

This information refers to the following products

**Rayburn 499K MK1
(Early models
1994-5)**

WARNING

This information is a copy of an original archive, therefore Aga cannot be held responsible for its continued accuracy or relevance.

RAYBURN

Home on the Range.

Installation Instructions for Rayburn 499k Central Heating Cooker

Consumer Protection Act 1987

As manufacturers and suppliers of cooking and heating products, in compliance with Section 10 of the Consumer Protection Act 1987, we take every care to ensure, as far as is reasonably practical, that these products are so designed and constructed as to meet the general safety requirement when properly used and installed. To this end, our products are thoroughly tested and examined before despatch.

IMPORTANT NOTICE: Any alteration that is not approved by Aga-Rayburn could invalidate the approval of the appliance, operation of the warranty and could affect your statutory rights.

Control of Substances - Health and Safety - Important.

This appliance may contain some of the materials that are indicated below. It is the Users/Installers responsibility to ensure that the

necessary personal protective clothing is worn when handling where applicable, the pertinent parts that contain any of the listed materials that could be interpreted as being injurious to health and safety, see below for information.

Firebricks, Fuel beds, Artificial Fuels - when handling use disposable gloves.

Fire cement - when handling use disposable gloves.

Glues and Sealants - exercise caution - if these are still in liquid form use face mask and disposable gloves.

Glass Yarn, Mineral Wool, Insulation Pads, Ceramic Fibre, Kerosene/Gas Oil - may be harmful if inhaled. May be irritating to skin, eyes, nose and throat. When handling avoid contact with skin or eyes. Use disposable gloves, face-masks and eye protection. After handling wash hands and other exposed parts. When disposing of the product, reduce dust with water spray, ensure that parts are securely wrapped.

INTRODUCTION

The Rayburn 499k is a floor standing combined cooker and central heating boiler. It gives independent operation for space heating, domestic hot water and cooking. It is available with vertical flue outlet. The appliance is fired by two independent pressure jet oil burners. Either burner can be independently operated under programmer control if required.

The boiler is designed for use on a fully pumped low pressure hot water circulation system, with a pumped over run facility or alternatively on a sealed system.

IMPORTANT

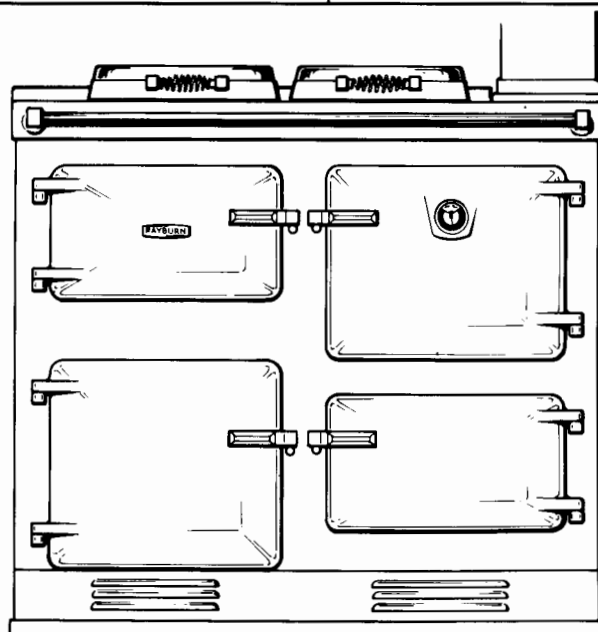
This appliance must only be used with 28 seconds Commercial Kerosene to BS2869 : 1988: Class C2.

An Indirect Cylinder to BS1566 Part 1 must be fitted.

If the heating circuits are controlled in such a way that both heating and cylinder circuits can be closed off at the same time then a PERMANENTLY OPEN BYPASS LOOP should be provided as shown on the heating system layout drawing to enable the pump over run facility to work.

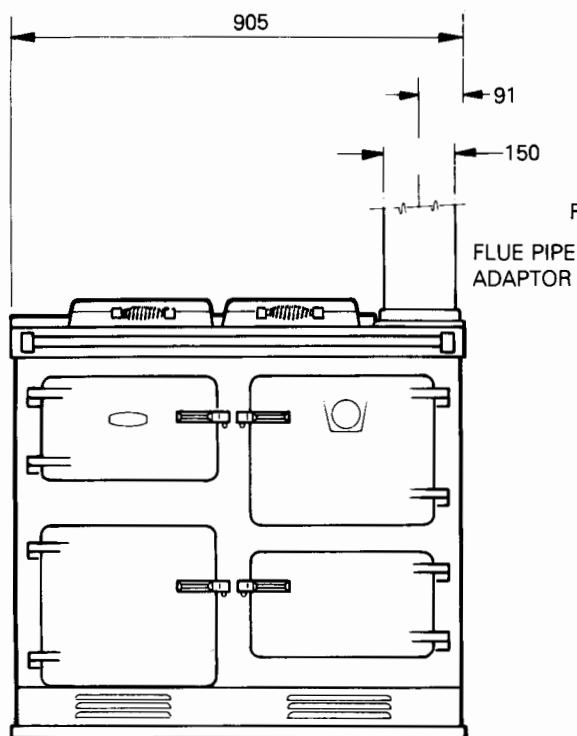
A Fire Valve MUST be fitted in the oil supply line.

The supplied in line filter MUST be fitted. See page 4 for further details.

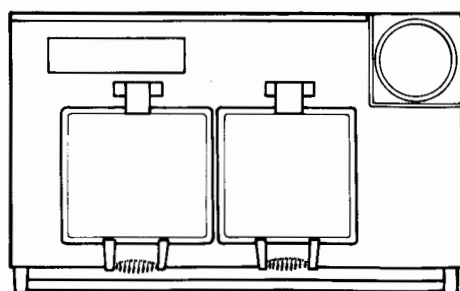


DESN 510517

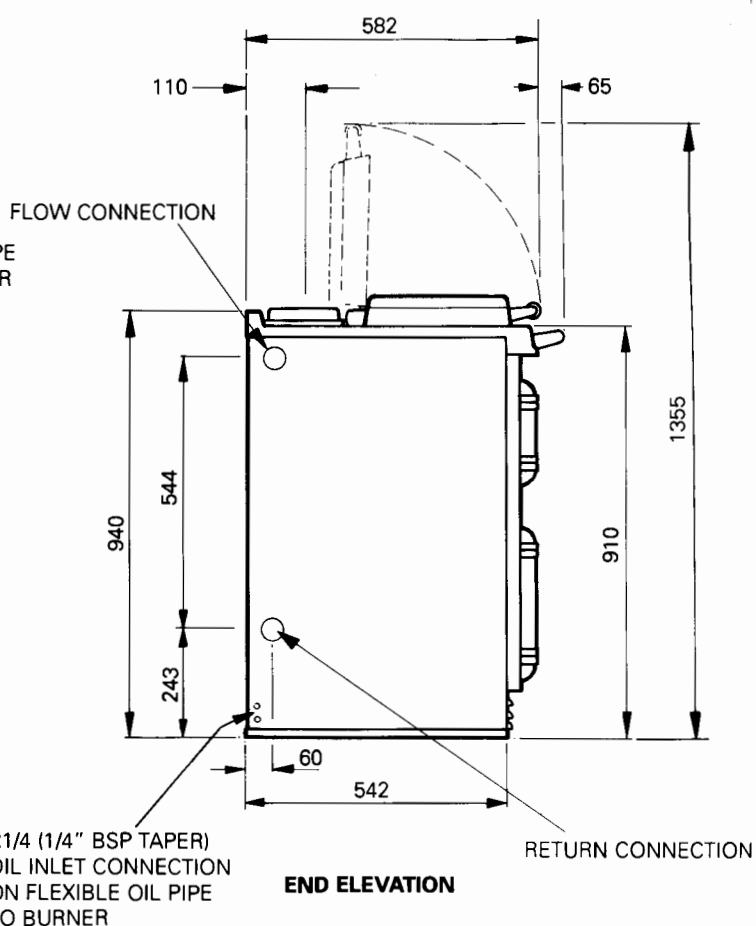
PAT. APP 2 280 747
AND OTHER GB & IE
PATENTS PENDING



FRONT ELEVATION



PLAN



END ELEVATION

ALL DIMENSIONS IN MILLIMETRES.

DESN 510518

SPECIFICATIONS

	BOILER BURNER	COOKER BURNER
BURNER NOZZLE (US g/h)	0.85 @80 °H	0.40 @80 °SF
OIL PRESSURE Bar (psi)	9.9 (144)	9.0 (130)
OIL BURNING RATE cc/m	58.0	28.5
HEAT INPUT kW	35.2	17.6
BOILER OUTPUT kW	29.3	0.8 MAX

Boiler Water Connections

Flow (one) Rp 1 (1in.BSP Int)
Return (one) Rp 1 (1in.BSP Int)

Water Capacity of Boiler

25.5 litres

Both connections are located towards the rear edge of the appliance L.H. side panel.

Oil Inlet R $\frac{1}{4}$ (1/4" BSP Taper Ext)
Flue Outlet 150mm
Electrical Supply 240V ~ 50Hz 5 amp Fused

Weight of Appliance 420kg

FUEL-COMMERCIAL KEROSENE
28 seconds to BS2869: 1988 Class C2

REGULATIONS

The installation of the appliance must be in accordance with the relevant requirements of the current Building Regulations, current IEE Wiring Regulations and the bylaws of the local Water Undertaking. It should also be in accordance with the relevant recommendations of the following current British Standard Codes of Practice.

BS 5410 Installation of oil fired appliances for space, heating and hot water supply purposes. Part 1 Boilers of rated output not exceeding 45kW.

BS 5449 Central Heating for domestic purposes. Part 1. Forced circulation hot water system.

