

SV8

INSTALLATION & OPERATING INSTRUCTIONS

e.l.m. leblanc

TYPE GVM 4.20

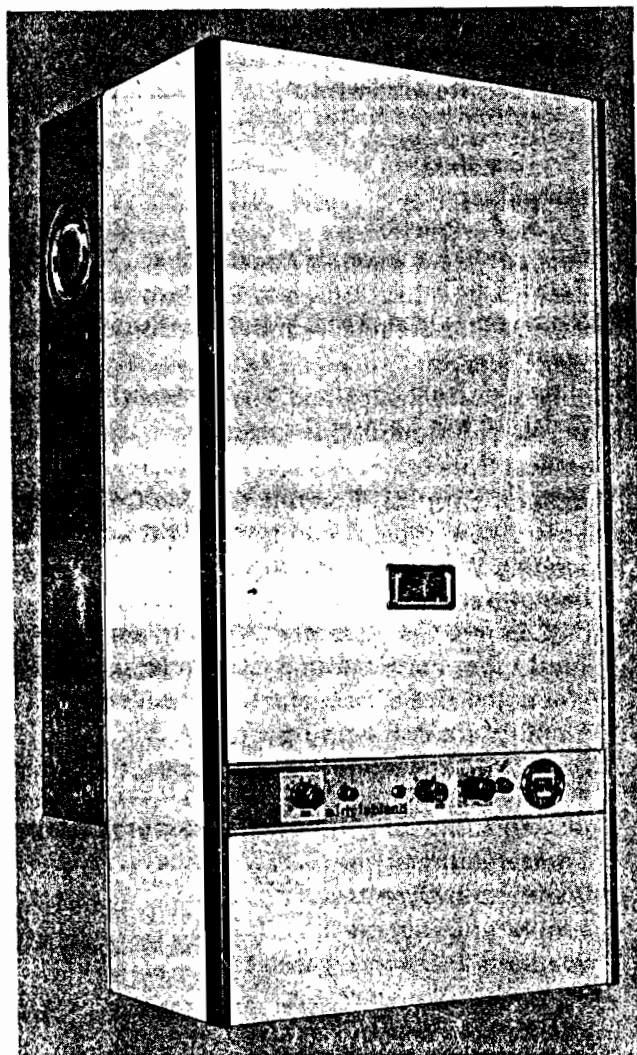
COMBINATION

GAS FIRED

BALANCED FLUE

WALL HUNG

BOILER



THESE INSTRUCTIONS ARE FOR NATURAL GAS MODELS ONLY

DAMAGE

The carton should be opened and the appliance inspected as soon as possible after delivery. Damage must be reported to the distributor (see last sheet) **WITHIN THE CUSTOMARY 3 DAYS OF DELIVERY** as claims on the Carriers cannot be made after that time.

CONTENTS

Introduction	Page 3
Design.	
Outline of the Boiler.....	Page 3
Diagramatic Layout ; Fig. 2	Page 4
Central Heating System	Page 5
Domestic Hot Water System	Page 6
Boiler Dimensions	Page 6
Installation Requirements	Page 7
Replacing old boiler.	
Service pipes.	
Gas Meters.	
Installation Pipes	Page 7
Gas Connection.	
Balanced-Flue Assembly Locations.	Page 7
Balanced-Flue Assembly and Extensions	Page 8
Balanced-Flue Assembly and Extensions	Page 9
Boiler Location	Page 10
Fitting of Time Switch and Thermostat (diagrams).....	Page 10
Controls and Control Box Layout	Page 11
Electrical Supply	Page 11
Diagram : Electrical Controls Outside Control Box.....	Page 12
Diagram : Electrical Controls Within Control Box	Page 13
Operating Wiring Diagram	Page 13
Fixing of Boiler	Page 14
Pipe Connections ; Gas and Water (diagram)	Page 15
Typical Layout of Heating System (diagramatic)	Page 15
Water and Gas Connections to the Boiler	Page 16
Filling of Central Heating System.....	Page 16
Diagram to show connection for filling the heating system with special requirement of the National Water Council	Page 16
Checking and Setting up Gas Pressures (Commissioning)	Pages 17-18
Technical Information	Page 19
Spare Parts Diagrams	Page 20
Spare Parts Diagrams	Page 21
Spare Parts Diagrams with List	Page 22
Parts List continued.....	Page 22
Pomp characteristics.....	Page 23

INTRODUCTION

The GVM 4.20 brings a new concept to central heating design for domestic dwelling is contained in an attractive wall-hung boiler finished in stoved white.

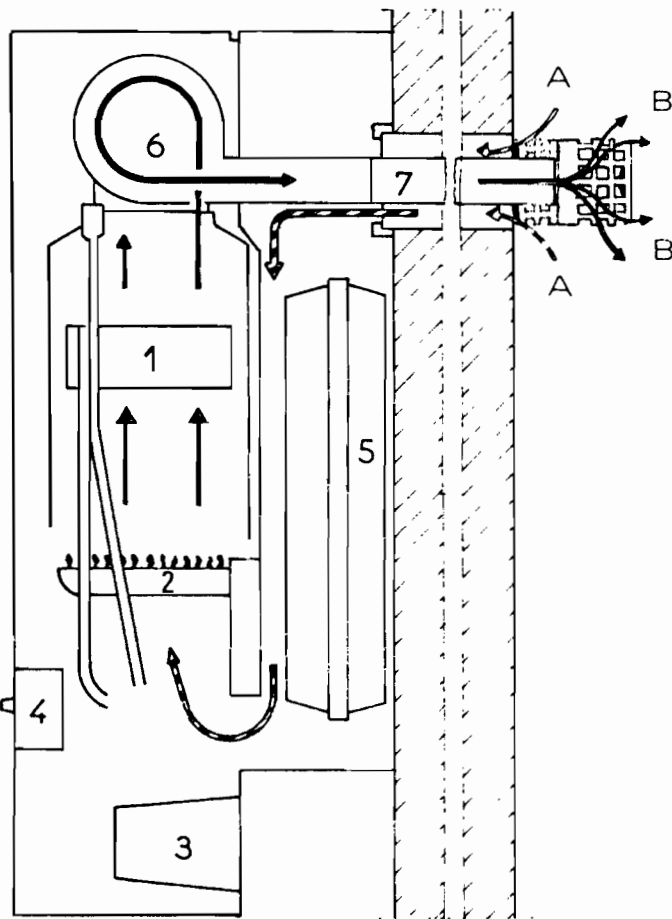
The siting of the boiler is important but, because of the alternative fluing arrangements (central or side flue fixing) this will facilitate the positioning on either internal or external walls, we draw your attention to the 90 mm flue assembly terminal supplied with this boiler, which can be found in the inside of the polystyrene packing at the base of the unit.

As you can see from Fig. 1, this combination boiler is self-contained and needs connection to the mains electricity, gas and water supplies, as the boiler is pre-wired, pre-plumbed and tested before leaving the factory.

This type of combination boiler has the advantage that no tanks or copper cylinders are needed and it can be hung at high level in standard kitchen units or cupboards. It can supply continuous hot water as the demand is heated instantaneously.

When the Central Heating system is not required one simply turns the switch to 'Hot Water Only' on the control. The unit has two completely separate heating systems within the all copper heat exchanger, both being self reliant.

Manufactured to the highest standards and specifications by elm leblanc (France), who have produced over 1000,000 combination boilers, ensures that this boiler, if properly maintained, should give you years of trouble-free use.



"A" arrows represent combustion air intake, and circulation within the boiler case.

"B" arrows represent combustion products passing through heat exchanger, flue fan and out through the inner duct of the balanced-flue assembly.

1. Heat Exchanger.
2. Burner Assembly.
3. Pump.
4. Control Box.
5. Expansion Vessel.
6. Flue Fan.
7. Balanced-Flue Assembly.

Fig. 1

DESIGN

The GVM 4.20 is a wall-hung central heating and instantaneous hot water boiler having a fan assisted balanced flue and a heat output of 22.2kW (75.840 Btu/h).

The boiler, a central heating and hot water appliance, was designed with great care and thought, with the installer, service engineer and, of course, the user in mind. After years of development we feel that this boiler is probably the most sophisticated available today. Fig. 2 gives you an outline of the boiler's construction.

The casing contains a copper heat exchanger designed to give the highest efficiency ; an expansion vessel to stabilise pressures for the sealed heating circuit, and a control box containing all electrical safety devices for this boiler.

- 1 - Thermo-couple
- 2 - Pilot assembly
- 3 - Spark electrode
- 4 - Hot water limit thermostat (fixed)
- 5 - Hot water thermostat sensor
- 6 - Two ways gas control valve
- 7 - Main gas governor
- 8 - Expansion vessel
- 9 - Push button and thermo-electric flame failure valve
- 10 - Heating circulation pump
- 11 - Sealed electrical control box (as panel)
- 12 - Heating temperature selector
- 13 - Push button for thermo-electric flame failure valve
- 14 - Operating selector knob
- 15 - Hot water temperature selector
- 16 - Electronic igniter button
- 17 - Heat exchanger
- 18 - Over heat cut out device
- 19 - Heating thermostat sensor
- 20 - Burner assembly all gas
- 21 - Modulating gas valve
- 22 - Injectors support unit
- 23 - Two stage gas solenoid valve
- 24 - Heating pressure & temperature gauge (as thermomanometer)
- 25 - Diaphragm water valve
- 26 - Double acting microswitch
- 27 - Domestic hot water thermostat adjuster
- 28 - Heating limit thermostat (fixed)
- 29 - Domestic pressure relief valve
- 30 - Heating water flow/pressure safety valve
- 31 - Heating automatic air vent
- 32 - Non return valve (Heating)
- 33 - Central heating flow isolating cock
- 34 - Central heating return isolating cock
- 35 - Gas isolating cock (as tap gas)
- 36 - Heating pressure relief valve
- 37 - Flue-gas safety pressure switch
- 38 - Flue-Boost fan
- 39 - Case safety switch
- 40 - Balanced flue assembly

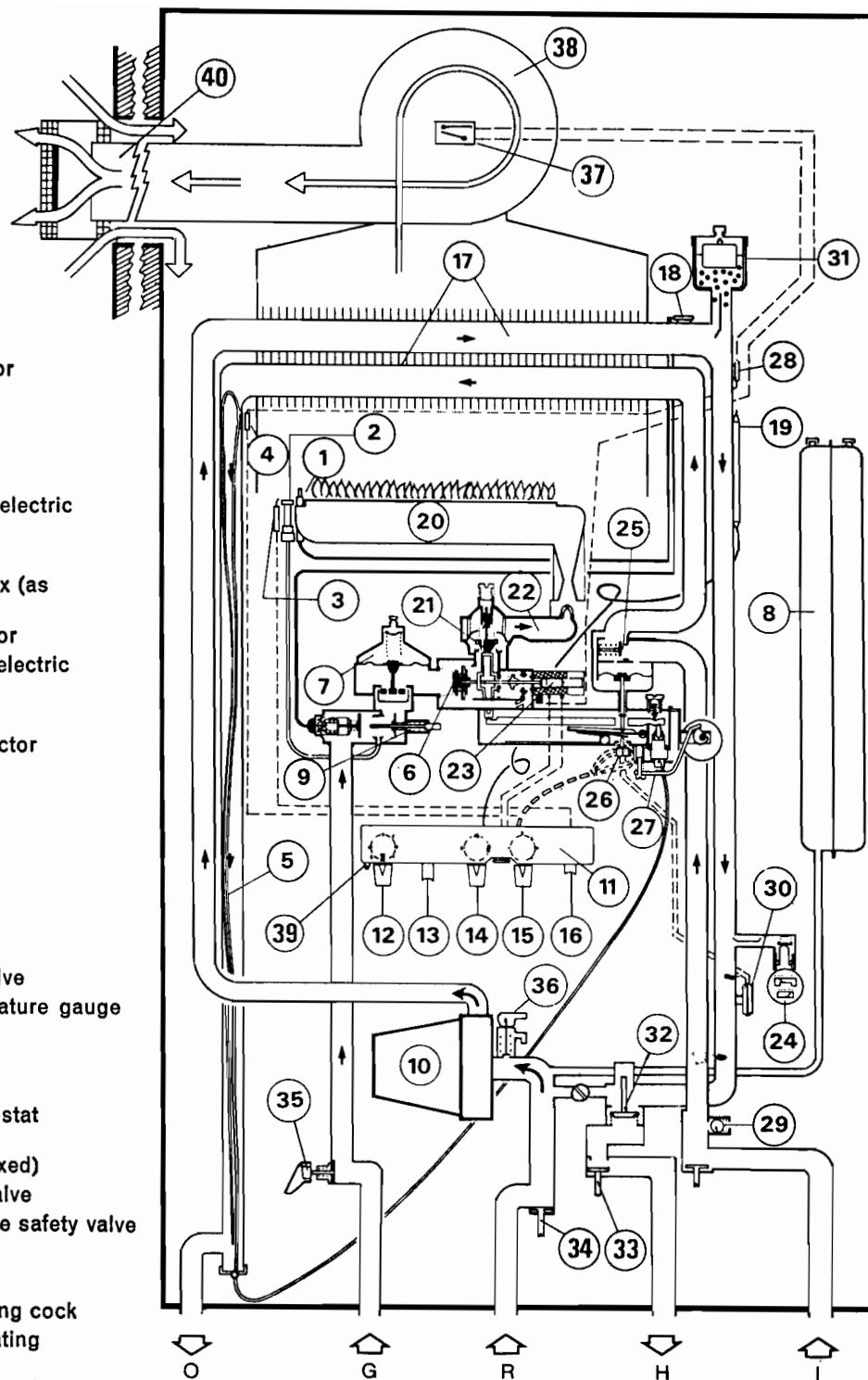


Fig. 2

H - Heating Flow.
 O - Hot water Outlet.
 G - Gas.
 R - Heating Return.
 I - Domestic Inlet (Cold).

