostat fitted.
Note: Frost protection devices cannot operate if the boiler is completely shut down and the electricity supply turned off. Where there is vulnerable pipework and no additional protection is provided it may be necessary to run the boiler at a low setting at times when it would normally be turned off.

To ensure that the highest possible efficiency can be obtained from your boiler an aluminium heat exchanger is used. Your installer has therefore been advised that the heating system should be protected by a corrosion inhibitor.

The products recommended by Potterton are:- Fernox Copal or Grace Dearborn Sentinel X100. Periodical checks will need to be made to ensure that the correct concentration levels are maintained. Your installer should provide further information on these aspects.

Annual Servicing

Annual skilled servicing is required to keep your boiler operating safely and efficiently throughout its long working life. It is also advisable to have the whole heating system checked over annually, so that excessive costs are not incurred by such things as air temperature thermostats or radiator valves getting out of adjustment. Servicing should be carried out by a trained service engineer, and it is suggested that an annual contract be arranged. Contact your local Potterton regional service office for details.

Cleaning the Outside of the Boiler Casing

The outside of the boiler casing can be wiped when necessary by using a damp cloth to remove finger marks etc. Do not use an abrasive cleaner as this may damage the casing finish.

Care of Your Boiler and System – Page 6

Care Of Your Boiler and System During the Guarantee Period and Beyond

1. Registration of Purchase

It is important to register the purchase of your Potterton boiler to ensure you receive prompt and efficient handling in the event your boiler requires attention during the guarantee period.

To register your guarantee simply complete and detach the Registration of Purchase form enclosed with these instructions. It is important to include details of your installer (if known) and to return the completed form to the Potterton Myson Registration Department.

register your purchase, as part of the "User Pack" supplied with your boiler.

If you have not been handed a Registration Card/additional 2nd Year Breakdown Insurance offer, Please contact the Potterton Myson Registration Department for a copy by telephoning (0181) 944 4972.

2. During the Guarantee Period

In the event of any problems with your system or the operation of the boiler, you should first call your installer.

If there is a fault with the boiler under guarantee which your installer is unable to rectify, he/she will call Potterton Myson Service Operations. For 12 months from the date of installation (or 18 months from the date of manufacture, whichever is shorter), Potterton Myson will attend to any manufacturing defect, on the appliance only (not the system or ancillary controls), free of charge for parts and labour, subject to there being no misuse or abuse. This does not effect your statutory rights.

Service visits by Potterton Myson Service Operations outside the terms of the boiler guarantee, will be charged for both parts and labour at our normal rates for chargeable work. During the period of the boiler guarantee, Potterton Myson will only be responsible for the cost of work done by them or on their instructions by their Agent. We cannot accept any liability for expenditure or work done by other parties without our knowledge and/or approval.

3. Safety Check / Routine Maintenance

It is strongly recommended you have your boiler checked annually for safety and to have routine maintenance. This should be carried out by a CORGI Registered Installer/Service Agent or Potterton Myson Service Operations to comply with the requirements of the Gas Safety (Installation & Use) Regulations 1994.

4. Boiler Breakdown Insurance

We are pleased to offer you the opportunity to protect your investment once your initial boiler guarantee has expired, by the payment of an annual premium. You can continue with this insurance for the normal life of your boiler and you will find a special 30 day introductory offer for a second year cover together with a card to