Building Regulations England & Wales. Part J. Heat producing appliances.

Building Standards Scotland - Technical Standard Part F. Heat producing appliances and storage of liquid and gaseous fuel.

Building Regulations Northern Ireland - Technical Booklet to Part L. Heat Producing appliances.

LOCATION

Appliance Hearth. This appliance must be installed on a solid floor or base of incombustible material which is capable of supporting the total weight.

The location chosen for the appliance must permit the installation and the provision of a satisfactory flue and an adequate air supply. The location must also provide adequate space for servicing and for air circulation around the appliance. See "Installation of the Appliance".

OIL PIPE LINE

The oil supply connection between the storage tank and the oil pump should be run in copper or steel pipe with a minimum diameter of 10mm. Galvanised pipes and fittings should not be used. Annealed copper pipe is preferred with flare type manipulative fittings. Capillary fittings with soft solder should not be used. Steel pipes should be joined using taper threads.

All pipe work and fittings must be completely air tight. Only oil resistant compounds and PTFE tape should be used when making joints. Pipe work must be protected against damage whether fitted above or below ground.

The size and arrangement of pipe work will depend upon the distance and height of the oil storage tank in relation to the oil pump inlet.

The oil line from the storage tank to the appliance must be fitted with a remote acting fire valve such as the TEDDINGTON KBB C 150°F. fitted with an appropriate length of capillary to enable the valve body to be located externally at the point where the oil line enters the building. The heat sensing phial of the fire valve MUST be fitted to the clips, in the front left hand side of the burner compartment.

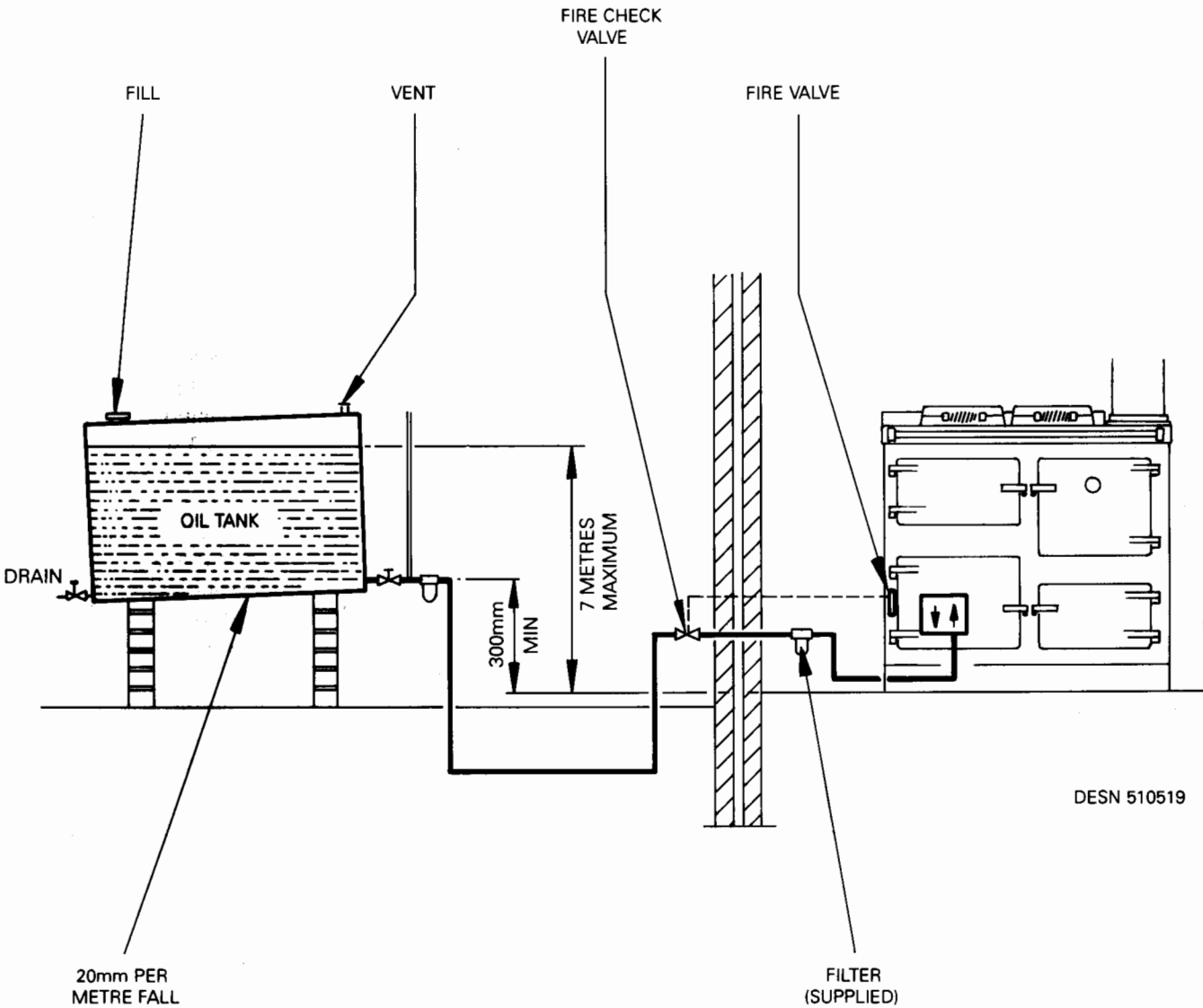
The 5-10 micron oil filter supplied with the appliance must be fitted on the oil pipe line and stop valve must be fitted, as close to the cooker as possible in an accessible position.

A flexible pipe connection, approximately 500 mm. long, is supplied to fit between the copper oil pipe and the oil pump for ease of burner removal.

OIL STORAGE - see fig. 1

The minimum recommended oil tank size is 1400 litres and the Code of Practice governing its installation are covered by BS 5410 Part 1. Mild steel tanks should be to BS 799 Part 5 and plastic tanks to OFTEC Standard OFS T100.

SINGLE PIPE OIL SYSTEM - TANK OUTLET ABOVE BURNER



DESN 510519

FIG. 1

FLUE SYSTEM - see fig. 2

Detailed recommendations for flueing in England & Wales are given in Part J of the Building Regulations. For Scotland in Technical Standard F to the Building Standards and in Northern Ireland in Technical Booklet L to the Building Regulations. Guidance is also given in BS 5410: Part 1.

The following notes are intended to give general guidance. The flue pipe and chimneys must be Class 1 as recommended for flue gas temperatures exceeding 260°C in Building Regulations and Standards.

The cross sectional area of the flue serving the appliance, must be not less than the equivalent area of 150mm. diameter flue pipe, and be at least 4.5m high.

The flue pipe to be used must not be less than 150mm internal diameter. Flue pipes and fittings should be constructed from one of the following materials:

- a Mild steel with a wall thickness of 3mm. minimum.
- b Stainless Steel to BS 1449 Part 2.
- c Cast Iron to BS 41.
- d Mild Steel, acid resistant vitreous lined to BS 1344 Part 2.

NOTE: TO ACHIEVE THE OPTIMUM OPERATIONAL SOUND LEVELS FROM THE APPLIANCE IT IS RECOMMENDED THAT CAST IRON FLUE PIPE IS USED WHERE POSSIBLE.

Chimneys

Chimneys should be built of masonry or be assembled from factory made components. Masonry chimneys may be built of any masonry material, with a lining, or of flue blocks, without a lining. The Chimney lining should be 150mm. minimum diameter and be formed of moisture and acid resistant liners to BS 1181 with rebated or socketed joints uppermost.

Alternatively, linings may be imperforate clay flue pipes as described in BS 65 or flue blocks to BS 1289 and installed to BS 6461 Part 1.

Ensure that the chimney is swept over its entire height before connection of the new appliance. No other appliance can share the chimney. Ensure all chimney mid-feather walls are intact and the complete chimney is airtight.

Chimney Termination

All chimneys should terminate at least 600mm above the roof level in accordance with current Building Regulations and statutory requirements as outlined in BS 5410 Part 1, BS 6461 Part 1 and BS 7566 Parts 1 to 4.

Chimney Cleaning

Ensure there are accessible airtight flue cleaning doors in order to obtain cleaning access to the complete chimney. Providing the appliance is operating correctly, an annual chimney flue cleaning will suffice, but if in doubt, arrange for a half yearly clean, preferably at the beginning/end of the central heating season.

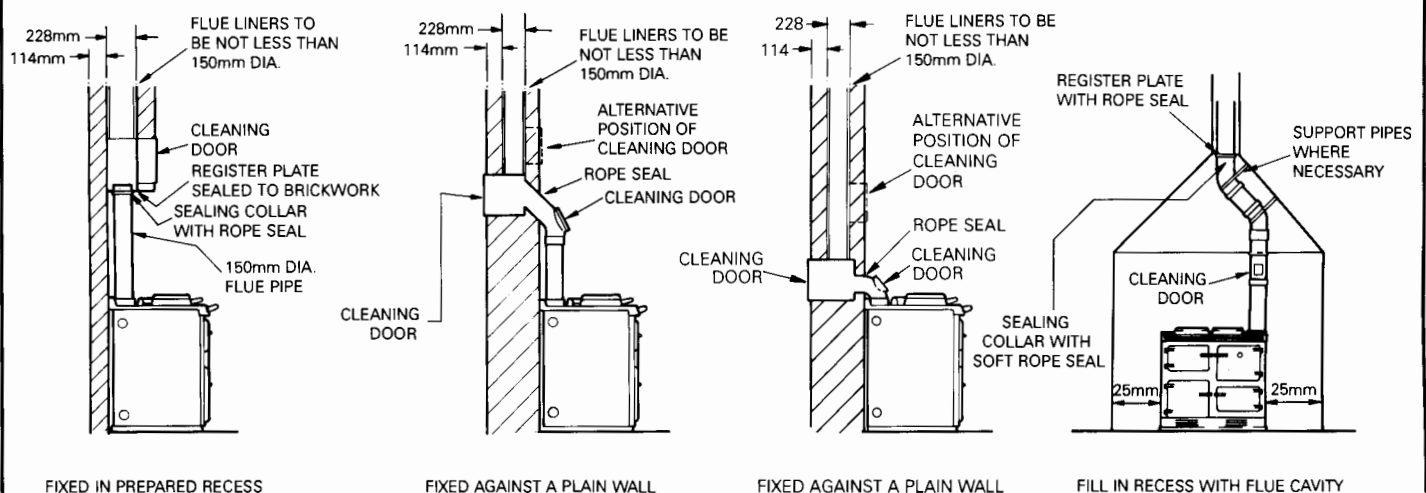


FIG. 2

DESN 510521'A'

AIR SUPPLY

Detailed recommendations for air supply are given in the Building regulations, and in BS 5410: Part 1. The following notes are intended to give general guidance.