Diagrammatic layout only

For pipe connections see Installation.

CENTRAL HEATING SYSTEM

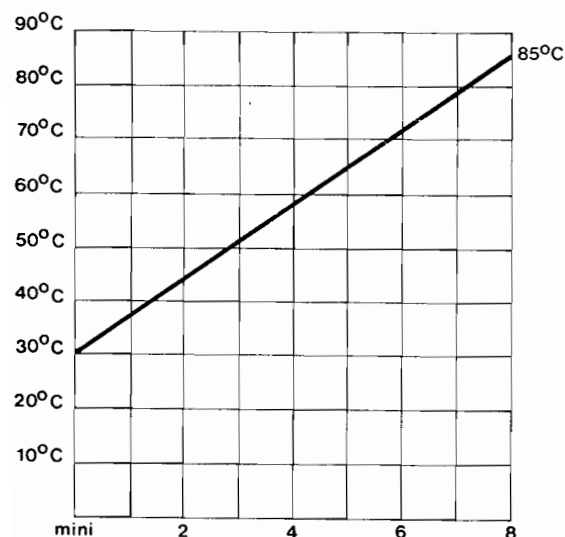
The heating system for the boiler must not be directly connected to the incoming water mains supply. (For further information see Installation Heating Section, pages 14 to 19).

Although the GVM 4.20 could be used in conjunction with a central heating header tank, we suggest and advise that it should be used as a sealed system.

The heating system is fitted with a pressure relief valve (36), (Fig. 2 ; p. 4), and should the pressure within the system reach 3 bars it will operate. The boiler also is fitted with an integral expansion vessel (8) to stabilise the rising pressures. The heating water passes through the pump (10) and up around the heat exchanger (17) into the outlet and past the heating thermostat phial (19) which is clipped to the heating outlet pipe within the boiler. The thermostat is operating the two-stage gas magnetic valve (23) (32v DC). This thermostat is not a modulating type. (for gas setting pressures, see technical informations - commissioning. Pages 17 and 18).

When turning on the central heating by either Knob A and C, (see users instructions Fig. 3 ; page 1). Through a temporization device, the burner will light at the low rate for two seconds before increasing to full rate. When the temperature set by Knob A is reached, the burner will go out but the pump will continue working at all times unless the boiler control Knob C is switched to domestic water only ; (see controls, page 11) ; or unless a time switch and/or room thermostat are fitted. If a time switch or room thermostat are fitted they must only be connected as described in the instructions, page 10. The heating system has a maximum temperature setting of 85°C. If, for any reason, this temperature is exceeded, the Heating Limit Thermostat (28) will cause the main gas to go off leaving the pilot on. Main gas is automatically restored when the Heat Exchanger has cooled. On domestic water circuit a Hot Water Limit Thermostat (4) operates in the same manner. **The water pressure in the central heating is essential.** In case of deficiency of water a heating water flow/pressure safety valve (30) will switch off the electrical circuit of the burner. The circuit will be restored after filling of the central heating circuit (see page 16). If even higher temperatures occur, **the Overheat Cut-out Device** (18) operates Thermocouple, thereby turning off the appliance completely. Manual operation is then necessary to re-start the boiler. If the Overheat Device operates again, check for defects.

CHART GIVING TEMPERATURES OF WATER AT HEATING THERMOSTAT SETTINGS (+/- 3°)



CENTRAL HEATING OUTPUT CONTROL KNOB SETTINGS (Knob A)

DOMESTIC WATER TEMPERATURE RISE CHART (approximate)

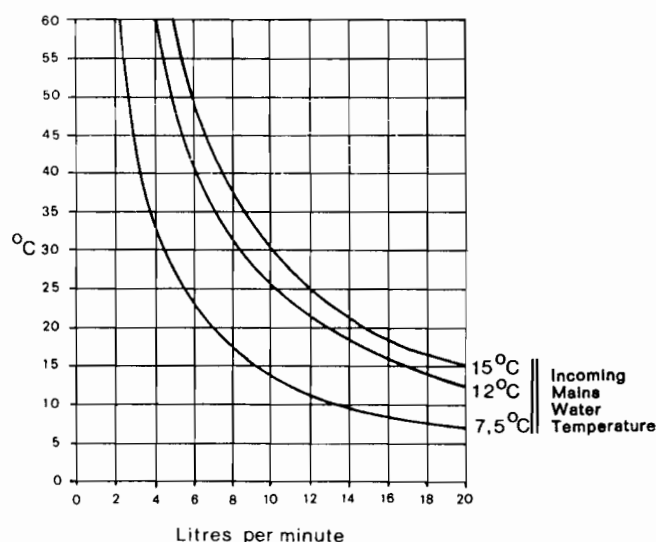


Fig. 3

DOMESTIC HOT WATER SYSTEM

This side of the appliance has a maximum working pressure of 146 p.s.i. (10 bar). The mains water supply passes into the unit via an integral stop cock up into the diaphragm pressure valve. The mains water pressure must be at least 0.4 bar (5.875 p.s.i.), (13ft.6ins head), with a flow rate of at least 2.5 litres (0.55 gals.) per minute. Should the pressure within the appliance exceed this maximum, an integral pressure relief valve will pass the excess pressure.

IMPORTANT : To conform to the requirements of the National Water Council ; if the water mains supply pressure is at any time in excess of 73 p.s.i., (5 bar), (169ft), a Pressure Limiting or Pressure Reducing Valve **must be fitted** by the installer into the mains supply in an inconspicuous but accessible position, preferably between 3 and 5 metres (10 to 16 ft.) before the appliance. Such a Valve must be of a type approved by the N.W.C. and **must not pass more than 73 p.s.i. (5 bar)** pressure to the appliance.

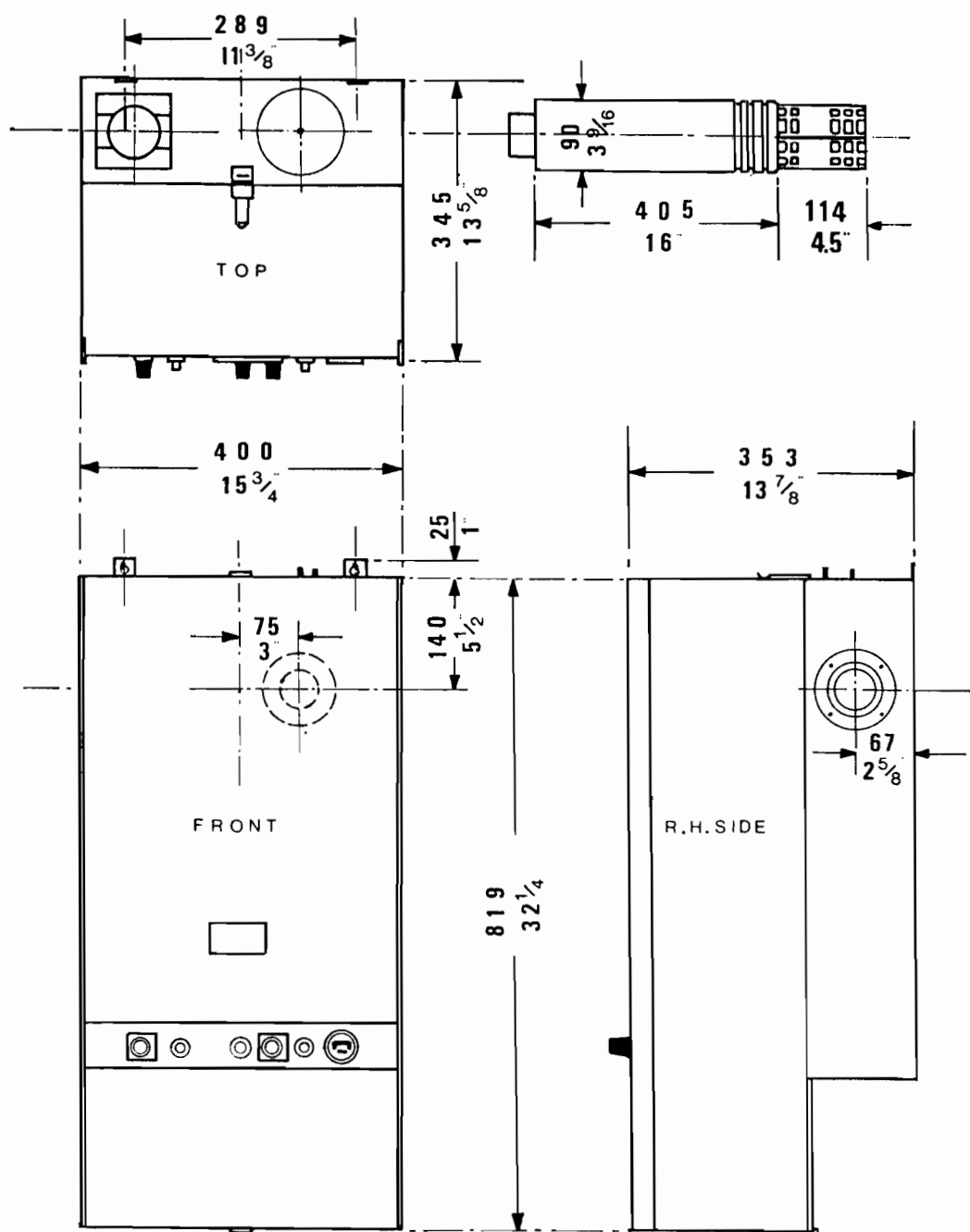
Any water treatment device to be used must be fitted before the Reducing Valve. Should the mains supply pressure be less than 0.4 bar (5.875 p.s.i.), (13'6''), at any time, the diaphragm pressure valve (25) (Fig. 2) will not be pushed down and in turn will not operate the microswitches beneath the valve: thus the supply of electricity to the control box will not pass to the gas valve which will remain closed.

When the water conditions are favourable, the water will pass through the diaphragm pressure valve (25) the electrical supply operates the necessary controls ; the gas comes on first at low rate, then up to maximum. As the water passes through the copper heat exchanger and down through the outlet, it passes the integral domestic water thermostat (5) which will govern the water temperature to a maximum of 65°C. at 6,25 litres per minute. Should the water flow be less than 6,25 litres per minute, the thermostat will govern the gas input.

The domestic water has a maximum output of 22.2kW: 75,840 Btu/hr and a minimum output at low burning rate of 4.7kW: 16.000 Btu/hr.

The maximum and minimum outputs will, of course, be regulated by the incoming water temperature and litres per minute output.

BOILER DIMENSIONS



INSTALLATION REQUIREMENTS

The installation must only be carried out by a qualified installer and should conform to the regulations as covered by British Gas Corporation and Institution of Electrical Engineers. No responsibility will be accepted by the manufacturer or distributor if these conditions are not observed.

The installation of the boiler must also be in accordance with the relevant requirements of the Gas Safety Regulations, Building Regulations, IEE Regulations and the bye laws of the local water undertaking.

It should be in accordance also with any relevant requirements of the local Gas Region and the local Authorities, plus the relevant recommendations of the following British Standards and codes of practice ;

B S.5376 - 2 Boilers of rated input, not exceeding 60 Kw.

B S 5449 - 1 Forced circulation hot water systems (small bore and microbore domestic central heating systems).

C P 342 Centralised hot water supply.

REPLACING OLD BOILER

IMPORTANT Before commencing to connect the boiler, it is necessary to wash out the circuit to eliminate swarf, solder, grease, etc., which could be carried into the boiler and interfere with it's operation.

If the installation is old, it would be preferable to carry out this cleaning with an appropriate detergent type product and to install, at the lowest point on the return, a decanting vessel of sufficient capacity to receive the particles and oxides which come off the internal surfaces during operation.

DO NOT USE SOLVENT OR AROMATIC HYDROCARBON (petrol, paraffin, etc.) **FOR CLEANING.** To avoid electrolytic problems which could arise from the use of different materials in the circuit, it is recommended to use a neutralising product which avoids gas production and possible oxide formation. These products should be added in accordance with the maker's recommendations.

SERVICE PIPES

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

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

METERS

A gas meter is connected to the service pipe by the local Gas Region.

An existing meter should be checked, preferably by the Gas Region, to ensure that the meter is adequate to deal with the rate of gas supply required.

INSTALLATION PIPES

Installation pipes should be fitted in accordance with C.P. 331 - 3.

Pipe work from the meter to the boiler must be of adequate size. Do not use pipes of a smaller size than the boiler gas connection (22 mm).

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

GAS CONNECTION

The gas supply connecting to the boiler must be made in 22 mm pipe or tube and a union gas cock to British Standard **must** be fitted.

BALANCE FLUE ASSEMBLY LOCATION

The following notes are intended to give general guides.

The boiler must be installed so the flue terminal is exposed to the external air. Termination should be on a clear expanse of wall ; the terminal being preferably not less than 600 mm (2 ft) away from a corner recess or projection.

DO NOT install the terminal:

- Within 300 mm (1 ft) measured vertically, from the bottom of an openable window, air vent or any other ventilation opening.
- Within 300 mm (1 ft) above adjacent ground level.
- Within 600 mm (2 ft) of any surface facing the terminal.
- Immediately beneath eaves or a balcony.

Where the lowest part of the terminal is less than 2 m (6.6 ft) above the level of any ground, balcony, flat roof or place to which people have access, the terminal must be protected by a guard of durable material.

A terminal protective guard is available as an optional extra with the boiler. Alternatively, a terminal guard may be obtained from the distributor, see last sheet, Type K3 Gas Council No. 393554 - Manufacturer: Tower Flue Components Limited.

The air-inlet, products-outlet-duct and the terminal of the boiler must be no closer than 50 mm (2") to combustion material. Detailed recommendations on protection of combustion material are given in B S 5440-1.

BALANCED-FLUE ASSEMBLY

The Balanced-Flue Assembly is packed in the base of the carton inside the foam plastic block.

The air inlet and outlet duct consists of two concentric tubes, allowing air to enter through the outer tube and for the exhaust gasses to pass out through the central tube. This is designed so that the installer can carry out all the necessary work from inside the room where the boiler is installed. In the standard version, the duct is supplied for 400 mm thick walls with the outlet to the rear. For left and right Flue connections the standard Balanced-Flue is suitable for walls up to 350 mm thick.

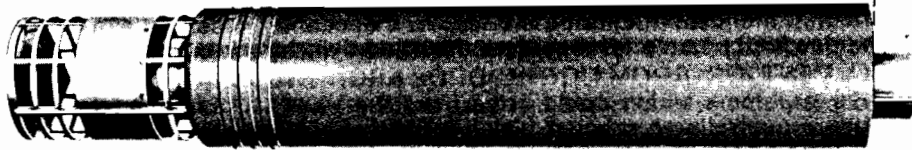
Extension pieces for thicker walls are available.

Maximum flue length to rear is 750 mm.

Maximum flue length to either side is 700 mm.

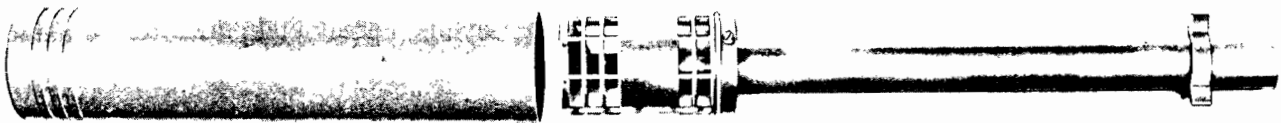
Standard Balanced Flue Assembly

25 mm

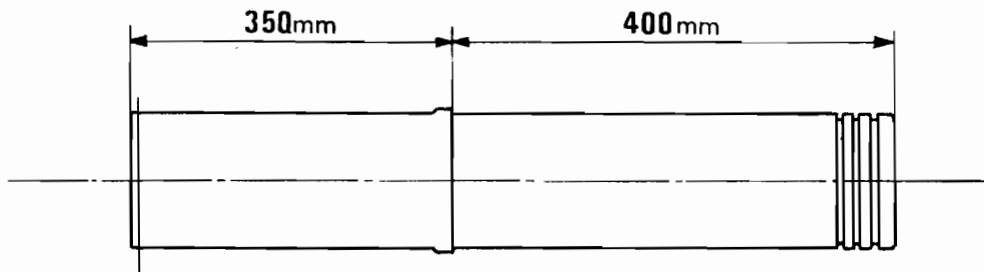


Air Inlet Duct

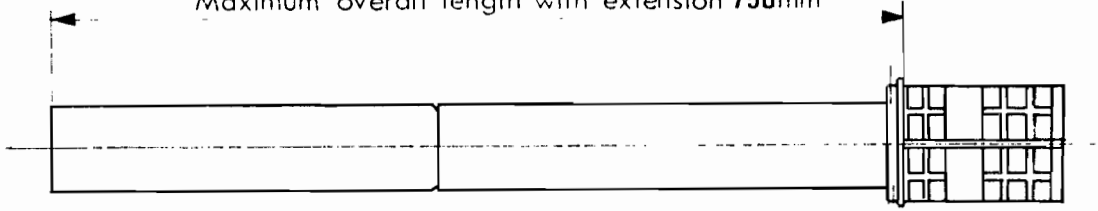
Outlet Duct with Integral Terminal



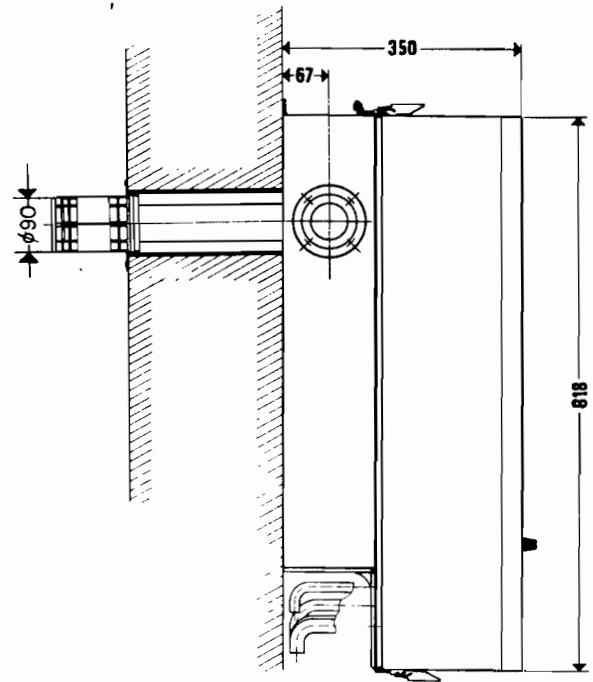
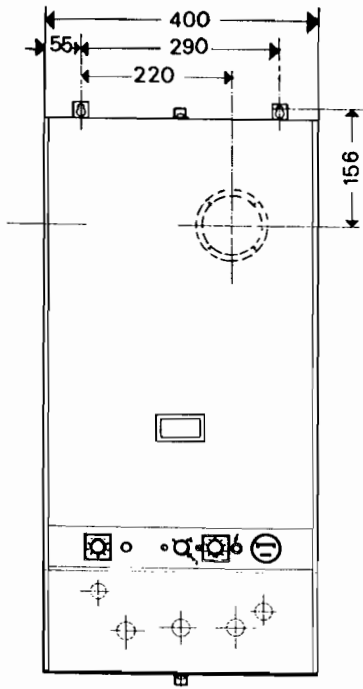
Maximal Overall length with extension 750 mm



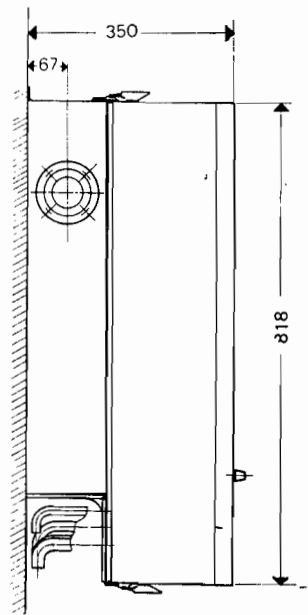
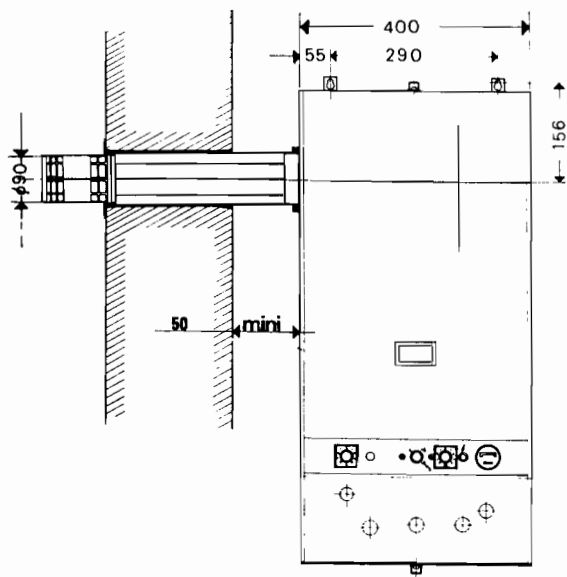
Maximum overall length with extension 750mm



BALANCED-FLUE ASSEMBLY



Flue Fitted at the Rear



Flue Fitted at the Left

BOILER LOCATION

The provision for satisfactory flue termination must be made. The location must also provide adequate space for servicing and air circulation around the boiler.

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

Where the installation of the boiler will be in an unusual location, special procedures may be necessary and B.S.5376 - 2 gives detailed guidance on this aspect.

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

Details of essential features of cupboard/compartiment design including airing cupboard installations are given in B.S.5372 - 2.

Detailed recommendations for air supply are given in B.S.5440 - 2.

The following notes are intended to give general guidance:

The boiler does not require the room containing it to have a purpose provided air vent.

If the boiler is to be installed in a cupboard or compartment, permanent air vents are required (for cooling purposes) in the cupboard or compartment at high and low levels. These air vents may communicate with a room or direct to the outside air.

The minimum effective areas of the permanent vents required in the cupboard or compartment are as follows:

Position of air vents	Air from room	Air direct from outside
High level	253 cm ² (10'' ²)	126 cm ² (5'' ²)
Low level	253 cm ² (10'' ²)	126 cm ² (5'' ²)

NOTE :

Both air vents must communicate with the same room or must both be on the same wall to outside air.

FITTING OF TIME SWITCH, PROGRAMMER OR ROOM THERMOSTAT

WARNING The cover of the terminal block and the case of the boiler, must not be removed before disconnecting the power supply to the boiler.

IMPORTANT Ensure that an earth connection is made.

Although the boiler already has two integral thermostats to control the domestic and central heating systems, it may be required to fit a further control to the central heating system. Should this work be carried out, these controls must be wired as per instructions and illustrations as in fig. 4. Should these requirements not be carried out and the additional controls fitted in any other way faults will occur on the boiler which could result in damage to the electrical components within the boiler. Should damage occur, the distributor will not accept responsibility for components if controls are wired incorrectly.

DIAGRAM FOR WIRING OF TIME SWITCH, PROGRAMMER,
AND ROOM THERMOSTAT.