1. Combustion and ventilation air supply to oil fired appliances has to comply with the Building Regulations and with BS 5410 Part 1. The air supply requirement for oil fired appliances is 550mm² per kW of maximum rated output above 5kW. These requirements are illustrated in OFTEC Technical Book No. 3.

2. The combustion air supply to open flued appliances should normally be provided at high level into a room where it will not cause discomfort by creating a cold draught across the floor.

3. If combustion air is supplied through an under floor duct the grilles at each end should be positioned in the vertical plane to reduce the risk of blockage. Ducts should be sized so as to reduce resistance to air flow.

4. The ventilation requirement for kitchens in Part F of the Building Regulations is for mechanical extract at the rate of 60 litres per second or 30 litres per second if the fan is incorporated in a cooker hood. This amount can be reduced if spillage of flue gases might be caused by the outflow of air from the room.

Background ventilation is also required, either by producing a constant mechanical extract rate of one air change per hour or by having ventilation openings of not less than 4000mm².

5. Extract fans should be positioned as far away from the open flue as possible and should have a sufficient dedicated air supply. To undertake a test the oil fired appliance should be set in operation and the doors and windows of the room containing it should be closed. The extract fan should then be run at its maximum setting. The Oil Fired heating appliance should be observed to operate satisfactorily both before and after the fan is switched on.

6. It is preferable for the air supply for an extract fan to be located where it can serve the fan without the air stream passing close to the oil fired appliance.

7. Oil fired appliances must not draw combustion air from a garage.

WATER CIRCULATION SYSTEM

Space and water heating systems should be in accordance with the relevant recommendations of BS 5410 Part 1.

In a combined central heating and domestic hot water system, the hot water storage vessel must be of the indirect cylinder type to BS 1566 Part 1. The hot water storage vessel should be insulated with not less than 75mm. thick mineral fibre or its equivalent.

Cisterns and pipework situated in areas which may be exposed to freezing conditions should be insulated.

Draining taps must be located in accessible positions which permit the draining of the whole system, including the heat storage vessel. Draining taps should be at least ½in. BSP nominal size and be in accordance with BS 2879.

The appliance boiler section should be connected to a cistern water supply, subject to a maximum head of 18.25m. The heating system must be designed (and adjusted if necessary) to give a temperature differential across the boiler at full output of 10-14°C. When horizontal runs are used the pipes should rise upwards in the direction away from the appliance.

Circulating Pump

It is recommended that the selected pump be of a propriety type and manufacture, and be adequate to give the required temperature differential between the boiler flow and return. The pump should be able to meet the requirements of the system design and be fitted in a readily accessible position. See Fig. 4.

The boiler section pressure loss curve, see Fig 3, indicates the loss of head across the boiler section and should be considered when selecting the correct pump size.

Isolating Valves

Isolating valves (preferably of the keyless type) must be fitted to the inlet and outlet of the circulating pump to facilitate service and replacement without draining the system.

Open Vent Systems

The appliance boiler section should be connected to a feed and expansion cistern water supply, subject to a maximum head of 18.25m.

See Fig. 4 for a typical pipework layout for Rayburn 499k cooker/boiler instructions.

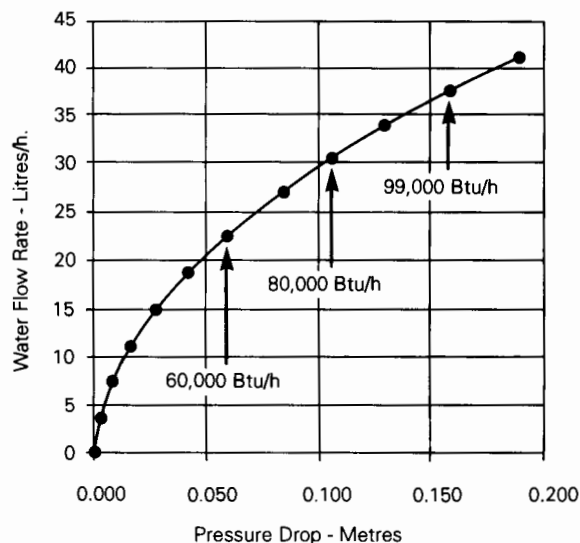


FIG. 3

Fully Pumped System

The domestic hot water pipes are pumped, and a pump overrun facility is fitted.

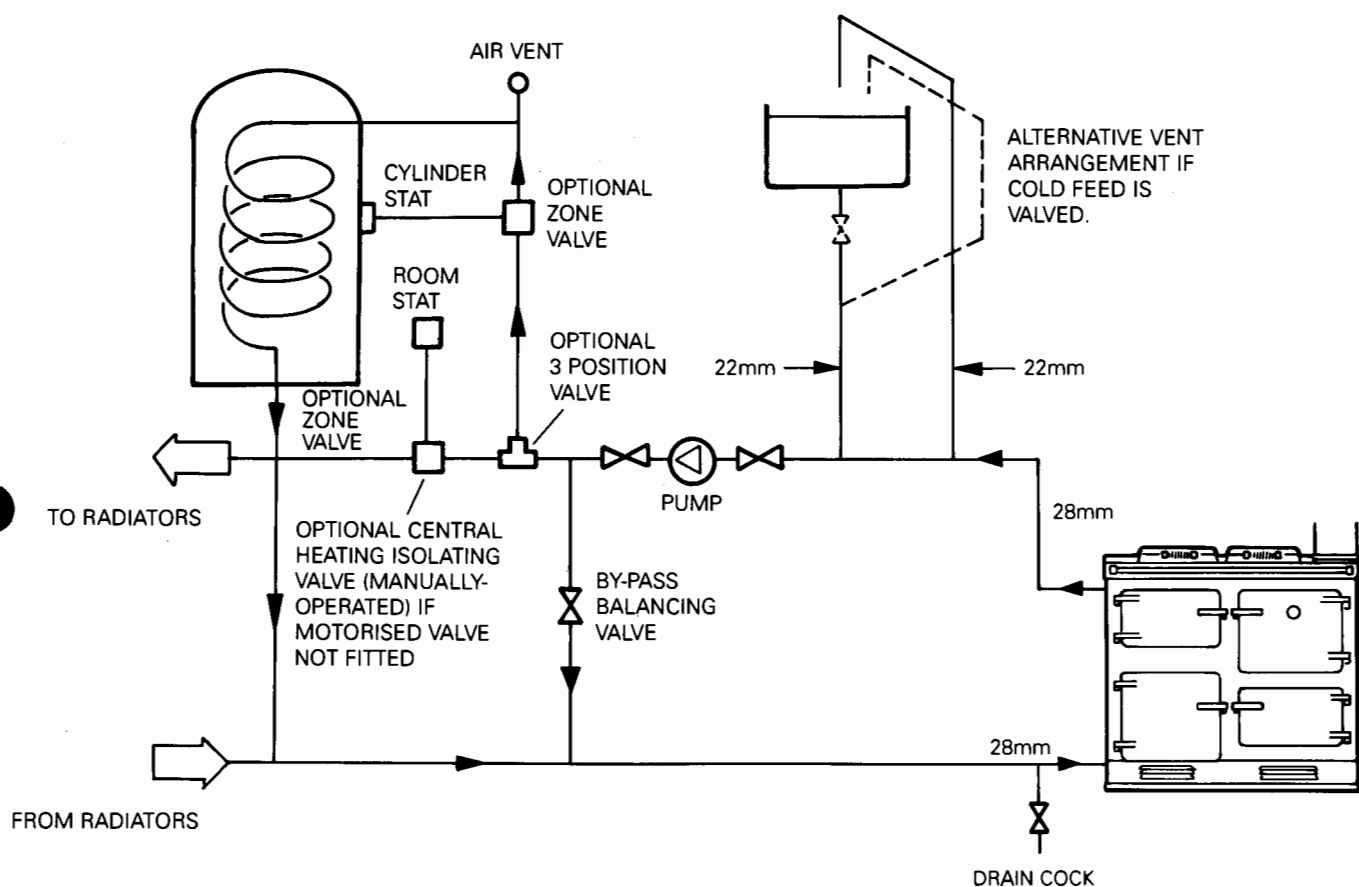
Water Circulating System

The whole of the system should be thoroughly flushed out with cold water without the pump fitted. The pump should be fitted and all air locks cleared. Vent all heat emitters and check for water soundness. It is recommended that existing heating systems are chemically cleaned with a product such as Fernox Superfloc.

For additional information on filling sealed systems see section SEALED SYSTEMS.

Sealed Systems

See separate section SEALED SYSTEMS.



THE BYPASS BALANCING VALVE SHOULD BE OF A TYPE NON-ADJUSTABLE BY THE HOUSEHOLDER AND MUST HAVE AT LEAST 2.5 METRES OF 28mm PIPE EACH SIDE BETWEEN IT AND THE COOKER BURNER.