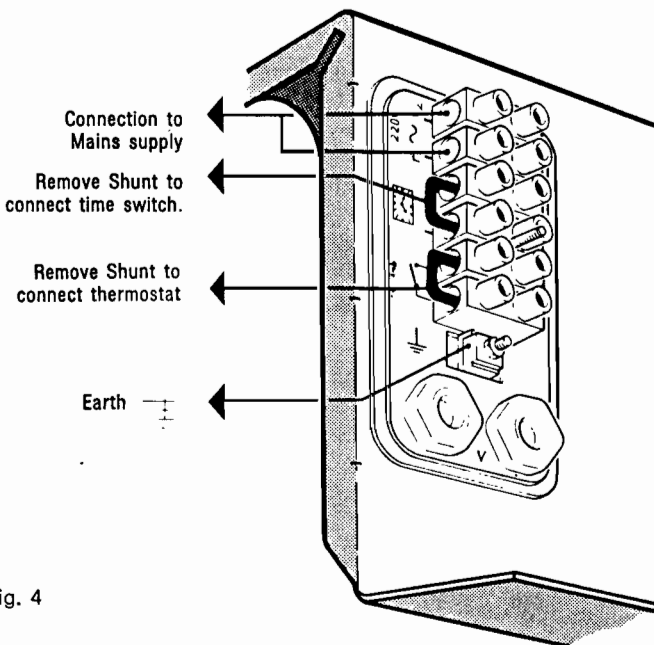
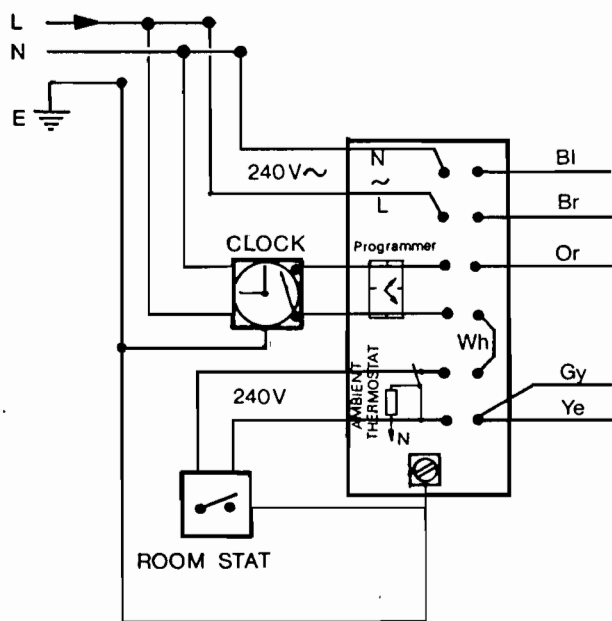


Fig. 4

CONTROLS

Controls within the boiler have been designed especially for this particular unit by e.l.m. leblanc. The main control of the boiler is made via the main control box (fig. 5). This contains the heating thermostat, the spark ignition device, the case safety switch, transformers, condensers and a printed circuit board with components to convert to D.C., and to stabilise voltage. Also the main fuses, 3 amp, for the 240 volts controls, and 250m/A for the transformer are positioned within this box. There is also a relay switch within the box, which controls the operation for the flue fan. Other electrical controls such as safety devices are fitted throughout the boiler. There are safety switches fitted to the heat exchanger, one for the domestic system and one for the heating system which operate at 92 °C. to close the electrical supply to the two stage magnetic valve (23) (Fig. 2) which stops gas to the main burner. A case ambient temperature limit stat (41) controls the rising temperature, inside the case, caused by the lighted pilot when the boiler does not work. It operates the fan when the ambient temperature reaches 55 °C. An Over-heat Cut-out Device and Flame Failure Device are fitted via the Thermocouple (18). These will cause the Boiler to close down completely, including the Pilot light if a temperature of 98°C should be reached or should the Pilot light be extinguished for any reason. Detailed drawings of the Electrical Controls are given in the Wiring Diagrams (pages 10 to 13) ; but we must advise you that should a fault arise within the Control system, an authorised agent of the supplier should be called to make any necessary adjustment or repairs.

CONTROL BOX LAYOUT

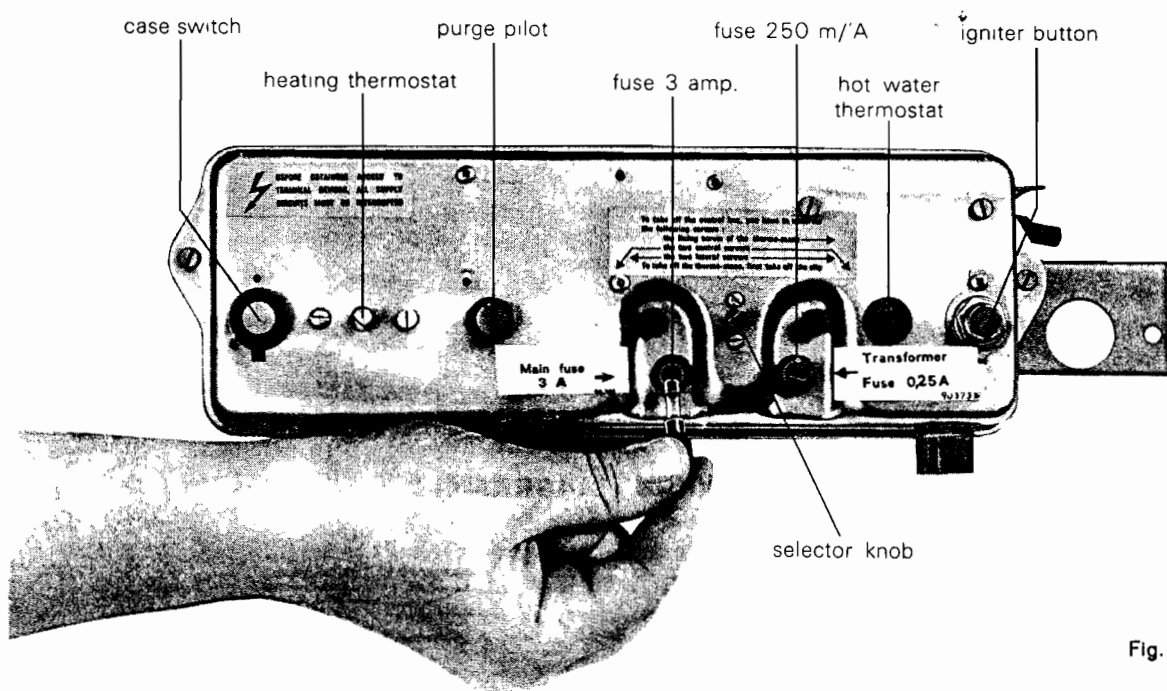


Fig. 5

ELECTRICAL SUPPLY

WARNING This appliance must be earthed.

This appliance is equipped for use on 240 v. AC only.

All external wiring must be in accordance with the current IEE regulations for electrical equipment in buildings.

Connection to the boiler must be made in the appropriate input cable size (0.75 mm, 24 - 0.20 mm to BSI 6500, 1975). Connection to the terminal block is made through the rear of the boiler base. See fig. 8. Ensure that cable is firmly fastened into cable retaining clips. Remove cable holding screws and push cable through into terminal box. Strip wire and connect to terminal block as illustrated in fig. 4. Ensure that cable holding screws for terminal block are replaced and secured. Ensure that the incoming earth cable is connected. Replace terminal box cover and replace outer case before trying to light boiler.

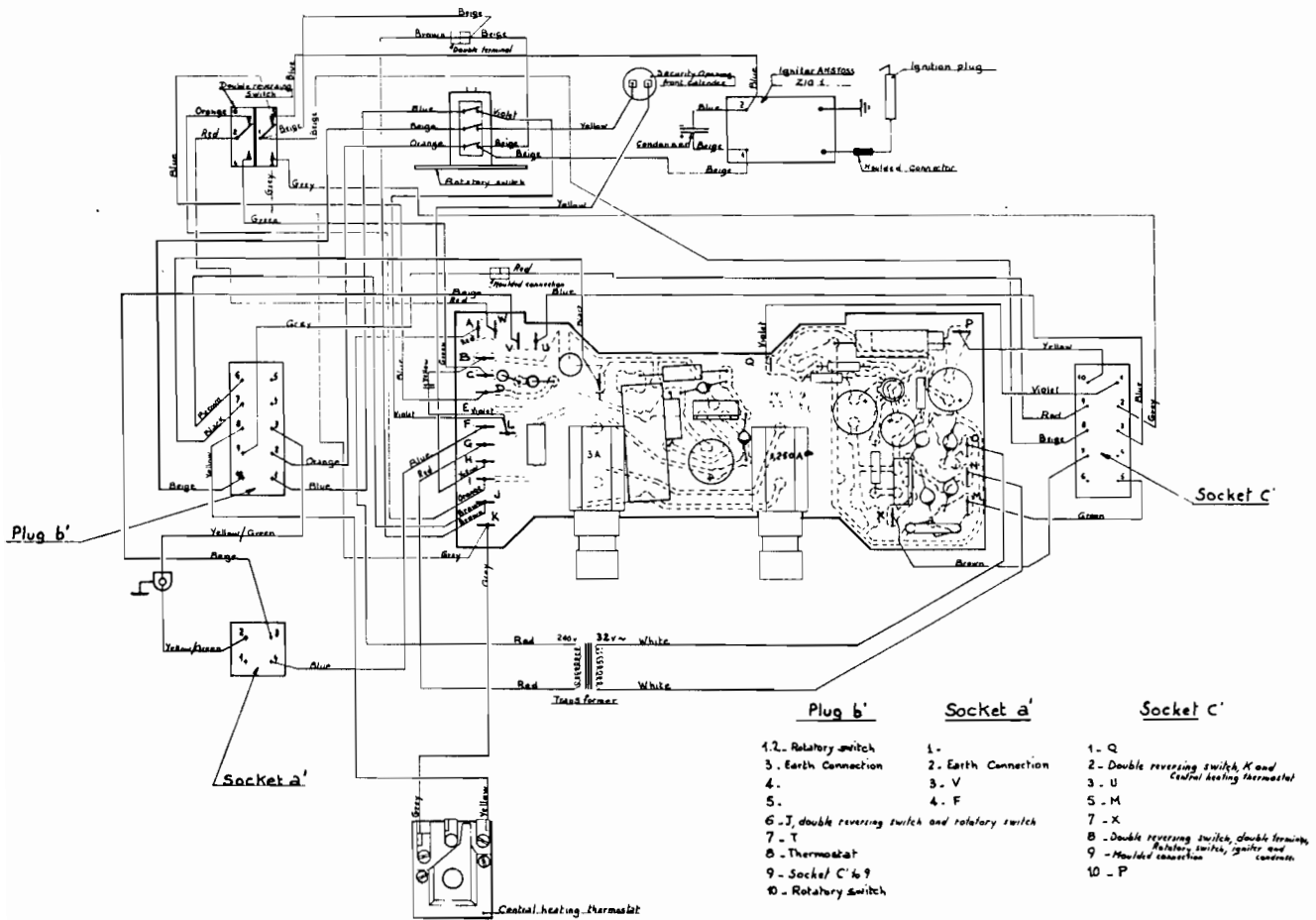
The boiler is supplied for 240 volts AC, 50 Hz. Fuse rating is 3 amp. Power input 145 watts.

The method of connection to the mains electricity supply should facilitate complete electrical isolation of boiler, preferably by use of a fused, double pole switch or spur box, serving only the boiler.

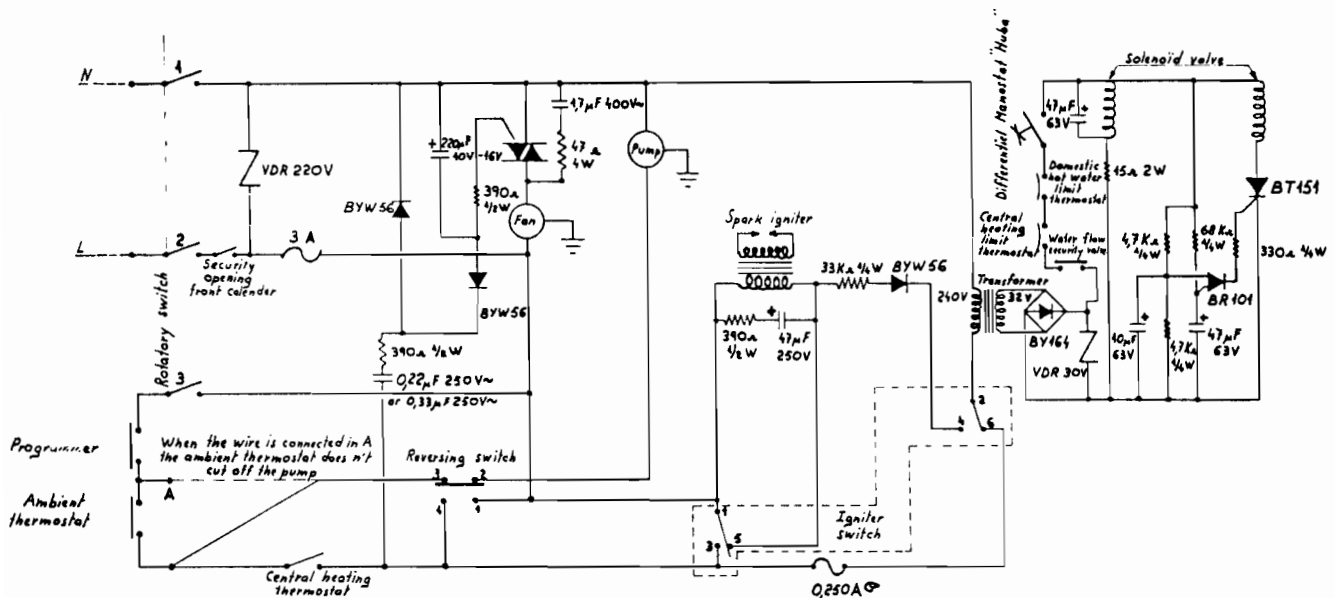
Alternatively, a fused three-pin plug and shuttered socket outlet, both complying with the requirements of BS 1363, may be used.

The point of connection to the mains should readily be accessible and adjacent to the boiler.

WIRING DIAGRAM II



OPERATIVE WIRING DIAGRAM

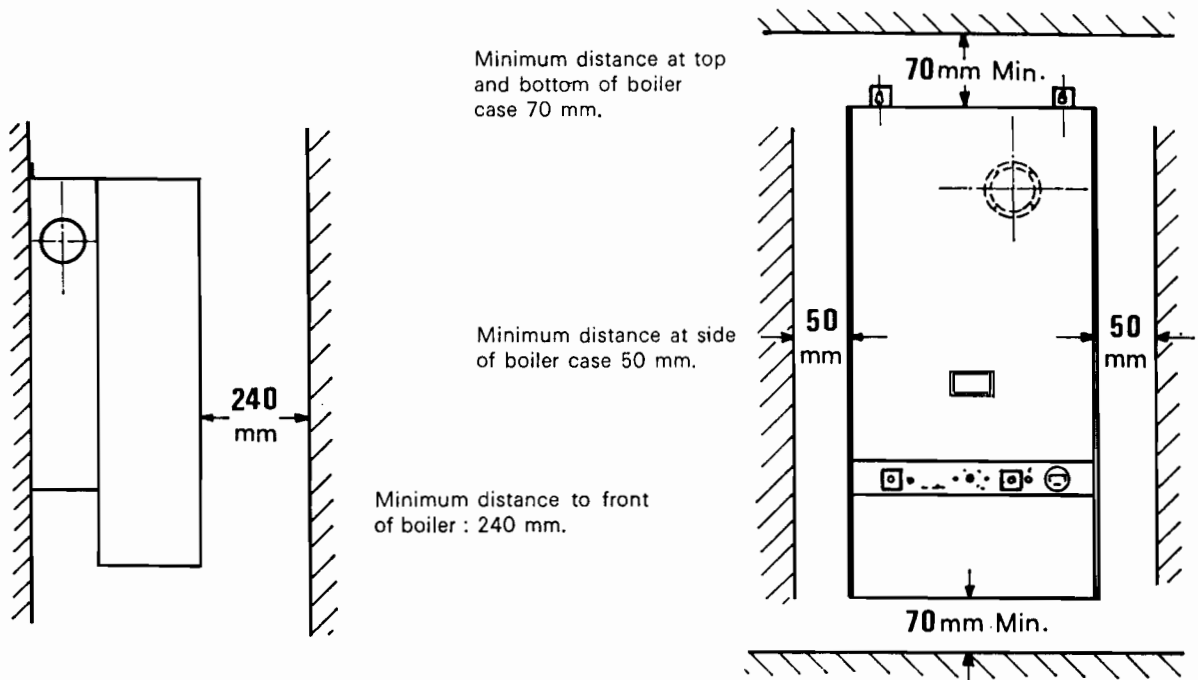


FIXING OF THE BOILER

1. Choose the position on the wall for the boiler to be fitted, taking into consideration boiler dimensions.

NOTE : Should the boiler be fixed to a wooden wall, see special instructions.

2. **VERY IMPORTANT:** The clearance is shown on the diagram as under should be maintained between the top, sides and bottom of the boiler so that connections to the boiler can be made with ease and the boiler case can be removed for repair and servicing.



3. Change boiler flue spigot and blanking plate as required, depending on which position the flue will be fitted to the boiler (see 15 below).

4. Take from the boiler carton the template and hang on the wall in the chosen position using the side of the template for either rear or side flue connections. Tape is enclosed in the box for fixing of template to the wall.

5. Drill out the two holes for the hanging position of the boiler at the top. Fit wall plugs and screws as enclosed in heater carton, leaving screws in such a position that the boiler hanging brackets may fit onto them.

IMPORTANT: Ensure that the wall structure is such that it is capable of holding the weight of the boiler. For boiler weight, see technical instructions. Where necessary use an alternative method for fixing.

6. Cut a hole in the wall for the flue as indicated in the template to a diameter of 95 mm, and at an angle of 1°30' downwards, towards the outside wall, as illustrated on Template.

7. Remove template from wall.

8. Measure exactly the thickness of the wall and add the distance between the wall and the boiler. (If rear connection, measure the thickness of the wall and add 5 mm): (If side flue connection (see 15) measure the thickness of the wall, and add a minimum of 50 mm). Minimum thickness of wall should be such that a minimum length of flue is 117 mm. Take into account any deformation of the wall face to define the flue length required in order to ensure that the fitting of the balanced-flue assembly will be waterproof and that the casing will not foul protrusions on the inside wall face.

9. Remove inner flue duct from outer flue duct (see template). Cut flue to required length.

NOTE: It may be necessary to fit an extension flue pipe. This will give you a maximum length of 750 mm for rear flue or 700 mm for side connections.

10. Take the outer duct and fit through the wall. Wedge to fix securely and set in cement, so that the two notches are vertical at the exterior. Make good the wall around.

IMPORTANT: Do not fill the two notches with cement.

11. Fit inner flue duct and stabilising flue clip. See figs. 6 on template.

12. Remove front cover from boiler by first pulling off the plastic control knobs, unscrewing the retaining ring around the thermocouple knob, and the two C.P. screws in the control panel. Unclip the two retaining clips at the top and bottom of the casing. Carefully pull forward the case and remove.

13. Lift boiler and hang on boiler hanging screws and mate flue to boiler spigot.

14. Ensure the boiler spigot is firmly fitted to inner and outer ducts of the flue assembly.

15. Adjust boiler hanging screws if necessary.

16. SIDE FLUE CONNECTIONS:

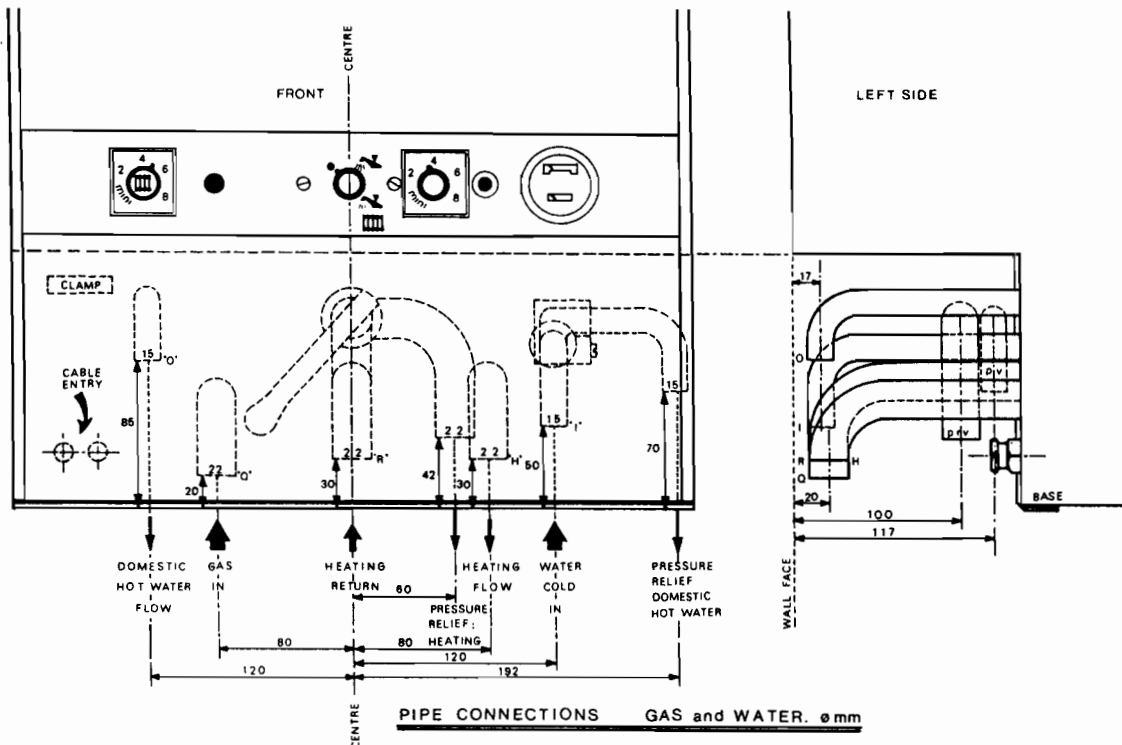
Remove foam plastic ring from rear flue spigot.

Remove the flue spigot (4 screws).

Remove circular side masking plate as appropriate and re-fix over rear flue aperture.

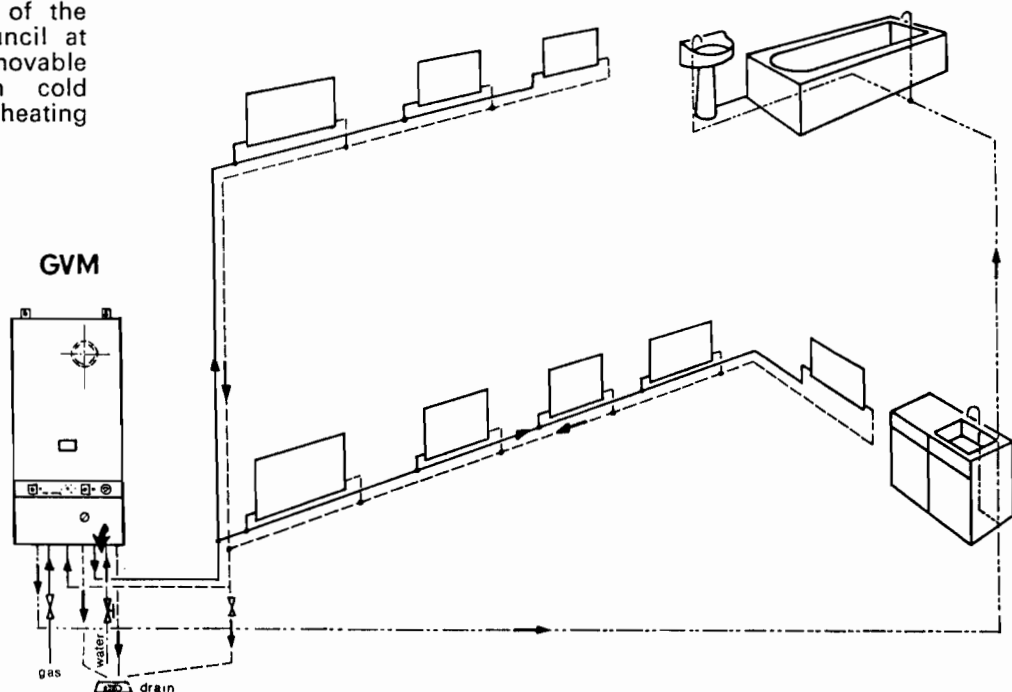
Fix flue spigot at side and replace foam plastic ring.

17. With the template you will find "User's Instructions,, and "Service Contract Form". Both must be handed to the user.



TYPICAL LAYOUT

IMPORTANT : See page 15 for spécial requirement of the National Water Council at point Ø below. (Removable connection between cold supply and central heating system).



WATER AND GAS CONNECTIONS TO THE BOILER

A fully illustrated drawing shows the connections to the boiler and they are also individually marked on the boiler itself. (See pages 15 and 16).