ALTERNATIVELY THE BYPASS LOOP CAN INCORPORATE A TOWEL RAIL, CONTROLLED BY A NON-ADJUSTABLE BALANCING VALVE.

THE BYPASS LOOP MUST NOT BE INSULATED

FIG. 4

DESN 510522

HEATING CONTROLS

Internal temperatures and time controls are supplied for providing control of cooking and hotwater temperatures. The cooker is supplied with 2-channel programmer:- Channel 1 controls the cooker burner - Marked "COOKER". Channel 2 supplies hot water - Marked "BOILER". A separate switch in conjunction with the hot water channel gives priority to either the domestic hot water or the supply of hot water for central heating/DHW. It is recommended that independent temperature controls are provided for comfortable room temperatures, for economic operation and for control of the domestic hot water flow to the cylinder.

NOTES - ONE 3-PORT MOTORISED VALVE

1. When the boiler time switch is made the water circulating pump will run. With the switch on the control panel set to "HOTWATER" then there will be no power supplied to the 3-port valve and the heating side of the valve will be closed off.
2. With the switch on the control panel set to "HEATING/HOTWATER" then power is available at terminals L2 & N2 to operate the motorised valve. Live power is supplied to the White cable (terminal 10) through the link between terminals 4 & 5 and between terminals 5 & 10. This will move the valve to its mid-position supplying both heating and hotwater. The flow of water through the valve to the heating can be controlled by replacing the link between terminals 4 & 5 with the connections of a room thermostat.
3. If it is intended to operate the valve in the mid-position then a manually operated heat balancing valve may be necessary in the flow pipe to the cylinder to ensure adequate circulation through the radiators.
4. If it is required to close off the feed to the cylinder at this time then a link between the White cable (terminal 10) and the Grey cable (terminal 9) will make the valve more fully over. Alternatively this link can be replaced by the "make-on-rise" connections of a cylinder thermostat to give "Hot Water Control".
5. If it is intended that the valves should control the boiler burner, then remove loop between L3 and L4 and wire as fig. 5A.

NOTES - TWO SEPARATE MOTORISED VALVES

1. When the boiler time switch is made the water circulating pump will run and the valve to the domestic hot water cylinder will open. The temperature of the water in the cylinder can be controlled by removing the link between terminals 6 & 7 and replacing them with the "Break-on-rise" connections of a cylinder thermostat.
2. With the switch on the control panel set to "HEATING/HOTWATER" then power is available at terminals L2 & N2 to operate the motorised valve to the heating circuit. The flow of water through the central heating can be also controlled by replacing the link between terminals 8 & 9 by the connection of a Room Thermostat. This will remove the power off the motorised valve and will close off the heating circuit.
3. If it is intended to operate the system with both valves open at the same time then a manually operated heat balancing valve may be necessary in the flow pipe from the valve to the cylinder to ensure adequate circulation through the radiators.
4. If it is intended that the valves should control the boiler burner, then remove loop between L3 & L4 and wire connections through the auxiliary switches at the zone valves.

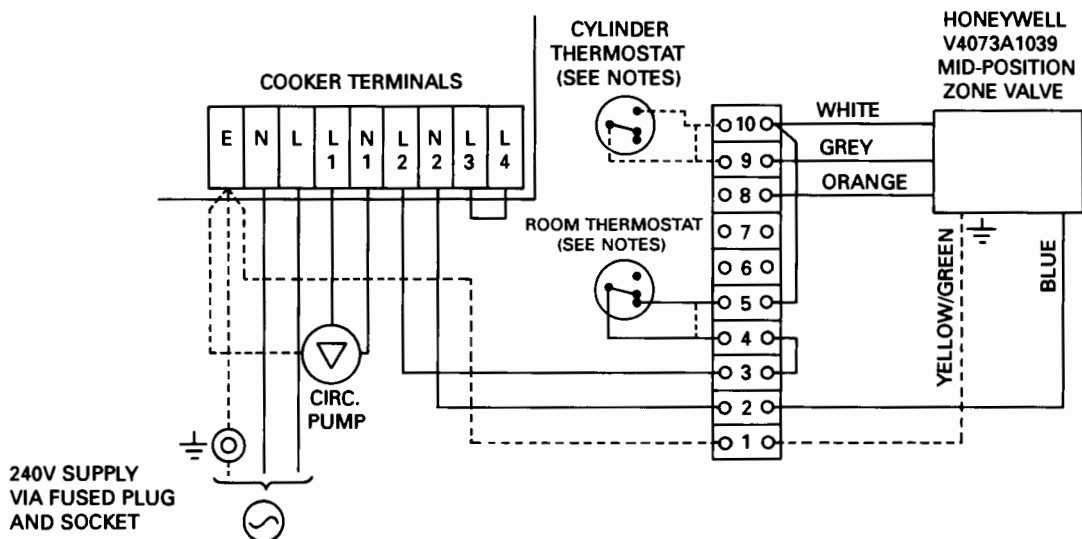


FIG. 5 CENTRAL HEATING/DHW CIRCULATION CONTROLLED BY ONE 3-PORT MV

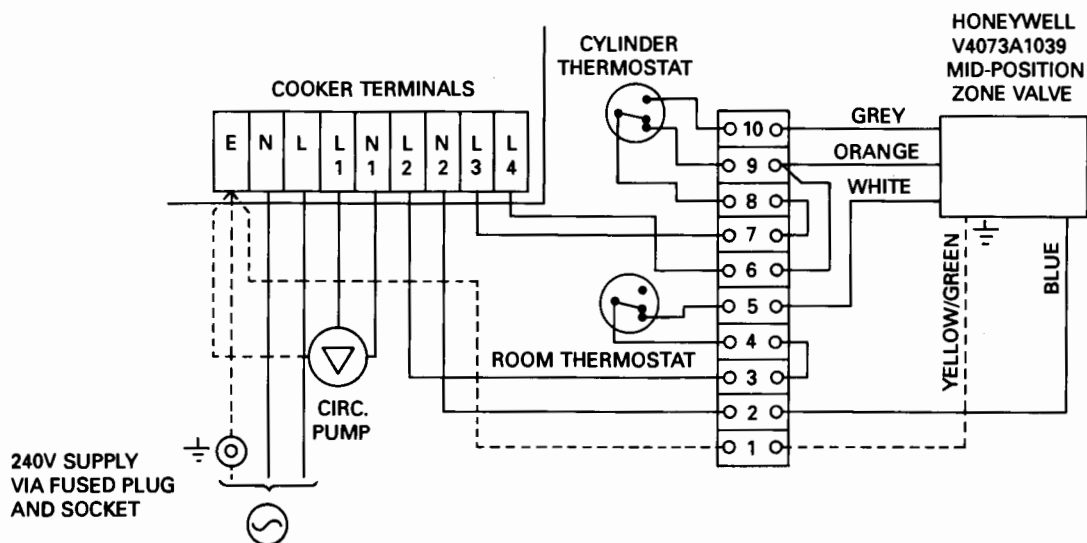


FIG. 5A ALTERNATIVE METHOD TO GIVE CONTINUOUS TEMPERATURE CONTROL

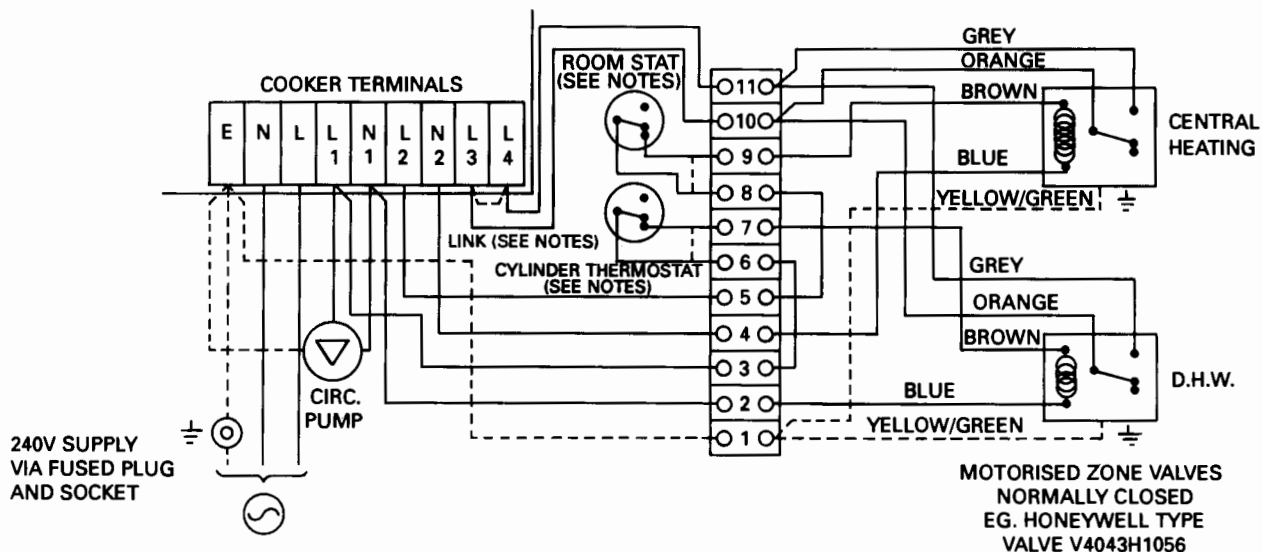


FIG. 6 CENTRAL HEATING/DHW CIRCULATION CONTROLLED BY TWO N.C. MV's

ELECTRICAL SUPPLY

Wiring external to the appliance must be installed in accordance with the current National Wiring Regulations and any local regulations which apply. The appliance is supplied for 220/240 Volt ~ 50Hz and a fuse rating of 5 amps.

The method of connection to the mains supply should facilitate complete electrical isolation of the appliance, by the use of a fused double pole switch having a contact separation of at least 3mm serving only the appliance.

The point of connection to the mains should be readily accessible and adjacent to the appliance. The installation should be protected by a 30mA Residual Current Circuit Breaker (RCCB).

The minimum requirement for the power cable is that it should be a 3 core PVC sheathed flexible cord (85°C min) at least 0.75mm² (24 x 0.2mm) to the relevant standard.

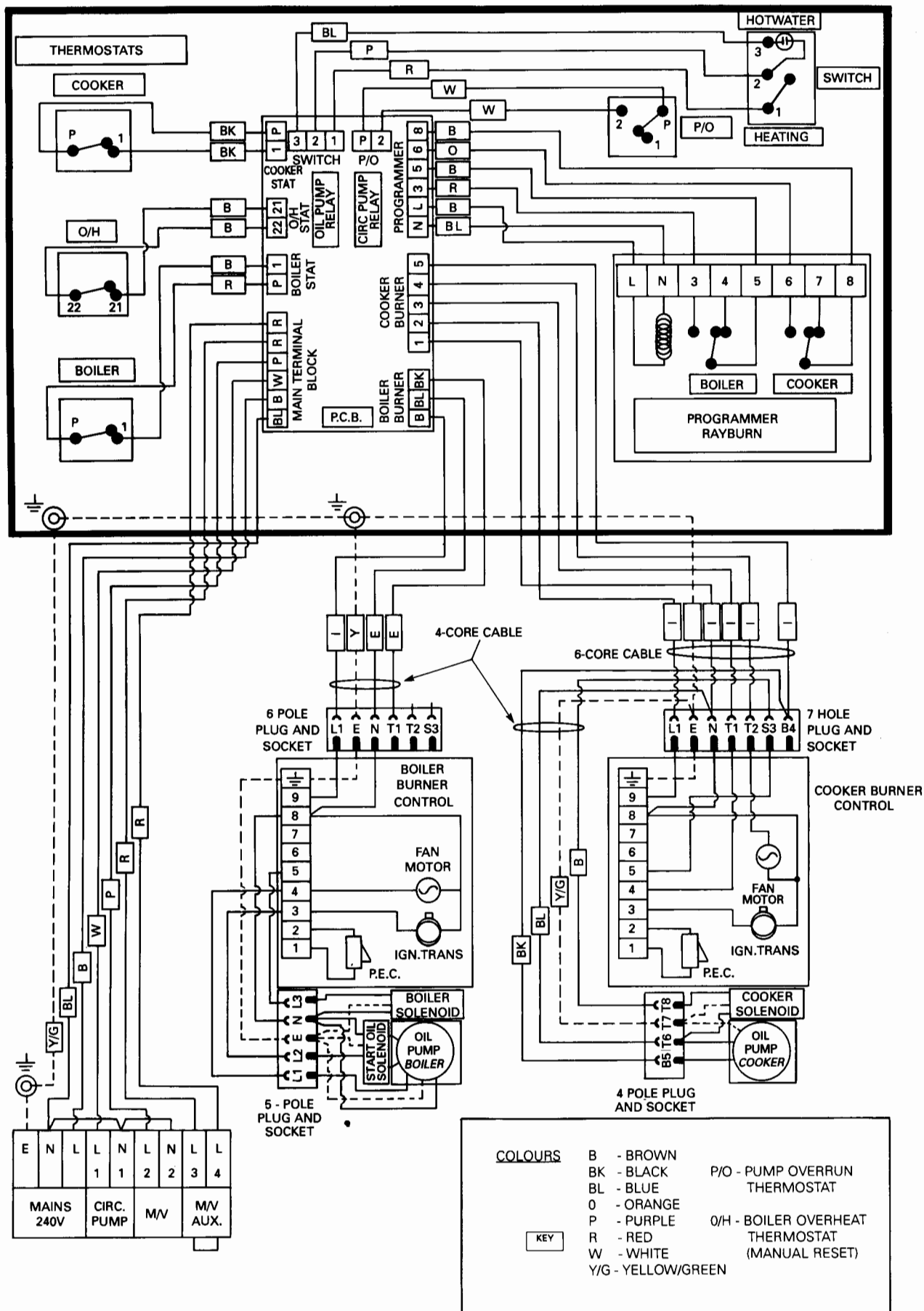
WARNING THIS APPLIANCE MUST BE EARTHED

In the event of an electrical fault after installation of the appliance, preliminary electrical system checks must be carried out i.e. earth continuity, short circuit, polarity and resistance to earth.

For wiring instructions see wiring diagram.

The circulating pump should be connected to L1 and N1 on the terminal block (see Fig. 7) and the cables passed through the grommet in the left hand side panel, at the rear.

For external connections to the motorised valve see Fig. 5 & 6. For ease of access of electrical cables and of oil pipes it is recommended that the oil pump is removed in installation. See removal of Oil pump in COMMISSIONING section.



Wiring Diagram with PCB - Twin Oil Pumps

Installation Instructions

CLEARANCES

The appliance is floor mounted. The space in which the appliance is to be fitted must have the following minimum dimensions.

- Between wall and LH side of appliance - 3mm
 - Between wall and RH side of appliance - 10mm
 - Above the raised insulating cover handle - 60mm
- In addition adequate clearance must be available at the front of the appliance to enable it to be operated and serviced.

PRELIMINARY INSTALLATION

The appliance is delivered in a fully assembled condition with the exception of the following items which are supplied separately packed and require assembly:-

The appliance rear distance bracket.

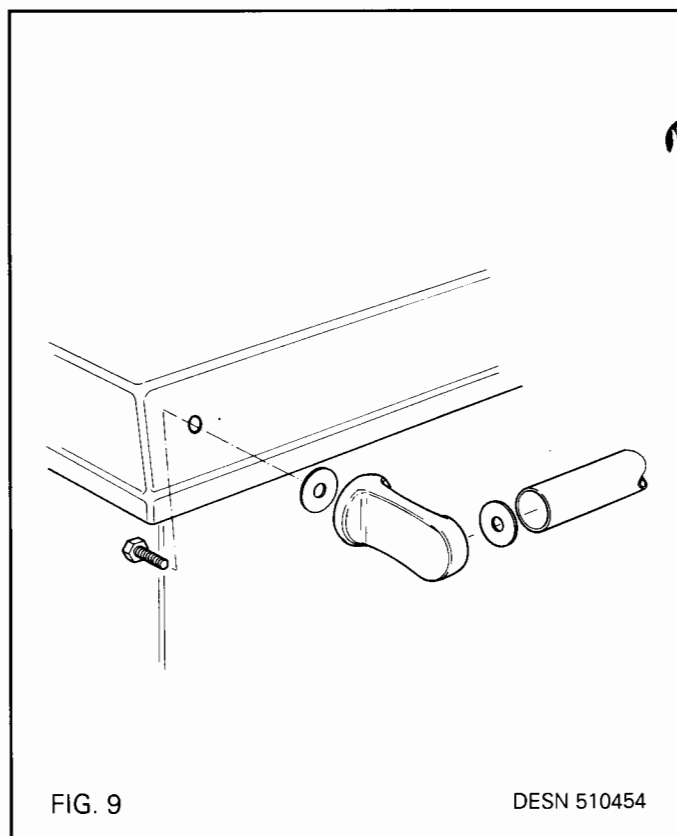
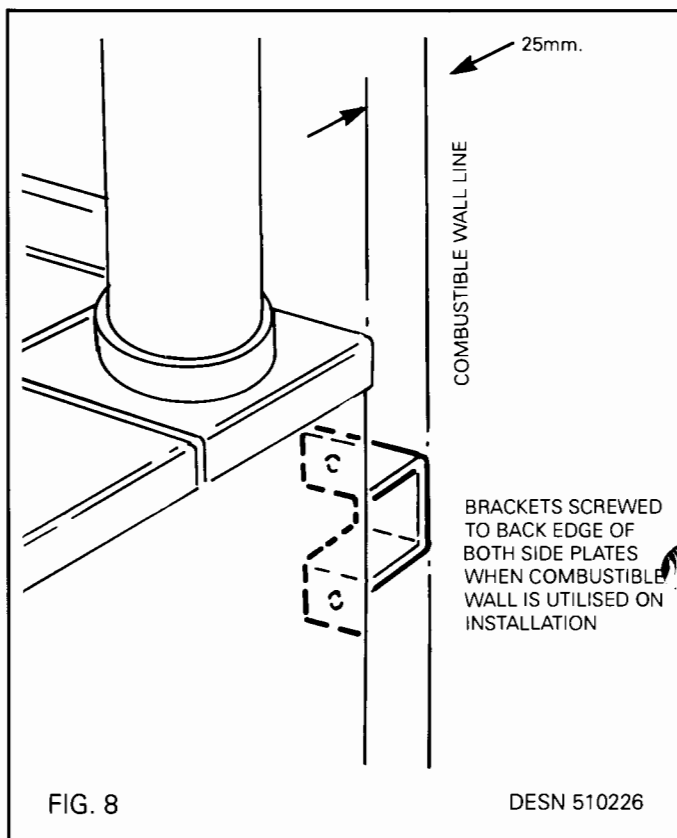
The cooker handrail.

The oil filter, flexible oil feed pipe and the two pipes to connect between solenoids and oil burners.

Appliance rear distance bracket: if the rear wall is of combustible material, there must be an air gap of 25mm between the wall and the rear of the cooker. Fit the rear distance brackets as shown in Fig. 8. Whenever possible it is recommended that the skirting board is removed for the width of the appliance to enable the rear edge of the appliance top plate to make contact with the vertical wall and avoid a rear gap. (Combustible wall excepted).