1. Connect the incoming mains water supply pipe to the boiler (marked 'I') (15 mm) ensuring that an approved water isolating valve is fitted on the incoming pipe so that the mains supply may be shut off should it be necessary to remove the boiler at any time for repairs or service.
2. Ensure that the mains pressure is at a minimum of 0.4 bars with a minimum flow of 2,5 litres per minute. If this pressure and flow rate is not available the boiler will not operate.
3. Connect the heating flow pipe (marked 'H') (22 mm) to the boiler. An isolating valve is already fitted within the boiler so that the water may be turned off without draining the system.
4. Connect the heating return pipe (Marked 'R') (22 mm) to the boiler. An isolating valve is already fitted within the boiler so that the water may be turned off without draining the system.
4. Connect the domestic water flow pipe to the boiler (marked 'O') (15 mm).
6. Ensure that the pressure relief valve connections are made and that they are run to a position on the outside of the wall to an external drain, but allowing any flow through these pipes to be seen.
Note : National Water Council Regulations state that an overflow or expansion pipe must not be fitted into a sink, handbasin or W.C.
7. Pressure Relief Valve Connections / Domestic 15 mm
Central Heating 22 mm
8. Connect the gas supply as illustrated on drawing and as marked 'G' (22 mm). Ensure that the union gas cock is fitted to the incoming supply so that the boiler may be completely removed for service or repair without having to turn off the gas from the meter position.

FILLING A CENTRAL HEATING SYSTEM

The boiler is designed to be used with a sealed central heating system. National Water Council Regulations state clearly that no permanent connection may be made between the heating system and incoming mains water supply. We have therefore enclosed a detailed drawing showing the typical way of installation for filling of the central heating system (On Page 15 and 16).

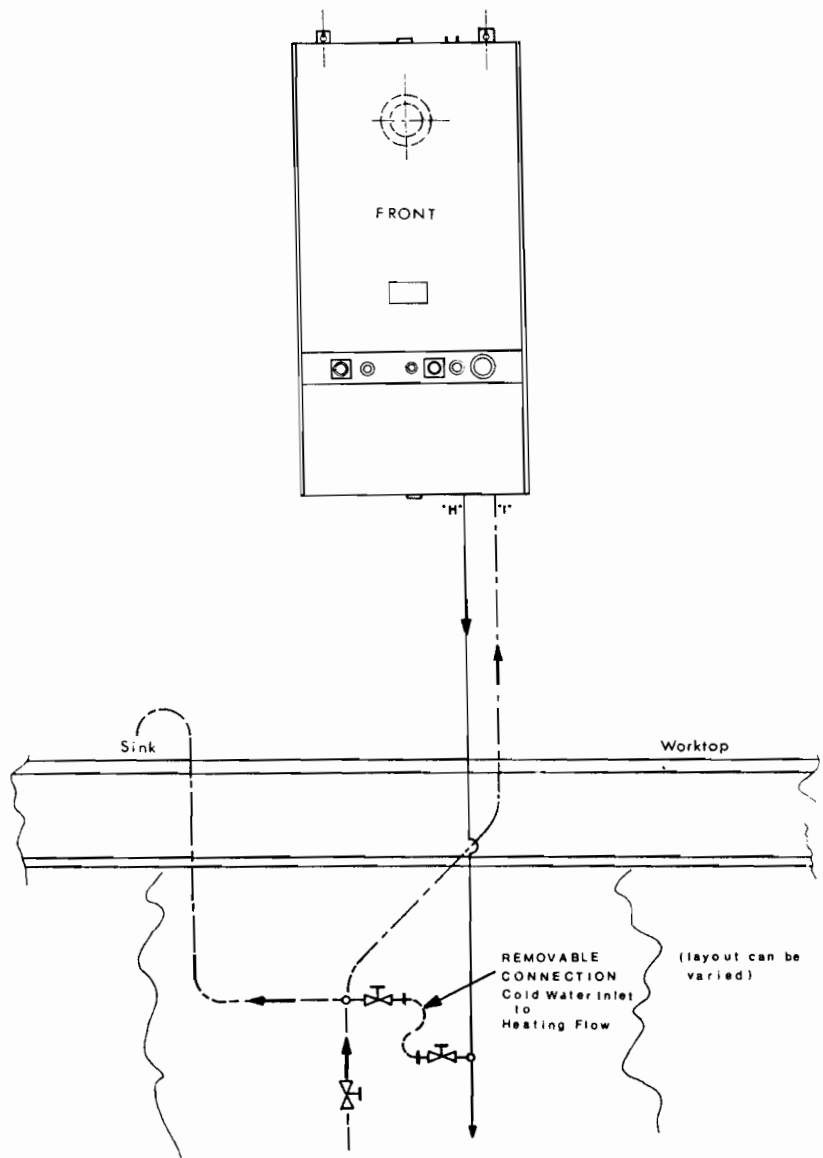
Before beginning to fill the system, loosen the automatic air vent screw as illustrated in Fig. 2, No 31, so that air may escape from the system as filling takes place. Check that all pipe fittings and connections are watertight.

- VERY IMPORTANT -

Central Heating Pressure

The central heating water pressure should be at a minimum of 0.5 bars when full and no more than a maximum of 3 bars. To determine the required pressure an approximate measurement should be made from the base of the boiler to the highest position of the highest radiator.

For every metre measured, a pressure of 0.1 bar is required within the heating system. Should this distance be less than 5 metres, a pressure of 0.5 bars must still be made and if the distance measured is more than 30 metres the central heating pressure should not reach more than 3 bars. The Boiler is fitted with an integral expansion vessel of 8 litres capacity which allows a maximum system capacity of 190 litres giving an average maximum temperature of 80°C (2 1/2 % volume expansion).



CHECKING AND SETTING-UP PRESSURES COMMISSIONING

After checking all gas supply connections for soundness. Purge air from pipes at screw "Z".

1. Light the boiler as described in "Users Instructions".
2. Remove the outer case of the boiler. See "Fixing of Boiler", para 11.
3. After removing the case, fit the special clamp (available to Installer from the distributor over the red Case Switch as illustrated under "Controls". (Left-hand side of control box.)
4. Turn Knob "C", to position for Central Heating and Hot Water, (Tap & Radiator) Fig. 3.
5. To purge the Pump - remove the plug "W", from pump-face (See illustration below.) Fig. 9.
6. Insert a screwdriver into the pump to turn the armature of the pump. (This may not be necessary as the armature may already be free).
7. Replace the plug "W", tightly.
8. Turn knob "C", (Users Instructions) back to position showing black spot, Fig. 3.
9. Remove the sealing screw from the Main Burner Test Point "T" and fix the tube for the Manometer (water gauge).
10. Turn knob "C" (See Users Instructions) back to position for Central Heating and hot water.

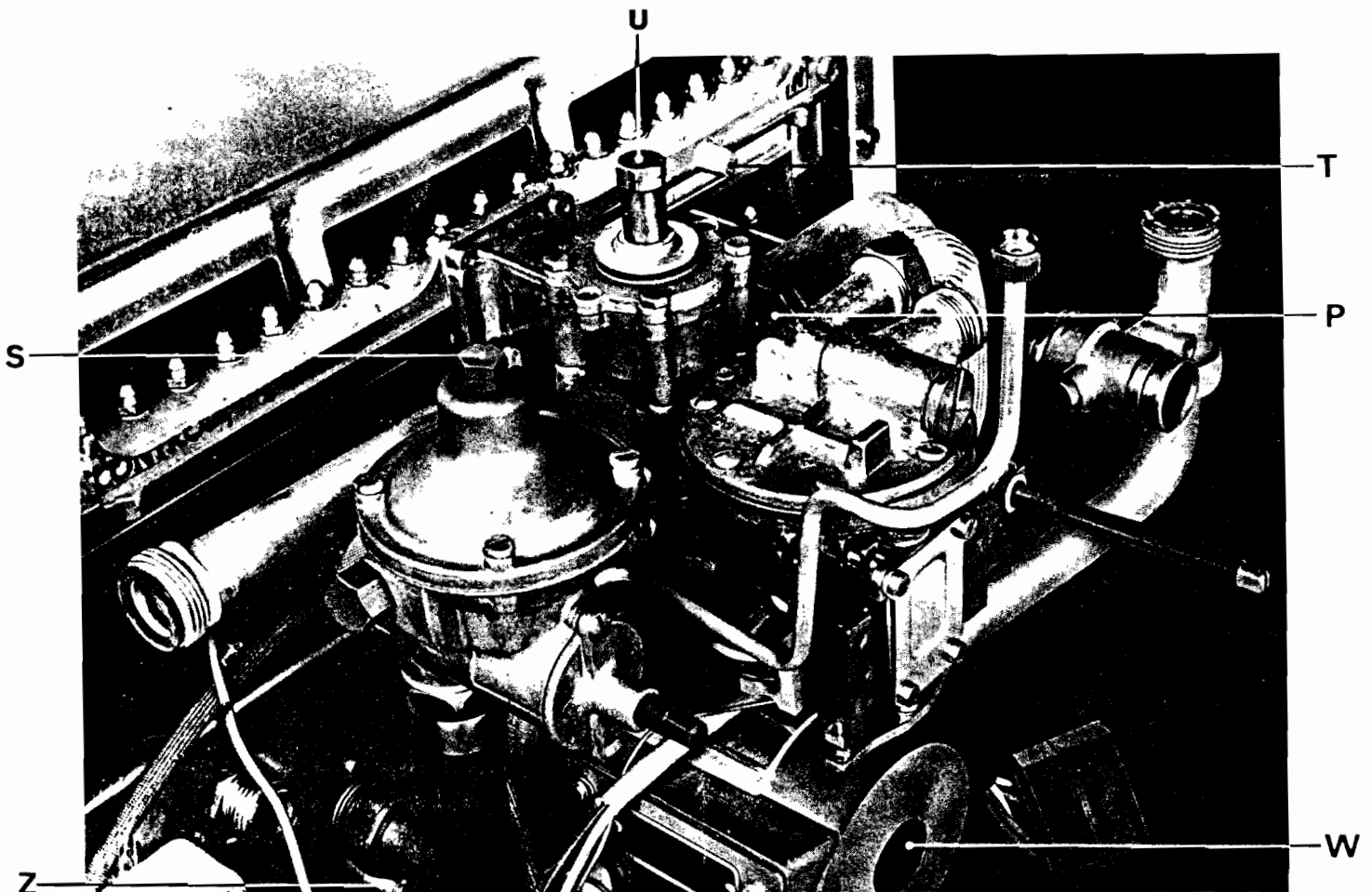
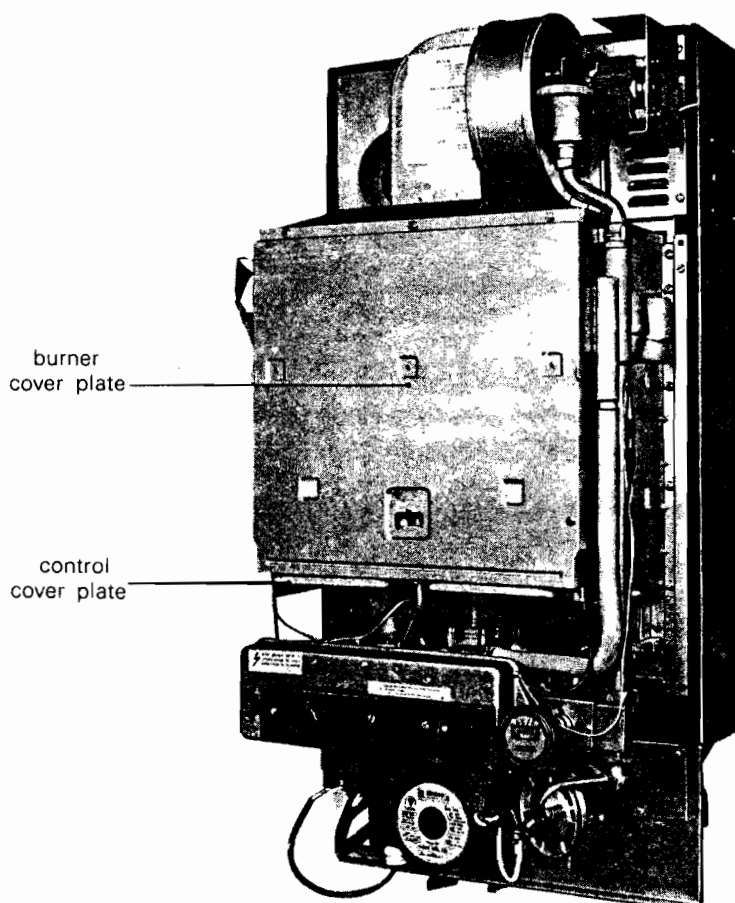


Fig. 9

11. Turn knobs "A", and "D", (Users Instructions) to No. 8.
 12. Central heating should now be in operation.
 13. If the Main Burner does not light, check that room thermostat, time switch or programmer are all calling for heat.
 14. With central heating operating at maximum output, the manometer should show a pressure of 7,6 m/bar (3.08" WG).
 15. If the pressure is higher or lower than that stated, adjustment should be made by turning the Screw-head "S", Fig. 9). Clockwise to decrease the pressure, anti-clockwise to increase the pressure.
- NOTE :** When the cover of the heater is replaced the burner pressure will drop to 7,1 m/bar (2,88" WG) (Technical Information) due to the negative pressure created within the case by the fan in withdrawing the products of combustion.
16. It is possible to reduce the Gas Output Heating Maximum From 22.2 kW to 8.7 kW (Screw-head "U" Fig. 9) to unscrew for reducing. The heating output has been adjusted at 48,000 Btu/h in the Factory.
 17. An adjustment of low burning rate must be made by the capstan plug "P" (fig. 9), (on left for Natural gas, on right for LP gas).
 18. Turn knob "C", to position showing Tap only (hot-water-only position).
 19. The pump will now stop.
 20. Open a Hot Water Outlet Tap. This allows water to flow through the heat exchanger.
 21. The main burner will now light at the maximum rate.
 22. The burner pressure will now read as 16 above.
 23. Remove the manometer tube from the test point and replace the sealing screw.
 24. Remove the special clamp from the red Case Switch.
 25. Replace the Outer Case ensuring that both front screws are fitted tightly and that the Case Retaining Clips, top and base, are correctly fastened.
 26. **VERY IMPORTANT :** Hand the "Instructions for Use" to the user.