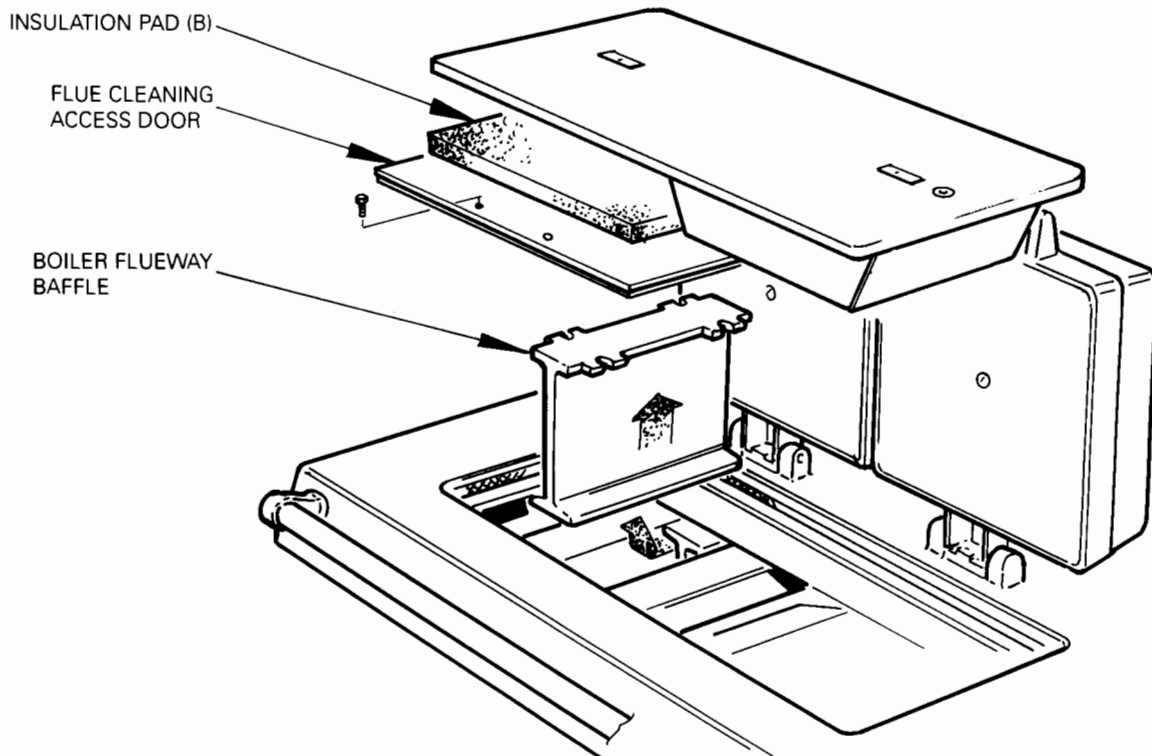
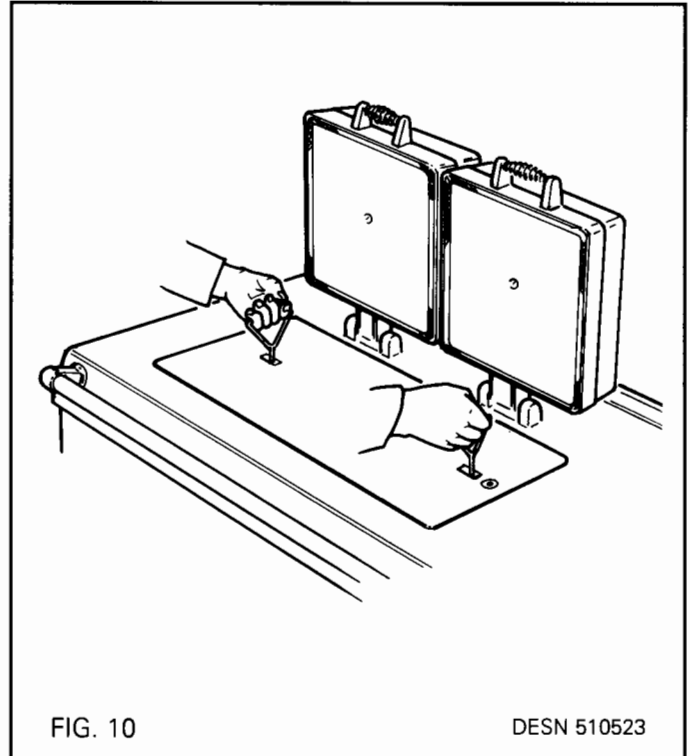
Where the cooker is to stand in a recess or against a wall which is to be tiled, **IN NO CIRCUMSTANCES SHOULD THE TILES OVERLAP THE TOP PLATE.**

The handrail brackets are held on the front edges of the cooker top-plate casting. Remove the travel nuts and replace with the handrail brackets ensuring the fibre protecting washers are in position. Insert the handrail into the brackets, positioning them correctly, and tighten the locating bolts (Fig. 9).



SITE LOCATION

1. Check that the hearth is level, then remove the appliance from its transit wooden pallet, and position it with its back against the wall and in its intended position for flue connection.
2. Locate and fit flue pipe into socket of flue pipe adaptor, sealing joint with fire cement.
3. Connect and terminate the flue system in accordance with standard practice.
4. Lift up the insulating covers and remove the hotplate using lifting hooks provided (See Fig. 10).
5. Remove the insulation pad (B).
6. Remove the 4 flue cleaning access door securing bolts and remove door.
7. Check the position of the boiler flueway baffles.
8. Replace door and refit bolts.
9. Replace insulation pad (B) and the hotplate ensuring that it seals around the edges.



BURNER ACCESS

- SEE FIG. 12.

1. Open the burner access door. Remove door and put in a safe place.
2. Remove 4 inner panel securing screws and remove panel.
3. Remove the 3 plinth securing screws and remove plinth.

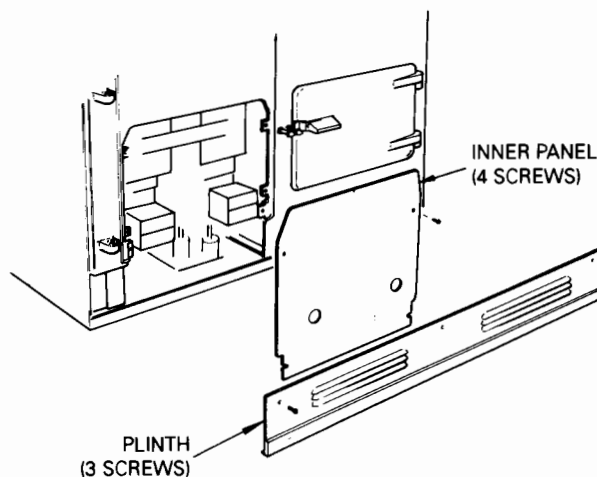


FIG. 12

DESN 510855

OIL PUMP

- SEE FIG. 13 & 14

1. Disconnect the 4-pin plug from the oil pump.
2. Disconnect the 5-pin plug from the second oil pump withdraw the oil pump and complete the electrical wiring.
3. Bring the sensing phial of the fire valve through the grommet in the left hand side panel and place it in the clips provided at the front of the burner chamber.
4. Connect the flexible hose to the outlet pipe from the oil filter

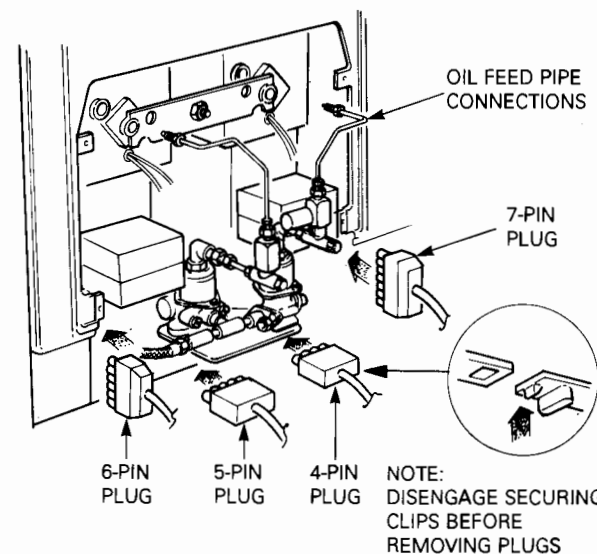


FIG. 13

DESN 510856

BLEED AIR FROM OIL SUPPLY

- SEE FIG. 13 & 14

1. Before connecting the flexible oil pipe to the pump inlet, open the stop valve slowly and run off some of the oil into a receptacle to establish an air free supply to the pump. Make the connection onto the pump oil tight and leave valve open.
2. Re-connect the 4-pin plug to the oil pump.
3. Re-connect the 5-pin plug to the second oil pump. Make the oil pipe connections, from the oil solenoids to the burners, with the two pipes supplied.

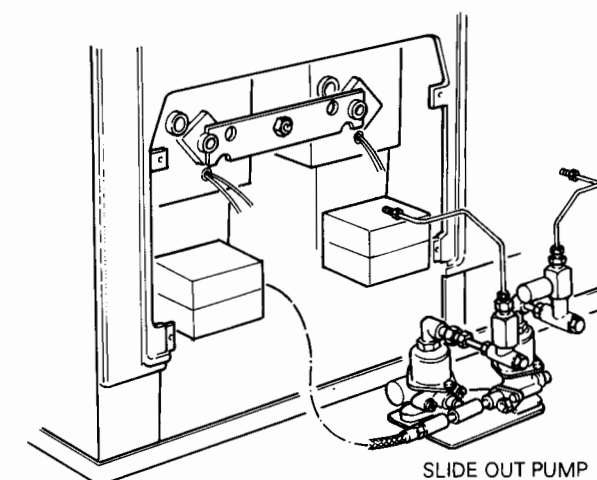


FIG. 14

DESN 510857

Commissioning Instructions

FIT PRESSURE GAUGE

- SEE FIG. 15

Remove the bleed screw from the boiler oil pump and fit an oil pressure gauge to check the pump output pressure.

ELECTRICAL CHECK

Checks to ensure electrical safety should be carried out by a competent person.

Switch on the Electricity

Set the boiler burner time clock switch to continuous and turn the boiler thermostat to maximum. The boiler burner should run on pre-purge for 7 to 15 seconds, with the ignition spark energised. The oil solenoid valve should then open allowing the burner to fire.

Until all the air from the oil pump is flushed out there may be some flame instability resulting in the burner locking out.

This will be shown by the burner stopping and the illumination of the signal light in the reset button of the control box (see Fig. 16). In this event, **wait at least one minute**, then press the re-set button to restart.

VENT OIL PUMP

- SEE FIG. 15

Whilst the burner is running, vent air from the pump by slackening the pressure gauge connection sufficient to allow air to bleed out. When bubble free oil seeps out retighten.

ADJUST OIL PRESSURE

- SEE FIG. 15

Whilst the burner is running check the oil pressure on the pressure gauge. With the boiler burner, wait for 30 seconds after ignition, for the burner to establish full firing rate.

If the pressure gauge is not indicating the correct reading then adjust the pressure by turning the pressure regulator clockwise to increase or anti-clockwise to decrease the pressure until the pressure gauge reads 9.9 bar (144 lb/in²) for the boiler burner.

The air controls of the burners are factory pre-set, however small adjustments may be necessary to suit the site conditions (See Fig. 17).

COOKER PUMP

Repeat sections 'FIT PRESSURE GAUGE', 'ELECTRICAL CHECK', 'VENT OIL PUMP' and 'ADJUST OIL PRESSURE' to 9.0 bar (130lb/in²).

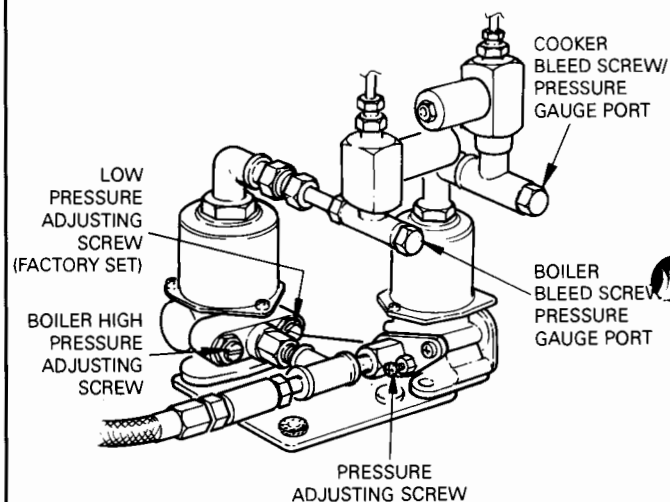


FIG. 15

DESN 510858

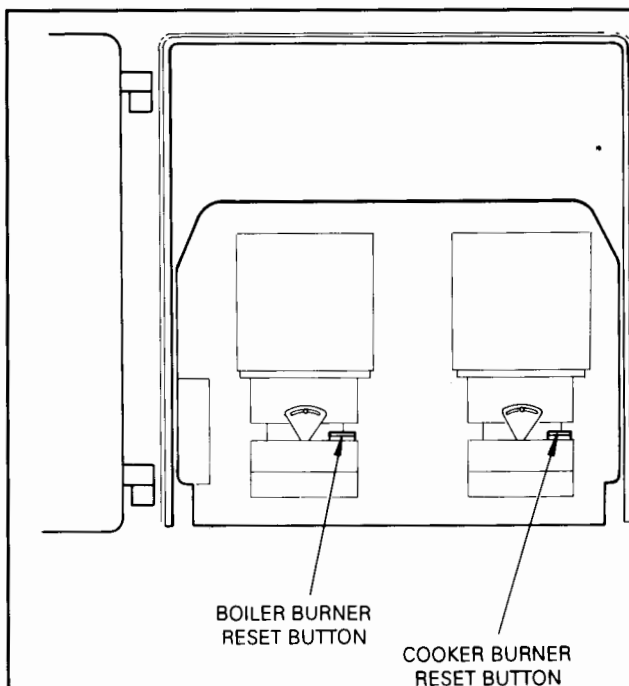


FIG. 16

DESN 510859

SET COMBUSTION AIR

- SEE FIG. 15 & 18

Switch off the burner, remove the pressure gauge and refit the bleed screw.

IMPORTANT: Ensure that the bottom louvred plinth is in place during combustion setting procedures.

Remove the enamelled top cover panel (behind the L.H. insulating cover) and remove the insulation pad A. Remove the plugging screw and insert the sensing end of a portable indicator to check the CO₂ (Carbon Dioxide) level. Adjust the boiler burner air intake until a reading of 12.0% CO₂ is recorded on the indicator.

Check Smoke

Remove the CO₂ sampling tube and using the same hole for flue sampling insert the sensing end of a Baccarach Smoke Pump and check that the smoke in the boiler flue ways does not exceed No. 2 on the scale. Replace the plugging screw, insulation pad and cover panel.

Cooker Burner

Switch off the boiler burner and repeat the procedure with cooker burner. To sample the flue gases from the cooker burner lift up the R.H. insulating cover and remove the countersunk headed screw in the hotplate. The cooker burner should be set to 12.0% CO₂ with a maximum Smoke No. of 2. Replace the countersunk headed screw on completion ensuring that it will not interfere with any pots and pans placed on the hotplate.

When satisfied with combustion check refit burner door inner panel.

Refit outer burner door.

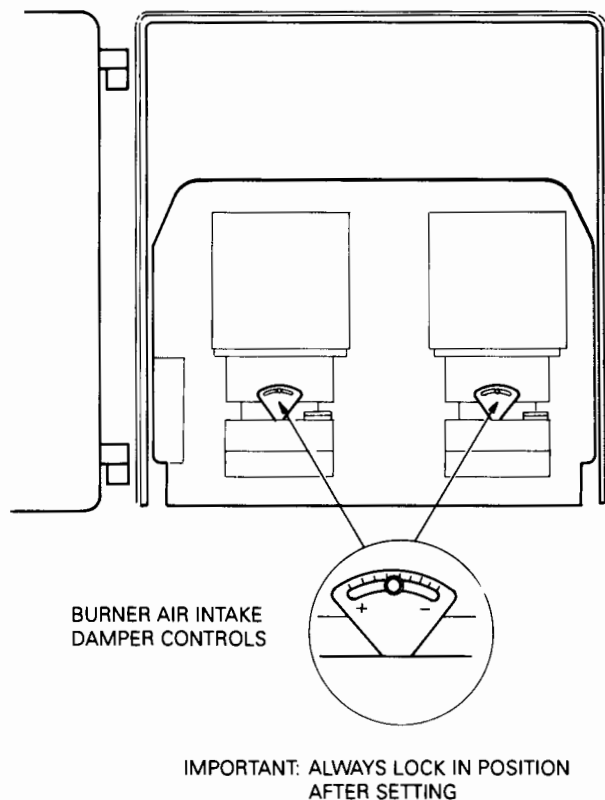


FIG. 17

DESN 510860

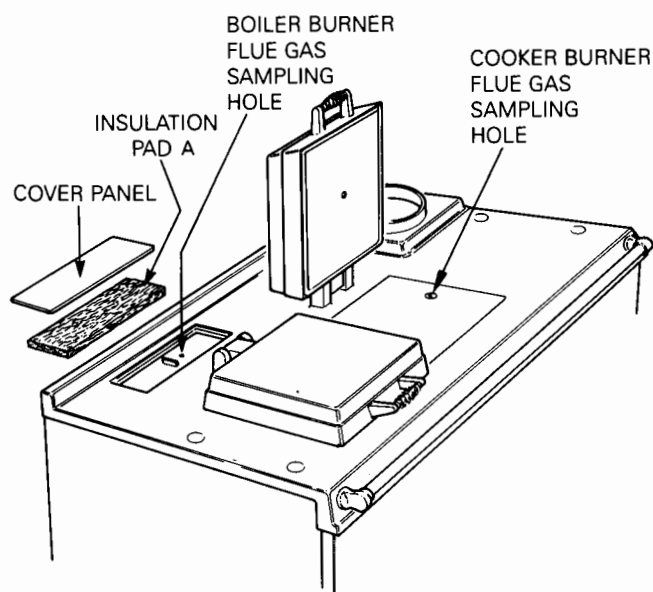


FIG. 18

DESN 510531

Commissioning Instructions

ANCILLARY CONTROLS CHECK

Before leaving the site, check the operation of programmer, control thermostats are working correctly and are capable of controlling the burners correctly. Check the operation of both burner control boxes.

In the event of a flame failure the control boxes should cut off the oil supply by closing the solenoid valves. The reset buttons will then be illuminated.

WAIT 1 MINUTE BEFORE RESETTNG THE CONTROL BOX.

BOILER CONTROL CHECK

Check that:-

1. The boiler system is full of water and all the valves are fully open.
2. The programmer is set to continuous heating and the heating switch set to heating.
3. Ensure that the electricity supply is ON, that the pump, is running and the boiler thermostat is ON.
4. Allow the pump adjuster to maintain a boiler "flow and return" temperature differential of 10°C - 14°C.

Checks must be made by the installer to see that this differential is obtained after the boiler 'Flow' temperature is stabilised.

The system should be balanced by regulating the water flow rate through individual heat emitters to ensure a satisfactory water temperature at each emitter.