TECHNICAL INFORMATION

GAS		
Gas Input C.H. and D.H.W.	28.13 kW	96,000 Btu/hr
Gas Output Heating Maximum	22.2 kW	75,840 Btu/hr
Gas Output Heating Minimum	8.7 kW	30,000 Btu/hr
Gas Output Domestic Hot Water		
Modulating - Maximum	22.2 kW	75,840 Btu/hr
Minimum	4.7 kW	16,000 Btu/hr
Main Burner Pressure		
Maximum Output Heating with cover	7.1 m bar	2.85 in.w.g.
without cover	7.6 m bar	3.08 in.w.g.
For Output Heating of 48,000 Btu/hr	3.2 m bar	
Main burner Pressure		
Maximum Domestic with cover	7.1 m bar	2.85 in.w.g.
without cover	7.6 m bar	3.08 in.w.g.

ELECTRICAL

Boiler for use on - 240 Volts A.C.	50 Hz
Power Input	145 Watts
Main Fuse	3 Amps
Transformer Fuse	250 M.a.

WATER

Maximum Domestic Water Temperature	65°C: 150°F
Maximum Heating Water Temperature	85°C: 185°F
Domestic Hot Water Flow at 65°C	6.25 Litres/Min. for 50°C Rise.
Minimum Incoming Mains Water Pressure	0.4 Bars
Minimum Incoming Mains Flow	2.5 Litres/Min. (0.55 gallons/min.)
Maximum Incoming Water Pressure	73 p.s.i. (5 bars) (10.65 Kn/m²)
	See also N.W.C. requirement ; page 5 ; paragraph 2 ; regarding Pressure Reducing Valves.
Heating Minimum Circuit Pressure	0.5 bars
Heating Maximum Circuit Pressure	3.0 bars

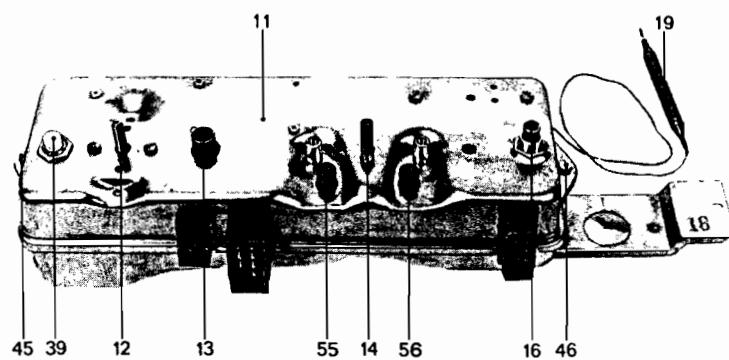
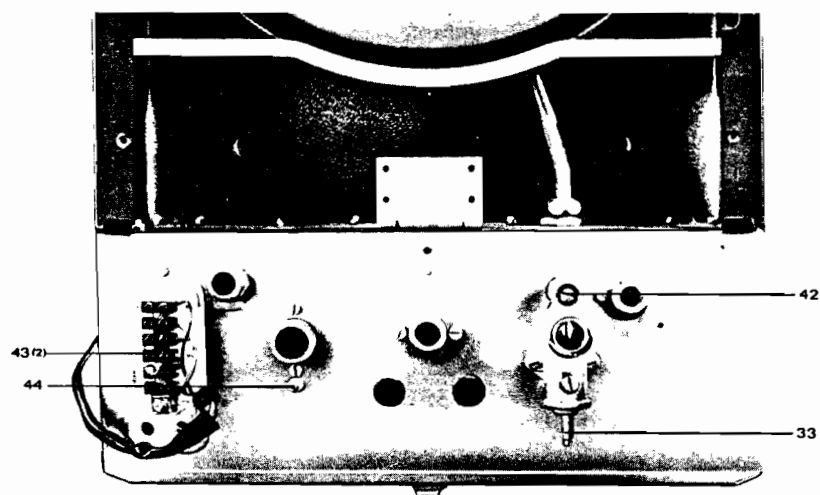
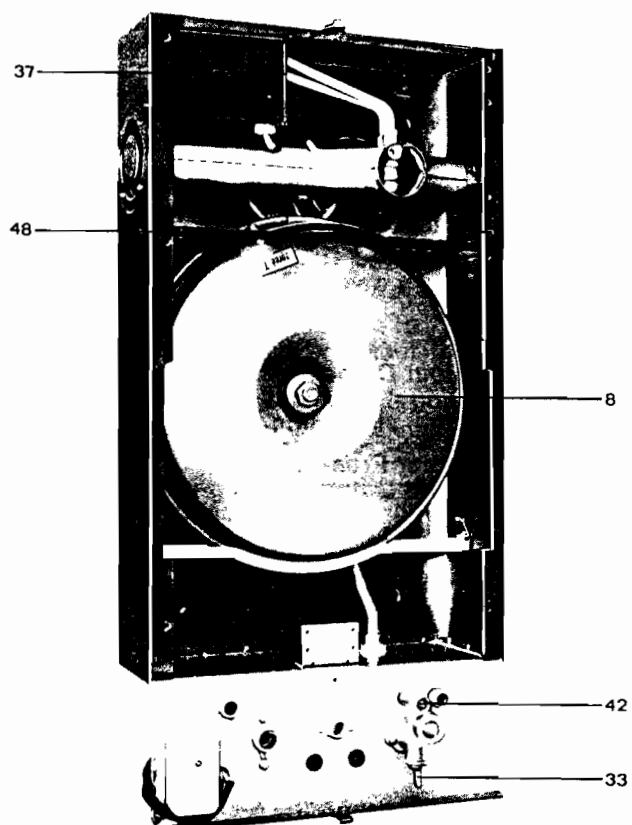
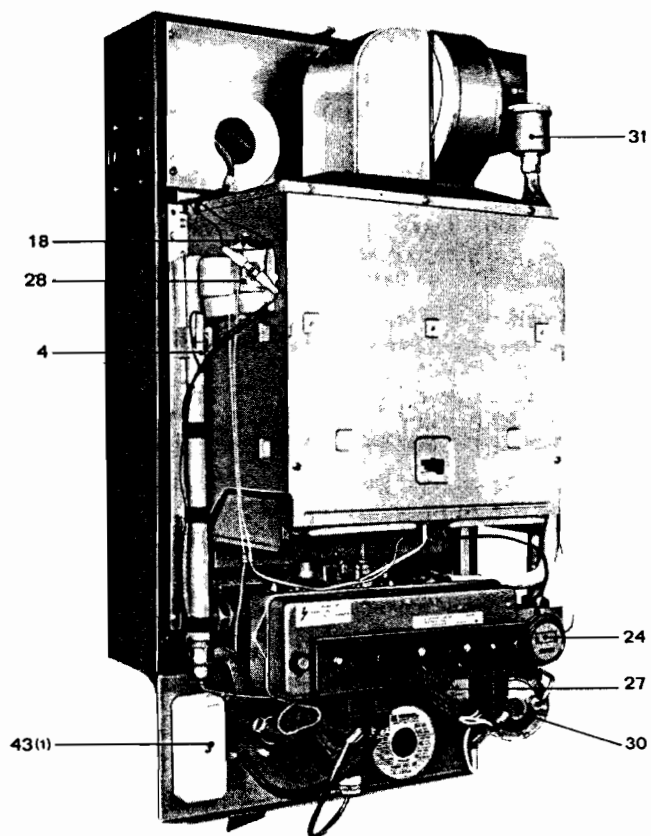
FOR HEATING CIRCUIT PRESSURES - SEE INSTALLATION (PAGE 16)

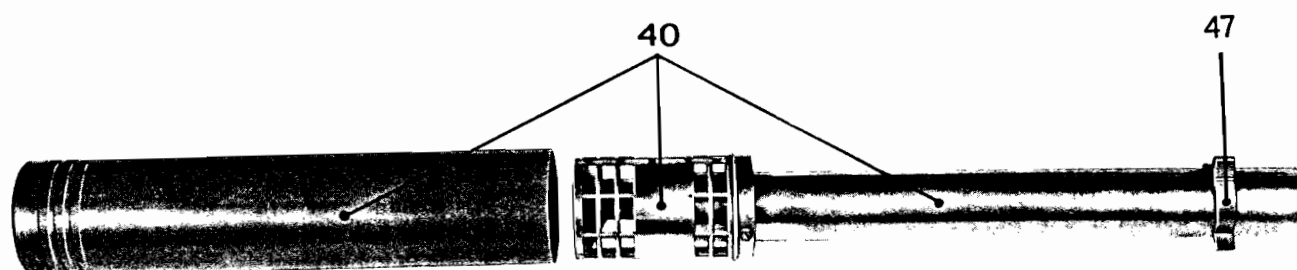
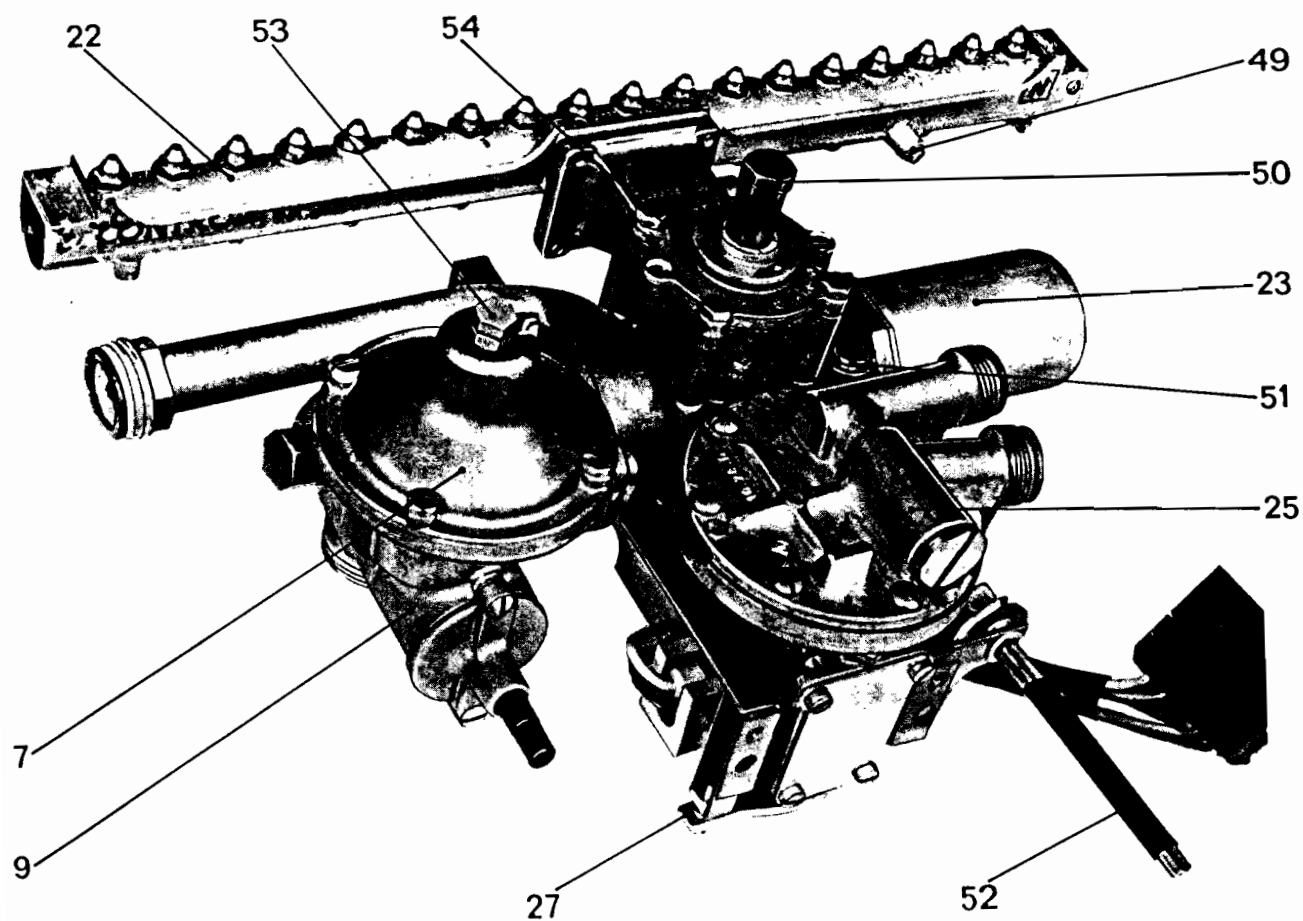
GENERAL