5. When the water system reaches working temperature check that the boiler thermostat operates satisfactorily.
6. Examine the system for water soundness. The system should then be turned off and rapidly drained whilst still hot. The system should again be filled and cleared of all air locks. Whilst refilling the system it is recommended that a corrosion inhibitor is added to the feed water.
7. For additional information on sealed system see section SEALED SYSTEMS.

INSTRUCT THE USER

1. Advise the User of the precautions necessary to prevent damage to the heating system and to the building in the event of the heating season being inoperative during frost conditions.
2. Advise the User that, for continued efficient and safe operation of the appliance, it is important that adequate servicing is carried out at regular 12 monthly intervals.
3. Hand the Operating Instructions to the User and demonstrate the correct operation of the appliance and system controls.
4. Leave the Installation and Servicing Instructions with the User.

SEALED SYSTEM REQUIREMENTS

See Fig. 19

a. The installation must comply with the requirements of BS 6798 and BS 449. Maximum water 82°C + 3°C.

b. A safety valve set to operate at 3 bar (45 lbf/in²) shall be fitted in the flow pipe close to the boiler. There must not be any valves between the safety valve and the boiler. The valve should be positioned on a discharge pipe fitted to prevent any discharge creating a hazard to occupants or cause damage to electrical components and wiring.

c. A Pressure gauge covering at least the range 0 to 4 bar (0 to 60 lbf/in²) shall be fitted in the system.

d. A diaphragm type expansion vessel, to BS 4814, shall be connected at a point in the return pipe close to the boiler. The vessel must be chosen to suit the volume of water in the system and the charge pressure must not be less than the static head at the point of connection. Further details can be obtained from "Materials and Installation Specification for Domestic Central Heating and Hot Water" published by British Gas and BS 7074:1.

Sizing table:

Air or Nitrogen charge pressure (bar)	0.5	1.0
Pre-pressurisation pressure (bar)	None 1.0	None 1.5
Expansion vessel volume (litres)	Ax Ax 0.07 0.120	Ax Ax 0.088 0.160

A = System volume (litres)

e. The hot water cylinder shall be either the indirect coil type or a cylinder fitted with a calorifier.

f. Water lost from the system shall be replaced from a make-up vessel and non-return valve, mounted higher than the top of the system on the return side of the cylinder or radiators. Where access to a make-up vessel would be difficult make-up can be provided by pre-pressurisation of the system.

g. The system may be filled from the mains via a temporary hose connection from a draw-off tap supplied from a service pipe under mains pressure, provided that this pressure is acceptable to the local water authority. See Fig. 20.

The following fittings should form from a permanent part of the system and fitted in the order stated. (See Figs. 19 & 20).

(i) a stop valve complying to the requirements of BS1010:2.

(ii) an anti-vacuum valve of a type approved by the National Water Council.

(iii) a non-return valve of an approved type.

h. Fill the system until the pressure gauge registers 1.5 bar (22 lbf/in²). Examine for leaks and rectify where necessary. Refer to the commissioning instructions, switch on the boiler burner and allow the system to reach its maximum working temperature.

Examine for leaks then turn off the boiler.

Drain the system while it is still hot.

Refill, vent and adjust the cold fill pressure to the required value.

Whilst refilling the system it is recommended that a corrosion inhibitor is added to the feed water.

COMMISSIONING

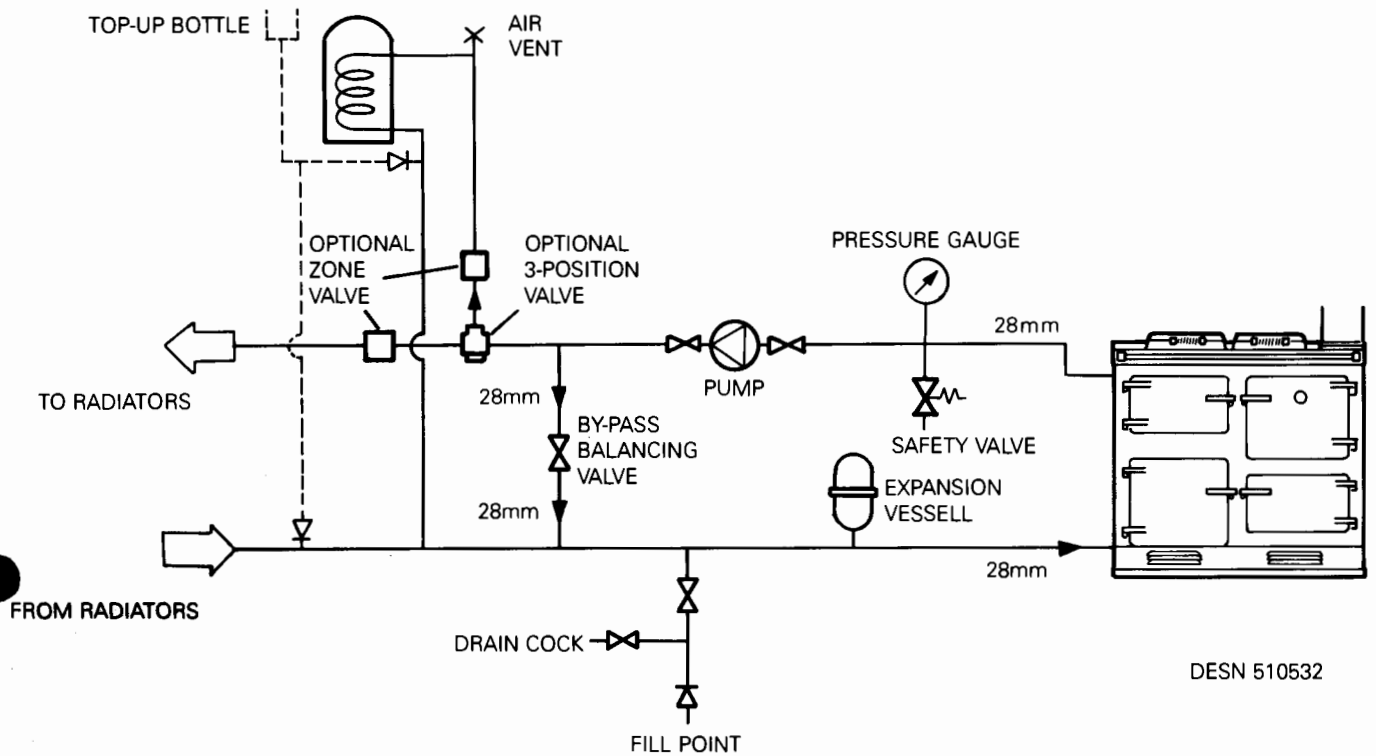
Follow the commissioning instructions as for open vented systems, See Section Commissioning Instructions, with the following additions:

Fill the system until the pressure gauge registers 1.5 bar (22 lbf/in²). Clear any airlocks and check for watertightness.

Check the operation of the safety valve, by allowing the water pressure to rise until the valve opens. The valve should open within ±0.3 bar (± 0.43 lbf/in²) of the pre-set pressure. If this is not possible conduct a manual check and test.

Release cold water to initial filling pressure.

Any set pointer gauge should be set to coincide with the recommended filling pressure.



THE BYPASS BALANCING VALVE SHOULD BE OF A TYPE NON-ADJUSTABLE BY THE HOUSEHOLDER AND MUST HAVE AT LEAST 2.5 METRES OF 28mm PIPE EACH SIDE BETWEEN IT AND THE COOKER BURNER.

ALTERNATIVELY THE BYPASS LOOP CAN INCORPORATE A TOWEL RAIL, CONTROLLED BY A NON-ADJUSTABLE BALANCING VALVE.

THE BYPASS LOOP MUST NOT BE INSULATED

FIG. 19

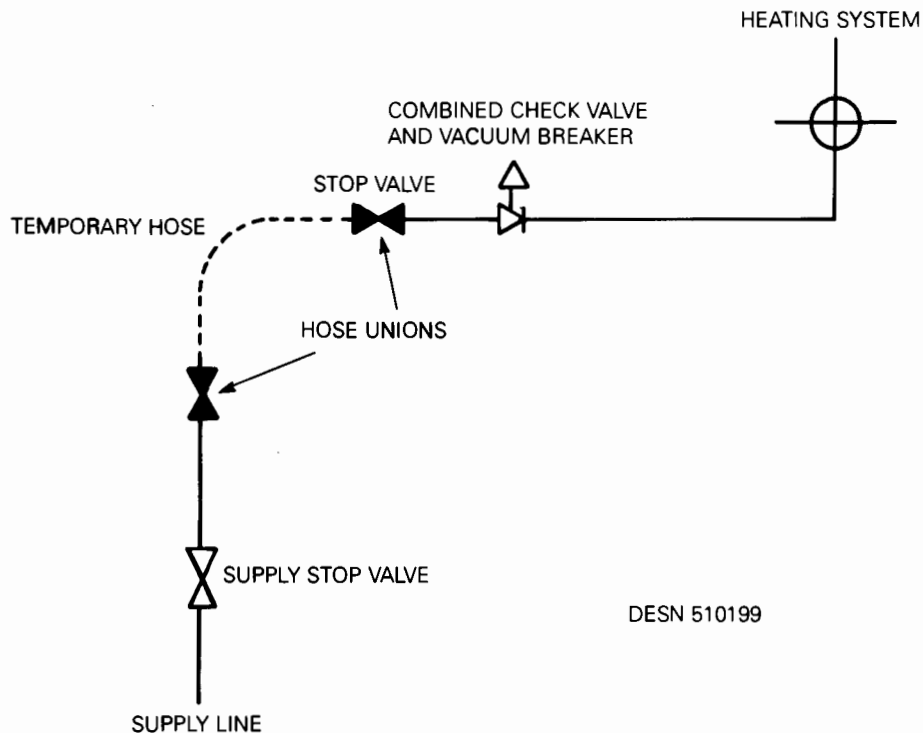


FIG. 20 MAINS FILLING METHOD