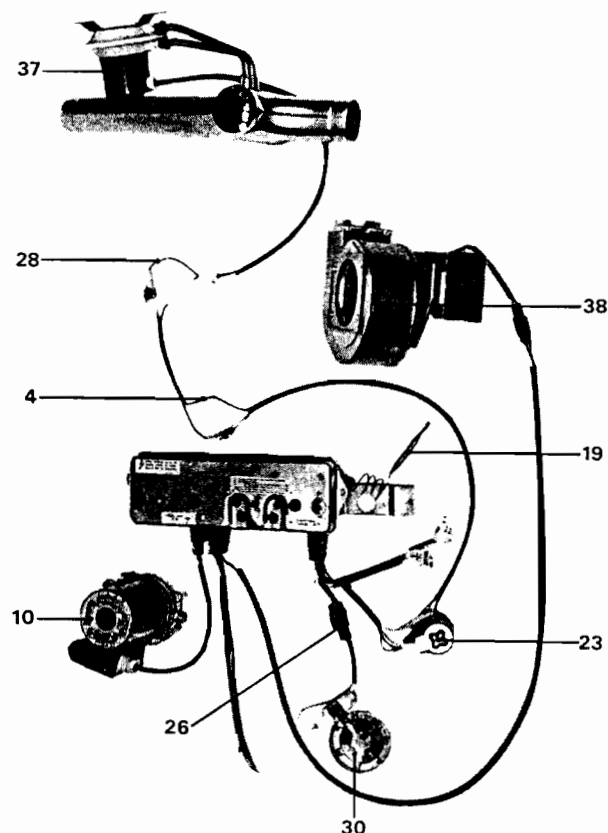
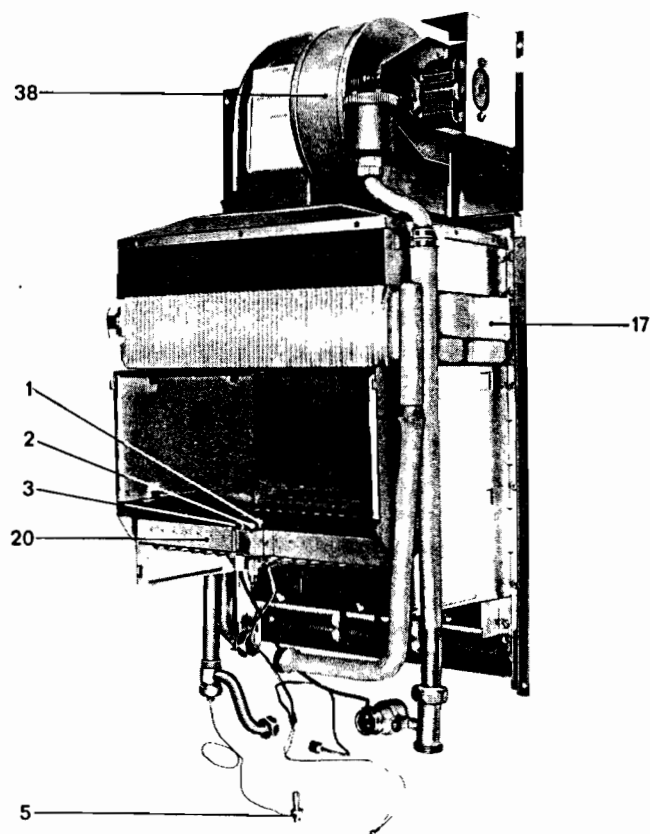
Main Burner Jets Natural Gas: 18 × 1.2 ∅ mm	Domestic Water Incoming Mains Connection :
Pilot Jet Natural Gas: 1 × 0.30 ∅ mm	15 mm
Central Heating Motor Pump: 240 V - 50 Hz (0.24, 0.32, 0.39 Amps) (49. 70. 90Watts) Type LMT	Domestic Water Flow Connection: 15 mm
MXL 130 3 Speeds.	Domestic Water Pressure Relief Valve Connection:
Flue Fan : 240 V - 50 Hz Type ITT- 3030L-66 SK	15 mm
Nett Weight: 42 Kg.	Standard Balanced Flue Length: 400 mm
Maximum Pump Head (see page 23)	Standard Balanced Flue Extension Length: 350 mm
Heating Fow Connection: 22 mm	Flue Rear Connection Maximum Wall Thickness :
Heating Return Connection: 22 mm	750 mm
Heating Pressure Relief Valve Connection: 22 mm	Flue Side Connection Maximum Wall Thickness:
	705 mm

BOILER WATER CAPACITY

Heating	0,6 Lit.
Domestic	0,5 Lit.



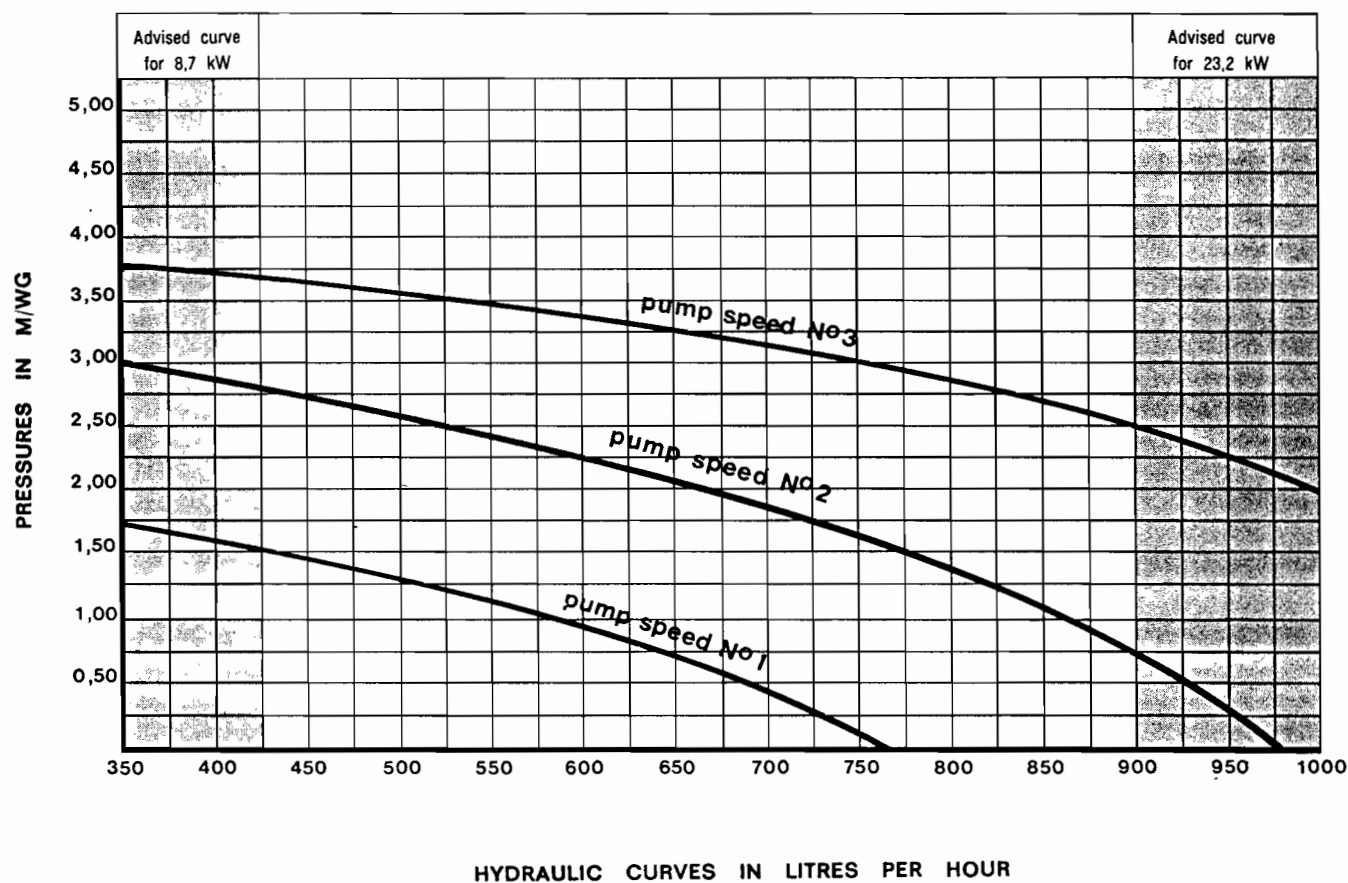




PARTS LIST

- | | |
|--|--|
| 1 - Thermo-couple | 29 - Domestic pressure relief valve |
| 2 - Pilot assembly | 30 - Heating water flow/pressure safety valve |
| 3 - Spark electrode | 31 - Heating automatic air vent |
| 4 - Hot water limit thermostat (fixed) | 32 - Non return valve (heating) |
| 5 - Hot water thermostat sensor | 33 - Central heating flow isolating cock |
| 6 - Two ways gas control valve | 34 - Central heating return isolating cock |
| 7 - Main gas governor | 35 - Gas Isolating cock (as gas tap) |
| 8 - Expansion vessel | 36 - Heating pressure relief valve |
| 9 - Push button and thermo-electric flame failure valve | 37 - Flue gas safety pressure switch |
| 10 - Heating circulation pump | 38 - Flue boost fan |
| 11 - Sealed electrical control box (as panel) | 39 - Case safety switch |
| 12 - Heating temperature selector | 40 - Balanced flue assembly |
| 13 - Push button for thermo-electric flame failure valve | 42 - Adjustment screw heating flow by-pass |
| 14 - Operating selector knob | 43 - Electrical terminal block (1) |
| 15 - Hot water temperature selector | 43 - Electrical terminal connection (2) |
| 16 - Electronic Igniter button | 44 - Main gas pressure test nipple |
| 17 - Heat exchanger | 45 - Control box securing screw |
| 18 - Over heat cut out device | 46 - Control box securing screw |
| 19 - Heating thermostat sensor | 47 - Stabilising flue clip |
| 20 - Burner assembly all gas | 48 - Expansion vessel holding bracket |
| 21 - Modulating gas valve | 49 - Burner gas adjustment pressure nipple |
| 22 - Injectors support-unit | 50 - Heating maximum gas regulator adjustment screw (fixed in factory) |
| 23 - Two stage gas magnetic valve | 51 - Low burning rate adjustment |
| 24 - Heating pressure & temperature gauge (as thermomanometer) | 52 - Domestic water thermostat spindle |
| 25 - Diaphragm water valve | 53 - Main gas governor adjustment screw |
| 26 - Double acting microswitch | 54 - Heating maximum gas regulator |
| 27 - Domestic hot water thermostat adjuster | 55 - 3 amp. fuse and holder |
| 28 - Heating limit thermostat (fixed) | 56 - 250 m.A. fuse and holder |

PUMP CHARACTERISTICS OUTLET OF THE BOILER



— Modifications for improvement reserved

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